



UNIVERSITY OF THE AEGEAN

DOCTORAL THESIS

**DEVELOPMENT OF LINGUISTIC TOOLS TO
INVESTIGATE CONSUMERS' SENSORY PERCEPTION
AND EMOTIONAL RESPONSE TO FOOD**

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**AUTHOR
MALAMATENIA PANAGIOTOU**



**SUPERVISOR
KONSTANTINOS GKATZIONIS**

**DEPARTMENT OF FOOD SCIENCE AND NUTRITION
SCHOOL OF THE ENVIRONMENT
UNIVERSITY OF THE AEGEAN**

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*"My mission in life is not merely to survive, but to thrive;
and to do so with some passion, some compassion, some humor,
and some style."*

2

by Maya Angelou

Abstract

This doctoral thesis contributes to the field of sensory studies with research that specifically regards food consumption and emotion measurement. Its aim is to review the existing emotion lexicon development methods and emotion measurement tools, and to present the compilation of a food-related emotion lexicon in Greek and its application as a measurement tool for food-elicited emotions. This emotion lexicon, developed specifically for the Greek food consumer, is the first of its kind.

The review of word-based emotion lexicons is thorough and critical. The key concepts of emotion lexicon development are presented along with the main aspects of emotion measurement. The available methods and techniques of emotion measurement and statistical analysis of data from word-based questionnaires are presented with their advantages and disadvantages. The alternative emotion measurement method of using emoji instead of words is also presented in short, as it appears to be a new trend.

Even though there are quite a few emotion lexicons in English and other languages, and emotion measurement tools available, a need was diagnosed for such lexicons and tools to be developed in Greek for the Greek consumer. The first step taken to cater for this need was to translate an existing English emotion measurement tool into Greek and test it with Greek consumers. The tool gave satisfactory results, providing statistically significant differences among the tested foods, but the participants reported that many of the emotion words contained felt inappropriate for the task. Thus, the need to develop a lexicon of food-elicited emotion in Greek from scratch emerged.

The process of compiling the lexicon is presented in detail. For this lexicon, no emotion lists were used as there were not any pre-existing available in Greek. Linguistic sources were used, such as dictionaries and thesauri, as well as consumers' -native speakers of Greek- input via questionnaires. What is specifically interesting is the use of the World Wide Web as a corpus and of Instagram as a linguistic source.

The emotion lexicon compiled was then used as a measurement tool with many different food categories to validate that it can provide differentiation among and within categories. It was tested both in online and Central Location Tests studies, with and without actual food tasting and has been proven to be effective. The new Greek tool was then compared to the original English tool and its Greek translation on the same

food categories to check in what ways it provides clearer information as regards the Greek consumer. The new Greek tool was also compared to an existing emoji tool on the same food categories to check similarities and differences, as well as advantages and disadvantages of each method.

Literature for the field of sensory studies is almost exclusively written in English. The need to translate sensory analysis terminology into Greek became soon evident. For this purpose, the translation of the terms was undertaken in parallel to the actual research, using the International Organization for Standardization ISO 5492:2009 as a guide. The task was not easy, as the terminology of the field is used by both professionals and laypeople -consumers that take part in sensory analysis studies. The principles followed were based on ELOT 402 Greek standard for term formation and the translation techniques applied were based on ISO 704:2000. The translation process is presented in detail, as well as issues that arose with specific terms and how they were resolved.

The emotion lexicon developed can be used to measure emotions elicited by foods and beverages in studies with Greek consumers. The emotion terms that each food category and each specific product elicits can be used in product development, on the packaging, and for marketing purposes. The emotion lexicon developed can also be used in consumer studies to investigate demands and needs but also to detect target groups, that is consumer groups that might be interested in a specific product.

The present thesis is written from a linguistic and lexicographical perspective. New trends in linguistics and lexicography have been applied, and the research conducted is an application of specialized lexicography.

Περίληψη

Η παρούσα διδακτορική διατριβή συμβάλλει στο πεδίο των αισθητηριακών σπουδών παρουσιάζοντας έρευνα σχετικά με την κατανάλωση τροφίμων και την μέτρηση συναισθημάτων. Σκοπός της διατριβής είναι να προσφέρει εκτεταμένη κριτική ανάλυση των υπάρχουσών μεθόδων ανάπτυξης γλωσσαρίων συναισθημάτων και γλωσσικών εργαλείων μέτρησης συναισθημάτων που προκαλούνται από την κατανάλωση τροφίμων και ποτών, καθώς και να παρουσιάσει τη διαδικασία ανάπτυξης ελληνικού γλωσσαρίου συναισθημάτων σχετικών με το τρόφιμο και τη χρήση του ως εργαλείο μέτρησης συναισθημάτων που προκαλούνται από την κατανάλωση τροφίμων. Αυτό το γλωσσάριο συναισθημάτων που αναπτύχθηκε ειδικά για τον Έλληνα καταναλωτή είναι το πρώτο στο είδος του.

Η παρουσίαση των υπάρχόντων γλωσσαρίων συναισθημάτων και των γλωσσικών ερωτηματολογίων μέτρησης συναισθημάτων είναι πλήρης και συνοδεύεται από κριτική ανάλυση. Παρουσιάζονται τα βασικά στοιχεία της ανάπτυξης γλωσσικών εργαλείων και της μέτρησης συναισθημάτων. Οι διαθέσιμες μέθοδοι και τεχνικές μέτρησης συναισθημάτων και στατιστικής ανάλυσης των δεδομένων από γλωσσικά εργαλεία παρουσιάζονται με τα προτερήματα και τα μειονεκτήματά τους. Η εναλλακτική της χρήσης ερωτηματολογίων με εικονίδια προσώπου (emoji) αντί λέξεων επίσης παρουσιάζεται εν συντομία, καθώς φαίνεται να είναι η νέα τάση.

Αν και υπάρχουν αρκετά γλωσσάρια συναισθημάτων και διαθέσιμα εργαλεία μέτρησης συναισθημάτων στα Αγγλικά και σε άλλες γλώσσες, διαγνώστηκε η ανάγκη να αναπτυχθούν τέτοια γλωσσάρια και εργαλεία στα Ελληνικά για τον Έλληνα καταναλωτή. Το πρώτο βήμα για την κάλυψη αυτής της ανάγκης ήταν να μεταφραστεί υπάρχον Αγγλικό εργαλείο στα Ελληνικά και να ελεγχθεί η εφαρμογή του με Έλληνες καταναλωτές. Το εργαλείο έδωσε ικανοποιητικά αποτελέσματα, καθώς έδωσε διαφοροποίηση μεταξύ των τροφίμων που ελέγχθηκαν, αλλά οι συμμετέχοντες ανέφεραν ότι πολλές από τις λέξεις-συναισθήματα που περιλαμβάνονταν στο εργαλείο ήταν ακατάλληλες για τρόφιμα. Έτσι, προέκυψε η ανάγκη να αναπτυχθεί γλωσσάριο συναισθημάτων στα Ελληνικά εξ αρχής.

Η διαδικασία δημιουργίας του γλωσσαρίου παρουσιάζεται σε λεπτομέρεια. Για το γλωσσάριο αυτό, δεν χρησιμοποιήθηκαν προϋπάρχουσες λίστες συναισθημάτων, καθώς δεν υπήρχαν για την ελληνική γλώσσα. Χρησιμοποιήθηκαν γλωσσικές πηγές,

όπως λεξικά και θησαυροί, αλλά και δεδομένα από καταναλωτές -φυσικούς ομιλητές της Ελληνικής- που συλλέχθηκαν μέσω ερωτηματολογίων. Το ιδιαίτερα ενδιαφέρον στοιχείο της μεθοδολογίας είναι η χρήση του Παγκόσμιου Ιστού ως σώμα κειμένων και του Instagram ως γλωσσικής πηγής.

Το γλωσσάριο συναισθημάτων που δημιουργήθηκε χρησιμοποιήθηκε στη συνέχεια ως εργαλείο μέτρησης συναισθημάτων με διάφορες κατηγορίες τροφίμων ώστε να ελεγχθεί η ικανότητά του να διακρίνει μεταξύ διαφορετικών κατηγοριών τροφίμων και μεταξύ τροφίμων της ίδιας κατηγορίας. Το εργαλείο ελέγχθηκε και σε διαδικτυακές έρευνες και σε έρευνες με φυσική παρουσία, με και χωρίς γευστική δοκιμή τροφίμου και αποδείχτηκε αποτελεσματικό. Το νέο ελληνικό εργαλείο στη συνέχεια συγκρίθηκε με το αγγλικό εργαλείο και την ελληνική του απόδοση στις ίδιες τροφικές κατηγορίες σε Έλληνες καταναλωτές. Το νέο ελληνικό εργαλείο επίσης συγκρίθηκε με υπάρχον εργαλείο με εικονίδια προσώπου (emoji) αντί λέξεων στις ίδιες τροφικές κατηγορίες, ώστε να ελεγχθούν ομοιότητες και διαφορές, καθώς και πλεονεκτήματα και μειονεκτήματα κάθε μεθόδου.

Η βιβλιογραφία για το πεδίο των αισθητηριακών σπουδών είναι σχεδόν εξ ολοκλήρου στα Αγγλικά. Η ανάγκη να αποδοθεί η ορολογία του πεδίου της αισθητηριακής ανάλυσης στα Ελληνικά διαπιστώθηκε εξ αρχής. Για τον σκοπό αυτό χρησιμοποιήθηκε το Διεθνές Πρότυπο ISO 5492:2009 ως οδηγός. Το εγχείρημα δεν ήταν εύκολο, καθώς η ορολογία του πεδίου χρησιμοποιείται και από επαγγελματίες του χώρου, αλλά και από μη ειδικούς -καταναλωτές που συμμετέχουν σε έρευνες αισθητηριακής ανάλυσης. Οι αρχές που ακολουθήθηκαν βασίστηκαν στο ελληνικό πρότυπο για τον σχηματισμό όρων ΕΛΟΤ 402 και οι μεταφραστικές τεχνικές που αξιοποιήθηκαν είχαν βάση το Διεθνές Πρότυπο ISO 704:2000. Η διαδικασία απόδοσης της ορολογίας του πεδίου παρουσιάζεται σε λεπτομέρεια, όπως και θέματα που προέκυψαν με συγκεκριμένους όρους και πώς αυτά αντιμετωπίστηκαν.

Το γλωσσάριο συναισθημάτων που αναπτύχθηκε μπορεί να χρησιμοποιηθεί για τη μέτρηση συναισθημάτων που προκαλεί η κατανάλωση τροφίμων σε Έλληνες καταναλωτές. Οι όροι-συναισθήματα που προκαλεί κάθε τροφική κατηγορία και κάθε συγκεκριμένο προϊόν μπορούν να αξιοποιηθούν κατά τη διαδικασία παραγωγής προϊόντων, στη συσκευασία και για προωθητικούς σκοπούς. Το γλωσσάριο που δημιουργήθηκε μπορεί επίσης να χρησιμοποιηθεί σε μελέτες καταναλωτή για τη

διερεύνηση προτιμήσεων και αναγκών, αλλά και για τον εντοπισμό ομάδων-στόχων, δηλαδή ομάδων καταναλωτών στους οποίους θα μπορούσε να απευθύνεται ένα προϊόν.

Η παρούσα διατριβή γράφτηκε υπό γλωσσολογική και λεξικογραφική οπτική. Στην έρευνα που διεξήχθη εφαρμόστηκαν νέες τάσεις στη γλωσσολογία και τη λεξικογραφία και η εργασία αυτή αποτελεί εφαρμογή της λεξικογραφίας για ειδικούς σκοπούς.

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I hope that as a working mother and wife, as a researcher, and as an educator, I have inspired my children, other women in my community, and my students to dream big, to stay focused on fulfilling their dreams, to be life-long learners, to never stop working on themselves, and to be open to challenges. I believe that the reason for our existence is to cultivate our talents and give the fruits back to our community; to **RISE BY LIFTING OTHERS!**

Table of contents

1	Introduction	18
1.1	Lexicography: new trends and applications	18
1.2	Terminology.....	19
1.3	The human senses, language, and food.....	19
1.4	Sensory studies: Profiling of foods and beverages	21
1.4.1	Sensory Linguistics and Sensory adjectives	21
1.4.2	Sensory profiling	27
1.5	Emotions, language, and food.....	28
1.6	Aim and methodology of the present research.....	28
1.7	Overview of the present thesis.....	29
2	Literature review of explicit self-report word-based emotion lexicons	34
2.1	Lexicon development.....	34
2.1.1	Language and Culture, translatability of emotions and emotion words.....	40
2.1.2	Emotion terms collection and identification - sources of terms:.....	42
2.1.3	Developing food- and non- food-specific emotion lexicons.....	49
2.1.4	Criteria for term selection	50
2.1.5	Lexicon: word class, form, and number of terms	52
2.1.6	Dimensions of emotion often depicted in food-related lexicons: valence and arousal	53
2.2	Emotional profiling: implicit and explicit	55
2.2.1	Word-based lexicons.....	56
2.2.2	Emoji-based lexicons.....	58
2.3	Conclusions.....	59
3	Emotion measurement – Questionnaire design	62
3.1	Clusters versus terms.....	62
3.2	Language as context in emotion measurement	65
3.3	Ordering of terms	65
3.4	What is measured? What are the participants expressing?	65
3.5	Stimuli selection for emotion measurement.....	67
3.6	Time of emotion measurement when tasting is involved.....	68
3.7	Context and setting of emotion measurement	68
3.8	Response formats and statistical analysis per response format for lexicon development and emotion measurement	69

3.8.1	Free listing of terms	70
3.8.2	CATA.....	70
3.8.3	Rating scales and rating lines.....	71
3.8.4	RATA.....	72
3.9	Emotions and overall liking as inter-complementary measurements and the position of overall liking/acceptability question in emotion questionnaire.....	72
3.10	Creating consumer-led emotion and sensory lexicons, linking emotions and sensory attributes	74
3.11	Demographic data	75
3.12	The alternative of emoji questionnaires as emotion measurement tools.....	76
3.13	Conclusions.....	81
4	Emotion lexicons in Greek	83
4.1	Introduction.....	83
4.2	The process of translating an emotion measurement tool from English into Greek and using it with Greek consumers.....	86
4.2.1	Introduction	86
4.2.2	Materials and methods	86
4.2.3	Results	87
4.2.4	Discussion	88
4.3	The process of developing an emotion lexicon in Greek and using it as an emotion measurement tool.....	88
4.3.1	Materials and methods with results per stage	88
4.3.2	Results and statistical analysis of validation process	100
4.3.3	Discussion	109
4.4	Comparison of tools: original EsSense Profile, translated EsSense Profile into Greek, original Greek tool.....	111
4.4.1	Materials and Methods	111
4.4.2	Statistical analysis	112
4.4.3	Results	112
4.4.4	Discussion	121
4.5	Comparison of Greek word-based tool and emoji tool on six foods online and on olive oils in CLTs	123
4.5.1	Emoji tool online study across food categories	123
4.5.2	Emoji versus emotion word tool in CLT within food category: the case of olive oils	135
4.5.3	Discussion	136

4.6	General conclusions	139
5	Sensory analysis vocabulary into Greek	141
5.1	The term “sensory” in English	141
5.2	How the term “sensory” is translated into Greek	141
5.3	Grouping the translational equivalents of the term “sensory”	141
5.4	Definitions of the Greek translational equivalents of the term “sensory”	141
5.5	Final proposal for the translation of the term “sensory linguistics” and the key terms/ notions of the field into Greek for validation and standardization	142
6	Translating the ISO 5492:2009 for sensory analysis vocabulary into Greek.....	146
6.1	Distinction between general and technical language.....	146
6.2	The process of translating the sensory analysis vocabulary into Greek	147
6.2.1	Translation techniques based on ISO 704:2000 and ELOT 402 Greek standard for term formation	148
6.2.2	Principles based on ELOT 402 Greek standard for term formation	148
6.3	Issues that arose during the process of translating sensory analysis terminology into Greek and how they were resolved	149
6.3.1	Putting part of the term in parentheses to differentiate similar concepts ...	149
6.3.2	Forming new terms in analogy to existing ones	149
6.3.3	Using existing forms and attaching a new meaning	150
6.3.4	Using the definition in the term.....	151
6.3.5	Transliterating English terms into Greek.....	152
6.3.6	Various other cases of neologism formation.....	152
6.4	Conclusion	153
7	Conclusion.....	154
7.1	Research aims.....	154
7.2	Research findings.....	154
7.2.1	Findings from the systematic review of existing emotion lexicon development methods and emotion measurement tools.	154
7.2.2	Findings from translating an emotion measurement tool and using it with Greek consumers	155
7.2.3	Findings from developing an original Greek emotion lexicon and testing it with consumers.....	155
7.2.4	Findings from comparing the new Greek tool with the translated emotion measurement tool.	157
7.2.5	Findings from comparing the new Greek emotion measurement tool with an emoji measurement tool.....	158

7.2.6	Findings from translating sensory analysis terminology into Greek.....	158
7.3	Limitations.....	159
7.4	Conclusions and Future perspectives	159
Appendix A: Research - Questionnaire samples		162
Appendix B: Publications		173
Bibliography.....		292

List of tables (with hyperlinks)

[Table 1: Studies on the senses, emotions, and food.](#)

[Table 2: Schematic review of food-related emotion lexicon development studies and their methodology features.](#)

[Table 3: Universally applied and optional criteria, applied in some studies, for term selection during emotion lexicon development.](#)

[Table 4: Available and recommended \(indicated with +\) options regarding food-related stimuli, the form of the emotion lexicon list, and the response format questionnaire, according to the aim of study.](#)

[Table 5: Frequency of selection of food-related emotions by consumers during the term identification process.](#)

[Table 6: Description of case studies used in the validation arm of the emotion lexicon list and emotion measurement tool.](#)

[Table 7: Example of within food category discrimination ability of the developed tool: the liking scores of cracker samples and the frequency of selection of the most frequently selected emotions per sample.](#)

[Table 8: Example of across food categories discrimination ability of the developed tool: the rating scores of emotions on 5pt scales per food category are presented.](#)

[Table 9: Summary of SL means from ANOVA of study 6. Emotions that provide discrimination between foods are given in bold. 23 out of 33 emotions are statistically significant](#)

[Table 10: Reliability analysis and internal consistency test for study 6 \(Cronbach's alpha statistics\).](#)

[Table 11: Deleted items for Cronbach's alpha statistics for study 6; test performed to check internal consistency of the developed emotion measurement tool.](#)

[Table 12: Covariance matrix from Reliability Analysis of developed emotion measurement tool for study 6.](#)

[Table 13: Correlation matrix from Reliability analysis of developed emotion measurement tool for study 6](#)

[Table 14: Emotion terms of EsSense Profile, translated EsSense Profile into Greek, and Greek tool.](#)

[Table 15: Top 20 terms for translated EsSense Profile and Greek tool.](#)

[Table 16: Mean scores \(5pt Likert scales\) and difference intervals of the 13 common terms for the translated EsSense Profile \(E.P.\) in Greek, and the Greek tool..](#)

[Table 17: Summary of LS means table from the ANOVA for the emoji tool online testing: the food categories seem to have similar emotional profiles that consists of five intense positive emotions \(highlighted in red, oranges, and yellows\) and five negative emotions of low intensity \(highlighted in greens and blues\).](#)

[Table 18: Reliability analysis and internal consistency test for emoji tool \(Cronbach's alpha statistics\).](#)

[Table 19: Deleted items for Cronbach's alpha statistics for emoji tool; test performed to check internal consistency of the emoji-based measurement tool.](#)

[Table 20: Covariance matrix from Reliability Analysis of the emoji-based measurement tool.](#)

[Table 21: Correlation matrix from Reliability Analysis of the emoji-based measurement tool.](#)

[Table 22: Demographic data on gender, age, and level of education of participants per frequency of use of emoji \(3-a lot, 2-a bit, 1-not at all\) of the emoji-based measurement tool online testing case study.](#)

[Table 23: Emotions elicited by olive oil samples under blind and informed conditions.](#)

[Table 24: Definitions of the term "sensory" in English dictionaries.](#)

[Table 25: Translational equivalents of the term "sensory".](#)

[Table 26: Definitions of the Greek translational equivalents of the term "sensory".](#)

List of figures (with hyperlinks)

[Fig.1: Emotion lexicon development sources.](#)

[Fig.2: Food-evoked emotion words that appear in EsSense Profile, EsSense25, EmoSemio, Empathic Food Test, and Global Profile. The larger the font, the more frequent the word.](#)

[Fig.3: Emoji and their description.](#)

[Fig. 4: Emoji, their names, and their meanings as retrieved from internet sources.](#)

[Fig.5: Stages and sources of emotion lexicon compilation and validation.](#)

[Fig.6: Emotion terms collected and checked for food consumption relatedness during the various stages of term collection and identification.](#)

[Fig.7: Screenshots of searching for the emotion terms as hashtags in posts on Instagram. Patterns of specific foods and emoji/emoticons collocating with specific terms also helped in grouping the terms as positive or negative.](#)

[Fig.8: Principal Component Analysis of terms \(factors 1 and 2\). The red dots represent active variables. Terms grouped as positive, negative, and neutral.](#)

[Fig.9: Correlation map from Reliability analysis of developed emotion measurement tool for study.](#)

[Fig.10: PCA for terms of the translated EsSense Profile \(Factors 1 and 2\).](#)

[Fig.11: Active variables for translated EsSense Profile \(PCA for foods\).](#)

[Fig.12: Active variables for Greek tool \(PCA for terms\). Terms grouped as positive, negative, and neutral.](#)

[Fig.13: Active variables for Greek tool \(PCA for foods\).](#)

[Fig.14: Scree plot from PCA for emoji tool online testing: one main component was exported that explained 66.35% of the variation.](#)

[Fig.15: Active variables from PCA for emoji tool online testing: all foods were grouped together except fried chicken.](#)

[Fig.16: Scree plot from PCA of emoji tool online testing: two main factors were extracted that explained 57.6% of the variation.](#)

[Fig.17: Active variables from the PCA of emoji tool online testing.](#)

Fig.18: Summary of LS means from ANOVA of emoji tool online testing: 13 out of 33 emoji were statistically different.

Fig.19: Covariance map from Reliability Analysis of the emoji-based measurement tool.

1 Introduction

1.1 Lexicography: new trends and applications

Lexicography is the scientific field that deals with monitoring, collecting, selecting, analyzing, and describing in a dictionary a set of lexical units of one or more languages; it is the craft of compiling lexicons (Κουτσομπάρη et al., 2011). Lexicography has historically evolved alongside Language since its origins are documented in ancient civilizations.

In the modern digital world, lexicography has had to adjust its tools and re-invent itself. New branches have sprung, such as computational/electronic lexicography to handle electronic corpora and produce electronic dictionaries, and specialized lexicography to handle terminology of various scientific fields and foreign language learners' educational needs. Lexicographic tools have also found applications in: a) Natural Language Processing, which focuses on the understanding and generation of human language by computers (Paraiso-Medina et al., 2019), and b) sentiment analysis and opinion mining in Online Social Media, meaning the tasks of classifying a piece of text with respect to its sentiment, which can be positive, negative, or neutral (Tsakalidis et al., 2018).

More specifically, as regards corpora in lexicography, they perform their traditional functions – explaining meanings, giving examples of usage, and describing syntactic behavior – more effectively than was previously possible. But additionally, the use of corpora has made more detailed and systematic coverage of phenomena, such as pragmatics, register, and collocation, possible (Rundell & Granger, 2007). With regard to specialized lexicography, dictionaries for specific purposes are usually compiled by non-linguists with no lexicographical training, are mainly prescriptive in nature, and rarely corpus-based (Norman, 2002).

The use of corpora in lexicography, specialized lexicography, and the lexicographical applications in Natural Language Processing and sentiment analysis/opinion mining in Online Social Media are of particular interest in the present thesis. For the purposes of the research presented here, the World Wide Web (the Web) and Instagram, the popular social media platform, have been used as corpora for data collection and the identification of linguistic patterns. In addition, the emotion lexicon compiled (presented in chapter 4) is a product of specialized lexicographic work. The data

collected and the emotion lexicon compiled can find applications in Natural Language Processing tools, sentiment analysis, and opinion mining.

1.2 Terminology

It is important for scientists to be able to communicate in their native language. It is also important to produce knowledge in national languages. Studying the existing literature for the field of sensory linguistics and sensory analysis made the need for standardized terminology in the Greek language evident.

Terminology is defined as: 1) the discipline concerned with the principles and methods governing the study of concepts and their designations (terms, names, symbols) in any field of knowledge, and the job of collecting, processing, and managing relevant data, and 2) the set of terms that belong to the special language of an individual field of knowledge (Valeontis & Mantzari, 2006).

Term handling is a standardized process that follows specific principles and applies specific techniques regardless of the working language. For Greece, the national organization for standardization in Terminology is ELOT whose committee TE21 is the respective of TC37 of the International Organization for Standardization (ISO). ELOT develops the Greek standards and greatly supports the Greek language in Terminology, given that it is a language with a small number of natives speakers in the world of scientific and technical communication, that has not yet developed adequate conventions and terminology tools for socio-economic and historical reasons (Κατσογιάννου & Τοράκη, 2011). ELOT also deals with the compilation of lexicons of terms for the systematic analysis, codification, presentation, and definition of terms, thus describing and documenting a field.

Lexicography and Terminology both deal with the lexical unit, but in a different way: the former names it word or phrase and is word-oriented, while the latter names it term and is concept-oriented (Κουτσομπάρη et al., 2011).

1.3 The human senses, language, and food

Various theories have been proposed as regards the number of the human senses and their classification. Some of them, such as the theory of Stoffregen & Bardy (2001), do not accept any classification at all on the grounds that the stimuli are received multimodally at the same time (Stoffregen & Bardy, 2001). Other theories propose that smell and taste should be considered as one sense as they interact very closely (e.g.,

(Spence et al., 2014). Scientists need classifications to facilitate analysis, but this does not mean that the actual senses need to obey such categorization processes [paraphrasing (Winter, 2019b)]. When confronted with a multisensory object such as food with congruent sensory inputs, individuals experience a unified emotion without differentiating the individual senses -this is especially true for the chemical senses- that contributed to it as food is a unified emotional experience (Dantec et al., 2021).

There are also mentions of other senses apart from the commonly accepted five, such as the sense of space [e.g., (Talmy, 1983)], pain [e.g., (von Frey, 1894)], and intuition [e.g., (Hill, 1980)]. Nevertheless, the traditional Aristotelian model of the five senses is still used to make everyday communication and scientific research easier.

According to the theory of embodiment, cognition and language are constructed by our constant encounter and interaction with the world via our bodies (through our senses) and brains [(Gallese & Lakoff, 2005), qtd in (Winter, 2019b)]. This theory is the basis for the Embodied Lexicon Hypothesis (Winter, 2019b), according to which language reflects perception. Thus, language, perception, and cognition are communicating vessels and the aim is to explore the way in which speakers of different languages and different cultures use language to describe experiences, smell, taste, texture, and sound (Caballero & Paradis, 2015).

There are a lot of studies -mainly in the English language- on the way the senses are experienced and expressed, for example on: touch [e.g., (Popova, 2009)], colors [e.g., (Berlin & Kay, 1969)], music and how it can affect our taste (Spence & Deroy, 2013), taste [e.g., (Muehleisen & Backhouse, 1996)], smells in combination to shapes (Hanson-Vaux et al., 2013), perfumes [e.g., (Manetta et al., 2007)], pain [e.g., (Johnson et al., 2016; Λασκαράτου, 2012)], sound in combination to taste and touch (Sakamoto & Watanabe, 2016).

The senses are especially important to the process of food consumption. All of them but especially taste and smell participate in the perception and enjoyment of food. The cuisines of cultures have evolved to fit the tastes of their communities, and individuals learn throughout their lifetime what they like or do not like in terms of food (Winter, 2016). The whole food consumption experience such as its objective description, its subjective assessment, and the emotions that it elicits are a favorite conversation topic for people regardless of culture. Food is very often the topic and reason of

communication. The need to eat and the need to communicate can both be seen as basic human essentials, and they may also both be approached as semiotic systems, engaging sensually embodied forms in the expression of socio-culturally situated meanings (Cavanaugh et al., 2014). The way food is described, and the way people express themselves as regards food differ across cultures but also within culture.

1.4 Sensory studies: Profiling of foods and beverages

During the past few decades, a new scientific field has emerged, that of sensory studies, dealing with the study of the senses and of the human reactions – physiological, cognitive, emotional- to anything from food and medicine to cosmetics and cars. The aim is to develop products and provide services in a focused and successful way, as well as to promote them effectively. The field of sensory studies makes use of scientific branches such as food science, linguistics, psychology, medicine, statistics, trade, advertising, and many others. Within the framework of today’s technological advances and consumers’ demands for immersive experiences, with the Internet of Things and the Internet of Senses under development, investigating consumers demands and needs through tests and questionnaires or through opinion mining and sentiment analysis in social media, attracts the interest of industry and is done by using tools developed from academic and theoretical studies. What is also essential is to detect target groups of consumers interested in a specific product and this is done by using demographic data as well. A field that has a lot to offer to these studies is linguistics.

1.4.1 Sensory Linguistics and Sensory adjectives

“Sensory linguistics” is the field that studies the ways in which language is related to the senses and attempts to answer questions such as: how is what we perceive through the senses grouped into words? which physical features are easier to express through words? how are languages different in the way they encode what is perceived through the senses? how are words linked to the cognitive systems in our brain? (Winter, 2019a).

Key to the field of sensory linguistics is the “theory of embodiment” or else “the embodied lexicon hypothesis” according to which language depicts perception as cognition and language are constructed through constant interaction with the environment through our body (our senses) and our brain (Diederich, 2015; Winter, 2019a).

What has already been studied is how many words there are relative to specific senses per language (Viberg, 1983), how often we talk about each sense (San Roque et al., 2015) and how metaphor¹ (de Ullmann, 1945; Williams, 1976) and iconicity² (Dingemanse, 2012; Marks et al., 1978) are used to achieve reference to the physical world around us (Winter, 2019a).

There are also linguistic studies, the so called “sensory norms”, that deal with the semantic mapping of words related to the senses as regards valence, i.e., if a word is considered positive or negative, sensory modality, and sensory exclusivity, i.e., which senses participate to the perception of a specific attribute or action and to what degree, etc.

Linguistic studies of the senses use various sources, such as dictionaries, thesauri, corpora, the Internet, and consumers, as well as various methods, such as semiotic analysis and frame semantics, and deal with verbs, nouns, and adjectives. Most sensory-related studies seem to focus on adjectives since they are descriptors that combine objective and subjective evaluation. These adjectives are called “sensory adjectives” and are the parts of speech that attribute features as they are perceived through the senses, like attributes of taste, warmth, texture etc. (Diederich, 2015; Winter, 2019a).

Adjectives are the word class that describes properties. Sensory adjectives are those adjectives that are about sensory content (Dieterich, 2015). Our queries regarding the senses, culture, and language fall within the scope of sensory adjectives studies. Since 2010, sensory and emotional language has been theoretically and empirically studied in relation to food. Table 1 presents such studies.

¹ Metaphor, and more specifically within the field of sensory linguistics “synaesthetic metaphor”, is the usage of properties perceived through a specific sense to describe a notion that belongs to a different sense, i.e., harsh sound (harshness is perceived through touch while sound is perceived through hearing).

² Iconicity is the way of attributing meaning when the word depicts reality as is the case with sound (onomatopoeic) words (e.g., barking), in contrast to symbolism when there is no real connection to the referred object (e.g., dog).

Table 1: Studies on the senses, emotions, and food

reference reference	theoretical (T) / empirical (E)	language	senses (S) / emotions (E)	foods
(Baker et al., 2014)	E	English	S	caviar
(Bhumiratana et al., 2014)	E	English	E	coffee
(Caballero & Paradis, 2015)	T			
(Cavanaugh et al., 2014)	T	English		
(Carolina Chaya et al., 2015)	E	English	E	beer
(Davidson & Sun, 1998)	T+E	English	S	peanuts
(Diederich, 2015)	T+E	English + German	S	meat, poultry, vegetables, fruit
(Eaton et al., 2019)	T+E	English	E	beer
(Fenko et al., 2010)	T+E	English + Dutch+ Russian	S	
(Galán-Soldevilla et al., 2005)	E		S	flower honey
(Giboreau et al., 2007)	T+E	English + French	S	biscuits, cream desserts, foods (in general)
(Gmuer et al., 2015)	T+E	German	E	
(Gunaratne et al., 2019)	E	English	E	chocolate
(Hretcanu et al., 2016)	E	Romanian	S	soy-added beef hamburger
(Kim et al., 2018)	T+E	Korean	S	tea
(King & Meiselman, 2010)	T+E	English	E	various
(Koch et al., 2012)	E	English	S	Rooibos tea
(Lagast et al., 2017)	T	English	S + E	various
(Lawless & Civille, 2013)	T+E	English		foods, beverages
(Lee & Kwon, 2007)	T+E	Korean	S	sausages

Table 1: Studies on the senses, emotions, and food

(López-Arroyo & Roberts, 2014)	T+E	English + Spanish	S	wine
(Lynott & Connell, 2009)	E	English	S	
(Connell et al., 2012)	E	English	S	
(Nacchia & Massaro, 2017)	T+E	English + Italian		
(Nestrud et al., 2016)	T+E	English	E	various
(Ng et al., 2013a)	T+E	English	E	blackcurrant juice
(Papies, 2013)	E		S + E	various
(Park et al., 2019)	T+E	Chinese + Korean	S	Korean broth kimchi
(Plümacher & Holz, 2014)	T	English	S	
(Prescott, 1998, 2017)	T+E	English + Japan	S	various
(Price et al., 2019)	E	Greek + Chinese		honey
(Goded Rambaud, 2007)	T	Spanish + English	S	wine
(Singh et al., 2012)	E	Indian	S	bread
(Tekiroglu et al., 2015)	T	English	S	
(Thomson et al., 2010)	T+E	English	S + E	black chocolate
(Tu et al., 2010)		Vietnamese + French	S	soy yogurts
(van Dantzig et al., 2011)	E	English	S	
(Wardy et al., 2015)	E	English	quality attributes + E	chicken eggs
(Winter, 2019a)	T+E	English	S	
(G. Wu et al., 2017)	E	English	S	quinoa
(Zannoni, 1997)	T	English + French + German + Spanish + Italian		

Table 1: Studies on the senses, emotions, and food

reference reference	theoretical (T) / empirical (E)	language	senses (S) / emotions (E)	foods
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(Cavanaugh et al., 2014)	T	English		
(Carolina Chaya et al., 2015)	E	English	E	beer
(Davidson & Sun, 1998)	T+E	English	S	peanuts
(Diederich, 2015)	T+E	English + German	S	meat, poultry, vegetables, fruit
(Eaton et al., 2019)	T+E	English	E	beer
(Fenko et al., 2010)	T+E	English + Dutch+ Russian	S	
(Galán-Soldevilla et al., 2005)	E		S	flower honey
(Giboreau et al., 2007)	T+E	English + French	S	biscuits, cream desserts, foods (in general)
(Gmuer et al., 2015)	T+E	German	E	
(Gunaratne et al., 2019)	E	English	E	chocolate
(Hretcanu et al., 2016)	E	Romanian	S	soy-added beef hamburger
(Kim et al., 2018)	T+E	Korean	S	tea
(King & Meiselman, 2010)	T+E	English	E	various
(Koch et al., 2012)	E	English	S	Rooibos tea
(Lagast et al., 2017)	T	English	S + E	various
(Lawless & Civille, 2013)	T+E	English		foods, beverages
(Lee & Kwon, 2007)	T+E	Korean	S	sausages

Table 1. Studies on the senses, emotions, and food

(López-Arroyo & Roberts, 2014)	T+E	English + Spanish	S	wine
(Lynott & Connell, 2009)	E	English	S	
(Connell et al., 2012)	E	English	S	
(Nacchia & Massaro, 2017)	T+E	English + Italian		
(Nestrud et al., 2016)	T+E	English	E	various
(Ng et al., 2013a)	T+E	English	E	blackcurrant juice
(Papies, 2013)	E		S + E	various
(Park et al., 2019)	T+E	Chinese + Korean	S	Korean broth kimchi
(Plümacher & Holz, 2014)	T	English	S	
(Prescott, 1998, 2017)	T+E	English + Japan	S	various
(Price et al., 2019)	E	Greek + Chinese		honey
(Goded Rambaud, 2007)	T	Spanish + English	S	wine
(Singh et al., 2012)	E	Indian	S	bread
(Tekiroglu et al., 2015)	T	English	S	
(Thomson et al., 2010)	T+E	English	S + E	black chocolate
(Tu et al., 2010)		Vietnamese + French	S	soy yogurts
(van Dantzig et al., 2011)	E	English	S	
(Wardy et al., 2015)	E	English	quality attributes + E	chicken eggs
(Winter, 2019a)	T+E	English	S	
(G. Wu et al., 2017)	E	English	S	quinoa
(Zannoni, 1997)	T	English + French + German + Spanish + Italian		

Glossaries containing descriptive terms are available on the Web for foods such as coffee, wine, and cheese. These term lists have been created by trained testers to be used by professionals and on menus. In the Greek language, such lists exist only for coffee (translations of English glossaries though) and wine (Βέκτιος Γ. et al., 2011; Νέτσικα Μ., 2004; Τσακίρης Α., 2010). On the Web one can also find lists of adjectives that describe foods, to be used on menus, by literary texts authors, by foreign language learners etc. Sensory descriptors of foods can also be found in corpora, such as the BalkaNet, the Sensicon, the FrameNet, mainly in English but corpora of texts in other languages are being created. Finally, the ISO 11035:1994 describes the process of descriptive term identification and selection while creating the sensory profile of a product.

1.4.2 Sensory profiling

Food-related glossaries are lists of terms that describe products as perceived by consumers through their senses, e.g., hard, noisy, relaxing, feminine etc. There are several examples of such glossaries related to food, such as for different varieties of tea, caviar, quinoa, honey, etc. (Baker et al., 2014; Fenko et al., 2010; Galán-Soldevilla et al., 2005; Koch et al., 2012; Ng et al., 2013a; G. Wu et al., 2017). There is not only one way to collect sensory terms for foods and not all senses have been studied in relation to every food category, as seen in Table 1. Neither are all senses equally important in the sensory experience of food categories. An interesting point in literature is that even word gender affects our perception and we tend to attribute feminine qualities to feminine gender objects (Fenko et al., 2010). English words don't have genders (there are a few exceptions) but it would be interesting to check if this is true for foods in Greek and French, for example, that have three and two genders respectively.

It is interesting that for some sensory terms there is one specific product that comes to mind -probably different per culture- and this product could be characterized as “prototypical” (e.g., knives and scissors may be prototypical ‘sharp’ products for the Dutch, while spicy foods may be prototypical for the Russians) (Fenko et al., 2010).

Sensory lexicons with terms describing foods can be used for diachronic studies, too, as changes in food products, language, and culture can be identified (G. Wu et al., 2017).

1.5 Emotions, language, and food

Emotions have always been an area of interest for various theoretical and applied scientific fields, such as medicine, philosophy, psychology, linguistics, education. Various definitions of emotion have been proposed according to the field of science or the perspective from which it is studied. An emotion can be broadly defined as a two-step event during which emotion elicitation mechanisms, caused by a “related” or “significant” event, generate immediate emotional responses, namely action tendency, automatic bodily reaction, expression, feeling, and appraisal (Coppin & Sander, 2016). These are considered as the five components of emotion. Emotion is considered different from feeling. For example, the emotion of tiredness is generally understood to refer to an unpleasant state and can be used to communicate a feeling of sleepiness, annoyance and misery, or fatigue (Barrett, 2004). Emotion is also considered different from mood. A clear distinction is provided by King & Meiselman: emotions are brief, intense, and focused on a referent (e.g., The comment made him angry), while moods are more enduring, build up gradually, are more diffuse, and are not focused on a referent (e.g., I am happy) (King & Meiselman, 2010).

An emotion lexicon is a list of emotion words or phrases used to describe emotions. Food-elicited emotion lexicons can be (a) language or culture-specific, containing emotion words only in Italian for example (Ferrarini et al., 2010), (b) cross-linguistic or cross-cultural, containing emotion words for example in Dutch and Portuguese (Silva et al., 2016), (c) general, containing words expressing emotions elicited by food in general (King & Meiselman, 2010), (d) food-specific, containing words expressing emotions elicited by a specific type of food such as coffee (Bhumiratana et al., 2014).

1.6 Aim and methodology of the present research

The broad aim of the research presented in this thesis was to identify the emotions elicited in Greek consumers by food and beverage consumption. To this end, first, a systematic review of existing emotion lexicon development methods and measurement tools needed to be done. A gap in Greek literature was diagnosed. So, following

international literature, an emotion measurement tool was translated into Greek and used with Greek consumers to check whether translational adaptations of existing tools are the optimal route in emotion measurement. However, the translated tool did not meet the needs of the Greek consumers. This led to the development of an original Greek emotion lexicon and test it with Greek consumers. As soon as literature review and research started, it became obvious that the Greek language lacked in sensory analysis related terminology. So, the task to provide the language needed by Greek professionals of the sensory field to communicate effectively with each other and with consumers in their native language was undertaken.

1.7 Overview of the present thesis

The present thesis consists of two parts: the first part deals with the development of emotion lexicons and their application as emotion measurement tools used in food consumer studies, and the second part deals with the terminology of the sensory analysis field.

Part one:

The **second chapter** presents a thorough review of literature regarding lexicons containing words for self-report of food elicited emotions. The main aspects of lexicon development are analyzed. Language and culture play the leading role in emotional experience and expression, which in turn affects the translatability of emotions and emotion measurement tools. In current literature, there is a variety of methodologies, techniques, sources of terms, and criteria for inclusion applied to term collection and identification, as well as the number and word class of the emotions that appear on the lexicon list. The two dimensions of emotion, valence and arousal, are explained along with how they are depicted in emotion lexicons. Each one of these main aspects of lexicon development is presented with its strong and weak points, to help researchers make informed choices when setting out to compile a food related emotion lexicon.

The **third chapter** presents methodologies and techniques applied in emotion measurement using questionnaires that contain lexicon lists. Forms of emotion lexicon list presentation, i.e., individually or in clusters, the alphabetical or random ordering of terms, the stimuli, setting -linguistic or not-, used for emotion elicitation and the time of measurement are all presented in detail. The chapter also presents self-report questionnaire formats and statistical analysis tests that can be performed on collected

data. In addition, overall liking of food samples and acceptability of products is a factor that is usually measured alongside emotions to help explain results. Apart from standardized emotion lexicons, consumer-led lexicon development is a popular method to apply while creating the sensory and/or emotional profile of a product. Demographic data should also be collected and studied, as they help outline target group characteristics that will determine product development and marketing related decisions. A popular alternative to word-based questionnaires is emoji containing ones. This type is also presented covering thus the new trend. The modern lexicographer can work in the consumer studies field, applying traditional and new lexicographic techniques that will provide food scientists with the tools and data necessary to investigate and understand consumers' needs and choices.

The **fourth chapter** deals with emotion lexicon development and emotion measurement in the Greek language. A gap in literature was diagnosed as mentioned in chapter 1.6. The research conducted and presented in this thesis has covered this gap by first adapting an emotion measurement tool developed in English into Greek, which was found not suitable for the Greek consumer, and second by developing an emotion lexicon and measurement tool in Greek from scratch. An interesting part of the process was the use of the Web and Instagram, the well-known Online Social Media platform, as linguistic sources, as corpora, for emotion term extraction. The new lexicon and tool were tested with a variety of food categories, in both online and Central Location Tests, and found valid. In this chapter these processes and case studies are presented in detail, as well as the comparison of the new word-based tool with the translated English tool and with a standardized questionnaire with emoji. The new food-related emotion lexicon and the respective measurement tool developed in Greek is the first of its kind.

Second part:

The **fifth chapter** deals with the terminology of the sensory analysis field. It is important for scientists and professionals of new fields to be able to communicate in their own native language. The Greek language has traditionally offered the linguistic means for term formation internationally, so it is important to promote the use of Greek as a scientific language in its country of origin. The term “sensory” has been translated into Greek in a variety of ways. The various equivalents are presented with examples of use and a final suggestion is provided.

In the **sixth chapter**, the process of translating the sensory analysis vocabulary as it is defined and translated into other languages in the ISO 5492:2009 is presented. The term formation principles and term translation techniques that were applied during this process have been previously defined by Greek and international terminology related standards. The distinction between general and technical/professional language is outlined as relevant because sensory analysis is a process that involved both food experts and consumers of various educational levels. The experimental set up of a sensory analysis case study can be a formal communication event, but also a casual one. This duality of register has caused some interesting translational difficulties, which are explained through examples along with the course of action taken per case.

The **seventh chapter** presents the main conclusions drawn from all previous chapters, as well as suggestions for future research based on these conclusions. The research on sensory linguistics, food-elicited emotions, and their applications in consumer studies described in the present thesis is the first one in Greek for the Greek consumer. The changing role of the lexicographer in the modern world is also highlighted.

Appendix A contains questionnaire samples from conducted research:

- I. EsSense Profile translated into Greek
- II. Greek 119 emotions in 3 groups for term food-relatedness identification
- III. Questionnaire sample of giving emotion words to be matched with a food category
- IV. Pictures of foods for free listing of emotion words and questionnaire sample
- V. Greek tool tested with foods as translated EsSense Profile
- VI. Emoji tool tested with foods as Greek tool
- VII. General dietary questionnaire

Appendix B contains proof of publications and announcements stemming from the present thesis:

1. Innovation and Research Days by the University of the Aegean
2. Aegean Science Festival Workshop
3. 13th International Conference on “Hellenic Language and Terminology” by ELETO – paper
4. Review article published at “Measurement: Food” journal by Elsevier

5. 30th International Functional Foods Conference – poster
6. 2nd International Conference on Advanced Production and Processing – poster
7. Sensory Analysis Glossary ISO 5492:2009 translation into Greek
«Αγγλοελληνικό γλωσσάριο όρων και ορισμών εννοιών αισθητηριακής
ανάλυσης» (2022) as published in installments in ELETO’s magazine
“Orogramma” so far, and the entire glossary, also available online by ELETO
[English-Greek-Glossary-of-Sensory-analysis ELETO EMAKOATP.pdf](#)
8. Research article “The effect of modern claim related to packaging sustainability
on the sensory perception of traditional Greek rusks (paximathi)” in the *Food
Quality and Preference* journal of Elsevier.
<https://doi.org/10.1016/j.foodqual.2023.104817> .
9. Research article “Development of a Greek emotion lexicon for the self-report and
measurement of emotions elicited by foods: a case study of comparison with
English and translated into Greek tools.” in *Journal of Sensory Studies* of Wiley
(under review)

PART ONE:

EMOTION LEXICON DEVELOPMENT

AND

EMOTION MEASUREMENT

2 Literature review of explicit self-report word-based emotion lexicons

2.1 Lexicon development

The focus of this review is the development of lexicons of food-elicited emotions, and their implementation in consumers' verbal self-reporting questionnaires to identify and measure these emotions. This review covers the trends in emotion lexicon development approaches and methods, and emotion measurement questionnaire design techniques of the last decade, as well as some of their adaptations, and presents them in a systematic way according to the approach, method and technique used and the objectives of study. This categorization will be useful to emotion lexicon developers, product developers, marketers, and other parties that work with consumers. The aim of this review was to identify the various possibilities in how to develop and utilize a lexicon of food-elicited emotions, to identify key trends, to check the strong and weak points of each, and present them in a critical qualitative, not quantitative, manner.

The sources used to search for candidate studies are: ScienceDirect.com, academia.edu, mendeley.com, scopus.com, online.wiley.com, heal-link.gr, scholar.google.com during the months of October 2020 through March 2021. The papers selected by the authors had to contain the words/phrases: emotion lexicon (development), emotion measurement, questionnaires, emotions, food and had to be published in 2010 and since. The review was decided to depict the last decade and 2010 was the year that the first food-related emotion lexicon and measurement tool was published.

The inclusion criteria were the following:

(a) to be about the food as a whole experience, not about a specific sensory or chemical property of the food under study.

(b) to be original as regards the methods, tools, and techniques applied. We then noticed that there were interesting adaptations of them and decided to include those, too. We did not include straightforward applications of existing tools and methods though.

(c) to have emotion lexicon development as its main aim or the means to other ends. The other ends were a) conceptual profiling of foods, b) emotion measurement, and c) the study of food-elicited emotions.

The search yielded twenty-two (22) original methods and thirty-eight (38) adaptations of these methods that had added value. Other related reviews were consulted. Every reference made in the papers selected was also checked. Issues that arose as to the inclusion or exclusion of studies were solved after discussion between the authors, the criterion always being originality as regards emotion lexicon development and application.

The final list of studies reviewed are presented in Table 2, categorized according to the aim of study and their being an original method or an adaptation. For each emotion lexicon development study/stage of study, specific characteristics are presented. Columns C-G present aspects of emotion lexicon development. Columns H-J present aspects of emotion measurement using the respective lexicon. Columns K and L present the foods and the language under study for each case.

Table 2: Schematic review of food-related emotion lexicon development studies and their methodology features.

A	B	C		D	E	F	G	H	I	J	K	L	M	
aim of study		term sources		stimulus for term elicitation	lexicon list	word class of terms	ordering of terms	questionnaire response format	stimulus for emotion measurement	context/setting of measurement (other than lab/Central Location/internet)	foods	language	references	
		other than consumers	focus groups											
emotion lexicon development	original	p, e	CATA	n	16 t	a	r	5pt	n	lc	wine	Italian	Ferrarini et al. (2010)	
		ls	fl	t	12 c	a, p	r	150mm	t		beer	Spanish	Chaya et al. (2015)	
		ls	fl, d	n, t	43 t, 9 c	a	r	150mm	t		beer	Spanish English	Eaton (2015)	
		ls			49 t	a	r				x	German	Gmuer et al. (2015)	
		p	fl, st, d, rl	t	15 c	a, n	r	10cm	t	lc	wine	Spanish	Mora, Dupas de Matos et el. (2020)	
	adaptation	p				33 t + e	a, n, p	r	CATA	n, t	ws	milk, water, red wine, chocolate, muesli bars, popcorn	English Mandarin	Jaeger, Roigard et al. (2018)
		p	fl, CATA	n, t	64 t	a, n, p				n, t		chocolate	English	Gunaratne et al. (2019)
		p, ls	fl, d	t	43 t, 9 c	a, n	r	150mm	t			beer	English	Eaton et al. (2019)
		p		t	11 c	a, n	r	15cm	t			beer	Spanish	Mora et al. (2019)
	conceptual profiling	original		fl, bws	t	24 t	a					chocolate	English	Thomson et al. (2010)
			fl, d	p, t	25 t	a					beer, wine	Dutch Portuguese	Silva et al. (2016)	
p					16 t	a, n	r	CATA	t		cashew nuts, peanuts, chocolate, fruit, processed tomatoes	English Italian	Jaeger, Spinelli et al. (2018)	
p			i	t	27 t	n		7pt		real	processed tomatoes	Italian	Spinelli, Dinnella et al. (2019)	
adaptation		p	fl	t	34 t, 38 t, 50 t	a, n, p	r	CATA	t		blackcurrant squash	English	Ng et al. (2013b)	

		p			24 t, 12 c	a, n		CATA (choose 1 only)	t		salted snacks, potato chips, yogurt, cheese, snack bars, fruit	English	Jaeger et al. (2019)			
emotion measurement	original	p	fl, CATA	n, t	39 t	a	a	5pt	n, t		among & within product categories	English	King & Meiselman (2010)			
		p	fl	t	36 t	a, n, p	a, r	CATA, 5pt	t		blackcurrant squash	English	Ng et al. (2013a)			
		p	fl, i, CATA	t	23 t+s	a, p	r	5pt	t	lc	chocolate and hazelnut spreads	English	Spinelli et al. (2014)			
		p	fl, d	t	44 t	a, p	a	5pt	t	real	coffee	English	Bhumiratana et al. (2014)			
		p	fl, CATA		14 - 17 t	a, n, p	a	RATA	t	real	cola, chocolate, crisps, burgers, vanilla pudding (blind, informed)	Dutch	Schouteten et al. (2015a)			
		p, e	fcp	t	12 t	a, p	r	5pt	t		milk, water, bread, sugar	German	Geier et al. (2016)			
	adaptation	p	st		25 t	a	a	5pt	n, t		various un/branded	English	Nestrud et al. (2016)			
		p	rs	n	39 t	a	a	5pt	n, t		comfort foods	English	Cardello et al. (2012)			
		p			13 t	a, n, p	a	RATA	t	lc	cheese	Dutch	Schouteten et al. (2015b)			
		p			19 t	a, n	a	CATA, RATA	t		chocolate, yogurt	Dutch	Schouteten et al. (2017)			
		p			39 t / 44 t	a	a	5pt	t	real	coffee	English	Kanjanakorn & Lee (2017)			
		p	RATA	lc	10 t	a	r	RATA	t	real	wine	Portuguese	Silva et al. (2018)			
		p			39 t	a	r	CATA	t		white wine, honey, peanuts, chocolate, cheese crackers, white bread, cashew nuts	English	Jaeger, Swaney-Stueve et al. (2018)			
		p			25 t	a	a	5pt	t		sweet & savoury snacks with Bambara flour	English	Yang et al. (2020)			
		p			25 t	a	a	10cm	t		apple cider	Spanish	Mora, Elzo-Aizarna et al. (2020)			
		study food-elicited emotions	original	p			18 pairs of opposites	a, n, p		5pt	t		dairy products, non-dairy milk substitutes, vegetables, bakery products	German	Geier et al. (2012)	
				p, e	mod. CATA		12 c	a, p	r			x	English French German Italian	Thomson & Crocker (2013)		
				p	CATA	t	10 t + d + e	a	r	temp. CATA	t		chocolate	English	Jager et al. (2014)	

adaptation	p	st		15 t	a		9pt			mealtimes	Dutch	den Uijl et al (2014)
	p, e	st, d	n	66 t	n		3pt †			beverages, beer	English Spanish	van Zyl & Meiselman (2015)
	p	d, rs, fl	t	19 t	a	a	9pt	t	real	wine	English	Danner et al. (2016)
	e	fl		17 c	a, n, p					x	Brazilian	Fonseca et al. (2019)
	p			39 t	a	a	5pt	t		breakfast drinks	Dutch	Dalenberg et al. (2014)
	p	fl, bws	n, p	33 t	a, n, p	a	CATA	p		chocolate, soup, pizza, beer/wine, steak, yogurt	Spanish	Sosa et al. (2015)
	p			43 t	a	a	CATA	t		artificial & natural sweeteners in tea	English	Leitch et al. (2015)
	p			39 t	a	a	5pt	t	real-like	breakfast drinks & dessert products	English Dutch	Gutjar et al. (2015)
	p	CATA		20 t	a	a	5pt	n, p, lc		chicken eggs	English	Wardy et al. (2015)
	p	fl	t	10 c	a, n	r	line + CATA	t	ws	beer	English	Dorado, Chaya et al. (2016)
	p			38 t / 12 c	a, n, p		5pt, 15cm	t		chocolate, beer	Spanish	Dorado, Pérez-Hugalde et al. (2016)
	p			66 t	a		3pt †	n		beverages, beer	English Spanish Portuguese	van Zyl & Meiselman (2016)
	p			19 t	a	a	9pt	t	lc	wine	English	Danner et al. (2017)
	p			10 c	a, n, p	a	line	t		beer	English	Beyts et al. (2017)
	p			42 t	a	a	CATA	t	videos	breakfast meal	English	Walsh et al. (2017)
	p			25 t	a	r	100mm	t		beer	Dutch	Silva et al. (2017)
	p			26 t	a	r	10cm	t		wine	Spanish	Mora et al. (2018)
	p		t	53 Ch / 29 Kor	a, p	r	mod. RATA	t		coffee	Chinese Korean	Hu & Lee (2019)
	p			39 ESP/ 9 EmoS / 24 GP				t		cashew nuts, chocolate (ESP), canned tomatoes (EmoS), potato crisps (GP)	English Italian	Spinelli, Monteleone et al. (2019)
p			25 t	a	a	5pt	t		vegetable juice products	English	Samant & Seo (2019)	

		p		t	10 t	a		temp. CATA	t		beer	Dutch	Silva et al. (2019)	
		p			10 t	a		CATA	p, t		various	English	Torrice et al. (2019)	
		p			11 t	a	r	CATA	t	real, VR, VR-360°	beer	Italian	Sinesio et al. (2019)	
		p			11 t	a	r	CATA	t	real, real- like, VR- 360° video, VR-3D modelling + 360° photos	beer	Italian	Worch et al. (2020)	
		p			33 t	a	r	CATA	t	real, VR	wine	English	Torrice et al. (2020)	
		p			60 t	a		5pt	t	videos	beer	English	Desira et al. (2020)	
		p			25 t	a		mod. RATA	t	real, VR	tea break snacks	English	Low et al. (2021)	

abbreviations per column:

C: p = pre-existing list of terms, e = experts, ls = linguistic sources, fl = free listing, d = discussion, st = sorting task, rl = rating lines, rs = rating scales, bws = best-worst scaling, i = interviews, fcp = free choice profiling

D, I: n = food names, p = food pictures, t = tasting, lc = linguistic context

E: t = terms, c = clusters / categories, e = example, s = sentence, d = definition

F: a = adjectives, n = nouns, p = phrases

G: a = alphabetical, r = random

H: pt = point scales, mm=millimeters (line), cm=centimeters (line)

J: lc = linguistic context, ws = written scenario, VR = Virtual Reality

general abbreviations: CATA=Check-All-That-Apply, RATA=Rate-All-That-Apply, mod. =modified, temp.=temporal, Ch = Chinese, Kor = Korean, ESP = EsSense Profile®, EmoS = EmoSemio, GP = Global Profile

†1: makes me feel more like that, 2: makes me feel less like that, 3: not applicable

2.1.1 Language and Culture, translatability of emotions and emotion words

Cultures are complex sets of shared meanings, values and, corresponding behavior and cultural products (Chentsova Dutton & Lyons, 2021). The same applies to languages and emotions. The construction of emotional meaning is determined by social, cultural, and linguistic factors. The social environment is a major regulator of emotional display and culture is a central factor that mediates emotional experience, conceptualization, and expression. Thus, emotions are culture- and language-specific constructs, fundamentally biocultural in nature (Chentsova Dutton & Lyons, 2021). There are both quantitative and qualitative divergences in how different languages lexicalize emotions (Ogarkova, 2021). On the other hand, emotion words in many different languages appear to refer to the same, or very similar phenomena. And, while there is no consensus about what exactly constitutes a universal level of emotions, there is no denying that this universality exists (Ogarkova, 2016, 2021). From a quantitative perspective though, there are considerable differences among languages as to the number of distinct emotions that are lexicalized in them or the number of emotion words available to express a specific emotion. On these grounds, lexical designations of emotions should be translatable across languages. However, the absence of exact correspondence between words in different languages is one of the fundamental presuppositions in semantic analysis, leading to the conclusion that equivalence of any two emotion words in two different languages is always a matter of degree (Ogarkova, 2016).

In cross-cultural studies or when using pre-existing emotion lists compiled in other languages, translation of emotion terms is an issue. Most research utilizes professionals in translations of different languages, and the terms are back-translated for confirmation purposes (Hu & Lee, 2019). The terms do not usually exhibit a one-to-one correspondence between different languages. Sometimes the meaning of a word in the source language needs two words to be covered, but it is also possible that the meaning of two words can be covered by just one in the target language. For example, a comparative cross-cultural study of affective terms showed that the dimensional organization of odor-related affective terms in a given culture better explained data variability for that culture than data variability for the other cultures, thus highlighting the importance of culture-specific tools in the investigation of odor-related affect; for Swiss, Dutch, and Singaporean populations Disgust, Happiness/Well-being,

Sensuality/ Desire, and Energy were common dimensions, Soothing/ Peacefulness was common to the two European samples, and Sensory Pleasure specific in Geneva; Nostalgia and Hunger/ Thirst specific in Liverpool; Intellectual Stimulation, Spirituality, and Negative Feelings specific in Singapore (Ferdenzi et al., 2011).

The process of translation and back-translation was followed by van Zyl & Meiselman (2015) when working with English and Spanish. The English terms were translated from English into Spanish and back-translated. Another approach is to assign translation to bilingual experts (Thomson & Crocker, 2013). In Thomson & Crocker's study, bilingual psychologists translated the terms from English into idiomatic Italian, French, or German, making additions and deletions as appropriate. A similar approach was followed by Silva et al. (2016), who assigned the translation of Dutch and Portuguese terms into English native speakers of Dutch and Portuguese, respectively. The resulting translations were then agreed upon by at least 3 authors for each language (Silva et al., 2016). An interesting and innovative technique was applied in a cross-cultural study by Hu and Lee (2019). For each English term they chose 2-3 candidate words in Korean and Chinese from dictionaries, and they made a multiple-choice questionnaire to be answered by consumers native speakers of Korean and Chinese. For each English term, the participants could choose either one of these 2-3 terms or "I do not know" or "other". Their approach was justified by the fact that English is taught as the first foreign language in all primary schools in Korea and China as early as the 3rd grade (Hu & Lee, 2019).

Language is inextricably linked with culture, the context in which food and food consumption is experienced. Food as a concept is learnt through associated learning, dietary habits are formed by family and social practices, and language provides the medium and the linguistic context in which food-evoked emotions are expressed. Mental frames in general, and the mental frame of food more specifically, vary cross-culturally as do their culture-specific connotations (Fenko et al., 2010). Current research has shown that the perceived health effects of food products are more important for Asian consumers than Westerners and that Western participants tend to express high arousal emotions when assessing food products while Asian participants express low arousal emotions (Gunaratne et al., 2019). These differences lead to the conclusion that emotion lexicons should be developed using linguistic and cultural data

from the frame in which they are going to be exploited, and that using pre-existing lists of food-evoked emotions developed in another language should be done with caution.

2.1.2 Emotion terms collection and identification - sources of terms:

Emotion lexicon development can either be the main objective of a food-related study or a major step towards creating an emotion measurement instrument. Either way, there seem to be certain steps and methods towards the creation of such a list (Fig. 1).

2.1.2.1 *Using pre-existing lists*

Before 2010, food scientists relied on research within the psychology and consumer domains for lists of emotions, as was the Consumption Emotion Set (Richins, 1997), for categories and hierarchies of emotions (Laros & Steenkamp, 2005; Shaver et al., 1987; Storm & Storm, 1987), as well as for measurement methods and tools, such as the Profile of Mood States (POMS), the Multiple Affect Adjective Check Lists (MAACL, MAACL-R), the Emotion and Odor Scales (LEOS, SEOS, GEOS, UniGEOS).

Since 2010, however, the interest has shifted towards the consumer and food domains, as more and more emotion lexicons are being developed in various languages targeted at specific products and groups of consumers. Within the food science domain the first study in English is that by King and Meiselman, the EsSense Profile, a measurement tool for consumer emotions associated with foods, aimed for commercial usage (King & Meiselman, 2010). The initial list of terms was taken from existing mood and emotion lists compiled by and for psychiatrists and psychologists. Feedback was also provided by consumers. For the present review this study was taken as a chronological starting point since it was the first study done specifically for foods.

Using pre-existing lists from other countries speaking the same language [e.g., list of terms in Spanish developed in Spain to be used in Mexico (van Zyl & Meiselman, 2016), or list of terms in English developed in the USA (King & Meiselman, 2010) to be used in New Zealand (Jaeger, Swaney-Stueve, et al., 2018; van Zyl & Meiselman, 2015)] is an option but needs to be confirmed. Using lists developed in other languages after applying valid translation methods can be used when the cultures under study are quite similar to each other [e.g., China and Korea (Hu & Lee, 2019)], but the need to run validity checks still exists.

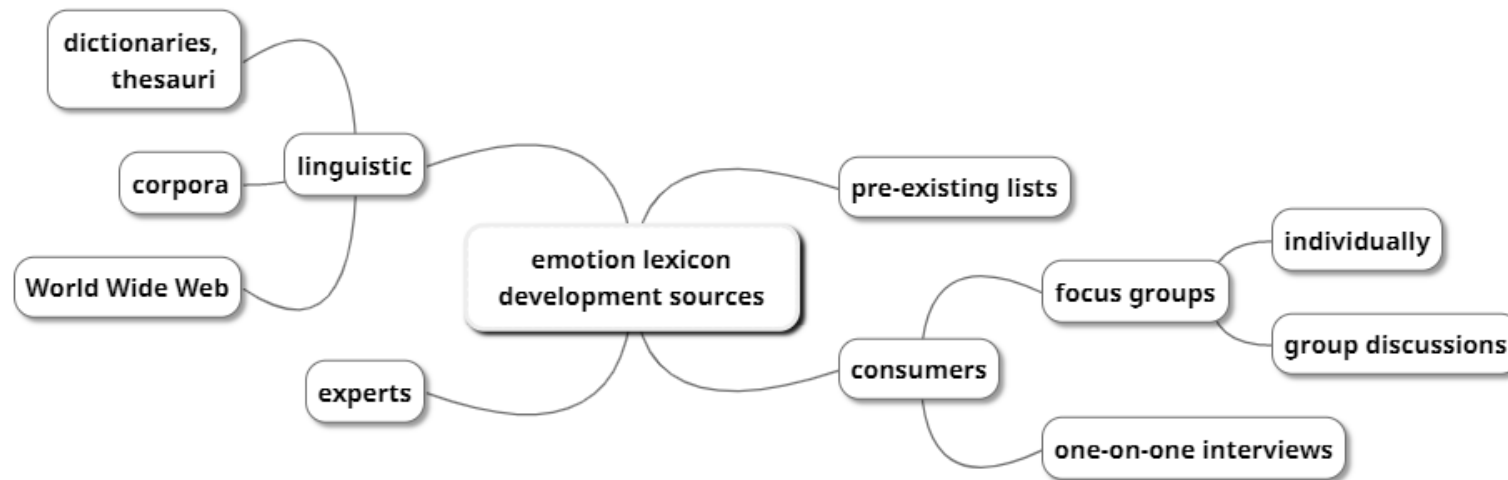


Fig.1: Emotion lexicon development sources (Panagiotou & Gkatzionis, 2022).

2.1.2.2 *Collecting terms from scratch – applying linguistics methodology*

On the other hand, there are studies that have created emotion lexicons from scratch, without using existing term lists. Focus groups of consumers is usually the first step in such a process for term collection. These studies are mainly food category specific and have used consumers' feedback to create the respective lexicon. Consumers are usually asked to taste samples and provide emotional responses to them in free listing tasks, either individually or after group discussions. Beverages, especially, beer and wine, are the foods that have been studied the most in this way (C. Chaya et al., 2015; Eaton, 2015; Silva et al., 2016).

When developing an emotion lexicon, a variety of sources should be used to achieve maximum validity. Linguistic sources, such as dictionaries, thesauri, and corpora, are especially useful for word disambiguation and synonymity checks. Another linguistic source available thanks to modern technology is the Web.

Thesauri, dictionaries: Reference works such as thesauri (i.e., reference books in which words with similar meanings are grouped together) and dictionaries, even though they are not usually the source of terms for an emotion lexicon, serve as a useful tool, for meaning disambiguation, synonymity checks, cluster formation, use information and so on. These tools are usually used during the term selection process to narrow down the list.

Corpora: A corpus is a body of machine-readable authentic texts, sampled to be representative of a language or language variety (Bouzou, 2018). Corpora can provide word frequencies and linguistic patterns and can be used for qualitative and quantitative analysis. They are not very often used in consumer studies. However, in languages that no emotion lists exist yet, corpora have been used in from scratch lexicon development (Gmuer et al., 2015), as they provide data on linguistic patterns.

The World Wide Web: The Web, its search engines and lexicon database, has been used as a source of emotion terms in emotion lexicon development from scratch (Gmuer et al., 2015). The Web has some very distinctive features that render it a unique tool for linguistic research:

- (a) it is connected and thus it can be examined and used as a single unit.

- (b) it contains authentic spontaneous speech.
- (c) it contains a new style of speech: written speech with features of oral speech.
- (d) it is inclusive and thus all linguistic styles within a language can be found and studied.
- (e) it always contains up-to-date language which makes it ideal for synchronic research but also provides data for diachronic research.
- (f) it is self-productive because of the wikis, blogs, and forums daily updated and created.

There are however some disadvantages in its use:

- (a) its dimensions are unknown and constantly changing.
- (b) replicability of results is impossible, because of the use of algorithms.
- (c) because of its broad heterogeneity it can be a double-edged sword for a researcher.

According to Sinclair “the World Wide Web is not a corpus, because its dimensions are unknown and constantly changing, and because it has not been designed from a linguistic perspective” (Sinclair, 2004). Nevertheless, the number of researchers that are using the Web to create corpora and as a corpus itself has increased lately.

“During the last decade, the amount of content that is published online has increased tremendously, primarily due to the wide adoption and use of Online Social Media (OSM) platforms. The content produced within OSM has the potential to be used for understanding, modelling and predicting human behavior and its effects.” (Tsakalidis et al., 2018).

A distinctive study within the food science field is that by Gmuer et al. (2015), a linguistic-based systematic approach to design a food-associated emotion lexicon in German. Since there was no food-related emotion list in German, a three-step approach was followed to investigate which words are appropriate in the German language for describing emotions associated with food products. The initial list of terms, single-word adjectives only, was accumulated using thesauri, electronic corpora, dictionaries, the Web (Google search, lexicon-database), and the emotion hierarchy by Storm and Storm (1987). The aim was to extract the German emotion terms that were more actively used in everyday situations and met specific syntactic criteria (i.e., co-occurred with the verbs *I feel/I am* within the same sentence). The terms were then evaluated using several

linguistic-related criteria to identify the terms that possess potential emotional connotations or describe an overall emotional condition, including evaluative terms, following Storm and Storm's taxonomy. These terms were assembled through consumer free-listing or free-labelling tasks. An online survey followed in which the final candidate terms were rated for their food relatedness. Thus, the criteria for term selection were (a) emotionality, (b) food-relatedness, (c) being up to date. Being single-word adjectives and following specific syntactic patterns were prerequisites. The terms approved by at least two-thirds of the participants formed the lexicon. The next step of the study was to characterize the emotion terms as positive, negative, or neutral, following the methodology by King and Meiselman (2010), to be able to interpret the food-related emotional experiences assessed with these words and check whether this hedonic asymmetry was true for the German language as well, which was confirmed.

Using linguistic sources as a starting point has the advantage of accumulating a variety of terms which consumers might not recall during a free-listing task. This is especially useful when creating an emotion list from scratch, without using specific foods as stimuli, in order to develop a comprehensive language-specific emotion lexicon from which to form food-specific lists and tools. Nevertheless, several words in the initial list may not be understood or may be unknown to the consumers. The use of other sources and screening by consumers are needed to capture the real contemporary use of language.

2.1.2.3 Experts

Experts, other than the main researchers of a study, such as psychologists, linguists, translators, sometimes participate to offer guidance in the lexicon development process without providing the terms themselves, except in the case of the Empathic Food Test (Geier et al., 2016) (Table 2, column C).

2.1.2.4 Consumers: focus groups, group discussion, interviews

Consumers have become the main source of data for emotion lexicon development as they simultaneously express the linguistic, cultural, and social aspects under study. In focus groups, in Central Location Tests (CLTs), online surveys and real consumption settings, consumers of the food product category in question are asked to provide emotion terms as a response to various stimuli. Three distinct types of stimuli are used in food-evoked emotion studies in the early stages of term generation or identification,

either individually or in combinations: food pictures, food names, and actual food tasting. The latter is the most frequently used.

A focus group is an interview technique that brings together 6–10 participants and a moderator, in the framework of a structured discussion about a specific topic and is especially important when little is known about the topic. It is a qualitative method that provides deeper insights into beliefs, by encouraging participant interaction socially (Talavera & Sasse, 2019), as is the case in real life when discussing foods and products in general. Focus groups are usually used in the early stages of emotion lexicon development and in food-evoked emotion studies in general for term generation and term identification. This method has been applied in several cross-cultural studies and is gaining importance in consumer behaviour related to food and beverages (Silva et al., 2016). Focus groups have proven especially useful for the sensory characterization of products as well.

Most reviewed studies, as depicted in Table 2, have used focus groups of consumers to generate emotion terms in free listing tasks, to identify terms from given lists using CATA (Check-All-That-Apply), rating scales, RATA (Rate-All-That-Apply), best-worst scaling -where participants are presented with the object under investigation with a set of 4 or 5 words and asked to decide which of these words they feel is most and least closely associated with what they are experiencing in response to the object-, to decide on food-appropriateness of terms or to categorize emotion terms in sorting tasks either individually or after reaching consensus through discussion. The number of participants and the number of groups per study varies widely though (Table 2).

The members of focus groups can either work individually taking notes on their own or work as a group, discussing the topic in question and reaching a consensus. Most focus groups reach a consensus via discussion. If they are working as a group, the moderator is taking notes while the participants are exchanging views. Both techniques, individual and group work, have their benefits and drawbacks. Group work is closer to real-life conditions of consuming and talking about food as a social practice but has the potential danger of forming false tendencies as individuals with less powerful personalities tend to assimilate their opinion to that of the group's. The method of interviewing consumers one-on-one is used as an alternative or in addition to groups and can help shy personalities open up and co-operate more freely but is extremely time consuming. The

Repertory Grid Method (RGM) can be used in interviews to collect information on food related perceptions. The RGM is considered an efficient interviewing procedure, able to generate series of attributes used by consumers to discriminate amongst foods. Three stimuli are presented at once to the participants who are asked to describe the similarities and the differences amongst them (Monteleone et al., 1997). Modified versions of the RGM have been developed and used in sensory and emotional characterization of foods (Ng et al., 2013a, 2013b; Sara Spinelli et al., 2014).

In the reviewed studies, there was a case where the participants' views underwent semiotic analysis (Sara Spinelli et al., 2014), since linguistic context disambiguates meaning and the use of semiotics allows a deep analysis. The semiotic approach “decomposes” the texts in order to deeply investigate their meaning by identifying the semantic units in the text. The words or expressions referring to similar meaning are grouped together and recognized as belonging to the same “semantic category”. Then, the inter-relationships (e.g., oppositions) between the different semantic categories are investigated. Semiotics has a long tradition in advertising and communication analysis and has developed various approaches to research in marketing; it is currently used to study brands, advertisements and consumer styles and recently it was applied in storytelling and consumer food studies (Sara Spinelli et al., 2014).

Segmentation of focus groups participants, i.e. how participants of focus groups are grouped together, can be made on the basis of gender, age, social status and other characteristics according to the aim of study but demographic criteria seem to affect food-evoked emotions less than food consumption habits, ways of dealing with the products and the expectations of their benefits (Köster & Mojet, 2015). Therefore, unless the focus of the study demands otherwise, focus groups should be segmented based on food consumption and purchase criteria. Food related studies have shown that consumers of a food category or product create very different emotional profiles from non-consumers.

If the emotion lexicon development process is not food-specific, then demographic criteria can be applied. In the studies reviewed here, research shows that women express emotions at a higher level than men (M. Mora et al., 2020), they appear to be more elaborate in their emotion terms production and exhibit greater granularity, i.e., the ability to distinguish between different emotional states in a more fine-grained way. As

regards age, as people grow older they more often seek emotionally meaningful goals, food neophobia increases with age, and food type consumption is affected by health issues (den Uijl et al., 2014). These factors need to be taken into account when working with focus groups.

2.1.3 Developing food- and non- food-specific emotion lexicons

Emotions are by definition stimulus dependent. Thus, studies within the consumer and food domain are usually food specific. It is proven and generally accepted that lexicons should be food category specific to be effective and accurate when used to describe and measure food-evoked emotions. Discussion on the advantages of each method, i.e., using a general food related emotion list versus using a consumer-defined emotion list, is presented in chapter 2.2 of this review. For example, the Coffee Drinking Experience captured changes in mental state better than the non food-specific lexicon of the EsSense Profile® (Kanjanaorn & Lee, 2017). Table 2 summarizes the foods studied for developing food specific lexicons. Some examples of foods frequently studied are coffee (3 studies), wine (11 studies), chocolate (12 studies), and beer (15 studies) (Table 2). Other studies focus on food products containing sustainable ingredients, namely Bambara flour (Yang et al., 2020), products with protected designation of origin, namely apple cider (M. Mora et al., 2020), and non-alcoholic beverages, namely non-alcoholic beer (Silva et al., 2016, 2017). There seems to be an intense interest in studying emotions elicited by beverages and comfort foods. This might be due to the fact that people consume beverages, especially alcoholic drinks, and comfort foods, such as chocolate, to make certain feelings duller or more intense. To make negative feelings duller people in some cultures tend to consume beverages (Desira et al., 2020; van Zyl, 2016). On these grounds, beverages are culture-specific³ and studying them provides insight into the culture under study. Our cultural heritage does not only determine the type of products we are familiar with and learn to like but also the emotional connection that we have with those products. Wine for example is part of everyday life in France, Italy, Spain, and Portugal, where consumers expect it to be part of the meal, while in some other countries wine might be seen as a way of reducing stress (van Zyl, 2016).

³ As culture-specific are defined foods and beverages that are closely linked to culture, because they are traditionally produced, or linked to traditional and religious practices, thus becoming part of a people's identity (Reddy & van Dam, 2020).

There are however food-evoked emotion lexicon development studies that are not food category specific, which either use a variety of food categories as stimuli or no food stimulus at all (Table 2). Some of these aim at developing emotion lexicons, emotion measurement instruments, conceptual profiling instruments, or at studying various aspects of food-elicited emotions, such as well-being (Geier et al., 2012), socio-economic status (Fonseca et al., 2019), emotion classification (Thomson & Crocker, 2013), temporal dynamics of emotions (Jager et al., 2014), culture and language (van Zyl & Meiselman, 2015, 2016), context (Danner et al., 2016; Damir D. Torrico et al., 2020), food choice prediction (Dalenberg et al., 2014; Swetlana Gutjar et al., 2015; Samant & Seo, 2019), health labels (J. Schouteten et al., 2015), health concerns (Walsh et al., 2017), liking (Leitch et al., 2015; Low et al., 2021; Ng et al., 2013b; Samant & Seo, 2019; Silva et al., 2017, 2019), sensory drivers of emotions (Jaeger et al., 2019; Sara Spinelli et al., 2019).

2.1.4 Criteria for term selection

While reviewing emotion lexicon development studies, certain criteria for the selection of emotion terms that form a food-related lexicon immerge (Table 3). These can be summarized in two main categories: universal criteria, applied by most researchers, and optional criteria, applied according to the needs of each study. The decisive factors for term inclusion in an emotion lexicon are that the terms refer to distinct food-evoked emotions [excluding moods, and hedonic terms (e.g., excellent, good, fair, poor)], currently used by most consumers at a high frequency. There are also some additional inclusion criteria applied by some studies, such as grammatical and syntactic criteria, or how clearly positive or negative the terms are when related to food. Modifications to inclusion criteria can be made due to feedback from participants on unclear, or potentially offensive terms.

Table 3: Universally applied and optional criteria, applied in some studies, for term selection during emotion lexicon development (Panagiotou & Gkatzionis, 2022).

universal criteria
to describe emotions (not moods nor evaluative terms)
to describe food-evoked emotions
to be clear in meaning
to be politically correct (not offensive to persons with mental illnesses)
to be up to date
to have a high frequency of use
to be statistically discriminant and not redundant
additional criteria
to be clearly positive or negative in context
to fulfil grammatical criteria (e.g., be a single-word adjective)
to fulfil syntactic criteria (e.g., I feel + adjective)
to be in relation to food, not in relation to another person (e.g., envy, pride)

2.1.5 Lexicon: word class, form, and number of terms

The list of an emotion lexicon can consist of adjectives only, or nouns only, or adjectives and nouns, or adjectives and phrases, or adjectives, nouns, and phrases (Table 2). This is a decision made by the researchers according to the aim of study and can be affected by consumer responses during the lexicon development process and the language studied.

An emotion lexicon can consist of terms only, or clusters of emotions (emotion categories) formed either by applying statistics, researchers, and participants, or by statistics and researchers, or by statistics only, or by participants only. There is also an emotion lexicon presenting its terms in pairs of opposites, another presenting each term with a sentence clarifying the emotion, and another one presenting each term with a description (definition) and an example (Table 2). The latter follows sensory attribute list guidelines.

Emotion lexicons appear in either the form of lists of terms or sets of emotion categories/clusters with or without super-ordinate/representative terms. Clustering of emotion terms can be done by participants of a study or by statistics. If the process is done by the participants, a sorting task is usually used (participants may also be asked to choose the representative emotion term for each emotion category) and hierarchical clustering is then applied to form the final categories. This process is preferable when developing a non-food-specific lexicon. Emotion categories can also be formed by applying cluster analysis to the responses of participants to an emotion measurement questionnaire consisting of separate terms. This process is usually preferred when developing a food-specific emotion lexicon. These statistical methods of forming clusters of emotions make the process quick, easy, objective, and reproducible. Clusters of emotions are especially practical when the emotion lexicon is going to be used for emotion measurement purposes, as this form provides a concise and semantically clearer set of terms, making the process quicker and easier for the participant. According to Eaton et al. (2019) both forms of the lexicon -one with clusters and one with separate terms- are consistent in their discriminating ability and one should prefer the shorter form (with clusters) for product comparisons (Eaton et al., 2019). Shorter lexicons could be more sensitive to first position effect though (R. Dorado et al., 2016).

As regards the number of terms in the reviewed studies, an emotion lexicon can consist of 9-66 terms with a median of 26. Consumer-defined lexicons tend to consist of fewer terms. The number of terms depends on the aim of study. For instance, when the focus of the study is cultural comparison or conceptual profiling of a food category then more terms seem to be necessary to capture habits, beliefs, conceptualizations, associations (in the studies currently reviewed 66-86 terms) (Table 2).

2.1.6 Dimensions of emotion often depicted in food-related lexicons: valence and arousal

2.1.6.1 *Valence (also called pleasantness): positive and negative terms*

An emotion is a valenced affective reaction to perceptions of situations (Richins, 1997). This definition of emotion highlights how important it is to include the valence dimension when studying emotions. The valence dimension can be conceived as an axis with pleasure and displeasure, or attractiveness and averseness at its ends. It is an emotional value associated with an event, object, or situation (Barrett, 2004). Valence is depicted in the distinction of terms as positive and negative.

In psychiatry and psychology, most emotion lists refer to five or six basic emotions, namely love, joy, anger, sadness, fear, and perhaps surprise (Shaver et al., 1987). They contain mostly negative emotions probably because the focus is on dealing with mental illnesses. In the food studies reviewed here, positive emotions seem to outnumber the negative ones (Bhumiratana et al., 2014; Pieter M.A. Desmet & Schifferstein, 2008; Geier et al., 2016; King & Meiselman, 2010; Leigh Gibson, 2006; Nestrud et al., 2016; Ng et al., 2013a; J. Schouteten et al., 2015; Sara Spinelli et al., 2014), since food consumption is thought to be a generally pleasurable experience for healthy humans. This phenomenon is called “hedonic asymmetry” and suggests that people prefer positive rather than negative words to describe food experiences, because healthy people tend to like eating and tasting food, and because food products are formulated to be appealing and liked by consumers (Pieter M.A. Desmet & Schifferstein, 2008).

When developing an emotion lexicon, researchers sometimes choose to include a balanced amount of positive and negative terms, while others choose to include mostly positive terms in accordance with the “hedonic asymmetry hypothesis”. There are also terms that are both positive and negative or neither positive nor negative and are thus characterized as unclear, neutral, or unclassified as regards their valence. These neutral

terms should not be considered lacking information and thus be left out of emotion lexicons. Neutrality of emotion is a state on its own. Neutral terms show a lack of positive or negative appraisal, and a lack of arousal. Depending on the food/ beverage product type, neutrality of emotion may or may not be desired. It should be noted that the terms are not labelled when presented to the participants. The labels positive, negative, and neutral are used when setting up the study and when analyzing the data.

Most emotion lexicon development studies use existing lists of positive and negative terms to classify their terms. There is also a method that provides classification of emotion terms implicitly. Participants are asked to think of their most and their least favourite foods and characterize them using emotion terms. This way, the researchers get a list of positive terms, i.e., emotion words that describe the most favourite foods, and a list of negative terms, i.e., emotion words that describe the least favourite foods (Fonseca et al., 2019; King & Meiselman, 2010). In emotion measurement questionnaires, the overall liking question can help distinguish between positive and negative terms, even without characterizing the terms one by one.

2.1.6.2 Arousal (also called engagement): activation and deactivation

Arousal or engagement is another key dimension of emotion that can be conceived as an axis with felt activation and deactivation at its ends or high to low energy feelings. It is related to interoceptive sensitivity (Barrett, 2004). Interoception is a broad term that refers to perception internal to the body's surface, and incorporates sensations from the visceral organs (e.g., heart, lungs, stomach) along with autonomic, hormonal, and even immunological signals. Since emotional experience incorporates physiological and visceral changes, there has also been some speculation regarding how interoceptive sensations contribute to the processing of emotions (Connell et al., 2018). According to research, emotions with the same valence (e.g., anger, fear, sadness, shame) produce a similar influence on judgments and choices (Laros & Steenkamp, 2005). That is why arousal can add a lot of information and understanding when studying emotions. For example, anger and sadness are emotions of the same valence but very different affect (arousal). Both emotions express that someone feels wronged in some way but sad people become inactive and withdrawn while angry people become more energized to fight (Laros & Steenkamp, 2005).

The two main dimensions of emotion, valence and arousal, need to be taken into consideration when developing emotion lexicons. Evolutionary reasons have made us want to minimize experience of negative emotions and maximize experience of positive emotions (Thomson & Crocker, 2013) and food consumption is in general a positive experience for healthy individuals. The decision as to whether a balanced lexicon is needed or not depends on the aim of the study. If the focus of a study is a new food product, a variety of terms both positive and negative are needed to capture food acceptability and food-evoked emotions. The arousal dimension of emotions might be of special interest when studying beverages, as the reviewed studies here show, or when studying functionality⁴ of foods and mealtimes. For example, people consume main meals to get energy; snacks and desserts are considered a reward; dinner is consumed for pleasure; breakfast is consumed out of habit (den Uijl et al., 2014). However, research has shown that sub-categories of products have different emotional associations in different cultures, especially beverages. As a result, it could be concluded that what is pleasant and what is not is culture- and food-specific and should be studied within context (Hu & Lee, 2019; Jaeger, Spinelli, et al., 2018; van Zyl & Meiselman, 2015, 2016).

2.2 Emotional profiling: implicit and explicit

During the past few decades, other fields, like the consumer, food, and marketing industries, have turned to the study of emotion and the application of findings -mainly from psychology- to product development and promotion for better targeted results. Research is aimed at creating emotion lexicons, measuring, and studying emotions within and across languages and cultures, creating conceptual profiles of food products, and identifying consumer groups.

In literature it is often suggested to combine sensory and emotional measurements with liking and acceptability measurement, because these combined drive consumer's choice (Ng et al., 2013a) and because the emotions a food products elicits cannot be completely separated from its sensory attributes, which are part of its identity (Thomson et al., 2010).

⁴ The functions that people ascribe to specific foods and mealtimes expressing their expectations and motives for consumption.

Various emotion measurement methods have been developed: physiological, behavioral, and cognitive, each focusing on a different component of emotion. Physiological measures include electroencephalography (EEG), magnetic resonance imaging (MRI), electrocardiography (ECG), and skin conductance response measurements, used to measure automatic bodily reactions to emotion. Behavioral measures include voice tone, pitch, facial expressions, body expressions and postures measurements, used to measure expression of emotion.

Cognitive measures, used to measure feeling, action tendency, and appraisal, expect the participants to self-report on how they process perceived emotions mentally and can be visual, depicting emotions as cartoons (P.M.A. Desmet et al., 2000), pictures (Collinsworth et al., 2014), or emoji (Ares & Jaeger, 2017).

2.2.1 Word-based lexicons

Cognitive measures can also be verbal, using emotion words (King & Meiselman, 2010). The latter type of emotion measurement, i.e., cognitive verbal self-report, is the focus of this review, as it is linked to the development and use of emotion lexicons.

The number and variety of the existing emotion lexicons and measurement instruments are indicative of the variety in theories and views as regards the number of human emotions, emotion categories, emotion dimensions, the hierarchy of these emotions, their universality, and other aspects of emotion. Verbal report, even with all its failings, is considered the most accurate means of assessing the experience of emotion (Barrett, 2006). Furthermore, self-report questionnaires are the preferred method to access consumers' emotions because emotions are defined as cognitive concepts and thus only language-based methods offer a comprehensive approach to measurement, and because data can be collected faster, more easily, and with less expenses than using implicit methods, by requiring no equipment and by engaging multiple participants at the same time (Cardello & Jaeger, 2021; J. J. Schouteten, 2021). What is more, self-report questionnaires offer many advantages when studying emotions cross-culturally (Chentsova Dutton & Lyons, 2021). However, as Dutton & Lyons (2021) pinpoint out, it is imperative that researchers pay close attention to characteristics of languages spoken by their participants that may lead them to respond to questions a certain way. Existing food-evoked emotion lexicons consist of terms varying in number and form, and emotion measurement questionnaires come in varying forms. According to the aim

of the study and the theoretical assumptions of the researcher, the appropriate method is implemented (Panagiotou & Gkatzionis, 2022).

2.2.1.1 Standardized lexicons / fixed word lists vs consumer-led lexicons

The use of standardized questionnaires containing fixed emotion lists, instead of consumer-defined lexicons (Ferrarini et al., 2010; Lagast et al., 2017; Ng et al., 2013; Schouteten, 2021), is less time and money consuming. These standardized questionnaires usually consist of a hedonic question and a list of emotion terms to choose from using Check-All-That-Apply (CATA), or with rating scales, or rating lines, or a combination of the first two known as Rate-All-That-Apply response type (RATA).

2.2.1.2 Language / Culture – specific vs universal / translated lexicons

Emotions are experienced, expressed and explained within a specific cultural and linguistic context, as discussed in detail in chapter 2.1 of the thesis. The various ways and the degree to which culture and language form and affect food-related emotion expression and measurement is not a point of convergence (Hu & Lee, 2019; Silva et al., 2016; van Zyl & Meiselman, 2015, 2016). This is especially evident in emotion lexicon development and emotion measurement instruments in cross-linguistic and cross-cultural studies. As food product companies are trying to grow bigger in a global market, is developing universal emotion measures or translating an instrument that works into other languages the best way to measure emotion?

The globalization of the food market has created the need for cross-cultural consumer studies. Thus, tools could either be applied universally or translated in order to be used across users speaking different languages or be developed from scratch to include emotion words in the language and cultural context for which they have been developed. Universal tools consist of emotion lists developed in one of the main international languages that are used for populations speaking the language but not having the same culture. For example, an emotion list in Spanish is used for inhabitants of Spain, Mexico, and other Spanish-speaking countries, or a list in English is used for Chinese populations that are proficient English-speakers. This approach, using translations/adaptations of emotion measurement tools developed in a different language and for a different culture, benefits from saving time and money (den Uijl et al., 2014; S Gutjar, 2015; Hu & Lee, 2019; Sosa et al., 2015).

However, caution should be taken when following this approach because culture and language both affect food consumption, emotional experience, and emotional expression. Such differences would not necessarily be captured in the direct translations, as equivalence of any two emotion words in two different languages is always a matter of degree (Ogarkova, 2016). Even in cases of a core overlap of meaning, several aspects, including the social parameters, still differentiate between deemed translation correlates. In a practical sense, what these asymmetries suggest is that any study that uses dictionary translation equivalents should carefully consider available literature for the potential semantic divergence (Ogarkova, 2021). Moreover, language and culture both play a significant role in the experience and expression of emotions. Culture affects emotion language usage for products, and certainly for beverages (van Zyl & Meiselman, 2016). In some cases, translating/adapting a tool into another language has proven to be inappropriate. Even between countries speaking the same language there are considerable differences in emotion responses, there were more similarities for example between Mexican respondents and English-speaking respondents than between Mexican and Spanish respondents (van Zyl & Meiselman, 2015, 2016). This shows that culture is even more important than language in emotion measurement. Culture is a central factor that mediates emotional experience, conceptualization, and expression (Ogarkova, 2016). There are also words referring to culture-specific emotions in a language that either do not have an one-word equivalent in other languages or, if a conventional translation is possible, nuanced specifications are necessary to properly render their meaning in other cultures (Ogarkova, 2016). From a quantitative perspective, there are considerable differences among languages as to the number of different emotions that are lexicalized in them (Ogarkova, 2016).

2.2.2 Emoji-based lexicons

An alternative to self-report verbal questionnaires for emotion measurement is the use of emoji instead of emotion words (Jaeger, Roigard, et al., 2018). According to Evans (2015), emoji are to “text-speak what intonation, facial expression and body language are to spoken interaction” [as quoted in (Jaeger, Lee, et al., 2018)]. Emoji was first studied with regard to their application in Twitter food-related posts (Vidal et al., 2018) and have become a new trend lately in customer satisfaction questionnaires (more on emoji in chapter 2.2 and 4.5 of the present thesis).

2.3 Conclusions

When compiling emotion lexicons, it is important to take both culture and language into consideration and to bear in mind that an emotion lexicon developed in one country for a specific product type is not necessarily suitable for another country or for a different product. Emotion lexicons should be developed using linguistic and cultural data from the frame in which they are going to be exploited. Using pre-existing lists of food-evoked emotions developed in another language should be done while paying attention to certain parameters. On the other hand, from a practical point of view, the process of generating emotion lists for each country is both time consuming and expensive. For this reason, pan-global questionnaires implemented locally in local languages have been proposed. The need to have quick, easy, inexpensive, universal instruments within the global market and international companies' landscape is evident and rational. In Fig. 2, the words that appear the most frequently in emotion lexicons reviewed in this article are presented in size according to their frequency of appearance. They could be used as a starting point in creating pan-global emotion measurement tools.

The most important participant in the emotion lexicon development process is consumers. Personal and cultural conceptualizations, associations, expectations, habits, and past experiences with foods form consumers' emotions and preferences. Thus, a hybrid approach for lexicon development is recommended, one that combines published lists and consumer input, at first applying CATA for term identification and then rating scales or RATA for emotion measurement.

A combination of pre-existing lists and product specific consumer-defined lists in lexicon development may provide a more comprehensive strategy, so as not to miss important discriminating terms (Ng et al., 2013a). Consumer-defined lexicons are for sensory science what data-driven grammars are for linguistics and what descriptive dictionaries are for lexicography. They depict the actual synchronic usage of language and should be taken into account.

In languages less studied, time consuming but thorough linguistic methods should be the first step to identify food-appropriate non-food-specific emotion terms. New linguistic sources available thanks to technology, such as the Web, Information

Technology tools, and social media, should be exploited for term collection and for qualitative analysis of food-elicited emotions.

The use of clusters or emotion categories instead of individual terms is a good choice especially in reduced lexicon forms and in cross-cultural studies, when comparing emotion categories is better than comparing specific emotion words, and term to term translation should be avoided. It would, therefore, be a good idea for an emotion lexicon to have two versions for researchers to choose from, a full version and a short one.



Fig.2: Food-evoked emotion words that appear in EsSense Profile, EsSense25, EmoSemio, Empathic Food Test, and Global Profile. The larger the font, the more frequent the word (Panagiotou & Gkatzionis, 2022).

3 Emotion measurement – Questionnaire design

Lexicons of food-elicited emotions are usually developed to be used for emotion measurement. Decisions taken during the lexicon development process affect the emotion measurements that result from the tool.

One of the first decisions to make is whether the length of the lexicon list can be used as compiled during the emotion terms generation and collection process or needs reducing. In general, when working on a new food product, or working in a language whose waters are uncharted, or when the aim is to explore the concept of a food category, then the full version of the lexicon should be used. However, there are cases when a reduced version of the lexicon is preferable to make the process quicker, easier for the participant, and more focused. This reduced version can either be non-food-specific, as is EsSense25 (Nestrud et al., 2016), or it could be food-specific.

3.1 Clusters versus terms

The use of clusters or emotion categories instead of terms is a good choice especially in reduced lexicon forms and in cross-cultural studies (Table 4). As regards cross-cultural studies, it is linguistically and semantically preferable to translate emotion categories instead of individual terms, because as already explained absolute linguistic, semantic, and pragmatic equivalence for individual words across languages is a rare phenomenon.

In Mora et al. (2019), following the procedure of van Zyl and Meiselman (2015) allowed for an easy filtering of terms for the study of the emotional response. As a consequence, the test was shorter, clearer, and easier to understand and to complete by consumers, as stated by the authors. In the context of the shorter list, overlapping meanings were less frequent and the terms became more differentiated, even though they may be less precise. Thus, an unintended benefit of the shorter list was that there seemed to be more agreement on how the words were interpreted. The words in the shorter list had a more distinct meaning, because there are simply fewer words of similar meaning in the shortened list (Nestrud et al., 2016). This was due to the fact that emotion terms were easier to deal with not only because they were fewer, but also because their meaning was clearer to the participants. Word sense disambiguation is done within context, i.e., people understand the meaning of words in relation and in contrast to the words that “surround” them. The interpretation of the emotional map

obtained after the improvement of the lexicon was clearer than the one obtained from the complete - non reduced lexicon. The new emotional lexicon of beer improved 1) the efficiency of the research in terms of discrimination among samples, 2) the simplicity of use by the consumers (M. Mora et al., 2019).

This leads to the conclusion that linguistic context -more specifically using clusters of emotions for emotion measurement- disambiguates meaning. The meaning of each word is clearer when the word is presented as part of a group. This is obvious in sorting task procedures where words may move between factors indicating that there is either disagreement among the participants about what the words mean, or agreement but the meaning changes depending on the specific set of words being used (Nestrud et al., 2016). As a result, the participants still have the terms that form the cluster available in order to grasp the emotion category concept but rate the category as a whole.

As regards emotion measurement, when comparing the differences among mean emotion ratings for the same words between questionnaires (meaning EsSense Profile and EsSense25), there appears to be a tendency for the ratings to be greater when using EsSense25. One potential explanation for this is halo-dumping, a response bias that occurs when individuals are given a limited number of response alternatives with which to describe or rate a product (Clark & Lawless, 1994). In such situations, when the questionnaire respondents experience emotions for which appropriate words are not available on the list, they choose emotion words that do appear on the list and are close to the desired meaning resulting in higher ratings, thus “dumping” values to the available responses (Nestrud et al., 2016).

Table 4: Available and recommended (indicated with +) options regarding food-related stimuli, the form of the emotion lexicon list, and the response format questionnaire, according to the aim of study (Panagiotou & Gkatzionis, 2022).

aim of study	stimuli		lexicon list		response format		
	food pictures /names	tasting blind/unbranded	clusters	terms	CATA	rating scales	RATA
food-specific lexicon	+	+	+	+	+	+	+
non-food-specific lexicon	+		+	+	+		+
cross-cultural study	+	+	+		+	+	+
to distinguish within food category		+		+		+	+
to distinguish across food categories	+		+		+		+
to develop emotion lexicons	+	+					
to develop emotion measurement instruments		+					
to develop conceptual profiling instruments	+						
to study various aspects of food-elicited emotions	+	+					

3.2 Language as context in emotion measurement

People use the same emotion words in very different ways to communicate their feelings (Barrett, 2004). That is why, including linguistic context helps in determining the meaning of a word, thus reducing ambiguity. For example, using full sentences, it was possible to specify the emotion for a better understanding by respondents (Sara Spinelli et al., 2014). The semiotic analysis of interviews showed that “relax” was used by respondents with two meanings. For this reason, the questionnaire included two different sentences where a context helped to clarify the meaning of the emotion to be evaluated: “It is an antistress: it calms me, soothes me, reassures me” referred to a situation where the product acted as an active agent, able to inspire a passage from a negative state of uneasiness and agitation (a stressful state) to a positive mood characterized by more serenity. The emotion described with this sentence was different from that described in the sentence “It makes me feel relaxed”, which referred to an emotional state of relaxation and did not necessarily imply a passage from a negative to a positive state. This leads to the conclusion that semiotic analysis and term disambiguation using linguistic context is not to be skipped.

3.3 Ordering of terms

The terms of an emotion lexicon, when presented to survey participants for emotion measurement, can either be in alphabetical order, or in random order (Table 4).

Ordering of terms in emotion measurement tools alphabetically is thought to make the task cognitively easier and thus quicker for the respondent than working with terms in random order, without affecting the results (King et al., 2013). However, this is not probably true for all response formats. The CATA format seems to be slightly more sensitive to the order of the emotion terms (alphabetical vs. random) (King et al., 2013). When using clusters of emotions terms, this predicament is overcome. Emotion categories are always presented in random order with subordinate terms sometimes presented alphabetically within each cluster.

3.4 What is measured? What are the participants expressing?

Sources of food emotions include sensory attributes (e.g., amusing, surprising taste or texture), experienced (e.g., relief, stimulation, dissatisfaction) and anticipated consequences (e.g., health effects, fear of obesity), individual meaning (personal/cultural) (e.g., this reminds me of somebody), and actions of associated agents (e.g., contempt towards meat eaters) (Pieter M.A. Desmet & Schifferstein,

2008). Food and drink consumption is not only a physical experience that involves smell, taste and appearance, thus determining the subjective bodily state, but also -and mainly- a cognitive and affective experience” (Ferrarini et al., 2010).

Whether emotion measurement is food-specific or not, taking place under blind conditions or not, it provides deep insights into personal and cultural conceptualizations, associations, expectations, habits, and past experiences. The aim of study is what guides the use of specific stimuli (Table 4). Food names and food pictures are preferred when studying emotions based on memory and past experiences. Food names create an emotional response that is consistent across time (Jiang et al., 2014) and may elicit memories of an emotional experience with the food, whereas actual consumption of that food may not evoke this idealized experience (Cardello et al., 2012). Strangely enough the role of memory is almost always neglected in food-related consumer research, although it is probably much more important than the first impression experiences that are commonly investigated, as memory gives rise to more intense emotions than actual sensory contact with food. The emotions, evoked by remembering a product, are essential in the expectations that guide repurchase decisions. What is remembered is what influences our later food choice decisions (Köster & Mojet, 2015). An interesting finding is that feelings of discontent seem to grow over time and positive feelings seem to wear off with repeated exposure (Köster & Mojet, 2015). Using food names or pictures to elicit emotions is a quick, easy, and economical method, allowing for the use of online questionnaires and the participation of more people. Food tasting should be preferred when interested in specific food products, not in the respective food category. Furthermore, research has shown that by providing elaborate description of the tasted product results in more intense positive emotions and less intense negative emotions, as this technique seems to bring expectations and sensory/emotional experience to convergence (Danner et al., 2017).

Meal functionality – the functions that people ascribe to specific mealtimes, e.g., energizing, or relaxing – seems to be another concept that provides a deeper understanding of food consumption motives. Thomson, Crocker, and Marketo (2010) recently discussed this topic and emphasized the use of conceptualizations, such as ‘will refresh me,’ ‘will make me happy,’ and ‘will annoy me,’ to understand consumer behaviour (Thomson et al., 2010). These conceptualizations seem to be inevitably

connected to food experience, since we react not only to the product itself but also to the associations that we assign to that product (den Uijl et al., 2014).

3.5 Stimuli selection for emotion measurement

By measuring food-evoked emotions we gain insight into the consumers' personal and cultural habits, into their expectations, into how they conceptualize and associate specific foods and beverages, into how they visualize their own selves and make choices accordingly, into how emotions are expressed through Language as a coding system and through specific languages, and so on. According to the aim of the study, various stimuli can be used to elicit emotions (Table 4). Most of the studies that were included in the review (47 studies) used actual food tasting (blind-unbranded, branded). The rest used food names (9 studies) (e.g., bread) informed food tasting (6 studies) (e.g., bread with Bambara flour), food pictures (showing food under study) (3 studies), and food videos (showing food under study being consumed) (2 studies) (Table 2).

Actual food tasting is used as the main food-specific stimulus (48 studies). The tasting is done under blind/unbranded conditions (when the participant has no information regarding the contents, ingredients, brand, packaging etc of the food product being tested) except when the use of packaging, name, origin, ingredients etc. are being assessed. Even in blind testing conditions though, cultural conceptualizations and personal past experiences are present. The sensory information is perceived, processed, and reacted to, based on both intrinsic and extrinsic features of the tasted food. Intrinsic features are more closely associated with emotions, than extrinsic features which tend to have more abstract and functional associations (Ng et al., 2013b). It has also been noted that absence of attributes rather than presence evokes greater consumer discriminating emotions (Wardy et al., 2015).

Testing emotions under informed conditions is especially interesting. Participants are given information on the ingredients, origin, (alleged or real) health benefits etc. of the food or beverage about which they are asked to express emotions. Under such conditions, there seems to be a halo effect over actual sensory perception. Knowledge of food nutrient content, even if false, can alter emotions towards food (Rousset et al., 2005; Yang et al., 2020), increase consumers' hedonic evaluation and purchase intention, as well as vary the perception of different sensory attributes (M. Mora et al., 2020). The effect on emotions of knowing more about the product can be better

identified by measuring emotions before tasting or under blind conditions and after tasting or getting the relevant information. Such processes can be very useful when studying novel products, such as functional foods, or products with sustainable ingredients, and their findings can be applied to branding, packaging design, marketing, restaurant menu writing, health campaigns etc.

3.6 Time of emotion measurement when tasting is involved

The usual process in most emotion measurement studies is to ask for the consumers' emotions after having tasted the foods under study. However, there are other choices for specific reasons. For example, especially when measuring beverage-evoked emotions, and comfort foods, before and after measurement seems to be the most preferred choice. Participants' mood before tasting an alcoholic beverage has been found to strongly influence the emotions evoked (Danner et al., 2016; Desira et al., 2020). There is also the Temporal Dominance of Emotions model which measures emotions while tasting, using a multi-sip approach. And finally, there is the whole experience evaluation which takes place after tasting but the question refers to the entire consumption/emotional experience (Table 4).

The time of measuring the emotions is a parameter that can affect the results. If the measurement is done only after tasting, then there is no way to check to what extent the emotions can be attributed to the food itself and to what extent to expectations either met or not. A solution to this can be measuring emotions both before and after tasting, or measuring emotions during the whole process of tasting, applying the Temporal Dominance Model.

3.7 Context and setting of emotion measurement

Emotion lexicon development and emotion measurement is usually a lab or CLTs process in order to have as much control over the process as possible, following procedure guidelines for sensory testing which is often combined. However, emotions are by definition context-relevant, and cues external to sensory attributes drive different emotions (Swetlana Gutjar et al., 2015; Damir D. Torrico et al., 2020), so labs and CLTs are probably not the best choice of venue to measure emotions related to food consumption. Frequency of emotional terms and intensity of response seem to be much higher when the dimensions of location, social setting, and time have been included. More surprisingly, the differences in emotional responses attributed to the samples

seem to be smaller compared to the differences due to the different test conditions, and/or the test settings (Worch et al., 2020). This agrees with observations made by Silva et al. (2014) when studying the emotional and functional conceptualizations of beer consumers with the typical predefined scenario approach where researchers usually specify the social settings, the location, or the time in which the product is consumed. Linguistic context, as well as physical and social setting, are important parameters of food consumption and thus of emotion elicitation (Rocio Dorado et al., 2016; Silva et al., 2014).

The use of a written scenario to accompany emotion questionnaires, the use of video as a stimulus (Desira et al., 2020; Walsh et al., 2017), the use of real-like, real, or virtual-reality environments in food-evoked emotion measurements seem to be the new trends, in an effort to recreate a setting as close to real food-consumption as possible (Table 2). Food and drink consumption is a social event, even when done individually at home, and if we want to be as close to the real thing as possible then real, or real-like, settings need to be used. Recent studies taking place in real restaurants, bars, cafeterias, or recreating these environments using virtual reality set the trend. The use of video, or of a written scenario that sets the scene for tasting, can make the experience as complete as possible within the lab environment and is less costly (Table 4). One should however bear in mind that there can be lesser product discrimination for emotions, but better repeatability of results, and a higher relation between emotions and liking in real and immersive environments than in a lab (Sinesio et al., 2019).

3.8 Response formats and statistical analysis per response format for lexicon development and emotion measurement

When developing an emotion lexicon and measuring emotions using self-report verbal questionnaires, various response formats may be used according to the task at hand and the decisions taken as regards methodology, namely free-listing, CATA, rating scales, rating lines, and RATA (Table 2).

Most of the reviewed studies have opted for rating scales in their ballots (21 studies), which seems to work well for the participant alongside the rating scale used for liking measurement. Most rating scales consist of 5 points (17 studies), and there are versions of 7 (1 study) and 9 points (3 studies). Rating scales demand an intensity rating for every term, even if the emotion is not experienced at all (e.g., satisfied 1: not at all,

2: slightly - 3: moderately - 4: very - 5: extremely). Next in popularity comes the CATA format where the participants just check the emotions they experience, regardless of intensity. There is also the option to use rating lines instead of scales which seems to be popular with ballots consisting of clusters/categories of emotions (11 studies). The final option is the RATA, a combination of CATA and rating scales, where the participants provide ratings of intensity for the terms that they experience only. The RATA method has been modified to contain a “not-at-all” option which makes it even more similar to the rating scales. In Table 4, the response format options are presented as recommendations according to the aim of study.

Many of the reviewed studies have used the EsSense Profile in either its original form for emotion measurement using rating scales or in the CATA version, which is very popular as well, depending on the aim of study.

3.8.1 Free listing of terms

Asking the participants to provide their own terms in a free-listing task, including triadic elicitation [i.e., say in what way two samples are similar but different from the third in terms of the emotional response they evoke (Eaton et al., 2019)], or to talk about their emotions during a focus group discussion or a one-on-one interview, results in a list of terms that are food-appropriate or food-specific. The terms to be kept are determined by their frequency of citation, by counting the number of participants who mentioned the term. The cut-off point is not a point of convergence. Some researchers use the emotion terms mentioned by the 50% of the participants and above, others use the 20% threshold. It probably depends on how long the list needs to be and to what extent these terms express distinguishable emotions, after grouping synonyms.

3.8.2 CATA

Using a pre-defined list of terms and asking the participants to check-all-that-apply, usually allowing for the addition of any extra terms that do not appear in the list, is a response format that is quick and cognitively easy for the participant, and quick and easy for statistical analysis by the researcher. It can be used to narrow down the terms of a long list so as to keep the food-appropriate emotions or to create a food-specific emotional profile. Providing the terms from which to choose is helpful to the participants, as some people find it hard to pinpoint and accurately express their exact feelings. When answering CATA questions most consumers might not select all the terms that apply, but simply select those that are the most important to them for the task

at hand. The drawback of this format, while compiling a lexicon, is that it may seed terms that would not come up in a free-listing task.

While measuring emotions, frequency of citation is calculated by counting the number of participants who selected the term. This format has the drawback of not discriminating between highly intense emotions and emotions only slightly experienced. This drawback can be overcome by using a modified CATA where each term can be endorsed by one to three checks, depending on the appropriateness or the intensity of the emotion experienced, thus providing a certain degree of discrimination (Thomson & Crocker, 2013). One could then decide to keep the terms endorsed with two or three checks only, to avoid casual endorsement. The CATA format also seems to be affected by the order in which the terms are presented, which means that random ordering across participants should be preferred, but the same order by participant should be used to keep the task cognitively easy (Jaeger, Swaney-Stueve, et al., 2018). This format allows discrimination across food categories. For statistical analysis of CATA data one can apply the Cochran's Q test to check frequency of selection per emotion term and pairwise comparisons between terms. The use of ANOVA has also been proposed and checked but there are limitations acknowledged and further research needs to be done on that (Meyners & Hasted, 2021).

3.8.3 Rating scales and rating lines

Rating scales and rating lines can be used as the step following CATA in the lexicon development process, in order to create a food-specific profile using a relatively short pre-defined list but are especially used in emotion measurement questionnaires as they discriminate well both across and within food categories. Such a format demands the participant to attend to all terms equally and is thus more time consuming and cognitively harder than the CATA format, but ratings yield more detailed information as regards the experienced emotions. Demographic information, such as gender and cultural background, should be taken into account when using ratings, because of the variations in expressing intensity of emotion. Rating lines are probably more discriminating than rating scales but may be confusing to participants due to their relativity and the lack of specific intensity markers. Statistical analysis of these formats is done via ANOVA or MANOVA, to identify significantly discriminating factors.

3.8.4 RATA

The Rate-All-That-Applies format seems to combine the advantages of the CATA format and of the rating scales, i.e., it is quick and discriminating. That is because frequency of use of the terms correlates with intensity ratings (Bruzzone et al., 2015; Meyners et al., 2016). Consumers are expected to only select the most applicable attributes in CATA questions, so they only check an attribute if its intensity exceeds a certain (subject-specific) threshold, whereas in RATA questions consumers are expected to provide a more detailed characterization of the samples by selecting a larger number of attributes and additionally indicating their intensity (Vidal et al., 2018). There is also an interesting variation, a modified RATA where participants are asked to rate all terms using a rating method, where 0 reflects not feeling the emotion at all (Hu & Lee, 2019; Low et al., 2021).

Results from a RATA questionnaire can be analysed in two ways: RATA as CATA and RATA as scores, giving a 0 score to the attributes that are not endorsed. It has been noted that using a RATA ballot and treating the data as CATA is likely to be disadvantageous to sample discrimination. All-in-all, however, no clear superiority of one methodology over the other has been observed.

3.9 Emotions and overall liking as inter-complementary measurements and the position of overall liking/acceptability question in emotion questionnaire

Emotions and liking, or else hedonic, ratings are inter-complementary. That is why emotion lexicons in emotion measurement tools are usually accompanied by an overall liking or overall acceptability question, in order to gain deeper insight into consumers' preferences, as liking ratings express which sensory and emotional attributes are desirable and which are not for the food under study. Emotion profiles can differentiate between products of the same acceptability and liking. Emotion responses may even be a decisive factor for consuming or buying a food product, even more decisive than sensory liking and price (Jiang et al., 2014). Research on food products has shown that liking, expressed through hedonic tests, cannot predict food choice and purchase on its own (King & Meiselman, 2010; Meiselman, 2013). What is more, liking cannot always differentiate between a consumer's attitude towards a food product before and after tasting it (especially beverages) but emotions can give such a differentiation (Silva et al., 2017). On the other hand, emotions alone cannot provide us with a full food profile

as hedonic ratings help explain the choice of emotion terms. This happens because certain emotions can be considered desirable in some food cases or in some cultures but undesirable in others, and hedonic ratings clarify emotions that are neither positive nor negative or both positive and negative depending on context. For example, the emotion of *guilt*, needs the liking factor to be correctly understood. Actually, in Dalenberg et al. the strongest predictive strength was achieved by the combination of evoked emotions and liking (Dalenberg et al., 2014), and according to Beyts et al. emotions are more discriminating than hedonic liking alone (Beyts et al., 2017).

An overall acceptability or overall liking question is added to most emotion measurement tools, usually to be answered on a 9-pt scale (1-dislike extremely, 5-neither like nor dislike, 9-like extremely) and usually precedes the emotions questions. The rating scale format seems more sensitive to the position of the emotion terms relative to the overall acceptance question (King et al., 2013). Information provided by this hedonic liking question adds information to emotions, especially in cross-cultural studies where some emotions may be experienced but undesirable. For example, in a study Asian participants were found to have positive attitudes toward a healthier variety of foods compared to that of Western participants (Damir Dennis Torrico et al., 2019). In another study, the conclusion was that although chocolate is highly liked, actual consumption of chocolate varies between consumers and heavily depends on many more factors than merely liking (Dalenberg et al., 2014). In a cross-cultural study between Westerners and Asians to develop emotion lexicons for chocolate types, Westerners felt a little naughty and guilty at a high frequency when consuming chocolate, which were characterized as unclassified emotions, while Asians had only clearly positive emotions and these specific emotions were not in the final lexicon. Westerners were also found to feel mainly elegant when consuming dark chocolate, while Asians felt mainly healthy (Gunaratne et al., 2019). In another study, sweeteners high in liking have been associated with neutral to positive terms, while sweeteners low in liking, and neither liked nor disliked have been uniquely associated with negative terms (Leitch et al., 2015). These studies emphasize the fact that emotion terms and liking on their own tell only half the story.

Beverages, even if equally liked by consumers within a specific group (i.e., who have the same age, gender, or frequency of consumption), can have very different emotional profiles. In a study, consumers grouped according to their frequency of consumption as

“heavy”, “medium”, and “light” users, who liked light and dark roast coffee samples equally, expressed different emotions towards each sample: positive-high energy emotions were generated when drinking one type of coffee (active, boosted, energetic, rested, and empowering), while positive-low energy feelings were felt when drinking another type of coffee (comfortable, pleasant, warm) or a third one (relaxed, curious) (Bhumiratana et al., 2014). In a study comparing beer, wine, and non-alcoholic beer, consumers distinctively expressed feeling free when drinking beer, calm and loving when drinking wine, but safe, responsible, rational, and conscious when drinking non-alcoholic beer (Silva et al., 2016).

3.10 Creating consumer-led emotion and sensory lexicons, linking emotions and sensory attributes

Sensory perception, usually through the sense of taste, is a source of emotions, and there are quite a few studies (9 reviewed here) that combine data from sensory and emotion measurements to gain deeper insights into consumers’ preferences (Jaeger et al., 2019; Jaeger, Spinelli, et al., 2018; M. Mora et al., 2018; Ng et al., 2013b; Samant & Seo, 2019; J. Schouteten et al., 2015; Silva et al., 2019; Sara Spinelli et al., 2019; Thomson et al., 2010). Linking emotional attributes with sensory attributes, such as amusing, surprising etc., can provide deeper insights into consumers’ preferences and is necessary during the product development process (Table 2). There are ready-made models to make this link with specific advantages each:

EmoSemio / Global Profile (S. Spinelli et al., 2019; Sara Spinelli et al., 2014; Sara Spinelli & Jaeger, 2019): The EmoSemio, by providing sentences along with emotion terms, can be clearer for the participants as to the meaning of the terms. It has also proven discriminating and good at creating product-specific profiles. Its extension, the Global Profile, is the most complete emotion measurement tool, including liking, sensory characterization, emotions, emotional and functional conceptualizations, and context. It thus measures the experience as a whole, which makes it ideal for creating complete food profiles.

The Temporal Dominance of Emotions Model (Jaeger et al., 2014; Silva et al., 2018, 2019): This model is analogous to the Temporal Dominance of Sensations and the Temporal Dominance of Liking and is often combined with them. It studies emotions as they evolve during the tasting process instead of measuring them as static events

after tasting. The participants evaluate the dominant emotion since its onset through to its peak and its dissipation. This approach is far closer to the real eating/drinking process, and it adds an extra layer of information when liking, emotions, and emotion intensities cannot discriminate between foods. This method can be very insightful for beverages and comfort foods, where the “flow” of emotions can indeed be the factor that determines purchase and preference.

EmoSensory® Wheel (J. Schouteten et al., 2015; J. J. Schouteten et al., 2015, 2017): The wheel response format, where participants can choose the emotions they want by using CATA or RATA. This format can be used to easily link sensory and emotional attributes, and because of its electronic format it can easily be made product specific.

The Emotional Circumplex Model (Jaeger et al., 2019; Jaeger, Spinelli, et al., 2018): This model distinguishes well among foods but cannot be used for emotional profiling as the participants choose only one pair of emotions, capturing valence and arousal. It can be used when locating the emotional domain instead of specific emotions is enough. This model makes linkages between emotional and sensory terms easy, and its response format allows for less dispersion of data than others.

3.11 Demographic data

One should keep in mind certain trends, such as that female consumers and Westerners rate emotions more intensely than male consumers and Asians, or that men tend to report higher positive emotions for comfort foods than women (M. Mora et al., 2020). Another example can be found in the emotion of *guilt*. If the reason of guilt is the amount of calorie intake from a type of food, then it could be explained as guilty pleasure and be considered a desirable attribute. If the reason of guilt is the high price paid for a food type considered a luxury, then it would be an undesirable attribute. Income is another factor that can affect emotional responses. For example, low-income consumers tend to express negative emotions (e.g., disappointed, anguish, annoyed, sad, rejection, disgusted) towards beer and wine probably because these beverages can cause social and family problems due to drinking issues, while middle-income consumers tend to express positive emotions (e.g., loving, good-humoured, fun, sharing, friendship) towards beer and wine (Sosa et al., 2015). There are other studies that deal with different aspects of demographics, but they did not fulfil the inclusion criteria for this review.

3.12 The alternative of emoji questionnaires as emotion measurement tools

An alternative to self-report verbal questionnaires for emotion measurement is the use of emoji instead of emotion words (Jaeger, Roigard, et al., 2018). According to Evans (2015), emoji are to “text-speak what intonation, facial expression and body language are to spoken interaction” [as quoted in (Jaeger, Lee, et al., 2018) (Fig.3)]. Emoji was first studied with regard to their application in Twitter food-related posts (Vidal et al., 2018). The meanings of emoji were then studied in an online study with Chinese consumers, matching emoji to emotion terms (Jaeger & Ares, 2017) (Fig.4). This led to a list of 33 distinct emoji out of the 39 studied. Then, the use of emoji as a direct method to measure emotional associations to food names was investigated with consumers in USA and China (Jaeger et al., 2017). While the number of emoji (33) in this research was comparable to the number of words in published emotion surveys, it is suggested that fewer emoji can be used without sacrificing too much discriminative ability. Jaeger et al. (2017) also note also that emoji approaches, like word-based approaches, may require product specific applications.

To investigate the effect of question wording, stimulus context, and response format on emoji questionnaires used for direct measurement of product-elicited emotions, a comparison of five methodological variants of emoji questionnaires was conducted on seafood with Chinese consumers (Ares & Jaeger, 2017). The same 33 emoji were used with food names, without actual tasting. The authors noted that emoji questionnaires can be used without explicitly instructing consumers to consider their feelings when responding. Ares & Jaeger (2017) also point out that the emoji face with heart shaped eyes is of particular interest because of its potential ability to distinguish between products that inspire feelings of love versus those that inspire feelings of general positive affect (e.g., smiling face with smiling eyes).


































Emoji	Description	Emoji	Description
	Smiling face with smiling eyes		Sleeping face
	Grinning face		Flushed face
	Smiling face with smiling eyes and open mouth		Face with stuck out tongue and tightly closed eyes
	Smiling face with heart shaped eyes		Face screaming in fear
	Smiling face		Confused face
	Relieved face		Confounded face
	Smiling face with sunglasses		Unamused face
	Smirking face		Tired face
	Face with stuck out tongue		Pensive face
	Grinning face with smiling eyes		Persevering face
	Winking face		Weary face
	Face throwing kiss		Disappointed face
	Face with stuck out tongue and winking eye		Angry face
	Face with tears of joy		Face with cold sweat
	Neutral face		Crying face
	Expressionless face		Loudly crying face
	Grimacing face		

Fig.3: Emoji and their description (Jaeger et al., 2017)

Emoji	Emoji name	Emoji meaning retrieved from internet sites
😡	angry face	angry ^{1,3,4,5,8,9} , grumpy ^{3,12} , mad ^{2,4}
👏	clapping hand sign	applause ^{3,4,9,11} , amusement ² , appreciation ² , encouragement ² , excitement ²
😬	confounded face	confused ^{2,4,5,9,10,11} , angry ⁴ , disgusted ⁴ , upset ⁴
😕	confused face	confused ^{3,5,12} , puzzled ^{3,12} , neutral ⁴ , sad ⁴ , unhappy ⁴
😭	crying face	sad ^{2,3,4,9,11} , crying ^{11,12} , bad ⁴ , teary ¹²
😞	disappointed face	disappointed ^{1,3,5,11,12} , sad ^{1,3,4,5,12} , unhappy ^{4,8} , defeated ⁴
😐	expressionless face	indifferent ^{4,5} , meh ¹² , unconcerned ⁴
😱	face screaming in fear	scared ^{1,2,4,9,11,12} , scream ^{1,2,3,4,12} , surprised ^{2,4} , shocked ⁴
😘	face throwing kiss	blowing a kiss ^{3,4,9,11,12} , loving ^{1,4,8,11} , kissing ^{2,4,12} , affectionate ^{4,5} , cute ⁴
😓	face with cold sweat	stressed ^{2,4,5,10} , nervous ^{4,11} , cold ⁴ , tired ⁴ , sad ³ , weeping ⁴
😛	face with stuck out tongue	cheeky ^{3,12} , funny ⁴ , flirtation ⁴ , happy ⁴ , hot ¹² , salacious ² , silly ²
😜	face with stuck out tongue and tightly closed eyes	barfing ^{8,13} , really crazy ^{4,12} , silly ^{2,4} , disgust ⁴ , funny ⁴ , LOL ⁴
😝	face with stuck out tongue and winking eye	cheeky ^{9,12} , crazy ^{2,12} , silly ^{2,4} , flirtation ¹ , funny ⁴ , sexy ⁴
😄	face with tears of joy	laughing ^{1,2,4,5,8,12} , happy tears ^{1,2,3,12} , laughing out loud ^{4,5,11,12} , funny ^{4,5} , happy ^{1,2}
😬	flushed face	embarrassed ^{1,2,3,5,8,12} , blushing ^{2,3,11,12} , surprised ^{4,9}
😏	grimacing face	awkward ^{4,6,12} , grimace ^{1,12} , nervous ^{4,12} , surprised ⁴
😄	grinning face	smiling ^{1,2,3,9,11,12} , happy ^{1,3,8,13}
😁	grinning face with smiling eyes	smiling ^{2,3,4,11} , happy ^{1,3,4} , awkward ^{1,4} , angry ⁴ , excited ⁴
😭	loudly crying face	crying ^{1,2,3,4,9,11,12} , sad ^{1,2,3,5,7,12} , sobbing ^{2,4,9,11,12} , broken heart ⁴ , grief ⁴ , inconsolable ⁷ , sorrow ⁴
😐	neutral face	neutral ^{1,2,4} , straight faced ^{2,3,12} , no expression ^{2,4} , meh ¹²
👌	OK hand sign	Ok ^{1,2,3,4,5,9,11} , acceptance ⁵ , good ⁵ , satisfaction ⁵ , tiny or small thing ⁵
😓	pensive face	sad ^{3,5,7,9,13} , disappointment ^{4,5,9} , remorse ^{3,5,7} , depressed ⁴ , melancholy ⁴ , sorrow ¹² , unhappy ¹²
😓	persevering face	helpless ^{3,7} , confused ⁴ , persist ⁹ , sad ⁴ , scrunched face ³ , sorrow ⁴
😏	pouting face	angry ^{4,5,9,12,14} , mad ^{3,4,8,12,13} , furious ^{1,8,9,10} , displeasure ³ , grumpy ¹²
❤️	red heart	love ^{1-3,4,5} , being touched ⁹ , caring ⁹ , romance ⁵
😌	relieved face	content ^{2,3,4,5,7,12} , relief ^{1,2,3,4,5} , pleased ¹² , relaxed ¹²
😴	sleeping face	sleeping ^{3,4,12} , sleepy ^{3,4,5} , tired ^{4,8,13} , peaceful ⁴
😄	smiling face	grinning ^{1,12} , smile ^{2,12} , happy ⁵ , joy ⁵
😍	smiling face with heart shaped eyes	love ^{1,2,3,4,5,9,11,12} , adore ⁵ , affection ¹¹ , hot ⁴ , sexy ⁹
😄	smiling face with smiling eyes	happy ^{1,4,5,8,11} , smiling ^{2,3,4,12} , blushing ^{1,4} , cute ^{4,9} , content ¹²
😄	smiling face with smiling eyes and open mouth	happy ^{4,5,9,11} , smiling ^{2,4,9} , funny ⁴ , grinning ¹
😎	smiling face with sunglasses	cool ^{1,2,3,4,5,12} , relaxed ^{4,12} , sunnies ¹²
😏	smirking face	smirk ^{2,3,4,7,9,11} , smug ^{2,3,7,12} , sly ^{3,4} , suggestive ^{5,12} , flirting ¹² , suspicious ⁴
👍	thumbs up sign	approval ^{2,3,14} , good job ^{2,4} , okay ^{1,4} , acceptance ⁵ , compliment ⁹ , satisfaction ⁴
👎	thumbs down sign	disapproval ^{2,3,4,14} , dislike ^{2,5,14} , rejection ^{1,4,5} , despise ^{9,11} , not good ^{2,4}
😓	tired face	exhausted ^{1,3,12} , tired ^{1,5,12} , over it ¹² , upset ⁴
😏	unamused face	dissatisfied ^{3,5,12} , annoyed ¹ , not impressed ¹² , skeptical ⁵
😓	weary face	tired ^{2,4,5} , distraught ^{3,12} , despair ⁴ , frustrated ⁴ , sad ⁴ , upset ⁴
😏	winking face	flirtation ^{2,3,4,5,9} , joke ^{1,2,3,4,5} , humor ^{1,3,5} , wink ^{4,11,12} , sly ^{4,5} , suggestive ^{4,5} , cheeky ⁴ , say no more ¹²

Fig.4: Emoji, their names, and their meanings as retrieved from internet sources (Jaeger & Ares, 2017).

Ares & Jaeger (2019) presented very interesting conclusions are regards the emoji questionnaire format. More specifically:

- a) participants selected only a few emoji per stimulus when using CATA
- b) the layout of the CATA question had only a small impact on responses (more emoji were selected when they were displayed on a single page and emoji were selected by clicking on an adjacent box compared to when displayed on a single page with direct selection as buttons
- c) a comparison of CATA questions with forced yes/no questions and RATA questions revealed an increase in frequency of emoji use for yes/no questions, but not a corresponding improvement in sample discrimination
- d) RATA was probably the best methodological choice, with 8.5 emoji being used per stimulus, on average, and increased sample discrimination relative to CATA
- e) RATA questions were associated with greatest sample discrimination
- f) Forced yes/no questions were consumers' least favourite methodological variant and despite leading to high frequency of emoji use, sample discrimination was unchanged relative to CATA questions
- g) RATA questions seem to have more strengths than weaknesses, while the opposite was found for forced yes/no questions.

To explore the role of product involvement in consumers' emotional associations to food and beverage stimuli (actual tasting and written stimulus), product involvement and consumer food-elicited emotional associations were studied using emoji questionnaires (Jaeger, Lee, et al., 2018). Participants were from New Zealand and China.

To compare the use of emoji versus the use of emotion words in questionnaires, participants from New Zealand and China responded to CATA questionnaires after tasting foods and using written stimuli (Jaeger, Roigard, et al., 2018). The conclusions of the study were:

- a) emoji, overall, were more discriminatory than emotion words
- b) emotion words were less suitable for use with Chinese consumers responding to written stimuli, especially those that evoked negative emotions
- c) emotion words were slightly more discriminatory than emoji in the case of pairs of samples with high overall liking (tasted foods)

d) the choice between emoji or emotion words should be made per study.

Another study followed with a primary focus on response frequencies, rather than a matching of emoji and emotion-words (Jaeger et al., 2019). Task perception measures were obtained from Korean and New Zealand participants, who tasted a variety of foods and beverages, to gain some insight of emoji surveys through the eyes of research participants. An interesting finding was that the dominant sample discrimination occurred by valence. Jaeger et al. (2019) also concluded that emoji should not be regarded as a direct substitute for existing word-based emotion surveys, but as an alternative method for emotion measurement.

Another dimension of emotion has been proposed in an emoji-based study, in addition to valence and arousal, that of power. According to this study, the power dimension is associated with lack of control and control, weakness and potency/strength, submissiveness and dominance (da Cruz et al., 2021).

This approach has its advantages and drawbacks, among their advantages being enhanced ecological validity, familiarity, and cross-culturally shared meanings, and among their disadvantages multiple or unclear emoji meanings, appropriateness for older consumers, and lack of ability to represent degrees of emotional arousal (activation to deactivation) (Jaeger et al., 2021).

The choice for either emotion words or emoji might depend on the stimuli and presentation mode under study although the age of the participants should be considered but there is no clear direction on whether words or emoji generate more discriminative differences in product testing (J. J. Schouteten & Meiselman, 2021). Since emoji is a fun and easy way to express emotion requiring little cognitive effort and linguistic ability, they could be the way to go when the participants are children or young adults, much accustomed to using them in text messaging and on social media, as well as in cross-cultural studies when developing an emotion lexicon from scratch or translating existing lists is not an available or the right option. As Schouteten & Meiselman (2021) put it, we probably do not need to make a choice between either emotion words or emoji; it might be interesting to include both.

3.13 Conclusions

In emotion measurement, especially of alcoholic beverages and comfort foods, a measurement of the participants' mood before or during the entire tasting process should be taken to trace the emotional alterations and gain better insight since consumption of these types of food are specifically targeted at altering our emotional state.

Researchers should be aware of the fact that creating high expectations to participants when performing informed testing may be risky as these expectations may not be met and may result in decreased satisfaction. Nevertheless, informed conditions can be used when studying cultural aspects of food acceptability and attitudes to specific food attributes. These conditions could also give great insight into target group discrimination.

In emotion measurement, opting for a response format should be done according to the task at hand. To discriminate between quite different food categories, one can choose CATA with the option to add terms that are not on the list. To discriminate products within the same food category, rating scales would be the format to choose. The modified RATA with a scale of 0-5 (0 not feeling the emotion at all) is a good alternative if keeping the task quick and easy is an important factor.

Liking ratings, linking sensory and emotional attributes, and also taking into account demographic information such as income can provide even deeper insights into consumers' preferences.

Food-elicited emotions and the respective emotion lexicons could be used outside the food science and consumer studies field, in Natural Language Processing for opinion mining in food talk social media and reviews of restaurants, recipes etc. on the Web.

Studying food-elicited emotions is more important than ever now that people are becoming more and more conscious of what they purchase and what they consume. They are mindful eaters, have high expectations, and health and wellness are a big issue (Meiselman, 2013, 2015; J. J. Schouteten et al., 2017). Functionality of foods and meals is a key concept as well (den Uijl et al., 2014; Silva et al., 2014). The reviewed studies, having emotion lexicon development as the main focus, were conducted with healthy participants. As a result, health issues such as obesity, diabetes, anorexia nervosa etc.

have not been addressed here. However, this is a point where emotion measurement could be applied to provide helpful data.

To be as close to the real food consumption experience as possible, settings such as restaurants, bars, cafeterias, or virtual environments recreating these settings should be used. Another option, less costly, is the use of video, or of a written scenario that sets the scene for tasting. As an extension of this, emotion measurements should be taken at the time of actual purchase or consumption, via the use of interactive electronic devices, for the outcome to depict reality.

From a linguist's and a lexicographer's perspective, the process of developing and applying emotion lexicons in general and more specifically in the domain of food is enticing for various reasons. On the one hand, a linguist or a lexicographer can offer their expertise in every step of the emotion lexicon development process: as regards possible sources of terms for lexicon development from scratch, collection of data techniques, for example by making use of electronic lexicography and Natural Language Processing tools, highlighting aspects of the relationship between language and culture, working on the translatability of emotions and emotion words in cross-cultural studies, providing insight into how to work with clusters of emotions or with the valence and arousal dimensions of emotions based on frame semantics, conceptual linguistics, and sensory linguistics, providing guidelines as to how to use linguistic context to make emotion terms clearer to consumers/ research participants, helping explain results in the light of "language within context".

On the other hand, concepts about food, eating habits, and relative emotional associations are depicted in linguistic constructs, such as metaphors, and research regarding emotions in the food domain can offer a wealth of data and great insight that can -and should- be depicted in dictionary definitions and examples, or provided as pragmatic information about the usage of a word or expression. Also, making use of demographic data about the frequency of use and the way of usage of emotion terms as related to foods can enrich dictionary entries, too.

To conclude, there is an opportunity of a rich and fruitful give-and-take between food science and linguistics / lexicography, beneficial for all parties concerned.

4 Emotion lexicons in Greek

4.1 Introduction

Measuring emotions elicited by foods has attracted great research interest in the past few decades. By 2010 food scientists used mainly emotion lists from the psychology domain. Since then, lists containing food-elicited emotions are created in various languages. These lists can be for general use or food-specific or even for specific consumer groups. The first food-related study was the EsSense Profile, an emotion measurement commercial tool (King & Meiselman, 2010). The original word list was compiled by using existing lists from the psychiatry and psychology domain, and by getting feedback from consumers.

Since 2010 there have also been a few attempts to compile emotion lexicons from scratch, without using existing lists (Carolina Chaya et al., 2015; Eaton, 2015; Fonseca et al., 2019; Gmuer et al., 2015; Silva et al., 2016). The first stage in such a process is term collection and identification using focus groups or larger consumer studies. Such studies are usually food specific and use consumer feedback to compile the respective lexicon. Consumers usually taste samples and report their emotional responses to them either by using free-listing techniques (Carolina Chaya et al., 2015; Rocio Dorado et al., 2016; Eaton, 2015; Eaton et al., 2019; Fonseca et al., 2019; Gunaratne et al., 2019; María Mora et al., 2020; Silva et al., 2016) or by answering closed-ended questionnaires, individually (Cardello et al., 2012; Ferrarini et al., 2010; Jager et al., 2014; Silva et al., 2018; Wardy et al., 2015) or after group discussion (Bhumiratana et al., 2014; Danner et al., 2016; Eaton, 2015; Eaton et al., 2019; María Mora et al., 2020; Silva et al., 2016).

Most measurement tools are developed in English. For less widespread languages, and smaller markets, universal and translated tools have been used to cater for measurement needs in general, not only for food-related studies (den Uijl et al., 2014; Ferdenzi et al., 2013; Swetlana Gutjar et al., 2015; Hu & Lee, 2019; Jaeger et al., 2017; Sosa et al., 2015; Thomson & Crocker, 2013). However, such tools are not always efficient, especially for emotions, as the experience and expression of emotion is linguistically and culturally conditioned (van Zyl & Meiselman, 2015, 2016).

Specifically for the Greek language, no emotion measurement tool is available to date. An attempt to use a direct translation of the EsSense Profile in Greek has provided evidence that an English-language emotion lexicon (adapted into Greek) cannot cater for the needs of the Greek consumer. According to participants' feedback, most of the emotions on the list seemed "weird" to the Greek consumer and "not suitable for the task", "not food-related", whilst relevant emotions were reported to be missing from the list. This highlighted the need to develop a language-specific tool and address cultural and language differences from the use of English tools.

To develop a lexicon from scratch, linguistic sources, such as dictionaries, thesauri, and corpora, and the most recent source the Web, are very helpful when checking synonyms, meanings, and usages (Bouzou, 2018; Carolina Chaya et al., 2015; Eaton, 2015; Eaton et al., 2019; Gmuer et al., 2015; Vaezian, 2018; L. Wu, 2015). Corpora are machine-readable, usually finite-sized, collections of authentic texts. These texts have been collected to represent a language or a language variety (Bouzou, 2018). Corpora can provide information such as frequency of use of words, linguistic patterns, and can also be used for qualitative and quantitative analysis. So far, their use is not frequent in consumer studies. However, in languages that lack emotion lists, corpora have been used to compile lexicons from scratch (Gmuer et al., 2015). The Web, its search engines, and its lexical databases have also been used as sources of data for the development of emotion lexicons (Gmuer et al., 2015). The Web, in fact, can be considered as a very large multilingual corpus containing texts in almost all languages and all text types (Vaezian, 2018).

The Web has some very specific features that render it unique and ideal for linguistic research, particularly a) can be used as one unified source, because its content is interconnected, b) contains authentic, spontaneous, natural speech, c) contains a new style of writing: written speech with characteristics of oral speech, d) contains all styles and registers of a language, e) contains synchronous language, but can also be used for diachronic research, f) its contents are self-productive, as wikis, blogs, and forums are daily enriched and updated.

However, using the Web as a corpus for linguistic research has some disadvantages: a) its dimensions are unknown and constantly altering, b) repeatability of results is impossible due to the algorithms used in searches, c) because of its great heterogeneity,

it can prove to be risky for the researcher Sinclair et al. (2004) seem to be concerned and mention that the Web cannot be considered as a corpus because of its unknown and constantly altering dimensions, and because it is not designed from a linguistic perspective. Nevertheless, the number of researchers currently using the Web to create corpora, and those using the Web itself as a corpus is increasing (Bouzou, 2018; Vaezian, 2018; L. Wu, 2015).

During the past decade the size of the content published online has drastically increased, mainly due to the widespread use of online social media (OSM). The content produced within OSM has the potential to be used for understanding, modeling and predicting human behavior and its effects (Tsakalidis et al., 2018). Twitter is already being used as a linguistic source within and outside food research to identify linguistic patterns and for sentiment analysis (Novak et al., 2015; Swaney-Stueve et al., 2018; Vidal et al., 2015, 2016). Consequently, the Web can be used mainly for qualitative instead of quantitative research, to identify patterns and tendencies. This is very helpful in the case of the Greek language, because the available corpora in Greek are limited in size and variety of texts.

A special study within the domain of food-related research was that by Gmuer (2015). A systematic approach on a linguistic basis was applied, aiming at the compilation of a food-elicited emotion lexicon in German. Since there was no food-related emotion list in German, a three-step approach was followed to identify which German words can describe emotions elicited by foods. The original list consisted of single-word adjectives and was compiled using thesauri, electronic corpora, the Web (Google search and lexical databases), as well as an emotions hierarchy from literature (Storm & Storm, 1987). The inclusion criteria for the emotion terms were to be frequently used in everyday situations and to follow certain syntactic criteria, i.e., to collocate with the verbs “feel” and “be” (Gmuer et al., 2015).

In this study, the process of compiling a food-related emotion lexicon in the Greek language is described. Standard sources of emotion terms were used, such as thesauri and dictionaries, as well as the consumers. The Web and Instagram were also used as linguistic sources, which is not standard methodology but follows recent literature. Emotion terms were collected by consumers who were also asked to check the terms’ appropriateness for food studies, using questionnaires with foods. The emotion list

compiled was then used as an emotion measurement tool to measure emotions evoked by foods and beverages.

4.2 The process of translating an emotion measurement tool from English into Greek and using it with Greek consumers

4.2.1 Introduction

The EsSense Profile (EP), as described in King and Meiselman (2010), and consists of 39 emotion terms. It was developed using previous emotion lists from mood and emotion questionnaires, not food related, and feedback from consumers from CLTs, online studies, and a focus group. During an internet survey, 105 participants were asked to describe their favorite beverage, snack, or dessert as well as their least favorite meal, snack, or dessert, and by using CATA and free-listing methodology choose the emotions they associate with each. A list of 80 emotion words was created. Another internet study was then conducted in which 200 respondents were asked to categorize given emotions, as they relate to food, as positive, negative, both positive and negative, or neither positive nor negative. Of the 80 terms evaluated, 32 were positive (25 clearly positive and 7 not as clearly positive) and 27 were negative (17 clearly negative and 10 not as clearly negative), leaving 21 terms with no clear classification. After a number of studies, the researchers decided to keep 39 emotions, positive, negative, and uncategorized ones, keeping those selected by more than 20% of the participants.

4.2.2 Materials and methods

The translation of the EP into Greek was done by the author and the supervisor of the present thesis, both native speakers of Greek and proficient in English, with certified qualifications in translation and lexicography, using standard methods of translation and back-translation. Each emotion in the original EP list was covered by a Greek term; however, this was not done by translating terms one-to-one but by making sure all emotions on the original list were covered in the Greek list, and all the emotional spaces on the pleasantness – arousal plot, as described by van Zyl & Meiselman (2015) were covered. Thus, the translated EP consists of 36 emotion terms, not 39 as EP (see also Table 14).

EsSense Profile: active, adventurous, affectionate, aggressive, bored, calm, daring, disgusted, eager, energetic, enthusiastic, free, friendly, glad, good, good-natured, guilty,

happy, interested, joyful, loving, merry, mild, nostalgic, peaceful, pleasant, pleased, polite, quiet, satisfied, secure, steady, tame, tender, understanding, warm, wild, worried, whole.

translated EsSense Profile in Greek: ενεργός, περιπετειώδης, στοργικός, επιθετικός, βαριεστημένος, ήρεμος, τολμηρός, αηδιασμένος, ανυπόμονος, δραστήριος, ενθουσιώδης, ελεύθερος, φιλικός, χαρούμενος, καλοσυνάτος, ένοχος, ευτυχισμένος, ενδιαφερόμενος, εύθυμος, πράος, νοσταλγία, γαλήνιος, ευχάριστος, ευχαριστημένος, ευγενικός, ήσυχος, ικανοποιημένος, ασφαλής, σταθερός, βαρετός, τρυφερός, συμπονετικός, θαλπωρή, ασυγκράτητος, ανήσυχος, πλήρης.

More specifically, the term *good* was not translated into Greek because the English expression “I feel good” means “I feel in good health or in a good mood” but as a notion it was partly covered by other terms, such as *glad*, *happy*, *joyful*. The term *loving* was covered by the translations of *affectionate* and *tender*. The term *merry* was covered by the translation of *joyful*. The terms *nostalgic* and *warm* were turned into the respective nouns *νοσταλγία* and *θαλπωρή* in Greek because there is no respective Greek adjective for these emotions, but the meaning was important to be maintained in the list, so using a different part of speech category was opted for.

The translated tool was tested with: a) 295 Greek participants in a CLTs survey (169 women) after tasting honey samples, and b) 134 Greek participants in an online survey (101 women) for meat and potatoes, vanilla ice cream, fried chicken, pizza, chocolate, and fruit. For both surveys, the participants were asked to indicate the frequency of consumption of the tested foods (never – rarely – occasionally – frequently). Then, the intensity of food-elicited emotions was requested providing the list of emotions with 5-point ratings scales for each term (1: not at all – 2: slightly – 3: moderately – 4: very – 5: extremely).

4.2.3 Results

For honey, the ten most frequently selected emotions were: *secure*, *enthusiastic*, *calm*, *whole*, *active*, *energetic*, *peaceful*, *glad*, *pleased*, *satisfied*. The honey case study was the first to bring forth *healthy* as a strong candidate for the Greek emotion lexicon. It was added by 20 participants. In total, 34 different emotion words were added by the participants.

The second survey results are presented in detail in chapter 4.4 in comparison to the original Greek tool developed.

4.2.4 Discussion

Participants in both studies reported difficulty in rating the presented emotions. They found some emotions on the list inappropriate for the task, i.e., not related to food consumption.

The original and the translated terms of EP are presented in Table 14, in chapter 4.4 where the two tools are compared with the new Greek tool developed and presented in chapter 4.3.

4.3 The process of developing an emotion lexicon in Greek and using it as an emotion measurement tool

4.3.1 Materials and methods with results per stage

Before starting the term collection process, a choice had to be made as to whether to include nouns or adjectives. The verbs that express the experiencing of emotion in Greek collocate with both nouns and adjectives, according to examples mentioned in the Babiniotis dictionary (2002). Grammatically speaking, nouns collocating with such verbs denote a state or mood, while adjectives denote a quality less permanent in nature and may be caused by an external stimulus, especially when the adjective is a passive voice participle (e.g., “I feel satisfaction” meaning I am in a non-momentary state of feeling this emotion versus “I am satisfied” meaning something or someone has evoked this emotion in me for some reason). Since the aim was to study emotions elicited by foods, i.e., by external stimuli, adjectives were opted for. This choice was supported with evidence from literature, as most emotion measurement tools use lists of adjectives (Eaton, 2015; Ferrarini et al., 2010; Jaeger et al., 2019; King & Meiselman, 2010; M. Mora et al., 2020; Nestrud et al., 2016; Silva et al., 2016; Yik et al., 2011).

The study consists of 8 stages, from emotion term collection to validation of the final emotion lexicon and its application as an emotion measurement tool in food studies (Fig.5). In total, 1,814 people participated in the study; of them 983 took part in the development process (n=194, stage 3; n=566, stage 4; n=223, stage 5), and 831 in the validation process of the measurement tool (stage 8). Samples of the questionnaires used with consumers are provided in the Appendix.



Fig.5: Stages and sources of emotion lexicon compilation and validation.

Stage 1: Emotion terms collection from thesaurus

As a source of terms, the Greek thesaurus “Antilexiko” (1998) was first used to create a full list of emotion words, not food specific. Emotion words were taken from the categories “emotion” (συναίσθημα/ sinésθima/), “feeling/sensation” (αίσθημα/ ésθima/), and “ethos” (ήθος/'i:θɒs/) (Vostantzoglou, 1998). They had to collocate with the verb “feel” (e.g., “I feel upset” but not “I feel violent”).

Words that were excluded from the beginning were: archaic and old-fashioned, informal, foreign in morphology, rare and literary/poetic, expressing degree of emotion, figurative, expressing idiosyncratic characteristics not caused by external stimuli, politically incorrect and related to mental illnesses, words a person would not use to refer to oneself, such as derogatory words, repeated in various subcategories, that cannot be attributed to a human being. Through this process 204 adjectives were collected.

Stage 2: Elimination of synonyms

Then, a dictionary of Modern Greek was used to group tautonyms and synonyms (Babinotis, 2002). The adjectives that remained on the list were 119 (Fig.6). The most general or the most frequently used term from each group of synonyms, according to the dictionary and the thesaurus used, was chosen to represent the group as an “umbrella term” (i.e., the term that semantically covers all others within the group).

Stage 3: Emotion terms identification as to food-relatedness by consumers

According to van Zyl & Meiselman (2015, 2016) the highest number of terms that should be given to participants, limiting their burden, is 66. However, although the number of emotion terms that are usually given to participants of consumer studies to evaluate varies between 9 and 66, many studies present 10-40 emotion terms (Panagiotou & Gkatzionis, 2022). Therefore, the list of 119 terms, containing 68 positive and 51 negative adjectives, was broken down to three groups, allowing for up to 40 words in each group. The three groups were created by allocating in equal numbers the positive and negative adjectives randomly, with the use of an online randomizer tool, resulting thus in two groups of 40 adjectives and one group of 39 adjectives. Each group of adjectives was presented to participants in a CATA

questionnaire in an online survey, exhibiting the terms in random order to participants, so as not to affect the selection of adjectives (King et al., 2013). CATA questionnaires were preferred in this stage instead of rating scales, as the aim was to reduce adjectives by eliminating those that were not food related. Also, CATA questionnaires are reported to be less time-consuming for the participants (King et al., 2013). Native Greek speakers participated in the survey [n=194 in total; 26% men, mean age (SD): 40 (11); 74% women, mean age (SD): 35 (10)]. The participants were instructed to think about how they feel when consuming their most favorite and least favorite drink, snack, dessert, meal, and choose the words that express their emotions. The instructions aimed at eliciting both positive and negative emotions related to food consumption (King & Meiselman, 2010). Personal information namely gender, age, native language, country of residence, level of education was also recorded. These factors have been linked to the formation of personal dietary habits, and to linguistic expression. The 23 terms selected by more than 20% of the participants were kept for further testing (Fig.6, Table 5).

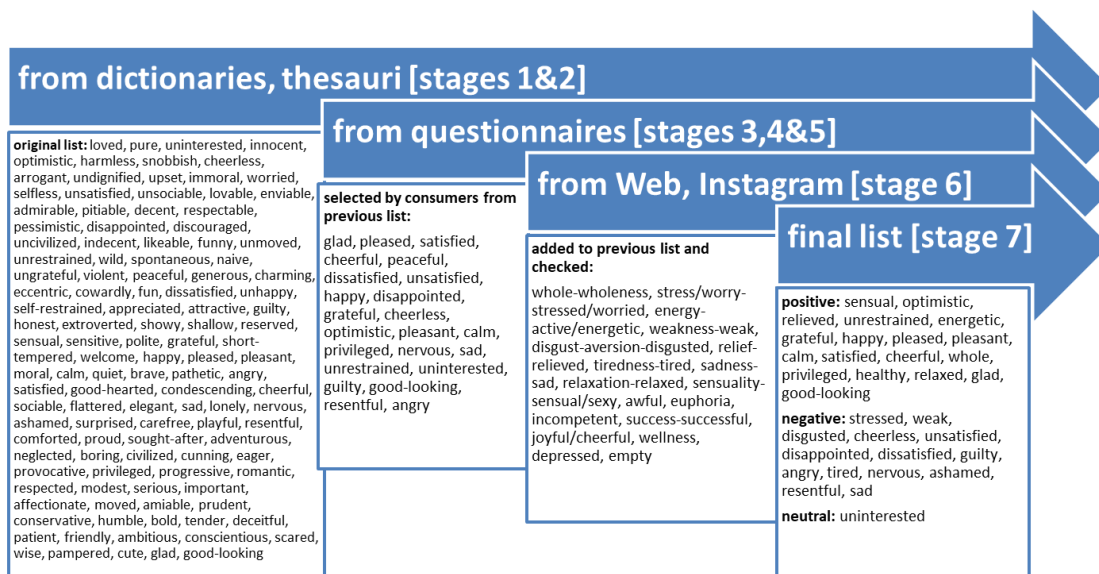


Fig.6: Emotion terms collected and checked for food consumption relatedness during the various stages of term collection and identification.

Table 5: Frequency of selection of food-related emotions by consumers during the term identification process.

GROUP A		GROUP B		GROUP C	
word	%	word	%	word	%
peaceful	49.2	pleased	66.7	glad	75.9
unsatisfied	42.9	satisfied	66.7	privileged	29.1
disappointed	39.7	cheerful	53.8	nervous	29.1
cheerless	38.1	dissatisfied	48.7	sad	26.6
optimistic	36.5	happy	39.7	good-looking	21.5
uninterested	23.8	grateful	38.5	resentful	21.5
sensual	19.0	pleasant	34.6	angry	20.3
upset	19.0	calm	34.6	moved	17.7
fun	19.0	unrestrained	25.6	eager	16.5
spontaneous	17.5	guilty	23.1	pathetic	15.2
attractive	15.9	carefree	19.2	friendly	15.2
self-restrained	15.9	reserved	17.9	bold	10.1
extroverted	14.3	unhappy	12.8	patient	10.1
polite	14.3	comforted	11.5	surprised	10.1

loved	12.7	quiet	11.5	affectionate	8.9
discouraged	12.7	unmoved	9.0	important	8.9
likeable	12.7	short-tempered	9.0	romantic	8.9
generous	11.1	sociable	9.0	boring	8.9
pessimistic	11.1	good-hearted	6.4	pampered	7.6
worried	11.1	shallow	6.4	cute	7.6
charming	9.5	brave	6.4	wise	6.3
envidable	7.9	sensitive	5.1	neglected	6.3
pitiabile	7.9	elegant	5.1	serious	5.1
appreciated	7.9	civilized	3.8	lonely	5.1
lovable	6.3	welcome	3.8	ashamed	5.1
honest	6.3	proud	3.8	amiable	5.1
harmless	6.3	naive	3.8	scared	5.1
admirable	6.3	ungrateful	3.8	ambitious	5.1
innocent	6.3	adventurous	2.6	cunning	3.8
decent	4.8	moral	2.6	provocative	2.5
pure	4.8	condescending	2.6	deceitful	2.5
selfless	3.2	playful	2.6	humble	2.5
respectable	3.2	funny	2.6	conservative	2.5
unsociable	3.2	eccentric	2.6	conscientious	2.5
snobbish	1.6	sought-after	1.3	prudent	2.5
indecent	1.6	showy	1.3	respected	1.3
arrogant	1.6	violent	1.3	modest	1.3
undignified	1.6	wild	1.3	affectionate	1.3
uncivilized	1.6	flattered	0.0	progressive	0.0
immoral	0.0	cowardly	0.0		

Note: The 119 terms originally collected were presented to participants in stage 3 to select those appropriate to express food-elicited emotions. **Bold** fonts were used to highlight words selected by at least 20% of the participants and were included in further testing.

Stage 4: Emotion terms added by consumers per food category using food words as a stimulus

To make sure that the emotions evoked by all major food categories were represented on the list, a CATA questionnaire with a short-answer section provided after each choice was set up using the same three randomly created groups of adjectives from the previous stage. The participants were provided with a set of words and were instructed to choose only those that express emotions elicited by foods and provide an example of food that elicits this emotion. The questionnaires were answered by 567 participants in total [28% men, mean age (SD): 37 (13); 72% women, mean age (SD): 35 (12)]. The data from this stage were used to create food-specific lists of emotions, which were used in stage 8 of emotion measurement tool validation and in further case studies.

Stage 5: Emotion terms added by consumers per food category using food pictures as a stimulus

To provide participants with a different type of stimulus, instead of word-based questionnaires used in previous stages, a questionnaire with pictures of foods was set up. It consisted of 34 pictures of foods and beverages with an open-ended answering space below each. The pictures were selected purposefully to cover various every-day (e.g., cooked vegetables, legumes, bread, coffee, pasticcio, souvlaki) and celebratory conditions (e.g., Easter lamb on the spit, magiritsa soup, champagne, ouzo with seafood meze) of food and beverage consumption for the Greek culture, as well as foods not habitually consumed by the Greeks (e.g., insects, tartare, sushi, Roquefort cheese). The task was to write one to three adjectives expressing the emotion that each food/beverage evokes in the participant when consumed. The participants in this study were 223 [17.5% men, mean age (SD): 38.5 (12); 82.5% women, mean age (SD): 39 (11)].

Stage 6: The Web and Instagram as linguistic sources

To deepen our understanding of how emotion related to foods is expressed in Greek, the Web and Instagram were used as corpora. At first, a search for food-elicited emotions was made on the Google search engine to make sure all the emotions most frequently related to food were included on the list, using the keywords: feel (νιώθω /νόθο/, αισθάνομαι /esθánome/), food (τρόφιμο /trófimo/, φαγητό /fajitó/), emotion

(συναίσθημα /sinésθima/), feeling (αίσθηση /ésθisi/, αίσθημα /ésθima/), in various combinations.

Then, the Google search engine was used to check whether the 119 terms of the original list from stage 2 were indeed used in natural speech by consumers. The search was performed using the words: feel (νιώθω /nóθo/, αισθάνομαι /esθánome/), eat (τρώω /tróo/), food (φαγητό /fajitó/, τρόφιμο /trófimo/), emotion (συναίσθημα /sinésθima/), feeling (αίσθηση /ésθisi/, αίσθημα /ésθima/), consumption (κατανάλωση /katanálosi/), and each one of the 119 emotions of the original list. The number of times each emotion was found collocating with food consumption was recorded together with the specific food it collocated with. Both nouns and adjectives were searched for (e.g., surprise, surprised), so as not to miss any important connections.

The same terms were searched for on Instagram as hashtags (see an example of the search strategy in Fig.7). The specific foods with which each emotion was related to was noted, and the positive or negative sense in which the terms were used was also recorded. This was done by assessing the rest of the hashtags used by the post creator and the emoji/emoticons used by the creator and the followers commenting underneath the post. For example, the term “disgust” is used negatively as expected, but also ironically in a positive sense, expressing intense liking. These findings were cross-checked to the list presented on Facebook on which emoji/emoticons are matched to emotion words. During this stage, 18 terms were added to the list (stage 6, Fig.6).

Stage 7: Finalizing the emotion lexicon list and identifying positive/negative terms

The terms that were chosen by 20% and more of the participants during the previous stages formed the final list that consists of 33 emotion terms, here grouped as positive, negative, and neutral, according to grouping patterns identified as described above (step 7, Fig.6):

positive: sensual, optimistic, relieved, unrestrained, energetic, grateful, happy, pleased, pleasant, calm, satisfied, cheerful, whole, privileged, healthy, relaxed, glad, good-looking

negative: stressed, weak, disgusted, cheerless, unsatisfied, disappointed, dissatisfied, guilty, angry, tired, nervous, ashamed, resentful, sad

neutral: uninterested.

Stage 8: Using the emotion lexicon as a measurement tool and tool validation

Eleven different food items (non-carbonated orangeade classic and with propolis extract, crackers, olives, olive oils, pizza, vanilla ice cream, fried chicken, meat and potatoes, chocolate, fruit) were used to examine the tool's discriminating ability. both in CLTs (case studies 2, 3, 5) and online surveys (case studies 1, 4, 6), within (case studies 1, 2, 3, 4, 5) and across food categories (case study 6) (Table 6). The total number of participants for these studies was 837 (47.6% men).

More specifically, the final emotion lexicon list reported in stage 7 was used in CATA and rating scales. The stimuli used to elicit emotions were actual tasting of foods, food names, and food pictures.

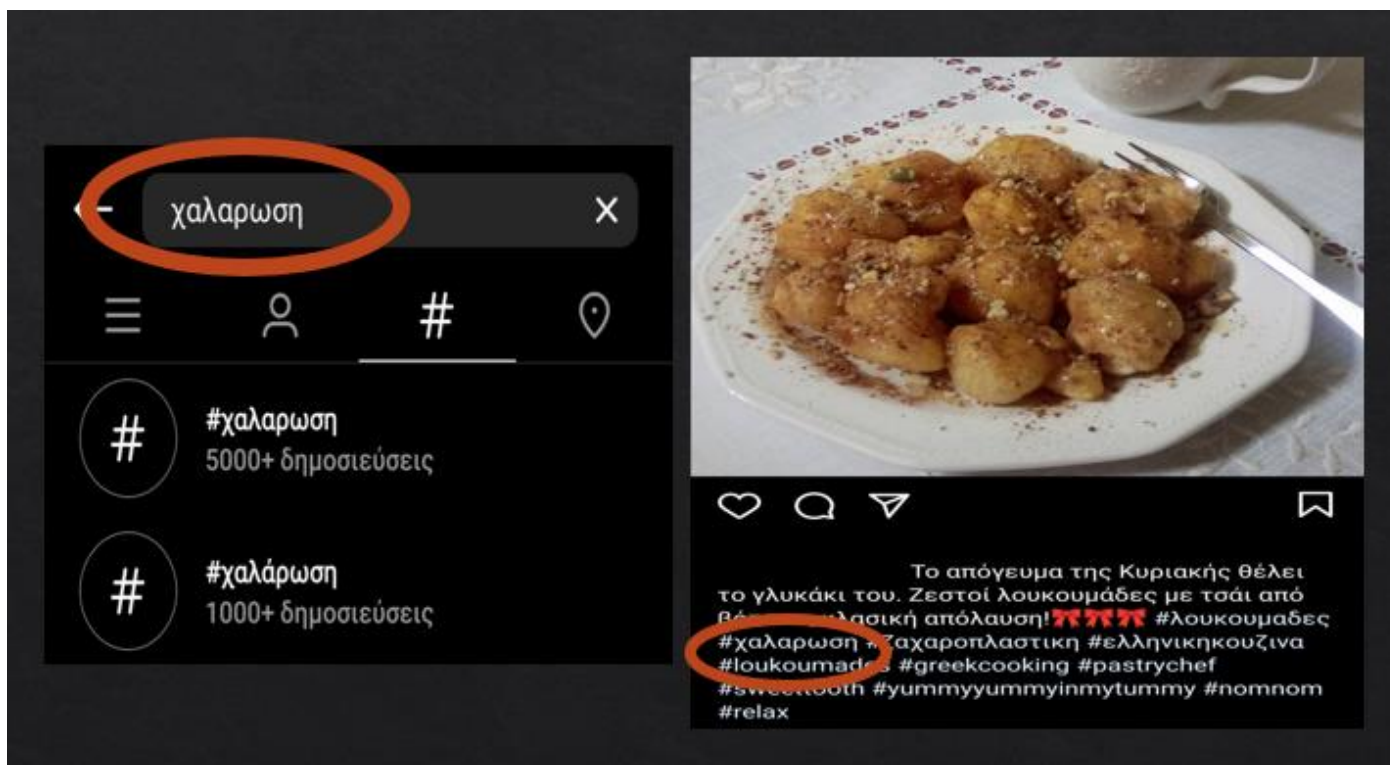


Fig.7: Screenshots of searching for the emotion terms as hashtags in posts on Instagram. Patterns of specific foods and emoji/emoticons collocating with specific terms also helped in grouping the terms as positive or negative.

Table 6: Description of case studies used in the validation arm of the emotion lexicon list and emotion measurement tool.

case study	food category/ aspect of product studied (if applicable)	participants (general population unless stated otherwise)	questionnaire format and number of terms	stimulus
1	non-carbonated orangeade, non-carbonated orangeade with propolis extract / acceptability	n=108 aged 19-60	CATA 119 terms	one video for each product with audio & written information on propolis (online study)
		n=29 aged 55-78	8pt rating scales (emotions selected in previous stage)	
		n=60 athletes aged 16-48		
		n=89 children aged 9-12	CATA 119 terms	
2	crackers / sound	n=108 aged 19-65	CATA 33 general + 5 food-specific emotion terms	tasting
3	crackers / packaging sound	n=105 aged 18-80	CATA 33 general + 4 food-specific terms	tasting (blind & informed)
4	olives / packaging	n=106 aged 18-62	5pt rating scales 33 terms	pictures (online study)
5	olive oils / acceptability	n= 101 aged 18-65	5pt rating scales 33 terms	tasting (blind & informed)
6	pizza, chocolate, meat and potatoes, vanilla ice cream, fried chicken, fruit	n=125 aged 18-62	5pt rating scales 33 terms	food names (online study)

Table 7: Example of within food category discrimination ability of the developed tool: the liking scores of cracker samples and the frequency of selection of the most frequently selected emotions per sample.

Mean rating liking scores per cracker sample					
Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
5.2	4.8	5.1	5.6	3.5	5
emotions (frequency selection, %)					
pleased	pleased	pleased	satisfied	nervous	calm
(50)	(36.5)	(40.4)	(58.7)	(38.5)	(43.3)
satisfied	satisfied	satisfied	pleased	unsatisfied	pleased
(46.2)	(33.7)	(39.4)	(51.9)	(29.8)	(34.6)
calm	calm	calm	relaxed	stressed	relaxed
(34.6)	(32.7)	(28.8)	(50)	(28.8)	(34.6)
relaxed	relaxed	optimistic	calm	uninterested	satisfied
(29.8)	(22.1)	(24)	(44.2)	(26.9)	(32.7)
healthy	uninterested	relaxed	healthy	dissatisfied	uninterested
(27.9)	(20.2)	(24)	(30.8)	(22.1)	(26.9)
optimistic	unsatisfied	healthy	pleasant	disappointed	pleasant
(26)	(15.4)	(22.1)	(26.9)	(13.5)	(18.3)
happy	reserved	pleasant	glad	angry	condescending
(22.1)	(15.4)	(21.2)	(24)	(13.5)	(16.3)
relieved	pleasant	reserved	optimistic	pleased	unsatisfied
(18.3)	(15.4)	(19.2)	(15.4)	(12.5)	(12.5)
whole	healthy	uninterested	whole	satisfied	optimistic
(18.3)	(15.4)	(17.3)	(12.5)	(12.5)	(10.6)
pleasant	condescending	whole	cheerful	calm	glad
(17.3)	(14.4)	(15.4)	(11.5)	(11.5)	(10.6)

Note: High liking correlates with high selection of positive emotions (e.g., satisfied, pleased, calm); low liking correlates with high selection of negative emotions (e.g., nervous, unsatisfied, stressed). Medium liking correlates with neutral emotions (e.g., uninterested, condescending).

4.3.2 Results and statistical analysis of validation process

CATA analyses, Cochran's Q tests, Principal Components Analyses (PCAs), ANOVAs and a Reliability Analysis were used to validate the emotions on the final list for each of the six validation case studies. The tool was able to discriminate between samples of the same food category (Table 7) and across different food categories (Table 8).

The same emotions were selected for samples of the same food category but there were one to three terms different per sample (Table 7). The positive-negative grouping was also validated as the emotions correlated to liking measurements for the foods per case (7pt scales). Positive emotions correlate to high liking, high frequency of consumption, and high selection of positive emotions (e.g., satisfied, pleased, and calm correlate with a liking of 5.6). Negative emotions correlate with low liking, low frequency of consumption, and high selection frequency of negative emotions (e.g., nervous, unsatisfied, and stressed correlate with a liking of 3.5). Medium liking correlates with higher selection frequency of neutral emotions (e.g., uninterested, and condescending correlate with a liking of 4.7 (Table 7).

The food-specific lists created during the term identification process provided extra food-specific terms that were added to the general list in case studies 2, 3, 5. For example, the extra food-specific terms added to the 33 emotions of the general emotion lexicon for crackers were: self-restrained, sensible, condescending, lonely, eccentric. These extra terms per food-category were validated as the terms were indeed selected by the participants.

In case study 6, according to the PCA, two main components were extracted that explained 53.6% of the variation in emotions. Component 1 was loaded by the positive terms whilst component 2 was loaded by the negative terms (Fig.8).

By performing ANOVA for study 6, statistical differentiation was provided by 23 out of the 33 emotions, which is a satisfactory 70% assessing this according to other measurement tools in literature (Table 9).

Table 8: Example of across food categories discrimination ability of the developed tool: the rating scores of emotions on 5pt scales per food category are presented.

	pizza	meat and potatoes	vanilla ice cream	fried chicken	chocolate	fruit
pleased	3,144	2,936	2,656	2,576	3,152	3,000
satisfied	2,968	2,752	2,504	2,440	3,024	2,888
glad	2,848	2,672	2,616	2,392	2,896	2,904
relaxed	2,704	2,520	2,512	2,240	2,728	2,808
calm	2,552	2,504	2,440	2,328	2,728	2,848
happy	2,560	2,432	2,400	2,272	2,864	2,776
cheerful	2,712	2,272	2,448	2,216	2,720	2,648
whole	2,504	2,528	2,296	2,144	2,640	2,656
grateful	2,096	2,456	2,208	2,072	2,520	2,760
pleasant	2,352	2,168	2,288	2,208	2,504	2,624
healthy	2,080	2,488	2,056	2,056	2,096	3,632
privileged	2,016	2,208	2,064	1,928	2,416	2,416
good-looking	1,984	2,024	2,016	1,976	2,232	2,608
optimistic	1,928	1,760	1,968	1,752	2,480	2,392
relieved	2,000	1,792	1,912	1,728	2,424	2,264
unrestrained	2,096	1,552	1,704	1,544	2,216	1,392
energetic	1,680	1,712	1,680	1,648	2,104	2,480
sensual	1,312	1,216	1,552	1,248	1,928	1,368
guilty	1,664	1,160	1,536	1,392	1,984	1,040
uninterested	1,464	1,288	1,304	1,200	1,152	1,344
unsatisfied	1,144	1,144	1,304	1,128	1,232	1,232
tired	1,168	1,128	1,096	1,120	1,296	1,104
stressed	1,160	1,072	1,080	1,144	1,312	1,104
dissatisfied	1,168	1,096	1,200	1,144	1,208	1,056
disappointed	1,128	1,064	1,176	1,128	1,216	1,080
sad	1,104	1,096	1,128	1,048	1,224	1,040
angry	1,088	1,040	1,128	1,096	1,160	1,080
cheerless	1,072	1,080	1,072	1,104	1,160	1,072
weak	1,120	1,024	1,088	1,056	1,216	1,072
disgusted	1,136	1,056	1,104	1,088	1,072	1,056
nervous	1,104	1,056	1,120	1,064	1,240	1,040
ashamed	1,112	1,064	1,160	1,064	1,200	1,024
resentful	1,040	1,072	1,128	1,088	1,152	1,064
Pr > F(Model)	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Significant	Yes	Yes	Yes	Yes	Yes	Yes

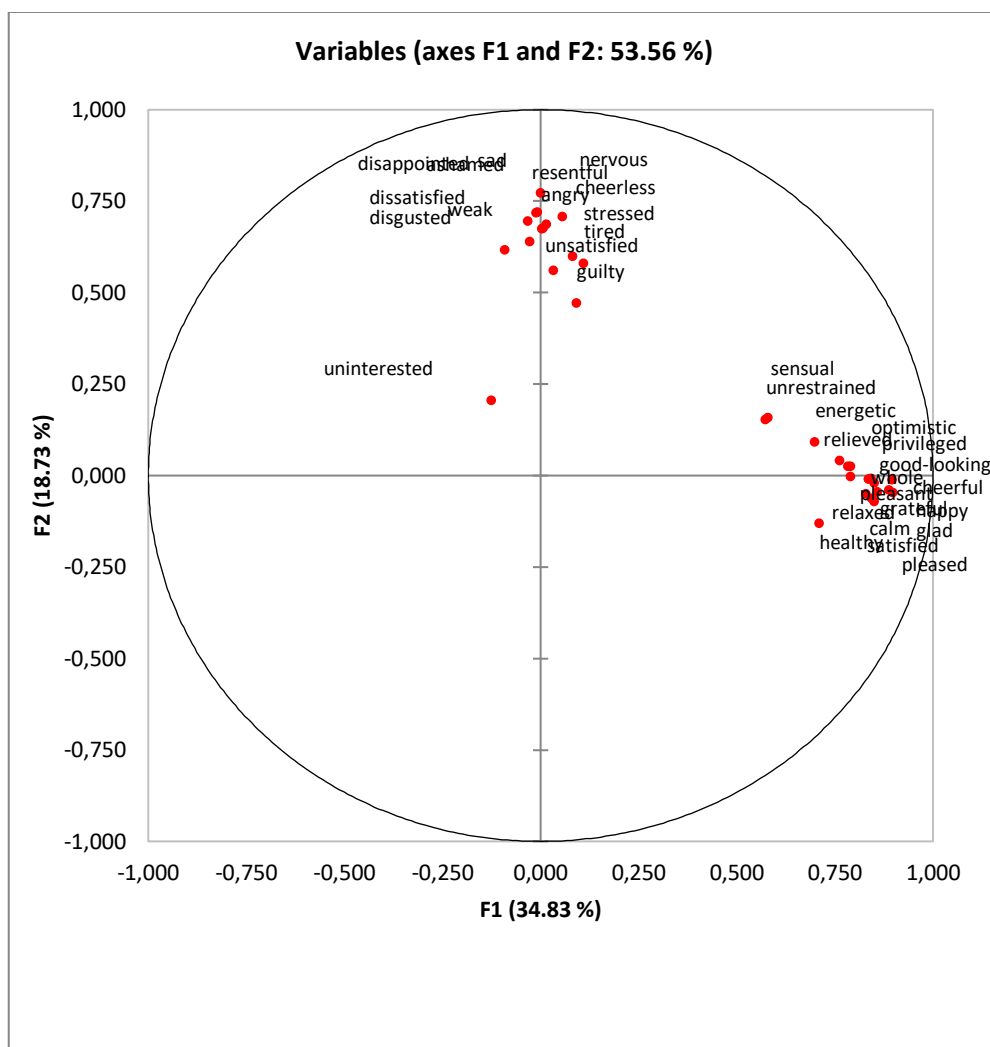


Fig.8: Principal Component Analysis of terms (factors 1 and 2). The red dots represent active variables. Terms grouped as positive, negative, and neutral.

Table 9: Summary of SL means from ANOVA of study 6. Emotions that provide discrimination between foods are given in bold. 23 out of 33 emotions are statistically significant.

Summary (LS means):	chocolate	pizza	fruit	vanilla ice cream	meat and potatoes	fried chicken	Pr > F(Model)	Significant
stressed	1.312 a	1.160 ab	1.104 b	1.080 b	1.072 b	1.144 ab	0.007	Yes
uninterested	1.152 b	1.464 a	1.344 ab	1.304 ab	1.288 ab	1.200 b	0.007	Yes
weak	1.216 a	1.120 ab	1.072 ab	1.088 ab	1.024 b	1.056 b	0.013	Yes
disgusted	1.072 a	1.136 a	1.056 a	1.104 a	1.056 a	1.088 a	0.676	No
sensual	1.928 a	1.312 bc	1.368 bc	1.552 b	1.216 c	1.248 bc	< 0.0001	Yes

optimistic	2.480 a	1.928 c	2.392 ab	1.968 bc	1.760 c	1.752 c	< 0.0001	Yes
cheerless	1.160 a	1.072 a	1.072 a	1.072 a	1.080 a	1.104 a	0.598	No
relieved	2.424 a	2.000 abc	2.264 ab	1.912 bc	1.792 c	1.728 c	< 0.0001	Yes
unsatisfied	1.232 a	1.144 a	1.232 a	1.304 a	1.144 a	1.128 a	0.112	No
disappointed	1.216 a	1.128 a	1.080 a	1.176 a	1.064 a	1.128 a	0.219	No
wild	2.216 a	2.096 ab	1.392 c	1.704 bc	1.552 c	1.544 c	< 0.0001	Yes
energetic	2.104 ab	1.680 c	2.480 a	1.680 c	1.712 bc	1.648 c	< 0.0001	Yes
dissatisfied	1.208 a	1.168 a	1.056 a	1.200 a	1.096 a	1.144 a	0.248	No
guilty	1.984 a	1.664 b	1.040 d	1.536 b	1.160 cd	1.392 bc	< 0.0001	Yes
grateful	2.520 ab	2.096 b	2.760 a	2.208 b	2.456 ab	2.072 b	< 0.0001	Yes
happy	2.864 a	2.560 ab	2.776 a	2.400 ab	2.432 ab	2.272 b	0.002	Yes
pleased	3.152 a	3.144 a	3.000 ab	2.656 b	2.936 ab	2.576 b	0.000	Yes
pleasant	2.504 a	2.352 a	2.624 a	2.288 a	2.168 a	2.208 a	0.052	No
calm	2.728 ab	2.552 ab	2.848 a	2.440 ab	2.504 ab	2.328 b	0.013	Yes
angry	1.160 a	1.088 a	1.080 a	1.128 a	1.040 a	1.096 a	0.478	No
satisfied	3.024 a	2.968 a	2.888 ab	2.504 b	2.752 ab	2.440 b	0.000	Yes
joyful	2.720 a	2.712 a	2.648 ab	2.448 ab	2.272 ab	2.216 b	0.003	Yes
tired	1.296 a	1.168 ab	1.104 b	1.096 b	1.128 ab	1.120 ab	0.023	Yes
sad	1.224 a	1.104 a	1.040 a	1.128 a	1.096 a	1.048 a	0.074	No
nervous	1.240 a	1.104 ab	1.040 b	1.120 ab	1.056 b	1.064 ab	0.020	Yes
ashamed	1.200 a	1.112 a	1.024 a	1.160 a	1.064 a	1.064 a	0.066	No
resentful	1.152 a	1.040 a	1.064 a	1.128 a	1.072 a	1.088 a	0.351	No
whole	2.640 a	2.504 ab	2.656 a	2.296 ab	2.528 ab	2.144 b	0.012	Yes
privileged	2.416 a	2.016 ab	2.416 a	2.064 ab	2.208 ab	1.928 b	0.007	Yes
healthy	2.096 b	2.080 b	3.632 a	2.056 b	2.488 b	2.056 b	< 0.0001	Yes
relaxed	2.728 a	2.704 ab	2.808 a	2.512 ab	2.520 ab	2.240 b	0.008	Yes
glad	2.896 a	2.848 ab	2.904 a	2.616 ab	2.672 ab	2.392 b	0.013	Yes
good-looking	2.232 ab	1.984 b	2.608 a	2.016 b	2.024 b	1.976 b	0.001	Yes

Table 10: Reliability analysis and internal consistency test for study 6 (Cronbach's alpha statistics).

Cronbach's alpha statistics :	
Observations: 750	
Items on scale: 33	
1-5 Likert scale	
Cronbach's alpha	Standardized Cronbach's Alpha
0.936	0.924

The tool was proven valid, but it needed to be reliable as well. So, to have its internal consistency tested, statistical analysis for internal reliability was performed using XLSTAT software. Internal reliability analysis helps study the properties of measurement scales and the items that compose the scales, by providing information about the relationship between individual items of the scale. The closer to 1 alpha is, the more respectable and internally consistent the measurement tool is.

Cronbach's alpha is very close to 1 (Table 10). This means that most items on the scale are well established. The analysis further provided information about each specific item, by deleting them one by one to check if internal consistency changes by the removal. If Cronbach's alpha lowers by a deletion, then the item is an important component of the tool. When negative emotions were deleted, Cronbach's alpha slightly increased from 0.936 to 0.937 for *stressed, weak, disgusted, cheerless, unsatisfied, disappointed, dissatisfied, guilty, angry, tired, sad, nervous, ashamed, resentful* and from 0.936 to 0.939 for *uninterested*. *Uninterested* was the only emotion that negatively correlated to others (Table 11).

As regards the Covariance matrix of an internal consistency analysis, if the covariance of two items is 1, then the two variables have the perfect linear relationship. If their covariance is negative, they vary in opposite directions. If their covariance is positive, they vary in the same direction. If their covariance is 0, then they don't vary together. For the newly developed measurement tool, overall covariance per emotions was >1.5 for *optimistic, grateful, happy, pleased, pleasant, calm, satisfied, joyful, whole, privileged, healthy, relaxed, glad, good-looking*, 1-1.5 for *relieved, wild, energetic*, 0.5-1 for *sensual, guilty*, and <0.5 for *stressed, uninterested, weak, disgusted, cheerless, unsatisfied, disappointed, dissatisfied, angry, tired, sad, nervous, ashamed, resentful*. Paired covariances exhibit negative associations between negative and positive emotions, which strengthens the respective findings and PCA groupings (Table 12).

The correlation matrix and the correlation map show that there are strong correlations between the positive emotions *glad, joyful, happy, pleased, satisfied, pleasant*, and the negative emotions *sad, nervous* (Table 13, Fig.9).

Table 11: Deleted items for Cronbach's alpha statistics for study 6; test performed to check internal consistency of the developed emotion measurement tool.

Deleted items statistics:						
Variable	Mean	Variance	Correlation	R ²	Cronbach's alpha	Guttman L6
stressed	57.785	357.079	0.237	0.563	0.937	0.972
uninterested	57.639	364.819	-0.111	0.183	0.939	0.973
weak	57.835	359.847	0.139	0.599	0.937	0.972
disgusted	57.845	360.337	0.111	0.683	0.937	0.972
sensual	57.493	343.425	0.553	0.468	0.934	0.972
optimistic	56.884	327.881	0.734	0.678	0.932	0.970
cheerless	57.837	359.269	0.167	0.670	0.937	0.972
relieved	56.911	329.174	0.721	0.655	0.932	0.971
unsatisfied	57.733	358.193	0.173	0.490	0.937	0.972
disappointed	57.799	358.527	0.173	0.714	0.937	0.972
wild	57.180	337.494	0.566	0.456	0.934	0.972
energetic	57.047	332.640	0.669	0.607	0.933	0.971
dissatisfied	57.785	358.684	0.152	0.754	0.937	0.972
guilty	57.468	352.612	0.256	0.459	0.937	0.972
grateful	56.579	324.006	0.780	0.737	0.931	0.970
happy	56.380	321.867	0.818	0.834	0.931	0.969
pleased	56.020	326.743	0.766	0.798	0.932	0.970
pleasant	56.573	322.838	0.788	0.758	0.931	0.970
calm	56.364	325.906	0.768	0.752	0.931	0.970
angry	57.832	358.516	0.196	0.769	0.937	0.972
satisfied	56.168	324.428	0.786	0.795	0.931	0.970
joyful	56.428	321.190	0.834	0.812	0.930	0.969
tired	57.779	357.214	0.248	0.443	0.937	0.972
sad	57.824	357.865	0.212	0.883	0.937	0.972
nervous	57.827	357.524	0.242	0.866	0.937	0.972
ashamed	57.827	358.613	0.178	0.730	0.937	0.972
resentful	57.840	359.256	0.173	0.716	0.937	0.972
whole	56.469	323.139	0.786	0.730	0.931	0.970
privileged	56.756	325.651	0.744	0.654	0.932	0.971
healthy	56.529	330.938	0.605	0.630	0.934	0.971
relaxed	56.345	325.070	0.755	0.735	0.932	0.970
glad	56.209	321.514	0.821	0.831	0.931	0.969
good-looking	56.791	324.337	0.742	0.688	0.932	0.970

Table 12: Covariance matrix from Reliability Analysis of developed emotion measurement tool for study 6.

Variables	stressed	uninterested	weak	disgusted	sensual	optimistic	cheerless	relieved	unsatisfied	disappointed	wild	energetic	dissatisfied	guilty	grateful	happy	pleased	pleasant	calm	angry	satisfied	joyful	tired	sad	nervous	ashamed	resentful	whole	privileged	healthy	relaxed	glad	good-looking
stressed	0.308623053	0.028	0.128	0.124	0.067	0.048	0.137	0.049	0.086	0.138	0.024	0.086	0.150	0.226	0.013	0.017	-0.003	0.041	-0.004	0.134	0.035	0.056	0.107	0.190	0.174	0.178	0.140	0.033	0.040	-0.050	0.019	0.026	0.046
uninterested	0.028	0.4799375	0.021	0.042	-0.054	-0.123	0.005	-0.106	0.105	0.023	-0.043	-0.100	0.024	0.004	-0.136	-0.160	-0.111	-0.131	-0.071	0.005	-0.092	-0.126	0.010	0.012	0.002	0.007	0.012	-0.092	-0.107	-0.056	-0.074	-0.107	-0.078
weak	0.128	0.021	0.193709	0.131	0.021	-0.027	0.121	-0.039	0.109	0.142	0.009	0.016	0.145	0.150	-0.042	-0.049	-0.057	-0.049	-0.040	0.141	-0.044	-0.040	0.100	0.149	0.137	0.142	0.131	-0.019	-0.017	-0.079	-0.042	-0.051	-0.040
disgusted	0.124	0.042	0.131	0.190305	-0.011	-0.048	0.127	-0.044	0.119	0.164	-0.017	0.019	0.164	0.147	-0.063	-0.066	-0.082	-0.053	-0.056	0.152	-0.079	-0.063	0.088	0.152	0.135	0.151	0.135	-0.041	-0.040	-0.066	-0.065	-0.079	-0.060
sensual	0.067	-0.054	0.021	-0.011	0.783117	0.607	0.001	0.517	0.055	0.033	0.434	0.462	0.018	0.189	0.507	0.525	0.445	0.568	0.474	0.022	0.475	0.545	0.094	0.039	0.059	0.033	0.027	0.507	0.570	0.282	0.457	0.511	0.600
optimistic	0.048	-0.123	-0.027	-0.048	0.607	1.537205	-0.007	1.066	0.024	-0.017	0.694	0.963	-0.044	0.108	1.068	1.101	0.893	1.070	0.974	-0.017	0.987	1.110	0.069	-0.014	0.007	-0.036	-0.018	1.035	0.984	0.896	0.995	1.040	1.084
cheerless	0.137	0.005	0.121	0.127	0.001	-0.007	0.207566	-0.027	0.122	0.167	0.005	0.050	0.192	0.149	-0.030	-0.027	-0.046	-0.016	-0.032	0.155	-0.042	-0.031	0.103	0.164	0.148	0.129	0.118	-0.039	-0.010	-0.024	-0.052	-0.046	-0.018
relieved	0.049	-0.106	-0.039	-0.044	0.517	1.066	-0.027	1.469559	0.025	-0.007	0.723	0.914	-0.035	0.176	1.044	1.066	0.912	1.050	0.903	-0.023	0.911	1.055	0.034	-0.022	-0.003	-0.009	-0.022	1.025	0.911	0.804	0.963	1.028	1.017
unsatisfied	0.086	0.105	0.039	0.119	0.055	0.024	0.122	0.025	0.34018	0.159	0.015	0.036	0.196	0.124	0.015	-0.007	-0.052	0.009	-0.006	0.127	-0.048	-0.007	0.110	0.135	0.122	0.105	0.129	0.001	0.042	0.041	0.005	-0.016	0.034
disappointed	0.138	0.023	0.142	0.164	0.033	-0.017	0.167	-0.007	0.159	0.290964	0.046	0.027	0.241	0.191	-0.043	-0.037	-0.067	-0.019	-0.039	0.195	-0.066	-0.045	0.121	0.185	0.164	0.181	0.148	-0.018	-0.015	-0.066	-0.041	-0.057	-0.019
wild	0.024	-0.043	0.009	-0.017	0.434	0.694	0.005	0.723	0.015	0.046	1.284879	0.556	0.034	0.272	0.742	0.774	0.705	0.755	0.660	0.018	0.735	0.797	0.034	0.013	0.029	0.042	-0.001	0.756	0.622	0.345	0.648	0.740	0.628
energetic	0.086	-0.100	0.016	0.019	0.462	0.963	0.050	0.914	0.036	0.027	0.556	1.352347	0.026	0.092	0.919	0.877	0.728	0.872	0.764	0.048	0.782	0.874	0.056	0.038	0.044	0.024	0.043	0.840	0.749	0.861	0.737	0.825	0.955
dissatisfied	0.150	0.024	0.145	0.164	0.018	-0.044	0.192	-0.035	0.196	0.241	0.034	0.026	0.335325	0.233	-0.065	-0.056	-0.072	-0.040	-0.080	0.213	-0.080	-0.057	0.135	0.210	0.189	0.189	0.164	-0.055	-0.017	-0.070	-0.062	-0.072	-0.046
guilty	0.226	0.004	0.150	0.147	0.189	0.108	-0.149	0.176	0.124	0.191	0.272	0.092	0.233	0.85775	0.073	0.120	0.120	0.079	0.047	0.188	0.175	0.161	0.138	0.224	0.215	0.247	0.142	0.193	0.151	-0.201	0.125	0.150	0.034
grateful	0.013	-0.136	-0.042	-0.063	0.507	1.068	-0.030	1.044	0.015	-0.043	0.742	0.919	-0.065	0.073	1.702366	1.365	1.174	1.256	1.147	-0.039	1.176	1.267	0.045	-0.042	-0.021	-0.029	-0.025	1.210	1.209	1.076	1.138	1.289	1.126
happy	0.017	-0.160	-0.049	-0.066	0.525	1.101	-0.027	1.066	-0.007	-0.037	0.774	0.877	-0.056	0.120	1.365	1.74309	1.352	1.420	1.258	-0.036	1.311	1.413	0.035	-0.031	-0.004	-0.049	-0.053	1.256	1.159	1.056	1.206	1.446	1.191
pleased	-0.003	-0.111	-0.057	-0.082	0.445	0.893	-0.046	0.912	-0.052	-0.067	0.705	0.728	-0.072	0.120	1.174	1.352	1.515373	1.195	1.172	-0.053	1.290	1.259	0.031	-0.044	-0.016	-0.047	-0.059	1.136	1.025	0.898	1.096	1.316	1.013
calm	0.041	-0.131	-0.049	-0.053	0.568	1.070	-0.016	1.050	0.009	-0.019	0.755	0.872	-0.040	0.079	1.256	1.420	1.195	1.776014	1.269	-0.017	1.177	1.353	0.046	-0.011	0.016	-0.028	-0.026	1.165	1.130	1.001	1.174	1.320	1.298
pleasant	-0.004	-0.071	-0.040	-0.056	0.474	0.974	-0.032	0.903	-0.006	-0.039	0.660	0.764	-0.080	0.047	1.147	1.258	1.172	1.269	1.580997	-0.032	1.193	1.250	0.039	-0.032	-0.020	-0.052	-0.038	1.132	1.046	1.018	1.257	1.253	1.083
angry	0.134	0.005	0.141	0.152	0.022	-0.017	0.155	-0.023	0.127	0.195	0.018	0.048	0.213	0.188	-0.039	-0.036	-0.053	-0.017	-0.032	0.235913	-0.034	-0.008	0.122	0.194	0.181	0.173	0.157	-0.012	0.000	-0.052	-0.032	-0.045	-0.021
satisfied	0.035	-0.092	-0.044	-0.079	0.475	0.987	-0.042	0.911	-0.048	-0.066	0.735	0.782	-0.080	0.175	1.176	1.311	1.290	1.177	1.193	-0.034	1.644532	1.385	0.060	-0.023	0.001	-0.025	-0.045	1.295	1.082	0.991	1.168	1.349	1.143
joyful	0.056	-0.126	-0.040	-0.063	0.545	1.110	-0.031	1.055	-0.007	-0.045	0.797	0.874	-0.057	0.161	1.267	1.413	1.259	1.353	1.250	-0.008	1.385	1.740313	0.052	-0.014	0.014	-0.020	-0.019	1.334	1.212	1.058	1.255	1.449	1.245
tired	0.107	0.010	0.100	0.088	0.094	0.069	0.103	0.034	0.110	0.121	0.034	0.056	0.135	0.138	0.045	0.035	0.031	0.046	0.039	0.122	0.060	0.052	0.27059	0.163	0.156	0.104	0.113	0.045	0.280	0.023	0.035	0.036	0.051
sad	0.190	0.012	0.149	0.152	0.039	-0.014	0.164	-0.022	0.135	0.185	0.013	0.038	0.210	0.224	-0.042	-0.031	-0.044	-0.011	-0.032	0.194	-0.023	-0.014	0.163	0.276992	0.243	0.201	0.168	0.004	0.012	-0.066	-0.030	-0.034	-0.014
nervous	0.174	0.002	0.137	0.135	0.059	0.007	0.148	-0.003	0.122	0.164	0.029	0.044	0.189	0.215	-0.021	-0.004	-0.016	0.016	-0.020	0.181	0.001	0.014	0.156	0.243	0.250852	0.181	0.153	0.024	0.026	-0.055	-0.017	-0.006	0.015
ashamed	0.178	0.007	0.142	0.151	0.033	-0.036	0.129	-0.009	0.105	0.181	0.042	0.024	0.189	0.247	-0.029	-0.049	-0.047	-0.028	-0.052	0.173	-0.025	-0.020	0.104	0.201	0.181	0.266873	0.167	0.009	-0.005	-0.110	-0.030	-0.035	-0.051
resentful	0.140	0.012	0.131	0.135	0.027	-0.018	0.118	-0.022	0.129	0.148	-0.001	0.043	0.164	0.142	-0.025	-0.053	-0.059	-0.026	-0.038	0.157	-0.045	-0.045	0.113	0.168	0.153	0.167	0.193736	-0.026	0.006	-0.054	-0.044	-0.052	-0.019
whole	0.033	-0.092	-0.019	-0.041	0.507	1.035	-0.039	1.025	0.001	-0.018	0.756	0.840	-0.055	0.193	1.210	1.256	1.136	1.165	1.132	-0.012	1.295	1.334	0.045	-0.004	0.024	0.009	-0.026	1.757515	1.228	1.058	1.222	1.354	1.181
privileged	0.040	-0.107	-0.017	-0.040	0.570	0.984	-0.010	0.911	0.042	-0.015	0.622	0.749	-0.017	0.151	1.209	1.159	1.026	1.130	1.046	0.000	1.082	1.212	0.080	-0.012	0.026	-0.005	0.006	1.228	1.701093	1.011	1.115	1.200	1.106
healthy	-0.050	-0.056	-0.079	-0.060	0.282	0.896	-0.024	0.804	0.041	-0.066	0.345	0.861	-0.070	-0.201	1.076	1.056	0.898	1.001	1.018	-0.052	0.991	1.058	0.023	-0.066	-0.055	-0.110	-0.054	1.058	1.011	1.808009	0.083	1.132	1.123
relaxed	0.019	-0.074	-0.042	-0.065	0.457	0.995	-0.052	0.963	0.005	-0.041	0.648	0.737	-0.062	0.125	1.138	1.206	1.095	1.174	1.257	-0.032	1.168	1.255	0.035	-0.030	-0.017	-0.030	-0.044	1.222	1.115	1.083	1.708997	1.386	1.197
glad	0.026	-0.107	-0.051	-0.079	0.511	1.040	-0.0																										

Table 13: Correlation matrix from Reliability analysis of developed emotion measurement tool for study 6.

Variables	stressed	uninterested	weak	disgusted	sensual	optimistic	cheerless	relieved	unsatisfied	disappointed	wild	energetic	dissatisfied	guilty	grateful	happy	pleased	pleasant	calm	angry	satisfied	joyful	tired	sad	nervous	ashamed	resentful	whole	privileged	healthy	relaxed	glad	good-looking
stressed	1	0.073	0.522	0.511	0.137	0.070	0.542	0.073	0.266	0.462	0.039	0.134	0.465	0.440	0.018	0.024	-0.004	0.056	-0.005	0.496	0.048	0.077	0.372	0.650	0.627	0.622	0.569	0.045	0.055	-0.067	0.026	0.035	0.062
uninterested	0.073	1	0.070	0.138	-0.089	-0.143	0.015	-0.126	0.260	0.061	-0.055	-0.124	0.061	0.006	-0.151	-0.175	-0.131	-0.142	-0.081	0.013	-0.104	-0.138	0.029	0.032	0.005	0.019	0.040	-0.100	-0.119	-0.060	-0.081	-0.116	-0.084
weak	0.522	0.070	1	0.680	0.053	-0.050	0.601	-0.074	0.425	0.599	0.019	0.032	0.569	0.369	-0.073	-0.084	-0.105	-0.084	-0.072	0.661	-0.078	-0.069	0.438	0.642	0.621	0.625	0.672	-0.033	-0.029	-0.133	-0.072	-0.087	-0.067
disgusted	0.511	0.138	0.680	1	-0.028	-0.089	0.638	-0.084	0.469	0.695	-0.035	0.038	0.648	0.365	-0.111	-0.114	-0.152	-0.092	-0.103	0.716	-0.140	-0.109	0.390	0.664	0.619	0.671	0.697	-0.070	-0.071	-0.113	-0.113	-0.136	-0.102
sensual	0.137	-0.089	0.053	-0.028	1	0.553	0.001	0.482	0.107	0.069	0.432	0.449	0.035	0.230	0.439	0.450	0.408	0.482	0.426	0.052	0.419	0.467	0.203	0.083	0.132	0.073	0.069	0.432	0.494	0.237	0.395	0.434	0.500
optimistic	0.070	-0.143	-0.050	-0.089	0.553	1	-0.012	0.709	0.033	-0.025	0.494	0.668	-0.062	0.094	0.660	0.673	-0.585	0.648	0.624	-0.028	0.621	0.679	0.107	-0.022	0.012	-0.056	-0.032	0.629	0.608	0.537	0.614	0.632	0.646
cheerless	0.542	0.015	0.601	0.638	0.001	-0.012	1	-0.049	0.458	0.678	0.009	0.094	0.728	0.353	-0.051	-0.046	-0.083	-0.026	-0.055	0.700	-0.072	-0.052	0.436	0.682	0.648	0.549	0.585	-0.065	-0.016	-0.039	-0.087	-0.076	-0.030
relieved	0.073	-0.126	-0.074	-0.084	0.482	0.709	-0.049	1	0.036	-0.010	0.526	0.648	-0.050	0.157	0.660	0.666	0.611	0.650	0.593	-0.040	0.586	0.660	0.054	-0.035	-0.006	-0.014	-0.041	0.638	0.576	0.493	0.608	0.639	0.619
unsatisfied	0.266	0.260	0.425	0.469	0.107	0.033	0.458	0.036	1	0.507	0.022	0.053	0.579	0.229	0.019	-0.010	-0.072	0.012	-0.009	0.450	-0.064	-0.060	0.363	0.440	0.419	0.348	0.498	0.001	0.055	0.052	0.006	-0.020	0.043
disappointed	0.462	0.061	0.599	0.695	0.069	-0.025	0.678	-0.010	0.507	1	0.076	0.044	0.772	0.383	-0.060	-0.052	-0.101	-0.027	-0.057	0.745	-0.096	-0.063	0.433	0.651	0.606	0.650	0.619	-0.026	-0.021	-0.092	-0.059	-0.079	-0.025
wild	0.039	-0.055	0.019	-0.035	0.432	0.494	0.009	0.526	0.022	0.076	1	0.422	0.051	0.259	0.502	0.517	0.505	0.500	0.463	0.033	0.506	0.533	0.058	0.022	0.050	0.072	-0.003	0.503	0.421	0.226	0.437	0.491	0.409
energetic	0.134	-0.124	0.032	0.038	0.449	0.668	0.094	0.648	0.053	0.044	0.422	1	0.039	0.086	0.606	0.571	0.509	0.563	0.523	0.084	0.524	0.570	0.093	0.062	0.076	0.040	0.082	0.545	0.494	0.551	0.485	0.534	0.606
dissatisfied	0.465	0.061	0.369	0.365	0.435	-0.062	0.728	-0.050	0.579	0.772	0.051	0.039	1	0.435	-0.085	-0.073	-0.102	-0.052	-0.110	0.756	-0.108	-0.075	0.450	0.689	0.652	0.632	0.639	-0.072	-0.023	-0.090	-0.083	-0.093	-0.058
guilty	0.440	0.006	0.369	0.365	0.230	0.094	0.353	0.157	0.229	0.383	0.259	0.086	0.435	1	0.061	0.098	0.105	0.064	0.041	0.418	0.148	0.132	0.286	0.460	0.463	0.516	0.346	0.158	0.125	-0.161	0.104	0.122	0.027
grateful	0.018	-0.151	-0.073	-0.111	0.439	0.660	-0.051	0.660	0.019	-0.060	0.502	0.606	-0.085	0.061	1	0.793	0.731	0.722	0.699	-0.061	0.703	0.736	0.067	-0.061	-0.032	-0.042	-0.044	0.699	0.711	0.613	0.667	0.744	0.637
happy	0.024	-0.175	-0.084	-0.114	0.450	0.673	-0.046	0.666	-0.010	-0.052	0.517	0.571	-0.073	0.098	0.793	1	0.832	0.807	0.758	-0.056	0.774	0.811	0.051	-0.044	-0.006	-0.072	-0.090	0.717	0.673	0.595	0.699	0.825	0.666
pleased	-0.004	-0.131	-0.105	-0.152	0.408	0.585	-0.083	0.611	-0.072	-0.101	0.505	0.509	-0.102	0.105	0.731	0.832	1	0.728	0.757	-0.088	0.817	0.775	0.048	-0.068	-0.026	-0.074	-0.107	0.696	0.638	0.543	0.680	0.805	0.607
pleasant	0.056	-0.142	-0.084	-0.092	0.482	0.648	-0.026	0.650	0.012	-0.027	0.500	0.563	-0.052	0.064	0.722	0.807	0.728	1	0.757	-0.026	0.689	0.770	0.066	-0.016	0.024	-0.040	-0.044	0.659	0.650	0.558	0.674	0.746	0.719
calm	-0.005	-0.081	-0.072	-0.103	0.426	0.624	-0.055	0.593	-0.009	-0.057	0.463	0.523	-0.110	0.041	0.699	0.758	0.757	0.757	1	-0.052	0.740	0.574	0.060	-0.049	-0.032	-0.081	-0.068	0.679	0.638	0.602	0.765	0.750	0.636
angry	0.496	0.013	0.661	0.716	0.052	-0.028	0.700	-0.040	0.450	0.745	0.033	0.084	0.756	0.418	-0.061	-0.056	-0.088	-0.026	-0.052	1	-0.055	-0.013	0.090	-0.034	0.001	-0.037	-0.079	0.762	0.647	0.575	0.697	0.792	0.658
satisfied	0.048	-0.104	-0.078	-0.140	0.419	0.621	-0.072	0.586	-0.064	-0.096	0.506	0.524	-0.108	0.148	0.703	0.774	0.817	0.689	0.740	-0.055	1	0.819	0.090	-0.034	0.001	-0.037	-0.079	0.762	0.647	0.575	0.697	0.792	0.658
joyful	0.077	-0.138	-0.069	-0.109	0.467	0.679	-0.052	0.660	-0.009	-0.063	0.533	0.570	-0.075	0.132	0.736	0.811	0.775	0.770	0.754	-0.013	0.819	1	0.075	-0.020	0.022	-0.030	-0.032	0.763	0.705	0.597	0.728	0.827	0.697
tired	0.372	0.029	0.438	0.390	0.203	0.107	0.436	0.054	0.363	0.433	0.058	0.093	0.450	0.286	0.067	0.051	0.048	0.066	0.060	0.485	0.090	0.075	1	0.594	0.600	0.388	0.489	0.065	0.118	0.033	0.052	0.052	0.072
sad	0.650	0.032	0.642	0.664	0.083	-0.022	0.682	-0.035	0.440	0.651	0.022	0.062	0.689	0.460	-0.061	-0.044	-0.068	-0.016	-0.049	0.758	-0.034	-0.020	0.594	1	0.920	0.740	0.718	-0.006	0.018	-0.093	-0.044	-0.049	-0.019
nervous	0.627	0.005	0.621	0.619	0.132	0.012	0.648	-0.006	0.419	0.606	0.050	0.076	0.652	0.463	-0.032	-0.006	-0.026	0.024	-0.032	0.743	0.001	0.022	0.600	0.920	1	0.701	0.690	0.036	0.040	-0.082	-0.026	-0.009	0.022
ashamed	0.622	0.019	0.625	0.671	0.073	-0.056	0.549	-0.014	0.348	0.650	0.072	0.040	0.632	0.516	-0.042	-0.072	-0.107	-0.040	-0.081	0.688	-0.037	-0.030	0.388	0.740	0.701	1	0.727	0.014	-0.007	-0.158	-0.045	-0.051	-0.072
resentful	0.569	0.040	0.672	0.697	0.069	-0.032	0.585	-0.041	0.498	0.619	-0.003	0.082	0.639	0.346	-0.044	-0.090	-0.107	-0.044	-0.068	0.726	-0.079	-0.032	0.489	0.718	0.701	1	0.044	0.009	-0.090	-0.075	-0.088	-0.032	
whole	0.045	-0.100	-0.033	-0.070	0.432	0.629	-0.065	0.638	0.001	-0.026	0.503	0.545	-0.072	0.158	0.699	0.717	0.696	0.659	0.679	-0.019	0.762	0.763	0.065	-0.006	0.036	0.014	-0.044	1	0.710	0.593	0.705	0.769	0.658
privileged	0.055	-0.119	-0.029	-0.071	0.494	0.608	-0.036	0.576	0.055	-0.021	0.421	0.494	-0.023	0.125	0.711	0.673	0.696	0.650	0.638	0.000	0.647	0.705	0.118	0.018	0.040	-0.007	0.009	0.710	1	0.577	0.654	0.693	0.626
healthy	-0.067	-0.060	-0.133	-0.113	0.237	0.537	-0.039	0.493	0.052	-0.092	0.226	0.551	-0.090	-0.161	0.613	0.595	0.543	0.558	0.602	-0.079	0.575	0.597	0.033	-0.093	-0.082	-0.158	-0.090	0.593	0.577	1	0.616	0.634	0.616
relaxed	0.026	-0.081	-0.072	-0.113	0.395	0.614	-0.087	0.608	0.006	-0.059	0.437	0.485	-0.083	0.104	0.667	0.699	0.680	0.674	0.765	-0.051	0.697	0.728	0.052	-0.044	-0.026	-0.045	-0.075	0.705	0.654	0.616	1	0.799	0.676
glad	0.035	-0.116	-0.087	-0.136	0.434	0.632	-0.076	0.639	-0.020	-0.079	0.491	0.534	-0.093	0.122	0.744	0.825	0.805	0.746	0.750	-0.069	0.792	0.827	0.052	-0.049	-0.009	-0.051	-0.088	0.769	0.693	0.634	0.799	1	0.718
good-looking	0.062	-0.084	-0.067	-0.102	0.500	0.646	-0.030	0.619	0.043	-0.025	0.409	0.606	-0.058	0.027	0.637	0.666	0.607	0.719	0.636	-0.031	0.658	0.697	0.072	-0.019	0.022	-0.072	-0.032	0.658	0.626	0.616	0.676	0.718	1

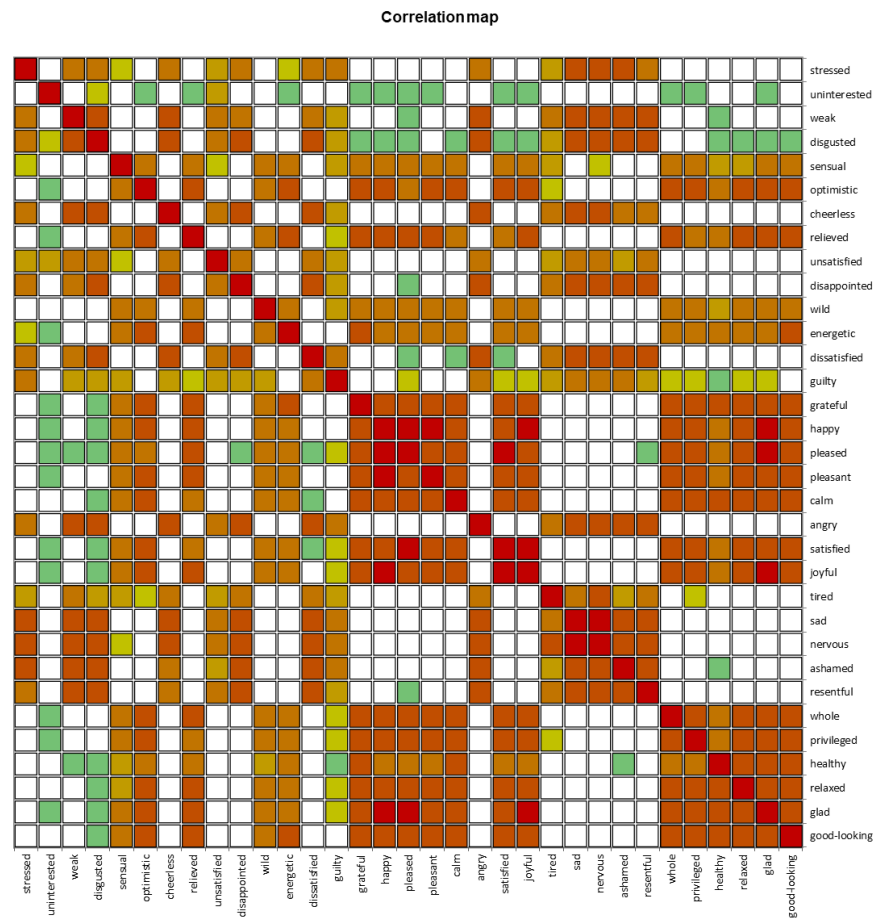


Fig.9: Correlation map from Reliability analysis of developed emotion measurement tool for study.

4.3.3 Discussion

Based on the statistical analyses performed, the new tool can discriminate between samples of the same and different food categories, with a high percentage of emotions on the list being statistically significant (70%). Cronbach's alpha is very close to 1, which means that most emotions on the list are well established. *Uninterested* was the only emotion that negatively correlated to others. This is understandable because if one is not interested in something, they have neither positive nor negative emotions towards it. However, this emotion should not be considered redundant because it provides differentiation between food samples, according to the validation studies. The strong correlations between *glad, joyful, happy, pleased, satisfied, pleasant* should be checked further to see if some of them could be excluded from the tool.

Some of the words on the emotion list, such as *healthy, sensual, and good-looking*, are not emotions in the strict sense of the term. However, these words appeared very frequently in all consumer-defined sources, namely the Web, Instagram, and questionnaires, to collocate as feelings/sensations with food consumption. These words also appear frequently in advertisements of products in general, and food products specifically, and are a key driver of purchase. Who does not want to feel healthy, sensual, and good-looking?

The emotion list compiled can be used in CATA and rating scales questionnaires to measure food-elicited emotions and create emotional profiles of foods and beverages, for Greek consumer studies, as presented in the final stage of validation. To create the emotional profile of a food/ beverage, or to distinguish between very different food products, the CATA format can be applied. However, if the aim is to distinguish between samples of the same food category, then rating scales or RATA questionnaires would be a better choice (Panagiotou & Gkatzionis, 2022).

Apart from the emotion lexicon developed that consists of 33 emotions, we have created a big database of food-category specific emotion terms. According to these data, beverages, especially alcoholic drinks, are either consumed with the aim to diminish negative or even painful emotions, or to boost self-confidence and energy. Sweets are mainly consumed to cause positive emotions. Comfort foods are mainly consumed to “comfort”, i.e., to diminish negative emotions such as sadness, anxiety, and boredom. This means that when studying beverages and sweets one should pay attention to the

pre-consumption emotional state of the consumer as well. These food-specific terms are added to the final general list of 33 terms of the developed tool according to the food category under study. Extra terms added by participants at the stage of validation did not appear more than the terms already on the list, which again validates the final emotion lexicon list. The usage of linguistic and language sources as a starting point has the advantage of containing a variety of terms, which the consumers might not be able to remember while performing a free-listing task. This is especially useful when compiling a general, not a food-specific, emotion lexicon from scratch, without the use of specific foods as stimuli. However, some words on the list may not be known or clear to the consumers. Making use of other sources and collecting data from consumers are necessary steps to depict real and synchronous usage of language. Using Online Social Media as a linguistic source has the advantage of combining words (text and hashtags) with images (pictures and emoji), and it is a medium of spontaneous communication and self-expression. One should not forget though that the aim of this type of communication is usually the attraction of “likes”, so the message can be exaggerated, and idealized.

The “hedonic asymmetry” hypothesis, detected in various languages (Pieter M.A. Desmet & Schifferstein, 2008; Gmuer et al., 2015; Ng et al., 2013b; Papies, 2013), suggests that people prefer positive rather than negative words to describe food experiences, because healthy people tend to like eating and tasting food, and because food products are formulated to be appealing and liked by consumers (Pieter M.A. Desmet & Schifferstein, 2008; Thomson & Crocker, 2013). This phenomenon was also detected in Greek during the various case studies performed. It was also detected that negative emotions exhibit greater diversity, as has already been noted in literature for emoji meanings (Jaeger, Roigard, et al., 2018). The positive emotions that came up in the Web search were less diverse but appeared more. Some emotions come up in almost every emotional profile of food. The positive emotions outnumber the negative ones on the emotion lexicon developed. This means that people are usually in a positive state of emotions when consuming food described by the adjectives: pleased, satisfied, glad, cheerful, relaxed, happy, calm, whole, pleasant, unrestrained, grateful, healthy, privileged, relieved, good-looking, optimistic, energetic, sensual.

The Greek emotion measurement tool developed as presented here is the first tool of its kind specifically developed for the Greek language and the Greek consumer. Further

research is needed to check it with more food/beverage categories. The emotion list compiled could also be tested in other scientific fields related to food, such as psychology and marketing studies.

4.4 Comparison of tools: original EsSense Profile, translated EsSense Profile into Greek, original Greek tool

For the purposes of the present study, three emotion measurement questionnaires were compared, namely the EsSense Profile (King & Meiselman, 2010) (referred to as EP), an adaptation of the EsSense Profile into Greek (referred to as translated EP, described in detail in chapter 4.2 of the present thesis), and a tool developed based on the EP methodology specifically for the Greek language (referred to as Greek tool, described in detail in chapter 4.3 of the present thesis). Table 14 presents the terms of all three compared tools. The comparison presented is based on surveys, with no actual tasting of foods. In this way, linguistic and cultural aspects could be compared without influence from specific food samples. The three questionnaires were presented to the participants in the same format. For each food category, the frequency of consumption was requested providing four choices: never – rarely – occasionally – frequently. Then, the intensity of food-elicited emotions was requested providing a list of emotions with 5-point ratings scales for each term (1: not at all – 2: slightly – 3: moderately – 4: very – 5: extremely).

Food category names -not actual foods nor pictures of foods- were used to compare the tools, namely pizza, mashed potatoes and gravy, vanilla ice cream, fried chicken, and chocolate, for all three measurement tools, and fruit for the two Greek tools only. “Mashed potatoes and gravy” was substituted by “meat and potatoes” for the translated EP and the Greek tool because mashed potatoes and gravy is not a common Greek food, whereas meat and potatoes is. These food categories were chosen because the EP was tested on those while it was being developed and the results are presented in King & Meiselman (2010). No other substitutions were deemed necessary for cultural reasons.

4.4.1 Materials and Methods

In our study, the data used for the comparison were taken from King & Meiselman (2010) and resulted from an internet study with 143 participants. The EP was tested for the five food categories using rating scales as mentioned in detail in chapter 4.2 of the

present article and lasted 10-15 mins. The translated EP was tested with 134 participants in an online survey (101 women) and lasted 8-10 mins, as mentioned in chapter 4.2. The Greek terms of the original Greek tool with their English equivalents are provided in Table 14. It was tested with 125 participants (84 women) in an online survey and lasted 8-10 mins.

4.4.2 Statistical analysis

For the EP, the statistical analysis was done using R version 2.13.2. For the translated EP and the Greek tool, XLSTAT software (Version, 2018.1., Addinsoft) was used.

As for the original EP, Analysis of Variance (ANOVA) was performed for foods and for terms for the translated EP and for the Greek tool to check how foods and terms are grouped together based on allocated intensities, and if the tools provide statistically significant differences between foods and terms.

Principal Component Analysis (PCA) for foods and for terms was conducted for the translated EP and the Greek tool to visualize correlations.

4.4.3 Results

All three tools were able to differentiate across food categories.

For the EP, significant differences were provided by 23 out of the 39 terms. The terms that did not differentiate between foods were *aggressive*, *bored*, *daring*, *disgusted*, *eager*, *glad*, *joyful*, *merry*, *mild*, *nostalgic*, *quiet*, *steady*, *tame*, *tender*, *warm*, and *worried*. All foods were perceived as different. Pizza and chocolate got the highest mean intensities of all foods. Pizza got high intensity ratings, especially for the terms *satisfied* and *guilty*, while chocolate for *active*, *adventurous*, *affectionate*, *whole*, *loving*, and *guilty*. For *guilty*, pizza, chocolate, and fried chicken got the highest ratings, while mashed potatoes and gravy the lowest.

Table 15 shows the top 20 terms as regards allocated intensity for the translated EP, for which 33 out of the 36 terms provided significant differences except *aggressive* and *bored*. The PCA for terms showed that *disgusted*, *boring*, *worried*, *bored*, *guilty*, and *aggressive* are different than the other terms (Fig.10). These are the negative emotion terms of the list. The PCA for foods grouped ice cream and fruit together, chocolate on

its own, and fried chicken with meat and potatoes and pizza (Fig.11). Chocolate and fruit were the foods with the highest mean intensities. Vanilla ice cream and fruit were associated with intense positive emotions. As regards the relation between frequency of consumption and terms, the term *guilty* was statistically significantly different.

Table 15 also shows the top 20 terms as regards allocated intensity for the Greek tool, for which 23 out of the 33 terms provided significant differences except *disgusted*, *cheerless*, *unsatisfied*, *disappointed*, *pleasant*, *angry*, *sad*, *ashamed*, and *resentful*. The PCA for terms showed that *uninterested*, *disgusted*, *weak*, *dissatisfied*, *resentful*, *cheerless*, *disappointed*, *ashamed*, *sad*, *nervous*, *unsatisfied*, *worried*, *guilty*, and *tired* are different than the other terms (Fig.12). These are the negative emotion terms. The terms *sensual*, *optimistic*, *relieved*, *wild*, *energetic*, *guilty*, *grateful*, and *healthy* had $F < 0.0001$. The PCA for foods grouped fruit separately, meat and potatoes with fried chicken together, pizza separately, and chocolate together with ice cream (Fig. 13). Fruit and chocolate got the highest mean intensities. Vanilla ice cream and fruit were associated with intense positive emotions only. Meat and potatoes received the lowest mean intensities. As regards frequency of consumption with relation to the terms, the terms that related to frequent consumption (level 4 of the scales) were *pleased*, *satisfied*, *glad*, *healthy*, *happy*, while *guilty* related to rare consumption (level 2 of the scales).

In the PCA for terms for the translated EP, one factor stands out and corresponds to 53% of the variability (Fig.10), while for the Greek tool, two factors stand out corresponding to about 35% and 19% of the variability (Fig.12). These two factors group the terms into positive, negative, and neutral.

In the PCA for foods for the translated EP, one factor stands out and corresponds to about 62% of the variability (Fig.11), while for the Greek tool, one factor stands out corresponding to about 71% of the variability (Fig.13).

Table 16 shows the 13 terms common for all three tools and their mean intensities. As can be seen, most of the common terms got a lower intensity rating using the Greek tool in comparison to the intensity the terms were allocated when using the translated tool.

Specifically, as regards the original Greek tool, being the focus of the study, *satisfied* highly correlated with *glad*, *disappointed* highly correlated with *dissatisfied*, *unrestrained* highly correlated with *guilty*, and *guilty* was highly determined by *healthy*.

The terms that were identified as statistically significant were: *sensual, optimistic, relieved, wild, energetic, guilty, grateful, healthy*. By statistically analyzing the terms as factors contributing to one another, the following findings have arisen: *sad* has noticeably higher quantity of *stressed* and *ashamed*. *Glad* has noticeably higher quantity of *happy*, and *good-looking*. *Sad* and *glad* account for the majority of *wild*. *Sad* accounts for the majority of *weak, unsatisfied, and tired*. *Glad* accounts for the majority of *satisfied, relieved, and privileged*.

Table 14: Emotion terms of EsSense Profile, translated EsSense Profile into Greek, and Greek tool

EsSense Profile	Translated EsSense Profile	Greek tool
active	ενεργός	
adventurous	περιπετειώδης	
affectionate	στοργικός	
aggressive	επιθετικός	
bored	βαριεστημένος	
calm	ήρεμος	V
daring	τολμηρός	
disgusted	αηδισμένος	V
eager	ανυπόμονος	
energetic	δραστικός	V
enthusiastic	ενθουσιώδης	
free	ελεύθερος	
friendly	φιλικός	
glad	χαρούμενος	V
good	X	
good-natured	καλοσυνάτος	
guilty	ένοχος	V
happy	ευτυχισμένος	V
interested	ενδιαφερόμενος	
joyful	εύθυμος	V (κεφάλτος)
loving	X	
merry	X	
mild	πράος	
nostalgic	νοσταλγία	
peaceful	γαλήνιος	
pleasant	ευχάριστος	V
pleased	ευχαριστημένος	V
polite	ευγενικός	
quiet	ήσυχος	
satisfied	ικανοποιημένος	V
secure	ασφαλής	
steady	σταθερός	
tame	βαρετός	
tender	τρυφερός	
understanding	συμπνετικός	
warm	θαλπωρή	
whole	πλήρης	V
wild	ασυγκράτητος	V
worried	ανήσυχος	V (αγχωμένος) (stressed)
		αδιάφορος (uninterested)
		αδύναμος (weak)
		αισθησιακός (sensual)
		ασιόδοξος (optimistic)
		άκεφος (cheerless)
		ανακουφισμένος (relieved)
		ανικανοποίητος (unsatisfied)
		απογοητευμένος (disappointed)
		δυσανεστημένος (dissatisfied)
		ευγνώμων (grateful)
		θυμωμένος (angry)
		κουρασμένος (tired)
		λυπημένος (sad)
		νευρικός (nervous)
		ντροπιασμένος (ashamed)
		παραπονεμένος (resentful)
		προνομιούχος (privileged)
		υγιής (healthy)
		χαλαρός (relaxed)
		ωραίος (good-looking)

Note: 2nd column: The Greek terms are provided next to their English equivalents from EsSense Profile. An “X” is given for English terms whose meaning is already covered by existing terms in the translated tool. 3rd column: The English equivalent of the terms of the Greek tool is provided in square brackets. A “V” is used to show that the emotion is covered in the Greek tool list of terms.

Table 15: Top 20 terms for translated EsSense Profile and Greek tool.

pizza		meat		vanilla ice cream		chicken		chocolate		fruit	
translated	Greek tool	translated	Greek tool	translated	Greek tool	translated	Greek tool	translated	Greek tool	translated	Greek tool
pleased	pleased	pleased	pleased	pleased	pleased	pleased	pleased	pleased	pleased	satisfied	healthy
satisfied	satisfied	satisfied	satisfied	satisfied	glad	glad	satisfied	satisfied	satisfied	pleased	pleased
glad	glad	glad	glad	glad	relaxed	satisfied	glad	glad	glad	glad	glad
joyful	joyful	whole	whole	friendly	satisfied	happy	calm	enthusiastic	happy	secure	satisfied
enthusiastic	relaxed	happy	relaxed	happy	joyful	whole	happy	happy	relaxed	active	calm
whole	happy	calm	calm	pleasant	calm	calm	relaxed	whole	calm	whole	relaxed
happy	calm	quiet	healthy	enthusiastic	happy	pleasant	joyful	joyful	joyful	energetic	happy
calm	whole	joyful	grateful	calm	whole	enthusiastic	pleasant	calm	whole	calm	grateful
pleasant	pleasant	pleasant	happy	joyful	pleasant	quiet	whole	pleasant	grateful	happy	whole
quiet	wild	enthusiastic	joyful	quiet	grateful	joyful	grateful	active	pleasant	enthusiastic	joyful
friendly	grateful	warm	privileged	whole	privileged	friendly	healthy	peaceful	optimistic	quiet	pleasant
peaceful	healthy	secure	pleasant	tender	healthy	good-	good-	quiet	relieved	free	good-
warm	privileged	friendly	good-	peaceful	good-	natured	looking	wild	privileged	peaceful	looking
free	relieved	good-	looking	good-	looking	polite	privileged	warm	good-	joyful	energetic
good-	good-	natured	relieved	natured	optimistic	steady	optimistic	free	looking	steady	privileged
natured	looking	mild	optimistic	warm	relieved	mild	relieved	energetic	wild	pleasant	optimistic
secure	optimistic	steady	energetic	free	wild	free	energetic	eager	energetic	friendly	relieved
eager	energetic	active	wild	steady	energetic	active	wild	friendly	healthy	mild	wild
wild	guilty	nostalgic	uninterested	mild	sensual	interested	guilty	good-	guilty	warm	sensual
guilty	uninterested	peaceful	sensual	polite	guilty	affectionate	sensual	natured	sensual	interested	uninterested
polite	sensual	polite	guilty	active	uninterested	energetic	uninterested	interested	worried		unsatisfied

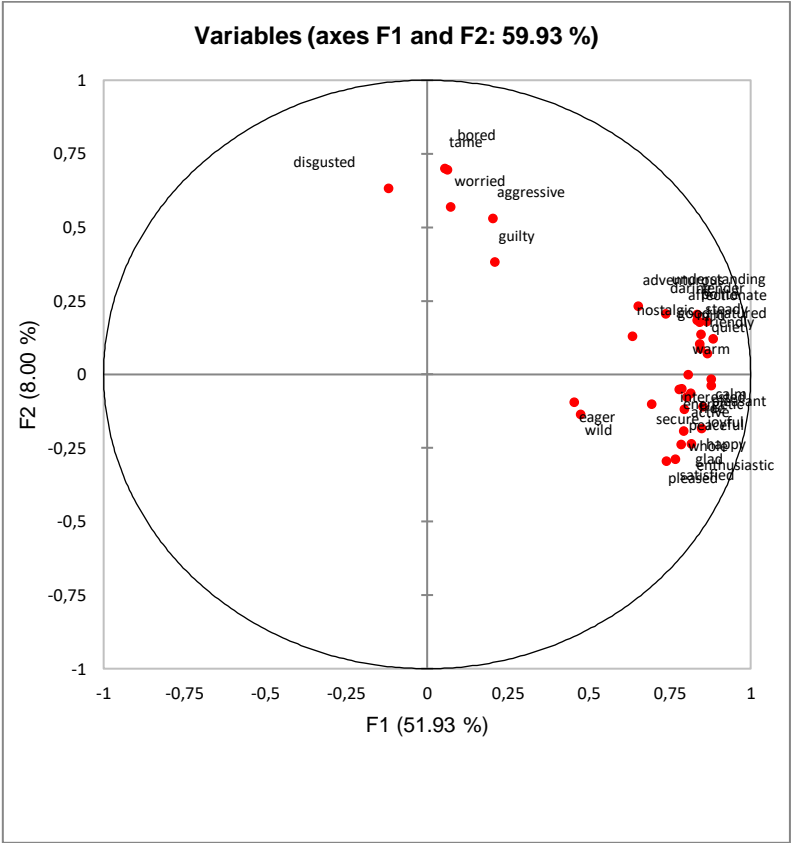


Fig.10: Principal Component Analysis of terms (factors 1 and 2) for translated EsSense Profile. The red dots represent active variables.

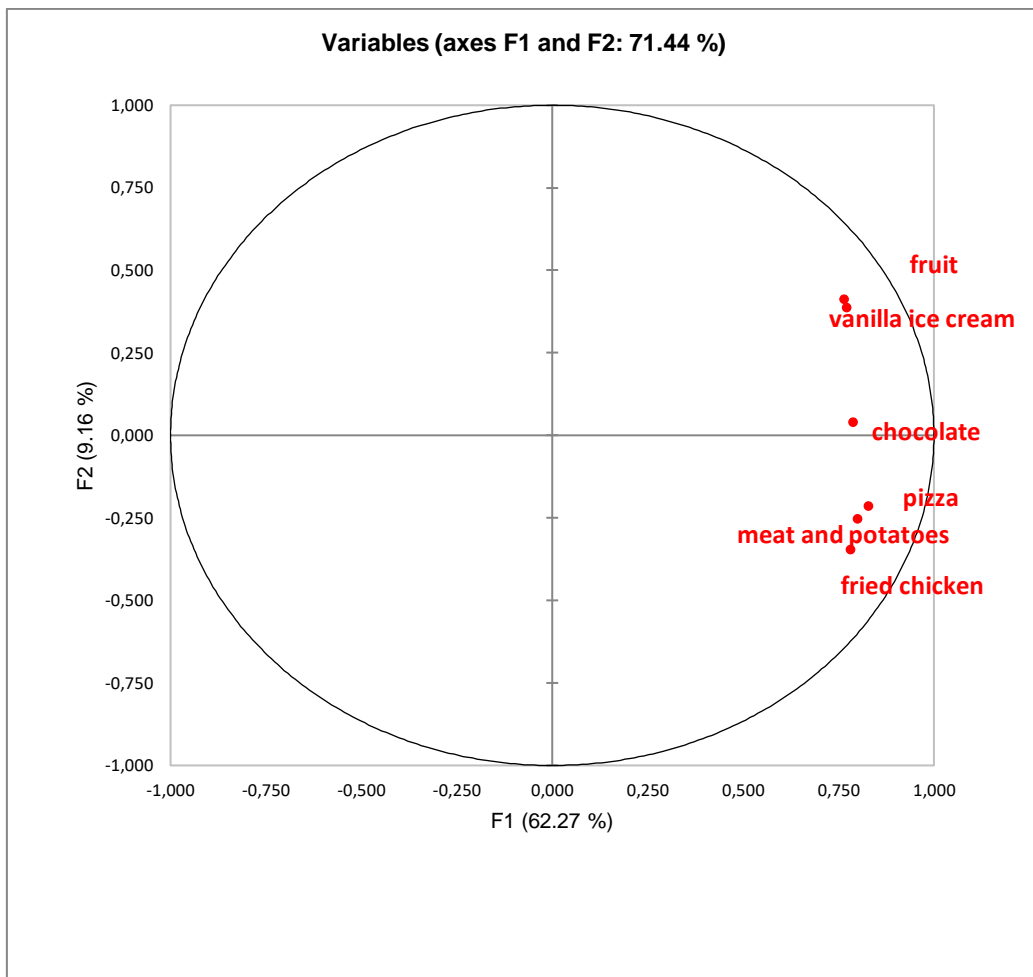


Fig.11: Active variables for translated EsSense Profile (PCA for foods).

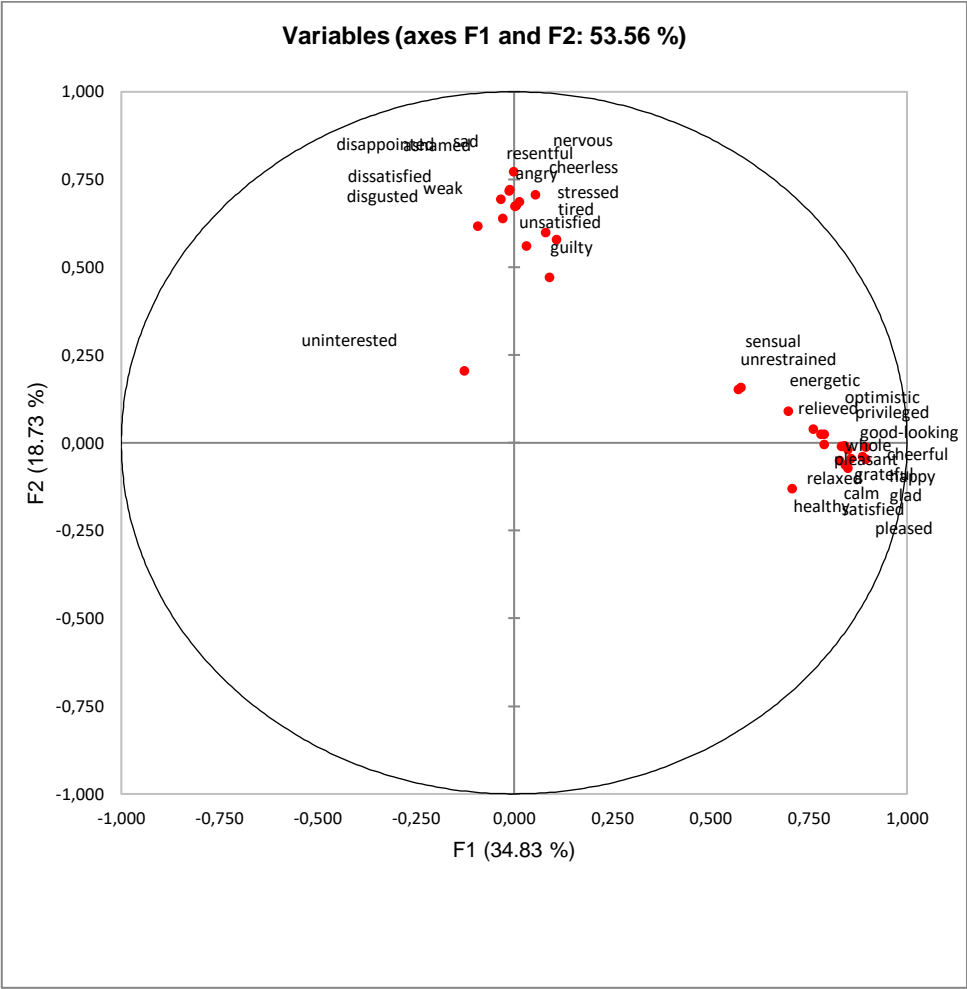


Fig.12: Active variables for Greek tool (PCA for terms). Terms grouped as positive, negative, and neutral.

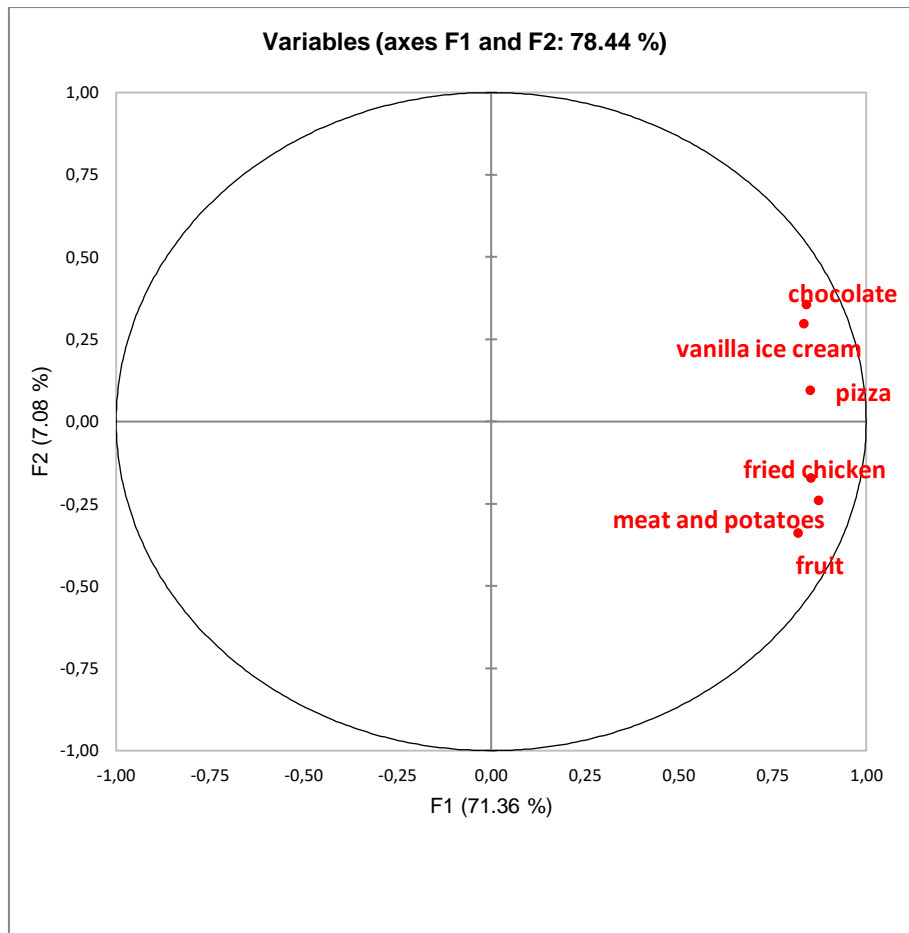


Fig.13: Active variables for Greek tool (PCA for foods).

Table 16: Mean scores (5pt Likert scales) and difference intervals of the 13 common terms for the translated EsSense Profile (E.P.) in Greek, and the Greek tool.

terms	Translated E.P.	Greek tool	Difference interval
Calm	2.51	2.567	57
Disgusted	1.163	1.085	-78
Energetic	2.168	1.884	-284
Glad	2.905	2.721	-184
Guilty	1.736	1.463	-273
Happy	2.606	2.551	-55
Joyful	2.494	2.503	9
Pleasant	2.442	2.357	-85
Pleased	3.017	2.911	-106
Satisfied	2.947	2.763	-184
Whole	2.604	2.461	-143
Wild	1.935	1.751	-184

Worried	1.286	1.145	-141
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4.4.4 Discussion

For the translated EP, the terms were not closely grouped and 6 out of 39 terms were grouped as negative, while for the EP 3 terms were classified as negative and 11 as having no clear classification. This shows that the same terms are not regarded as having the same positive or negative load by English-speaking and Greek-speaking populations. For the Greek tool, on the other hand, the terms got more meaningful groupings: 14 terms were classified as negative, one as neutral, and 18 as positive. The PCAs for terms for the two tools in Greek were remarkably close as regards groupings of the same terms (Fig.10, Fig.12).

As mentioned in 4.4.3, only 13 emotions were included in all three emotion measurement tools. This is the key point of this study. While and after running the translated EP, comments were made by the participants that the list contained emotions that were not relevant to food consumption, or terms that were not frequently used by native speakers of Greek. Participants also felt the need to add various terms to the list in the space provided in each questionnaire.

As suggested in literature, within a region it might be possible to translate a longer list from existing research before narrowing it down for a specific language or country but for very different cultures (East vs West) it would be prudent to understand the emotional engagement of consumers with a product category by doing qualitative and quantitative research in each region (van Zyl & Meiselman, 2016).

From the intensities attributed to each term with each tool, it is evident that the rest of the terms in each list weighs differently upon each term (Table 16). There is a phenomenon in literature called “halo-dumping” (Clark & Lawless, 1994; Nestrud et al., 2016). According to this phenomenon, when participants are given a limited number of responses or the emotions they experience are not within the given choices in a questionnaire, they “dump” the emotional intensity of those onto the existing ones. As a result, term selection is affected by the length of the list and the connections between

the terms within the list, and this could be the explanation in our case for the participants using the translated EP. The fact that only 2 out of the 13 common terms got a higher intensity rating using the Greek tool, supports this idea and can be taken as proof that participants, when presented with less fitting choices, “dump” their emotional load onto the existing terms. Participants using the Greek tool did not have this problem.

As regards food categories groupings in PCAs, the groupings made by the translated EP, are not reasonable (Fig.11). Ice cream was grouped with fruit, chocolate on its own, and fried chicken with meat and potatoes and pizza. On the contrary, using the Greek tool, fruit and pizza were two separate categories, meat with potatoes and fried chicken were grouped together, and chocolate together with ice cream (Fig.13). This categorization is more reasonable because meat-containing foods were grouped together, sweets together, fruit and fast food on their own.

Pizza and chocolate were the foods with the highest intensities for the English-speaking participants but for the Greek-speaking participants chocolate and fruit got the highest intensities. This is true for both Greek tools used, and as a result it must be considered safe to say that the Greeks love fruit as much as they love chocolate.

The top 20 terms as regards intensity allocated are more or less common to the six food categories. What changes is the specific position of the emotions on the list per food category (Table 15). For example, the terms “pleasant” and “friendly” appear in all food categories for the translated EP as do the terms “joyful” and “healthy” for the Greek tool, but they appear in quite distinct positions per food. This leads to the conclusion that the specific emotional profile of each food category should be created not by taking into account these common terms or the terms with the highest intensity only, but by looking at the big picture, what type of emotions each food evokes. This agrees with what is stated in literature, that negative emotions might reflect cultural differences more than positive (van Zyl & Meiselman, 2015), and as a result foods with mainly positive profiles can have very similar emotional profiles. In literature it is also mentioned that attribute absence rather than presence evokes greater discrimination for emotions (Wardy et al., 2015).

Following the remarks above, we could conclude that better discrimination between food categories of similarly positive emotional profiles can be provided by using

emotion lists with rating scales for intensity rather than emotion lists to choose from in CATA questionnaires. Another solution could be RATA questionnaires, that combine the advantages of both rating scales and CATA questionnaires (Ng et al., 2013a).

For all three tools, it was proven that frequent users have the strongest positive emotions and that non-users provide mainly negative terms (King & Meiselman, 2010).

The translated tool does not seem to work well in Greek as it does not provide clear differentiation among foods and terms. We do get some differentiation for level 1 ratings (i.e., feel this emotion not at all) but not for level 5 (i.e., feel this emotion extremely) and especially for medium intensities. It is unclear if this is due to the specific food categories or the terms.

Word-based questionnaires should ideally be administered in the native language of the respondents. There are subtle differences in expression which may be lost on an individual if they are completing the questionnaire in their second or third language (van Zyl & Meiselman, 2015).

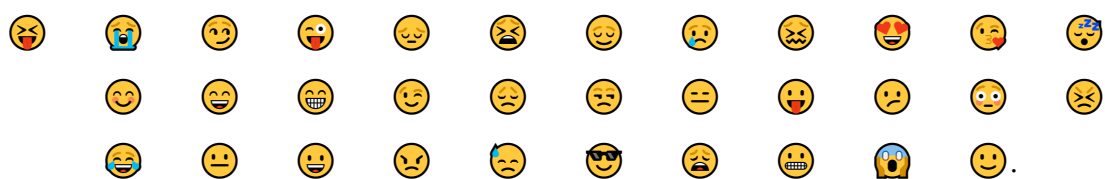
As regards the original Greek tool, the statistical analysis of the terms included highlighted some aspects of the emotions and inter-relations among them. These must be cross-checked in other food categories and see if in the next version of the tool some emotions should be eliminated as they covered by others.

4.5 Comparison of Greek word-based tool and emoji tool on six foods online and on olive oils in CLTs

4.5.1 Emoji tool online study across food categories

4.5.1.1 *Materials and Methods*

Following the current trend of using emoji questionnaires to measure food-elicited emotions (see chapters 2.2.2 and 3.12 of the present thesis), instead of word-based questionnaires, we decided to test a standardized popular list of emoji on the same foods as our Greek word-based tool and compare the two. The emoji tool selected is a widely used list of 33 emoji (Ares & Jaeger, 2017; Jaeger et al., 2017; Jaeger & Ares, 2017):



The emoji list was used in an online questionnaire with 5pt rating scales per emoji, in an analogy to the word-based questionnaire to be comparable. A frequency of consumption question preceded each food category. Questions on demographic data followed, as well as a question on frequency of use of emoji (3-a lot, 2-a bit, 1-not at all) to combine responses with emoji familiarity/use frequency. The food categories tested were pizza, fried chicken, vanilla ice cream, meat and potatoes, chocolate, and fruit. The online questionnaire was taken by 119 participants: men (20.2%) and women (79.8%), aged 18-70 (the majority between 41-50), whose educational level varied from high school graduates to doctoral degree holders (the majority being university degree holders). Most of the participants state that they use emoji in their everyday communication from a little to a lot.

4.5.1.2 Results

PCAs and ANOVAs were performed. From the PCA for foods, one main component was extracted that explained 66.35% of the variation (Fig.14). All foods were grouped together except fried chicken (Fig.15).

From the ANOVA for foods, all foods were identified as statistically different. However, the six food categories seem to have similar positive emotional profiles that consist of the following intense positive emotions (five emotions highlighted in red, oranges, and yellows) and the negative emotions of low intensity (five highlighted in greens and blues) (Table 17).

From the PCA for emoji, two main factors were extracted that explained 57.6% of the variation (Fig.16). Component 1 was loaded by the positive emoji whilst component 2 was loaded by the negative emoji (Fig.17).

From the ANOVA for emoji, only 13 out of the 33 emoji were found to be statistically different (Fig.18).

Internal reliability and consistency analysis was performed to check how reliable the tool is and check the items on the scale list. Cronbach's alpha is 0.928, which is close to 1, meaning that the tool is internally consistent and reliable (Table 18).

Cronbach's alpha is close to 1. This means that most items on the scale are well established. The analysis further provided information about each specific item, by deleting them one by one to check if internal consistency changes by the removal. If

Cronbach's alpha lowers by a deletion, then the item is an important component of the tool. Cronbach's alpha did not increase after any deletion. On the contrary it decreased every time. This makes the items on the list solid and reliable (Table 19).

There is negative pairwise covariance between negative and positive emotions. Overall covariance per emoji was >1.5 for 😏, 😜, 😊, 😍, 😘, 😁, 😃, 😄, 😅, 😆, 😇, 😈, 😉, 😊, 😋, 😌, 😍, 😎, 😏, 1-1.5 for 😐, 0.5-1 for 😞, 😟, 😠, 😡, 😢, 😣, 😤, 😥, 😦, 😧, 😨, 😩, 😪, 😫, 😬, 😭, 😮, 😯, and <0.5 for 😔, 😕, 😖, 😗, 😘, 😙, 😚. It is interesting that 😏, 😃, and 😎 have a covariance of >1.9 . This means they covary with most emoji on the list; they are the most popular on the list (Fig.19).

The correlation matrix and the correlation map show that there are strong correlations between the negative emoji 😞, 😟, and 😠. This means it should be checked if all three are necessary for the tool (Table 20, Table 21).

Gender, age, educational level, and frequency of emoji of use are all statistically significant factors both for emoji and foods differentiation (Table 22).

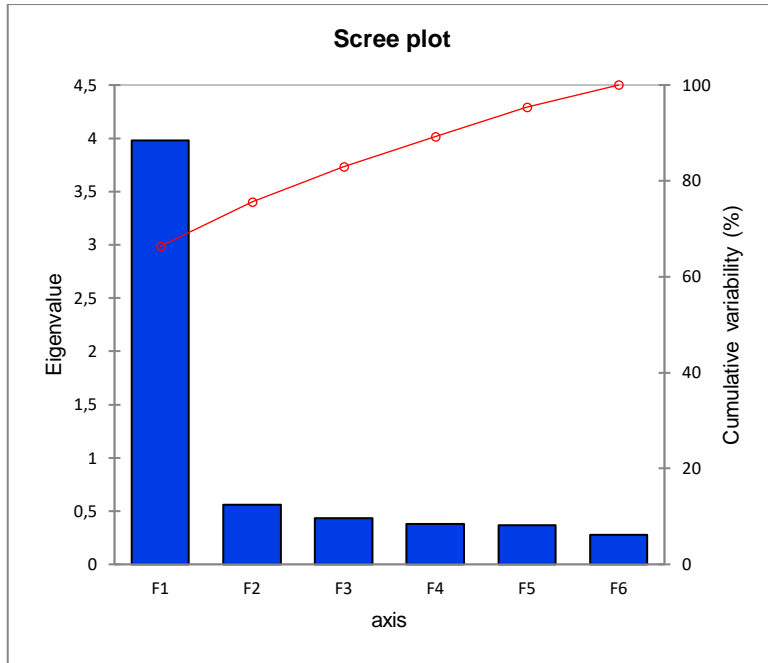


Fig.14: Scree plot from PCA for emoji tool online testing: one main component was exported that explained 66.35% of the variation.

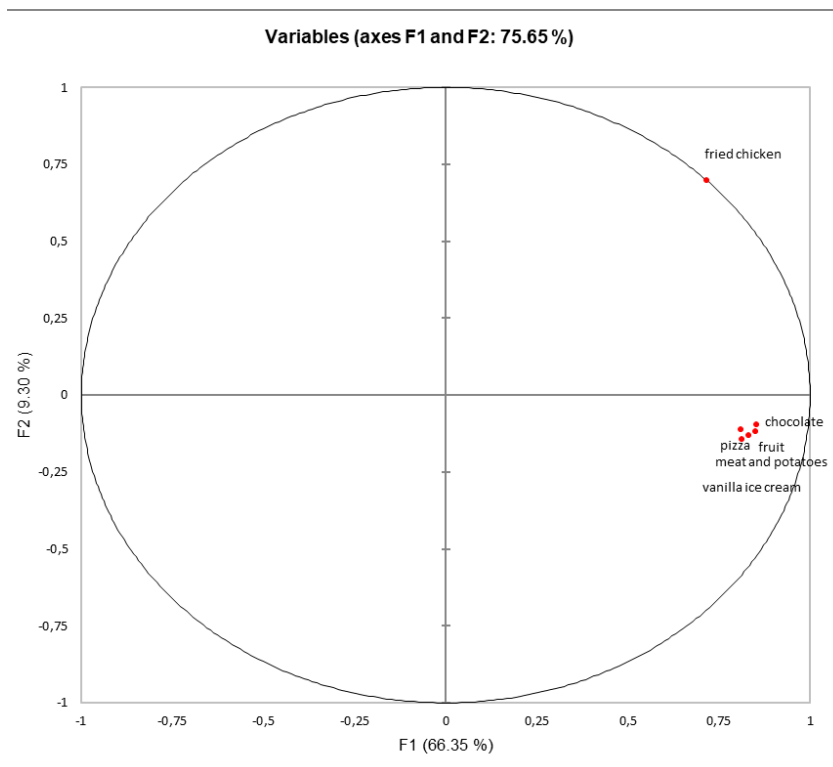


Fig.15: Active variables from PCA for emoji tool online testing: all foods were grouped together except fried chicken.

Table 17: Summary of LS means table from the ANOVA for the emoji tool online testing: the food categories seem to have similar emotional profiles that consists of five intense positive emotions (highlighted in red, oranges, and yellows) and five negative emotions of low intensity (highlighted in greens and blues).

	pizza		meat and potatoes		vanilla ice cream		fried chicken		chocolate		fruit	
😄	3,471	3,118	3,067	2,782	3,580	3,546						
😊	3,471	3,092	3,025	2,756	3,403	3,521						
🙂	3,395	3,042	2,882	2,664	3,319	3,403						
😁	3,269	3,025	2,815	2,622	3,218	3,303						
😃	3,210	2,899	2,815	2,513	3,151	3,286						
😞	1,328	1,235	1,252	1,286	1,244	1,193						
😓	1,319	1,235	1,227	1,286	1,235	1,193						
😔	1,303	1,218	1,227	1,277	1,235	1,193						
😖	1,286	1,218	1,218	1,269	1,218	1,185						
😡	1,277	1,193	1,210	1,261	1,218	1,185						

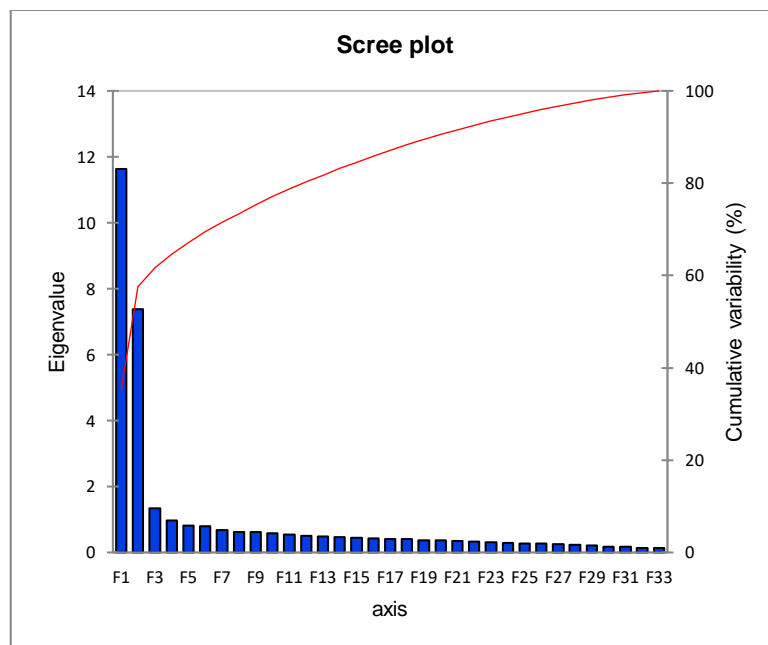


Fig.16: Scree plot from PCA of emoji tool online testing: two main factors were extracted that explained 57.6% of the variation.

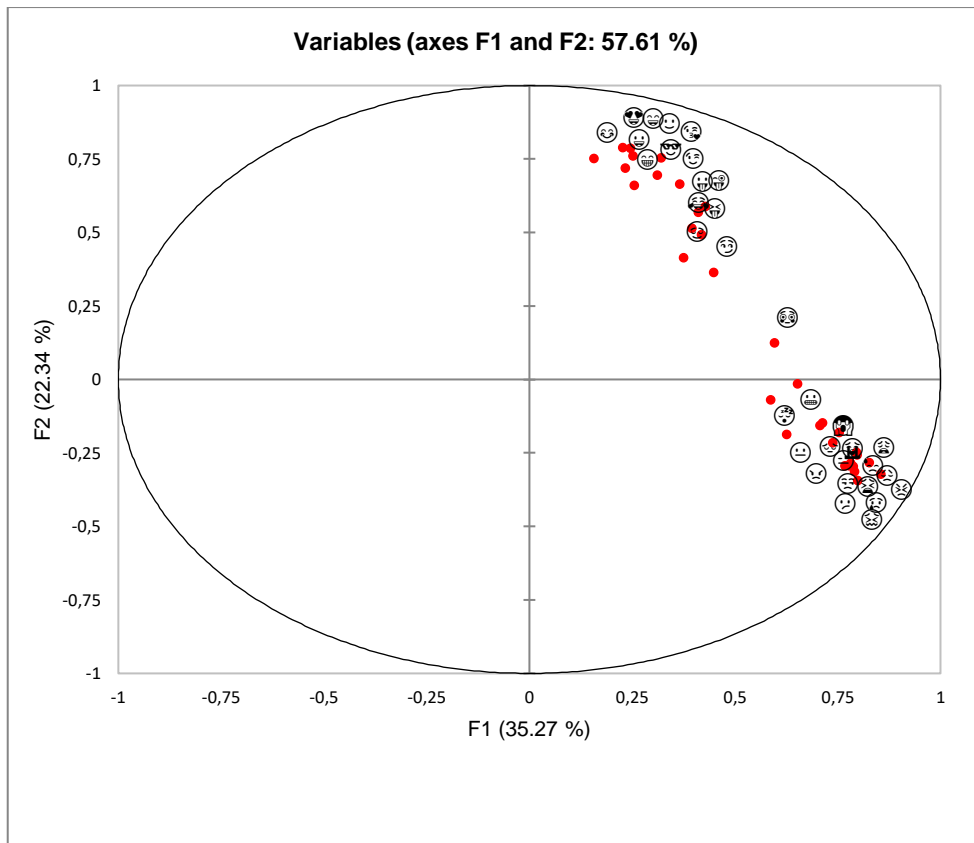


Fig.17: Active variables from the PCA of emoji tool online testing.

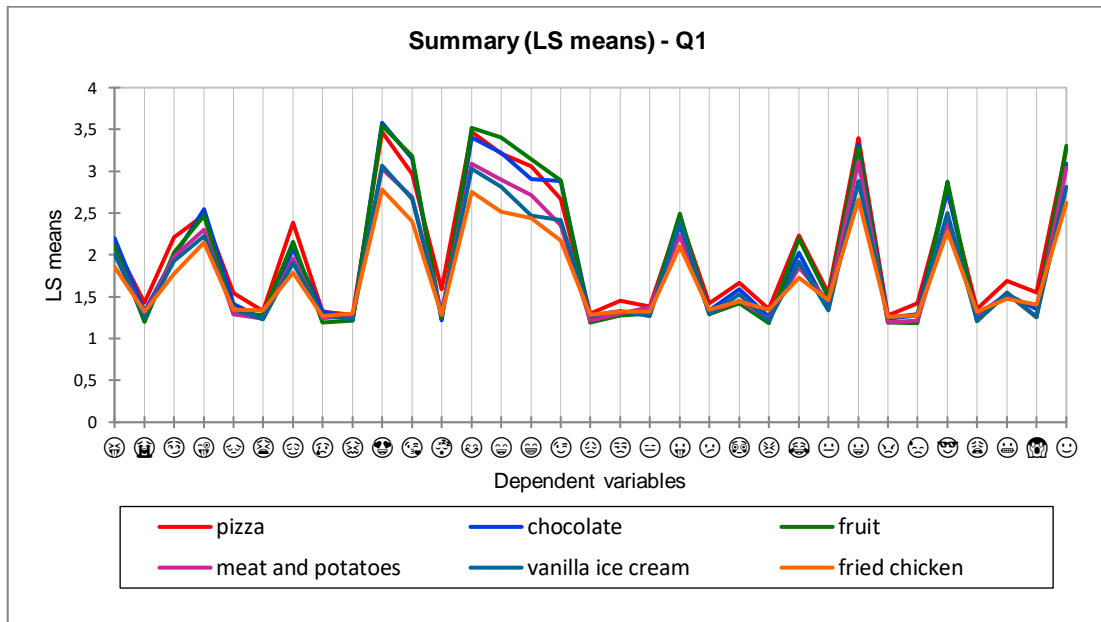


Fig.18: Summary of LS means from ANOVA of emoji tool online testing: 13 out of 33 emoji were statistically different.

Table 18: Reliability analysis and internal consistency test for emoji tool (Cronbach's alpha statistics).

Cronbach's alpha statistics :	
Observations: 714	
Items on scale: 33	
1-5 Likert scales	
Cronbach's alpha	Standardized Cronbach's Alpha
0.928	0.938

Table 19: Deleted items for Cronbach's alpha statistics for emoji tool; test performed to check internal consistency of the emoji-based measurement tool.

Deleted items statistics:						
	Mean	Variance	Correlation	R ²	Cronbach's alpha	Guttman L6
🙄	61,069	334,631	0,569	0,545	0,926	0,957
🙇	61,821	347,971	0,519	0,594	0,926	0,957
😏	61,139	338,049	0,531	0,397	0,926	0,958
🙄	60,759	330,152	0,627	0,647	0,925	0,956
😏	61,748	347,213	0,493	0,536	0,927	0,957
🙄	61,847	349,302	0,485	0,764	0,927	0,957
😏	61,076	338,157	0,493	0,379	0,927	0,958
🙄	61,850	349,519	0,490	0,728	0,927	0,957
😏	61,868	349,826	0,475	0,764	0,927	0,957
😏	59,877	333,682	0,552	0,692	0,926	0,956
🙄	60,277	329,477	0,618	0,671	0,925	0,956
😏	61,801	349,663	0,436	0,349	0,927	0,958
😏	59,910	339,193	0,472	0,613	0,927	0,957
😏	60,112	333,931	0,568	0,689	0,926	0,956
😏	60,333	335,201	0,510	0,536	0,927	0,957
😏	60,557	331,751	0,611	0,549	0,925	0,957
😏	61,867	349,538	0,533	0,771	0,927	0,957
😏	61,794	348,859	0,475	0,693	0,927	0,957

☹️	61,790	348,887	0,490	0,605	0,927	0,957
😬	60,784	332,355	0,602	0,633	0,925	0,956
😞	61,789	349,483	0,485	0,685	0,927	0,957
😬	61,605	342,688	0,536	0,395	0,926	0,957
😬	61,857	348,992	0,538	0,832	0,926	0,957
😬	61,130	335,603	0,560	0,439	0,926	0,957
😬	61,682	349,721	0,410	0,458	0,927	0,958
😬	60,011	335,273	0,561	0,660	0,926	0,956
😬	61,887	349,983	0,493	0,694	0,927	0,957
😬	61,843	349,311	0,519	0,719	0,927	0,957
😬	60,524	331,394	0,580	0,543	0,926	0,957
😬	61,852	348,357	0,525	0,748	0,926	0,957
😬	61,567	343,003	0,515	0,454	0,926	0,957
😬	61,775	347,008	0,501	0,527	0,927	0,957
😬	60,098	337,188	0,523	0,532	0,926	0,957

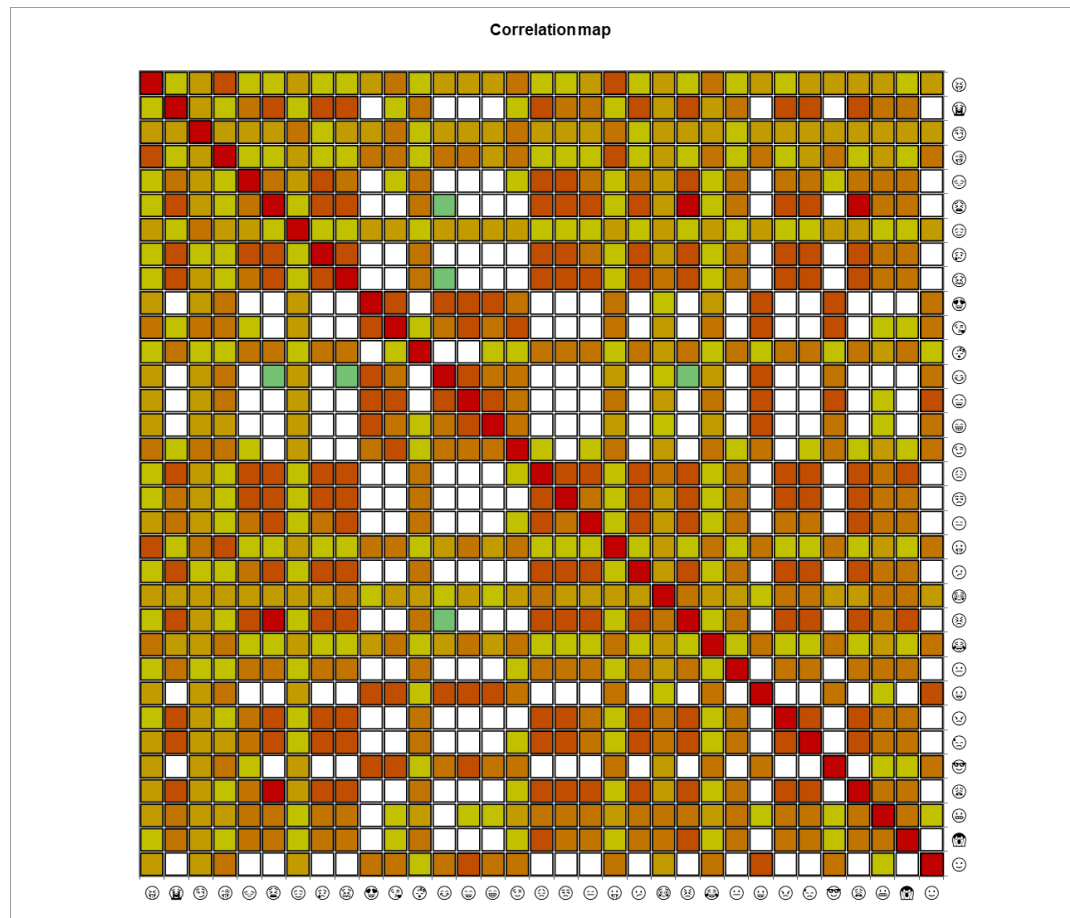


Fig.19: Covariance map from Reliability Analysis of the emoji-based measurement tool.

Table 22: Demographic data on gender, age, and level of education of participants per frequency of use of emoji (3-a lot, 2-a bit, 1-not at all) of the emoji-based measurement tool online testing case study.

frequency of use	3	2	1
gender	88.3% women	78.3% women	37.5% women
age	10% 61-70 5.9% 51-60 29.5% 41-50 15.7% 31-40 37.3% 21-30 9.8% 18-20	1.7% 61-70 16.7% 51-60 33.3% 41-50 23.3% 31-40 20% 21-30 5% 18-20	- 12.5% 51-60 62.5% 41-50 12.5% 31-40 - 12.5% 18-20
level of education	3.9% - PhD 23.5% - MA 35.3% - BA 9.8% - College 25.5% - Highschool	- 25% - MA 46.7% - BA 6.7% - College 21.7% - Highschool	- 12.5% - MA 50% - BA 12.5% - College 12.5% - Highschool

4.5.2 Emoji versus emotion word tool in CLT within food category: the case of olive oils

4.5.2.1 *Materials and Methods*

The original Greek word-based emotion measurement tool was also tested and compared with an emoji containing tool with five different samples of olive oils: kernel oil, green olive oil, protected designation of origin (PDO) extra virgin olive oil, extra virgin olive oil, refined olive oil. 101 participants aged 18-65 tasted the samples first under blind and then under informed conditions and answered a word-based questionnaire. They rated each sample on a 5pt hedonic scale and then rated the emotions on the list on 5pt scales. The list consisted of the 33 general food consumption emotions. 107 participants aged 18-65 tasted the samples first under blind and then under informed conditions and answered an emoji-based questionnaire. They checked the emoji that expressed emotions they were feeling after tasting the samples. The list consisted of the 33 emoji of the standardized tool described in chapter 4.5.1 of the present thesis.

4.5.2.2 *Results*

In the word-based part of the study, the samples were very close in liking, ranging between 4.5 – 4.9 (blind) and 4.1 – 4.9 (informed) with 3 samples almost identical in liking intensities. All samples were identified as statistically different. The statistically significant emotions were completely different under blind and informed conditions (Table 23). The PCA also discriminated the samples into two groups for both blind and informed conditions as follows:

group A: kernel oil, refined olive oil

group B: green olive oil, PDO extra virgin olive oil, extra virgin olive oil.

In the emoji-based part of the study, the PCA grouped the samples into three groups for both blind and informed conditions as follows:

group A: kernel oil, refined olive oil

group B: PDO extra virgin olive oil, extra virgin olive oil

group C: green olive oil.

4.5.2.3 Discussion

The emotion measurement tool was able to discriminate between hedonically similar samples of olive oils under both blind and informed conditions, as all samples were identified as statistically different. This agrees with literature stating that emotion measurement is necessary in sample discrimination providing extra information when liking alone fails to discriminate (see chapter 3.9). Emotions were able to discriminate even between samples grouped together by the PCA. The emoji-based tool showed better discrimination between the five samples, dividing them into three instead of two categories. The kernel and the refined olive oil samples were correctly grouped together and discriminated from others, since by definition they are of poorer quality than the other types.

4.5.3 Discussion

A comparison of the two measurement tools, the one containing Greek emotion words and the other containing emoji, has led to interesting findings. The PCAs performed did not provide the same groupings for the food categories and samples tested in the two studies, namely pizza, meat and potatoes, fried chicken, vanilla ice cream, chocolate, fruit, and kernel oil, green olive oil, PDO extra virgin olive oil, extra virgin olive oil, refined olive oil.

As regards emotions, only 13 out of 33 emoji were considered statistically significant and able to provide discrimination, while 23 out of 33 words were considered so. It is a considerable difference.

The two tools were quite similar as regards the number of positive and negative terms on their lists. The word-based tool consists of 17 positive, 15 words, and 1 neutral word, while the emoji list consists of 15 positive, 17 negative, and 1 neutral emoji.

As regards the emotional profile created by the two tools, the positive emoji used were almost identical in selection and intensity in all the tested food category profiles. This was not exactly true for the word-based tool that showed greater variety of emotions and intensities of selected positive emotions for the same food categories. The negative emoji exhibited greater variety, which was also true for the negative emotion words, as mentioned in relevant literature.

The emoji-based tool was able to discriminate better between olive oil samples after tasting. This could be due to the tool itself or the tasting conditions.

With regard to the emoji questionnaire participants, women aged 21-30 holders of a university degree reported that they use emoji frequently in their everyday communication, more frequently than other gender, age, and educational level groups.

It would be useful to shorten the emoji list without compromising the tool effectiveness. The number of emoji -33- is too much for the task, as reported by participants to the online emoji study. The first emoji to check would be the ones found to have high correlation.

Table 23: Emotions elicited by olive oil samples under blind and informed conditions.

blind	informed
cheerful	disappointed
cheerless	dissatisfied
disgusted	grateful
glad	happy
optimistic	healthy
privileged	pleasant
relieved	pleased
satisfied	unsatisfied
uninterested	whole
weak	

4.6 General conclusions

The choice between using a translated emotion measurement tool versus using a tool developed in Greek for the Greek consumer must be an informed one. Having readily available tools, translated from another language, can be quicker and more economical but, as already stated in the introduction and the discussion section, it is preferable to use emotion measurement tools containing emotion words in the language and cultural context in which they have been collected.

Culture- and language- specific tools are more time and money consuming but original, i.e., developed from scratch, culture- and language- specific tools provide more accurate results and are more participant friendly.

A relatively new type of emotion measurement tools is questionnaires with emoji instead of words that have been proposed as an alternative route, overcoming many obstacles as these have been mentioned in the introduction. However, they have shortcomings too and must be further tested and compared cross-culturally for various foods and groups of participants.

Further research, comparing emotional profiles of beverages, or focusing on foods with negative emotional profiles, could provide more insight into translated and universal emotion measurement tools. Another solution might be to find the position of each food category on a four-quadrant plot [for example, Russell's Circumplex Model of Affect (Russell, 1980)] and compare the foods as regards pleasantness (also known as valence) and arousal, the two components of emotion.

An extension of the latter solution would be to translate broad emotion categories or clusters of emotion words, corresponding to entire emotional spaces from the pleasantness – arousal plot, instead of individual emotions/emotion terms.

As regards the original Greek tool, the statistical analysis of the terms included highlighted some aspects of the emotions and inter-relations among them. These must be cross-checked in other food categories and see if in the next version of the tool some emotions should be eliminated as they covered by others.

PART TWO:

SENSORY ANALYSIS TERMINOLOGY

5 Sensory analysis vocabulary into Greek

5.1 The term “sensory” in English

In Table 24, the term *sensory* is presented with its definitions. The term appears to refer to that which is related to: 1) the five senses, 2) the ability of sensation, and 3) the ability to perceive stimuli through the senses.

5.2 How the term “sensory” is translated into Greek

In Table 25, various translations of the term *sensory* are given, as provided in parallel documents issued by the European Union in English and in Greek (the term is used in domains such as health/ medicine, information technology, chemistry, agriculture, and education), in European Union Law, in the European Union glossary, and an English-Greek dictionary of translations (Glosbe). Collocations of the equivalent terms are also provided as found in examples in two major Greek dictionaries.

5.3 Grouping the translational equivalents of the term “sensory”

Four groupings of the Greek equivalents of the term *sensory* as shown in the first column of Table 25 seem to emerge. There are however “gray” collocations, that belong to two groups. These are the cases where term *sensory* can be translated into Greek by two different terms. The collocations that belong to group 1 are clear cases and refer to food attributes perceived through the senses and translated by *οργανοληπτικός*. The same goes to the terms that belong to group 4, that refer to sensory organs, and are translated by the term *αισθητικός*. The term *sensory* in the collocations of group 3 can be translated by the Greek equivalent for groups 2 and 4, that is, instead of *αισθητήριο*, it can be translated as *αισθητηριακός* or *αισθητικός*. The conclusion drawn from Table 2 is that the term *αισθητηριακός* is mostly used as the translational equivalent of *sensory* for all collocational cases except those of groups 1 and 4.

5.4 Definitions of the Greek translational equivalents of the term “sensory”

The definitions of the Greek translational equivalents of the term *sensory* as provided in Greek dictionaries are given in Table 26, in order to compare their meanings to the meanings of the original English term. The sources used are two renowned dictionaries of modern Greek: the Dictionary of Modern Greek (DMG) and the Dictionary of Standard Modern Greek (DSMG).

These definitions explain the groupings made in Table 25. The term *οργανοληπτικός* that appears in group 1 of collocations is a technical term that refers to the organoleptic perception of food attributes through the senses and can be easily distinguished from the rest of the terms. The term *αισθητήριος* of group 3 is characterized in one of the dictionaries as archaic and so it is semantically covered by the terms *αισθητηριακός* and *αισθητικός* of the groups 2 and 4.

5.5 Final proposal for the translation of the term “sensory linguistics” and the key terms/ notions of the field into Greek for validation and standardization

Following the two possible etymologies of the English term that appear in Table 24, if the word *sensory* comes from the noun “sense” then the Greek term could be formed from the noun “αίσθηση” and be *αισθητικός*. Thus, *sensory linguistics* would be *αισθητική γλωσσολογία*. But as one can conclude from the collocations offered for the term “sensory” in Table 25 and from the definitions and the examples of the word *αισθητικός* in Greek dictionaries as shown in Table 26, the term *αισθητικός* cannot cover the same semantic and pragmatic instances as the English term. So, such a proposal would be incorrect.

142

If the term *sensory* derives from the noun “sensor” according to the second etymology provided in Table 24, then the Greek term could be formed from the noun *αισθητήρ(ας)* and be either *αισθητήριος* or *αισθητηριακός*. The term *αισθητήριος* is archaic and is less used than the term *αισθητηριακός*, as explained in the two Greek dictionaries in Table 26, and the translational equivalents of the term *sensory* in Table 25. Therefore, the term *sensory* in the field of sensory linguistics should be translated as *αισθητηριακός*.

Table 24: Definitions of the term “sensory” in English dictionaries.

connected with the physical senses of touch, smell, taste, hearing, and sight
<https://dictionary.cambridge.org/dictionary/english/sensory>

1. of or relating to the senses or the power of sensation
2. of or relating to those processes and structures within an organism that receive stimuli from the environment and convey them to the brain

Word origin: from Latin sensōrius, from sentīre to feel

<https://www.collinsdictionary.com/dictionary/english/sensory> (from Collins English Dictionary. Copyright © HarperCollins Publishers)

1. of the senses or sensation
2. connected with the reception and transmission of sense impressions

Also sen'sorial ('sen 'sɔriəl)

Word origin: sense + -ory

<https://www.collinsdictionary.com/dictionary/english/sensory> (from Webster's New World College Dictionary, 4th Edition. Copyright © 2010 by Houghton Mifflin Harcourt)

Table 25: Translational equivalents of the term “sensory”.

Sources:							
European Union (EU) sources: https://iate.europa.eu/home ,							
https://eur-lex.europa.eu/homepage.html							
Glosbe: https://glosbe.com/							
Dictionary of Modern Greek (DMG) (Babinotis, 2002)							
Dictionary of Standard Modern Greek (DSMG)							
https://www.greek-language.gr/greekLang/modern_greek/tools/lexica/triantafyllides/index.html							
gro up	2 nd word in collocation	1.	2.	3.	4.		
1	ανάλυση	οργανοληπτικός	αισθητηριακός	αισθητήριος	αισθητικός	EU	

1	χαρακτηριστικά		EU		
1	εξέταση		EU		
1	δοκιμασία		EU		
1	αξιολόγηση		EU		
1	εκτίμηση		EU		
1	έλεγχος		EU		
1,2	προφίλ	EU	EU		
1,2	ιδιότητα	DSMG	EU		
2	διαφορά		EU		
2	λειτουργία		EU, Glosbe		
2	παρατηρητής		EU		
2	ευαισθησία		EU		
2	μνήμη		EU		
2	όρος		EU		
2	έλλειμμα		EU		
2	ανταπόκριση		EU		
2	κόπωση		EU		
2	εντύπωση		EU, DSMG		
2	ικανότητα		Glosbe		
2	καταγραφή		Glosbe		
2	ερέθισμα		DMG, DSMG		
2	διέγερση		DSMG		
2	εμπειρία		DSMG		
2	δεδομένα		DSMG		
2,3	αντίληψη		EU, Glosbe	Glosbe	
2,3	αναπηρία		EU	EU	
2,3	δραστηριότητα		Glosbe	Glosbe	
3	απώλεια			EU	
3,4	όργανο			EU, DSMG	Glosbe

3,4	νεύρο			DSMG	DSMG
4	κύτταρο				DSMG
4	κέντρο				DSMG
4	σύστημα				EU, Glosbe
4	διαταραχή				EU
4	δεξιότητα				EU

Table 26: Definitions of the Greek translational equivalents of the term “sensory”.

		DMG	DSMG
1	οργανοληπτικός	(XHM) (για τις ιδιότητες των τροφίμων) αυτός που γίνεται αντιληπτός από τα αισθητήρια όργανα (π.χ. οργανοληπτικά χαρακτηριστικά των τροφίμων είναι το χρώμα, η οσμή, η γεύση και η υφή)	-
2	αισθητηριακός	αυτός που σχετίζεται με τα αισθητήρια όργανα (πχ αισθητηριακό ερέθισμα)	που γίνεται ή γενικά σχετίζεται με τα αισθητήρια όργανα
3	αισθητήριος	(αρχ.) αυτός που σχετίζεται με τις αισθήσεις	που έχει σχέση με τις αισθήσεις
4	αισθητικός	1. αυτός που σχετίζεται με τις αισθήσεις και την αντίληψη διά μέσου αυτών	που έχει σχέση με τις αισθήσεις. α. (φυσιολ.) αισθητήριος: Αισθητικές ίνες. Οι αισθητικές θηλές της γλώσσας / ρίζες του νωτιαίου μυελού. Αισθητικό νεύρο / κέντρο. Αισθητικά κύτταρα. β. (σπάν.) που αισθάνεται: Αισθητικά όντα. γ. που προέρχεται από τις αισθήσεις: Αισθητική παράσταση. Οι γνώσεις του ανθρώπου είναι νοητικές ή αισθητικές.

6 Translating the ISO 5492:2009 for sensory analysis vocabulary into Greek

The International Organization for Standardization, aka ISO, is an independent, non-governmental international organization with a membership of 167 national standards bodies. It was founded in 1947 and initially consisted of 67 technical committees, i.e., groups of experts focusing on a specific subject (*International Organization for Standardization*, n.d.).

6.1 Distinction between general and technical language

Technical language or language for specific purposes is the language used by experts in a certain field professional or scientific. Special languages are individual systems based on - and produced by - the general language. There is no absolute threshold between general and special language. The threshold between general and special language can only be defined by pragmatic criteria produced by usage (*Πύλη Ελληνικής Γλώσσας- Λεξικό Γλωσσολογίας*, n.d.). The most important characteristic of technical language is the terminology of the field (Βαλεοντής & Κριμπάς, 2014). Some differentiate even further between technical and professional communication, by defining technical communication as targeting a broader or non-specialist audience, while professional communication is more specific to a certain profession or internal to an organization or a field (Allen, n.d.). The sensory analysis vocabulary is an example of technical language comprising a subgroup of general language and used in professional and technical communication instances.

As a communication event, translation is affected by a variety of textual and extratextual factors, such as the transmitter of the message, its receiver, the message itself, and the aim of the source and the target texts (Λουπάκη, 2005). When translating, one should take into consideration all aspects of language, e.g., register, stylistic characteristics, and the end user. For the translation of sensory vocabulary, one should consider that the register can vary from formal register for professional communication instances between experts, to semi-formal register for technical communication instances that involve communicating complex information to a non-specialized audience, to casual register for communication between consumers or sensory analysis panel members of various educational levels. Thus, the terms in Greek should be able

to cater for both scientists' and laypeople's communication needs since these terms are used in food characterization during sensory profiling and sensory analysis processes.

For example, the word **sourness** was translated as *ζινότητα* which is a new word, a neologism, and the word *ζινάδα* was provided as a more casual equivalent, which is a known general vocabulary word. Another example is the word **brittle** which was decided to be translated as *εύθραυστος (που θραύεται στο δάγκωμα)*, combining in way a higher register word with a simple explanation. The word *ψαθυρός* which is another Greek equivalent for **brittle** was not opted for, as it is not recorder in all Modern Greek dictionaries, and it is labeled as “archaic” in those where it is recorded.

6.2 The process of translating the sensory analysis vocabulary into Greek

The ISO 5492:2009 for sensory analysis contains English, French, German, Russian, and Spanish equivalents for the terms defined. A committee was formed for the task consisting of two members of the Laboratory of Consumer and Sensory Perception of Foods and Beverages, Department of Food Science and Nutrition, University of the Aegean (LCSP) (a linguist and a food scientist -the author and supervisor of the present thesis), and two members of the Hellenic Society for Terminology (known as ELETO in Greek) (the president and the secretary general -both experienced terminologists).

The LCSP and the ELETO groups worked independently to translate the terms into Greek, using available resources such as online translation tools and databases, parallel texts in English and in Greek, documents translated by the European Union services, Greek and English bilingual and monolingual dictionaries, Greek grammar textbooks, scientific articles, doctoral theses etc. The committee met on a biweekly basis with the ELETO general scientific board members, who are distinguished linguists, terminologists, and translators. The proposed Greek equivalents were discussed, and consensus had to be reached through exchange of opinions, and presentation of supporting evidence, otherwise the opinion of the majority was preferred. Problems that arose regarding term translation techniques were also discussed with members of the TermNet terminology coaching group, which consists of internationally accredited terminologists and translators.

The committee worked applying the following techniques and with the following principles in mind (ISO 704:2000, ELOT 402, Orogramma 102, Orogramma 103). In

chapters 6.2.1 and 6.2.2 of the present thesis, these techniques and principles are presented.

6.2.1 Translation techniques based on ISO 704:2000 and ELOT 402 Greek standard for term formation

Formation of new terms: New words, also known as neologisms, can be formed following the principles of derivation, compoundness, or abbreviation, thus creating single-word simple terms, single- or multi-word compound forms, or acronyms and short forms respectively.

Use of existing terms: Terms can be formed by transforming an existing form (e.g., adjective to noun), by using a general vocabulary word as a term, by borrowing terms from other scientific fields, or by using semasiological metaphor and synecdoche.

Cross-linguistic loans: Terms can be formed by borrowing foreign terms and transliterating or translating them.

6.2.2 Principles based on ELOT 402 Greek standard for term formation

Transparency: The morphology of the term must give out the concept to some degree without the need for a definition.

Consistency: The terms of a field are part of a system, and every term must fit in the system morphologically, stylistically, etc.

Appropriateness: The terms must be formed in such a way as to follow familiar and established semasiological forms for the specific field and its professional community.

Linguistic economy: The terms must be as concise as possible, e.g., prefer single-word formations.

Derivability: The terms must have a form that can easily provide derivatives.

Compoundability: The terms must have a form that can easily provide derivatives.

Linguistic correctness: Term formation must comply with morphological, morphosyntactic, and phonological standards of the specific language.

Preference for native language: The native language of work must be preferred instead of transliterating foreign terms.

6.3 Issues that arose during the process of translating sensory analysis terminology into Greek and how they were resolved

While translating the sensory analysis terminology into Greek certain issues arose dealing with new term formation and translation techniques applied. Examples of such terms and the decisions made are provided below:

6.3.1 Putting part of the term in parentheses to differentiate similar concepts

The term **attribute** denotes a key concept in sensory analysis and appeared in many definitions. The word is usually translated in general language as *χαρακτηριστικό* (feature, characteristic). The problem is that in sensory analysis it denotes features specifically as they are perceived through the senses and the term may appear in the same sentence with the words features or characteristics. Thus, the decision was made to be translated as *(αντιληπτό) χαρακτηριστικό* (perceptible characteristic), by making use of the definition, and putting the word *perceptible* in parenthesis in case we need to differentiate between attributes, features, and characteristics of a product.

For the adjectives **crunchy** and **crispy**, that express degrees of fracturability, the same adjective was used with the addition of extra description in parenthesis in case they need to be distinguished one from the other: **crunchy** = *τραγανός (κατά τη μάσηση)*, **crispy** = *τραγανός (στο δάγκωμα)*.

6.3.2 Forming new terms in analogy to existing ones

The term **duo-trio test** was translated as *δοκιμή «δύο-από-τρία»*, even though it has been used in Greek literature as *δοκιμή duo-trio*. Using the Greek language was considered a better choice and the new term was formed using the definition and in analogy to the translation of another test, the **two-out-of-five test** = *δοκιμή «δύο-από-πέντε»*.

For a lot of terms, the translation principle of consistency was applied, following the principles of appropriateness, and linguistic correctness. The Greek nouns were formed in analogy to existing terms, applying the single-word term preference rule, and using the Greek adjective as the root to which the suffix for nouns *-ότητα* was added: **sourness** = *ξινότητα*, **bitterness** = *πικρότητα*, **saltiness** = *αλμυρότητα*, **astringency** = *στυφότητα*, **pungency** = *πικαντικότητα*, **fracturability** = *θραυστότητα*, **adhesiveness** = *προσφυσικότητα*, **granularity** = *κοκκιότητα*.

For the word **palatability** two translational options were available from the general language vocabulary *νοστιμάδα*, and *γευστικότητα*. But neither belongs stylistically to the same register as palatability. As a result, the new term *ευγευστότητα* was formed.

Having to translate English terms formed with the use of Greek words was an easy case. Even though the new terms were neologisms, words unknown to the users, they are transparent due to their Greek origin. For example: **somesthesis** = *σωματαιοσθησία, σωματαίοσθηση*, **kinesthesis** = *κιναιοσθησία, κιναίοσθηση*, **psychophysics** = *ψυχοφυσική*.

These terms were translated into Greek in analogy to the English terms. More specifically, the Greek term for **somesthesis** was formed using the root of the genitive case of the first part of the compound (*του σώματ-ος*), while the Greek term for **kinesthesis** was formed in analogy through transliteration of the first part of the compound as it is known to native speakers of Greek that it denotes *kinesis* (motion). The term is transparent in Greek.

Another interesting case was the term **halo effect**, which had been translated as *φαινόμενο του φωτοστέφανου*. This is a mistranslation because the phenomenon has no connection to the Greek object «φωτοστέφανο», but it denotes ‘a special case of context effect where the favorable or unfavorable evaluation of a stimulus on one attribute tends to induce favorable or unfavorable evaluation of other attributes of the same stimulus considered at the same time’. So, the term was translated as *φαινόμενο της άλω* which describes the phenomenon in a more transparent way, using the same word that originated the English term. Even though the Greek word ‘η άλως’ is formal and literary and its declension follows ancient and not modern Greek rules, it was the most suitable in terms of etymology and ability to illustrate the phenomenon.

Other terms that were translated in analogy to the English ones are: **mouthfeel** = *στοματαίοσθημα*, **afterfeel** = *μεταίοσθημα*.

6.3.3 Using existing forms and attaching a new meaning

The adjective **crusty**, meaning a food product with a hard and easily fractured crust, like French-like bread, was translated as *κρουστός*, by using an existing Greek form with a new meaning. The adjective *κρουστός* in general language is used to denote 1) a musical instrument played by strike and 2) a type of fabric with dense texture or very tightly knit.

6.3.4 Using the definition in the term

The adjectives provided in ISO 5492:2008 as examples of degree for adhesiveness and granularity were translated in Greek by providing quality degrees. There are not so many different synonyms in Greek to express these qualities. For example: **tacky** = ελαφρώς κολλώδης, **clinging** = μετρίως κολλώδης, **goeey** and **gluey** = πολύ κολλώδης, **sticky** and **adhesive** = εξαιρετικά κολλώδης.

Grading is an assessment method, consisting of various sub-methods such as **ranking**, **rating**, and **scoring**. In general language all three could be translated as *βαθμολόγηση*, *βαθμολογία* (assigning a number that has a specific value). In sensory analysis though these terms refer to different assessment methods and the distinction should be clear. Thus, the definitions had to be used and the same word with a specification was used for **grading** and **rating**: **scoring** = *βαθμολόγηση*, **grading** = *διαβάθμιση*, **rating** = *διαβάθμιση σε κλίμακα*.

The word **hedonic** is a general vocabulary Greek word that means ‘pertaining to pleasure’ (*Hedonic - English-Greek Dictionary WordReference.Com*, n.d.). In the field of sensory analysis, the word means ‘retaining to degrees of like or dislike’, not liking only. The two terms, “hedonic” in English and “ηδονικός” in Greek, are what is called false friends in linguistics, meaning words in two different languages that have a close phonological form and are often interlingual loans (Chatzidaki et al., 2005). They usually share a common etymological root or the one originates from the other but do not share the same meaning(s). As a result, the word “hedonic” should not be translated using the respective Greek word, because then the term would lead the Greek speaker to a misunderstanding. The term had to be translated as *αρέσκειας* (of liking), in the genitive case, and in collocations it is translated as follows:

hedonic liking = *αρέσκεια*

hedonic (liking) scales = *κλίμακες μέτρησης αρέσκειας*

hedonic rating / judgement = *βαθμολόγηση / κρίση αρέσκειας*

hedonic questionnaire / test = *ερωτηματολόγιο / δοκιμή αρέσκειας*

hedonic term = *όρος αρέσκειας π.χ. ευχάριστος, δυσάρεστος*

hedonic criteria = *κριτήρια αρέσκειας*

Three terms (two word-forms) **odour** and **aroma**^{1,2} were translated into *οσμής*^{1,2} and *άρωμα* respectively, taking into consideration the defined concepts more than the word-forms: **odour** = *οσμής*¹, **aroma**¹ = *οσμής*², **aroma**² = *άρωμα*.

6.3.5 Transliterating English terms into Greek

However, for the term **umami** the transliteration technique was applied instead of forming a new term (= *ουμάμι*), as the original term is being used as it is for years now in various languages. The transliteration technique was opted for in other cases as well since Greek speakers are familiar with the transliterated forms of the words. Examples of such words follow: **marshmallow** = *μαρσμέλλοου*, **profile** = *προφίλ*.

6.3.6 Various other cases of neologism formation

The term **flavour** was difficult to render into Greek as it denotes the complex combination of the olfactory, gustatory, and trigeminal sensations perceived during tasting. It was difficult to form a transparent and simple enough term in Greek. Finally, the neologism *οσμόγευση* was formed using the Greek words for odour and taste compounded.

For the word **taint**, meaning taste or odor foreign to the product originating from external contamination, a new term had to be found, too. The word *μόλυσμα* was proposed, from the word *μολύνω* (to contaminate) and the suffix *-σμα*, a common noun-forming suffix.

The word **moisture**^{1,2} with its two different meanings in English was translated using two different Greek terms, one of which was a new form. This was done for a clearer distinction between the two since the Greek language could offer a new noun form.

moisture¹ = *υγρασία* (perception of moisture content of a food by the tactile receptors in the mouth and also in relation to the lubricating)

moisture² = *υγρότητα* (surface textural attribute that describes the perception of water absorbed by or released from a product) (neologism)

Off- in *off-flavor*, *off-odor*, *off-note* was translated as *αποκλίνων/-ουσα/-ον* (=that deviates from normal or expected). Thus, the definition was used to denote atypical flavor, odor, and note respectively.

6.4 Conclusion

During the process of translating sensory vocabulary from English into Greek, issues and concerns arose but the techniques and principles provided as translation and term formation tools by ISO and ELOT standards were extremely useful. They provided the framework and a safe ground for the task.

As regards the techniques used for term translation and formation, preference for the native language, in this case Greek, was the first one to apply as this was the main aim of the task. Linguistic correctness, appropriateness for the scientific field under study, linguistic economy, and morphological/stylistic consistency were also applied in every case of term translation or new term formation. Transparency of the terms was a priority. Derivability and compoundability were taken into consideration, too.

The use of existing Greek forms for the translation of English terms, especially in the case of adjectives describing food product attributes, was preferred. These adjectives are part of the general vocabulary in the source language, used by consumers and experiment participants. Cross-linguistic loans using transliteration were used in some cases when there was no Greek word, and the English term was used internationally.

However, the most interesting and significant product of this translation process is the formation of new terms, the production of neologisms in Greek. This was done for noun forms denoting concepts and qualities of food products. The same techniques and principles were applied, resulting in noun forms that are semantically transparent to the native speaker of Greek, apply grammatical rules of Greek with regard to word formation, are mostly single-word terms, and are smoothly embodied into the Greek vocabulary.

7 Conclusion

7.1 Research aims

The broad aim of this research was to identify the emotions elicited in Greek consumers by food and beverages consumption. The specific objectives formed to this end were:

- a) to do a systematic review of existing emotion lexicon development methods and measurement tools,
- b) to check whether translational adaptations of existing tools are the optimal route in emotion measurement,
- c) to develop an original Greek emotion lexicon and test it,
- d) to provide the language needed by Greek professionals of the sensory field to communicate effectively with each other and with consumers in their native language.

7.2 Research findings

7.2.1 Findings from the systematic review of existing emotion lexicon development methods and emotion measurement tools.

When compiling emotion lexicons, it is important to take both culture and language into consideration and to bear in mind that an emotion lexicon developed in one country for a specific product type is not necessarily suitable for another country or for a different product. On the other hand, the need to have quick, easy, inexpensive, universal instruments within the global market and international companies' landscape is evident and rational. Words that appear the most frequently in emotion lexicons are: *satisfied, bored, secure, happy, guilty*. They could be used as a starting point in creating universal emotion measurement tools.

The most important participant in the emotion lexicon development process is consumers. Personal and cultural conceptualizations, associations, expectations, habits, and past experiences with foods form consumers' emotions and preferences.

New linguistic sources available thanks to technology, such as the Web, Information Technology tools, and social media, are being exploited for term collection and for qualitative analysis of food-elicited emotions.

In emotion measurement, especially of alcoholic beverages and comfort foods, a measurement of the participants' mood before or during the entire tasting process

should be taken to trace the emotional alterations and gain better insight since consumption of these types of food are specifically targeted at altering our emotional state.

In emotion measurement, opting for a response format should be done according to the task at hand. To discriminate between quite different food categories, one can choose CATA with the option to add terms that are not on the list. To discriminate products within the same food category, rating scales would be the format to choose. The modified RATA with a scale of 0-5 (0 not feeling the emotion at all) is a good alternative if keeping the task quick and easy is an important factor.

7.2.2 Findings from translating an emotion measurement tool and using it with Greek consumers

The emotion measurement tool translated from English into Greek when used with Greek consumers showed discrimination between food categories, which means that in effect it can be used. However, consumers reported that the emotions included in the tool were not food appropriate in their opinion and they felt the need to add quite a few extra terms. The halo dumping effect (see chapter 3.1) is probably the reason the tool was effective in discriminating the foods but was not appropriate to identify the emotions experienced by the participants. This is the reason an original Greek emotion lexicon an emotions measurement tool had to be developed.

7.2.3 Findings from developing an original Greek emotion lexicon and testing it with consumers.

Based on the statistical analyses performed, the new tool can discriminate between samples of the same and different food categories, with a high percentage of emotions on the list being statistically significant (70%). Cronbach's alpha is very close to 1, which means that most emotions on the list are well established. *Uninterested* was the only emotion that negatively correlated to others. This is understandable because if one is not interested in something, they have neither positive nor negative emotions towards it. However, this emotion should not be considered redundant because it provides differentiation between food samples, according to the validation studies. The strong correlations between *glad, joyful, happy, pleased, satisfied, pleasant* should be checked further to see if some of them could be excluded from the tool.

Some of the words on the emotion list, such as *healthy, sensual, and good-looking*, are not emotions in the strict sense of the term. However, these words appeared very

frequently in all consumer-defined sources, namely the Web, Instagram, questionnaires, to collocate as feelings/sensations with food consumption. These words also appear frequently in advertisements of products in general, and food products specifically, and are a key driver of purchase.

The emotion list compiled can be used in CATA and rating scales questionnaires to measure food-elicited emotions and create emotional profiles of foods and beverages, for Greek consumer studies, as presented in the final stage of validation. To create the emotional profile of a food/ beverage, or to distinguish between very different food products, the CATA format can be applied. However, if the aim is to distinguish between samples of the same food category, then rating scales would be a better choice (Panagiotou & Gkatzionis, 2022).

When studying beverages and sweets one should pay attention to the pre-consumption emotional state of the consumer as well. These food-specific terms are added to the final general list of 33 terms of the developed tool according to the food category under study. Extra terms added by participants at the stage of validation did not appear more than the terms already on the list, which again validates the emotion lexicon list developed. The usage of linguistic and language sources as a starting point has the advantage of containing a variety of terms, which the consumers might not be able to remember while performing a free-listing task. This is especially useful when compiling a general, not a food-specific, emotion lexicon from scratch, without the use of specific foods as stimuli. However, some words on the list may not be known or clear to the consumers. Making use of other sources and data from consumers are necessary to depict real and synchronous usage of language.

Using Online Social Media as a linguistic source has the advantage of combining words (text and hashtags) with images (pictures and emoji), and it is a medium of spontaneous communication and expression. One should not forget though that the aim of this type of communication is usually the attraction of likes, so the message can be exaggerated, and idealized. The “hedonic asymmetry” hypothesis was also confirmed for the Greek language during the various case studies performed. It was also detected that negative emotions exhibit greater diversity, as has already been noted in literature for emoji meanings (Jaeger, Roigard, et al., 2018). The positive emotions that came up in the Web search were less diverse but appeared more. Some emotions come up in almost every

emotional profile of food. The positive emotions outnumber the negative ones on the emotion lexicon developed. This means that people are usually in a positive state of emotions when consuming food described by the adjectives: pleased, satisfied, glad, cheerful, relaxed, happy, calm, whole, pleasant, unrestrained, grateful, healthy, privileged, relieved, good-looking, optimistic, energetic, sensual.

The Greek emotion measurement tool developed as presented here is the first such tool specifically developed for the Greek language and the Greek consumer. Further research is needed to check it with more food/beverage categories. The emotion list compiled could also be tested in other scientific fields related to food, such as psychology and marketing studies.

7.2.4 Findings from comparing the new Greek tool with the translated emotion measurement tool.

The terms are not regarded as having the same positive or negative load by English-speaking and Greek-speaking populations. For the Greek tool, the terms got more meaningful groupings: 14 terms were classified as negative, one as neutral, and 18 as positive.

Only 13 emotions were present in both emotion measurement tools. This is a key point. The fact that only 3 out of the 13 common terms got a higher intensity rating using the Greek tool, supports this idea and can be taken as proof that participants, when presented with less fitting choices, “dump” their emotional load onto the existing terms. Participants using the Greek tool did not have this problem.

The statistical groupings made by the translated EP, are not reasonable. Ice cream was grouped with fruit, chocolate on its own, and fried chicken with meat and potatoes and pizza. On the contrary, using the Greek tool, fruit and pizza were two separate categories, meat with potatoes and fried chicken were grouped together, and chocolate together with ice cream. This categorization is more reasonable because meat-containing foods were grouped together, sweets together, fruit and fast food on their own.

While and after running the translated EP, comments were made by the participants that the list contained emotions that were not relevant to food consumption, or terms that

were not frequently used by native speakers of Greek. Participants also felt the need to add various terms to the list in the space provided in each questionnaire.

7.2.5 Findings from comparing the new Greek emotion measurement tool with an emoji measurement tool.

A comparison of the two measurement tools, the one containing Greek emotion words and the other containing emoji, has led to interesting findings. The PCAs performed did not provide the same groupings for the six food categories, namely pizza, meat and potatoes, fried chicken, vanilla ice cream, chocolate, fruit.

As regards emotions, only 13 out of 33 emoji were considered statistically important and able to provide differentiation, while 23 out of 33 words were considered so. It is a considerable difference.

The two tools were quite similar as regards the number of positive and negative terms on their lists. The word-based tool consists of 17 positive, 15 words, and 1 neutral word, while the emoji list consists of 15 positive, 17 negative, and 1 neutral emoji.

Regarding the emotional profile created by the two tools, the positive emoji used were almost identical in selection and intensity in all the tested food category profiles. This was not exactly true for the word-based tool that showed greater variety in terms of emotions and intensities of selected positive emotions for the same food categories. The negative emoji exhibited greater variety, which was true for the negative emotion words as well and agrees with relevant literature.

The emoji-based tool was able to discriminate better between olive oil samples after tasting. This could be due to the tool itself or the tasting conditions. This remains to be further tested.

With regard to the emoji questionnaire participants, women aged 21-30 holders of a university degree reported that they use emoji frequently in their everyday communication, more frequently than other gender, age, and educational level groups.

7.2.6 Findings from translating sensory analysis terminology into Greek.

During the translation process, emphasis was given on using Greek words, and on forming neologisms when necessary, avoiding the use of English terms as they are or transliterating them. A lot of terms in the sensory analysis vocabulary are formed from

words of Greek origin, which makes them easy to transliterate into Greek and transparent to the Greek user.

7.3 Limitations

Limitations of the present research are related to the development of the Greek food-related emotion lexicon and measurement tool. The new lexicon was tested with a variety of acceptable foods by Greek consumers. It was also tested with one case of novel food, propolis containing orangeade, and that without actual tasting. It would be interesting to have more data on novel foods, foods not traditionally consumed by Greeks, under informed versus blind conditions.

7.4 Conclusions and Future perspectives

When compiling emotion lexicons, it is important to take both culture and language into consideration and to bear in mind that an emotion lexicon developed in one country for a specific product type is not necessarily suitable for another country or for a different product. Emotion lexicons should be developed using linguistic and cultural data from the frame in which they are going to be exploited.

Apart from using existing lists of emotions, researchers should obtain feedback from consumers. In this way, the data will be up to date, representing the synchronic use of language, the current trends in lifestyle and food-related choices. Only then can the results be used in food production and marketing. This in turn means that emotion lexicons should regularly be tested and updated.

The Web and Instagram (and other Online Social Media platforms, such as Tweeter), are a new trend in linguistic research and consumer studies. Because of the magnitude of the contained data and the fact that the content is constantly changing and there is no repeatability of results, even in the next second, one should be careful when mining data. If the search is done in a systematic way, and there have been set specific criteria as to what will be included, then there is no reason research should not benefit from the wealth of linguistic content of the Web and OSM platforms.

The emotional profile of food products created by consumers can, as mentioned, be implemented in packaging and marketing, as it provides the right words that will make the consumer purchase the product. The extra step would be to create the emotional

profile of local products and local cuisines, so that shops, restaurants, hotels, and travel agents can promote the experience using the right words.

Using the right words, in this case the emotions that consumers should expect to experience when consuming a food product, works as performing tests under informed conditions. Under such conditions participants are previously informed about say the nutritional content or the expected health benefits of a food sample etc. This knowledge affects the emotions of the consumers and their acceptability of the sample. However, researchers should be aware of the fact that creating high expectations to participants may be risky as these expectations may not be met and may result in decreased satisfaction.

The emotion lexicon developed in Greek is the first of its kind for use in emotion measurement of food-elicited emotions. Future research could focus on shortening the developed emotion lexicon. As presented in statistical analysis results of its validation process, there are some emotions that seem to correlate highly. These are candidates for elimination. More case studies and statistical tests can make the tool more concise. The emotion lexicon could also be specifically adapted for children to cover consumer studies needs in that domain.

The use of emoji-based questionnaires is a good alternative, which can be used with users of various ages and educational levels, especially children, who do not have an extensive vocabulary yet. Further research is needed to shorten the list of emoji of the popular measurement tool presented in this thesis, as 33 emoji can be confusing and tiring especially when assessing multiple samples.

As an extension and combination of the two methods, an interface between the word-based and the emoji-based lists for the Greek consumer could be created. This would help to study food-elicited emotions thoroughly create emotional spaces, and identify emotion words and emoji within them.

Studying food-elicited emotions is more important than ever now that people are becoming more and more conscious of what they purchase and what they consume. They are mindful eaters, have high expectations, and health and wellness are a big issue. Functionality of foods and meals is a key concept as well. Emotional response to foods with participants having health issues such as obesity, diabetes, anorexia nervosa etc.

could be studied. Emotion measurement in such cases could provide data to be used in functional food products and supplements production.

Finally, with regard to sensory analysis terminology, the terms in Greek, especially the neologisms, should be taught in relevant University courses, and in sensory analysis studies. Time will show how the new Greek terms are received and incorporated into professional and technical communication. On the other hand, a sensory analysis glossary and hierarchy of terms should be created in Greek from scratch, providing examples from the Greek food market and cuisine. Input from Greek consumers could be useful to this end.

Taking all aspects of sensory analysis and consumer studies into consideration, it is safe to say that linguists and lexicographers have a lot to offer in the fields. They can provide the theoretical and practical expertise to be applied in the development of measurement tools, identification of linguistic and cultural patterns related to food consumption, and the implementation of these findings in marketing.

Appendix A: Research - Questionnaire samples

I. EsSense Profile translated into Greek tested

Πόσο συχνά καταναλώνετε πίτσα; *

	ποτέ	σπάνια	περιστασιακά	αρκετά συχνά
συχνότητα:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Πώς αισθάνεστε όταν καταναλώνετε πίτσα; *

απαιτείται μια απάντηση για κάθε όρο της αριστερής στήλης

	καθόλου	λίγο	αρκετά	πολύ	πάρα πολύ
αηδιασμένος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ανήσυχος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ανυπόμονος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ασυγκράτητος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ασφαλής	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ανιαρός (βαρετός)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
βαριεστημένος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
γαλήνιος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
δραστήριος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ελεύθερος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ενδιαφερόμενος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

II. Greek 119 emotions in 3 groups for term food-relatedness identification

Συναισθήματα που μπορεί να προκαλέσει η κατανάλωση τροφίμων



Σκεφτείτε πώς νιώθετε όταν καταναλώνετε ένα αγαπημένο σας τρόφιμο (ποτό, σνακ, επιδόρπιο, γεύμα) και ένα τρόφιμο που σας είναι δυσάρεστο.

Επιλέξτε όσες λέξεις εκφράζουν τα συναισθήματα σας για το αγαπημένο και το μη αρεστό σας τρόφιμο.

Ακολουθούν 3 ομάδες λέξεων (Α, Β, Γ) με τυχαία σειρά. Επιλέξτε λέξεις ΜΟΝΟ από την ομάδα που εμφανίζεται ΠΡΩΤΗ στη σειρά. Αγνοήστε τις ομάδες που εμφανίζονται δεύτερη κι τρίτη στη σειρά και αφήστε τις χωρίς απάντηση.

Ομάδα Α

- | | |
|---|---|
| <input type="checkbox"/> εξωστρεφής | <input type="checkbox"/> αξιοπρεπής |
| <input type="checkbox"/> γοητευτικός | <input type="checkbox"/> αισιόδοξος |
| <input type="checkbox"/> αξιαγάπητος | <input type="checkbox"/> ανήθικος |
| <input type="checkbox"/> ελκυστικός | <input type="checkbox"/> αντικοινωνικός |
| <input type="checkbox"/> αδιάφορος | <input type="checkbox"/> άκεφος |
| <input type="checkbox"/> αγαπητός | <input type="checkbox"/> απρεπής |
| <input type="checkbox"/> έντιμος | <input type="checkbox"/> αγνός |
| <input type="checkbox"/> ανιδιοτελής | <input type="checkbox"/> αβώος |
| <input type="checkbox"/> ακατάδεχτος | <input type="checkbox"/> αξιοζήλευτος |
| <input type="checkbox"/> ευγενικός | <input type="checkbox"/> ανικανοποίητος |
| <input type="checkbox"/> άκακος | <input type="checkbox"/> αξιολύπητος |
| <input type="checkbox"/> γενναιόδωρος | <input type="checkbox"/> ανήσυχος |
| <input type="checkbox"/> ερωτικός | <input type="checkbox"/> εκτιμημένος |
| <input type="checkbox"/> απαισιόδοξος | <input type="checkbox"/> αποθαρρυσμένος |
| <input type="checkbox"/> απογοητευμένος | <input type="checkbox"/> αναστατωμένος |
| <input type="checkbox"/> αξιοθαύμαστος | <input type="checkbox"/> αυθόρμητος |
| <input type="checkbox"/> εγκρατής | <input type="checkbox"/> αλαζονικός |
| <input type="checkbox"/> αξιοσέβαστος | <input type="checkbox"/> αναξιοπρεπής |
| | <input type="checkbox"/> διασκεδαστικός |
| | <input type="checkbox"/> αρεστός |
| | <input type="checkbox"/> απολίτιστος |
| | <input type="checkbox"/> γαλήνιος |

Ομάδα Β

- | | |
|--|---------------------------------------|
| <input type="checkbox"/> δυστυχημένος | |
| <input type="checkbox"/> πολιτισμένος | |
| <input type="checkbox"/> κεφάτος | |
| <input type="checkbox"/> ευπρόσδεκτος | |
| <input type="checkbox"/> περήφανος | |
| <input type="checkbox"/> περιπετειώδης | |
| <input type="checkbox"/> περιζήτητος | |
| <input type="checkbox"/> παρηγορημένος | |
| <input type="checkbox"/> ευτυχημένος | <input type="checkbox"/> ένοχος |
| <input type="checkbox"/> επιδεικτικός | <input type="checkbox"/> αχάριστος |
| <input type="checkbox"/> επιφυλακτικός | <input type="checkbox"/> καταδεκτικός |
| <input type="checkbox"/> ασυγκίνητος | <input type="checkbox"/> ασυγκράτητος |
| <input type="checkbox"/> ευχάριστος | <input type="checkbox"/> παιχνιδιάρης |
| <input type="checkbox"/> ηθικός | <input type="checkbox"/> ήσυχος |
| <input type="checkbox"/> ευέξαπτος | <input type="checkbox"/> βίαιος |
| <input type="checkbox"/> δισταραστημένος | <input type="checkbox"/> ήρεμος |
| <input type="checkbox"/> ευγνώμων | <input type="checkbox"/> κολακευμένος |
| <input type="checkbox"/> ευαίσθητος | <input type="checkbox"/> θαρραλέος |
| <input type="checkbox"/> καλόκαρδος | <input type="checkbox"/> αστείος |
| <input type="checkbox"/> αφελής | <input type="checkbox"/> γραφικός |
| <input type="checkbox"/> επιπόλαιος | <input type="checkbox"/> δειλός |
| <input type="checkbox"/> ευχαριστημένος | <input type="checkbox"/> ξέγνοιαστος |
| <input type="checkbox"/> ικανοποιημένος | <input type="checkbox"/> κομψός |
| <input type="checkbox"/> κοινωνικός | <input type="checkbox"/> ατίθασος |

Ομάδα Γ

- | | |
|--|---|
| <input type="checkbox"/> λυπημένος | |
| <input type="checkbox"/> σοβαρός | |
| <input type="checkbox"/> μοναχικός | |
| <input type="checkbox"/> προκλητικός | |
| <input type="checkbox"/> τρυφερός | |
| <input type="checkbox"/> ντροπιασμένος | |
| <input type="checkbox"/> σπουδαίος | |
| <input type="checkbox"/> συμπαθητικός | <input type="checkbox"/> ηλικτικός |
| <input type="checkbox"/> υποκριτής | <input type="checkbox"/> συντηρητικός |
| <input type="checkbox"/> συγκινημένος | <input type="checkbox"/> πρόθυμος |
| <input type="checkbox"/> σεβαστός | <input type="checkbox"/> θλιβερός |
| <input type="checkbox"/> σεμνός | <input type="checkbox"/> προοδευτικός |
| <input type="checkbox"/> χαϊδεμένος | <input type="checkbox"/> φιλότιμος |
| <input type="checkbox"/> φοβισμένος | <input type="checkbox"/> ωραίος |
| <input type="checkbox"/> τολμηρός | <input type="checkbox"/> φιλόδοξος |
| <input type="checkbox"/> σταργικός | <input type="checkbox"/> χαρούμενος |
| <input type="checkbox"/> θυμωμένος | <input type="checkbox"/> πονηρός |
| <input type="checkbox"/> χαριτωμένος | <input type="checkbox"/> νευρικός |
| <input type="checkbox"/> ταπεινός | <input type="checkbox"/> φιλικός |
| <input type="checkbox"/> προνομιούχος | <input type="checkbox"/> ξαφνιασμένος |
| <input type="checkbox"/> φρόνιμος | <input type="checkbox"/> παραπονεμένος |
| <input type="checkbox"/> υπομονετικός | <input type="checkbox"/> συνετός |
| <input type="checkbox"/> ρομαντικός | <input type="checkbox"/> περιφρονημένος |

III. Questionnaire sample of giving emotion words to be matched with a food category

"Συναισθήματα που προκαλεί η κατανάλωση τροφίμων"

Ακολουθούν λέξεις που εκφράζουν συναίσθημα.

Επιλέξτε μόνο όσες από τις παρακάτω λέξεις εκφράζουν συναίσθημα που σας προκαλεί η κατανάλωση τροφίμων (μία τροφή, ποτό, γεύμα, σνακ, επιδόρπιο κλπ)

Για κάθε λέξη που επιλέξετε γράψτε στο χώρο της σύντομης απάντησης, κάτω από τη λέξη, ένα παράδειγμα τροφίμου που σας το προκαλεί, όπως:

πολιτισμένος

φρυγανιά

Αγνοήστε όσες λέξεις δεν εκφράζουν κατά τη γνώμη σας συναίσθημα που προκαλείται από κατανάλωση τροφίμων.

εξωστρεφής

Κείμενο σύντομης απάντησης

γοητευτικός

Κείμενο σύντομης απάντησης

αξιαγάπητος

Κείμενο σύντομης απάντησης

IV. Pictures of foods for free listing of emotion words and questionnaire sample



4. Όταν καταναλώνω το τρόφιμο αυτό νιώθω/επιθυμώ/αγαπώ...
 Να γράψετε από 2ΝΑ (1) μέχρι ΤΡΙΑ (3) ΣΠΙΔΙΣΤΑ.



Κατηγορία σύνταξης απάντησης:

5. Όταν καταναλώνω το τρόφιμο αυτό νιώθω/επιθυμώ/αγαπώ...
 Να γράψετε από 2ΝΑ (1) μέχρι ΤΡΙΑ (3) ΣΠΙΔΙΣΤΑ.



Κατηγορία σύνταξης απάντησης:

V. Greek tool tested with foods as translated EsSense Profile

Πόσο συχνά καταναλώνετε πίτσα; *

ποτέ σπάνια περιστασιακά αρκετά συχνά

συχνότητα:

Πώς αισθάνεστε όταν καταναλώνετε πίτσα; *

απαιτείται μια απάντηση για κάθε όρο της αριστερής στήλης

	καθόλου	λίγο	αρκετά	πολύ	πάρα πολύ
αγχωμένος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
αδιάφορος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
αδύναμος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
αηδιασμένος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
αισθησιακός	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
αισιόδοξος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
άκεφος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ανακουφισμέν...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ανικανοποίητος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
απογοητευμέν...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ασυγκράτητος	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

VI. Emoji tool tested with foods as Greek tool

Πόσο συχνά καταναλώνετε πίτσα; (4 επιλογές) *

	ποτέ	σπάνια	περισποσιακά	αρκετά συχνά
συχνότητα:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Πώς αισθάνεστε όταν καταναλώνετε πίτσα; *
Ακολουθούν 33 emoji. Απαιτείται μια απάντηση ανά σειρά. 5 επιλογές

	καθόλου	λίγο	αρκετά	πολύ	πάρα πολύ
😄	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
😁	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
😂	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
😃	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
😄	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
😅	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
😆	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
😇	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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😎	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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VII. General dietary questionnaire

Οι Διατροφικές σας Συνήθειες

Ακολουθούν ερωτήσεις που αφορούν στις διατροφικές και καταναλωτικές σας συνήθειες, καθώς και στον γενικότερο τρόπο ζωής σας. Οι απαντήσεις στις ερωτήσεις αυτές, όπως και όλες οι προηγούμενες, συλλέγονται αυστηρά για επιστημονικούς σκοπούς και με απόλυτο σεβασμό στα προσωπικά σας δεδομένα.

Γενικά προτιμάτε η τροφή που καταναλώνετε να είναι κυρίως... *

- γευστική
- υγιεινή

Ποιο γεύμα είναι πιθανότερο να παραλείψετε κατά τη διάρκεια της ημέρας; *

- το πρωινό
- το δεκατιανό
- το μεσημεριανό
- το απογευματινό
- το βραδινό
- κανένα από τα παραπάνω

Αν αποφεύγετε την κατανάλωση κρέατος, γιατί συμβαίνει αυτό; *

- για λόγους προσωπικών γευστικών προτιμήσεων
- για λόγους υγείας
- για λόγους που σχετίζονται με τις πρακτικές εκτροφής και επεξεργασίας του κρέατος
- όχι, δεν αποφεύγω την κατανάλωση κρέατος

Υπάρχουν συγκεκριμένα τρόφιμα, φαγητά ή γεύματα που έχετε συνδέσει με ευχάριστες μνήμες; Αν ναι, εξηγήστε σύντομα.

Η απάντησή σας

Υπάρχουν συγκεκριμένα τρόφιμα, φαγητά ή γεύματα που έχετε συνδέσει με δυσάρεστες μνήμες; Αν ναι, εξηγήστε σύντομα.

Η απάντησή σας

Πόσο συχνά καταναλώνετε έτοιμο φαγητό [take-away]; [1 = καθόλου, 2 = λίγο, 3 = αρκετά, 4 = πολύ]

- | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 | 2 | 3 | 4 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Πόσο πρόθυμα δοκιμάζετε νέες τροφές; [1 = καθόλου, 2 = λίγο, 3 = αρκετά, 4 = πολύ]

- | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 | 2 | 3 | 4 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Πόσο συχνά καταναλώνετε οινοπνευματώδη ποτά / αλκοόλ; [1 = καθόλου, 2 = λίγο, 3 = αρκετά, 4 = πολύ]

- | | | | |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
|---|---|---|---|

Πόσο συχνά γυμνάζεστε; [1 = καθόλου, 2 = λίγο, 3 = αρκετά, 4 = πολύ] *

- | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 | 2 | 3 | 4 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Πόσο εκδηλωτικό θα χαρακτηρίζατε τον εαυτό σας; [1 = καθόλου, 2 = λίγο, 3 = αρκετά, 4 = πολύ] *

- | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 | 2 | 3 | 4 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Πόσο συχνά καταναλώνετε καφέ; [1 = καθόλου, 2 = λίγο, 3 = αρκετά, 4 = πολύ] *

- | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 | 2 | 3 | 4 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

172

Αν έχετε τροφικές αλλεργίες / δυσανεξίες, παρακαλώ προσδιορίστε τις. Αν όχι, προχωρήστε στην επόμενη ερώτηση.

Η απάντησή σας _____

Αν είχατε να επιλέξετε ανάμεσα σε τρία προϊόντα ίδιας κατηγορίας, ποιο από τα παρακάτω θα επιλέγατε; *

- το πιο γευστικό
- το πιο υγιεινό

Appendix B: Publications

1. Innovation and Research two-day event by University of the Aegean (19-21/05/2021)



ΒΕΒΑΙΩΣΗ ΣΥΜΜΕΤΟΧΗΣ

Βεβαιώνεται ότι ο/η Παναγιώτου Μ. παρακολούθησε την 1η ετήσια εκδήλωση με τίτλο «Ημέρες Καινοτομίας & Έρευνας Πανεπιστημίου Αιγαίου - Δημήτρης Εδουάρδος Γαρδίκης» η οποία πραγματοποιήθηκε διαδικτυακά στις 19-21 Μαΐου 2021 και παρουσίασε την εργασία με τίτλο: «Ανάπτυξη γλωσσολογικών εργαλείων για την κατανόηση των συναισθηματικών αντιδράσεων και προτιμήσεων του καταναλωτή προς τα τρόφιμα: θεωρητικό υπόβαθρο, μελέτες περίπτωσης, πρακτικές εφαρμογές»

Η Πρόεδρος της Οργανωτικής Επιτροπής
Αναπληρώτρια Καθηγήτρια Μαρία Μαύρη
Αντιπρυτάνισσα Έρευνας & Δια Βίου Εκπαίδευσης
Πανεπιστήμιο Αιγαίου



2. Aegean Science Festival Workshop (24-26/09/2021)



“Τρώμε με τα μάτια μας”

Μαλαματένια Παναγιώτου : Εκπαιδευτικός,
Μαρία Μαμαλίκου : Σχολική Ψυχολόγος,
Κωνσταντίνος Γκατζιώνης : Βιοχημικός Τροφίμων

Το δικό μας εργαστήριο

“Τρώμε με τα μάτια μας”

« Έχεις σκεφτεί τι σε τραβάει σε ένα τρόφιμο; Γιατί τα παιδιά βγάζουν στη άκρη του πιάτου ό,τι είναι πράσινο χωρίς καν να το δοκιμάσουν; Μήπως προτιμάς συσκευασίες κόκκινου χρώματος; Έχεις προσέξει ότι σε πολλά εστιατόρια το επιδόρπιο σερβίρεται σε γαλαζοπράσινο πιάτο; Μπορείς, από το χρώμα και μόνο, να μαντέψεις τι γεύση έχει ένα τρόφιμο;

Το ψηφιακό εργαστήριο για μαθητές Δημοτικού «Τρώμε με τα Μάτια μας» θα σου δώσει τροφή για σκέψη, αλλά θα δώσει και απαντήσεις.»



Πρόγραμμα Δραστηριοτήτων

Παρασκευή 24 Σεπτεμβρίου 2021



ΔΡΑΣΕΙΣ ΓΙΑ ΣΧΟΛΕΙΑ

ΠΑΝΤΕΛΙΔΕΙΟ

10:00 – 13:00 | **ΕΡΓΑΣΤΗΡΙΑ ΓΙΑ ΠΑΙΔΙΑ** | Εφαρμογές επαυξημένης πραγματικότητας - Κωνσταντίνος Μιχαλάκης, Μάρκος Κωνσταντάκης (P)

10:00 – 13:00 | **ΠΕΙΡΑΜΑΤΑ ΕΠΙΔΕΙΞΗΣ** | «Πώς επιλέγουμε, τελικά, προϊόντα τροφίμων;» - Κωνσταντίνος Γκατζιώνης (P)

ΙΕΡΟΣ ΛΟΧΟΣ

10:00 – 13:00 | **ΠΕΙΡΑΜΑΤΑ ΕΠΙΔΕΙΞΗΣ** | «Εισαγωγή στη Μικροβιολογία Τροφίμων» - Δήμητρα Κώσταγλου, Ιωάννα Γκτσάκη, Μαρία Σιμώνη, Χρήστος Τολιόπουλος (P)

10:00 – 13:00 | **ΠΕΙΡΑΜΑΤΑ ΕΠΙΔΕΙΞΗΣ** | «Καινοτόμα λειτουργικά τρόφιμα» - Ολγα Παπαγιάννη, Αικατερίνη Κανδυλιάρη (P)

ΔΡΑΣΕΙΣ ΓΙΑ ΤΟ ΕΥΡΥ ΚΟΙΝΟ

ΚΙΝΗΜΑΤΟΘΕΑΤΡΟ ΜΑΡΟΥΛΑ

17:00 – 18:00 | **ΟΜΙΛΙΑ** | “Science Illustration” - Μανώλης Μπαμπάτσικος (V)

20:00 – 20:30 | **Τελετή Έναρξης** - ΖησιΣΤΗΜ3\$ αλλιώς\$ (P)

20:30 – 21:30 | **PANEL** | Τμήμα Επιστήμης Τροφίμων και Διατροφής - Αντώνιος Κουτελιδάκης, Κωνσταντίνος Γκατζιώνης, Κατερίνα Κανδυλιάρη | Συντονίζει η Δέσποινα Βασιλειάδου (P)

ΠΑΝΤΕΛΙΔΕΙΟ

17:00 – 18:00 | **ΕΡΓΑΣΤΗΡΙΑ ΓΙΑ ΠΑΙΔΙΑ** | «Τρώμε με τα μάτια μας;» - Μαλαμαστένια Παναγιώτου, Μαρία Μαμαλίκου (P)

18:00 – 20:00 | **ΠΕΙΡΑΜΑΤΑ ΕΠΙΔΕΙΞΗΣ** | «Πώς επιλέγουμε, τελικά, προϊόντα τροφίμων;» - Κωνσταντίνος Γκατζιώνης (P)

ΙΕΡΟΣ ΛΟΧΟΣ

Πώς σας φαίνεται αυτό που τρώει ο χαρακτήρας του βίντεο; Τσεκάρτε όσες από τις παρακάτω επιλογές επιθυμείτε.

- γευστικό
- τραγανό
- υγιεινό
- γλυκό
- πικρό
- ξινό
- αλμυρό

Πώς πιστεύετε ότι νιώθει ο χαρακτήρας του βίντεο τρώγοντας το συγκεκριμένο τρόφιμο; Τσεκάρτε όσες από τις παρακάτω επιλογές επιθυμείτε.

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3. 13th International Conference on “Hellenic Language and Terminology” by ELETO – paper presentation (11-13/11/2021)

ELETO – 13th Conference “Hellenic Language and Terminology”
11–13 November 2021, Online

Terminology of the field named “sensory linguistics” in Greek: proposal for validation and standardization

Malamatenia Panagiotou, Konstantinos Gkatzionis

ABSTRACT

In the English language the term “sensory” denotes the related to the senses and is used in collocations such as sensory perception, sensory organs, sensory studies, sensory modalities, sensory vocabulary, sensory lexicon, sensory adjectives, sensory analysis, sensory linguistics. In Greek bibliography, in Greek dictionaries, and in official translations of documents issued by the European Union, the term “sensory” has been translated as “αισθητηριακός”, “αισθητήριο”, “αισθητικός” and “οργανοληπτικός”, depending on the meaning of the term in each case. As the field of sensory linguistics, i.e., the study of the connection between language and the senses, is being enriched by new studies and finds applications in various domains, such as that of food, advertising, and lexicography, the need for terminology in the Greek language is evident. The present study presents the field of sensory linguistics, the possibilities in translating and defining the term “sensory” in collocations of this field [sensory modalities, sensory vocabulary, sensory lexicon, sensory adjectives, sensory linguistics] and makes a final proposal for validation and standardization of this terminology. Aiming at reinforcing the status of the Greek language as an effective language for the production of knowledge, dissemination of ideas, and communication between Greek scientists, it is important to have standardized, validated terminology for the field of sensory linguistics in Greek.

0 Introduction

Humans live in a physical world which they perceive through their senses: sight, hearing, smell, touch, and taste. In antiquity, Aristotle studied in depth and talked about the senses, and his division of them into five has been maintained until today to a large extent even though a lot of stimuli are perceived through more than one senses simultaneously, as is the case with taste and smell when consuming food. How important the senses are for humans becomes evident when one of them is not available, even temporarily. Winter takes it a step further when he says that, if we couldn't express what we perceive through the senses, language would be of no use (Winter, 2019).

The human brain perceives stimuli provided by the environment through the senses and, by performing subconscious and cognitive processes, it makes sense of these stimuli and of our reactions to them – physiological, mental, and emotional. These processes and conscious conclusions are expressed through language, which takes part in the previous stage of cognitive processes as well, as it is known that humans think in words and pictures together.

Language though is not a personal means of expression. It is created and acquires sense within a given culture, which influences our perceptions as well. For this reason, the relation between language and the senses is studied within a given language/ culture and across languages/ cultures. It is commonly acknowledged that people from different cultures experience and express the stimuli they perceive through their senses and the emotions that these stimuli provoke in them in different ways. They get pleased and displeased by different experiences. These preferences are shaped by personal experiences but also, to a great extent, by collective cultural habits. There are also variations within population groups in the same culture, according to age, gender, income, or educational level.

1 Sensory Studies: related branches of science, object of study

In the past few decades, a new scientific field has emerged, that of sensory studies, dealing with the study of the senses and of the human reactions – physiological, cognitive, emotional- to anything from food and medicine to cosmetics and cars. The aim is to develop products and provide services in a focused and successful way, as well as to promote them effectively. The field of sensory studies makes use of scientific branches such as food science, linguistics, psychology, medicine, statistics, trade, advertising, and many others. Within the framework of today's technological advances and consumers' demands for immersive experiences, with the Internet of Things and the Internet of senses under development, investigating consumers demands and needs through tests and questionnaires or through opinion mining and sentiment analysis in social media, attracts the interest of industry and is done by using tools developed from academic and theoretical studies. What is also essential is to detect target groups of consumers interested in a specific product and this is done by using demographic data as well. A field that has a lot to offer to these studies is linguistics.

2 Sensory Linguistics: key notions¹, object of study

“Sensory linguistics” is the field that studies the ways in which language is related to the senses and attempts to answer questions such as: how is what we perceive through the senses grouped into words? which physical features are easier to express through words? how are languages different in the way they encode what is perceived through the senses? how are words linked to the cognitive systems in our brain? (Winter, 2019).

Key to the field of sensory linguistics is the “theory of embodiment” or else “the embodied lexicon hypothesis” according to which language depicts perception as cognition and language are constructed through constant interaction with the environment through our body (our senses) and our brain (Diederich, 2015; Winter, 2019).

What has already been studied is how many words there are relative to specific senses per language (Viberg, 1983), how often we talk about each sense (San Roque *et al.*, 2015) and how metaphor² (de Ullmann, 1945; Williams, 1976) and iconicity³ (Marks, Carterette and Friedman, 1978; Dingemanse, 2012) are used to achieve reference to the physical world around us (Winter, 2019).

Linguistic studies of the senses use various sources, such as dictionaries, thesauri, corpora, the Internet, and consumers, as well as various methods, such as semiotic analysis and frame semantics, and deal with verbs, nouns, and adjectives. Most studies seem to focus on adjectives since these descriptors combine objective and subjective evaluation. These adjectives are called “sensory adjectives” and are the parts of speech that attribute features as they are perceived through the senses, like attributes of taste, warmth, texture etc (Diederich, 2015; Winter, 2019).

Within the field of sensory studies, terms are collected into lists, called “sensory lexicons”, and they are lists of terms used to describe products as they are perceived by consumers through their senses, for example, hard, noisy, soothing, feminine etc. There are many such lexicons, quite a few related to food, such as various types of tea, caviar, kinoa, honey, and others (Galán-Soldevilla *et al.*, 2005; Fenko, Otten and Schifferstein, 2010; Koch *et al.*,

¹ The correspondence between English and Greek terms is given in chapter 4 of the present paper.

² Metaphor, and more specifically within the field of sensory linguistics “synaesthetic metaphor”, is the usage of properties perceived through a specific sense to describe a notion that belongs to a different sense, i.e., harsh sound [harshness is perceived through touch while sound is perceived through hearing].

³ Iconicity is the way of attributing meaning when the word depicts reality as is the case with sound (onomatopoeic) words (e.g., barking), in contrast to symbolism when there is no real connection to the referred object (e.g., dog).

2012; Ng, Chaya and Hort, 2013; Baker *et al.*, 2014; Wu *et al.*, 2017). In the Greek language there are such lists of terms only for coffee and wine. These lists though contain mainly technical terms which are hard to be understood by non-experts, like body (for coffee), felt tannins, sharp (wine), reductive (aroma).

Other studies target consumers' emotions elicited by certain products and the so called "emotion lexicons" are created containing emotions, either related to food in general or related to a specific food category in a given language.

Combining sensory and emotion lexicons with liking and sensory measurements as well as demographic data of participants in food studies can provide directions for the focused development and successful marketing of products.

There are also linguistic studies, the so called "sensory norms", that deal with the semantic mapping of words related to the senses as regards valence, i.e., if a word is considered positive or negative, sensory modality, and sensory exclusivity, i.e., which senses participate to the perception of a specific attribute or action and to what degree, etc.

Such research is being done in Greece too lately. Thus, it is important for scientists to be able to communicate with each other and with experts of other fields where findings of the sensory field are applied. The need for terminology, available and standardized for the Greek language, is evident.

3 The term "sensory" in English and its possible translational equivalents into Greek

3.1 How the term "sensory" is defined in English

In Table 1, the term "sensory" is presented with its definitions. The term appears to refer to that which is related to: 1) the five senses, 2) the ability of sensation, and 3) the ability to perceive stimuli through the senses.

Table 1: Definitions of the term "sensory" in English dictionaries

connected with the physical senses of touch, smell, taste, hearing, and sight https://dictionary.cambridge.org/dictionary/english/sensory
1. of or relating to the senses or the power of sensation 2. of or relating to those processes and structures within an organism that receive stimuli from the environment and convey them to the brain Word origin: from Latin <i>sensōrius</i> , from <i>sentire</i> to feel https://www.collinsdictionary.com/dictionary/english/sensory [from Collins English Dictionary. Copyright © HarperCollins Publishers]
1. of the senses or sensation 2. connected with the reception and transmission of sense impressions Also <i>sen'sorial</i> ('sen'sorial) Word origin: sense + -ory https://www.collinsdictionary.com/dictionary/english/sensory [from Webster's New World College Dictionary, 4th Edition. Copyright © 2010 by Houghton Mifflin Harcourt]

3.2 How the term "sensory" is translated into Greek

In Table 2, various translations of the term "sensory" are given, as provided in parallel documents issued by the European Union in English and in Greek (the term is used in domains such as health/ medicine, information technology, chemistry, agriculture, and education), in European Union Law, in the European Union glossary, and an English-Greek dictionary of translations (Glosbe). Collocations of the equivalent terms are also provided as found in examples in two major Greek dictionaries.

Table 2: Translational equivalents of the term "sensory"

Sources: European Union (EU) sources: https://iate.europa.eu/home , https://eur-lex.europa.eu/homepage.html Glosbe: https://glosbe.com/ Dictionary of Modern Greek (DMG)
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Dictionary of Standard Modern Greek (DSMG)					
https://www.greek-language.gr/greekLang/modern_greek/tools/lexica/triantafyllides/index.html					
group	2 nd word in collocation	1. οργανοληπτικός	2. αισθητηριακός	3. αισθητήριο	4. αισθητικός
1	ανάλυση		EU		
1	χαρακτηριστικά		EU		
1	εξέταση		EU		
1	δοκιμασία		EU		
1	αξιολόγηση		EU		
1	εκτίμηση		EU		
1	έλεγχος		EU		
1,2	προφίλ	EU	EU		
1,2	ιδιότητα	DSMG	EU		
2	διαφορά		EU		
2	λειτουργία		EU, Glosbe		
2	παρατηρητής		EU		
2	ευαισθησία		EU		
2	μνήμη		EU		
2	όρος		EU		
2	έλλειμμα		EU		
2	ανταπόκριση		EU		
2	κόπωση		EU		
2	εντύπωση		EU, DSMG		
2	ικανότητα		Glosbe		
2	καταγραφή		Glosbe		
2	ερέθισμα		DMG, DSMG		

2	διέγερση		DSMG		
2	εμπειρία		DSMG		
2	δεδομένα		DSMG		
2,3	αντίληψη		EU, Glosbe	Glosbe	
2,3	αναπηρία		EU	EU	
2,3	δραστικότητα		Glosbe	Glosbe	
3	απώλεια			EU	
3,4	όργανο			EU, DSMG	Glosbe
3,4	νεύρο			DSMG	DSMG
4	κύτταρο				DSMG
4	κέντρο				DSMG
4	σύστημα				EU, Glosbe
4	διαταραχή				EU
4	δεξιότητα				EU

3.3 Grouping the translational equivalents of the term "sensory"

Four groupings of the Greek equivalents of the term "sensory" as shown in the first column of Table 2 seem to emerge. There are however "gray" collocations, that belong to two groups. These are the cases where term "sensory" can be translated into Greek by two different terms. The collocations that belong to group 1 are clear cases and refer to food attributes perceived through the senses and translated by "οργανοληπτικός". The same goes to the terms that belong to group 4, that refer to sensory organs, and are translated by the term "αισθητικός". The term "sensory" in the collocations of group 3 can be translated by the Greek equivalent for groups 2 and 4, that is, instead of "αισθητήριο", it can be translated as "αισθητηριακός" or "αισθητικός". The conclusion drawn from Table 2 is that the term "αισθητηριακός" is mostly used as the translational equivalent of "sensory" for all collocational cases except those of groups 1 and 4.

3.4 Definitions of the Greek translational equivalents of the term “sensory”

The definitions of the Greek translational equivalents of the term “sensory” as provided in Greek dictionaries are given in Table 3, in order to compare their meanings to the meanings of the original English term. The sources used are two renowned dictionaries of modern Greek: the Dictionary of Modern Greek (DMG) and the Dictionary of Standard Modern Greek (DSMG).

Table 3: Definitions of the Greek translational equivalents of the term “sensory”:

		DMG	DSMG
1	οργανοληπτικός	[ΧΗΜ] [για τις ιδιότητες των τροφίμων] αυτός που γίνεται αντιληπτός από τα αισθητήρια όργανα [π.χ. οργανοληπτικά χαρακτηριστικά των τροφίμων είναι το χρώμα, η οσμή, η γεύση και η υφή]	-
2	αισθητηριακός	αυτός που σχετίζεται με τα αισθητήρια όργανα [πχ αισθητηριακό ερέθισμα]	που γίνεται ή γενικά σχετίζεται με τα αισθητήρια όργανα
3	αισθητήριος	[αρχ.] αυτός που σχετίζεται με τις αισθήσεις	που έχει σχέση με τις αισθήσεις
4	αισθητικός	1. αυτός που σχετίζεται με τις αισθήσεις και την αντίληψη διά μέσου αυτών	που έχει σχέση με τις αισθήσεις. α. (φυσιολ.) αισθητήριος: Αισθητικές ίνες. Οι αισθητικές θηλές της γλώσσας / ρίζες του νωτιαίου μυελού. Αισθητικό νεύρο / κέντρο. Αισθητικά κύτταρα. β. (σπάν.) που αισθάνεται: Αισθητικά όντα. γ. που προέρχεται από τις αισθήσεις: Αισθητική παράσταση. Οι γνώσεις του ανθρώπου είναι νοητικές ή αισθητικές.

These definitions explain the groupings made in Table 2. The term “οργανοληπτικός” that appears in group 1 of collocations is a technical term that refers to the organoleptic perception of food attributes through the senses and can be easily distinguished from the rest of the terms. The term “αισθητήριος” of group 3 is characterized in one of the dictionaries as archaic and so it is semantically covered by the terms “αισθητηριακός” and “αισθητικός” of the groups 2 and 4.

4 Final proposal for the translation of the term “sensory linguistics” and the key terms/ notions of the field into Greek for validation and standardization:

Following the two possible etymologies of the English term that appear in Table 1, if the word “sensory” comes from the noun “sense” then the Greek term could be formed from the noun “αίσθηση” and be “αισθητικός”. Thus, “sensory linguistics” would be “αισθητική γλωσσολογία”. But as one can conclude from the collocations offered for the term “sensory” in Table 2 and from the definitions and the examples of the word “αισθητικός” in Greek dictionaries as shown in Table 3, the term «αισθητικός» cannot cover the same semantic and pragmatic instances as the English term. So, such a proposal would be incorrect.

If the term “sensory” derives from the noun “sensor” according to the second etymology provided in Table 1, then the Greek term could be formed from the noun “αισθητήρ(ας)” and be either “αισθητήριος” or “αισθητηριακός”. The term “αισθητήριος” is archaic and is less used than the term “αισθητηριακός”, as explained in the two Greek dictionaries in Table 3, and the translational equivalents of the term “sensory” in Table 2. Therefore, the term “sensory” in the field of sensory linguistics should be translated as “αισθητηριακός”.

An alphabetical listing of corresponding terms from English into Greek, as presented and used in the present paper, follows for validation and standardization:

(emotional) valence= (συναισθηματικό) σθένος
embodied lexicon= ενσώματο λεξιλόγιο
embodiment=ενσωμάτωση
emotion lexicon= λεξιλόγιο / γλωσσάρι συναισθημάτων
modality exclusivity= τροπική αποκλειστικότητα
sensory adjectives= αισθητηριακά επίθετα
sensory lexicon= αισθητηριακό γλωσσάρι / λεξιλόγιο / λεξικό
sensory linguistics= αισθητηριακή γλωσσολογία
sensory modality= αισθητηριακή τροπικότητα

sensory vocabulary= αισθητηριακό λεξιλόγιο / γλωσσάρι

sensory= αισθητηριακός

syn(a)esthesia= συναισθησία

syn(a)esthetic metaphor= συναισθητική μεταφορά

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Marks, L. E., Carterette, E. C. and Friedman, M. P. (1978) 'The Unity of the Senses: interrelations among the modalities'. Academic Press, p. 302.

Ng, M., Chaya, C. and Hort, J. (2013) 'Beyond liking: Comparing the measurement of emotional response using EsSense Profile and consumer defined check-all-that-apply methodologies', *Food Quality and Preference*. doi: 10.1016/j.foodqual.2012.08.012.

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Authors:

Malamatenia Panagiotou

Teacher of English / Lexicographer / PhD candidate

Department of Food Science and Nutrition, University of the Aegean

Mitropoliti Ioakeim 2, 81400, Myrina, Lemnos

email: teniapanagiotou@gmail.com

Dr Konstantinos Gkatzionis

Associate Professor / Director of Laboratory of Consumer Responses and Sensory Perception of Food & Drinks' (ConsumerLab) / Head of Department of Food Science and Nutrition, University of the Aegean

Mitropoliti Ioakeim 2, 81400, Myrina, Lemnos

email: kgkatzionis@aegean.gr



13^ο Συνέδριο

«Ελληνική Γλώσσα και Ορολογία» 11–13 Νοεμβρίου 2021, Διαδικτυακό

ΒΕΒΑΙΩΣΗ ΣΥΜΜΕΤΟΧΗΣ ΟΜΙΛΗΤΗ / ΟΜΙΛΗΤΡΙΑΣ

Η κα **Μαλαματένια Παναγιώτου**

συμμετέσχε ενεργά ως **ομιλήτρια** στο 13^ο Συνέδριο «Ελληνική Γλώσσα και Ορολογία» που διοργάνωσαν η Ελληνική Εταιρεία Ορολογίας και το Πανεπιστήμιο Κύπρου, με συνδιοργανωτές το Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, το Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης, το Ιόνιο Πανεπιστήμιο, το Πανεπιστήμιο Αιγαίου, το Τεχνικό Επιμελητήριο Ελλάδας, τον Ελληνικό Οργανισμό Τυποποίησης (Εθνικό Σύστημα Υποδομών Ποιότητας), το Ερευνητικό Κέντρο «Αθηνά» / Ινστιτούτο Επεξεργασίας του Λόγου, τον Οργανισμό για την Διάδοση της Ελληνικής Γλώσσας, την Πανελλήνια Ένωση Μεταφραστών, την Ελληνική Εταιρεία Μεταφρασεολογίας και το Ελληνικό Δίκτυο Ορολογίας.

Η εναρκτήρια συνεδρία πραγματοποιήθηκε στις 11 Νοεμβρίου 2021 ώρα 19.00, ενώ οι εργασίες του Συνεδρίου πραγματοποιήθηκαν στις 12 και 13 Νοεμβρίου 2021.

Θέμα ανακοίνωσης: Πρόταση απόδοσης της ορολογίας του κλάδου της γλωσσολογίας «sensory linguistics» στην ελληνική γλώσσα

Το κείμενο της ανακοίνωσης συμπεριλαμβάνεται στον ήδη εκτυπωμένο τόμο των ανακοινώσεων του Συνεδρίου (σελ. 259–269) και πρόκειται να αναρτηθεί στην ιστοσελίδα: <http://www.eleto.gr/gr/papers.htm>.

Αθήνα, 13 Νοεμβρίου 2021

13^ο ΣΥΝΕΔΡΙΟ
«ΕΛΛΗΝΙΚΗ ΓΛΩΣΣΑ & ΟΡΟΛΟΓΙΑ»
11–13 ΝΟΕΜΒΡΙΟΥ 2021, ΔΙΑΔΙΚΤΥΑΚΟ

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Lexicon development to measure emotions evoked by foods: A review

Malamatenia Panagiotou^{*}, Konstantinos Gkatzionis

University of the Aegean, School of the Environment, Department of Food Science and Nutrition, Lemnos, Greece



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ABSTRACT

There is rising research interest in consumers' emotions elicited by foods. To this end, emotion lexicons as part of food-evoked emotion measurement methods have been developed. Though there are various methods and techniques for emotion measurement, verbal self-report on behalf of the consumer has been identified as the most direct means of assessing the experience of emotion. The focus of this review is mapping the development of lexicons of food-evoked emotions, and their implementation in questionnaires to identify gaps and opportunities in research and methodologies currently developed. The emotion lexicon and emotion measurement questionnaires of the last decade have been reviewed, including adaptations, and presented in a systematic way according to approach, method and technique used, and objectives of study. The manuscript is structured in such a way that it can be used both as an in-depth review of the subject and as a tool for new and future users of lexicon applications for the assessment of consumer responses. The categorization presented is useful in emotion lexicon development, product development, and marketing, in food and consumer studies in general. This review provides experts and non-experts interested in working with emotions with categorizations, available options with their advantages and disadvantages for each step of the process, from developing a food-related emotion lexicon and designing an emotion measurement questionnaire to implementing the tool and analyzing the data.

1. Introduction to lexicons of food-elicited emotions

Emotions have always been an area of interest for various theoretical and applied scientific fields, such as medicine, philosophy, psychology, linguistics, education. Various definitions of emotion have been proposed according to the field of science or the perspective from which it is studied. An emotion can be broadly defined as a two-step event during which emotion elicitation mechanisms, caused by a "related" or "significant" event, generate immediate emotional responses, namely action tendency, automatic bodily reaction, expression, feeling, and appraisal [1]. These are considered as the five components of emotion. Emotion is considered different from feeling. For example, the emotion of tiredness is generally understood to refer to an unpleasant state and can be used to communicate a feeling of sleepiness, annoyance and misery, or fatigue [2]. Emotion is also considered different from mood. A clear distinction is provided by King and Meiselman: emotions are brief, intense, and focused on a referent (e.g., The comment made him angry), while moods are more enduring, build up gradually, are more diffuse, and are not focused on a referent (e.g., I am happy) [3].

During the past few decades, other fields, like the consumer, food, and marketing industries, have turned to the study of emotion and the application of findings -mainly from psychology- to product development and promotion for better targeted results. Research is aimed at

creating emotion lexicons, measuring, and studying emotions within and across languages and cultures, creating conceptual profiles of food products, and identifying consumer groups. An emotion lexicon is a list of emotion words or phrases used to describe emotions. Food-elicited emotion lexicons can be (a) language or culture-specific¹, containing for example only Italian emotion words [4], (b) cross-linguistic or cross-cultural, containing for example Dutch and Portuguese emotion words [5], (c) general, containing words expressing emotions elicited by food in general [3], (d) food-specific, containing words expressing emotions elicited by a specific type of food such as coffee [6].

Various emotion measurement methods have been developed: physiological, behavioral, and cognitive, each focusing on a different component of emotion. Physiological measures include electroencephalography (EEG), magnetic resonance imaging (MRI), electrocardiography (ECG), and skin conductance response measurements, used to measure automatic bodily reactions to emotion. Behavioral measures include voice tone, pitch, facial expressions, body expressions and postures measurements, used to measure expression of emotion. Cognitive measures, used to measure feeling, action tendency, and appraisal, expect the participants to self-report on how they process perceived emotions mentally

¹ As culture-specific are defined foods and beverages that are closely linked to culture, because they are traditionally produced, or linked to traditional and religious practices, thus becoming part of a people's identity [100].

^{*} Corresponding author.

E-mail address: teniapanag@aegean.gr (M. Panagiotou).

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and can be visual, depicting emotions as cartoons [7], pictures [8], or emoji [9]. Cognitive measures can also be verbal, using emotion words [3]. The latter type of emotion measurement, i.e., cognitive verbal self-report, is the focus of this review, as it is linked to the development and use of emotion lexicons.

The number and variety of the existing emotion lexicons and measurement instruments are indicative of the variety in theories and views as regards the number of human emotions, emotion categories, emotion dimensions, the hierarchy of these emotions, their universality, and other aspects of emotion. Verbal report, even with all its failings, is considered the most accurate means of assessing the experience of emotion [10]. Furthermore, self-report questionnaires is the preferred method to access consumers' emotions because data can be collected faster, more easily, and with less expenses than using implicit methods, by requiring no equipment and by engaging multiple participants at the same time [11]. What is more, self-report questionnaires offer many advantages when studying emotions cross-culturally [12]. As Dutton & Lyons (2021) pinpoint however, it is imperative that researchers pay close attention to characteristics of languages spoken by their participants that may lead them to respond to questions a certain way. Existing food-evoked emotion lexicons consist of terms varying in number and form, and emotion measurement questionnaires come in varying forms. According to the aim of the study and the theoretical assumptions of the researcher, the appropriate method is implemented.

Emotions are experienced, expressed and explained within a specific cultural and linguistic context, as discussed in detail in chapters 3.1 and 5 of this review. The various ways and the degree to which culture and language form and affect food-related emotion expression and measurement is not a point of convergence [5, 13–15]. This is especially evident in emotion lexicon development and emotion measurement instruments in cross-linguistic and cross-cultural studies. As food product companies are trying to grow bigger in a global market, is developing universal emotion measures or translating an instrument that works into other languages the best way to measure emotion?

2. Focus, aim, sources, and methods of review

The focus of this review is the development of lexicons of food-elicited emotions, and their implementation in consumers' verbal self-reporting questionnaires to identify and measure these emotions. This review covers the trends in emotion lexicon development approaches and methods, and emotion measurement questionnaire design techniques of the last decade, as well as some of their adaptations, and presents them in a systematic way according to the approach, method and technique used and the objectives of study. This categorization will be useful to emotion lexicon developers, product developers, marketers, and other parties that work with consumers. The aim of this review was to identify the various possibilities in how to develop and utilize a lexicon of food-elicited emotions, to identify key trends, to check the strong and weak points of each, and present them in a critical qualitative, not quantitative, manner.

The sources used to search for candidate studies are: ScienceDirect.com, academia.edu, mendeley.com, scopus.com, online.wiley.com, heal-link.gr, scholar.google.com during the months of October 2020 through March 2021. The papers selected by the authors had to contain the words/phrases: emotion lexicon (development), emotion measurement, questionnaires, emotions, food and had to be published in 2010 and since. The review was decided to depict the last decade and 2010 was the year that the first food-related emotion lexicon and measurement tool was published.

The inclusion criteria were the following:

- (a) to be about the food as a whole experience, not about a specific sensory or chemical property of the food under study.
 - (b) to be original as regards the methods, tools, and techniques applied.
- We then noticed that there were interesting adaptations of them and

decided to include those, too. We did not include straightforward applications of existing tools and methods though.

- (c) to have emotion lexicon development as its main aim or the means to other ends. The other ends were a) conceptual profiling of foods, b) emotion measurement, and c) the study of food-elicited emotions.

The search yielded twenty-two (22) original methods and thirty-eight (38) adaptations of these methods that had added value. Other related reviews were consulted. We also checked every reference made in the papers selected. Issues that arose as to the inclusion or exclusion of studies were solved after discussion between the authors, the criterion always being originality as regards emotion lexicon development and application.

The final list of studies reviewed are presented in Table 1, categorized according to the aim of study and their being an original method or an adaptation. For each emotion lexicon development study/stage of study, specific characteristics are presented. Columns G-G present aspects of emotion lexicon development. Columns H-J present aspects of emotion measurement using the respective lexicon. Columns K and L present the foods and the language under study for each case.

3. General aspects of emotion lexicon development

3.1. Language and culture, translatability of emotions and emotion words

Cultures are complex sets of shared meanings, values and, corresponding behavior and cultural products. [12]. The same applies to languages and emotions. The construction of emotional meaning is determined by social, cultural, and linguistic factors. The social environment is a major regulator of emotional display and culture is a central factor that mediates emotional experience, conceptualization, and expression. Thus, emotions are culture- and language-specific constructs, fundamentally biocultural in nature [12]. There are both quantitative and qualitative divergences in how different languages lexicalize emotions [16]. On the other hand, emotion words in many different languages appear to refer to the same, or very similar phenomena. And, while there is no consensus about what exactly constitutes a universal level of emotions, there is no denying that this universality exists [16,17]. From a quantitative perspective though, there are considerable differences among languages as to the number of distinct emotions that are lexicalized in them or the number of emotion words available to express a specific emotion. On these grounds, lexical designations of emotions should be translatable across languages. However, the absence of exact correspondence between words in different languages is one of the fundamental presuppositions in semantic analysis, leading to the conclusion that equivalence of any two emotion words in two different languages is always a matter of degree [17].

In cross-cultural studies or when using pre-existing emotion lists compiled in other languages, translation of emotion terms is an issue. Most research utilizes professionals in translations of different languages, and the terms are back-translated for confirmation purposes [15]. The terms do not usually exhibit a one-to-one correspondence between different languages. Sometimes the meaning of a word in the source language takes two words to be covered, but it is also possible that the meaning of two words can be covered by just one in the target language. For example, a comparative cross-cultural study of affective terms showed that the dimensional organization of odor-related affective terms in a given culture better explained data variability for that culture than data variability for the other cultures, thus highlighting the importance of culture-specific tools in the investigation of odor-related affect [18].

The process of translation and back-translation was followed by van Zyl & Meiselman (2015) when working with English and Spanish. The English terms were translated from English into Spanish and back-translated. Another approach is to assign translation to bilingual experts [19]. In Thomson & Crocker's study, bilingual psychologists trans-

Table 1
Schematic review of food-related emotion lexicon development studies and their methodology features.

A	B	C	D	E	F	G	H	I	J	K	L	M		
aim of study	term sources other than consumers	focus groups	stimulus for term elicitation	lexicon list	word class of terms	ordering of terms	questionnaire response format	stimulus for emotion measurement	context/setting of measurement [other than lab/Central Loca- tion/Internet]	foods	language	references		
emotion lexicon development	original	p, e	CATA	n	16 t	a	r	5pt	n	lc	wine	Italian	[4]	
		ls	H	t	12 c	a, p	r	150mm	t		beer	Spanish	[27]	
		ls	fl, d	n, t	43 t, 9 c	a	r	150mm	t		beer	Spanish English	[28]	
		ls			49 t	a	r				x	German	[30]	
adaptation	p	fl, st, d, fl	t	15 c	a, n	p	r	10cm	t	lc	wine	Spanish	[40]	
	p			33 t + e	a, n, p		r	CATA	n, t	ws	milk, water, red wine, chocolate, muesli bars, popcorn	English	[97]	
conceptual profiling	original	p	fl, CATA	n, t	64 t	a, n, p			n, t		chocolate	English	[21]	
		p, k	fl, d	t	43 t, 9 c	a, n	r	150mm	t		beer	English	[62]	
		p	fl, bws	t	24 t	a	n	r	15cm	t		beer	Spanish	[69]
	adaptation	p	fl, d	p, t	25 t	a						chocolate	English	[75]
		p			16 t	a, n		r	CATA	t		beer, wine	Dutch Portuguese	[5]
	adaptation	p	I	t	27 t	n			7pt		real	cashew nuts, peanuts, chocolate, fruit, processed tomatoes	Italian	[90]
		p	H	t	34 t, 38 t, 50 t	a, n, p		r	CATA	t		tomatoes blackcurrant squash	English	[36]
		p			24 t, 12 c	a, n			CATA (choose 1 only)	t		salted snacks, potato chips, yogurt, cheese, snack bars, fruit	English	[61]
		p										amazing & within product categories	English	[3]
		p										blackcurrant squash chocolate and hazelnut spreads	English	[36]
]motion measurement	original	p	fl, CATA	n, t	39 t	a	a	5pt	n, t			English	[3]	
		p	H	t	36 t	a, n, p	a, r	CATA, 5pt	t			English	[36]	
	adaptation	p	fl, I, CATA	t	23 t + e	a, p		r	5pt	t	lc	chocolate and hazelnut spreads	English	[38]
		p	fl, d	t	44 t	a, p	a	a	5pt	t	real	coffee	English	[6]
p	fl, CATA	t	14 - 17 t	a, n, p	a	a	RATA	t	real	cola, chocolate, crisps, burgers, vanilla pudding [blind, informed]	Dutch	[55]		
p, e	Rcp	t	12 t	a, p		r	5pt	t			milk, water, bread, sugar	German	[33]	

(continued on next page)

Table 1 (continued)

A	B	C	D	E	F	G	H	I	J	K	L	M	
aim of study	term sources other than consumers	focus groups	stimulus for term elicitation	lexicon list	word class of terms	ordering of terms	questionnaire response format	stimulus for emotion measurement	context/setting of measurement [other than lab/Central Loca- tion/Internet]	foods	language	references	
study food-elicited emotions	adaptation	p	St	n	25 t	a	a	5pt	n, t		various un/branded comfort foods	English	[66]
		p	Rt	n	39 t	a	a	5pt	n, t		cheese	English	[73]
	original	p			13 t	a, n, p	a	RATA	t	lc		Dutch	[55]
		p			19 t	a, n	a	CATA, RATA	t		chocolate, yogurt	Dutch	[93]
		p			39 t / 44 t	a	a	5pt	t	real	coffee	English	[42]
		p			10 t	a	r	RATA	t	real	wine	Portuguese	[92]
		p			39 t	a	r	CATA	t		white wine, honey, peanuts, chocolate, cheese	English	[26]
		p			25 t	a	a	5pt	t		crackers, white bread, cashew nuts	English	[43]
		p			25 t	a	a	10cm	t		savory snacks with Bambara flour	English	[40]
		p			18 pairs of opposites	a, n, p	a	5pt	t		apple cider	Spanish German	[47]
adaptation	p, e	mod. CATA		12 c	a, p	r					substitutes, vegetables, bakery products	English French	[19]
	p	GATA	t	10 t + d + e	a	r	temp. CATA	t		chocolate	English	[49]	
	p	St	n	15 t	a	a	9pt			meatloaves	Dutch	[41]	
	p, e	st, d	n	66 t	n		3pt t			beverages, beer	English Spanish	[13]	
	p	d, n, fl	t	19 t	a	a	9pt	t	real	wine	English	[50]	
	e	H	t	17 c	a, n, p	a				x	Brazilian	[48]	
	p			39 t	a	a	5pt	t		breakfast drinks	Dutch	[52]	
	p	fl, bws	n, p	33 t	a, n, p	a				chocolate, soup, pizza, beer/wine, stink, yogurt	Spanish	[95]	
	p			43 t	a	a				artificial & natural sweeteners in tea	English	[59]	
	p			39 t	a	a				breakfast drinks & dessert products	English Dutch	[53]	

(continued on next page)

Table 1 (continued).

A	B	C	D	E	F	G	H	I	J	K	L	M	
aim of study		term sources	stimulus for term elicitation	lexicon list	word class of terms	ordering of terms	questionnaire response format	stimulus for emotion measurement	context/setting of measurement [other than lab/Central Location/Internet]	foods	language	references	
		other than consumers	focus groups										
		p	CATA	20 t	a	a	5pt	n, p, lc		chicken eggs	English	[76]	
		p	fl	10 c	a, n	r	line + CATA	t	ws	beer	English	[63]	
		p		38 t / 12 c	a, n, p		5pt, 15cm	t		chocolate, beer	Spanish	[65]	
		p		66 t	a		3pt t	n		beverages, beer	English, Spanish	[14]	
		p		19 t	a	a	9pt	t	lc	wine	Portuguese	[74]	
		p		10 c	a, n, p	a	line	t		beer	English	[57]	
		p		42 t	a	a	CATA	t	videos	breakfast meal	English	[56]	
		p		25 t	a	r	100mm	t		beer	Dutch	[44]	
		p		26 t	a	r	10cm	t		wine	Spanish	[89]	
		p	t	53 Ch / 29 Kor	a, p	r	mod. RATA	t		coffee	Chinese, Korean	[15]	
		p		39 ESP / 9 EmoS / 24 GP				t		cashew nuts, chocolate	English, Italian	[60]	
										[ESP], canned tomatoes			
										[EmoS], potato crisps [GP]			
		p		25 t	a	a	5pt	t		vegetable juice products	English	[54]	
		p	t	10 t	a		temp. CATA	t		beer	Dutch	[58]	
		p		10 t	a		CATA	p, t		various	English	[88]	
		p		11 t	a	r	CATA	t		beer	Italian	[81]	
										real, VR, VR-360°			
		p		11 t	a	r	CATA	t		real, real-like, VR-360° video, VR-3D modeling + 360° photos	Italian	[78]	
										real, VR	wine	English	[51]
		p		33 t	a	r	CATA	t		videos	beer	English	[45]
		p		60 t	a		5pt	t		real, VR	tea break	English	[57]
		p		25 t	a		mod. RATA	t		snacks			

Abbreviations per column:

C: p = pre-existing list of terms, e = experts, ls = linguistic sources, fl = free listing, d = discussion, st = sorting task, rl = rating lines, rs = rating scales, bws = best-worst scaling, i = interviews, fcp = free choice profiling.

D, t: n = food names, p = food pictures, t = tasting, lc = linguistic context.

E: t = terms, c = clusters / categories, e = example, s = sentence, d = definition.

F: a = adjectives, n = nouns, p = phrases.

G: a = alphabetical, r = random.

H: pt = point scales, mm=millimeters (line), cm=centimeters (line).

J: lc = linguistic context, ws = written scenario, VR = Virtual Reality.

general abbreviations: CATA=Check-All-That-Apply, RATA=Rate-All-That-Apply, mod =modified, temp.=temporal, Ch = Chinese, Kor = Korean, ESP = ESsense Profile®, EmoS = EmoSense, GP = Global Profile.

†1: makes me feel more like that, †2: makes me feel less like that, †3: not applicable.

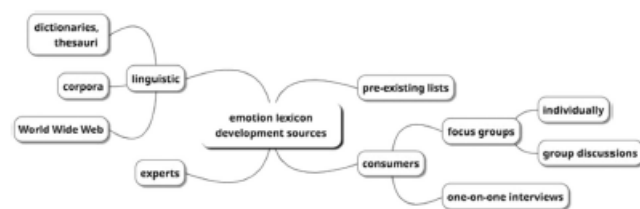


Fig. 1. Emotion lexicon development sources.

lated the terms from English into idiomatic Italian, French, or German, making additions and deletions as appropriate. A similar approach was followed by Silva et al. (2016), who assigned the translation of Dutch and Portuguese terms into English native speakers of Dutch and Portuguese, respectively. The resulting translations were then agreed upon by at least 3 authors for each language [5]. An interesting and innovative technique was applied in a cross-cultural study by Hu and Lee (2019). For each English term they chose 2-3 candidate words in Korean and Chinese from dictionaries, and they made a multiple-choice questionnaire to be answered by consumers native speakers of Korean and Chinese. For each English term, the participants could choose either one of these 2-3 terms or "I do not know" or "other". Their approach was justified by the fact that English is taught as the first foreign language in all primary schools in Korea and China as early as the 3rd grade [15].

Language is inextricably linked with culture, the context in which food and food consumption is experienced. Food as a concept is learnt through associated learning, dietary habits are formed by family and social practices, and language provides the medium and the linguistic context in which food-evoked emotions are expressed. Mental frames in general, and the mental frame of food more specifically, vary cross-culturally as do their culture-specific connotations [20]. Current research has shown that the perceived health effects of food products are more important for Asian consumers than Westerners and that Western participants tend to express high arousal emotions when assessing food products while Asian participants express low arousal emotions [21]. These differences lead to the conclusion that emotion lexicons should be developed using linguistic and cultural data from the frame in which they are going to be exploited, and that using pre-existing lists of food-evoked emotions developed in another language should be done with caution.

3.2. Emotion terms collection and identification - sources of terms

Emotion lexicon development can either be the main objective of a food-related study or a major step towards creating an emotion measurement instrument. Either way, there seem to be certain steps and methods towards the creation of such a list (Fig. 1).

3.2.1. Using pre-existing lists

Before 2010, food scientists relied on research within the psychology and consumer domains for lists of emotions, as was the *Consumption Emotion Set* [22], for categories and hierarchies of emotions [23-25], as well as for measurement methods and tools, such as the *Profile of Mood States* (POMS), the *Multiple Affect Adjective Check Lists* (MAACL, MAACL-R), the *Emotion and Odor Scales* (IEOS, SEOS, GEOS, UniGEOS).

Since 2010, however, the interest has shifted towards the consumer and food domains, as more and more emotion lexicons are being developed in various languages targeted at specific products and groups of consumers. Within the food science domain the first study in English is that by King and Meiselman, the *EsSense Profile*®, a measurement tool for consumer emotions associated with foods, aimed for commercial

usage [3]. The initial list of terms was taken from existing mood and emotion lists compiled by and for psychiatrists and psychologists. Feedback was also provided by consumers. For the present review this study was taken as a chronological starting point since it was the first study done specifically for foods.

Using pre-existing lists from other countries speaking the same language [e.g., list of terms in Spanish developed in Spain to be used in Mexico [14], or list of terms in English developed in the USA [3] to be used in New Zealand [13,26]] is an option but needs to be confirmed. Using lists developed in other languages after applying valid translation methods can be used when the cultures under study are quite similar to each other [e.g., China and Korea [15]], but the need to run validity checks still exists.

3.2.2. Collecting terms from scratch - applying linguistics methodology

On the other hand, there are studies that have created emotion lexicons from scratch, without using existing term lists. Focus groups of consumers is usually the first step in such a process for term collection. These studies are mainly food category specific and have used consumers' feedback to create the respective lexicon. Consumers are usually asked to taste samples and provide emotional responses to them in free listing tasks, either individually or after group discussions. Beverages, especially, beer and wine, are the foods that have been studied the most in this way [5,27,28].

When developing an emotion lexicon, a variety of sources should be used to achieve maximum validity. Linguistic sources, such as dictionaries, thesauri, and corpora, are especially useful for word disambiguation and synonymy checks. Another linguistic source available thanks to modern technology is the World Wide Web.

3.2.2.1. Thesauri, dictionaries. Reference works such as thesauri and dictionaries, even though they are not usually the source of terms for an emotion lexicon, serve as a useful tool, for meaning disambiguation, synonymy checks, cluster formation, use information and so on. These tools are usually used during the term selection process to narrow down the list.

3.2.2.2. Corpora. A corpus is a finite-size body of machine-readable authentic texts, sampled to be representative of a language or language variety [29]. Corpora can provide word frequencies and linguistic patterns and can be used for qualitative and quantitative analysis. They are not very often used in consumer studies. However, in languages that no emotion lists exist yet, corpora have been used in from scratch lexicon development [30], as they provide synchronous linguistic patterns.

3.2.2.3. The world wide web. The Web, its search engines and lexicon database, has been used as a source of emotion terms in emotion lexicon development from scratch [30]. The Web has some very distinctive features that render it a unique tool for linguistic research:

- it is connected and thus it can be examined and used as a single unit.
- it contains authentic spontaneous speech.

- (c) it contains a new style of speech: written speech with features of oral speech.
- (d) it is inclusive and thus all linguistic styles within a language can be found and studied.
- (e) it always contains up-to-date language which makes it ideal for synchronic research but also provides data for diachronic research.
- (f) it is self-productive because of the wikis, blogs, and forums daily updated and created.

There are however some disadvantages in its use:

- (a) its dimensions are unknown and constantly changing.
- (b) replicability of results is impossible, because of the use of algorithms.
- (c) because of its broad heterogeneity it can be a double-edged sword for a researcher.

According to Sinclair “the World Wide Web is not a corpus, because its dimensions are unknown and constantly changing, and because it has not been designed from a linguistic perspective” [31]. Nevertheless, the number of researchers that are using the Web to create corpora and as a corpus itself has increased lately.

“During the last decade, the amount of content that is published online has increased tremendously, primarily due to the wide adoption and use of online social media (OSM) platforms. The content produced within OSM has the potential to be used for understanding, modeling and predicting human behavior and its effects.” [32]. The Web can thus be used mainly not for quantitative but for qualitative research to identify patterns and tendencies.

A distinctive study within the food science field is that by Gmuer et al. (2015), a linguistic-based systematic approach to design a food-associated emotion lexicon in German. Since there was no food-related emotion list in German, a three-step approach was followed to investigate which words are appropriate in the German language for describing emotions associated with food products. The initial list of terms, single-word adjectives only, was accumulated using thesauri, electronic corpora, dictionaries, the Web (Google search, lexicon-database), and the emotion hierarchy by Storm and Storm (1987). The aim was to extract the German emotion terms that were more actively used in everyday situations and met specific syntactic criteria (i.e., co-occurred with the verbs *I feel/I am* within the same sentence). The terms were then evaluated using several linguistic-related criteria to identify the terms that possess potential emotional connotations or describe an overall emotional condition, including evaluative terms, following Storm and Storm’s taxonomy. These terms were assembled through consumer free-listing or free-labeling tasks. An online survey followed in which the final candidate terms were rated for their food relatedness. Thus, the criteria for term selection were (a) emotionality, (b) food-relatedness, (c) being up to date. Being single-word adjectives and following specific syntactic patterns were prerequisites. The terms approved by at least two-thirds of the participants formed the lexicon. The next step of the study was to characterize the emotion terms as positive, negative, or neutral, following the methodology by King and Meiselman (2010), to be able to interpret the food-related emotional experiences assessed with these words and check whether this hedonic asymmetry was true for the German language as well, which was confirmed.

Using linguistic sources as a starting point has the advantage of accumulating a variety of terms which consumers might not recall during a free-listing task. This is especially useful when creating an emotion list from scratch, without using specific foods as stimuli, in order to develop a comprehensive language-specific emotion lexicon from which to form food-specific lists and tools. Nevertheless, several words in the initial list may not be understood or may be unknown to the consumers. The use of other sources and screening by consumers are needed to capture the real contemporary use of language.

3.2.3. Experts

Experts, other than the main researchers of a study, such as psychologists, linguists, translators, sometimes participate to offer guidance

in the lexicon development process without providing the terms themselves, except in the case of the Empathic Food Test [33] (Table 1).

3.2.4. Consumers: focus groups, group discussion, interviews

Consumers have become the main source of data for emotion lexicon development as they simultaneously express the linguistic, cultural, and social aspects under study. In focus groups, in central location tests, online surveys and real consumption settings, consumers of the food product category in question are asked to provide emotion terms as a response to various stimuli. Three distinct types of stimuli are used in food-evoked emotion studies in the early stages of term generation or identification, either individually or in combinations: food pictures, food names, and actual food tasting. The latter is the most frequently used.

A focus group is an interview technique that brings together 6–10 participants and a moderator, in the framework of a structured discussion about a specific topic and is especially important when little is known about the topic. It is a qualitative method that provides deeper insights into beliefs, by encouraging participant interaction socially [34], as is the case in real life when discussing foods and products in general. Focus groups are usually used in the early stages of emotion lexicon development and in food-evoked emotion studies in general for term generation and term identification. This method has been applied in several cross-cultural studies and is gaining importance in consumer behavior related to food and beverages [5]. Focus groups have proven especially useful for the sensory characterization of products as well.

Most reviewed studies, as depicted in Table 1, have used focus groups of consumers to generate emotion terms in free listing tasks, to identify terms from given lists using CATA (Check-All-That-Apply), rating scales, RATA (Rate-All-That-Apply), best-worst scaling -where participants are presented with the object under investigation with a set of 4 or 5 words and asked to decide which of these words they feel is most and least closely associated with what they are experiencing in response to the object-, to decide on food-appropriateness of terms or to categorize emotion terms in sorting tasks either individually or after reaching consensus through discussion. The number of participants and the number of groups per study varies widely though (Table 1).

The members of focus groups can either work individually taking notes on their own or work as a group, discussing the topic in question and reaching a consensus. Most focus groups reach a consensus via discussion. If they are working as a group, the moderator is taking notes while the participants are exchanging views. Both techniques, individual and group work, have their benefits and drawbacks. Group work is closer to real-life conditions of consuming and talking about food as a social practice but has the potential danger of forming false tendencies as individuals with less powerful personalities tend to assimilate their opinion to that of the group’s. The method of interviewing consumers one-on-one is used as an alternative or in addition to groups and can help shy personalities open up and co-operate more freely but is extremely time consuming. The Repertory Grid Method (RGM) can be used in interviews to collect information on food related perceptions. The RGM is considered an efficient interviewing procedure, able to generate series of attributes used by consumers to discriminate amongst foods. Three stimuli are presented at once to the participants who are asked to describe the similarities and the differences amongst them [35]. Modified versions of the RGM have been developed and used in sensory and emotional characterization of foods [36–38].

In the reviewed studies, there was a case where the participants’ views underwent semiotic analysis [38], since linguistic context disambiguates meaning and the use of semiotics allows a deep analysis. The semiotic approach “decomposes” the texts in order to deeply investigate their meaning by identifying the semantic units in the text. The words or expressions referring to similar meaning are grouped together and recognized as belonging to the same “semantic category”. Then, the inter-relationships (e.g., oppositions) between the different semantic categories are investigated. Semiotics has a long tradition in advertising

and communication analysis and has developed various approaches to research in marketing; it is currently used to study brands, advertisements and consumer styles and recently it was applied in storytelling and consumer food studies [38].

Segmentation of focus groups participants, i.e. how participants of focus groups are grouped together, can be made on the basis of gender, age, social status and other characteristics according to the aim of study but demographic criteria seem to affect food-evoked emotions less than food consumption habits, ways of dealing with the products and the expectations of their benefits [39]. Therefore, unless the focus of the study demands otherwise, focus groups should be segmented based on food consumption and purchase criteria. Food related studies have shown that consumers of a food category or product create very different emotional profiles from non-consumers.

If the emotion lexicon development process is not food-specific, then demographic criteria can be applied. In the studies reviewed here, research shows that women express emotions at a higher level than men [40], they appear to be more elaborate in their emotion terms production and exhibit greater granularity, i.e., the ability to distinguish between different emotional states in a more fine-grained way. As regards age, as people grow older they more often seek emotionally meaningful goals, food neophobia increases with age, and food type consumption is affected by health issues [41]. These factors need to be taken into account when working with focus groups.

3.3. Developing food- and non-food-specific emotion lexicons

Emotions are by definition stimulus dependent. Thus, studies within the consumer and food domain are usually food specific. It is proven and generally accepted that lexicons should be food category specific to be effective and accurate when used to describe and measure food-evoked emotions. Discussion on the advantages of each method, i.e., using a general food related emotion list versus using a consumer-defined emotion list, is presented in chapter 4 of this review. For example, the Coffee Drinking Experience captured changes in mental state better than the non-food-specific lexicon of the EsSense Profile® [42]. Table 1 summarizes the foods studied for developing food specific lexicons. Some examples of foods frequently studied are coffee (3 studies), wine (11 studies), chocolate (12 studies), and beer (15 studies) (Table 1). Other studies focus on food products containing sustainable ingredients, namely Bambara flour [43], products with protected designation of origin, namely apple cider [40], and non-alcoholic beverages, namely non-alcoholic beer [5,44]. There seems to be an intense interest in studying emotions elicited by beverages and comfort foods. This might be due to the fact that people consume beverages, especially alcoholic drinks, and comfort foods, such as chocolate, to make certain feelings duller or more intense. To make negative feelings duller people in some cultures tend to consume beverages [45,46]. On these grounds, beverages are culture-specific³ and studying them provides insight into the culture under study. Our cultural heritage does not only determine the type of products we are familiar with and learn to like but also the emotional connection that we have with those products. Wine for example is part of everyday life in France, Italy, Spain, and Portugal, where consumers expect it to be part of the meal, while in some other countries wine might be seen as a way of reducing stress [46].

There are however food-evoked emotion lexicon development studies that are not food category specific, which either use a variety of food categories as stimuli or no food stimulus at all (Table 1). Some of these aim at developing emotion lexicons, emotion measurement instruments, conceptual profiling instruments, or at studying various aspects of food-elicited emotions, such as well-being [47], socioeconomic status [48], emotion classification [19], temporal dynamics of emotions [49], culture and language [13,14], context [50,51], food choice prediction [52–54], health labels [55], health concerns [56], liking [36,44,54,57–59], sensory drivers of emotions [60,61].

Table 2
Universally applied and optional criteria, applied in some studies, for term selection during emotion lexicon development.

universal criteria
to describe emotions [not moods nor evaluative terms]
to describe food-evoked emotions
to be clear in meaning
to be politically correct [not offensive to persons with mental illnesses]
to be up to date
to have a high frequency of use
to be statistically discriminant and not redundant
additional criteria
to be clearly positive or negative in context
to fulfill grammatical criteria [e.g., be a single-word adjective]
to fulfill syntactic criteria [e.g., 1 food + adjective]
to be in relation to food, not in relation to another person [e.g., envy, pride]

3.4. Criteria for term selection

While reviewing emotion lexicon development studies, certain criteria for the selection of emotion terms that form a food-related lexicon immerse (Table 2). These can be summarized in two main categories: universal criteria, applied by most researchers, and optional criteria, applied according to the needs of each study. The decisive factors for term inclusion in an emotion lexicon are that the terms refer to distinct food-evoked emotions (excluding moods, and hedonic terms), currently used by most consumers at a high frequency. There are also some additional inclusion criteria applied by some studies, such as grammatical and syntactic criteria, or how clearly positive or negative the terms are when related to food. Modifications to inclusion criteria can be made due to feedback from participants on unclear, or potentially offensive terms.

3.5. Lexicon word class, form, and number of terms

The list of an emotion lexicon can consist of adjectives only, or nouns only, or adjectives and nouns, or adjectives and phrases, or adjectives, nouns, and phrases (Table 1). This is a decision made by the researchers according to the aim of study and can be affected by consumer responses during the lexicon development process and the language studied.

An emotion lexicon can consist of terms only, or clusters of emotions (emotion categories) formed either by applying statistics, researchers, and participants, or by statistics and researchers, or by statistics only, or by participants only. There is also an emotion lexicon presenting its terms in pairs of opposites, another presenting each term with a sentence clarifying the emotion, and another one presenting each term with a description (definition) and an example (Table 1). The latter follows sensory attribute list guidelines.

Emotion lexicons appear in either the form of lists of terms or sets of emotion categories/clusters with or without superordinate/representative terms. Clustering of emotion terms can be done by participants of a study or by statistics. If the process is done by the participants, a sorting task is usually used (participants may also be asked to choose the representative emotion term for each emotion category) and hierarchical clustering is then applied to form the final categories. This process is preferable when developing a non-food-specific lexicon. Emotion categories can also be formed by applying cluster analysis to the responses of participants to an emotion measurement questionnaire consisting of separate terms. This process is usually preferred when developing a food-specific emotion lexicon. These statistical methods of forming clusters of emotions make the process quick, easy, objective, and reproducible. Clusters of emotions are especially practical when the emotion lexicon is going to be used for emotion measurement purposes, as this form provides a concise and semantically clearer set of terms, making the process quicker and easier for the participant. According to Eaton et al. (2019) both forms of the lexicon—one with clusters and one with separate terms—are consistent in their discriminating

ability and one should prefer the shorter form (with clusters) for product comparisons [62]. Shorter lexicons could be more sensitive to first position effect though [63].

As regards the number of terms in the reviewed studies, an emotion lexicon can consist of 9–66 terms with a median of 26. Consumer-defined lexicons tend to consist of fewer terms. The number of terms depends on the aim of study. For instance, when the focus of the study is cultural comparison or conceptual profiling of a food category then more terms seem to be necessary to capture habits, beliefs, conceptualizations, associations (in the studies currently reviewed 66–86 terms) (Table 1).

3.6. Dimensions of emotion often depicted in food-related lexicons: valence and arousal

3.6.1. Valence (also called pleasantness): positive and negative terms

An emotion is a valenced affective reaction to perceptions of situations [22]. This definition of emotion highlights how important it is to include the valence dimension when studying emotions. The valence dimension can be conceived as an axis with pleasure and displeasure, or attractiveness and averseness at its ends. It is an emotional value associated with an event, object, or situation [2]. Valence is depicted in the distinction of terms as positive and negative.

In psychiatry and psychology, most emotion lists refer to five or six basic emotions, namely love, joy, anger, sadness, fear, and perhaps surprise [24]. They contain mostly negative emotions probably because the focus is on dealing with mental illnesses. In the food studies reviewed here, positive emotions seem to outnumber the negative ones [3,6,33,37,38,55,64–66], since food consumption is thought to be a generally pleasurable experience for healthy humans. This phenomenon is called “hedonic asymmetry” and suggests that people prefer positive rather than negative words to describe food experiences, because healthy people tend to like eating and tasting food, and because food products are formulated to be appealing and liked by consumers [65].

When developing an emotion lexicon, researchers sometimes choose to include a balanced amount of positive and negative terms, while others choose to include mostly positive terms in accordance with the “hedonic asymmetry hypothesis”. There are also terms that are both positive and negative or neither positive nor negative and are thus characterized as unclear, neutral, or unclassified as regards their valence. These neutral terms should not be considered lacking information and thus be left out of emotion lexicons. Neutrality of emotion is a state on its own. Neutral terms show a lack of positive or negative appraisal, and a lack of arousal. Depending on the food/ beverage product type, neutrality of emotion may or may not be desired. It should be noted that the terms are not labelled when presented to the participants. The labels positive, negative, and neutral are used when setting up the study and when analyzing the data.

Most emotion lexicon development studies use existing lists of positive and negative terms to classify their terms. There is also a method that provides classification of emotion terms implicitly. Participants are asked to think of their most and their least favourite foods and characterize them using emotion terms. This way, the researchers get a list of positive terms, i.e., emotion words that describe the most favourite foods, and a list of negative terms, i.e., emotion words that describe the least favourite foods [3,48]. In emotion measurement questionnaires, the overall liking question can help distinguish between positive and negative terms, even without characterizing the terms one by one.

3.6.2. Arousal (also called engagement): activation and deactivation

Arousal or engagement is another key dimension of emotion that can be conceived as an axis with felt activation and deactivation at its ends or high to low energy feelings. It is related to interoceptive sensitivity [2]. Interoception is a broad term that refers to perception internal to the body's surface, and incorporates sensations from the visceral organs (e.g., heart, lungs, stomach) along with autonomic, hormonal, and

even immunological signals. Since emotional experience incorporates physiological and visceral changes, there has also been some speculation regarding how interoceptive sensations contribute to the processing of emotions [67]. According to research, emotions with the same valence (e.g., anger, fear, sadness, shame) produce a similar influence on judgments and choices [23]. That is why arousal can add a lot of information and understanding when studying emotions. For example, anger and sadness are emotions of the same valence but very different affect (arousal). Both emotions express that someone feels wronged in some way but sad people become inactive and withdrawn while angry people become more energized to fight [23].

The two main dimensions of emotion, valence and arousal, need to be taken into consideration when developing emotion lexicons. Evolutionary reasons have made us want to minimize experience of negative emotions and maximize experience of positive emotions [19] and food consumption is in general a positive experience for healthy individuals. The decision as to whether a balanced lexicon is needed or not depends on the aim of the study. If the focus of a study is a new food product, a variety of terms both positive and negative are needed to capture food acceptability and food-evoked emotions. The arousal dimension of emotions might be of special interest when studying beverages, as the reviewed studies here show, or when studying functionality² of foods and mealtimes. For example, people consume main meals to get energy; snacks and desserts are considered a reward; dinner is consumed for pleasure; breakfast is consumed out of habit [41]. However, research has shown that sub-categories of products have different emotional associations in different cultures, especially beverages. As a result, it could be concluded that what is pleasant and what is not is culture- and food-specific and should be studied within context [13–15,68].

4. Emotion measurement – questionnaire design

Lexicons of food-elicited emotions are usually developed to be used for emotion measurement. Decisions taken during the lexicon development process affect the emotion measurements that result from the tool.

One of the first decisions to make is whether the length of the lexicon list can be used as compiled during the emotion terms generation and collection process or needs reducing. In general, when working on a new food product, or working in a language whose waters are uncharted, or when the aim is to explore the concept of a food category, then the full version of the lexicon should be used. However, there are cases when a reduced version of the lexicon is preferable to make the process quicker, easier for the participant, and more focused. This reduced version can either be non-food-specific, as is EsSense25 [66], or it could be food-specific.

4.1. Clusters versus terms

The use of clusters or emotion categories instead of terms is a good choice especially in reduced lexicon forms and in cross-cultural studies (Table 3). As regards cross-cultural studies, it is linguistically and semantically preferable to translate emotion categories instead of individual terms, because as already explained absolute linguistic, semantic, and pragmatic equivalence for individual words across languages is a rare phenomenon.

In Mora et al. (2019), following the procedure of van Zyl and Meiselman (2015) allowed for an easy filtering of terms for the study of the emotional response. As a consequence, the test was shorter, clearer, and easier to understand and to complete by consumers, as stated by the authors. In the context of the shorter list, overlapping meanings were less frequent and the terms became more differentiated, even though they may be less precise. Thus, an unintended benefit of the shorter list

² The functions that people ascribe to specific foods and mealtimes expressing their expectations and motives for consumption.

Table 3
Available and recommended [indicated with +] options regarding food-related stimuli, the form of the emotion lexicon list, and the response format questionnaire, according to the aim of study.

aim of study	stimuli		lexicon list		response format		
	food pictures /names	testing blind/unbranded	clusters	terms	CATA	rating scales	RATA
food-specific lexicon	+	+	+	+	+	+	+
non-food-specific lexicon	+		+		+		
cross-cultural study to distinguish within food category	+	+	+	+	+	+	+
to distinguish across food categories	+		+		+		
to develop emotion lexicons	+	+					
to develop emotion measurement instruments		+					
to develop conceptual profiling instruments	+						
to study various aspects of food-elicited emotions	+	+					

was that there seemed to be more agreement on how the words were interpreted. The words in the shorter list had a more distinct meaning, because there are simply fewer words of similar meaning in the shortened list [66]. This was due to the fact that emotion terms were easier to deal with not only because they were fewer, but also because their meaning was clearer to the participants. Word sense disambiguation is done within context, i.e., people understand the meaning of words in relation and in contrast to the words that “surround” them. The interpretation of the emotional map obtained after the improvement of the lexicon was clearer than the one obtained from the complete - non reduced lexicon. The new emotional lexicon of beer improved 1) the efficiency of the research in terms of discrimination among samples, 2) the simplicity of use by the consumers [69].

This leads to the conclusion that linguistic context -more specifically using clusters of emotions for emotion measurement- disambiguates meaning. The meaning of each word is clearer when the word is presented as part of a group. This is obvious in sorting task procedures where words may move between factors indicating that there is either disagreement among the participants about what the words mean, or agreement but the meaning changes depending on the specific set of words being used [66]. As a result, the participants still have the terms that form the cluster available in order to grasp the emotion category concept but rate the category as a whole.

As regards emotion measurement, when comparing the differences among mean emotion ratings for the same words between questionnaires (meaning EsSense Profile® and EsSense25), there appears to be a tendency for the ratings to be greater when using EsSense25. One potential explanation for this is halo-dumping, a response bias that occurs when individuals are given a limited number of response alternatives with which to describe or rate a product [70]. In such situations, when the questionnaire respondents experience emotions for which appropriate words are not available on the list, they choose emotion words that do appear on the list and are close to the desired meaning resulting in higher ratings, thus “dumping” values to the available responses [66].

4.2. Language as context in emotion measurement

People use the same emotion words in very different ways to communicate their feelings [2]. That is why, including linguistic context helps in determining the meaning of a word, thus reducing ambiguity. For example, using full sentences, it was possible to specify the emotion for a better understanding by respondents [38]. The semiotic analysis of interviews showed that “relax” was used by respondents with two meanings. For this reason, the questionnaire included two different sen-

tences where a context helped to clarify the meaning of the emotion to be evaluated: “It is an antistress: it calms me, soothes me, reassures me” referred to a situation where the product acted as an active agent, able to inspire a passage from a negative state of uneasiness and agitation (a stressful state) to a positive mood characterized by more serenity. The emotion described with this sentence was different from that described in the sentence “It makes me feel relaxed”, which referred to an emotional state of relaxation and did not necessarily imply a passage from a negative to a positive state. This leads to the conclusion that semiotic analysis and term disambiguation using linguistic context is not to be skipped.

4.3. Ordering of terms

The terms of an emotion lexicon, when presented to survey participants for emotion measurement, can either be in alphabetical order, or in random order (Table 1).

Ordering of terms in emotion measurement tools alphabetically is thought to make the task cognitively easier and thus quicker for the respondent than working with terms in random order, without affecting the results [71]. However, this is not probably true for all response formats. The CATA format seems to be slightly more sensitive to the order of the emotion terms (alphabetical vs. random) [71]. When using clusters of emotions terms, this predicament is overcome. Emotion categories are always presented in random order with subordinate terms sometimes presented alphabetically within each cluster.

4.4. What is measured? What are the participants expressing?

Sources of food emotions include sensory attributes (e.g., amusing, surprising taste or texture), experienced (e.g., relief, stimulation, dissatisfaction) and anticipated consequences (e.g., health effects, fear of obesity), individual meaning (personal/cultural) (e.g., this reminds me of sb), and actions of associated agents (e.g., contempt towards meat eaters...) [65]. Food and drink consumption is not only a physical experience that involves smell, taste and appearance, thus determining the subjective bodily state, but also -and mainly- a cognitive and affective experience” [4].

Whether emotion measurement is food-specific or not, taking place under blind conditions or not, it provides deep insights into personal and cultural conceptualizations, associations, expectations, habits, and past experiences. The aim of study is what guides the use of specific stimuli (Table 3). Food names and food pictures are preferred when studying emotions based on memory and past experiences. Food names

create an emotional response that is consistent across time [72] and may elicit memories of an emotional experience with the food, whereas actual consumption of that food may not evoke this idealized experience [73]. Strangely enough the role of memory is almost always neglected in food-related consumer research, although it is probably much more important than the first impression experiences that are commonly investigated, as memory gives rise to more intense emotions than actual sensory contact with food. The emotions, evoked by remembering a product, are essential in the expectations that guide repurchase decisions. What is remembered is what influences our later food choice decisions [39]. An interesting finding is that feelings of discontent seem to grow over time and positive feelings seem to wear off with repeated exposure [39]. Using food names or pictures to elicit emotions is a quick, easy, and economical method, allowing for the use of online questionnaires and the participation of more people. Food tasting should be preferred when interested in specific food products, not in the respective food category. Furthermore, research has shown that by providing elaborate description of the tasted product results in more intense positive emotions and less intense negative emotions, as this technique seems to bring expectations and sensory/emotional experience to convergence [74].

Meal functionality – the functions that people ascribe to specific mealtimes, e.g., energizing, or relaxing – seems to be another concept that provides a deeper understanding of food consumption topics. Thomson, Crocker, and Marketo (2010) recently discussed this topic and emphasized the use of conceptualizations, such as ‘will refresh me,’ ‘will make me happy,’ and ‘will annoy me,’ to understand consumer behavior [75]. These conceptualizations seem to be inevitably connected to food experience, since we react not only to the product itself but also to the associations that we assign to that product [41].

4.5. Stimuli selection for emotion measurement

By measuring food-evoked emotions we gain insight into the consumers’ personal and cultural habits, into their expectations, into how they conceptualize and associate specific foods and beverages, into how they visualize their own selves and make choices accordingly, into how emotions are expressed through language as a coding system and through specific languages, and so on. According to the aim of the study, various stimuli can be used to elicit emotions (Table 3). Most of the studies that were included in our review (47 studies) used actual food tasting (blind-unbranded, branded). The rest used food names (9 studies) (e.g., bread) informed food tasting (6 studies) (e.g., bread with Bambara flour), food pictures (showing food under study) (3 studies), and food videos (showing food under study being consumed) (2 studies) (Table 1).

Actual food tasting is used as the main food-specific stimulus (48 studies). The tasting is done under blind/unbranded conditions (when the participant has no information regarding the contents, ingredients, brand, packaging etc. of the food product being tested) except when the use of packaging, name, origin, ingredients etc. are being assessed. Even in blind testing conditions though, cultural conceptualizations and personal past experiences are present. The sensory information is perceived, processed, and reacted to, based on both intrinsic and extrinsic features of the tasted food. Intrinsic features are more closely associated with emotions, than extrinsic features which tend to have more abstract and functional associations [36]. It has also been noted that absence of attributes rather than presence evokes greater consumer discriminating emotions [76].

Testing emotions under informed conditions is especially interesting. Participants are given information on the ingredients, origin, (alleged or real) health benefits etc. of the food or beverage about which they are asked to express emotions. Under such conditions, there seems to be a halo effect over actual sensory perception. Knowledge of food nutrient content, even if false, can alter emotions towards food [43,77], increase consumers’ hedonic evaluation and purchase intention, as well as vary the perception of different sensory attributes [40]. The effect on emo-

tions of knowing more about the product can be better identified by measuring emotions before tasting or under blind conditions and after tasting or getting the relevant information. Such processes can be very useful when studying novel products, such as functional foods, or products with sustainable ingredients, and their findings can be applied to branding, packaging design, marketing, restaurant menu writing, health campaigns etc.

4.6. Time of emotion measurement when tasting is involved

The usual process in most emotion measurement studies is to ask for the consumers’ emotions after having tasted the foods under study. However, there are other choices for specific reasons. For example, especially when measuring beverage-evoked emotions, and comfort foods, before and after measurement seems to be the most preferred choice. Participants’ mood before tasting an alcoholic beverage has been found to strongly influence the emotions evoked [45,50]. There is also the Temporal Dominance of Emotions model which measures emotions while tasting, using a multi-sip approach. And finally, there is the whole experience evaluation which takes place after tasting but the question refers to the entire consumption/emotional experience (Table 3).

The time of measuring the emotions is a parameter that can affect the results. If the measurement is done only after tasting, then there is no way to check to what extent the emotions can be attributed to the food itself and to what extent to expectations either met or not. A solution to this can be measuring emotions both before and after tasting, or measuring emotions during the whole process of tasting, applying the Temporal Dominance Model.

4.7. Context and setting of emotion measurement

Emotion lexicon development and emotion measurement is usually a lab or Central Location process in order to have as much control over the process as possible, following procedure guidelines for sensory testing which is often combined. However, emotions are by definition context-relevant, and cues external to sensory attributes drive different emotions [51,53], so labs and central locations are probably not the best choice of venue to measure emotions related to food consumption. Frequency of emotional terms and intensity of response seem to be much higher when the dimensions of location, social setting, and time have been included. More surprisingly, the differences in emotional responses attributed to the samples seem to be smaller compared to the differences due to the different test conditions, and/or the test settings [78]. This agrees with observations made by Silva et al. (2014) when studying the emotional and functional conceptualizations of beer consumers with the typical predefined scenario approach where researchers usually specify the social settings, the location, or the time in which the product is consumed. Linguistic context, as well as physical and social setting, are important parameters of food consumption and thus of emotion elicitation [79,80].

The use of a written scenario to accompany emotion questionnaires, the use of video as a stimulus [45,56], the use of real-like, real, or virtual-reality environments in food-evoked emotion measurements seem to be the new trends, in an effort to recreate a setting as close to real food-consumption as possible (Table 1). Food and drink consumption is a social event, even when done individually at home, and if we want to be as close to the real thing as possible then real, or real-like, settings need to be used. Recent studies taking place in real restaurants, bars, cafeterias, or recreating these environments using virtual reality set the trend. The use of video, or of a written scenario that sets the scene for tasting, can make the experience as complete as possible within the lab environment and is less costly (Table 3). One should however bear in mind that there can be lesser product discrimination for emotions, but better repeatability of results, and a higher relation between emotions and liking in real and immersive environments than in a lab [81].

4.8. Response formats and statistical analysis per response format for lexicon development and emotion measurement

When developing an emotion lexicon and measuring emotions using self-report verbal questionnaires, various response formats may be used according to the task at hand and the decisions taken as regards methodology, namely free-listing, CATA, rating scales, rating lines, and RATA (Table 1).

Most of the reviewed studies have opted for rating scales in their ballots (21 studies), which seems to work well for the participant alongside the rating scale used for liking measurement. Most rating scales consist of 5 points (17 studies), and there are versions of 7 (1 study) and 9 points (3 studies). Rating scales demand an intensity rating for every term, even if it the emotion is not experienced at all (e.g., satisfied: 1 = not at all – 2 = slightly – 3 = moderately – 4 = very – 5 = extremely). Next in popularity comes the CATA format where the participants just check the emotions they experience, regardless of intensity. There is also the option to use rating lines instead of scales which seems to be popular with ballots consisting of clusters/categories of emotions (11 studies). The final option is the RATA, a combination of CATA and rating scales, where the participants provide ratings of intensity for the terms that they experience only. The RATA method has been modified to contain a “not-at-all” option which makes it even more similar to the rating scales. In Table 3, the response format options are presented as recommendations according to the aim of study.

Many of the reviewed studies have used the eSense Profile® in either its original form for emotion measurement using rating scales or in the CATA version, which is very popular as well, depending on the aim of study.

4.8.1. Free listing of terms

Asking the participants to provide their own terms in a free-listing task, including triadic elicitation [i.e., say in what way two samples are similar but different from the third in terms of the emotional response they evoke [62]], or to talk about their emotions during a focus group discussion or a one-on-one interview, results in a list of terms that are food-appropriate or food-specific. The terms to be kept are determined by their frequency of citation, by counting the number of participants who mentioned the term. The cut-off point is not a point of convergence. Some researchers use the emotion terms mentioned by the 50% of the participants and above, others use the 20% threshold. It probably depends on how long the list needs to be and to what extent these terms express distinguishable emotions, after grouping synonyms.

4.8.2. CATA

Using a pre-defined list of terms and asking the participants to check-all-that-apply, usually allowing for the addition of any extra terms that do not appear in the list, is a response format that is quick and cognitively easy for the participant, and quick and easy for statistical analysis by the researcher. It can be used to narrow down the terms of a long list so as to keep the food-appropriate emotions or to create a food-specific emotional profile. Providing the terms from which to choose is helpful to the participants, as some people find it hard to pinpoint and accurately express their exact feelings. When answering CATA questions most consumers might not select all the terms that apply, but simply select those that are the most important to them for the task at hand. The drawback of this format, while compiling a lexicon, is that it may seed terms that would not come up in a free-listing task.

While measuring emotions, frequency of citation is calculated by counting the number of participants who selected the term. This format has the drawback of not discriminating between highly intense emotions and emotions only slightly experienced. This drawback can be overcome by using a modified CATA where each term can be endorsed by one to three checks, depending on the appropriateness or the intensity of the emotion experienced, thus providing a certain degree

of discrimination [19]. One could then decide to keep the terms endorsed with two or three checks only, to avoid casual endorsement. The CATA format also seems to be affected by the order in which the terms are presented, which means that random ordering across participants should be preferred, but the same order by participant should be used to keep the task cognitively easy [26]. This format allows discrimination across food categories. For statistical analysis of CATA data one can apply the Cochran's Q test to check frequency of selection per emotion term and pairwise comparisons between terms. The use of ANOVA has also been proposed and checked but there are limitations acknowledged and further research needs to be done on that [82].

4.8.3. Rating scales and rating lines

Rating scales and rating lines can be used as the step following CATA in the lexicon development process, in order to create a food-specific profile using a relatively short pre-defined list but are especially used in emotion measurement questionnaires as they discriminate well both across and within food categories. Such a format demands the participant to attend to all terms equally and is thus more time consuming and cognitively harder than the CATA format, but ratings yield more detailed information as regards the experienced emotions. Demographic information, such as gender and cultural background, should be taken into account when using ratings, because of the variations in expressing intensity of emotion. Rating lines are probably more discriminating than rating scales but may be confusing to participants due to their relativity and the lack of specific intensity markers. Statistical analysis of these formats is done via ANOVA or MANOVA, to identify significantly discriminating factors.

4.8.4. RATA

The rate-all-that-apply format seems to combine the advantages of the CATA format and of the rating scales, i.e., it is quick and discriminating. That is because frequency of use of the terms correlates with intensity ratings [83,84]. Consumers are expected to only select the most applicable attributes in CATA questions, so they only check an attribute if its intensity exceeds a certain (subject-specific) threshold, whereas in RATA questions consumers are expected to provide a more detailed characterization of the samples by selecting a larger number of attributes and additionally indicating their intensity [85]. There is also an interesting variation, a modified RATA where participants are asked to rate all terms using a rating method, where 0 reflects not feeling the emotion at all [15,57].

Results from a RATA questionnaire can be analysed in two ways: RATA as CATA and RATA as scores, giving a 0 score to the attributes that are not endorsed. It has been noted that using a RATA ballot and treating the data as CATA is likely to be disadvantageous to sample discrimination. All-in-all, however, no clear superiority of one methodology over the other has been observed.

4.9. Emotions and overall liking as inter-complementary measurements and the position of overall liking/acceptability question in emotion questionnaire

Emotions and liking, or else hedonic, ratings are inter-complementary. That is why emotion lexicons in emotion measurement tools are usually accompanied by an overall liking or overall acceptability question, in order to gain deeper insight into consumers' preferences, as liking ratings express which sensory and emotional attributes are desirable and which are not for the food under study. Emotion profiles can differentiate between products of the same acceptability and liking. Emotion responses may even be a decisive factor for consuming or buying a food product, even more decisive than sensory liking and price [72]. Research on food products has shown that liking, expressed through hedonic tests, cannot predict food choice and purchase on its own [3,86]. What is more, liking cannot always differentiate between a consumer's attitude towards a food product before and after tasting it (especially beverages) but emotions can give such a differentiation [44].

On the other hand, emotions alone cannot provide us with a full food profile as hedonic ratings help explain the choice of emotion terms. This happens because certain emotions can be considered desirable in some food cases or in some cultures but undesirable in others, and hedonic ratings clarify emotions that are neither positive nor negative or both positive and negative depending on context. For example, the emotion of *guilt*, needs the liking factor to be correctly understood. Actually, in Dahlenberg et al. the strongest predictive strength was achieved by the combination of evoked emotions and liking [52], and according to Beyts et al. emotions are more discriminating than hedonic liking alone [87].

An overall acceptability or overall liking question is added to most emotion measurement tools, usually to be answered on a 9-pt scale (1 dislike extremely, 5-neither like nor dislike, 9-like extremely) and usually precedes the emotions questions. The rating scale format seems more sensitive to the position of the emotion terms relative to the overall acceptance question [71]. Information provided by this hedonic liking question adds information to emotions, especially in cross-cultural studies where some emotions may be experienced but undesirable. For example, in a study Asian participants were found to have positive attitudes toward a healthier variety of foods compared to that of Western participants [88]. In another study, the conclusion was that although chocolate is highly liked, actual consumption of chocolate varies between consumers and heavily depends on many more factors than merely liking [52]. In a cross-cultural study between Westerners and Asians to develop emotion lexicons for chocolate types, Westerners felt a little naughty and guilty at a high frequency when consuming chocolate, which were characterized as unclassified emotions, while Asians had only clearly positive emotions and these specific emotions were not in the final lexicon. Westerners were also found to feel mainly elegant when consuming dark chocolate, while Asians felt mainly healthy [21]. In another study, sweeteners high in liking have been associated with neutral to positive terms, while sweeteners low in liking, and neither liked nor disliked have been uniquely associated with negative terms [59]. These studies emphasize the fact that emotion terms and liking on their own tell only half the story.

Beverages, even if equally liked by consumers within a specific group (i.e., who have the same age, gender, or frequency of consumption), can have very different emotional profiles. In a study, consumers grouped according to their frequency of consumption as “heavy”, “medium”, and “light” users, who liked light and dark roast coffee samples equally, expressed different emotions towards each sample: positive-high energy emotions were generated when drinking one type of coffee (active, boosted, energetic, rested, and empowering), while positive-low energy feelings were felt when drinking another type of coffee (comfortable, pleasant, warm) or a third one (relaxed, curious) [6]. In a study comparing beer, wine, and non-alcoholic beer, consumers distinctively expressed feeling free when drinking beer, calm and loving when drinking wine, but safe, responsible, rational, and conscious when drinking non-alcoholic beer [5].

4.10. Creating consumer-led emotion and sensory lexicons, linking emotions and sensory attributes

Sensory perception, usually through the sense of taste, is a source of emotions, and there are quite a few studies (9 reviewed here) that combine data from sensory and emotion measurements to gain deeper insights into consumers' preferences [36,54,55,58,60,61,68,75,89]. Linking emotional attributes with sensory attributes, such as amusing, surprising etc., can provide deeper insights into consumers' preferences and is necessary during the product development process (Table 1). There are ready-made models to make this link with specific advantages each:

4.10.1. *EmoSemio / global profile* [38,90,91]

The EmoSemio, by providing sentences along with emotion terms, can be clearer for the participants as to the meaning of the terms. It

has also proven discriminating and good at creating product-specific profiles. Its extension, the Global Profile, is the most complete emotion measurement tool, including liking, sensory characterization, emotions, emotional and functional conceptualizations, and context. It thus measures the experience as a whole, which makes it ideal for creating complete food profiles.

4.10.2. *The temporal dominance of emotions model* [49,58,92]

This model is analogous to the Temporal Dominance of Sensations and the Temporal Dominance of Liking and is often combined with them. It studies emotions as they evolve during the tasting process instead of measuring them as static events after tasting. The participants evaluate the dominant emotion since its onset through to its peak and its dissipation. This approach is far closer to the real eating/drinking process, and it adds an extra layer of information when liking, emotions, and emotion intensities cannot discriminate between foods. This method can be very insightful for beverages and comfort foods, where the “flow” of emotions can indeed be the factor that determines purchase and preference.

4.10.3. *EmoSensory® wheel* [55,93,94]

The wheel response format, where participants can choose the emotions they want by using CATA or RATA. This format can be used to easily link sensory and emotional attributes, and because of its electronic format it can easily be made product specific.

4.10.4. *The emotional circumplex model* [61,68]

This model distinguishes well among foods but cannot be used for emotional profiling as the participants choose only one pair of emotions, capturing valence and arousal. It can be used when locating the emotional domain instead of specific emotions is enough. This model makes linkages between emotional and sensory terms easy, and its response format allows for less dispersion of data than others.

4.11. Demographic data matters

One should keep in mind certain trends, such as that female consumers and Westerners rate emotions more intensely than male consumers and Asians, or that men tend to report higher positive emotions for comfort foods than women [40]. Another example can be found in the emotion of *guilt*. If the reason of *guilt* is the amount of calorie intake from a type of food, then it could be explained as guilty pleasure and be considered a desirable attribute. If the reason of *guilt* is the high price paid for a food type considered a luxury, then it would be an undesirable attribute. Income is another factor that can affect emotional responses. For example, low-income consumers tend to express negative emotions (e.g., disappointed, anguish, annoyed, sad, rejection, disgusted) towards beer and wine probably because these beverages can cause social and family problems due to drinking issues, while middle-income consumers tend to express positive emotions (e.g., loving, good-humoured, fun, sharing, friendship) towards beer and wine [95]. There are other studies that deal with different aspects of demographics, but they did not fulfill the inclusion criteria for this review.

5. Conclusions and future perspectives

When compiling emotion lexicons, it is important to take both culture and language into consideration and to bear in mind that an emotion lexicon developed in one country for a specific product type is not necessarily suitable in another country or for a different product. Emotion lexicons should be developed using linguistic and cultural data from the frame in which they are going to be exploited. Using pre-existing lists of food-evoked emotions developed in another language should be done while paying attention to certain parameters. On the other hand, from a practical point of view, the process of generating emotion lists for each country is both time consuming and expensive. For this reason,



Fig. 2. Food-evoked emotion words that appear in EsSense Profile®, EsSense25, EmoSense, Empathic Food Test, and Global Profile. The larger the font, the more frequent the word.

pan-global questionnaires implemented locally in local languages have been proposed. The need to have quick, easy, inexpensive, universal instruments within the global market and international companies' landscape is evident and rational. In Fig. 2, the words that appear the most frequently in emotion lexicons reviewed in this article are presented in size according to their frequency of appearance. They could be used as a starting point in creating pan-global emotion measurement tools.

The most important participant in the emotion lexicon development process is consumers. Personal and cultural conceptualizations, associations, expectations, habits, and past experiences with foods form consumers' emotions and preferences. Thus, a hybrid approach for lexicon development is recommended, one that combines published lists and consumer input, at first applying CATA for term identification and then rating scales or RATA for emotion measurement.

A combination of pre-existing lists and product specific consumer-defined lists in lexicon development may provide a more comprehensive strategy, so as not to miss important discriminating terms [37].

In languages less studied, time consuming but thorough linguistic methods should be the first step to identify food-appropriate non-food-specific emotion terms. New linguistic sources available thanks to technology, such as the World Wide Web, Information Technology tools, and social media, should be exploited for term collection and for qualitative analysis of food-elicited emotions.

The use of clusters or emotion categories instead of individual terms is a good choice especially in reduced lexicon forms and in cross-cultural studies, when comparing emotion categories is better than comparing specific emotion words, and term to term translation should be avoided. It would, therefore, be a good idea for an emotion lexicon to have two versions for researchers to choose from, a full version and a short one.

In emotion measurement, especially of alcoholic beverages and comfort foods, a measurement of the participants' mood before or during the entire tasting process should be taken to trace the emotional alterations and gain better insight since consumption of these types of food are specifically targeted at altering our emotional state.

Researchers should be aware of the fact that creating high expectations to participants when performing informed testing may be risky as these expectations may not be met and may result in decreased satis-

faction. Nevertheless, informed conditions can be used when studying cultural aspects of food acceptability and attitudes to specific food attributes. These conditions could also give great insight into target group discrimination.

In emotion measurement, opting for a response format should be done according to the task at hand. To discriminate between quite different food categories, one can choose CATA with the option to add terms that are not on the list. To discriminate products within the same food category, rating scales would be the format to choose. The modified RATA with a scale of 0–5 (0 not feeling the emotion at all) is a good alternative if keeping the task quick and easy is an important factor.

Liking ratings, linking sensory and emotional attributes and also taking into account demographic information such as income can provide even deeper insights into consumers' preferences.

Food-elicited emotions and the respective emotion lexicons could be used outside the food science and consumer studies field, in Natural Language Processing for opinion mining in food talk social media and reviews of restaurants, recipes etc. on the Web.

Studying food-elicited emotions is more important than ever now that people are becoming more and more conscious of what they purchase and what they consume. They are mindful eaters, have high expectations, and health and wellness are a big issue [86,93,96]. Functionality of foods and meals is a key concept as well [41,79]. The reviewed studies, having emotion lexicon development as the main focus, were conducted with healthy participants. As a result, health issues such as obesity, diabetes, anorexia nervosa etc. have not been addressed here. However, this is a point where emotion measurement could be applied to provide helpful data.

To be as close to the real food consumption experience as possible, then settings such as restaurants, bars, cafeterias, or virtual environments recreating these settings set the trend. Another option, less costly, is the use of video, or of a written scenario that sets the scene for tasting. As an extension of this, emotion measurements should be taken at the time of actual purchase or consumption, via the use of interactive electronic devices, for the outcome to depict reality.

An alternative to self-report verbal questionnaires for emotion measurement is the use of emoji instead of terms [97]. This approach has its advantages and drawbacks, among their advantages being enhanced ecological validity, familiarity and cross-culturally shared meanings, and among their disadvantages emoji meanings/interpretations, appropriateness for older consumers and ability to represent emotional arousal (activation to deactivation) [98]. Comparing emoji to emotion words in food studies there was greater agreement on which words best describe the samples than on which emoji. Emoji was also found to discriminate better among lesser liked samples, since there is greater diversity in meanings of negative emoji [97]. The choice for either emotion words or emoji might depend on the stimuli and presentation mode under study although the age of the participants should be considered but there is no clear direction on whether words or emoji generate more discriminative differences in product testing [99]. Since emoji is a fun and easy way to express emotion requiring little cognitive effort and linguistic ability, they could be the way to go when the participants are children or young adults, much accustomed to using them in text messaging and on social media, as well as in cross-cultural studies when developing an emotion lexicon from scratch or translating existing lists is not an available or the right option. As Schouteten and Meiselman (2021) put it, we probably do not need to make a choice between either emotion words or emoji; it might be interesting to include both.

From a linguist's and a lexicographer's perspective, the process of developing and applying emotion lexicons in general and more specifically in the domain of food is enticing for various reasons. On the one hand, a linguist or a lexicographer can offer their expertise in every step of the emotion lexicon development process: as regards possible sources of terms for lexicon development from scratch, collection of data techniques, for example by making use of electronic lexicography and Natural Language Processing tools, highlighting aspects of the rela-

tionship between language and culture, working on the translatability of emotions and emotion words in cross-cultural studies, providing insight into how to work with clusters of emotions or with the valence and arousal dimensions of emotions based on frame semantics, conceptual linguistics, and sensory linguistics, providing guidelines as to how to use linguistic context to make emotion terms clearer to consumers/research participants, helping explain results in the light of “language within context”.

On the other hand, concepts about food, eating habits, and relative emotional associations are depicted in linguistic constructs, such as metaphors, and research regarding emotions in the food domain can offer a wealth of data and great insight that can and should be depicted in dictionary definitions and examples, or provided as pragmatic information about the usage of a word or expression. Also, making use of demographic data about the frequency of use and the way of usage of emotion terms as related to foods can enrich dictionary entries, too.

To conclude, there is an opportunity of a rich and fruitful give-and-take between food science and linguistics / lexicography, beneficial for all parties concerned.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Measurement: Food

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5. 30th International Functional Foods Conference – poster presentation (23-25/09/2022)


**Self-reported lexicon tools for the emotional profiling of functional foods:
a case study on propolis.**

Panagiotou Malamateia, Timoftearaki Stavroula, Gkatzioni Konstantinos

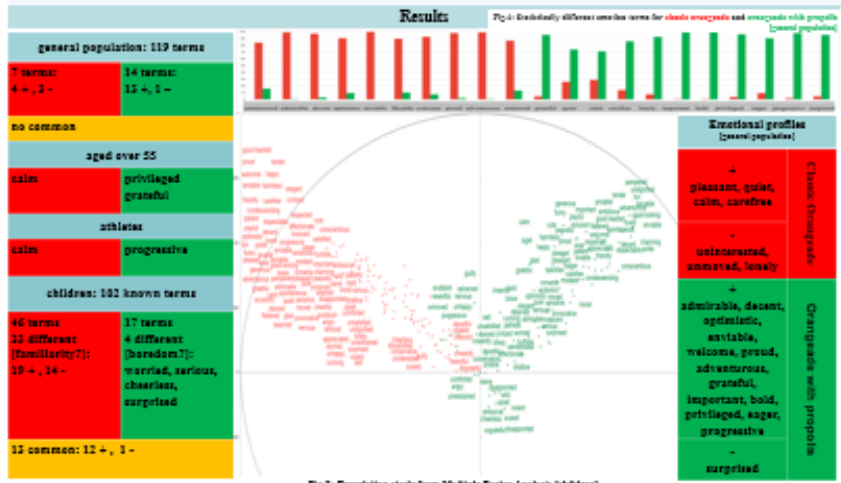
Laboratory of Consumer and Sensory Perception of Foods & Beverages, Department of Food Science and Nutrition, University of the Aegean, Mytilene 2, 81400, Mytilas, Lesvos, Greece [tonipana@aegean.gr]

Abstract: To understand key factors that affect consumers' acceptance and identify possible target groups for an orangeade drink with propolis extract, we investigated the emotional profile of a classic orangeade and an orangeade containing propolis extract. The profiling was conducted without tasting, using self-report questionnaires containing emotion terms.

Introduction: Food neophobia or neophilia, sensory perception, and emotions evoked by food/drink consumption can affect consumers' acceptability of innovative functional products. Especially emotions have been identified as a key driver of purchase. Consumers have turned to healthier choices as regards foods and drinks, pursuing a general wellness-oriented way of life. Propolis consumption has been growing in popularity due to its nutritional value, health benefits, and antimicrobial activity. Orangeade is an orange soft drink common in the Greek market which, however, is not considered healthy due to its high sugar concentration and preservatives. Using propolis extract as a preservative for orangeade can have health benefits for the consumer.

Method				
participants	108 general population	29 aged over 55	40 athletes	89 children aged 9-12
stimulus				
emotion questionnaire in Greek	CATA from 119 emotions	8pt rating scales for 7classic / 14propolis emotions		CATA from 119 emotions

also asked for demographic data, familiarity with propolis, willingness to purchase the propolis-containing product



Conclusions:

- diverse emotional profiles > the two products considered different by all consumers
- ideal target group: young athletes
- higher educational level > higher food neophilia, esp. for healthy food products
- self-report by the consumer > useful information for product production / marketing [packaging and advertisement]
- information on possible health benefits > consumer acceptance, even without familiarity
- functional claims elicit positive emotions in adults
- children: different emotional profiles than adults

FFC's 30th INTERNATIONAL CONFERENCE

Mediterranean Diet, Functional Foods and Bioactive Compounds: Science and Practice

Certificate of Participation

This certificate is awarded to

Panagiotou Malamatenia



Panagiotou Malamatenia actively participated in Functional Food Center's 30th International Conference on Functional Foods on September 23-25, 2022. Panagiotou Malamatenia earned 18 total credits for two days of participation, which can be used towards the Certified Functional Foods Scientist/Professional certification.

Danik Martirosyan, PhD
Co-Chairman of Conference

D.Martirosyan

September 26, 2022

6. 2nd International Conference on Advanced Production and Processing - poster (20-22/10/2022)



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DEPARTMENT OF FOOD SCIENCE AND NUTRITION

The effect of modern claim related to packaging sustainability on the sensory perception of Greek crackers

Konstantinos Giannoutsos, Danaï I. Koukoumaki, Malamatenia Panagiotou, Konstantinos Gkatzionis*

Laboratory of Consumer and Sensory Perception of Food & Drinks, Department of Food Science and Nutrition, University of the Aegean, Lemnos, Greece
*gkatzionis@aegean.gr

INTRODUCTION

Research shows that external product cues can be equally important with intrinsic cues in influencing the sensory perception of food. Several studies have revealed that product information such as product designation of origin (PDO), labeling, brand information and organic food labels, as external product cues, can have a direct effect on consumer acceptance and willingness to buy. In addition, consumers have become more sensitive to the environmental impact of the food they consume and are willing to pay a higher price for sustainable packaging. The aim of the study was to investigate how information on sustainable packaging can affect consumer perception of a traditional Greek bakery product (paximathi).

METHODS

The study consisted of three parts:



1. **Blind condition:** Paximathi was evaluated without packaging based on tasting only. To evaluate the sensory perception and emotional reactions to paximathi, without packaging (blind condition).



2. **Packaging condition:** Sensory comparison of plastic and biodegradable packaging without tasting of food. To study the sensory perception and emotional reactions to conventional/plastic (polypropylene – PP) compared with sustainable (biodegradable & 'edible': polylactic acid – PLA) packaging, without tasting of food (packaging condition). The analysis was influenced by the different sounds of plastic films and panel's familiarity with these.



3. **Informed condition:** Sensory comparison in three different packages following sustainability claim: plastic, biodegradable and 'edible' packaging. To investigate the effect of packaging sustainability information on the combined food /packaging sensory perception and consumer emotions (informed condition), Participants (n=104) assessed overall liking using a 7-point hedonic scale and reported their emotions with the use of a Check-All-That-Apply (CATA) list.

RESULTS & DISCUSSION

Samples evaluated without packaging (blind condition) scored the highest level of liking, while the sample with claim of 'edible' package in the informed condition received a similar liking score, indicating that packaging had a negative effect on the sensory perception of food. Under packaging condition, the conventional packaging was strongly preferred compared to biodegradable (attributed to its 'irritating' sound by many participants). However, during the informed condition, when consumers received information about the environmental impact of each packaging, the biodegradable sample scored higher than the conventional, while the 'edible' scored the highest. This shows that the lower liking of biodegradable packaging was masked by its environmental benefit in the informed condition. For biodegradable and 'edible' packages, under informed condition, the terms which were preferred most frequently were: 'pleased' (40.3% and 30%, respectively), 'satisfied' (39.4% and 46.1%) and 'calm' (28.8% and 34.6%), demonstrating that both sustainable packages share a similar emotional profile. However, this was in stark contrast, with the emotional profile formed for the biodegradable package, under packaging condition, which led to very negative emotional reactions. This effect was completely masked under informed conditions for both the biodegradable and 'edible' samples, indicating that claims of sustainability features result in higher satisfaction.

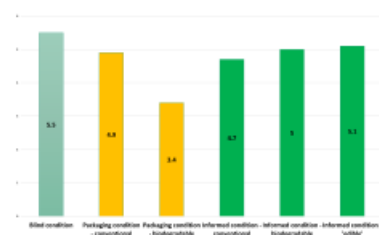


Figure 1: Liking scores recorded by samples in blind, packaging and informed conditions.

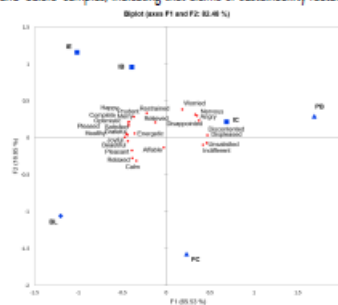


Figure 2: PCA biplot displaying association between sustainable packaging and experienced emotions. * Sample without packaging; R: Conventional packaging; PC: Biodegradable packaging; PE: Sample with conventional packaging – informed condition; IC: Sample with biodegradable packaging – informed condition; IE: Sample with 'edible' packaging – informed condition; E: Sample with 'edible' packaging – informed condition; E.

CONCLUSION

The results demonstrate that claims about packaging sustainability result in higher prevalence of positive emotions. As different packages can lead to very divergent and strong emotional reactions and liking, the negative sensory perception of certain packages (biodegradable package in this study) could be completely reversed by information about their sustainability and their positive environmental impact. Communication of information about the environmental sustainability of packaging results in positive product-evoked emotions. The study provides further evidence of the strong impact of external product cues on consumer perception and shows that sustainability claims could be used as part of the strategy for developing a product; however, such developments should be utilised after consideration of the sensorial perception of the food in order to complement it.

ACKNOWLEDGEMENTS: This research has been co-financed by the European Regional Development Fund of the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE – INNOVATE (project code: T2ED4-02137). The authors are grateful to Porizol Family – Lemnos for providing raw materials, expertise and equipment for the execution of this study.



7. Sensory Analysis Glossary ISO 5492:2009 translation into Greek

«Αγγλοελληνικό γλωσσάριο όρων και ορισμών εννοιών αισθητηριακής ανάλυσης» (2022) (published in installments in ELETO's magazine

“Orogramma”, available online https://eleto.gr/download/Bodies/English-Greek-Glossary-of-Sensory-analysis_ELETO_EMAKOATP.pdf)

ΟΡΟΓΡΑΜΜΑ Αρ.173

γ. Η έννοια **'ground effect'** στα αυτοκίνητα ορίζεται ως: χρήση αέριου ρευστού κάτω από το αυτοκίνητο που δημιουργεί δύναμη προς τα κάτω, δηλαδή αντίθετα από ό,τι συμβαίνει στην αεροτορπίλα:

Ορισμός: Use of airflow under the car to create downforce. (The term "ground effects" comes from aviation, but there it means the opposite: the tendency of an airplane near the ground to float on a high-pressure cushion of air.). Πηγή: <https://www.yumpu.com/en/document/read/34273204/hoosieracing-tire-tires-designed-for-champions>.

6. Για τον όρο **porpoising** κρίνεται επιτυχής ο ισοδύναμος όρος «**δελφίνισμος**» που χρησιμοποιείται ήδη στην κολύμβηση και στην υδροπλοία,

το ΓΕΣΥ υιοθέτησε τις ισοδυναμίες όρων:

ground effect (Φόρμουλα 1) ⇒ **επίδραση εδάφους**
porpoising (Φόρμουλα 1) ⇒ **δελφίνισμος**

3. lipoids, lipids ⇔ λιποειδή, λιπίδια

Υστερα από ηλ-μήνυμα του καθηγητή αναλυτικής χημείας του ΕΚΠΑ κ. Κ. Ευσταθίου ότι τα **'λιποειδή'** και τα **'λιπίδια'** είναι ακριβώς η ίδια έννοια, σύμφωνα και με τη γνώμη του ομότιμου καθηγητή Βιοχημείας ΕΚΠΑ κ. Κ. Δημόπουλου, μελετήθηκε ο ορισμός του επιγραμματικού Λεξικού Χημείας του ΕΚΠΑ:

lipids: λιποειδή (νεότερη απόδοση), λιπίδιο (παισιότερη απόδοση). Τα αδιάλυτα στο νερό οργανικά βιομόρια, διαλυτά όμως σε μη πολικούς οργανικούς διαλύτες (π.χ. χλωροφόρμιο, βενζόλιο) ή και μίγματα μη πολικών και πολικών οργανικών διαλυτών, όπως μίγματα χλωροφόρμιου-μεθανόλης (γενικό διαλυτικό μέσο των λιποειδών). Ο ορισμός δεν είναι απολύτως ακριβής, αφού υπάρχουν και υδατοδιαλυτά λιποειδή. Οποιαδήποτε από μια ετερογενή ομάδα λιπών και λιποειδών ουσιών (λιπαρά οξέα, εστέρες τους, κηροί, στεροειδή, λιποδιαλυτές βιταμίνες). Στα σύνθετα λιποειδή περιλαμβάνονται τα γλυκολιποειδή, οι λιποπρωτεΐνες και τα φωσφολιποειδή. Η αρχική αγγλική ονομασία των λιποειδών ως **lipoids**, απλουστεύθηκε στη **lipids**, η οποία επεστρέψε ως αντιστάσιο στην ελληνική ως **'λιπίδια'**.

και υιοθετήθηκε το ενιαίο ορολογικό λήμμα:

lipoids, lipids ⇔ **λιποειδή, λιπίδια**

4. Αγγλοελληνικό Γλωσσάριο όρων και ορισμών εννοιών αισθητηριακής ανάλυσης (σύμφωνα με το Διεθνές Πρότυπο ISO 5492:2008) – Μέρος 1

Με αφορμή το ενδιαφέρον που εκδηλώθηκε στο 13^ο Συνέδριο «Ελληνική Γλώσσα και Ορολογία» για τους όρους της αισθητηριακής ανάλυσης, μετά την ανακοίνωση «Πρόταση απόδοσης της ορολογίας του κλάδου της γλωσσολογίας «sensory linguistics» στην ελληνική γλώσσα» (Μαλαματένια Παναγιώτου, Κωνσταντίνος Γκατζώνης), εξετάστη στο ΓΕΣΥ, το ενδεχόμενο της απόδοσης των ορισμών και της ισοδυναμίας των όρων του Διεθνούς Προτύπου ISO 5492:2008 *Sensory analysis – Vocabulary*.

Έτσι, με μεταφραστική του κειμένου τον Γενικό Γραμματέα της ΕΛΕΤΟ Γιώργο Τσίμα και με αναθεωρητή-εισηγητή τον Πρόεδρο Κώστα Βαλεοντή άρχισε και συνεχίζεται στο ΓΕΣΥ η επεξεργασία των ελληνικών ορισμών και η υιοθέτηση ελληνικών ισοδύναμων όρων αισθητηριακής ανάλυσης για όλες τις έννοιες του Διεθνούς Προτύπου.

Από το παρόν τεύχος του «Ο» αρχίζουμε να δημοσιεύουμε τους όρους και ορισμούς του Αγγλοελληνικού Γλωσσαρίου όρων και ορισμών εννοιών αισθητηριακής ανάλυσης, με τη σειρά των κεφαλαίων του ISO 5492.

1. Γενική Ορολογία

Αγγλικός όρος Ελληνικός όρος	Ελληνικός ορισμός της έννοιας	Κωδ.
sensory analysis, noun αισθητηριακή ανάλυση	επιστήμη που ασχολείται με την αξιολόγηση των οργανοληπτικών ιδιοχαρακτηριστικών ενός προϊόντος μέσω των αισθήσεων	1.1

sensory, adj αισθητηριακός -ή -ο	που έχει σχέση με τη χρήση των αισθήσεων, δηλ. με την εμπειρία ενός προσώπου	1.2
attribute, noun ιδιοχαρακτηριστικό	ανιληπτό χαρακτηριστικό	1.3
organoleptic, adj οργανοληπτικός -ή -ο	που έχει σχέση με ένα ιδιοχαρακτηριστικό προϊόντος ανιληπτό μέσω των αισθήσεων	1.4
sensory assessor, noun αισθητηριακός αξιολογητής, αισθητηριακή αξιολογήτρια	πρόσωπο που μετέχει σε αισθητηριακή δοκιμή Σημείωση 1: Αιχμηρός αξιολογητής είναι το πρόσωπο που δεν πήραει συγκεκριμένα κριτήρια. Σημείωση 2: Μυημένος αξιολογητής είναι το πρόσωπο που έχει ήδη συμμετάσχει σε αισθητηριακή δοκιμή.	1.5
selected assessor, noun επιλεγμένος αξιολογητής, επιλεγμένη αξιολογήτρια	αξιολογητής/-τρια που έχει επιλεγεί για την ικανότητα του/της να εκτελέσει αισθητηριακές δοκιμές	1.6
expert, noun εμπειρογνώμονας, ειδικός	με τη γενική έννοια, πρόσωπο το οποίο, λόγω γνώσης ή εμπειρίας, έχει τα προσόντα να εκφέρει γνώμη στα πεδία για τα οποία ζητείται η συμβουλή του	1.7
expert sensory assessor, noun εμπειρογνώμονας αισθητηριακός αξιολογητής, εμπειρογνώμονας αισθητηριακή αξιολογήτρια	επιλεγμένος/-η αξιολογητής/-τρια με αποδεδειγμένη αισθητηριακή ευαισθησία και με σημαντική κατάρτιση και εμπειρία σε αισθητηριακές δοκιμές που είναι ικανός/-η να εκτελέσει συνεπείς και επαγγελματικές αισθητηριακές αξιολογήσεις διαφόρων προϊόντων	1.8
sensory panel, noun αισθητηριακή ομάδα	ομάδα αξιολογητών/-τριών που συμμετέχουν σε αισθητηριακή δοκιμή	1.9
panel training, noun κατάρτιση (αισθητηριακής) ομάδας	σειρά συνεδρίων κατά τις οποίες οι αξιολογητές/-τριες μισούνται στις εργασίες που πρέπει να επιτελεί μια αισθητηριακή ομάδα κατά την αξιολόγηση συγκεκριμένων προϊόντων Σημείωση: Η αξιολόγηση μπορεί να περιλαμβάνει σχετικά χαρακτηριστικά προϊόντος, πρότυπες κλιμακικές καταστάσεις, τεχνικές αποτύπωσης και ορολογία.	1.10
panel consensus, noun συναίνεση (αισθητηριακής) ομάδας	συμφωνία μεταξύ των αξιολογητών που αφορά την ορολογία και ένταση των χαρακτηριστικών προϊόντος	1.11
consumer, noun καταναλωτής, καταναλώτρια	πρόσωπο που χρησιμοποιεί ένα προϊόν	1.12
taster, noun δοκιμαστής, δοκιμαστριά	αξιολογητής/-τρια, επιλεγμένος/-η εμπειρογνώμονας που εκτιμά τα οργανοληπτικά ιδιοχαρακτηριστικά ενός τροφικού προϊόντος, κυρίως με το στόμα	1.13
tasting, noun δοκιμή	αισθητηριακή αξιολόγηση ενός τροφικού προϊόντος στο στόμα	1.14

product, noun πρόϊον	υλικό, φαγώσιμο ή μη, που μπορεί να αξιολογηθεί με αισθητηριακή ανάλυση ΠΑΡΑΔΕΙΓΜΑ: Τροφικά προϊόντα, καλλυντικά, υφάσματα	1.15
sample, noun, sample of product, noun δείγμα, δείγμα προϊόντος	δοκίμιο ή κλάσμα προϊόντος που παρουσιάζεται για αξιολόγηση	1.16
test sample, noun δείγμα δοκιμής	δείγμα του υπό δοκιμή υλικού	1.17
test portion, noun τμήμα δοκιμής	μέρος δείγματος δοκιμής που δοκιμάζεται απευθείας από τον αξιολογητή	1.18
reference point, noun σημείο αναφοράς	επιλεγμένη τιμή (ενός ή περισσοτέρων ιδιοχαρακτηριστικών ενός προϊόντος) ως προς την οποία αξιολογούνται τα δείγματα	1.19
control sample, noun δείγμα ελέγχου	δείγμα του υπό αξιολόγηση υλικού, που επιλέχθηκε ως αναφορά, με το οποίο συγκρίνονται όλα τα άλλα δείγματα Σημείωση 1: Το δείγμα μπορεί να αναγνωριστεί ως δείγμα ελέγχου ή ο έλεγχος μπορεί να είναι τυφλός	1.20
reference sample, noun δείγμα αναφοράς	ερέθισμα/ουσία, μερικές φορές διαφορετικά από το υπό δοκιμή υλικό, προσεκτικά επιλεγμένα για να ορίζουν ή απεικονίζουν ένα ιδιοχαρακτηριστικό ή ένα προδιαγραφόμενο επίπεδο ενός δεδομένου ιδιοχαρακτηριστικού με το οποίο πρόκειται να συγκριθούν όλα τα άλλα	1.21
hedonic, adj ηδονικός -ή -ο	που έχει σχέση με αρέσκεια/απαρέσκεια	1.22
acceptability, noun αποδεκτότητα	βαθμός στον οποίο ένα ερέθισμα είναι αρεστό ή όχι, συνολικά ή για ιδιαίτερα αισθητηριακά ιδιοχαρακτηριστικά	1.23
preference, noun προτίμηση	επιλογή, από έναν/μία αξιολογητή/-τρια, ενός ερέθισματος ή ενός προϊόντος έναντι άλλων σε ένα δεδομένο σύνολο, βασισμένη σε ηδονικά κριτήρια	1.24
aversion, noun απέχθεια	αίσθημα αποστροφής που προκαλείται από ένα ερέθισμα	1.25
discrimination, noun διακρίση	πραξη ποιοτικής και/ή ποσοτικής διαφοροποίησης μεταξύ δύο ή περισσότερων ερεθισμάτων	1.26
discriminating ability, noun διακριτική ικανότητα	ικανότητα αντίληψης ποσοτικών και/ή ποιοτικών διαφορών	1.27
appetite, noun όρεξη	φυσιολογική και ψυχολογική κατάσταση που εκφράζεται με την επιθυμία για φαγητό ή ποτό	1.28
appetizing, adj. ορεκτικός -ή -ο	<περιγραφή προϊόντος> ικανός -η -ο να διεγείρει την όρεξη ενός απόμου	1.29
palatability, noun ευγευστότητα, γευστικότητα, νοσημάδα	ιδιότητα ενός προϊόντος που το καθιστά ευχάριστο στη βρώση ή πόση	1.30

psychophysics, noun ψυχοφυσική	μελέτη των σχέσεων μεταξύ μετρήσιμων ερεθισμάτων και των αντίστοιχων αισθητηριακών αποκρίσεων	1.31
olfactometry, noun οσφρησιμετρία	μέτρηση της απόκρισης των αξιολογητών σε οσφρητικά ερεθίσματα Σημείωση 1: Αναφέρεται στους αξιολογητές.	1.32
olfactometer, noun οσφρησιόμετρο	συσσκευή που χρησιμοποιείται για την παρουσίαση οσφρητικών ερεθισμάτων στους αξιολογητές κάτω από αναπαραγόμενες συνθήκες	1.33
odorimetry, noun οσμομετρία	μέτρηση των οσμητικών ιδιοτήτων των ουσιών Σημείωση 1: Αναφέρεται στα προϊόντα.	1.34
odorant, noun οσμητικό	ουσία της οποίας οι πτητικές εκπομπές μπορούν να γίνουν ανιληπτές από το οσφρητικό όργανο (συμπεριλαμβανομένων των νευρών)	1.35
quality, noun ποιότητα	σύνολο γνωρισμάτων και χαρακτηριστικών ενός προϊόντος, μιας διεργασίας ή μιας υπηρεσίας που συνεισφέρουν στην ικανότητά του/της να ικανοποιεί δηλωμένες ή υπονοούμενες ανάγκες	1.36
quality factor, noun παράγοντας ποιότητας	ένα γνώρισμα ή χαρακτηριστικό που επιλέχθηκε μεταξύ άλλων για την αξιολόγηση της συνολικής ποιότητας ενός προϊόντος	1.37
attitude, noun στάση	διαθεση για απόκριση με δεδομένο τρόπο σε μια κατηγορία αντικειμένων ή ιδιών	1.38
mastication, noun μάσηση	κομμάτισμα,άλση και πολτοποιήση με τα δόντια	1.39

K.B.

208

<p>«ΟΡΟΓΡΑΜΜΑ»</p> <p>Το «Ορόγραμμα» είναι διημερής έκδοση της Ελληνικής Εταιρείας Ορολογίας (ΕΛΕΤΟ) για την αλληλοενημέρωση των μελών της και ευρύτερου κύκλου αποδεκτών για θέματα της Ελληνικής Γλώσσας και Ορολογίας.</p> <p>Ιδιοκτήτης: Ελληνική Εταιρεία Ορολογίας (ΕΛΕΤΟ) Εκδότης: Κ. Ε. Βαλεοντής, Πρόεδρος της ΕΛΕΤΟ Συντάκτες κειμένων φύλλου: Παναγιώτης Γ. Κοιμής Κώστας Βαλεοντής</p> <p>Εκδοτική Ομάδα: Κώστας Βαλεοντής, Θεόδωρος Βαυβάκος, Γιώργος Τσίμπος, Μιχάλης Καραμιχάλης, Τάνια Βαλεοντή</p> <p>Τηλέφωνα: 6974321009, 210-8662069 Ηλ-Ταχυδρομείο: valeont@otenet.gr Ιστοσελίδα: http://www.eleto.gr/orogramma.htm</p> <p>Γίνονται δεκτές συνεργασίες. Απαραίτητες προϋποθέσεις τα κείμενα να είναι σε επεξεργασμένη ηλεκτρονική μορφή, σύντομα και έτοιμα για δημοσίευση δίχως να απαιτείται περαιτέρω επεξεργασία.</p> <p>Τα δημοσιεύματα που προσυπογράφονται με αρχικά απηχούν τις προσωπικές απόψεις του/της συντάκτη/συντάκτριας τους, το πλήρες όνομα του/της οποιο/οποιας περιλαμβάνεται στους συντάκτες του εκάστοτε φύλλου.</p> <p>Τα θέματα των άρθρων της «ΓΩΝΙΑΣ ΤΟΥ ΓΕΕΥ» έχουν συζητηθεί στο ΓΕΕΥ και η δημοσίευση γίνεται ύστερα από απόφαση του.</p> <p>Επιτρέπεται η αναδημοσίευση ή η αναπαραγωγή κειμένων του «Ο» με την υποχρέωση αφενός να αναφέρεται η πηγή των κειμένων και αφετέρου, προκειμένου περί ολόκληρων άρθρων, να εξακολουθήσουν αυτά να διατίθενται δωρεάν σε κάθε ενδιαφερόμενο χωρίς καμία δέσμευση σε αντίθετη περίπτωση χρειάζεται άδεια της ΕΛΕΤΟ.</p>
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Εξετάστηκε το αίτημα της κας Ελένης Φακουρέλη, μεταπτυχιακής φοιτήτριας του ΕΑΠ, για την απόδοση στα ελληνικά της έννοιας **'crisis-resistant tourists'** και υιοθετήθηκε η ισοδυναμία:

crisis-resistant tourists =
τουρίστες/τουρίστριες που αφήφουν τις κρίσεις, αφήφοτουρίστες/αφήφοτουρίστριες

3. Αγγλοελληνικό Γλωσσάριο όρων και ορισμών εννοιών αισθητηριακής ανάλυσης (σύμφωνα με το Διεθνές Πρότυπο ISO 5492:2008) – Μέρος 2

Στο παρόν φύλλο του «Ο» συνεχίζουμε να δημοσιεύουμε τους όρους και ορισμούς του *Αγγλοελληνικού Γλωσσαρίου όρων και ορισμών εννοιών αισθητηριακής ανάλυσης*, που έχει επεξεργαστεί το ΓΕΣΥ, με τη σειρά των κεφαλαίων του ISO 5492. Κατά τη συνέχεια και ολοκλήρωση της επεξεργασίας του Γλωσσαρίου προβλέπεται επίσημη συνεργασία της ΕΛΕΤΟ με το *Εργαστήριο Μελέτης Αντιδράσεων Καταναλωτή και Οργανοληπτικής Ανάλυσης Τροφίμων και Ποτών* του Πανεπιστημίου Αιγαίου (ΦΕΚ 1552-Β'-23.04.2020) (Διευθύντης: Δρ. Κωνσταντίνος Γκατζιώνης), από το οποίο ορίστηκε σύνδεσμος με την ΕΛΕΤΟ και το ΓΕΣΥ η κα Μαλαματένια Παναγιώτου.

2. Ορολογία σχετική με τις αισθήσεις

Αγγλικός όρος Ελληνικός όρος	Ελληνικός ορισμός της έννοιας	Κωδ.
receptor , noun υποδοχέας	συγκεκριμένο μέρος ενός αισθητήριου οργάνου που αποκρίνεται σε ένα ιδιαίτερο ερέθισμα	2.1
stimulus , noun ερέθισμα	φυσικό ατμό που διεγείρει ένα αισθητήριο όργανο και προκαλεί το αντίστοιχο αίσθημα	2.2
perception , noun αντίληψη	επίγνωση των επιδράσεων ενός ή πολλών αισθητηριακών ερεθισμάτων	2.3
sensation , noun αίσθημα*	ψυχοφisiολογική αντίδραση, που προκύπτει από αισθητηριακή διεγερση	2.4
sensitivity , noun ευαισθησία	ικανότητα αντίληψης, αναγνώρισης και/ή διαφοροποίησης, ποιοτικά και/ή ποσοτικά, ενός ή περισσοτέρων ερεθισμάτων με τη βοήθεια των αισθητήριων οργάνων	2.5
sensory adaptation , noun αισθητηριακή προσαρμογή	προσωρινή μεταβολή της ευαισθησίας ενός αισθητήριου οργάνου λόγω συνεχιζόμενου και/ή επαναλαμβανόμενου ερεθίσματος	2.6
sensory fatigue , noun αισθητηριακή κόπωση	μορφή αισθητηριακής προσαρμογής κατά την οποία επέρχεται ελάττωση της ευαισθησίας	2.7
intensity¹ , noun ένταση ¹ , ένταση αίσθησης	μέγεθος του αντιληπτού αισθήματος	2.8
intensity² , noun ένταση ² , ένταση ερεθίσματος	μέγεθος του ερεθίσματος που προκαλεί το αντιληπτό αίσθημα	2.9
acuity , noun οξύτητα	ικανότητα διάκρισης μικρών διαφορών του ερεθίσματος	2.10
modality , noun, sensory modality , noun τροπικότητα, αισθητηριακή τροπικότητα	αίσθημα που διαμεσολαβούνται από οποιοδήποτε αισθητηριακό σύστημα ΠΑΡΑΔΕΙΓΜΑΤΑ: Από το σύστημα ακοής, γεύσης, όσφρησης, αφής, σωματαίσθησης ή όρασης.	2.11

taste , noun γεύση	αίσθημα αντιληπτό από το όργανο της γεύσης όταν αυτό ερεθίζεται από ορισμένες διαλυτές ουσίες Σημείωση: Ο όρος 'γεύση' δεν πρέπει να χρησιμοποιείται για να καταστήσει τον συνδυασμό αισθημάτων γεύσης, όσφρησης και τριβύμου (του τριβύμου νεύρου) που καταλαμβάνεται από τον όρο 'γευστικότητα' (βλ. 3.20). Εάν, σε ανεπίσημη γλώσσα, ο όρος χρησιμοποιείται με αυτή την έννοια, θα πρέπει πάντα να συσχετίζεται με έναν προσδιοριστικό όρο, π.χ. "γεύση μούχλας", "γεύση βοσπόμουρου", "γεύση φελλού".	2.12
gustatory , adjective γευστικός	σχετικός με την αίσθηση της γεύσης	2.13
olfactory , adj. όσφρητικός	σχετικός με την αίσθηση της όσφρησης	2.14
smell , verb οσφραίνομαι, οσμίζομαι, μυρίζω	αντλαμβάνομαι ή προσπαθώ να αντιληφθώ μια οσμή	2.15
touch , noun αφή	αίσθηση κατά την οποία οπιδήποτε γίνεται αντιληπτό μέσω επαφής με το δέρμα	2.16
vision , noun όραση	αίσθηση κατά την οποία γίνονται αντιληπτά η μορφή, το χρώμα, οι κινήσεις και οι αποστάσεις των αντικειμένων	2.17
auditory , adj. ακουστικός	σχετικός με την αίσθηση της ακοής	2.18
trigeminal sensations , noun, oro-nasal chemestheels , noun αίσθημα τριβύμου, στοματοορινική χημειοαίσθηση	αίσθημα που δημιουργείται από ερεθισμό ο οποίος προκαλείται από χημικό ερέθισμα στο στόμα, στη μύτη ή στον λαϊμό ΠΑΡΑΔΕΙΓΜΑ: Πικαντικότητα από ραπανάκι.	2.19

K.B.

«ΟΡΟΓΡΑΜΜΑ»	
Το «Ορογράμμα» είναι δημοσίευση έκδοση της Ελληνικής Εταιρείας Ορολογίας (ΕΛΕΤΟ) για την ενημέρωση των μελών της και ευρύτερου κύκλου αποδεκτών για θέματα της Ελληνικής Γλώσσας και Ορολογίας.	
Ιδιοκτήτης: Ελληνική Εταιρεία Ορολογίας (ΕΛΕΤΟ)	
Εκδότης: Κ. Ε. Βαλεοντής, Πρόεδρος της ΕΛΕΤΟ	
Συντάκτες κειμένων φύλλου: Κώστας Βαλεοντής, Μαρίνα Πανατζάρα, Δημήτρης Παναγιωτάκος	
Εκδοτική Ομάδα: Κώστας Βαλεοντής, Γιώργος Τσιόμης, Μιχάλης Καραμυχάλης, Τάνια Βαλεοντή, Μαρίνα Πανατζάρα	
Τηλέφωνο: 6974321009, 210-8662069	
Ηλ-Ταχυδρομείο: valeonti@otenet.gr	
Ιστότοπος: http://www.eleto.org/orologramma.htm	
Γίνονται δεκτές συνεργασίες. Απαραίτητες προϋποθέσεις τα κείμενα να είναι σε επεξεργασμένη ηλεκτρονική μορφή, σύντομα και έτοιμα για δημοσίευση δίχως να απαιτείται περαιτέρω επεξεργασία.	
Τα δημοσιεύματα που προσυπογράφονται με αρχικά απηχούν τις προσωπικές απόψεις του/της συντάκτη/συντάκτριας τους, το πλήρες όνομα του/της οποιο/οποίας περιλαμβάνεται στους συντάκτες του εκάστοτε φύλλου.	
Τα θέματα των άρθρων της «ΓΩΝΙΑΣ ΤΟΥ ΓΕΣΥ» έχουν συζητηθεί στο ΓΕΣΥ (Γενικό Επιστημονικό Συμβούλιο της ΕΛΕΤΟ) και η δημοσίευση γίνεται ύστερα από απόφασή του.	
Επιτρέπεται η αναδημοσίευση ή η αναπαραγωγή κειμένων του «Ο» με την υποχρέωση αφενός να αναφέρεται η πηγή των κειμένων και αφετέρου, προκειμένου περί ολόκληρων άρθρων, να εξακολουθήσουν αυτά να διατίθενται δωρεάν σε κάθε ενδιαφερόμενο χωρίς καμία δέσμευση σε αντίθετη περίπτωση, χρειάζεται άδεια της ΕΛΕΤΟ.	

Από τους αγγλικούς όρους του πίνακα, οι συνώνυμοι όροι **orography**, **orology**, που δεν έχουν καμία σχέση με την **Ορολογία**, ούτε με την **ορολογία** ή την **ορολογία** και την **ορογραφία**, αλλά αφορούν τα «έρη και τα βουνά», είναι ελληνογενείς όροι και γνήσια σύνθετα, ενώ όλοι οι άλλοι αγγλικοί όροι είναι «λατινοελληνογενείς» όροι, νόθα σύνθετα κατά το ΛΝΕΓ. Να τονιστεί, όμως, ότι το λατινικό συνθετικό **termino-** = **terminus** = όριο, σύνορο, είναι συγγενές με το ελληνικό **τέρμα**.

Να επισημανούμε, τέλος, ότι υπάρχει και ο αγγλικός όρος **horology**, που όμως δεν έχει σχέση με καμία από τις τρεις λέξεις που αναφέραμε, ούτε έχει σχέση με καμία **ορολογία**, αλλά αποδίδει τις έννοιες 'ωρολογοποιία' ή 'χρονομετρία', που δεν αφορούν **όρους** αλλά (ω)ρολόγια! (the art or science of making timepieces or of measuring time – Webster's RHUD).

K.B.



Έρρω, ένα ενδιαφέρον αρχαίο ρήμα

Αφορμή υπήρξε ένα σταυρόλεξο που ζητούσε να συμπληρωθεί η κατάλληλη λέξη που αντιστοιχεί στην προσακτική «χάσου!» των Αρχαίων. Με σύμβουλο την Έπιτομή LIDDEL & SCOTT και την Εγκυκλοπαίδεια Πάπυρος-Λαρούς-Μπριτάνικα εντοπίστηκε η ζητούμενη λέξη: **Έρρε!**

Ρήμα: Έρρω, μελλ. έρρησω, αορ. ήρρησα, παρακ. ήρρηκα

Απαντά: Έρροις σε Ευρ., στον πλῆθ. Έρρησε σε Ομήρ. Ιλ., β' ενικ. Έρρε (χάσου από εδώ), γ' ενικ. Έρρέτω, σε Ομήρ. Ιλ.

Σημασίες: 1α) πορεύομαι ή βαδίζω αργά και με κόπο, ιδίως για τον Ήφαιστο που ήταν χλωός «αὐτὰρ ὁ ἔρρων πλῆσιον» Ομήρ. Ιλ.

β) για τον Οδυσσέα «ἢ μ' οἴω ἔρρωντι συνήντητο» με συνάντησε να περιπλανιέμαι μόνος

2. πήγαινω, μεταβαίνω κάπου

3. βαδίζω στην καταστροφή, στον όλεθρο «ἔρρων ἐκ νηός» πέφτοντας από το πλοίο Αισχ.

4. Στην προσακτική:

α. «Έρρε!» ή «Έρρ' ἔς κόρακα!» πήγαινε να σε φάνε τα κοράκια, φύγα, γκρεμιστάκισου!

β. χάσου, ξεκουμπίσου, πήγαινε στ' ανάθεμα, «ἔρρέτω ἴλιον» Σοφ.

γ. Λατινικά: abi in maiam rem, χάσου, τσάκισου, φύγες rasae conno, πήγαινε να σε φάνε τα κοράκια, πήγαινε να πνιγείς.

5. Στην Αττική διάλεκτο, για πρόσωπα και πράγματα: χάνομαι, καταστρέφομαι, εξαφανίζομαι «ἔρρησι τὰ θεῖα» χάθηκε ο σεβασμός στους θεούς.

6. Σύνθετο (αρχ.) απαντά μόνο στον τύπο της προσακτικής ενστώτα **έρρέτω** με τα προθέματα: αν-, απ-, εισ-, εξ-, περι-.

Δ.Π.

Στη ΓΩΝΙΑ ΤΟΥ ΓΕΣΥ έλα κι εσύ

1. elevation/drawdown ↔ ανύψωση/πτώση

Μετά την ηλ-αλληλογραφία του Προέδρου του ΓΕΣΥ με τον Ν. Καρρά, σύνδεσμο ΕΛΕΤΟ – ΕΓΕ (Ελληνική Γεωλογική Εταιρεία) σχετικά με τον όρο **atmospheric CO2 drawdown** σε άρθρο της γεωλογίας με τίτλο: *Black shale deposition, atmospheric CO2 drawdown, and cooling during the Cenomanian–Turonian Oceanic Anoxic Event*, και τη συζήτηση στο ΓΕΣΥ, υιοθετήθηκαν οι ισοδυναμίες:

elevation ↔ ανύψωση (στάθμης) (ενός γεωλογικού μεγέθους)

drawdown ↔ πτώση (στάθμης) (ενός γεωλογικού μεγέθους)

atmospheric carbon dioxide drawdown, atmospheric CO2 drawdown ↔

πτώση (της στάθμης) του ατμοσφαιρικού διοξειδίου του άνθρακα, πτώση (της στάθμης) του ατμοσφαιρικού CO2

atmospheric carbon dioxide elevation, atmospheric CO2 elevation ↔

ανύψωση (της στάθμης) του ατμοσφαιρικού διοξειδίου του άνθρακα, ανύψωση (της στάθμης) του ατμοσφαιρικού CO2

Οι όροι έχουν εισαχθεί στο [Αγγλοελληνικό Γλωσσάριο Γεωλογικών Όρων](#) που είναι αναρτημένο στον ιστότοπο της ΕΛΕΤΟ.

2. βροχωτό τετράγωνο, βροχωτό τρίγωνο

Με εισήγηση του Προέδρου, σχετικά με ένα ορολογικό ερώτημα που τέθηκε στην Ομάδα *Greek translation professionals* στο Φεϊσμπουκ, εξετάστη η απόδοση της έννοιας 'looped square' (βλέπε σχήμα) και μαζί με αυτήν και της έννοιας 'looped triangle'.



Επισημάνθηκε ότι το χαρακτηριστικό σ' αυτές τις έννοιες δεν είναι ότι ολοκληρω το τετράγωνο (ή το τρίγωνο) μοιάζει με βρόχο (loop), αλλά ότι οι γωνίες του τετραγώνου (ή του τριγώνου) έχουν αντικατασταθεί με βρόχους.

Αντί «βροχοειδές» (που προτάθηκε από συνομιλήτη στο Φεϊσμπουκ) προτιμήθηκε το «βροχωτό» που μπορεί να σημαίνει και π.χ. «που έχει βρόχους» (εξετάστηκαν στοιχεία και από τις πηγές: LSJ, Δημητράκο και ΛΚΝ). Το ΓΕΣΥ υιοθέτησε τις ισοδυναμίες:

looped square ↔ βροχωτό τετράγωνο

looped triangle ↔ βροχωτό τρίγωνο



βροχωτό τετράγωνο

βροχωτό τρίγωνο

3. Αγγλοελληνικό Γλωσσάριο όρων και ορισμών εννοιών αισθητηριακής ανάλυσης (σύμφωνα με το Διεθνές Πρότυπο ISO 5492:2008) – Μέρος 3

Στο παρόν τεύχος του «Ο» συνεχίζουμε να δημοσιεύουμε τους όρους και ορισμούς του *Αγγλοελληνικού Γλωσσαρίου όρων και ορισμών εννοιών αισθητηριακής ανάλυσης*, που έχει επεξεργαστεί το ΓΕΣΥ, με τη σειρά των κεφαλαίων του ISO 5492.

Η επεξεργασία του Γλωσσαρίου γίνεται με επίσημη συνεργασία της ΕΛΕΤΟ με το *Εργαστήριο Μελέτης Αντιδράσεων Καταναλωτή και Οργανοληπτικής Ανάλυσης Τροφίμων και Ποτών* του Πανεπιστημίου Αιγαίου (Διευθυντής: Δρ. Κωνσταντίνος Γκατζιώνης), από το οποίο συμμετέχει, ως σύνδεσμος με την ΕΛΕΤΟ και το ΓΕΣΥ, η κα Μαλαματένια Παναγιώτου.

Στο παρόν φύλλο ολοκληρώνεται το κεφάλαιο 2.

Κεφ. 2. Ορολογία σχετική με τις αισθήσεις (συνέχεια)

<p>cutaneous sense, noun haptics, noun δερματική αίσθηση, απτική αίσθηση, ουσ. απτικός, -ή, -ό, επίθ.</p>	<p>οποιαδήποτε από τις αισθήσεις των οποίων οι υποδοχείς βρίσκονται μέσα στο δέρμα ή αμέσως κάτω από αυτό (ή στις βλεννώδεις μεμβράνες) οι οποίοι συντελούν στην αντίληψη της επαφής, της πίεσης, της θερμότητας, του κρύου και του πόνου</p>	<p>2.20</p>
<p>chemothermal sensation, noun χημειοθερμικό αίσθημα, ουσ.</p>	<p>αίσθημα θερμότητας ή κρύου που παράγεται από ορισμένες ουσίες μη σχετιζόμενο με τη θερμοκρασία της ουσίας ΠΑΡΑΔΕΙΓΜΑ: Τέτοια αίσθηματά παράγονται από την καυσακίνη (καυτού) και μινθόλη (κρύου).</p>	<p>2.21</p>

somesthesia , noun σωματοαίσθηση, σωματοαίσθηση, ουσ.	αισθήματα πίεσης (αφή), θερμοκρασίας και πόνου που γίνονται αντιληπτά από υποδοχείς που βρίσκονται στο δέρμα και στα χείλη, καθώς και στη στοματική βλεννογόνο, στη γλώσσα και στην περιodontική μεμβράνη Σημείωση: Να μην συγχέεται με την κιναισθησία (2.24).	2.22
tactile somesthetic receptor , noun απτικός σωματοαισθητικός υποδοχέας, ουσ.	υποδοχέας που βρίσκεται στο δέρμα της γλώσσας, του στόματος ή του λαιμού και αντιλαμβάνεται γεωμετρικά χαρακτηριστικά όπως αυτά αντικατοπτρίζονται/παρουσιάζονται στην εμφάνιση του τροφίμου	2.23
kinaesthesia , noun κιναισθησία, ουσ. κιναισθησία, ουσ.	αίσθημα της θέσης, της κίνησης και της έντασης των μερών του σώματος αντιληπτό μέσω νεύρων και οργάνων στους μυς, στους τένοντες και στις αρθρώσεις Σημείωση: Να μην συγχέεται με τη σωματοαίσθηση (2.22).	2.24
stimulus threshold , noun, detection threshold , noun κατώφλιο ερεθίσματος, ουσ. κατώφλιο ανίχνευσης, ουσ.	ελάχιστη τιμή ενός αισθητηριακού ερεθίσματος που χρειάζεται για την πρόκληση ενός αισθήματος Σημείωση 1: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο. Σημείωση 2: Το αίσθημα δεν χρειάζεται να ταυτοποιηθεί.	2.25
recognition threshold , noun κατώφλιο αναγνώρισης, ουσ.	ελάχιστη φυσική ένταση ερεθίσματος για την οποία ένας αξιολογητής θα προσδώσει τον ίδιο χαρακτηρισμό κάθε φορά που του παρουσιάζεται Σημείωση: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο.	2.26
difference threshold , noun κατώφλιο διαφοράς, ουσ.	τιμή της μικρότερης αντιληπτής διαφοράς στη φυσική ένταση ενός ερεθίσματος Σημείωση 1: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο. Σημείωση 2: Στα Αγγλικά, ο όρος «κατώφλιο διαφοράς» μερικές φορές σηματοδοτείται με τα γράμματα "DL" (difference limen) ή με τα γράμματα "JND" (just noticeable difference).	2.27
terminal threshold , noun τερματικό κατώφλιο, ουσ.	ελάχιστη τιμή ενός έντονου αισθητηριακού ερεθίσματος πάνω από την οποία δεν μπορεί να γίνει αντιληπτή καμία διαφορά έντασης Σημείωση 1: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο.	2.28
sub-threshold , adjective υποκατωφλιακός, επίθ.	αναφέρεται σε ένταση ερεθίσματος χαμηλότερη από τον υπό θεωρήση τύπο κατωφλίου	2.29
supra-threshold , adjective υπερκατωφλιακός, επίθ.	αναφέρεται σε ένταση ερεθίσματος υψηλότερη από τον υπό θεωρήση τύπο κατωφλίου	2.30
ageusia , noun αγευσία, ουσ.	έλλειψη ευαισθησίας σε γευστικά ερεθίσματα Σημείωση 1: Η αγευσία μπορεί να είναι ολική ή μερική και μόνιμη ή παροδική.	2.31

anosmia , noun ανοσμία, ουσ.	έλλειψη ευαισθησίας σε οσφρητικά ερεθίσματα Σημείωση 1: Η ανοσμία μπορεί να είναι ολική ή μερική και μόνιμη ή παροδική.	2.32
dyschromatopsia , noun δυσχρωματοψία, ουσ.	ελάττωμα της εγχρωμής όρασης που χαρακτηρίζεται από αντίληψη των χρωμάτων σημαντικά διαφορετική από αυτή ενός τυπικού παρατηρητή	2.33
colour blindness , noun αχρωματοψία, ουσ.	ολική ή μερική ανικανότητα διάκρισης ορισμένων αποχρώσεων	2.34
antagonism , noun ανταγωνισμός, ουσ.	συνδυασμένη δράση δύο ή περισσότερων ερεθισμάτων των οποίων ο συνδυασμός προκαλεί στάθμη αίσθηματος χαμηλότερη από την αναμενόμενη από την υπέρθεση των επιδράσεων κάθε ερεθίσματος όταν λαμβάνεται χωριστά Σημείωση: Βλέπε επίσης συνεργισμός (2.36).	2.35
synergism , noun συνεργισμός, ουσ.	συνδυασμένη δράση δύο ή περισσότερων ερεθισμάτων των οποίων ο συνδυασμός προκαλεί στάθμη αίσθηματος υψηλότερη από αυτή που αναμένεται από την απλή άθροιση των επιδράσεων κάθε ερεθίσματος όταν λαμβάνεται χωριστά Σημείωση: Βλέπε επίσης και ανταγωνισμός (2.35).	2.36
masking , noun επικάλυψη, ουσ.	φαινόμενο όπου μια ιδιότητα σε ένα μείγμα επισκιάζει μία ή περισσότερες άλλες υπάρχουσες ιδιότητες	2.37
contrast effect , noun φαινόμενο αντίθεσης, ουσ.	αύξηση της απόκρισης σε διαφορές μεταξύ δύο ταυτόχρονων ή διαδοχικών ερεθισμάτων	2.38
convergence effect , noun φαινόμενο σύγκλισης, ουσ.	μείωση της απόκρισης σε διαφορές μεταξύ δύο ταυτόχρονων ή διαδοχικών ερεθισμάτων	2.39

K.B.

<p>«ΟΡΟΓΡΑΜΜΑ»</p> <p>Το «Ορογράμμα» είναι διημερεια έκδοση της Ελληνικής Εταιρείας Ορολογίας (ΕΛΕΤΟ) για την ενημέρωση των μελών της και ευρύτερου κύκλου αποδεκτών για θέματα της Ελληνικής Γλώσσας και Ορολογίας.</p> <p>Ιδιοκτήτης: Ελληνική Εταιρεία Ορολογίας (ΕΛΕΤΟ)</p> <p>Εκδότης: Κ. Ε. Βαλκοντής, Πρόεδρος της ΕΛΕΤΟ</p> <p>Εύναξη κειμένων φύλλου: Κώστας Βαλκοντής, Δημήτρης Μουτσής, Δημήτρης Παναγιωτόπουλος</p> <p>Εκδοτική Ομάδα: Κώστας Βαλκοντής, Γιώργος Τσιόμας, Τάνα Βαλκοντή, Μαρίνα Παναγιώρα</p> <p>Τηλέφωνα: 6974321009, 210-8662069</p> <p>Ηλ-ταχυδρομείο: valcont@otenet.gr</p> <p>Ιστοσελίδα: http://www.eleto.gr/pr/orogramma.htm</p> <p>Γίνονται δεκτές συνεργασίες. Απαραίτητες προϋποθέσεις τα κείμενα να είναι σε επεξεργασμένη ηλεκτρονική μορφή, σύντομα και έτοιμα για δημοσίευση δίχως να απαιτείται περαιτέρω επεξεργασία.</p> <p>Τα δημοσιεύματα που προσυπογράφονται με αρχικά απηχούν τις προσωπικές απόψεις των συντακτών/συντακτριών τους, τα πλήρη ονόματα των οποίων αναφέρονται στο τέλος του εκάστοτε φύλλου.</p> <p>Τα θέματα των άρθρων της «ΓΩΝΙΑΣ ΤΟΥ ΓΕΣΥ» έχουν συζητηθεί στο ΓΕΣΥ (Γενικό Επιστημονικό Συμβούλιο της ΕΛΕΤΟ) και η δημοσίευση γίνεται ύστερα από απόφασή του.</p> <p>Επιτρέπεται η αναδημοσίευση ή η αναπαραγωγή κειμένων του «Ο» με την υποχρέωση αφενός να αναφέρεται η πηγή των κειμένων και αφετέρου, προκειμένου περί ολόκληρων άρθρων, να εξακολουθήσουν αυτά να διατίθενται δωρεάν σε κάθε ενδιαφερόμενο χωρίς καμία δέσμευση σε αντίθετη περίπτωση, χρειάζεται γραπτή άδεια της ΕΛΕΤΟ.</p>
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2. Αγγλοελληνικό Γλωσσάριο όρων και ορισμών εννοιών αισθητηριακής ανάλυσης (σύμφωνα με το Διεθνές Πρότυπο ISO 5492:2008) – Μέρος 4

Στο παρόν τεύχος του «Ο» συνεχίζουμε να δημοσιεύουμε τους όρους και ορισμούς του Αγγλοελληνικού Γλωσσαρίου όρων και ορισμών εννοιών αισθητηριακής ανάλυσης, που έχει επεξεργαστεί το ΓΕΣΥ, με τη σειρά των κεφαλαίων του ISO 5492.

Η επεξεργασία του Γλωσσαρίου έχει ολοκληρωθεί με επίσημη συνεργασία της ΕΛΕΤΟ με το Εργαστήριο Μελέτης Αντιδράσεων Καταναλωτή και Οργανοληπτικής Ανάλυσης Τροφίμων και Ποτών (ΕΜΑΚΟΑΤΠ) του Πανεπιστημίου Αιγαίου (Διευθυντής: Δρ Κωνσταντίνος Γκατζωάνης), από το οποίο συμμετάχεται, ως σύνδικσος με την ΕΛΕΤΟ και το ΓΕΣΥ, η υποψήφια δασκάλισσα Μαλεματίνα Παναγιώτου. Στο παρόν αρχίζει το κεφάλαιο 3.

Κεφ. 3. Ορολογία σχετική με οργανοληπτικά χαρακτηριστικά

appearance , noun εμφάνιση , ουσ.	το σύνολο των ορατών χαρακτηριστικών μιας ουσίας ή ενός αντικειμένου	3.1
basic taste , noun βασική γεύση , ουσ.	οποιαδήποτε από τις δεκατικές γεύσεις: οξείνη, πικρά, αλμυρά, γλυκά, ουμά Σημείωση 1: Άλλες γεύσεις που μπορούν να ταξινομηθούν ως βασικές είναι αλκαλική και μεταλλική.	3.2
acidity , noun acid taste , noun οξύτητα , ουσ. οξείνη γεύση , ουσ.	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα των περισσότερων όξινων ουσιών (π.χ. κτηρά οξεί και τρυγικό οξύ)	3.3
sourness , noun sour taste , noun ξινότητα , ουσ. ξινόδα , ουσ. ξινή γεύση , ουσ.	σύνθετο γευστικό αίσθημα, που οφείλεται γενικά στην παρουσία οργανικών οξέων Σημείωση 1: Σε κάποιες γλώσσες το «ξινό» δεν είναι συνώνυμο του «οξεί». Σημείωση 2: Μερικές φορές αυτός ο όρος δείχνει δυσάρεστο.	3.4
bitterness , noun bitter taste , noun πικρότητα , ουσ., πικρή γεύση , ουσ.	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα διάφορων ουσιών όπως η κινίνη και η καφεΐνη	3.5
saltiness , noun salty taste , noun αλμυρότητα , ουσ. αλμυρή γεύση , ουσ.	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα διαφόρων ουσιών όπως το χλωριούχο νάτριο	3.6
sweetness , noun sweet taste , noun γλυκύτητα , ουσ. γλυκιά γεύση , ουσ.	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα φυσικών ή τεχνητών ουσιών όπως η σακχαρόζη ή η ασπαρτάμη	3.7
alkalinity , noun alkaline taste , noun αλκαλικότητα , ουσ. αλκαλική γεύση , ουσ.	γεύση που παράγεται από αραιά υδατικά διαλύματα ουσιών που ανήκουν στις βάσεις, δηλαδή pH > 7,0, όπως το υδροξείδιο του νατρίου	3.8
umami , noun ουμάμι , ουσ.	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα ενός συγκεκριμένου είδους αμινοξέος ή νουκλεοπιδίου όπως το γλουταμινικό μονονάτριο ή το ινσανικό δινάτριο	3.9
astringency , noun στυφότητα , ουσ.	σύνθετο αίσθημα που συνοδεύεται από συρρίκνωση, έλξη ή ζάρωμα της επιφάνειας του δέρματος ή της βλεννογόνου στο στόμα και παράγεται από ουσίες όπως οι τανίνες κόκκι ή οι τανίνες αλάου	3.10

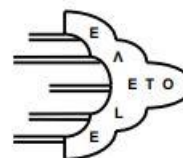
4

(installments to be continued)

chemical effect , noun χημική επίδραση , ουσ.	φυσικό, καυστικό χημικό αίσθημα που εμφανίζεται στη γλώσσα ως αποτέλεσμα της έκθεσης σε ουσίες όπως το ανθρακούχο νερό Σημείωση 1: Το αίσθημα μπορεί να παρακίνησει και είναι ανεξάρτητο από τη θερμοκρασία, τη γεύση και την οσμή. Σημείωση 2: Δημοφιλείς όροι: «στυφό» (δυνατό τσίλι), «καυτρό/θερμοντικό» (ούισκι), «αχημρό» (χυμός δαμάσκηνου), «πικάντικο» (ραπανάκι).	3.11
burning , adjective warming , adjective καυτερός , επίθ. θερμοντικός , επίθ.	περιγράφει ένα αίσθημα θερμότητας στο στόμα, π.χ. όπως προκαλείται από αλκοόλ (θερμανση) ή πιπέρι τσίλι (κάψιμο)	3.12
rungency , noun rungent , adjective πικαντικότητα , ουσ. πικάντικος -η -ο, επίθ.	οξύ αίσθημα της στοματικής και της ρινικής βλεννογόνου μεμβράνης, π.χ. όπως προκαλείται από έλξη, μουστάρδα, ραπανάκι Σημείωση 1: Το αντίστοιχο επίθετο είναι πικάντικός .	3.13
chemical cooling , noun χημικό ψύχος , ουσ.	αίσθημα μειωμένης θερμοκρασίας που εμφανίζεται ως αποτέλεσμα της έκθεσης σε ουσίες όπως η μενθόλη, η μέντα ή το γλυκάνισο Σημείωση 1: Το αίσθημα συνήθως επιμένει μετά την αφαίρεση του ερεθισματος.	3.14
physical cooling , noun φυσικό ψύχος , ουσ.	αίσθημα μειωμένης θερμοκρασίας που εμφανίζεται ως αποτέλεσμα της έκθεσης σε ψυχρές ουσίες σε ουσίες που έχουν αρνητική θερμότητα διάλυσης, όπως η κρυσταλλική σαββόλη ή σε ουσίες που εξαρμίζονται γρήγορα, όπως η ακτόνη ή το αλκοόλ Σημείωση 1: Η διάρκεια του αισθήματος συνήθως περιορίζεται στον χρόνο της άμεσης επαφής με το ερέθισμα.	3.15

K.B.

«ΟΡΟΓΡΑΜΜΑ»
 Το «Ορογράμμα» είναι διμηνιαία έκδοση της Ελληνικής Εταιρείας Ορολογίας (ΕΛΕΤΟ) για την ενημέρωση των μελών της και ευρύτερου κύκλου αποδελτίων για θέματα της Ελληνικής Γλώσσας και Ορολογίας.
 Ιδιοκτήτης: Ελληνική Εταιρεία Ορολογίας (ΕΛΕΤΟ)
 Εκδότης: Κ. Ε. Βαλεοντής, Πρόεδρος της ΕΛΕΤΟ
 Σύνταξη και έκδοση φύλλου: Κώστας Βαλεοντής, Μαρίνα Παναγιώτα
 Εκδοτική Ομάδα: Κώστας Βαλεοντής, Γιώργος Τσίμπος, Τάνια Βαλεοντή, Μαρίνα Παναγιώτα
 Τηλέφωνα: 6974321009, 210-8662069
 Ηλ-Ταχυδρομείο: yakoni@oleon.gr
 Ιστοτόπος: <http://www.oleon.gr/oleon/oleon/oleon/oleon/oleon/>
 Γίνονται δεκτές συνεργασίες. Απαραίτητη προϋπόθεση να κείμενα να είναι σε επιδεξιόμορφη ηλεκτρονική μορφή, σύντομα και έτοιμα για δημοσίευση δίχως να απαιτείται περαιτέρω επεξεργασία.
 Όλα τα άρθρα προσυπογράφονται με τα αρχικά των συγγραφέων τους, τα πλήρη ονόματα των οποίων αναφέρονται στο τέλος του εκάστου φύλλου. Δημοσιεύματα που εκφράζουν προσωπικές απόψεις απηθούν αποκλειστικά τις απόψεις των συγγραφέων τους.
 Τα θέματα των άρθρων της «ΓΩΝΙΑΣ ΤΟΥ ΓΕΣΥ» έχουν συζητηθεί στο ΓΕΣΥ (Γενικό Επιστημονικό Συμβούλιο της ΕΛΕΤΟ) και η δημοσίευση γίνεται ύστερα από απόφασή του.
 Επιτρέπεται η αναδημοσίευση ή η αναπαραγωγή κειμένων του «Ο» με την υποχρέωση αφενός να αναφέρεται η πηγή των κειμένων και αφετέρου, προκειμένου περί ολόκληρων άρθρων, να εξασφαλισθούν αυτά να διπλώνεται δωρεάν σε κάθε ενδιαφερόμενο χωρίς καμιά διάκριση σε αντίθετη περίπτωση, χρειάζεται γραπτή άδεια της ΕΛΕΤΟ.



Αγγλοελληνικό γλωσσάριο όρων και ορισμών εννοιών αισθητηριακής ανάλυσης (199 λήμματα)

Πηγή των αγγλικών όρων και ορισμών: ISO 5492:2008 *Sensory analysis – Vocabulary*

Μετάφραση/αναθεώρηση: Γιώργος Τσιάμας, Κώστας Βαλεοντής, Μαλαματένια Παναγιώτου, Κωνσταντίνος Γκατζιώνης

Επεξεργασία: ΓΕΣΥ σε συνεργασία με το Εργαστήριο Μελέτης Αντιδράσεων Καταναλωτή και Οργανοληπτικής Ανάλυσης Τροφίμων και Ποτών (ΕΜΑΚΟΑΤΠ) του Πανεπιστημίου Αιγαίου

Περιεχόμενα

Περιεχόμενα	1
Πρόλογος – Ιστορικό	1
1 General terminology – Γενική ορολογία	2
2 Terminology relating to the senses – Ορολογία σχετική με τις αισθήσεις	5
3 Terminology relating to organoleptic attributes – Ορολογία σχετική με οργανοληπτικά χαρακτηριστικά	8
4 Terminology relating to methods – Ορολογία σχετική με μεθόδους	20
ΣΥΝΟΛΙΚΟ ΑΛΦΑΒΗΤΙΚΟ ΑΓΓΛΟΕΛΛΗΝΙΚΟ ΓΛΩΣΣΑΡΙΟ	25
Βιβλιογραφία	50

Πρόλογος – Ιστορικό

Το Αγγλοελληνικό γλωσσάριο όρων και ορισμών εννοιών αισθητηριακής ανάλυσης (στο εξής «Γλωσσάριο») αποτελείται από το αγγλικό μέρος του ISO 5492:2008 *Sensory analysis – Vocabulary* και το ελληνικό ισοδύναμό του, που συντάχθηκε ύστερα από μετάφραση, αναθεώρηση και επεξεργασία του αγγλικού, και περιέχει 199 αγγλοελληνικά ορολογικά λήμματα το καθένα με τον αγγλικό όρο, τον ελληνικό όρο, τον αγγλικό ορισμό της έννοιας, τον ελληνικό ορισμό της έννοιας και τον κωδικό αριθμό του όρου.

Αφορμή για την ανάληψη του εγχειρήματος αποτέλεσε η ανακοίνωση «*Πρόταση απόδοσης της ορολογίας του κλάδου της γλωσσολογίας 'sensory linguistics' στην ελληνική γλώσσα*» της Μαλαματένιας Παναγιώτου (υποψήφιας διδακτορίσσης) και του Κωνσταντίνου Γκατζιώνη, διευθυντή του Εργαστηρίου Μελέτης Αντιδράσεων Καταναλωτή και Οργανοληπτικής Ανάλυσης Τροφίμων και Ποτών (στο εξής «Εργαστήριο ΕΜΑΚΟΑΤΠ») του Πανεπιστημίου Αιγαίου στο 13^ο Συνέδριο «Ελληνική Γλώσσα και Ορολογία» (11–13/11/2021).

Μετά το 13^ο Συνέδριο, ο Γενικός Γραμματέας της ΕΛΕΤΟ Γιώργος Τσιάμας, με δική του πρωτοβουλία, πραγματοποίησε μια πρώτη μετάφραση των αγγλικών λημάτων του ISO 5492:2008 και τον Δεκέμβριο 2021 υπέβαλε το μετάφρασμα στο

ΓΕΣΥ, το οποίο και αποφάσισε την περαιτέρω διαδικασία για την επεξεργασία και έγκριση του Γλωσσαρίου. Παράλληλα, η ΕΛΕΤΟ ήρθε σε επαφή με τον **Κ. Γκατζιώνη** και αποφασίστηκε η συνεργασία ΕΛΕΤΟ – Εργαστηρίου ΕΜΑΚΟΑΤΠ στη μετάφραση και επεξεργασία του γλωσσαρίου καθώς και η συμμετοχή της **Μ. Παναγιώτου**, ως εκπροσώπου του Εργαστηρίου ΕΜΑΚΟΑΤΠ, στις συνεδριάσεις του ΓΕΣΥ. Σύμφωνα με την απόφαση, με εισηγητή τον Πρόεδρο του ΓΕΣΥ **Κώστα Βαλεοντή**, ακολούθησε σταδιακή συζήτηση-επεξεργασία των λημμάτων σε 14 συνεδριάσεις του ΓΕΣΥ (από τις 11/1/2022 ως τις 11/10/2022).

Κατ' αντιστοιχίαν προς το ISO 5492:2008, το Γλωσσάριο περιλαμβάνει τέσσερα θεματικά κεφάλαια: *Γενική Ορολογία, Ορολογία σχετική με τις αισθήσεις, Ορολογία σχετική με οργανοληπτικά χαρακτηριστικά και Ορολογία σχετική με μεθόδους* καθώς και το *Συνολικό αλφαβητικό αγγλοελληνικό γλωσσάριο*, που περιλαμβάνει όλα τα λήμματα με αλφαβητική σειρά ως προς τον αγγλικό όρο.

Σύμφωνα με την απόφαση του ΓΕΣΥ, το Γλωσσάριο υποβλήθηκε αφενός στην Κρίση Μελών της ΕΛΕΤΟ και αφετέρου στην Επιστημονική Επιτροπή του Ελληνικού Δικτύου Ορολογίας (ΕΔΟ) και εγκρίθηκε από το ΓΕΣΥ, σε συνεργασία με το Εργαστήριο ΕΜΑΚΟΑΤΠ, στις 6/12/2022.

1 General terminology – Γενική ορολογία

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
sensory analysis , noun	αισθητηριακή ανάλυση , ουσ.	science involved with the assessment of the organoleptic attributes of a product by the senses	επιστήμη που ασχολείται με την αξιολόγηση των οργανοληπτικών χαρακτηριστικών ενός προϊόντος μέσω των αισθήσεων	1.1
sensory , adj	αισθητηριακός -ή -ό , επιθ.	relating to the use of the senses, i.e. to the experience of a person	που έχει σχέση με τη χρήση των αισθήσεων, δηλ. με την εμπειρία ενός προσώπου	1.2
attribute , noun	(αντιληπτό) χαρακτηριστικό , ουσ.	perceptible characteristic	χαρακτηριστικό που προσλαμβάνεται μέσω των αισθήσεων	1.3
organoleptic , adj	οργανοληπτικός -ή -ό , επιθ.	relating to an attribute perceptible by the senses, i.e. to an attribute of a product	που έχει σχέση με ένα χαρακτηριστικό προϊόντος αντιληπτό μέσω των αισθήσεων	1.4
sensory assessor , noun	αισθητηριακός αξιολογητής , ουσ.	any person taking part in a sensory test Note 1 to entry: A naive assessor is a person who does not meet any particular criterion. Note 2 to entry: An initiated assessor has already participated in a sensory test.	πρόσωπο που μετέχει σε αισθητηριακή δοκιμή Σημείωση 1: Αμύητος αξιολογητής είναι το πρόσωπο που δεν πληροί συγκεκριμένα κριτήρια. Σημείωση 2: Μυημένος αξιολογητής είναι το πρόσωπο που έχει ήδη συμμετάσχει σε αισθητηριακή δοκιμή.	1.5
selected assessor , noun	επιλεγμένος αξιολογητής , ουσ.	assessor chosen for his/her ability to perform a sensory test	αξιολογητής που έχει επιλεγεί για την ικανότητά του να εκτελέσει αισθητηριακές δοκιμές	1.6
expert , noun	ειδικός , ουσ.	in the general sense, a person who, through knowledge or experience, has competence to give an opinion in the fields about which he/she is consulted	με τη γενική έννοια, πρόσωπο το οποίο, λόγω γνώσης ή εμπειρίας, έχει τα προσόντα να εκφέρει γνώμη στα πεδία για τα οποία ζητείται η συμβουλή του	1.7

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
expert sensory assessor , noun	ειδικός αισθητηριακός αξιολογητής , ουσ.	selected assessor with a demonstrated sensory sensitivity and with considerable training and experience in sensory testing, who is able to make consistent and repeatable sensory assessments of various products	επιλεγμένος αξιολογητής με αποδεδειγμένη αισθητηριακή ευαισθησία και με σημαντική κατάρτιση και εμπειρία σε αισθητηριακές δοκιμές που είναι ικανός να εκτελεί συνεπείς και επαναλήψιμες αισθητηριακές αξιολογήσεις διαφόρων προϊόντων	1.8
sensory panel , noun	αισθητηριακή ομάδα , ουσ.	group of assessors participating in a sensory test	ομάδα αξιολογητών που συμμετέχουν σε αισθητηριακή δοκιμή	1.9
panel training , noun	κατάρτιση ομάδας , ουσ.	series of sessions in which assessors are oriented to the tasks to be completed by a sensory panel in assessing particular product(s), which may include relevant product characteristics, standard rating scales, techniques of evaluation and terminology	σειρά συνεδριών κατά τις οποίες οι αξιολογητές μισούνται στις εργασίες που πρέπει να επιτελεί μια αισθητηριακή ομάδα κατά την αξιολόγηση συγκεκριμένων προϊόντων Σημείωση 1: Η αξιολόγηση μπορεί να περιλαμβάνει σχετικά χαρακτηριστικά προϊόντος, πρότυπες κλιμακικές κατάταξης, τεχνικές αποτίμησης και ορολογία.	1.10
panel consensus , noun	συναίνεση ομάδας , ουσ.	agreement among assessors regarding terminology and intensity of product characteristics	συμφωνία μεταξύ των αξιολογητών που αφορά την ορολογία και ένταση των χαρακτηριστικών προϊόντος	1.11
consumer , noun	καταναλωτής , ουσ.	person who uses a product	πρόσωπο που χρησιμοποιεί ένα προϊόν	1.12
taster , noun	δοκιμαστής , ουσ.	assessor, selected assessor or expert who evaluates the organoleptic attributes of a food product, mainly with the mouth Note 1 to entry: The term "assessor" is usually preferred.	αξιολογητής, επιλεγμένος αξιολογητής ή ειδικός που εκτιμά τα οργανοληπτικά χαρακτηριστικά ενός τροφίμου, κυρίως με το στόμα Σημείωση 1: Συνήθως, προτιμάται ο όρος «αξιολογητής».	1.13
tasting , noun	γευστική δοκιμή , ουσ.	sensory assessment of a food product in the mouth	αισθητηριακή αξιολόγηση ενός τροφίμου στο στόμα	1.14
product , noun	προϊόν , ουσ.	matter, edible or otherwise, which can be evaluated by sensory analysis EXAMPLE: Food products, cosmetics, textile fabrics.	υλικό, φαγώσιμο ή μη, που μπορεί να αξιολογηθεί με αισθητηριακή ανάλυση ΠΑΡΑΔΕΙΓΜΑ: Τρόφιμα, καλλυντικά, υφάσματα	1.15
sample , noun, sample of product , noun	δείγμα , ουσ., δείγμα προϊόντος , ουσ.	specimen or aliquot of product presented for assessment	δοκίμιο ή κλάσμα προϊόντος που παρουσιάζεται για αξιολόγηση	1.16
test sample , noun	δείγμα δοκιμής , ουσ.	sample of the material under test	δείγμα του υπό δοκιμή υλικού	1.17
test portion , noun	μερίδα δοκιμής , ουσ.	portion of the test sample which is directly tested by the assessor	μέρος δείγματος δοκιμής που δοκιμάζεται απευθείας από τον αξιολογητή	1.18
reference point , noun	σημείο αναφοράς , ουσ.	selected value (of one or several attributes or of a product) against which samples are assessed	επιλεγμένη τιμή (ενός ή περισσοτέρων αντιληπτών χαρακτηριστικών ενός προϊόντος) ως προς την οποία αξιολογούνται τα δείγματα	1.19
control sample , noun	δείγμα ελέγχου , ουσ.	sample of the material under evaluation, chosen as a reference against which all other samples are compared Note 1 to entry: The sample may be identified as a control sample or be a blind control.	δείγμα του υπό αξιολόγηση υλικού, που επιλέχθηκε ως αναφορά, με το οποίο συγκρίνονται όλα τα άλλα δείγματα Σημείωση 1: Το δείγμα μπορεί να προσδιορίζεται ως δείγμα ελέγχου ή ως τυφλό δείγμα.	1.20

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
reference sample, noun	δείγμα αναφοράς, ουσ.	stimulus/substance, sometimes different from the material under test, carefully selected to define or illustrate an attribute or a specified level of a given attribute to which all others are to be compared	ερέθισμα/ουσία, μερικές φορές διαφορετικά από το υπό δοκιμή υλικό, προσεκτικά επιλεγμένα για να ορίζουν ή απεικονίζουν ένα αντιληπτό χαρακτηριστικό ή ένα προκαθορισμένο επίπεδο ενός δεδομένου αντιληπτού χαρακτηριστικού με το οποίο πρόκειται να συγκριθούν όλα τα άλλα	1.21
hedonic, adj	αρέσκειας, επιθ. προσδ.	relating to like or dislike	που έχει σχέση με αρέσκεια/απαρέσκεια Σημείωση 1: Δεν πρέπει να συγχέεται με το επίθετο «ηδονικός» (= που έχει σχέση με ηδονή ή που προκαλεί ηδονή) της γενικής γλώσσας.	1.22
acceptability, noun	αποδεκτότητα, ουσ.	degree to which a stimulus is liked or disliked, overall or for particular sensory attributes	βαθμός στον οποίο ένα ερέθισμα είναι αρεστό ή όχι, συνολικά ή για ιδιαίτερα αισθητηριακά χαρακτηριστικά	1.23
preference, noun	προτίμηση, ουσ.	selection, by an assessor, of one stimulus or product over others in a given set based on hedonic criteria	επιλογή, από έναν αξιολογητή, ενός ερεθίσματος ή ενός προϊόντος έναντι άλλων σε ένα δεδομένο σύνολο, βασισμένη σε κριτήρια αρέσκειας	1.24
aversion, noun	απέχθεια, ουσ.	feeling of repulsion provoked by a stimulus	αίσθημα αποτροφής που προκαλείται από ένα ερέθισμα	1.25
discrimination, noun	διάκριση, ουσ.	act of qualitative and/or quantitative differentiation between two or more stimuli	πράξη ποιοτικής και/ή ποσοτικής διαφοροποίησης μεταξύ δύο ή περισσότερων ερεθισμάτων	1.26
discriminating ability, noun	διακριτική ικανότητα, ουσ.	sensitivity, acuity, ability to perceive quantitative and/or qualitative differences	ικανότητα αντίληψης ποσοτικών και/ή ποιοτικών διαφορών	1.27
appetite, noun	όρεξη, ουσ.	physiological and psychological state expressed by the desire to eat and/or to drink	φυσιολογική και ψυχολογική κατάσταση που εκφράζεται με την επιθυμία για φαγητό ή ποτό	1.28
appetizing, adj.	ορεκτικός -ή -ό, επιθ.	describes a product capable of exciting the appetite of the individual	(για προϊόν) ικανός -ή -ό να διεγείρει την όρεξη ενός ατόμου	1.29
palatability, noun	ευγευστότητα, ουσ.	quality of a product which makes it pleasant to eat or drink	ιδιότητα ενός προϊόντος που το καθιστά ευχάριστο στη βρώση ή πόση	1.30
psychophysics, noun	ψυχοφυσική, ουσ.	study of relationships between measurable stimuli and the corresponding sensory responses	μελέτη των σχέσεων μεταξύ μετρήσιμων ερεθισμάτων και των αντίστοιχων αισθητηριακών αποκρίσεων	1.31
olfactometry, noun	οσφρησιομετρία, ουσ.	measurement of the response of assessors to olfactory stimuli Note 1 to entry: Refers to the assessors.	μέτρηση της απόκρισης των αξιολογητών σε οσφρητικά ερεθίσματα Σημείωση 1: Αναφέρεται στους αξιολογητές.	1.32
olfactometer, noun	οσφρησιόμετρο, ουσ.	apparatus used to present olfactory stimuli to assessors under reproducible conditions	συσκευή που χρησιμοποιείται για την παρουσίαση οσφρητικών ερεθισμάτων στους αξιολογητές κάτω από αναπαραγόμενες συνθήκες	1.33
odorimetry, noun	οσμομετρία, ουσ.	measurement of the odour properties of substances Note 1 to entry: Refers to the products	μέτρηση των οσμητικών ιδιοτήτων των ουσιών Σημείωση 1: Αναφέρεται στα προϊόντα.	1.34
odorant, noun	οσμητικό, ουσ.	substance whose volatiles can be perceived by the olfactory organ (including nerves)	ουσία της οποίας οι πτητικές εκπομπές μπορούν να γίνουν αντιληπτές από το οσφρητικό όργανο (συμπεριλαμβανομένων των νεύρων)	1.35

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
quality, noun	ποιότητα, ουσ.	collection of features and characteristics of a product, process or service that confer its ability to satisfy stated or implied needs	σύνολο γνωρισμάτων και χαρακτηριστικών ενός προϊόντος, μιας διεργασίας ή μιας υπηρεσίας που συνεισφέρουν στην ικανότητα του/της να ικανοποιεί δηλωμένες ή υπονοούμενες ανάγκες	1.36
quality factor, noun	παράγοντας ποιότητας, ουσ.	one feature or characteristic chosen among others to assess the overall quality of a product	ένα γνώρισμα ή χαρακτηριστικό που επιλέχθηκε μεταξύ άλλων για την αξιολόγηση της συνολικής ποιότητας ενός προϊόντος	1.37
attitude, noun	στάση, ουσ.	disposition to respond in a given way toward a class of objects or ideas	διάθεση για απόκριση με δεδομένο τρόπο σε μια κατηγορία αντικειμένων ή ιδεών	1.38
mastication, noun	μάσηση, ουσ.	act of chewing, grinding and comminuting with the teeth	καμμάτισμα, άλεση και πολτοποίηση με τα δόντια	1.39

2 Terminology relating to the senses – Ορολογία σχετική με τις αισθήσεις

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
receptor, noun	υποδοχέας, ουσ.	specific part of a sense organ which responds to a particular stimulus	συγκεκριμένο μέρος ενός αισθητήριου οργάνου που αποκρίνεται σε ένα ιδιαίτερο ερέθισμα	2.1
stimulus, noun	ερέθισμα, ουσ.	that which excites a receptor	φυσικό αίτιο που διεγείρει ένα αισθητήριο όργανο και προκαλεί το αντίστοιχο αίσθημα	2.2
perception, noun	αντίληψη, ουσ.	awareness of the effects of single or multiple sensory stimuli	επίγνωση των επιδράσεων ενός ή πολλών αισθητηριακών ερεθισμάτων	2.3
sensation, noun	αίσθημα, ουσ.	psychophysiological reaction, resulting from sensory stimulation	ψυχοφisiολογική αντίδραση, που προκύπτει από αισθητηριακή διέγερση	2.4
sensitivity, noun	ευαισθησία, ουσ.	ability to perceive, identify and/or differentiate, qualitatively and/or quantitatively, one or more stimuli by means of the sense organs Note 1 to entry: In French, this term should be differentiated from the term "sensibilité", which refers to the level of ability to discriminate (see 2.10).	ικανότητα αντίληψης, αναγνώρισης και/ή διαφοροποίησης, ποιοτικά και/ή ποσοτικά, ενός ή περισσότερων ερεθισμάτων με τη βοήθεια των αισθητήριων οργάνων	2.5
sensory adaptation, noun	αισθητηριακή προσαρμογή, ουσ.	temporary modification of the sensitivity of a sense organ due to continued and/or repeated stimulation	προσωρινή μεταβολή της ευαισθησίας ενός αισθητήριου οργάνου λόγω συνεχιζόμενου και/ή επαναλαμβανόμενου ερεθίσματος	2.6
sensory fatigue, noun	αισθητηριακή κόπωση, ουσ.	form of sensory adaptation in which a decrease in sensitivity occurs	μορφή αισθητηριακής προσαρμογής κατά την οποία επέρχεται ελάττωση της ευαισθησίας	2.7
intensity ¹ , noun	ένταση ¹ , ουσ., ένταση αίσθηματος, ουσ.	magnitude of the perceived sensation	μέγεθος του αντιληπτού αισθήματος	2.8
intensity ² , noun	ένταση ² , ουσ., ένταση ερεθίσματος, ουσ.	magnitude of the stimulus causing the perceived sensation	μέγεθος του ερεθίσματος που προκαλεί το αντιληπτό αίσθημα	2.9
acuity, noun	αντιληπτική οξύτητα, ουσ.	ability to discern small differences in stimuli Note 1 to entry: In French, this term should be differentiated from the term "acuité" which refers to the ability to perceive with no concept of level.	ικανότητα διάκρισης μικρών διαφορών του ερεθίσματος	2.10

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
modality , noun, sensory modality , noun	τροπικότητα , ουσ., αισθητηριακή τροπικότητα , ουσ.	sensations mediated by any of the sensory systems, for example auditory, taste, olfaction, touch, somesthesia or visual modality	αισθήματα που διαμεσολαβούνται από οποιοδήποτε αισθητηριακό σύστημα ΠΑΡΑΔΕΙΓΜΑΤΑ: Από το σύστημα ακοής, γεύσης, όσφρησης, αφής, σωματoαίσθησης ή όρασης	2.11
taste , noun	γεύση , ουσ.	sensations perceived by the taste organ when stimulated by certain soluble substances Note 1 to entry: The term "taste" should not be used to designate the combination of gustatory, olfactory and trigeminal sensations which are designated by the term "flavour" (see 3.20). If, in informal language, the term is used in this sense, it should always be associated with a qualifying term, e.g. "musty taste", "raspberry taste", "corky taste".	αίσθημα αντιληπτό από το όργανο της γεύσης όταν αυτό ερεθίζεται από ορισμένες διαλυτές ουσίες Σημείωση 1: Ο όρος 'γεύση' δεν πρέπει να χρησιμοποιείται για να κατασημάνει τον συνδυασμό αισθημάτων γεύσης, όσφρησης και τριδύμου (του τριδύμου νεύρου) που κατασημάνεται από τον όρο 'αρώμα' (βλ. 3.20). Εάν, σε ανεπίσημη γλώσσα, ο όρος χρησιμοποιείται με αυτή την έννοια, θα πρέπει πάντα να συσχετίζεται με έναν προσδιοριστικό όρο, π.χ. "γεύση μούχλας", "γεύση βατόμουρου", "γεύση φελλού".	2.12
gustatory , adjective	γευστικός , επίθ.	pertaining to the sense of taste	σχετικός με την αίσθηση της γεύσης	2.13
olfactory , adjective	οσφρητικός , επίθ.	pertaining to the sense of smell	σχετικός με την αίσθηση της όσφρησης	2.14
to smell , verb	οσφραίνομαι , ρήμα	to perceive or to attempt to perceive an odour	ανιλαμβάνομαι ή προσπαθώ να αντιληφθώ μια οσμή ¹	2.15
touch , noun	αφή , ουσ.	tactile sense	αίσθηση κατά την οποία οτιδήποτε γίνεται αντιληπτό μέσω επαφής με το δέρμα	2.16
vision , noun	όραση , ουσ.	sense of sight	αίσθηση κατά την οποία γίνονται αντιληπτά ερεθίσματα μέσω των οφθαλμών	2.17
auditory , adjective	ακουστικός , επίθ.	pertaining to the sense of hearing	σχετικός με την αίσθηση της ακοής	2.18
trigeminal sensations , noun, oro-nasal chemesthesia , noun	αισθήματα τριδύμου , ουσ., στοματορρινική χημειοαίσθησία , στοματορρινική χημειοαίσθηση , ουσ.	sensations resulting from irritation caused by chemical stimuli in the mouth, nose or throat EXAMPLE: Pungency from horseradish.	σύνολο αισθημάτων που δημιουργούνται από ερεθισμό ο οποίος προκαλείται από χημικά ερεθίσματα στο στόμα, στη μύτη ή στον λαιμό ΠΑΡΑΔΕΙΓΜΑ: Πικαντικότητα από ραπανάκι.	2.19
cutaneous sense , noun haptics , noun	δερματική αίσθηση , ουσ., απτική αίσθηση , ουσ. απτικός -ή -ό , επίθ.	any of the senses whose receptors lie in the skin or immediately beneath it (or in the mucous membranes) resulting in the perception of contact, pressure, warmth, cold and pain	οποιαδήποτε από τις αισθήσεις των οποίων οι υποδοχείς βρίσκονται μέσα στο δέρμα ή αμέσως κάτω από αυτό (ή στις βλενώδεις μεμβράνες) οι οποίοι συντελούν στην αντίληψη της επαφής, της πίεσης, της θερμότητας, του κρύου και του πόνου	2.20
chemothermal sensation , noun	χημειοθερμικό αίσθημα , ουσ.	sensation of heat or cold produced by certain substances, unrelated to the temperature of the substance ΠΑΡΑΔΕΙΓΜΑ: These sensations are produced by capsaicin (hot) and menthol (cold).	αίσθημα θερμότητας ή κρύου που παράγεται από ορισμένες ουσίες μη σχετιζόμενο με τη θερμοκρασία της ουσίας ΠΑΡΑΔΕΙΓΜΑ: Τέτοια αισθήματα παράγονται από την καψαϊκίνη (καυτού) και μινθόλη (κρύου).	2.21

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
somesthesia , noun	σωματαιοσθησία , ουσ., σωματαιοσθηση , ουσ.	sensations of pressure (touch), temperature, and pain perceived by the receptors located in the skin and lips, including oral mucosa, tongue and periodontal membrane Note 1 to entry: Do not confuse with kinaesthesia (2.24).	αισθήματα πίεσης (αφή), θερμοκρασίας και πόνου που γίνονται αντιληπτά από υποδοχείς που βρίσκονται στο δέρμα και στα χείλη, καθώς και στη στοματική βλενογόνο, στη γλώσσα και στην περιοδοντική μεμβράνη Σημείωση 1: Να μην συγχέεται με την κιναισθησία (2.24).	2.22
tactile somesthetic receptor , noun	απτικός σωματαιοσθητικός υποδοχέας , ουσ.	receptor located in the skin of the tongue, mouth or throat, which perceives geometrical characteristics as reflected in the appearance of the food product	υποδοχέας που βρίσκεται στο δέρμα της γλώσσας, του στόματος ή του λαιμού και αντιλαμβάνεται γεωμετρικά χαρακτηριστικά όπως αυτά αντικατοπτρίζονται/παρουσιάζονται στην εμφάνιση του τροφίμου	2.23
kinaesthesia , noun	κιναισθησία , ουσ., κιναισθηση , ουσ.	sensation of position, movement and tension of parts of the body perceived through nerves and organs in the muscles, tendons and joints Note 1 to entry: Do not confuse with somesthesia (2.22).	αίσθημα της θέσης, της κίνησης και έντασης των μερών του σώματος αντιληπτό μέσω νεύρων και οργάνων στους μύς, στους τένοντες και στις αρθρώσεις Σημείωση 1: Να μην συγχέεται με τη σωματαιοσθησία (2.22).	2.24
stimulus threshold , noun, detection threshold , noun	κατώφλιο ερεθίσματος , ουσ., κατώφλιο ανίχνευσης , ουσ.	minimum value of a sensory stimulus needed a sensation Note 1 to entry: The term "threshold" is always used with a qualifying term. Note 2 to entry: The sensation need not be identified.	ελάχιστη τιμή ενός αισθητηριακού ερεθίσματος που χρειάζεται για την πρόκληση ενός αισθήματος Σημείωση 1: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο. Σημείωση 2: Το αίσθημα δεν χρειάζεται να ταυτοποιηθεί.	2.25
recognition threshold , noun	κατώφλιο αναγνώρισης , ουσ.	minimum physical intensity of a stimulus for which an assessor will assign the same descriptor each time it is presented Note 1 to entry: The term "threshold" is always used with a qualifying term.	ελάχιστη φυσική ένταση ερεθίσματος για την οποία ένας αξιολογητής θα προσδώσει τον ίδιο χαρακτηρισμό κάθε φορά που του παρουσιάζεται Σημείωση 1: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο.	2.26
difference threshold , noun	κατώφλιο διαφοράς , ουσ.	value of the smallest perceptible difference in the physical intensity of a stimulus Note 1 to entry: The term "threshold" is always used with a qualifying term. Note 2 to entry: In English, the term "difference threshold" is sometimes designated by the letters "DL" (difference limen) or the letters "JND" (just noticeable difference).	τιμή της μικρότερης αντιληπτής διαφοράς στη φυσική ένταση ενός ερεθίσματος Σημείωση 1: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο. Σημείωση 2: Στα αγγλικά, ο όρος «κατώφλιο διαφοράς» μερικές φορές σηματοδοτείται με τα γράμματα "DL" (difference limen) ή με τα γράμματα "JND" (just noticeable difference).	2.27
terminal threshold , noun	τερματικό κατώφλιο , ουσ.	minimum value of an intense sensory stimulus above which no difference in intensity can be perceived Note 1 to entry: The term "threshold" is always used with a qualifying term.	ελάχιστη τιμή ενός έντονου αισθητηριακού ερεθίσματος πάνω από την οποία δεν μπορεί να γίνει αντιληπτή καμιά διαφορά έντασης Σημείωση 1: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο.	2.28
sub-threshold , adjective	υποκατωφλιακός , επίθ.	pertains to a stimulus intensity below the type of threshold under consideration	αναφέρεται σε ένταση ερεθίσματος χαμηλότερη από τον υπό θεώρηση τύπο κατωφλίου	2.29
supra-threshold , adjective	υπερκατωφλιακός , επίθ.	pertains to a stimulus intensity above the type of threshold under consideration	αναφέρεται σε ένταση ερεθίσματος υψηλότερη από τον υπό θεώρηση τύπο κατωφλίου	2.30

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
ageusia, noun	αγευσία, ουσ.	lack of sensitivity to gustatory stimuli Note 1 to entry: Ageusia may be total or partial, and permanent or temporary.	έλλειψη ευαισθησίας σε γευστικά ερεθίσματα Σημείωση 1: Η αγευσία μπορεί να είναι ολική ή μερική και μόνιμη ή παροδική.	2.31
anosmia, noun	ανοσμία, ουσ.	lack of sensitivity to olfactory stimuli Note 1 to entry: Anosmia may be total or partial, and permanent or temporary.	έλλειψη ευαισθησίας σε οσφρητικά ερεθίσματα Σημείωση 1: Η ανοσμία μπορεί να είναι ολική ή μερική και μόνιμη ή παροδική.	2.32
dyschromatopsia, noun	δυσχρωματοψία, ουσ.	defect of colour vision characterized by a perception significantly different from that of a standard observer	ελάττωμα της έγχρωμης όρασης που χαρακτηρίζεται από αντίληψη των χρωμάτων σημαντικά διαφορετική από αυτή ενός τυπικού παρατηρητή	2.33
colour blindness	αχρωματοψία, ουσ.	total or partial inability to differentiate certain hues	ολική ή μερική ανικανότητα διάκρισης ορισμένων αποχρώσεων	2.34
antagonism, noun	ανταγωνισμός, ουσ.	joint action of two or more stimuli, whose combination elicits a level of sensation lower than that expected from superimposing the effects of each stimulus taken separately Note 1 to entry: See also synergism (2.36).	συνδυασμένη δράση δύο ή περισσότερων ερεθισμάτων των οποίων ο συνδυασμός προκαλεί στάθμη αισθήματος χαμηλότερη από την αναμενόμενη από την υπέρθεση των επιδράσεων κάθε ερεθίσματος όταν λαμβάνεται χωριστά Σημείωση 1: Βλέπε επίσης συnergισμός (2.36).	2.35
synergism, noun	συnergισμός, ουσ.	joint action of two or more stimuli, whose combination elicits a level of sensation in excess of that expected from a simple addition of the effects of each stimulus taken separately Note 1 to entry: See also antagonism (2.35).	συνδυασμένη δράση δύο ή περισσότερων ερεθισμάτων των οποίων ο συνδυασμός προκαλεί στάθμη αισθήματος υψηλότερη από αυτή που αναμένεται από την απλή άθροιση των επιδράσεων κάθε ερεθίσματος όταν λαμβάνεται χωριστά Σημείωση 1: Βλέπε επίσης και ανταγωνισμός (2.35).	2.36
masking, noun	επικάλυψη, ουσ.	phenomenon where one quality within a mixture obscures one or several other qualities present	φαινόμενο όπου μια ιδιότητα σε ένα μείγμα επικαλύπτει μία ή περισσότερες άλλες υπάρχουσες ιδιότητες	2.37
contrast effect, noun	φαινόμενο αντίθεσης, ουσ.	increase in response to differences between two simultaneous or consecutive stimuli	αύξηση της απόκρισης σε διαφορές μεταξύ δύο ταυτόχρονων ή διαδοχικών ερεθισμάτων	2.38
convergence effect, noun	φαινόμενο σύγκλισης, ουσ.	decrease in response to differences between two simultaneous or consecutive stimuli	μείωση της απόκρισης σε διαφορές μεταξύ δύο ταυτόχρονων ή διαδοχικών ερεθισμάτων	2.39

3 Terminology relating to organoleptic attributes – Ορολογία σχετική με οργανοληπτικά χαρακτηριστικά

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
appearance, noun	εμφάνιση, ουσ.	all the visible attributes of a substance or object	το σύνολο των ορατών χαρακτηριστικών μιας ουσίας ή ενός αντικειμένου	3.1
basic taste, noun	βασική γεύση, ουσ.	any one of the distinctive tastes: acid/sour, bitter, salty, sweet, umami Note 1 to entry: Other tastes that may be classified as basic are alkaline and metallic.	οποιαδήποτε από τις διακριτικές γεύσεις: οξύ/ξινό, πικρό, αλμυρό, γλυκό, ουμάμι Σημείωση 1: Άλλες γεύσεις που μπορούν να ταξινομηθούν ως βασικές είναι αλκαλικό και μεταλλικό.	3.2

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
acidity , noun acid taste, noun	οξύτητα , ουσ., όξινη γεύση, ουσ.	basic taste produced by dilute aqueous solutions of most acid substances (e.g. citric acid and tartaric acid)	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα των περισσότερων όξινων ουσιών (π.χ. κίτρικο οξύ και τρυγικό οξύ)	3.3
sourness , noun sour taste, noun	ξινότητα , ουσ., ξινόδα, ουσ. ξινή γεύση, ουσ.	gustatory complex sensation, generally due to presence of organic acids Note 1 to entry: In some languages "sour" is not a synonym for "acid". Note 2 to entry: Sometimes this term has a negative hedonic sense.	σύνθετο γευστικό αίσθημα, που οφείλεται γενικά στην παρουσία οργανικών οξέων Σημείωση 1: Σε κάποιες γλώσσες το «ξινό» δεν είναι συνώνυμο του «αξίου». Σημείωση 2: Μερικές φορές αυτός ο όρος δείχνει δυσαρέσκεια.	3.4
bitterness , noun bitter taste, noun	πικρότητα , ουσ., πικρή γεύση, ουσ.	basic taste produced by dilute aqueous solutions of various substances such as quinine or caffeine	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα διάφορων ουσιών όπως η κινίνη και η καφεΐνη	3.5
saltiness , noun salty taste, noun	αλμυρότητα , ουσ., αλμυρή γεύση, ουσ.	basic taste produced by dilute aqueous solutions of various substances such as sodium chloride	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα διάφορων ουσιών όπως το χλωριούχο νάτριο	3.6
sweetness , noun sweet taste, noun	γλυκύτητα , ουσ γλυκιά γεύση, ουσ.	basic taste produced by dilute aqueous solutions of natural or artificial substances such as sucrose or aspartame	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα φυσικών ή τεχνητών ουσιών όπως η σακχαρόζη ή η ασπαρτάμη	3.7
alkalinity , noun alkaline taste, noun	αλκαλικότητα , ουσ., αλκαλική γεύση, ουσ.	taste produced by dilute aqueous solutions of basic, i.e. pH > 7.0, substances such as sodium hydroxide	γεύση που παράγεται από αραιά υδατικά διαλύματα ουσιών που ανήκουν στις βάσεις, δηλαδή pH > 7,0, όπως το υδροξείδιο του νατρίου	3.8
umami , noun	ουμάμι , ουσ.	basic taste produced by dilute aqueous solutions of a certain kind of amino acid or nucleotide such as monosodium glutamate or disodium inosinate	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα ενός συγκεκριμένου είδους αμινοξέος ή νουκλεοτιδίου όπως το γλουταμινικό μονονάτριο ή το ινσινικό δινάτριο	3.9
astringency , noun	στυφότητα , ουσ.	complex sensation, accompanied by shrinking, drawing or puckering of the skin or mucosal surface in the mouth, produced by substances such as kaki tannins or sloe tannins	σύνθετο αίσθημα που συνοδεύεται από συρρίκνωση, έλξη ή ζάρωμα της επιφάνειας του δέρματος ή της βλεννογόνου στο στόμα και παράγεται από ουσίες όπως οι τανίνες κάκι ή οι τανίνες αλόου	3.10
chemical effect , noun	χημική επίδραση , ουσ.	physical, stinging chemical sensation experienced on the tongue as a result of exposure to substances such as carbonated water Note 1 to entry: The sensation may linger and is independent of temperature, taste and odour. Note 2 to entry: Popular terms: "astringent" (strong tea), "burning" (whisky), "sharp" (prune juice), "pungent" (horseradish).	φυσικό, καυστικό χημικό αίσθημα που εμφανίζεται στη γλώσσα ως αποτέλεσμα της έκθεσης σε ουσίες όπως το ανθρακούχο νερό Σημείωση 1: Το αίσθημα μπορεί να παραμείνει και είναι ανεξάρτητο από τη θερμοκρασία, τη γεύση και την οσμή. Σημείωση 2: Δημοφιλείς όροι: «στυφό» (δυνατό τσάι), «καυτερό/θερμαντικό» (ουίσκι), «αιχμηρό» (χυμός σταμάκνου), «πικάντικο» (ραπανάκι).	3.11
burning , adjective warming, adjective	καυτερός , επιθ., θερμαντικός, επιθ.	describes a sensation of heat in the mouth, e.g. as caused by alcohol (warming) or chilli pepper (burning)	περιγράφει ένα αίσθημα θερμότητας στο στόμα, π.χ. όπως προκαλείται από αλκοόλ (θερμανση) ή πιπέρι τσίλι (κάψιμο)	3.12
pungency , noun pungent, adjective	πικάντικότητα πικάντικος -η -ο , επιθ.	sharp sensation of the buccal and nasal mucous membranes, e.g. as caused by vinegar, mustard, horseradish	οξύ αίσθημα της στοματικής και της ρινικής βλεννογόνου μεμβράνης, π.χ. όπως προκαλείται από ξίδι, μουστάρδα, ραπανάκι Σημείωση 1: Το αντίστοιχο επίθετο είναι πικάντικός .	3.13

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
chemical cooling , noun	χημικό ψύχος , ουσ.	sensation of reduced temperature experienced as a result of exposure to certain substances such as menthol, mints or anise Note 1 to entry: The sensation usually persists after the stimulus is removed.	αίσθημα μειωμένης θερμοκρασίας που εμφανίζεται ως αποτέλεσμα της έκθεσης σε ορισμένες ουσίες όπως η μινθόλη, η μέντα ή το γλυκάνισο Σημείωση 1: Το αίσθημα συνήθως επιμένει μετά την αφαίρεση του ερεθίσματος.	3.14
physical cooling , noun	φυσικό ψύχος , ουσ.	sensation of reduced temperature experienced as a result of exposure to thermally cold substances, to substances, that have a negative heat of solution, such as crystalline sorbitol, or to substances, that evaporate rapidly, such as acetone or alcohol Note 1 to entry: The duration of the sensation is usually limited to the time of direct contact with the stimulus.	αίσθημα μειωμένης θερμοκρασίας που εμφανίζεται ως αποτέλεσμα της έκθεσης σε ψυχρές ουσίες, σε ουσίες που έχουν αρνητική θερμότητα διάλυσης, όπως η κρυσταλλική σορβιτόλη ή σε ουσίες που εξατμίζονται γρήγορα, όπως η ακετόνη ή το αλκοόλ Σημείωση 1: Η διάρκεια του αισθήματος συνήθως περιορίζεται στον χρόνο της άμεσης επαφής με το ερέθισμα.	3.15
chemical heat , noun	χημική θερμότητα , ουσ.	sensation of increased temperature resulting from exposure to substances such as capsaicin or hot peppers Note 1 to entry: The sensation tends to persist after the stimulus is removed.	αίσθημα αυξημένης θερμοκρασίας που προκύπτει από την έκθεση σε ουσίες όπως η καψαϊκίνη ή οι καυτερές πιπεριές Σημείωση 1: Το αίσθημα τείνει να επιμένει μετά την αφαίρεση του ερεθίσματος.	3.16
physical heat , noun	φυσική θερμότητα , ουσ.	sensation experienced as a result of exposure to thermally hot substances such as water above 48 °C Note 1 to entry: The duration of the sensation is usually limited to the time of direct contact with the stimulus.	αίσθημα που εμφανίζεται ως αποτέλεσμα της έκθεσης σε θερμές ουσίες όπως το νερό πάνω από 48 °C Σημείωση 1: Η διάρκεια του αισθήματος συνήθως περιορίζεται στον χρόνο της άμεσης επαφής με το ερέθισμα.	3.17
odour , noun	οσμή ¹ , ουσ.	sensation perceived by means of the olfactory organ in sniffing certain volatile substances	αίσθημα που γίνεται αντιληπτό μέσω του οσφρητικού οργάνου όταν οσφρανόμαστε ορισμένες πτητικές ουσίες	3.18
off-odour , noun	αποκλίνουσα οσμή , ουσ.	atypical odour often associated with deterioration or transformation of the product	άτυπη οσμή ¹ (3.18) που συχνά συσχετίζεται με αλλοίωση ή μεταβολή του προϊόντος	3.19
flavour , noun	οσμόγευση , ουσ.	complex combination of the olfactory, gustatory and trigeminal sensations perceived during tasting Note 1 to entry: Flavour may be influenced by tactile, thermal, painful and/or kinaesthetic effects.	σύνθετος συνδυασμός των αισθημάτων όσφρησης, γεύσης ¹ και τριδύμου, που γίνονται αντιληπτά κατά τη διάρκεια της γευστικής δοκιμής Σημείωση 1: Η οσμόγευση μπορεί να επηρεαστεί από απτικές, θερμικές, επώδυνες και/ή κιναισθητικές επιδράσεις.	3.20
off-flavour , noun	αποκλίνουσα οσμόγευση , ουσ.	atypical flavour often associated with deterioration or transformation of the product	άτυπη οσμόγευση που συχνά συνδέεται με αλλοίωση ή μεταβολή του προϊόντος	3.21
flavour enhancer , noun	βελτιωτικό οσμόγευσης , ουσ.	substance that intensifies the flavour of a product without possessing its flavour	ουσία που ενισχύει τη οσμόγευση ενός προϊόντος χωρίς να την καταλαμβάνει	3.22
taint , noun	μόλυσμα , ουσ.	taste or odour foreign to the product originating from external contamination	γεύση ή οσμή ¹ ξένη προς το προϊόν που προέρχεται από εξωτερική μόλυνση	3.23

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
aroma¹ , noun	οσμή² , ουσ.	odour with a pleasant or unpleasant connotation Note 1 to entry: The terms "aroma" in English and "arôme" in French are not exactly equivalent.	οσμή ¹ (3.18) με ευχάριστη ή δυσάρεστη χροιά Σημείωση 1: Οι όροι "aroma" στα αγγλικά και "arôme" στα γαλλικά δεν είναι ακριβώς ισοδύναμοι.	3.24
aroma² , noun	άρωμα , ουσ.	sensory attribute perceptible by the olfactory organ via the back of the nose when tasting Note 1 to entry: The terms "aroma" in English and "arôme" in French are not exactly equivalent.	αισθητηριακό χαρακτηριστικό που γίνεται αντιληπτό από το οσφρητικό όργανο μέσω του πίσω μέρους της μύτης κατά τη γευστική δοκιμή Σημείωση 1: Οι όροι "aroma" στα αγγλικά και "arôme" στα γαλλικά δεν είναι ακριβώς ισοδύναμοι.	3.25
bouquet , noun	μπουκέτο , ουσ.	group of specific olfactory notes allowing a product (wine, spirits, etc.) to be characterized	ομάδα συγκεκριμένων οσφρητικών διαβαθμίσεων που επιτρέπουν τον χαρακτηρισμό ενός προϊόντος (κρασί, αισθηματώδη ποτά κ.λπ.)	3.26
body , noun	σώμα , ουσ.	consistency, compactness of texture, fullness, richness, flavour or substance of a product	πυκνότητα, συμπαγές υψή, πληρότητα, πλούτος, οσμόγευση ή υλική υπόσταση ενός προϊόντος	3.27
note , noun	νότα , ουσ.	distinctive and identifiable feature of an odour or flavor	διακριτικό και αναγνωρίσιμο γνώρισμα μιας οσμής ή οσμόγευσης	3.28
off-note , noun	αποκλίνουσα νότα , ουσ.	atypical note often associated with deterioration or transformation of the product	άτυπη διαβάθμιση που συχνά σχετίζεται με αλλοίωση ή μεταβολή του προϊόντος	3.29
character note , noun	νότα χαρακτήρα , ουσ.	perceptible sensory attribute, flavour and texture (mechanical, geometrical, and fat and moisture characteristics), in a food product	ανιληπτό αισθητηριακό χαρακτηριστικό, οσμόγευση και υψή (μηχανικά, γεωμετρικά χαρακτηριστικά και χαρακτηριστικά λίπους και υγρασίας) σε ένα τρόφιμο	3.30
colour¹ , noun	χρώμα¹ , ουσ.	sensation of hue, saturation and lightness induced by stimulation of the retina by light rays of various wavelengths	αίσθημα απόχρωσης, κορεσμού και φωτεινότητας που προκαλείται από τη διέγερση του αμφιβληστροειδούς από ακτίνες φωτός διαφόρων μηκών κύματος	3.31
colour² , noun	χρώμα² , ουσ.	attribute of products inducing a colour sensation	χαρακτηριστικό των προϊόντων που προκαλεί αίσθημα χρώματος ¹	3.32
hue , noun	απόχρωση , ουσ.	attribute of colour that corresponds to variation in wavelength Note 1 to entry: The equivalent Munsell term is "hue".	χαρακτηριστικό του χρώματος ¹ που αντιστοιχεί σε μεταβολή του μήκους κύματος Σημείωση 1: Ο ισοδύναμος όρος Munsell είναι «hue».	3.33
saturation , noun	κορεσμός , ουσ.	dimension of colour that describes its purity Note 1 to entry: If highly saturated, a colour appears to be pure hue — free of gray; if low in saturation, a colour appears to have a great deal of gray. Note 2 to entry: The equivalent Munsell term is "chroma".	διάσταση του χρώματος ¹ που περιγράφει την καθαρότητά του Σημείωση 1: Ένα πολύ κορεσμένο χρώμα φαίνεται να έχει καθαρή απόχρωση — χωρίς καθόλου γκρι. Ένα χρώμα με χαμηλό κορεσμό φαίνεται να έχει πολύ γκρι. Σημείωση 2: Ο ισοδύναμος όρος Munsell είναι «chroma».	3.34
lightness , noun	φωτεινότητα , ουσ.	degree of visual brightness compared with a neutral gray in a scale ranging from absolute black to absolute white Note 1 to entry: The equivalent Munsell term is "value".	βαθμός οπτικής λαμπρότητας σε σύγκριση με ένα ουδέτερο γκρι σε μια κλίμακα που κυμαίνεται από το απόλυτο μαύρο έως το απόλυτο λευκό Σημείωση 1: Ο ισοδύναμος όρος Munsell είναι «value».	3.35

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
brightness contrast , noun	αντίθεση λαμπρότητας , ουσ.	effect on the visual brightness of one object or colour of the brightness of surrounding objects or colours	αποτέλεσμα της επίδρασης της λαμπρότητας των αντικειμένων ή χρωμάτων γύρω από ένα αντικείμενο ή χρώμα ² στην οπτική λαμπρότητα του αντικείμενου ή χρώματος ²	3.36
transparency , noun) transparent , adjective	διαφάνεια , ουσ. διαφανής , επίθ.	allowing light to pass and distinct images to appear	ιδιότητα ενός υλικού να επιτρέπει τη διέλευση του φωτός και τη διάκριση εικόνων Σημείωση 1: Το αντίστοιχο επίθετο είναι διαφανής .	3.37
translucency , noun translucent , adjective	ημιδιαφάνεια , ουσ. ημιδιαφανής , επίθ.	allowing light to pass but not allowing images to be distinguished	ιδιότητα ενός υλικού να επιτρέπει τη διέλευση του φωτός και όχι τη διάκριση εικόνων Σημείωση 1: Το αντίστοιχο επίθετο είναι ημιδιαφανής .	3.38
opacity , noun opaque , adjective	αδιαφάνεια , ουσ. αδιαφανής , επίθ.	not allowing the passage of light	ιδιότητα ενός υλικού να μην επιτρέπει τη διέλευση του φωτός Σημείωση 1: Το αντίστοιχο επίθετο είναι αδιαφανής .	3.39
gloss , noun glossy, shiny , adjective	σπιλνότητα , ουσ. σπιλνός , επίθ.	a shiny or lustrous appearance resulting from the tendency of a surface to reflect light energy at one angle more than at others	γυαλιστερή ή απαστράπτουσα εμφάνιση που προκύπτει από την τάση μιας επιφάνειας να ανακλά φωτεινή ενέργεια σε μια γωνία περισσότερο από άλλες Σημείωση 1: Το αντίστοιχο επίθετο είναι σπιλνός .	3.40
texture , noun	υφή , ουσ.	all of the mechanical, geometrical, surface and body attributes of a product perceptible by means of kinaesthesia and somesthesia receptors and (where appropriate) visual and auditory receptors from the first bite to final swallowing Note 1 to entry: Over the course of mastication, perception is influenced by the physical transformations that occur from contact with the teeth and palate and mixture with saliva. Auditory information may contribute to judgement of texture and may predominate with dry products. Note 2 to entry: The "mechanical attributes" are those related to the reaction of the product to stress. They are: hardness, cohesiveness, viscosity, elasticity and adhesiveness. The "geometrical attributes" are those related to the size, shape and arrangement of particles within a product. They are: denseness, granularity and conformation. The "surface attributes" are those related to the sensations produced in the mouth by moisture and/or fat in and near the surface of the product. The "body attributes" are those related to the sensations	το σύνολο των μηχανικών, γεωμετρικών, επιφανειακών και σωματικών χαρακτηριστικών ενός προϊόντος που γίνονται αντιληπτά μέσω υποδοχέων κιναισθησίας και σωματαιοσθησίας και (όπου χρειάζεται) οπτικών και ακουστικών υποδοχέων από την πρώτη εισαγωγή στο στόμα έως την τελική κατάποση Σημείωση 1: Κατά τη διάρκεια της μάσησης, η αντίληψη επηρεάζεται από τις φυσικές μεταβολές που συμβαίνουν από την επαφή με τα δόντια και τον ουρανίσκο και την ανάμειξη με το σάλιο. Οι ακουστικές πληροφορίες μπορεί να συμβάλλουν στην κρίση της υφής και μπορεί να κυριαρχούν στα ξηρά προϊόντα. Σημείωση 2: Τα μηχανικά χαρακτηριστικά σχετίζονται με την αντίδραση του προϊόντος στην καταπόνηση και είναι: η σκληρότητα, η συνεκτικότητα, το ιξώδες, η ελαστικότητα και η προσφυστικότητα. Τα γεωμετρικά χαρακτηριστικά σχετίζονται με το μέγεθος, το σχήμα και τη διευθέτηση των σωματιδίων μέσα σε ένα προϊόν και είναι: η πυκνότητα, η κοκκιότητα και η διαμόρφωση. Τα επιφανειακά χαρακτηριστικά σχετίζονται με τα αισθήματα που παράγονται στο στόμα από την υγρασία και/ή το λίπος μέσα και κοντά στην επιφάνεια του προϊόντος. Τα σωματικά χαρακτηριστικά σχετίζονται με τα αισθήματα που	3.41

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
		produced in the mouth by moisture and/or fat in the substance of the product and the way in which these constituents are released.	παράγονται στο στόμα από την υγρασία και/ή το λίπος που περιέχονται στο προϊόν και με τον τρόπο με τον οποίο τα εν λόγω συστατικά απελευθερώνονται.	
hardness , noun	σκληρότητα , ουσ.	mechanical textural attribute relating to the force required to achieve a given deformation, penetration, or breakage of a product Note 1 to entry: In the mouth, it is perceived by compressing the product between the teeth (solids) or between the tongue and palate (semi-solids). Note 2 to entry: The main adjectives corresponding to different levels of hardness are: — "soft": low level, e.g. cream cheese; — "firm": moderate level, e.g. olive; — "hard": high level, e.g. boiled sweets.	μηχανικό χαρακτηριστικό υφής που σχετίζεται με τη δύναμη που απαιτείται για την επίτευξη μιας δεδομένης παραμόρφωσης, διείσδυσης ή θραύσης ενός προϊόντος Σημείωση 1: Στο στόμα γίνεται αντιληπτή με συμπίεση του προϊόντος μεταξύ των δοντιών (στερεά τρόφιμα) ή μεταξύ της γλώσσας και του ουρανίσκου (ημιστερεά τρόφιμα). Σημείωση 2: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα σκληρότητας είναι: — «μαλακός»: χαμηλό επίπεδο, π.χ. κρεμώδες τυρί, — «ημισκληρός», «σφιχτός»: μέτριο επίπεδο, π.χ. ελιά, — «σκληρός»: υψηλό επίπεδο, π.χ. καραμέλες.	3.42
cohesiveness , noun	συνεκτικότητα , ουσ.	mechanical textural attribute relating to the degree to which a substance can be deformed before it breaks, including the properties of fracturability (3.44), chewiness (3.45) and gumminess (3.47)	μηχανικό χαρακτηριστικό υφής που σχετίζεται με τον βαθμό μέχρι του οποίου μια ουσία μπορεί να παραμορφωθεί πριν σπάσει, συμπεριλαμβανομένων των ιδιοτήτων της θραυστότητας (3.44), της μασητότητας (3.45) και της κομμώδους υφής (3.47)	3.43
fracturability , noun	θραυστότητα , ουσ.	mechanical textural attribute related to cohesiveness and hardness and to the force necessary to break a product into crumbs or pieces Note 1 to entry: It is evaluated by suddenly squeezing a product between the incisors (front teeth) or fingers. Note 2 to entry: The main adjectives corresponding to different levels of fracturability are: — "cohesive": very low level, e.g. caramel, chewing gum; — "crumbly": low level, e.g. corn muffin, cake; — "crunchy": moderate level, e.g. apple, raw carrot; — "brittle": high level, e.g. peanut brittle, brandy snaps; — "crispy": high level, e.g. potato crisps/chips, cornflakes;	μηχανικό χαρακτηριστικό υφής που σχετίζεται με τη συνεκτικότητα και τη σκληρότητα καθώς και τη δύναμη που απαιτείται για να σπάσει ένα προϊόν σε θρύμματα ή κομμάτια Σημείωση 1: Η θραυστότητα αξιολογείται με απότομη συμπίεση ενός προϊόντος ανάμεσα στους κοπτήρες (μπροστινά δόντια) ή στα δάχτυλα. Σημείωση 2: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα θραυστότητας είναι: — «συνεκτικός»: πολύ χαμηλό επίπεδο, π.χ. καραμέλα, τσίχλα, — «εύθρυπτος» [που θρυμματίζεται κατά τη μάσηση]: χαμηλό επίπεδο, π.χ. κεκάκι καλαμποκιού, κέικ, — «τραγανός (κατά τη μάσηση)»: μέτριο επίπεδο, π.χ. μήλο, ωμό καρότο, — «εύθραυστος» [που θραύεται στο δάγκωμα]: υψηλό επίπεδο, π.χ. νουγκατίνα με αράπικο φιστίκι, τυλιχτά πουράκια, — «κρυσταλλικός, τραγανός στο δάγκωμα»: υψηλό επίπεδο, π.χ. πατατάκια, τσιπς, νιφάδες	3.44

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
		<p>— "crusty": high level, e.g. crust of fresh French-style bread;</p> <p>— "pulverulent": very high level, immediately disintegrating into powder upon biting, e.g. overcooked egg yolk.</p>	<p>καλαμποκιού,</p> <p>— «κρουστός»: υψηλό επίπεδο, π.χ. κόρα φρέσκου ψωμιού,</p> <p>— «κονιώδης»: πολύ υψηλό επίπεδο, που διασπάται αμέσως σε σκόνη με το δάγκωμα, π.χ. παραψημένος κρόκος αυγού.</p>	
chewiness , noun	μασητότητα , ουσ.	<p>mechanical textural attribute related to the amount of work required to masticate a solid product into a state ready for swallowing</p> <p>Note The main adjectives corresponding to different levels of chewiness are:</p> <p>— "melting": very low level, e.g. ice cream;</p> <p>— "tender": low level, e.g. young peas;</p> <p>— "chewy": moderate level, e.g. fruit gums (confectionery);</p> <p>— "tough": high level, e.g. old beef, bacon rind.</p>	<p>μηχανικό χαρακτηριστικό υψής που σχετίζεται με την ποσότητα εργασίας που απαιτείται για τη μάσηση ενός στερεού προϊόντος ώστε να είναι έτοιμο για κατάποση</p> <p>Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα μασητότητας είναι:</p> <p>— «εύηκτος»: πολύ χαμηλό επίπεδο, π.χ. παγωτό,</p> <p>— «τρυφερός»: χαμηλό επίπεδο, π.χ. φρέσκα μπιζέλια,</p> <p>— «μασητός»: μέτριο επίπεδο, π.χ. ζελεδάκια φρούτων,</p> <p>— «σκληρός»: υψηλό επίπεδο, π.χ. κρέας γέρικου βοδιού, φλούδα μπέικον.</p>	3.45
chew count , noun	αριθμός μασημάτων , ουσ.	<p>number of chews required to masticate the sample to reduce it to a consistency suitable for swallowing</p>	<p>το πλήθος των μασημάτων που απαιτούνται για τη μάσηση του δείγματος ώστε να μειωθεί η συνοχή του ώστε να είναι κατάλληλη για κατάποση</p>	3.46
gumminess , noun	κομμώδης υφή , ουσ. κομμώδης -ης -ες, επιθ. μαστιχωτός -ή -ό, επιθ.	<p>mechanical textural attribute related to the cohesiveness of a tender product</p> <p>Note 1 In the mouth, it is related to the effort required to disintegrate the product to the state ready for swallowing.</p> <p>Note 2 The main adjectives corresponding to different levels of gumminess are:</p> <p>— "short": low level, e.g. shortbread;</p> <p>— "mealy": moderate level, e.g. some potatoes, cooked dry haricot beans;</p> <p>— "pasty": moderate level, e.g. chestnut puree, flour paste;</p> <p>— "gummy": high level, e.g. overcooked oatmeal, edible gelatine.</p>	<p>μηχανικό χαρακτηριστικό υψής που σχετίζεται με τη συνεκτικότητα ενός τρυφερού προϊόντος</p> <p>Σημείωση 1: Στο στόμα, σχετίζεται με την προσπάθεια που απαιτείται για τη διάσπαση του προϊόντος σε κατάσταση έτοιμο για κατάποση.</p> <p>Σημείωση 2: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα κομμώδους υψής είναι:</p> <p>— «βραχύς»: χαμηλό επίπεδο, π.χ. θριφτοκούλουρα, κουραμπιές,</p> <p>— «αλευρώδης»: μέτριο επίπεδο, π.χ. κάποιες ποικιλίες πατάτας, μαγειρεμένα ξερά γαλλικά φασόλια,</p> <p>— «πολιτώδης»: μέτριο επίπεδο, π.χ. πουρές κάστανου, αλευρόπαστα,</p> <p>— «κομμώδης»: υψηλό επίπεδο, π.χ. παραμαγειρεμένη βρώμη, βρώσιμη ζελατίνη.</p>	3.47
viscosity , noun	ιξώδες , ουσ.	<p>mechanical textural attribute relating to resistance to flow</p> <p>Note 1 It corresponds to the force required to draw a liquid from a spoon over the tongue, or to spread it over a substrate.</p> <p>Note 2 The main adjectives corresponding to different levels of viscosity are:</p>	<p>μηχανικό χαρακτηριστικό υψής που σχετίζεται με την αντίσταση στη ροή</p> <p>Σημείωση 1: Αντιστοιχεί στη δύναμη που απαιτείται για να τραβηχτεί ένα υγρό από ένα κουτάλι με τη γλώσσα ή να απλωθεί σε ένα υπόστρωμα.</p> <p>Σημείωση 2: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα ιξώδους είναι:</p>	3.48

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
		<ul style="list-style-type: none"> — "fluid": low level, e.g. water; — "thin": moderate level, e.g. olive oil; — "unctuous" or "creamy": moderate level, e.g. double cream, heavy cream; — "thick" or "viscous": very high, e.g. sweetened condensed milk, honey. 	<ul style="list-style-type: none"> — «ρευστός»: χαμηλό επίπεδο, π.χ. νερό, — «λεπτόρρευστος»: μέτριο επίπεδο, π.χ. ελαιόλαδο, — «κρεμώδης»: μέτριο επίπεδο, π.χ. κρέμα γάλακτος με υψηλά λιπαρά, — «παχύρρευστος»: πολύ υψηλό επίπεδο, π.χ. ζαχαρούχο συμπυκνωμένο γάλα, μέλι. 	
consistency , noun	συνοχή , ουσ.	mechanical attribute detected by stimulation of the tactile or visual receptors	μηχανικό χαρακτηριστικό που ανιχνεύεται με διέγερση των απτικών ή οπτικών υποδοχέων	3.49
elasticity , noun springiness, noun resilience, noun	ελαστικότητα , ουσ. επανατακτικότητα , ουσ.	<p>mechanical textural attribute relating to: the rapidity of recovery from a deforming force; and the degree to which a deformed material returns to its original condition after the deforming force is removed</p> <p>Note The main adjectives corresponding to different levels of springiness are:</p> <ul style="list-style-type: none"> — "plastic": absence, e.g. margarine; — "malleable": moderate level, e.g. marshmallow; — "elastic"; "springy"; "rubbery": high level, e.g. cooked squid, clams, gums. 	<p>μηχανικό χαρακτηριστικό υφής το οποίο σχετίζεται με την ταχύτητα ανάκαμψης ενός υλικού από παραμόρφωση που προκλήθηκε από μια δύναμη μετά την αφαίρεση της δύναμης και με τον βαθμό στον οποίο το παραμορφωμένο υλικό επιστρέφει στην αρχική του κατάσταση</p> <p>Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα ελαστικότητας είναι:</p> <ul style="list-style-type: none"> — «πλαστικός»: απουσία ελαστικότητας, π.χ. μαργαρίνη, — «εύπλαστος»: μέτριο επίπεδο, π.χ. μαρσαμέλλου, λουκούμι, — «ελαστικός», «επανατακτικός», «λαστιχωτός»: υψηλό επίπεδο, π.χ. μαγειρεμένα καλαμάρια, αχιβάδες, τσίχλες. 	3.50
adhesiveness , noun	προσφυσικότητα	<p>mechanical textural attribute relating to the force required to remove material that sticks to the mouth or to a substrate</p> <p>Note 1 The main adjectives corresponding to different levels of adhesiveness are:</p> <ul style="list-style-type: none"> — "tacky": low level, e.g. marshmallow; — "clinging": moderate level, e.g. peanut butter; — "goosey", "gluey": high level, e.g. caramel sundae topping, overcooked rice; — "sticky", "adhesive": very high level, e.g. toffee. <p>Note 2 The adhesiveness of a product may be experienced in various ways, e.g.</p> <ul style="list-style-type: none"> — to palate — force required to remove product completely from the palate, using the tongue, after complete compression of the sample between tongue and palate; — to lips — degree to which the 	<p>μηχανικό χαρακτηριστικό υφής που σχετίζεται με τη δύναμη που απαιτείται για την αφαίρεση υλικού που κολλάει στο στόμα ή σε ένα υπόστρωμα</p> <p>Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα προσφυσικότητας είναι:</p> <ul style="list-style-type: none"> — «ελαφρώς κολλώδης»: χαμηλό επίπεδο, π.χ. μαρσαμέλλου, — «μετρίως κολλώδης»: μέτριο επίπεδο, π.χ. φυστικοβούτυρο, — «πολύ κολλώδης»: υψηλό επίπεδο, π.χ. πηχτό σιρόπι καραμέλας, παραψημένο ρύζι, — «εξαιρετικά κολλώδης»: πολύ υψηλό επίπεδο, π.χ. τόφι, καραμέλα. <p>Σημείωση 2: Η προσφυσικότητα ενός προϊόντος μπορεί να παρατηρηθεί με διάφορους τρόπους, π.χ.</p> <ul style="list-style-type: none"> — στον ουρανίσκο — δύναμη που απαιτείται για την πλήρη αφαίρεση του προϊόντος από τον ουρανίσκο, με τη χρήση της γλώσσας, μετά από πλήρη συμπίεση του δείγματος μεταξύ γλώσσας και υπερώας — στα χείλη — βαθμός στον οποίο το 	3.51

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
		product sticks/adheres to the lips — the sample is placed between the lips, compressed once slightly and released to assess adhesiveness; — to teeth — amount of product adhering on/in the teeth after product mastication; — to itself — force required to separate individual pieces with the tongue, when the sample is placed in the mouth; — manually — force required to separate individual pieces adhering to each other using the back of a spoon.	προϊόν κολλάει στα χείλη — το δείγμα τοποθετείται ανάμεσα στα χείλη, συμπιέζεται ελαφρά μία φορά και απελευθερώνεται για να εκτιμηθεί η προσφυσικότητά του· — στα δόντια — ποσότητα προϊόντος που προσκολλάται στα δόντια μετά τη μάσηση του προϊόντος — στον εαυτό του — δύναμη που απαιτείται για να διαχωριστούν μεμονωμένα κομμάτια με τη γλώσσα, όταν το δείγμα τοποθετείται στο στόμα· — χειρακτικά — δύναμη που απαιτείται για να διαχωριστούν μεμονωμένα κομμάτια που προσφύονται το ένα στο άλλο με τη χρήση του κυρτού μέρους ενός κουταλιού.	
heaviness, noun heavy, adjective	βαρύτητα, ουσ. βαρύς -ιά -ύ, επιθ.	property related to the viscosity of beverages or the denseness of solids Note Describes a solid food whose cross-section is compact or a beverage that flows with some difficulty.	ιδιότητα που σχετίζεται με το ιξώδες των ποτών ή την πυκνότητα των στερεών Σημείωση 1: Περιγράφει ένα στερεό τρόφιμο του οποίου η διατομή είναι συμπαγής ή ένα ποτό που ρέει με κάποια δυσκολία.	3.52
denseness, noun	πυκνότητα, ουσ.	geometrical textural attribute relating to perception of the compactness of a cross-section of a product after biting completely through it Note The main adjectives corresponding to different levels of denseness are as follows: — "light": low, e.g. whipped topping; — "heavy", "dense": high, e.g. chestnut cream, traditional English-style Christmas pudding.	γεωμετρικό χαρακτηριστικό υφής που σχετίζεται με την αντίληψη του συμπαγούς της διατομής ενός προϊόντος μετά από πλήρες δάγκωμα Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα πυκνότητας είναι τα εξής: — «ελαφρύς»: χαμηλό επίπεδο, π.χ. σαντιγί, — «βαρύς», «πυκνός»: υψηλό επίπεδο, π.χ. κρέμα κάστανου, παραδοσιακή χριστουγεννιάτικη πουτίγκα αγγλικού τύπου.	3.53
granularity, noun	κοκκιότητα, ουσ.	geometrical textural attribute relating to the perception of the size, shape and amount of particles in a product Note The main adjectives corresponding to different levels of granularity are as follows: — "smooth", "powdery": absence, e.g. icing sugar, dry cornflour; — "gritty": low level, e.g. some pears; — "grainy": moderate level, e.g. semolina; — "beady": having small, spherical particles, e.g. tapioca pudding; — "granular": having angular, hard particles, e.g. demerara	γεωμετρικό χαρακτηριστικό υφής που σχετίζεται με την αντίληψη του μεγέθους, του σχήματος και της ποσότητας των σωματιδίων σε ένα προϊόν Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα κοκκιότητας είναι τα εξής: — «λείος», «κονιώδης»: απουσία κοκκιότητας, π.χ. ζάχαρη άχνη, στεγνά καρν φλάουρ, — «ελαφρώς κοκκώδης»: χαμηλό επίπεδο, π.χ. κάποιες ποικιλίες αχλαδιών, — «μετρίως κοκκώδης»: μέτριο επίπεδο, π.χ. σιμιγδάλι, — «πολύ κοκκώδης»: που έχει μικρά, σφαιρικά σωματίδια, π.χ. πουτίγκα ταπόκας, — «κοκκώδης»: που έχει γωνιώδη,	3.54

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
		sugar; — "coarse": high level, e.g. cooked rolled oatmeal; — "lumpy": high level with larger, irregular particles, e.g. cottage cheese.	σκληρά σωματίδια, π.χ. ζάχαρη Demerara, — «αδρός»: υψηλό επίπεδο, π.χ. μαγειρεμένοι κόκκοι βρώμης, — «αβολώδης»: υψηλό επίπεδο με μεγαλύτερα, ακανόνιστα σωματίδια, π.χ. τυρί κάτατζ.	
conformation, noun	διαμόρφωση, ουσ.	geometrical textural attribute relating to the perception of the shape and the orientation of particles in a product Note The main adjectives corresponding to different conformations are as follows: — "cellular": spherical or ovoid particles consisting of thin walls surrounding liquid or gas, e.g. orange; — "crystalline": angular, similarly sized, symmetrical, three-dimensional particles, e.g. granulated sugar; — "fibrous": long particles or strands oriented in the same direction, e.g. celery; — "flaky": loose layers that separate easily, e.g. cooked tuna, croissant, flaky pastry; — "puffy": hard or firm outer shells filled with large, often uneven, air pockets, e.g. cream puff, puffed rice.	γεωμετρικό χαρακτηριστικό υφής που σχετίζεται με την αντίληψη του σχήματος και του προσανατολισμού των σωματιδίων σε ένα προϊόν Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικές διαμορφώσεις είναι τα εξής: — «κυτταρώδης»: σφαιρικά ή ωοειδή σωματίδια που αποτελούνται από λεπτά τοιχώματα που περιβάλλουν υγρό ή αέριο, π.χ. πορτοκάλι, — «κρυσταλλικός»: γωνιώδη, παρόμοιοι μεγέθους, συμμετρικά, τριδιάστατα σωματίδια, π.χ. κρυσταλλική ζάχαρη, — «κνώδης»: μακριά σωματίδια ή κλώνοι που προσανατολίζονται προς την ίδια κατεύθυνση, π.χ. σέλινο, — «νιφασοειδής»: χαλαρά στρώματα που διαχωρίζονται εύκολα, π.χ. μαγειρεμένος τόνος, κρουασάν, ζύμη σφολιάτα, — «φουσκωτός»: σκληρά ή σφιχτά εξωτερικά κελύφη γεμάτα με μεγάλους, συχνά ανομοιόμορφους, θύλακες αέρα, π.χ. γλύκισμα σου , αφράτοι τραγανοί κόκκοι ριζιού.	3.55
moisture ¹	υγρασία, ουσ.	perception of moisture content of a food by the tactile receptors in the mouth and also in relation to the lubricating properties of the product Note Reflects not only the total amount of moisture perceived but the type, rate and manner of release or absorption.	αντίληψη της περιεχόμενης ποσότητας υγρασίας ενός τροφίμου από τους ατπικούς υποδοχείς στο στόμα και επίσης σε σχέση με τις λιπαντικές ιδιότητες του προϊόντος Σημείωση 1: Αντικατοπτρίζει όχι μόνο τη συνολική ποσότητα υγρασίας που γίνεται αντιληπτή αλλά τον τύπο, τον ρυθμό και τον τρόπο απελευθέρωσης ή απορρόφησης.	3.56
moisture ² , noun moistness, noun	υγρότητα, ουσ.	surface textural attribute that describes the perception of water absorbed by or released from a product Note The main adjectives corresponding to different levels of moistness are as follows: Surface attributes: — "dry": absence, e.g. cream cracker; — "moist": moderate level, e.g. peeled apple; — "wet": high level, e.g. water chestnut, oyster.	επιφανειακό χαρακτηριστικό υφής που περιγράφει την αντίληψη του νερού που απορροφάται ή απελευθερώνεται από ένα προϊόν Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα υγρότητας είναι τα εξής: Επιφανειακά χαρακτηριστικά υφής: — «ξηρός»: απουσία υγρασίας, π.χ. κράκερ, — «ελαφρώς υγρός»: μέτριο επίπεδο, π.χ. αποφλοιωμένο μήλο, — «υγρός»: υψηλό επίπεδο, π.χ. κινέζικο νεροκάστανο, στρείδι.	3.57

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
		<p>Body attributes:</p> <p>— "dry": absence, e.g. cream cracker;</p> <p>— "moist": moderate level, e.g. apple;</p> <p>— "juicy": high level, e.g. orange;</p> <p>— "succulent": high level, e.g. meat;</p> <p>— "watery": water-like perception, e.g. watermelon.</p>	<p>Χαρακτηριστικά σώματος:</p> <p>— «στεγνός»: απουσία υγρασίας, π.χ. κράκερ,</p> <p>— «ελαφρώς υγρός»: μέτριο επίπεδο, π.χ. μήλο,</p> <p>— «ζουμερός»: υψηλό επίπεδο, π.χ. πορτοκάλι,</p> <p>— «χυμώδης»: υψηλού επιπέδου, π.χ. κρέας,</p> <p>— «υδαρής»: που μοιάζει με νερό, π.χ. καρπούζι.</p>	
<p>dryness, noun</p> <p>dry, adjective</p>	<p>ξηρότητα, ουσ.</p> <p>ξηρός -ή -ό, επιθ.</p>	<p>textural characteristic describing the perception of moisture absorbed by a product (e.g. cream cracker)</p> <p>Note In beverages, a liquid that feels dry on the tongue and in the throat, e.g. cranberry juice.</p>	<p>χαρακτηριστικό υφής που περιγράφει την αντίληψη υγρασίας που απορροφάται από ένα προϊόν (π.χ. γαλέτα)</p> <p>Σημείωση 1: Στα ποτά, ένα υγρό που γίνεται αντιληπτό ως ξηρό στη γλώσσα και στο λαιμό, π.χ. χυμός μούρων.</p>	3.58
<p>fattiness, noun</p>	<p>λιπαρότητα, ουσ.</p>	<p>textural attribute relating to the perception of the quantity or the quality of fat on the surface or in the body of a product</p> <p>Note The main adjectives corresponding to the perception of fattiness are as follows:</p> <p>— "oily": perception of soaking and running fat, e.g. salad with dressing;</p> <p>— "greasy": perception of exuding fat, e.g. bacon, chips, French fries;</p> <p>— "fatty": perception of high fat proportion in a product, oily, greasy, e.g. lard, tallow.</p>	<p>χαρακτηριστικό υφής που σχετίζεται με την αντίληψη της ποσότητας ή της ποιότητας του λίπους στην επιφάνεια ή στο σώμα ενός προϊόντος</p> <p>Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν στην αντίληψη της λιπαρότητας είναι τα εξής:</p> <p>— «ελαιώδης»: αντίληψη του να είναι κάτι μουσκεμένο ή να στάζει λίπος, π.χ. σαλάτα με λαδόξιδο,</p> <p>— «λιπαρώδης»: αντίληψη του εκκρινόμενου λίπους, π.χ. μπέικον, πατατάκια, τηγανιτές πατάτες,</p> <p>— «λιπαρός, λιπώδης»: αντίληψη υψηλής αναλογίας λιπαρών σε ένα προϊόν, ελαιώδης, λιπαρός, π.χ. λαρδί, ζωικά λίπη.</p>	3.59
<p>aeration, noun</p> <p>aerated, pp.</p>	<p>αεριούχηση, ουσ.</p> <p>αεριούχος -α -ο, επιθ.</p>	<p>describes a solid or semi-solid product containing small, even cells filled with gas (usually carbon dioxide or air) and usually surrounded by soft cell walls</p> <p>Note 1 See also effervescence (3.61).</p> <p>Note 2 The product may be described as "frothy" or "foamy" (fluid cell walls, e.g. milkshake) or "porous" (solid cell walls), e.g. marshmallows, meringue, chocolate mousse, chiffon pie filling, sandwich loaf.</p>	<p>περιγράφει ένα στερεό ή ημιστερεό προϊόν που περιέχει μικρές, ομοιόμορφες κυψελίδες γεμάτες με αέριο (συνήθως διοξείδιο του άνθρακα ή αέρα) που συνήθως περιβάλλονται από μαλακά κυτταρικά τοιχώματα</p> <p>Σημείωση 1: Βλέπε επίσης αναβρασμός (3.61).</p> <p>Σημείωση 2: Το προϊόν μπορεί να περιγραφεί ως «αφρώδες» (υγρά κυτταρικά τοιχώματα, π.χ. μιλκσέικ) ή «πορώδες» (στερεά κυτταρικά τοιχώματα), π.χ. μαρμελάου, μαρέγκα, μους σοκολάτας, γέμιση πίτας σφών, φραντζολάκι για σάντουιτς.</p>	3.60

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
effervescence, noun effervescent, adjective	αναβρασμός , ουσ. αναβράζων -ουσα, -ον, επιθ. μετοχή αεριούχος -α -ο, επιθ. αφρώδης -ης -ες, επιθ.	formation of gas bubbles in a liquid product when either the gas is generated by a chemical reaction or pressure is released NOTE 1 See also aeration (3.60). NOTE 2 The bubbles or their formation are often perceived as textural attributes, but at high levels may be perceived by vision or audition. Degrees of effervescence may be described as: — “still”: absence, e.g. tap water; — “flat”: having a lower level than expected, e.g. bottled beer that has been too long open; — “tingly”: perceptible mainly as a texture attribute in the mouth; — “bubbly”: having visibly rising bubbles; — “fizzy”: having briskly bursting bubbles making an audible hiss.	σχηματισμός φυσαλίδων αερίου σε ένα υγρό προϊόν όταν είτε το αέριο παράγεται από μια χημική αντίδραση είτε όταν ελαττώνεται η πίεση Σημείωση 1: Βλέπε επίσης αεριούχηση (3.60). Σημείωση 2: Οι φυσαλίδες ή ο σχηματισμός τους συχνά γίνονται αντιληπτές ως χαρακτηριστικά υφής, αλλά σε υψηλά επίπεδα μπορεί να γίνουν αντιληπτές από την όραση ή την ακοή. Οι βαθμοί αναβρασμού μπορούν να περιγραφούν ως: — «χωρίς ανθρακικό»: απουσία αναβρασμού, π.χ. νερό βρύσης, — «ξεθυμασμένος»: έχει χαμηλότερο επίπεδο από το αναμενόμενο, π.χ. εμφιαλωμένη μπίρα που παρέμεινε για πολύ καιρό ανοικτή, — «γαργαλιστικός»: γίνεται αντιληπτό κυρίως ως χαρακτηριστικό υφής στο στόμα, — «φυσαλιδούχος»: με εμφανώς ανερχόμενες φυσαλίδες, — «αφρώδης», «αεριούχος»: με φυσαλίδες που σκάνε ζωηρά και παράγουν ένα ακουστό σφύριγμα.	3.61
mouthfeel, noun	στοματαισθήμα , ουσ.	mixed experience derived from sensations in the mouth that relate to physical or chemical properties of a stimulus Note Assessors differentiate the physical sensations (e.g. density, viscosity, particulate) as texture properties and the chemical sensations (e.g. astringency, cooling) as flavour properties.	μεικτή εμπειρία που προέρχεται από αισθήματα στο στόμα που σχετίζονται με φυσικές ή χημικές ιδιότητες ενός ερεθίσματος Σημείωση 1: Οι αξιολογητές διαφοροποιούν τα φυσικά αισθήματα (π.χ. πυκνότητα, ιξώδες, διαμόρφωση) ως ιδιότητες υφής και τα χημικά αισθήματα (π.χ. στυφότητα, ψύξη) ως ιδιότητες οσμόγευσης.	3.62
clean feel, noun clean, adjective	καθαρότητα (στοματαισθήματος), ουσ. καθαρός -ή -ό, επιθ.	property of leaving no lingering mouth after-feel once swallowed (see adhesiveness , 3.51), e.g. water	ιδιότητα του να μην παραμένει στο στόμα κανένα επίμονο μεταίσθημα μετά την κατάποση (βλέπε προσφυσικότητα, 3.51), π.χ. νερό	3.63
palate cleanser, noun cleansing, adjective	καθαριστικό ουρανίσκου , ουσ. καθαριστικός -ή -ό, επιθ.	product that removes any lingering residue from the mouth EXAMPLE Water, cream crackers.	προϊόν που αφαιρεί τυχόν υπολείμματα από το στόμα ΠΑΡΑΔΕΙΓΜΑ: Νερό, κράκερ	3.64
after-taste, noun residual taste, noun	επίγευση , ουσ. υπολειμματική γεύση , ουσ.	olfactory and/or gustatory sensation that occurs after the elimination of the product, and differs from the sensations perceived whilst the product was in the mouth	οσφρητικό και/ή γευστικό αίσθημα που εμφανίζεται μετά την απομάκρυνση του προϊόντος και διαφέρει από τα αισθήματα που γίνονται αντιληπτά ενώσω το προϊόν βρισκόταν στο στόμα	3.65
after-feel, noun	μεταίσθημα , ουσ.	experience that follows the removal of a texture stimulus; it may be continuous with the primary experience or may follow as a different quality after	εμπειρία που ακολουθεί την αφαίρεση ενός ερεθίσματος υφής. Μπορεί να είναι σε συνέχεια της πρωταρχικής εμπειρίας ή μπορεί να ακολουθεί ως διαφορετική ιδιότητα μετά από μια	3.66

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
		a period during which swallowing, saliva, dilution and other influences may have affected the stimulus substance or sensing field	περίοδο κατά την οποία η κατάποση, το σάλιο, η αραιώση και άλλες επιδράσεις μπορεί να έχουν επηρεάσει το ερέθισμα ή το αισθητηριακό πεδίο	
persistence , noun	επιμονή , ουσ.	related to a response to a stimulus over a measurable period of time	σχετίζεται με απόκριση σε ερέθισμα σε όλη τη διάρκεια μιας μετρήσιμης χρονικής περιόδου	3.67
insipid , adjective	άνοστος -η -ο , επιθ.	describes a product with a much lower level of flavour than expected	περιγράφει ένα προϊόν με πολύ χαμηλότερο επίπεδο οσμόγευσης από το αναμενόμενο	3.68
bland , adjective	αδιάφορος -η -ο , επιθ.	describes a product with a low level of flavour, and without character	περιγράφει ένα προϊόν με χαμηλό επίπεδο οσμόγευσης και χωρίς χαρακτήρα	3.69
neutral , adjective	ουδέτερος -η -ο , επιθ.	describes a product without any distinct characteristic	περιγράφει ένα προϊόν χωρίς κανένα διακριτό χαρακτηριστικό	3.70
flat , adjective	επίπεδος, άτονος -η -ο , επιθ.	describes a product perceived to be below the expected organoleptic level	περιγράφει ένα προϊόν που γίνεται αντιληπτό ότι είναι κάτω από το αναμενόμενο οργανοληπτικό επίπεδο	3.71

4 Terminology relating to methods – Ορολογία σχετική με μεθόδους

Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
objective method , noun	αντικειμενική μέθοδος , ουσ.	any method in which the effects of personal opinions are minimized	οποιαδήποτε μέθοδος με την οποία ελαχιστοποιείται η επίδραση προσωπικών απόψεων	4.1
subjective method , noun	υποκειμενική μέθοδος , ουσ.	any method based on personal opinions	οποιαδήποτε μέθοδος βασίζεται σε προσωπικές απόψεις	4.2
grading , noun	διαβάθμιση , ουσ.	method in which an assumption of quality is inherent in the scale in order to categorize products into quality groups EXAMPLES Ranking (4.4), classification (4.5), rating (4.6), and scoring (4.7).	μέθοδος κατά την οποία η απόδοση ποιότητας είναι εγγενής στην κλίμακα προκειμένου να κατηγοριοποιηθούν τα προϊόντα σε ομάδες ποιότητας ΠΑΡΑΔΕΙΓΜΑΤΑ: κατάταξη (4.4), ταξινόμηση (4.5), διαβάθμιση σε κλίμακα (4.6) και βαθμολόγηση (4.7).	4.3
ranking , noun	κατάταξη , ουσ.	method in which a series of two or more samples is presented at the same time and arranged in order of intensity or degree of some designated attribute	μέθοδος κατά την οποία δύο ή περισσότερα δείγματα παρουσιάζονται ταυτόχρονα και διατάσσονται κατά σειρά έντασης ή βαθμού κάποιου καθορισμένου χαρακτηριστικού	4.4
classification , noun	ταξινόμηση , ουσ.	method of sorting into categories	μέθοδος κατηγοριοποίησης	4.5
rating , noun	διαβάθμιση σε κλίμακα , ουσ. κλιμακωτή διαβάθμιση , ουσ.	method of measuring on an ordinal scale where the magnitude of each perception is denoted by one of a number of possible categories	μέθοδος μέτρησης σε διατακτική κλίμακα όπου το μέτρο κάθε αντίληψης δηλώνεται με μία από ένα πλήθος δυνατές κατηγορίες	4.6
scoring , noun	βαθμολόγηση , ουσ.	evaluation of a product (or of attributes of a product) by assigning numbers that have some mathematical relationship to the product or attributes being evaluated	αξιολόγηση ενός προϊόντος (ή των χαρακτηριστικών ενός προϊόντος) με εκχώρηση αριθμών που έχουν κάποια μαθηματική σχέση με το προϊόν ή τα χαρακτηριστικά που αξιολογούνται	4.7

screening, noun	διαλογή , ουσ.	preliminary selection procedure	διαδικασία προκαταρκτικής επιλογής	4.8
matching, noun	αντιστοιχισή , ουσ.	experimental process of equating or relating stimuli, usually to determine the degree of similarity between a control sample and an unknown or between unknowns	πειραματική διεργασία εξίσωσης ή συσχέτισης ερεθισμάτων, συνήθως για τον προσδιορισμό του βαθμού ομοιότητας μεταξύ ενός δείγματος ελέγχου και ενός αγνώστου ή μεταξύ αγνώστων	4.9
magnitude estimation, noun	εκτίμηση μέτρου , ουσ.	process of assigning values to the intensities of an attribute in such a way that the ratios between assigned values are the same as between the magnitudes of the perceptions to which they correspond	διεργασία εκχώρησης τιμών στις εντάσεις ενός χαρακτηριστικού με τέτοιο τρόπο ώστε οι λόγοι μεταξύ των εκχωρημένων τιμών να είναι ίδιοι με τους λόγους μεταξύ των μέτρων των αντιλήψεων στις οποίες αντιστοιχούν	4.10
independent assessment, noun	ανεξάρτητη αξιολόγηση , ουσ.	evaluation of one or more stimuli without direct comparison	αξιολόγηση ενός ή περισσότερων ερεθισμάτων χωρίς άμεση σύγκριση	4.11
absolute judgement, noun	απόλυτη κρίση , ουσ.	evaluation of a stimulus made without direct comparison (e.g. monadic presentation)	αξιολόγηση ενός ερεθίσματος χωρίς άμεση σύγκριση (π.χ. μοναδική παρουσίαση)	4.12
comparative assessment, noun	συγκριτική αξιολόγηση , ουσ.	comparison of stimuli presented at the same time	σύγκριση ερεθισμάτων που παρουσιάζονται ταυτόχρονα	4.13
dilution method, noun	μέθοδος αραιώσης , ουσ.	technique in which samples are prepared at increasingly lower concentrations and examined in series	τεχνική κατά την οποία τα δείγματα παρασκευάζονται σε όλο και χαμηλότερες συγκεντρώσεις και εξετάζονται κατά σειρά	4.14
psychophysical method, noun	ψυχοφυσική μέθοδος , ουσ.	procedure for establishing relationships between measurable physical stimuli and sensory responses	διαδικασία για τη δημιουργία σχέσεων μεταξύ μετρήσιμων φυσικών ερεθισμάτων και αισθητηριακών αποκρίσεων	4.15
discrimination test, noun	δοκιμή διάκρισης , ουσ.	any method of test involving comparison between samples to determine if differences are perceptible EXAMPLES Triangle test (4.18), duo-trio test (4.19), or paired comparison (4.17).	οποιαδήποτε μέθοδος δοκιμής που περιλαμβάνει σύγκριση μεταξύ δειγμάτων για να προσδιοριστεί εάν οι διαφορές είναι αντιληπτές. ΠΑΡΑΔΕΙΓΜΑΤΑ: Τριγωνική δοκιμή (4.18), δοκιμή «δύο από τρία» (4.19), δοκιμή ζευγαρωτής σύγκρισης (4.17).	4.16
paired comparison test, noun	δοκιμή ζευγαρωτής σύγκρισης , ουσ.	method in which stimuli are presented in pairs for comparison on the basis of some defined criteria	μέθοδος κατά την οποία τα ερεθίσματα παρουσιάζονται κατά ζεύγη για σύγκριση με βάση καθορισμένα κριτήρια	4.17
triangle test, noun	τριγωνική δοκιμή , ουσ.	method of discrimination testing involving the simultaneous presentation of three coded samples, two of which are identical, and in which the assessor is asked to select the sample perceived as different	μέθοδος δοκιμής διάκρισης που περιλαμβάνει την ταυτόχρονη παρουσίαση τριών κωδικοποιημένων δειγμάτων, δύο από τα οποία είναι πανομοιότυπα, και στην οποία ο αξιολογητής καλείται να επιλέξει το δείγμα που γίνεται αντιληπτό ως διαφορετικό	4.18
duo-trio test, noun	δοκιμή «δύο από τρία» , ουσ.	method of discrimination testing in which each assessor receives a set of three samples, of which one is labelled as a reference, and is asked to identify either which of the others is the same as the reference or which is different from the reference	μέθοδος δοκιμής διάκρισης στην οποία κάθε αξιολογητής λαμβάνει ένα σύνολο τριών δειγμάτων, εκ των οποίων το ένα επισημαίνεται ως αναφορά, και του ζητείται να προσδιορίσει ποιο από τα άλλα είναι το ίδιο με το δείγμα αναφοράς ή ποιο είναι διαφορετικό από το δείγμα αναφοράς	4.19

"two-out-of-five" test noun	δοκιμή «δύο από πέντε», ουσ.	method of discrimination testing involving five coded samples, two of which are of one type and three of which are of another and in which the assessor is asked to group the samples into sets of two and of three samples of similar perception	μέθοδος δοκιμής διάκρισης που περιλαμβάνει πέντε κωδικοποιημένα δείγματα, δύο από τα οποία είναι ενός τύπου και τα τρία άλλου τύπου, στην οποία ο αξιολογητής καλείται να ομαδοποιήσει τα δείγματα σε ομάδες των δύο και τριών δειγμάτων παρόμοιας αντίληψης	4.20
"A" or "not A" test, noun	δοκιμή «Α» ή «όχι Α», ουσ.	method of discrimination testing in which a series of samples which may be "A" or "not A" is presented to the assessor after he/she has learned to recognize sample "A" and in which the assessor is asked to indicate whether each sample is "A" or "not A"	μέθοδος δοκιμής διάκρισης κατά την οποία μια σειρά δειγμάτων που μπορεί να είναι «Α» ή «όχι Α» παρουσιάζεται στον αξιολογητή αφού μάθει να αναγνωρίζει το δείγμα «Α» και στην οποία ο αξιολογητής καλείται να υποδείξει εάν κάθε δείγμα είναι "Α" ή "όχι Α"	4.21
descriptive analysis, noun	περιγραφική ανάλυση, ουσ.	any method to describe or quantify the sensory characteristics of stimuli by a panel of trained assessors	οποιαδήποτε μέθοδος για την περιγραφή ή την ποσοτικοποίηση των αισθητηριακών χαρακτηριστικών των ερεθισμάτων από μια ομάδα εκπαιδευμένων αξιολογητών	4.22
qualitative sensory profile, noun	ποιοτικό αισθητηριακό προφίλ, ουσ.	description of the sensory attributes of a sample but without intensity values	περιγραφή των αισθητηριακών χαρακτηριστικών ενός δείγματος αλλά χωρίς τιμές έντασης	4.23
quantitative sensory profile, noun	ποσοτικό αισθητηριακό προφίλ, ουσ.	description of a sample consisting of both attributes and their intensity values	περιγραφή ενός δείγματος που αποτελείται από δύο χαρακτηριστικά και τις τιμές έντασής τους	4.23
sensory profile, noun	αισθητηριακό προφίλ, ουσ.	description of the sensory properties of a sample, consisting of the sensory attributes in the order of perception, and with assignment of an intensity value for each attribute NOTE A generic term for any type of profile, whether full or partial, trademarked or not.	περιγραφή των αισθητηριακών ιδιοτήτων ενός δείγματος, που αποτελείται από τα αισθητηριακά χαρακτηριστικά κατά σειρά αντίληψης και με εκχώρηση τιμής έντασης για κάθε χαρακτηριστικό Σημείωση 1: Γενικός όρος για οποιοδήποτε τύπο προφίλ, πλήρες ή μερικό, με εμπορικό σήμα ή όχι.	4.25
free choice sensory profile, noun	αισθητηριακό προφίλ ελεύθερης επιλογής, ουσ.	form of sensory profiling in which each assessor independently chooses the attributes to be used for a group of samples NOTE A consensus sample space is derived statistically.	μορφή αισθητηριακού προφίλ στην οποία κάθε αξιολογητής επιλέγει ανεξάρτητα τα χαρακτηριστικά που θα χρησιμοποιηθούν για μια ομάδα δειγμάτων Σημείωση 1: Ένας συναινετικός δειγματοχώρος προκύπτει στατιστικά.	4.26
texture profile, noun	προφίλ υφής, ουσ.	qualitative or quantitative sensory profile of the texture of a sample	ποιοτικό ή ποσοτικό αισθητηριακό προφίλ της υφής ενός δείγματος	4.27
preference test, noun	δοκιμή προτίμησης, ουσ.	test to assess preference between two or more samples	δοκιμή για την αξιολόγηση της προτίμησης μεταξύ δύο ή περισσότερων δειγμάτων	4.28
scale, noun	κλίμακα, ουσ.	term applicable to either a response scale or a measurement scale	κλίμακα απόκρισης ή κλίμακα μέτρησης	4.29
response scale, noun	κλίμακα απόκρισης, ουσ.	means (e.g. numerical, verbal or pictorial) by which an assessor registers a quantitative response NOTE 1 In sensory analysis, this is a device or tool to capture the	μέσο (π.χ. αριθμητικό, λεκτικό ή εικονογραφικό) με το οποίο ένας αξιολογητής καταχωρεί μια ποσοτική απόκριση Σημείωση 1: Στην αισθητηριακή	4.29.1

		reaction of an assessor to some property such that it can be converted into numbers. NOTE 2 The term "scale" is widely used as being equivalent to the expression "response scale".	ανάλυση, αυτό είναι μια διάταξη ή ένα εργαλείο για τη λήψη της αντίδρασης ενός αξιολογητή σε κάποια ιδιότητα έτσι ώστε αυτή να μπορεί να μετατραπεί σε αριθμούς. Σημείωση 2: Ο όρος «κλίμακα» χρησιμοποιείται ευρέως ως συνώνυμος με τον όρο «κλίμακα απόκρισης».	
measurement scale, noun	κλίμακα μέτρησης, ουσ.	formal relationship (e.g. ordinal, interval or ratio) between a property (e.g. the intensity of a sensory perception) and the numbers used to represent values of the property (e.g. numbers registered by the assessors or derived from the assessors' responses) NOTE The term "scale" is widely used as being equivalent to the expression "measurement scale".	τυπική σχέση (π.χ. διάταξη, διάστημα ή λόγος) μεταξύ μιας ιδιότητας (π.χ. η ένταση μιας αισθητηριακής αντίληψης) και των αριθμών που χρησιμοποιούνται για την παράσταση των τιμών της ιδιότητας (π.χ. αριθμοί που έχουν καταχωρηθεί από τους αξιολογητές ή προέρχονται από τις αποκρίσεις των αξιολογητών) Σημείωση 1: Ο όρος «κλίμακα» χρησιμοποιείται ευρέως ως συνώνυμος με τον όρο «κλίμακα μέτρησης».	4.29.2
intensity scale, noun	κλίμακα έντασης, ουσ.	scale denoting the strength of a perception	κλίμακα που υποδηλώνει τη δύναμη μιας αντίληψης	4.30
attitude scale, noun	κλίμακα στάσεων, ουσ.	scale denoting attitudes or opinions	κλίμακα που υποδηλώνει στάσεις ή απόψεις	4.31
reference scale, noun	κλίμακα αναφοράς, ουσ.	scale in which reference samples are used to define an attribute or specific intensities of a given attribute	κλίμακα στην οποία χρησιμοποιούνται δείγματα αναφοράς για να ορίσουν ένα χαρακτηριστικό ή συγκεκριμένες εντάσεις ενός δεδομένου χαρακτηριστικού	4.32
hedonic scale, noun	κλίμακα αρέσκειας, ουσ.	scale expressing degrees of likes or dislike	κλίμακα που εκφράζει βαθμούς αρέσκειας ή απαρέσκειας	4.33
bipolar scale, noun	διπολική κλίμακα, ουσ.	scale with opposite descriptions at the two ends (e.g. a texture scale ranging from hard to soft)	κλίμακα με αντίθετες περιγραφές στα δύο άκρα (π.χ. κλίμακα υφής που κυμαίνεται από σκληρό έως μαλακό)	4.34
unipolar scale, noun	μονοπολική κλίμακα, ουσ.	scale with only one descriptor at one of the ends	κλίμακα με μόνο έναν περιγραφέα σε ένα από τα άκρα	4.35
ordinal scale, noun	διατακτική κλίμακα, ουσ.	scale in which the order of the values allocated corresponds to the order of the intensities perceived for the property being assessed	κλίμακα στην οποία η σειρά των τιμών που κατανέμονται αντιστοιχεί στη σειρά των εντάσεων που γίνονται αντιληπτές για την ιδιότητα που αξιολογείται	4.36
interval scale, noun	κλίμακα διαστημάτων, ουσ.	scale which, in addition to possessing the attributes of an ordinal scale, is distinguished by the fact that equal differences between numerical values correspond to equal differences between properties measured (in sensory analysis, perceived intensities)	κλίμακα η οποία, εκτός από το ότι διαθέτει τα χαρακτηριστικά μιας διατακτικής κλίμακας, διακρίνεται από το γεγονός ότι ίσες διαφορές μεταξύ αριθμητικών τιμών αντιστοιχούν σε ίσες διαφορές μεταξύ των ιδιοτήτων που μετρήθηκαν (στην αισθητηριακή ανάλυση, αντιληπτές εντάσεις)	4.37
ratio scale, noun	κλίμακα λόγων, ουσ.	scale which has the properties of an interval scale but for which, in addition, the ratio between the values allocated to two stimuli is equal to the ratio between the perceived intensities of these stimuli	κλίμακα που έχει τις ιδιότητες μιας κλίμακας διαστημάτων, για την οποία όμως επιπλέον ο λόγος μεταξύ των τιμών που κατανέμονται σε δύο ερεθίσματα είναι ίσος με τον λόγο μεταξύ των αντιληπτών εντάσεων αυτών των ερεθισμάτων	4.38

error (of assessment), noun	σφάλμα (αξιολόγησης), ουσ.	the difference between the observed value (or assessment) and the true value	η διαφορά μεταξύ της παρατηρούμενης τιμής (ή εκτίμησης) και της αληθούς τιμής	4.39
random errors, noun	τυχαία σφάλματα, ουσ.	(sensory analysis) unpredictable errors which average to zero	(αισθητηριακή ανάλυση) απρόβλεπτα σφάλματα που δίνουν μέση τιμή μηδέν	4.40
bias, noun	μεροληψία, ουσ.	(sensory analysis) systematic errors which may be positive or negative	(αισθητηριακή ανάλυση) συστηματικά σφάλματα που μπορεί να είναι θετικά ή αρνητικά	4.41
expectation bias, noun	μεροληψία προϋδεασμού, ουσ.	bias due to the assessor's preconceived ideas	μεροληψία λόγω προϋδεασμού του αξιολογητή	4.42
halo effect, noun	φαινόμενο της άλω, ουσ.	special case of context effect where the favourable or unfavourable evaluation of a stimulus on one attribute tends to induce favourable or unfavourable evaluation of other attributes of the same stimulus considered at the same time	ειδική περίπτωση επίδρασης του πλαισίου εφαρμογής όπου η ευνοϊκή ή δυσμενής αξιολόγηση ενός ερεθίσματος σε ένα χαρακτηριστικό τείνει να προκαλέσει ευνοϊκή ή δυσμενή αξιολόγηση άλλων χαρακτηριστικών του ίδιου ερεθίσματος που εξετάζονται ταυτόχρονα	4.43
true value noun	αληθής τιμή ουσ.	(sensory analysis) particular value which assessments are intended to estimate	ιδιαίτερη τιμή στην εκτίμηση της οποίας αποσκοπούν οι αξιολογήσεις	4.44
standard illuminant, noun	πρότυπο φωτιστικό ουσ.	colorimetric illuminant relating to the range of artificial or natural lights defined by the International Lighting Commission (CIE)	χρωματομετρικό φωτιστικό που σχετίζεται με το εύρος των τεχνητών ή φυσικών φώτων που ορίζεται από τη Διεθνή Επιτροπή Φωτισμού (CIE)	4.45
anchor point, noun	σημείο αγκύρωσης, ουσ.	reference point against which samples are assessed NOTE See reference point (1.19).	σημείο αναφοράς βάσει του οποίου αξιολογούνται τα δείγματα Σημείωση 1: Βλέπε σημείο αναφοράς (1.19).	4.46
score, noun	βαθμός, ουσ.	value assigned which describes the specific location of a stimulus material in the possible range of intensities for that attribute NOTE To score a food is to rate its properties on a scale or according to some numerically defined sense of criteria.	εκχωρούμενη τιμή που περιγράφει τη συγκεκριμένη θέση ενός διεγερτικού υλικού στο πιθανό εύρος εντάσεων για αυτό το χαρακτηριστικό Σημείωση 1: Η βαθμολόγηση ενός τροφίμου γίνεται μέσω της τοποθέτησης των ιδιοτήτων του σε κλίμακα ή σύμφωνα με κάποια αριθμητικά καθορισμένη έννοια κριτηρίων.	4.47
score sheet/card, noun	βαθμοδέλτιο, ουσ.	ballot	φύλλοκάρτα βαθμολόγησης	4.48

ΣΥΝΟΛΙΚΟ ΑΛΦΑΒΗΤΙΚΟ ΑΓΓΛΟΕΛΛΗΝΙΚΟ ΓΛΩΣΣΑΡΙΟ

1. General terminology – Γενική ορολογία
2. Terminology relating to the senses – Ορολογία σχετική με τις αισθήσεις
3. Terminology relating to organoleptic attributes – Ορολογία σχετική με οργανοληπτικά χαρακτηριστικά
4. Terminology relating to methods – Ορολογία σχετική με μεθόδους

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
1.	"A" or "not A" test, noun	δοκιμή «Α» ή «όχι Α» , ουσ.	method of discrimination testing in which a series of samples which may be "A" or "not A" is presented to the assessor after he/she has learned to recognize sample "A" and in which the assessor is asked to indicate whether each sample is "A" or "not A"	μέθοδος δοκιμής διάκρισης κατά την οποία μια σειρά δειγμάτων που μπορεί να είναι «Α» ή «όχι Α» παρουσιάζεται στον αξιολογητή αφού μάθει να αναγνωρίζει το δείγμα «Α» και στην οποία ο αξιολογητής καλείται να υποδείξει εάν κάθε δείγμα είναι "Α" ή "όχι Α"	4.21
2.	"two-out-of-five" test noun	δοκιμή «δύο από πέντε» , ουσ.	method of discrimination testing involving five coded samples, two of which are of one type and three of which are of another and in which the assessor is asked to group the samples into sets of two and of three samples of similar perception	μέθοδος δοκιμής διάκρισης που περιλαμβάνει πέντε κωδικοποιημένα δείγματα, δύο από τα οποία είναι ενός τύπου και τα τρία άλλου τύπου, στην οποία ο αξιολογητής καλείται να ομαδοποιήσει τα δείγματα σε ομάδες των δύο και τριών δειγμάτων παρόμοιας αντίληψης	4.20
3.	absolute judgement, noun	απόλυτη κρίση , ουσ.	evaluation of a stimulus made without direct comparison (e.g. monadic presentation)	αξιολόγηση ενός ερεθίσματος χωρίς άμεση σύγκριση (π.χ. μοναδική παρουσίαση)	4.12
4.	acceptability, noun	αποδεκτότητα , ουσ.	degree to which a stimulus is liked or disliked, overall or for particular sensory attributes	βαθμός στον οποίο ένα ερέθισμα είναι αρεστό ή όχι, συνολικά ή για ιδιαίτερα αισθητηριακά χαρακτηριστικά	1.23
5.	acidity, noun acid taste, noun	οξύτητα , ουσ., όξινη γεύση , ουσ.	basic taste produced by dilute aqueous solutions of most acid substances (e.g. citric acid and tartaric acid)	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα των περισσότερων όξινων ουσιών (π.χ. κιτρικό οξύ και τρυγικό οξύ)	3.3
6.	acuity, noun	αντιληπτική οξύτητα , ουσ.	ability to discern small differences in stimuli Note 1 to entry: In French, this term should be differentiated from the term "acuité" which refers to the ability to perceive with no concept of level.	ικανότητα διάκρισης μικρών διαφορών του ερεθίσματος	2.10
7.	adhesiveness, noun	προσφυσικότητα	mechanical textural attribute relating to the force required to remove material that sticks to the mouth or to a substrate Note 1 The main adjectives corresponding to different levels of adhesiveness are: — "lacky": low level, e.g. marshmallow;	μηχανικό χαρακτηριστικό υφής που σχετίζεται με τη δύναμη που απαιτείται για την αφαίρεση υλικού που κολλάει στο στόμα ή σε ένα υπόστρωμα Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα προσφυσικότητας είναι: — «ελαφρώς κολλώδης»: χαμηλό επίπεδο, π.χ. μαρσμέλλου, — «μετρίως κολλώδης»: μέτριο	3.51

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
			<p>— “clinging”: moderate level, e.g. peanut butter;</p> <p>— “gooey”, “gluey”: high level, e.g. caramel sundae topping, overcooked rice;</p> <p>— “sticky”, “adhesive”: very high level, e.g. toffee.</p> <p>Note 2 The adhesiveness of a product may be experienced in various ways, e.g.</p> <p>— to palate — force required to remove product completely from the palate, using the tongue, after complete compression of the sample between tongue and palate;</p> <p>— to lips — degree to which the product sticks/adheres to the lips — the sample is placed between the lips, compressed once slightly and released to assess adhesiveness;</p> <p>— to teeth — amount of product adhering on/in the teeth after product mastication;</p> <p>— to itself — force required to separate individual pieces with the tongue, when the sample is placed in the mouth;</p> <p>— manually — force required to separate individual pieces adhering to each other using the back of a spoon.</p>	<p>επίπεδο, π.χ. φυστικοβούτυρο,</p> <p>— «πολύ κολλώδης»: υψηλό επίπεδο, π.χ. πηχτό σιρόπι καραμέλας, παραψημένο ρύζι,</p> <p>— «εξαιρετικά κολλώδης»: πολύ υψηλό επίπεδο, π.χ. τόφι, καραμέλα.</p> <p>Σημείωση 2: Η προσφυσικότητα ενός προϊόντος μπορεί να παρατηρηθεί με διάφορους τρόπους, π.χ.</p> <p>— στον ουρανίσκο — δύναμη που απαιτείται για την πλήρη αφαίρεση του προϊόντος από τον ουρανίσκο, με τη χρήση της γλώσσας, μετά από πλήρη συμπίεση του δείγματος μεταξύ γλώσσας και υπερώας;</p> <p>— στα χείλη — βαθμός στον οποίο το προϊόν κολλάει στα χείλη — το δείγμα τοποθετείται ανάμεσα στα χείλη, συμπιέζεται ελαφρά μία φορά και απελευθερώνεται για να εκτιμηθεί η προσφυσικότητά του;</p> <p>— στα δόντια — ποσότητα προϊόντος που προσκολλάται στα δόντια μετά τη μύσηση του προϊόντος;</p> <p>— στον εαυτό του — δύναμη που απαιτείται για να διαχωριστούν μεμονωμένα κομμάτια με τη γλώσσα, όταν το δείγμα τοποθετείται στο στόμα;</p> <p>— χειρακτικά — δύναμη που απαιτείται για να διαχωριστούν μεμονωμένα κομμάτια που προσφύονται το ένα στο άλλο με τη χρήση του κυρτού μέρους ενός κουταλιού.</p>	
8.	aeration, noun, aerated, pp.	αεριούχηση , ουσ. αεριούχος -α -ο , επιθ.	<p>describes a solid or semi-solid product containing small, even cells filled with gas (usually carbon dioxide or air) and usually surrounded by soft cell walls</p> <p>Note 1 See also effervescence (3.61).</p> <p>Note 2 The product may be described as “frothy” or “foamy” (fluid cell walls, e.g. milkshake) or “porous” (solid cell walls), e.g. marshmallows, meringue, chocolate mousse, chiffon pie filling, sandwich loaf.</p>	<p>περιγράφει ένα στερεό ή ημιστερεό προϊόν που περιέχει μικρές, ομοιόμορφες κυψελίδες νεμάτες με αέριο (συνήθως διοξείδιο του άνθρακα ή αέρα) που συνήθως περιβάλλονται από μαλακά κυτταρικά τοιχώματα</p> <p>Σημείωση 1: Βλέπε επίσης αναβρασμός (3.61).</p> <p>Σημείωση 2: Το προϊόν μπορεί να περιγραφεί ως «αφρώδες» (υγρά κυτταρικά τοιχώματα, π.χ. μιλκσέικ) ή «πορώδες» (στερεά κυτταρικά τοιχώματα), π.χ. μαρσαμέλλου, μαρέγκα, μους σοκολάτας, γέμιση πίτας σιφόν, φραντζολάκι για σάντουιτς.</p>	3.60

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
9.	after-feel, noun	μεταίσθημα, ουσ.	experience that follows the removal of a texture stimulus; it may be continuous with the primary experience or may follow as a different quality after a period during which swallowing, saliva, dilution and other influences may have affected the stimulus substance or sensing field	εμπειρία που ακολουθεί την αφαίρεση ενός ερεθίσματος υφής. Μπορεί να είναι σε συνέχεια της πρωταρχικής εμπειρίας ή μπορεί να ακολουθεί ως διαφορετική ιδιότητα μετά από μια περίοδο κατά την οποία η κατάποση, το σάλιο, η αραιώση και άλλες επιδράσεις μπορεί να έχουν επηρεάσει το ερέθισμα ή το αισθητηριακό πεδίο	3.66
10.	after-taste, noun residual taste, noun	επιγευση, ουσ. υπολειμματική γεύση, ουσ.	olfactory and/or gustatory sensation that occurs after the elimination of the product, and differs from the sensations perceived whilst the product was in the mouth	οσφρητικό και/ή γευστικό αίσθημα που εμφανίζεται μετά την απομάκρυνση του προϊόντος και διαφέρει από τα αισθήματα που γίνονται αντιληπτά ενόσω το προϊόν βρισκόταν στο στόμα	3.65
11.	ageusia, noun	αγευσία, ουσ.	lack of sensitivity to gustatory stimuli Note 1 to entry: Ageusia may be total or partial, and permanent or temporary.	έλλειψη ευαισθησίας σε γευστικά ερεθίσματα Σημείωση 1: Η αγευσία μπορεί να είναι ολική ή μερική και μόνιμη ή παροδική.	2.31
12.	alkalinity, noun alkaline taste, noun	αλκαλικότητα, ουσ., αλκαλική γεύση, ουσ.	taste produced by dilute aqueous solutions of basic, i.e. pH > 7,0, substances such as sodium hydroxide	γεύση που παράγεται από αραιά υδατικά διαλύματα ουσιών που ανήκουν στις βάσεις, δηλαδή pH > 7,0, όπως το υδροξείδιο του νατρίου	3.8
13.	anchor point, noun	σημείο αγκύρωσης, ουσ.	reference point against which samples are assessed NOTE See reference point (1.19).	σημείο αναφοράς βάσει του οποίου αξιολογούνται τα δείγματα Σημείωση 1: Βλέπε σημείο αναφοράς (1.19).	4.46
14.	anosmia, noun	ανοσμία, ουσ.	lack of sensitivity to olfactory stimuli Note 1 to entry: Anosmia may be total or partial, and permanent or temporary.	έλλειψη ευαισθησίας σε οσφρητικά ερεθίσματα Σημείωση 1: Η ανοσμία μπορεί να είναι ολική ή μερική και μόνιμη ή παροδική.	2.32
15.	antagonism, noun	ανταγωνισμός, ουσ.	joint action of two or more stimuli, whose combination elicits a level of sensation lower than that expected from superimposing the effects of each stimulus taken separately Note 1 to entry: See also synergism (2.36).	συνδυασμένη δράση δύο ή περισσότερων ερεθισμάτων των οποίων ο συνδυασμός προκαλεί στάθμη αίσθηματος χαμηλότερη από την αναμενόμενη από την υπέρθεση των επιδράσεων κάθε ερεθίσματος όταν λαμβάνεται χωριστά Σημείωση 1: Βλέπε επίσης συνεργισμός (2.36).	2.35
16.	appearance, noun	εμφάνιση, ουσ.	all the visible attributes of a substance or object	το σύνολο των ορατών χαρακτηριστικών μιας ουσίας ή ενός αντικειμένου	3.1
17.	appetite, noun	όρεξη, ουσ.	physiological and psychological state expressed by the desire to eat and/or to drink	φυσιολογική και ψυχολογική κατάσταση που εκφράζεται με την επιθυμία για φαγητό ή ποτό	1.28
18.	appetizing, adj.	ορεκτικός -ή -ό, επίθ.	describes a product capable of exciting the appetite of the individual	(για προϊόν) ικανός -ή -ό να διεγείρει την όρεξη ενός ατόμου	1.29

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
19.	aroma ¹ , noun	οσμή ² , ουσ.	odour with a pleasant or unpleasant connotation Note 1 to entry: The terms "aroma" in English and "arôme" in French are not exactly equivalent.	οσμή ¹ (3.18) με ευχάριστη ή δυσάρεστη χροιά Σημείωση 1 Οι όροι "aroma" στα αγγλικά και "arôme" στα γαλλικά δεν είναι ακριβώς ισοδύναμοι.	3.24
20.	aroma ² , noun	άρωμα , ουσ.	sensory attribute perceptible by the olfactory organ via the back of the nose when tasting Note 1 to entry: The terms "aroma" in English and "arôme" in French are not exactly equivalent.	αισθητηριακό χαρακτηριστικό που γίνεται αντιληπτό από το οσφρητικό όργανο μέσω του πίσω μέρους της μύτης κατά τη γευστική δοκιμή Σημείωση 1 Οι όροι "aroma" στα αγγλικά και "arôme" στα γαλλικά δεν είναι ακριβώς ισοδύναμοι.	3.25
21.	astringency , noun	στυφότητα , ουσ.	complex sensation, accompanied by shrinking, drawing or puckering of the skin or mucosal surface in the mouth, produced by substances such as kaki tannins or sioe tannins	σύνθετο αίσθημα που συνοδεύεται από συρρίκνωση, έλξη ή ζάρωμα της επιφάνειας του δέρματος ή της βλεννογόνου στο στόμα και παράγεται από ουσίες όπως οι τανίνες κάκι ή οι τανίνες σλόου	3.10
22.	attitude scale , noun	κλίμακα στάσεων , ουσ.	scale denoting attitudes or opinions	κλίμακα που υποδηλώνει στάσεις ή απόψεις	4.31
23.	attitude , noun	στάση , ουσ.	disposition to respond in a given way toward a class of objects or ideas	διάθεση για απόκριση με δεδομένο τρόπο σε μια κατηγορία αντικειμένων ή ιδεών	1.38
24.	attribute , noun	(αντιληπτό) χαρακτηριστικό , ουσ.	perceptible characteristic	χαρακτηριστικό που προσλαμβάνεται μέσω των αισθήσεων	1.3
25.	auditory , adjective	ακουστικός , επιθ.	pertaining to the sense of hearing	σχετικός με την αίσθηση της ακοής	2.18
26.	aversion , noun	απέχθεια , ουσ.	feeling of repulsion provoked by a stimulus	αίσθημα αποστροφής που προκαλείται από ένα ερέθισμα	1.25
27.	basic taste , noun	βασική γεύση , ουσ.	any one of the distinctive tastes: acid/sour, bitter, salty, sweet, umami Note 1 to entry: Other tastes that may be classified as basic are alkaline and metallic.	οποιαδήποτε από τις διακριτικές γεύσεις: οξύ/ξινό, πικρό, αλμυρό, γλυκό, ουμάμι Σημείωση 1: Άλλες γεύσεις που μπορούν να ταξινομηθούν ως βασικές είναι αλκαλικό και μεταλλικό.	3.2
28.	bias , noun	μεροληψία , ουσ.	(sensory analysis) systematic errors which may be positive or negative	(αισθητηριακή ανάλυση) συστηματικά σφάλματα που μπορεί να είναι θετικά ή αρνητικά	4.41
29.	bipolar scale , noun	διπολική κλίμακα , ουσ.	scale with opposite descriptions at the two ends (e.g. a texture scale ranging from hard to soft)	κλίμακα με αντίθετες περιγραφές στα δύο άκρα (π.χ. κλίμακα υφής που κυμαίνεται από σκληρό έως μαλακό)	4.34
30.	bitterness , noun bitter taste, noun	πικρότητα , ουσ., πικρή γεύση , ουσ.	basic taste produced by dilute aqueous solutions of various substances such as quinine or caffeine	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα διάφορων ουσιών όπως η κινίνη και η καφεΐνη	3.5
31.	bland , adjective	αδιάφορος -η -ο , επιθ.	describes a product with a low level of flavour, and without character	περιγράφει ένα προϊόν με χαμηλό επίπεδο οσμώσεως και χωρίς χαρακτήρα	3.69
32.	body , noun	σώμα , ουσ.	consistency, compactness of texture, fullness, richness, flavour or substance of a product	πυκνότητα, συμπαγές υφές, πληρότητα, πλούτος, οσμώσεως ή υλική υπόσταση ενός προϊόντος	3.27

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
33.	bouquet , noun	μπουκέτο , ουσ.	group of specific olfactory notes allowing a product (wine, spirits, etc.) to be characterized	ομάδα συγκεκριμένων οσφρητικών διαβαθμίσεων που επιτρέπουν τον χαρακτηρισμό ενός προϊόντος (κρασί, οινοπνευματώδη ποτά κ.λπ.)	3.26
34.	brightness contrast , noun	αντίθεση λαμπρότητας , ουσ.	effect on the visual brightness of one object or colour of the brightness of surrounding objects or colours	αποτέλεσμα της επίδρασης της λαμπρότητας των αντικειμένων ή χρωμάτων γύρω από ένα αντικείμενο ή χρώμα ² στην οπτική λαμπρότητα του αντικειμένου ή χρώματος ²	3.36
35.	burning , adjective warming, adjective	καυτερός , επιθ., θερμαντικός, επιθ.	describes a sensation of heat in the mouth, e.g. as caused by alcohol (warming) or chilli pepper (burning)	περιγράφει ένα αίσθημα θερμότητας στο στόμα, π.χ. όπως προκαλείται από αλκοόλ (θέρμανση) ή πιπέρι τσίλι (κάψιμο)	3.12
36.	character note , noun	νότα χαρακτήρα , ουσ.	perceptible sensory attribute, flavour and texture (mechanical, geometrical, and fat and moisture characteristics), in a food product	ανιληπτό αισθητηριακό χαρακτηριστικό, οσμόγευση και υφή (μηχανικά, γεωμετρικά χαρακτηριστικά και χαρακτηριστικά λίπους και υγρασίας) σε ένα τρόφιμο	3.30
37.	chemical cooling , noun	χημικό ψύχος , ουσ.	sensation of reduced temperature experienced as a result of exposure to certain substances such as menthol, mints or anise Note 1 to entry: The sensation usually persists after the stimulus is removed.	αίσθημα μειωμένης θερμοκρασίας που εμφανίζεται ως αποτέλεσμα της έκθεσης σε ορισμένες ουσίες όπως η μινθόλη, η μέντα ή το γλυκάνισο Σημείωση 1: Το αίσθημα συνήθως επιμένει μετά την αφαίρεση του ερεθίσματος.	3.14
38.	chemical effect , noun	χημική επίδραση , ουσ.	physical, stinging chemical sensation experienced on the tongue as a result of exposure to substances such as carbonated water Note 1 to entry: The sensation may linger and is independent of temperature, taste and odour. Note 2 to entry: Popular terms: "astringent" (strong tea), "burning" (whisky), "sharp" (prune juice), "pungent" (horseradish).	φυσικό, καυστικό χημικό αίσθημα που εμφανίζεται στη γλώσσα ως αποτέλεσμα της έκθεσης σε ουσίες όπως το ανθρακούχο νερό Σημείωση 1: Το αίσθημα μπορεί να παραμείνει και είναι ανεξάρτητο από τη θερμοκρασία, τη γεύση και την οσμή. Σημείωση 2: Δημοφιλείς όροι: «στυφό» (δυνατό τσίλι), «καυτερό/θερμαντικό» (ουίσκι), «αιχμηρό» (χυμός δαμάσκηνου), «πικάντικο» (ραπανάκι).	3.11
39.	chemical heat , noun	χημική θερμότητα , ουσ.	sensation of increased temperature resulting from exposure to substances such as capsaicin or hot peppers Note 1 to entry: The sensation tends to persist after the stimulus is removed.	αίσθημα αυξημένης θερμοκρασίας που προκύπτει από την έκθεση σε ουσίες όπως η καψαϊκίνη ή οι καυτερές πιπεριές Σημείωση 1: Το αίσθημα τείνει να επιμένει μετά την αφαίρεση του ερεθίσματος.	3.16
40.	chemothermal sensation , noun	χημειοθερμικό αίσθημα , ουσ.	sensation of heat or cold produced by certain substances, unrelated to the temperature of the substance ΠΑΡΑΔΕΙΓΜΑ: These sensations are produced by capsaicin (hot) and menthol (cold).	αίσθημα θερμότητας ή κρύου που παράγεται από ορισμένες ουσίες μη σχετιζόμενο με τη θερμοκρασία της ουσίας ΠΑΡΑΔΕΙΓΜΑ: Τέτοια αισθήματα παράγονται από την καψαϊκίνη (καυτού) και μινθόλη (κρύου).	2.21

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
41.	chew count, noun	αριθμός μασημάτων , ουσ.	number of chews required to masticate the sample to reduce it to a consistency suitable for swallowing	το πλήθος των μασημάτων που απαιτούνται για τη μύσηση του δείγματος ώστε να μειωθεί η συνοχή του ώστε να είναι κατάλληλη για κατάποση	3.46
42.	chewiness, noun	μασητότητα , ουσ.	mechanical textural attribute related to the amount of work required to masticate a solid product into a state ready for swallowing Note The main adjectives corresponding to different levels of chewiness are: — "melting": very low level, e.g. ice cream; — "tender": low level, e.g. young peas; — "chewy": moderate level, e.g. fruit gums (confectionery); — "tough": high level, e.g. old beef, bacon rind.	μηχανικό χαρακτηριστικό υφής που σχετίζεται με την ποσότητα εργασίας που απαιτείται για τη μύσηση ενός στερεού προϊόντος ώστε να είναι έτοιμο για κατάποση Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα μασητότητας είναι: — «εύηκτος»: πολύ χαμηλό επίπεδο, π.χ. παγωτό, — «τριφερρός»: χαμηλό επίπεδο, π.χ. φρέσκα μπιζέλια, — «μασητός»: μέτριο επίπεδο, π.χ. ζελεδάκια φρούτων, — «σκληρός»: υψηλό επίπεδο, π.χ. κρέας γέρικου βοδιού, φλούδα μπέικον.	3.45
43.	classification, noun	ταξινόμηση , ουσ.	method of sorting into categories	μέθοδος κατηγοριοποίησης	4.5
44.	clean feel, noun clean, adjective	καθαρότητα (στοματαιοθήματος) , ουσ. καθαρός -ή -ό, επίθ.	property of leaving no lingering mouth after-feel once swallowed (see adhesiveness , 3.51), e.g. water	ιδιότητα του να μην παραμένει στο στόμα κανένα επίμονο μεταίσημα μετά την κατάποση (βλέπε προσφυσικότητα, 3.51), π.χ. νερό	3.63
45.	cohesiveness, noun	συνεκτικότητα , ουσ.	mechanical textural attribute relating to the degree to which a substance can be deformed before it breaks, including the properties of fracturability (3.44), chewiness (3.45) and gumminess (3.47)	μηχανικό χαρακτηριστικό υφής που σχετίζεται με τον βαθμό μέχρι του οποίου μια ουσία μπορεί να παραμορφωθεί πριν σπάσει, συμπεριλαμβανομένων των ιδιοτήτων της θραυστότητας (3.44), της μασητότητας (3.45) και της κομμώδους υφής (3.47)	3.43
46.	colour blindness	αχρωματοψία , ουσ.	otal or partial inability to differentiate certain hues	ολική ή μερική ανικανότητα διάκρισης ορισμένων αποχρώσεων	2.34
47.	colour ¹ , noun	χρώμα¹ , ουσ.	sensation of hue, saturation and lightness induced by stimulation of the retina by light rays of various wavelengths	αίσθημα απόχρωσης, κορεσμού και φωτεινότητας που προκαλείται από τη διέγερση του αμφιβληστροειδούς από ακτίνες φωτός διαφόρων μηκών κύματος	3.31
48.	colour ² , noun	χρώμα² , ουσ.	attribute of products inducing a colour sensation	χαρακτηριστικό των προϊόντων που προκαλεί αίσθημα χρώματος ¹	3.32
49.	comparative assessment, noun	συγκριτική αξιολόγηση , ουσ.	comparison of stimuli presented at the same time	σύγκριση ερεθισμάτων που παρουσιάζονται ταυτόχρονα	4.13
50.	conformation, noun	διαμόρφωση , ουσ.	geometrical textural attribute relating to the perception of the shape and the orientation of particles in a product Note The main adjectives corresponding to different conformations are as	γεωμετρικό χαρακτηριστικό υφής που σχετίζεται με την αντίληψη του σχήματος και του προσανατολισμού των σωματιδίων σε ένα προϊόν Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικές διαμορφώσεις είναι τα εξής: — «κυτταρώδης»: σφαιρικά ή	3.55

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
			<p>follows:</p> <p>— “cellular”: spherical or ovoid particles consisting of thin walls surrounding liquid or gas, e.g. orange;</p> <p>— “crystalline”: angular, similarly sized, symmetrical, three-dimensional particles, e.g. granulated sugar;</p> <p>— “fibrous”: long particles or strands oriented in the same direction, e.g. celery;</p> <p>— “flaky”: loose layers that separate easily, e.g. cooked tuna, croissant, flaky pastry;</p> <p>— “puffy”: hard or firm outer shells filled with large, often uneven, air pockets, e.g. cream puff, puffed rice.</p>	<p>ωσειδή σωματίδια που αποτελούνται από λεπτά τοιχώματα που περιβάλλουν υγρό ή αέριο, π.χ. πορτοκάλι,</p> <p>— «κρυσταλλικός»: γωνιώδη, παρόμοιοι μεγέθους, συμμετρικά, τριδιάστατα σωματίδια, π.χ. κρυσταλλική ζάχαρη,</p> <p>— «ινώδης»: μακριά σωματίδια ή κλώνοι που προσανατολίζονται προς την ίδια κατεύθυνση, π.χ. σέλινο,</p> <p>— « νιφθοειδής»: χαλαρά στρώματα που διαχωρίζονται εύκολα, π.χ. μαγειρεμένος τόνος, κρουασάν, ζύμη σφολιάτα,</p> <p>— «φουσκωτός»: σκληρά ή σφιχτά εξωτερικά κελύφη γεμάτα με μεγάλους, συχνά ανομοιόμορφους, θύλακες αέρα, π.χ. γλύκισμα σου , αφράτοι τραγανόι κόκκοι ρυζιού.</p>	
51.	consistency, noun	συνοχή, ουσ.	mechanical attribute detected by stimulation of the tactile or visual receptors	μηχανικό χαρακτηριστικό που ανιχνεύεται με διέγερση των απτικών ή οπτικών υποδοχέων	3.49
52.	consumer, noun	καταναλωτής, ουσ.	person who uses a product	πρόσωπο που χρησιμοποιεί ένα προϊόν	1.12
53.	contrast effect, noun	φαινόμενο αντίθεσης, ουσ.	increase in response to differences between two simultaneous or consecutive stimuli	αύξηση της απόκρισης σε διαφορές μεταξύ δύο ταυτόχρονων ή διαδοχικών ερεθισμάτων	2.38
54.	control sample, noun	δείγμα ελέγχου, ουσ.	sample of the material under evaluation, chosen as a reference against which all other samples are compared Note 1 to entry: The sample may be identified as a control sample or be a blind control.	δείγμα του υπό αξιολόγηση υλικού, που επιλέχθηκε ως αναφορά, με το οποίο συγκρίνονται όλα τα άλλα δείγματα Σημείωση 1: Το δείγμα μπορεί να προσδιορίζεται ως δείγμα ελέγχου ή ως τυφλό δείγμα.	1.20
55.	convergence effect, noun	φαινόμενο σύγκλισης, ουσ.	decrease in response to differences between two simultaneous or consecutive stimuli	μείωση της απόκρισης σε διαφορές μεταξύ δύο ταυτόχρονων ή διαδοχικών ερεθισμάτων	2.39
56.	cutaneous sense, noun haptics, noun	δερματική αίσθηση, ουσ., απτική αίσθηση, ουσ. απτικός -ή -ό, επίθ.	any of the senses whose receptors lie in the skin or immediately beneath it (or in the mucous membranes) resulting in the perception of contact, pressure, warmth, cold and pain	οποιαδήποτε από τις αισθήσεις των οποίων οι υποδοχείς βρίσκονται μέσα στο δέρμα ή αμέσως κάτω από αυτό (ή στις βλενώδεις μεμβράνες) οι οποίοι συντελούν στην αντίληψη της επαφής, της πίεσης, της θερμότητας, του κρύου και του πόνου	2.20
57.	denseness, noun	πυκνότητα, ουσ.	geometrical textural attribute relating to perception of the compactness of a cross-section of a product after biting completely through it Note The main adjectives	γεωμετρικό χαρακτηριστικό υφής που σχετίζεται με την αντίληψη του συμπαγούς της διατομής ενός προϊόντος μετά από πλήρες δάγκωμα Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά	3.53

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
			corresponding to different levels of denseness are as follows: — "light": low, e.g. whipped topping; — "heavy", "dense": high, e.g. chestnut cream, traditional English-style Christmas pudding.	επίπεδα πυκνότητας είναι τα εξής: — «ελαφρύς»: χαμηλό επίπεδο, π.χ. σαντιγί, — «βαρύς», «πυκνός»: υψηλό επίπεδο, π.χ. κρέμα κάστανου, παραδοσιακή χριστουγεννιάτικη πουτίγκα αγγλικού τύπου.	
58.	descriptive analysis, noun	περιγραφική ανάλυση, ουσ.	any method to describe or quantify the sensory characteristics of stimuli by a panel of trained assessors	οποιαδήποτε μέθοδος για την περιγραφή ή την ποσοτικοποίηση των αισθητηριακών χαρακτηριστικών των ερεθισμάτων από μια ομάδα εκπαιδευμένων αξιολογητών	4.22
59.	difference threshold, noun	κατώφλιο διαφοράς, ουσ.	value of the smallest perceptible difference in the physical intensity of a stimulus Note 1 to entry: The term "threshold" is always used with a qualifying term. Note 2 to entry: In English, the term "difference threshold" is sometimes designated by the letters "DL" (difference limen) or the letters "JND" (just noticeable difference).	τιμή της μικρότερης αντιληπτής διαφοράς στη φυσική ένταση ενός ερεθίσματος Σημείωση 1: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο. Σημείωση 2: Στα αγγλικά, ο όρος «κατώφλιο διαφοράς» μερικές φορές σηματοδοτείται με τα γράμματα "DL" (difference limen) ή με τα γράμματα "JND" (just noticeable difference).	2.27
60.	dilution method, noun	μέθοδος αραιώσης, ουσ.	technique in which samples are prepared at increasingly lower concentrations and examined in series	τεχνική κατά την οποία τα δείγματα παρασκευάζονται σε όλο και χαμηλότερες συγκεντρώσεις και εξετάζονται κατά σειρά	4.14
61.	discriminating ability, noun	διακριτική ικανότητα, ουσ.	sensitivity, acuity, ability to perceive quantitative and/or qualitative differences	ικανότητα αντίληψης ποσοτικών και/ή ποιοτικών διαφορών	1.27
62.	discrimination test, noun	δοκιμή διάκρισης, ουσ.	any method of test involving comparison between samples to determine if differences are perceptible EXAMPLES Triangle test (4.18), duo-trio test (4.19), or paired comparison (4.17).	οποιαδήποτε μέθοδος δοκιμής που περιλαμβάνει σύγκριση μεταξύ δειγμάτων για να προσδιοριστεί εάν οι διαφορές είναι αντιληπτές. ΠΑΡΑΔΕΙΓΜΑΤΑ: Τριγωνική δοκιμή (4.18), δοκιμή «δύο από τρία» (4.19), δοκιμή ζευγαρωτής σύγκρισης (4.17).	4.16
63.	discrimination, noun	διάκριση, ουσ.	act of qualitative and/or quantitative differentiation between two or more stimuli	πράξη ποιοτικής και/ή ποσοτικής διαφοροποίησης μεταξύ δύο ή περισσότερων ερεθισμάτων	1.26
64.	dryness, noun dry, adjective	ξηρότητα, ουσ. ξηρός -ή -ό, επιθ.	textural characteristic describing the perception of moisture absorbed by a product (e.g. cream cracker) Note In beverages, a liquid that feels dry on the tongue and in the throat, e.g. cranberry juice.	χαρακτηριστικό υφής που περιγράφει την αντίληψη υγρασίας που απορροφάται από ένα προϊόν (π.χ. γαλέτα) Σημείωση 1 Στα ποτά, ένα υγρό που γίνεται αντιληπτό ως ξηρό στη γλώσσα και στο λαιμό, π.χ. χυμός μούρων.	3.58

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
65.	duo-trio test, noun	δοκιμή «δύο από τρία», ουσ.	method of discrimination testing in which each assessor receives a set of three samples, of which one is labelled as a reference, and is asked to identify either which of the others is the same as the reference or which is different from the reference	μέθοδος δοκιμής διάκρισης στην οποία κάθε αξιολογητής λαμβάνει ένα σύνολο τριών δειγμάτων, εκ των οποίων το ένα επισημαίνεται ως αναφορά, και του ζητείται να προσδιορίσει ποιο από τα άλλα είναι το ίδιο με το δείγμα αναφοράς ή ποιο είναι διαφορετικό από το δείγμα αναφοράς	4.19
66.	dyschromatopsia, noun	δυσχρωματοψία, ουσ.	defect of colour vision characterized by a perception significantly different from that of a standard observer	ελάττωμα της έγχρωμης όρασης που χαρακτηρίζεται από αντίληψη των χρωμάτων σημαντικά διαφορετική από αυτή ενός τυπικού παρατηρητή	2.33
67.	effervescence, noun effervescent, adjective	αναβρασμός, ουσ. αναβράζων, -ουσα, -ον, επίθ. μετοχή αεριούχος -α -ο, επίθ. αφρώδης -ης -ες, επίθ.	formation of gas bubbles in a liquid product when either the gas is generated by a chemical reaction or pressure is released NOTE 1 See also aeration (3.60). NOTE 2 The bubbles or their formation are often perceived as textural attributes, but at high levels may be perceived by vision or audition. Degrees of effervescence may be described as: — "still": absence, e.g. tap water; — "flat": having a lower level than expected, e.g. bottled beer that has been too long open; — "tingly": perceptible mainly as a texture attribute in the mouth; — "bubbly": having visibly rising bubbles; — "fizzy": having briskly bursting bubbles making an audible hiss.	σχηματισμός φυσαλίδων αερίου σε ένα υγρό προϊόν όταν είτε το αέριο παράγεται από μια χημική αντίδραση είτε όταν ελαττώνεται η πίεση Σημείωση 1: Βλέπε επίσης αεριούχηση (3.60). Σημείωση 2: Οι φυσαλίδες ή ο σχηματισμός τους συχνά γίνονται αντιληπτές ως χαρακτηριστικά υφής, αλλά σε υψηλά επίπεδα μπορεί να γίνουν αντιληπτές από την όραση ή την ακοή. Οι βαθμοί αναβρασμού μπορούν να περιγραφούν ως: — «χωρίς ανθρακικό»: απουσία αναβρασμού, π.χ. νερό βρύσης. — «ξεθυμασμένος»: έχει χαμηλότερο επίπεδο από το αναμενόμενο, π.χ. εμφιαλωμένη μπίρα που παρέμεινε για πολύ καιρό ανοικτή. — «γαργαλιστικός»: γίνεται αντιληπτό κυρίως ως χαρακτηριστικό υφής στο στόμα, — «φυσαλιούχος»: με εμφανώς ανερχόμενες φυσαλίδες, — «αφρώδης», «αεριούχος»: με φυσαλίδες που σκάνε ζωηρά και παράγουν ένα ακουστό σφύριγμα.	3.61
68.	elasticity, noun springiness, noun resilience, noun	ελαστικότητα, ουσ. επανατακτικότητα, ουσ.	mechanical textural attribute relating to: the rapidity of recovery from a deforming force; and the degree to which a deformed material returns to its original condition after the deforming force is removed Note The main adjectives corresponding to different levels of springiness are: — "plastic": absence, e.g. margarine; — "malleable": moderate	μηχανικό χαρακτηριστικό υφής το οποίο σχετίζεται με την ταχύτητα ανάκαμψης ενός υλικού από παραμόρφωση που προκλήθηκε από μια δύναμη μετά την αφαίρεση της δύναμης και με τον βαθμό στον οποίο το παραμορφωμένο υλικό επιστρέφει στην αρχική του κατάσταση Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα ελαστικότητας είναι: — «πλαστικός»: απουσία ελαστικότητας, π.χ. μαργαρίνη, — «εύπλαστος»: μέτριο επίπεδο, π.χ. μαρμαέλλου, λουκούμι,	3.50

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
			level, e.g. marshmallow; — "elastic"; "springy"; "rubbery": high level, e.g. cooked squid, clams, gums.	— «ελαστικός», «επανακτικός», «λαστιχωτός»: υψηλό επίπεδο, π.χ. μαγειρεμένα καλαμάρια, αχιβάδες, τοίχλες.	
69.	error (of assessment) , noun	σφάλμα (αξιολόγησης) , ουσ.	the difference between the observed value (or assessment) and the true value	η διαφορά μεταξύ της παρατηρούμενης τιμής (ή εκτίμησης) και της αληθούς τιμής	4.39
70.	expectation bias , noun	μεροληψία προϋδεασμού , ουσ.	bias due to the assessor's preconceived ideas	μεροληψία λόγω προϋδεασμού του αξιολογητή	4.42
71.	expert sensory assessor , noun	ειδικός αισθητηριακός αξιολογητής , ουσ.	selected assessor with a demonstrated sensory sensitivity and with considerable training and experience in sensory testing, who is able to make consistent and repeatable sensory assessments of various products	επιλεγμένος αξιολογητής με αποδεδειγμένη αισθητηριακή ευαισθησία και με σημαντική κατάρτιση και εμπειρία σε αισθητηριακές δοκιμές που είναι ικανός να εκτελεί συνεπείς και επαναλήψιμες αισθητηριακές αξιολογήσεις διαφόρων προϊόντων	1.8
72.	expert , noun	ειδικός , ουσ.	in the general sense, a person who, through knowledge or experience, has competence to give an opinion in the fields about which he/she is consulted	με τη γενική έννοια, πρόσωπο το οποίο, λόγω γνώσης ή εμπειρίας, έχει τα προσόντα να εκφέρει γνώμη στα πεδία για τα οποία ζητείται η συμβουλή του	1.7
73.	fattiness , noun	λιπαρότητα , ουσ.	textural attribute relating to the perception of the quantity or the quality of fat on the surface or in the body of a product Note The main adjectives corresponding to the perception of fattiness are as follows: — "oily": perception of soaking and running fat, e.g. salad with dressing; — "greasy": perception of exuding fat, e.g. bacon, chips, French fries; — "fatty": perception of high fat proportion in a product, oily, greasy, e.g. lard, tallow.	χαρακτηριστικό υφής που σχετίζεται με την αντίληψη της ποσότητας ή της ποιότητας του λίπους στην επιφάνεια ή στο σώμα ενός προϊόντος Σημείωση 1: Τα κύρια επιθέτα που αντιστοιχούν στην αντίληψη της λιπαρότητας είναι τα εξής: — «ελαιώδης»: αντίληψη του να είναι κάτι μουσκεμένο ή να στάζει λίπος, π.χ. σαλάτα με λαδόξιδο, — «λιπαρώδης»: αντίληψη του εκκρινόμενου λίπους, π.χ. μπέικον, πατατάκια, τηγανιτές πατάτες, — «λιπαρός, λιπαώδης»: αντίληψη υψηλής αναλογίας λιπαρών σε ένα προϊόν, ελαιώδης, λιπαρός, π.χ. λαρδί, ζωικά λίπη.	3.59
74.	flat , adjective	επίπεδος, άτονος -η -ο , επιθ.	describes a product perceived to be below the expected organoleptic level	περιγράφει ένα προϊόν που γίνεται αντιληπτό ότι είναι κάτω από το αναμενόμενο οργανοληπτικό επίπεδο	3.71
75.	flavour enhancer , noun	βελτιωτικό οσμόγευσης , ουσ.	substance that intensifies the flavour of a product without possessing its flavour	ουσία που ενισχύει τη οσμόγευση ενός προϊόντος χωρίς να την καταλαμβάνει	3.22

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76.	flavour , noun	οσμόγευση , ουσ.	complex combination of the olfactory, gustatory and trigeminal sensations perceived during tasting Note 1 to entry: Flavour may be influenced by tactile, thermal, painful and/or kinaesthetic effects.	σύνθετος συνδυασμός των αισθημάτων όσφρησης, γεύσης ¹ και τριδύμου, που γίνονται αντιληπτά κατά τη διάρκεια της γευστικής δοκιμής Σημείωση 1: Η οσμόγευση μπορεί να επηρεαστεί από απτικές, θερμικές, επώδυνες και/ή κιναισθητικές επιδράσεις.	3.20
77.	fracturability , noun	θραυστότητα , ουσ.	mechanical textural attribute related to cohesiveness and hardness and to the force necessary to break a product into crumbs or pieces Note 1 to entry: It is evaluated by suddenly squeezing a product between the incisors (front teeth) or fingers. Note 2 to entry: The main adjectives corresponding to different levels of fracturability are: — “cohesive”: very low level, e.g. caramel, chewing gum; — “crumbly”: low level, e.g. corn muffin, cake; — “crunchy”: moderate level, e.g. apple, raw carrot; — “brittle”: high level, e.g. peanut brittle, brandy snaps; — “crispy”: high level, e.g. potato crisps/chips, cornflakes; — “crusty”: high level, e.g. crust of fresh French-style bread; — “pulverulent”: very high level, immediately disintegrating into powder upon biting, e.g. overcooked egg yolk.	μηχανικό χαρακτηριστικό υφής που σχετίζεται με τη συνεκτικότητα και τη σκληρότητα καθώς και τη δύναμη που απαιτείται για να σπάσει ένα προϊόν σε θρύμματα ή κομμάτια Σημείωση 1: Η θραυστότητα αξιολογείται με απότομη συμπίεση ενός προϊόντος ανάμεσα στους κοπήρες (μπροστινά δόντια) ή στα δάχτυλα. Σημείωση 2: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα θραυστότητας είναι: — «συνεκτικός»: πολύ χαμηλό επίπεδο, π.χ. καραμέλα, τσίχλα, — «εύθρυπτος» [που θρυμματίζεται κατά τη μάσηση]: χαμηλό επίπεδο, π.χ. κεκάκι, καλαμποκιού, κέικ, — «τραγανός (κατά τη μάσηση)»: μέτριο επίπεδο, π.χ. μήλο, ωμό καρότο, — «εύθραυστος» [που θραύεται στο δάγκωμα]: υψηλό επίπεδο, π.χ. νουγκατίνα με αράπικο φιστίκι, τυλιχτά πουράκια, — «κρυσταλλικός, τραγανός στο δάγκωμα»: υψηλό επίπεδο, π.χ. τσιπς, νιφάδες καλαμποκιού, — «κρουστός»: υψηλό επίπεδο, π.χ. κόρα φρέσκου ψωμιού, — «κονιώδης»: πολύ υψηλό επίπεδο, που διασπάται αμέσως σε σκόνη με το δάγκωμα, π.χ. παραψημένος κρόκος αυγού.	3.44
78.	free choice sensory profile , noun	αισθητηριακό προφίλ ελεύθερης επιλογής , ουσ.	form of sensory profiling in which each assessor independently chooses the attributes to be used for a group of samples NOTE A consensus sample space is derived statistically.	μορφή αισθητηριακού προφίλ στην οποία κάθε αξιολογητής επιλέγει ανεξάρτητα τα χαρακτηριστικά που θα χρησιμοποιηθούν για μια ομάδα δειγμάτων Σημείωση 1: Ένας συναινετικός δειγματοχώρος προκύπτει στατιστικά.	4.26

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
79.	gloss , noun glossy, shiny , adjective	σπιλνότητα , ουσ. σπιλνός , επιθ.	a shiny or lustrous appearance resulting from the tendency of a surface to reflect light energy at one angle more than at others	γυαλιστερή ή απαστράπτουσα εμφάνιση που προκύπτει από την τάση μιας επιφάνειας να ανακλά φωτεινή ενέργεια σε μια γωνία περισσότερο από άλλες Σημείωση 1: Το αντίστοιχο επίθετο είναι σπιλνός .	3.40
80.	grading , noun	διαβάθμιση , ουσ.	method in which an assumption of quality is inherent in the scale in order to categorize products into quality groups EXAMPLES Ranking (4.4), classification (4.5), rating (4.6), and scoring (4.7).	μέθοδος κατά την οποία η απόδοση ποιότητας είναι εγγενής στην κλίμακα προκειμένου να κατηγοριοποιηθούν τα προϊόντα σε ομάδες ποιότητας ΠΑΡΑΔΕΙΓΜΑΤΑ: κατάταξη (4.4), ταξινόμηση (4.5), διαβάθμιση σε κλίμακα (4.6) και βαθμολόγηση (4.7).	4.3
81.	granularity , noun	κοκκιότητα , ουσ.	geometrical textural attribute relating to the perception of the size, shape and amount of particles in a product Note The main adjectives corresponding to different levels of granularity are as follows: — "smooth", "powdery": absence, e.g. icing sugar, dry cornflour; — "gritty": low level, e.g. some pears; — "grainy": moderate level, e.g. semolina; — "beady": having small, spherical particles, e.g. tapioca pudding; — "granular": having angular, hard particles, e.g. demerara sugar; — "coarse": high level, e.g. cooked rolled oatmeal; — "lumpy": high level with larger, irregular particles, e.g. cottage cheese.	γεωμετρικό χαρακτηριστικό υφής που σχετίζεται με την αντίληψη του μεγέθους, του σχήματος και της ποσότητας των σωματιδίων σε ένα προϊόν Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα κοκκιότητας είναι τα εξής: — «λείος», «κονιώδης»: απουσία κοκκιότητας, π.χ. ζάχαρη άχνη, στεγνό κορν φλάουρ, — «ελαφρώς κοκκώδης»: χαμηλό επίπεδο, π.χ. κάποιες ποικιλίες αχλαδιών, — «μετρίως κοκκώδης»: μέτριο επίπεδο, π.χ. σιμιγδάλι, — «πολύ κοκκώδης»: που έχει μικρά, σφαιρικά σωματίδια, π.χ. πουτίγκα ταπίοκας, — «κοκκώδης»: που έχει γωνιώδη, σκληρά σωματίδια, π.χ. ζάχαρη Demerara, — «αδρός»: υψηλό επίπεδο, π.χ. μαγειρεμένοι κόκκοι βρώμης, — «σβολώδης»: υψηλό επίπεδο με μεγαλύτερα, ακανόνιστα σωματίδια, π.χ. τυρί κότατζ.	3.54
82.	gumminess , noun	κομμώδης υφή , ουσ. μαστιχωτή υφή , ουσ. κομμώδης -ης -ες, επιθ. μαστιχωτός -ή -ό, επιθ.	mechanical textural attribute related to the cohesiveness of a tender product Note 1 In the mouth, it is related to the effort required to disintegrate the product to the state ready for swallowing. Note 2 The main adjectives corresponding to different levels of gumminess are: — "short": low level, e.g. shortbread;	μηχανικό χαρακτηριστικό υφής που σχετίζεται με τη συνεκτικότητα ενός τρυφερού προϊόντος Σημείωση 1: Στο στόμα, σχετίζεται με την προσπάθεια που απαιτείται για τη διάσπαση του προϊόντος σε κατάσταση έτοιμο για κατάποση. Σημείωση 2: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα κομμώδους υφής είναι: — «βραχύς»: χαμηλό επίπεδο, π.χ. θριφτοκούλουρο, κουραμπιές, — «αλευρώδης»: μέτριο επίπεδο, π.χ. κάποιες ποικιλίες πατάτας.	3.47

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
			<p>— "mealy": moderate level, e.g. some potatoes, cooked dry haricot beans;</p> <p>— "pasty": moderate level, e.g. chestnut puree, flour paste;</p> <p>— "gummy": high level, e.g. overcooked oatmeal, edible gelatine.</p>	<p>μαγειρεμένα ξερά γαλλικά φασόλια,</p> <p>— «πολυώδης»: μέτριο επίπεδο, π.χ. πουρές κάστανου, αλευρόπαστα,</p> <p>— «κομμωδής»: υψηλό επίπεδο, π.χ. παραμαγειρεμένη βρώμη, βρώσιμη ζελατίνη.</p>	
83.	gustatory , adjective	γευστικός , επιθ.	pertaining to the sense of taste	σχετικός με την αίσθηση της γεύσης	2.13
84.	halo effect , noun	φαινόμενο της άλω , ουσ.	special case of context effect where the favourable or unfavourable evaluation of a stimulus on one attribute tends to induce favourable or unfavourable evaluation of other attributes of the same stimulus considered at the same time	ειδική περίπτωση επίδρασης του πλαισίου εφαρμογής όπου η ευνοϊκή ή δυσμενής αξιολόγηση ενός ερεθίσματος σε ένα χαρακτηριστικό τείνει να προκαλέσει ευνοϊκή ή δυσμενή αξιολόγηση άλλων χαρακτηριστικών του ίδιου ερεθίσματος που εξετάζονται ταυτόχρονα	4.43
85.	hardness , noun	σκληρότητα , ουσ.	mechanical textural attribute relating to the force required to achieve a given deformation, penetration, or breakage of a product Note 1 to entry: In the mouth, it is perceived by compressing the product between the teeth (solids) or between the tongue and palate (semi-solids). Note 2 to entry: The main adjectives corresponding to different levels of hardness are: — "soft": low level, e.g. cream cheese; — "firm": moderate level, e.g. olive; — "hard": high level, e.g. boiled sweets.	μηχανικό χαρακτηριστικό υφής που σχετίζεται με τη δύναμη που απαιτείται για την επίτευξη μιας δεδομένης παραμόρφωσης, διείσδυσης ή θραύσης ενός προϊόντος Σημείωση 1: Στο στόμα γίνεται αντιληπτή με συμπίεση του προϊόντος μεταξύ των δοντιών (στερεά τρόφιμα) ή μεταξύ της γλώσσας και του ουρανίσκου (ημιστερεά τρόφιμα). Σημείωση 2: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα σκληρότητας είναι: — «μαλακός»: χαμηλό επίπεδο, π.χ. κρεμώδες τυρί, — «ημίσκληρος», «σφιχτός»: μέτριο επίπεδο, π.χ. ελιά, — «σκληρός»: υψηλό επίπεδο, π.χ. καραμέλες.	3.42
86.	heaviness , noun heavy , adjective	βαρύτητα , ουσ. βαρύς -ιά -ύ , επιθ.	property related to the viscosity of beverages or the denseness of solids Note Describes a solid food whose cross-section is compact or a beverage that flows with some difficulty.	ιδιότητα που σχετίζεται με το ιξώδες των ποτών ή την πυκνότητα των στερεών Σημείωση 1: Περιγράφει ένα στερεό τρόφιμο του οποίου η διατομή είναι συμπαγής ή ένα ποτό που ρέει με κάποια δυσκολία.	3.52
87.	hedonic scale , noun	κλίμακα αρέσκειας , ουσ.	scale expressing degrees of likes or dislike	κλίμακα που εκφράζει βαθμούς αρέσκειας ή απάρεσκειας	4.33

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
88.	hedonic, adj	αρέσκεια, επιθ. προσδ.	relating to like or dislike	που έχει σχέση με αρέσκεια/ απαρέσκεια Σημείωση 1: Δεν πρέπει να συγχέεται με το επίθετο «ηδονικός» (= που έχει σχέση με ηδονή ή που προκαλεί ηδονή) της γενικής γλώσσας.	1.22
89.	hue, noun	απόχρωση, ουσ.	attribute of colour that corresponds to variation in wavelength Note 1 to entry: The equivalent Munsell term is "hue".	χαρακτηριστικό του χρώματος που αντιστοιχεί σε μεταβολή του μήκους κύματος Σημείωση 1: Ο ισοδύναμος όρος Munsell είναι «hue».	3.33
90.	independent assessment, noun	ανεξάρτητη αξιολόγηση, ουσ.	evaluation of one or more stimuli without direct comparison	αξιολόγηση ενός ή περισσότερων ερεθισμάτων χωρίς άμεση σύγκριση	4.11
91.	insipid, adjective	άνοστος, -η, -ο, επιθ.	describes a product with a much lower level of flavour than expected	περιγράφει ένα προϊόν με πολύ χαμηλότερο επίπεδο οσμώγευσης από το αναμενόμενο	3.68
92.	intensity scale, noun	κλίμακα έντασης, ουσ.	scale denoting the strength of a perception	κλίμακα που υποδηλώνει τη δύναμη μιας αντίληψης	4.30
93.	intensity ¹ , noun	ένταση ¹ , ουσ., ένταση αισθήματος, ουσ.	magnitude of the perceived sensation	μέγεθος του αντιληπτού αισθήματος	2.8
94.	intensity ² , noun	ένταση ² , ουσ., ένταση ερεθίσματος, ουσ.	magnitude of the stimulus causing the perceived sensation	μέγεθος του ερεθίσματος που προκαλεί το αντιληπτό αίσθημα	2.9
95.	interval scale, noun	κλίμακα διαστημάτων, ουσ.	scale which, in addition to possessing the attributes of an ordinal scale, is distinguished by the fact that equal differences between numerical values correspond to equal differences between properties measured (in sensory analysis, perceived intensities)	κλίμακα η οποία, εκτός από το ότι διαθέτει τα χαρακτηριστικά μιας διατακτικής κλίμακας, διακρίνεται από το γεγονός ότι ίσες διαφορές μεταξύ αριθμητικών τιμών αντιστοιχούν σε ίσες διαφορές μεταξύ των ιδιοτήτων που μετρήθηκαν (στην αισθητηριακή ανάλυση, αντιληπτές εντάσεις)	4.37
96.	kinaesthesia, noun	κιναισθησία, ουσ., κιναισθηση, ουσ.	sensation of position, movement and tension of parts of the body perceived through nerves and organs in the muscles, tendons and joints Note 1 to entry: Do not confuse with somesthesia (2.22).	αίσθημα της θέσης, της κίνησης και έντασης των μερών του σώματος αντιληπτό μέσω νευρών και οργάνων στους μύς, στους τένοντες και στις αρθρώσεις Σημείωση 1: Να μην συγχέεται με τη σωματ αισθησία (2.22).	2.24
97.	lightness, noun	φωτεινότητα, ουσ.	degree of visual brightness compared with a neutral gray in a scale ranging from absolute black to absolute white Note 1 to entry: The equivalent Munsell term is "value".	βαθμός οπτικής λαμπρότητας σε σύγκριση με ένα ουδέτερο γκρι σε μια κλίμακα που κυμαίνεται από το απόλυτο μαύρο έως το απόλυτο λευκό Σημείωση 1: Ο ισοδύναμος όρος Munsell είναι «value».	3.35

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
98.	magnitude estimation , noun	εκτίμηση μέτρου , ουσ.	process of assigning values to the intensities of an attribute in such a way that the ratios between assigned values are the same as between the magnitudes of the perceptions to which they correspond	διεργασία εκχώρησης τιμών στις εντάσεις ενός χαρακτηριστικού με τέτοιο τρόπο ώστε οι λόγοι μεταξύ των εκχωρημένων τιμών να είναι ίδιοι με τους λόγους μεταξύ των μέτρων των αντιληφμεν στις οποίες αντιστοιχούν	4.10
99.	masking , noun	επικάλυψη , ουσ.	phenomenon where one quality within a mixture obscures one or several other qualities present	φαινόμενο όπου μια ιδιότητα σε ένα μείγμα επικαλύπτει μία ή περισσότερες άλλες υπάρχουσες ιδιότητες	2.37
100.	mastication , noun	μάσηση , ουσ.	act of chewing, grinding and comminuting with the teeth	κομμάτιασμα, άλεση και πολτοποίηση με τα δόντια	1.39
101.	matching , noun	αντιστοιχισή , ουσ.	experimental process of equating or relating stimuli, usually to determine the degree of similarity between a control sample and an unknown or between unknowns	πειραματική διεργασία εξίσωσης ή συσχέτισης ερεθισμάτων, συνήθως για τον προσδιορισμό του βαθμού ομοιότητας μεταξύ ενός δείγματος ελέγχου και ενός αγνώστου ή μεταξύ αγνώστων	4.9
102.	measurement scale , noun	κλίμακα μέτρησης , ουσ.	formal relationship (e.g. ordinal, interval or ratio) between a property (e.g. the intensity of a sensory perception) and the numbers used to represent values of the property (e.g. numbers registered by the assessors or derived from the assessors' responses) NOTE The term "scale" is widely used as being equivalent to the expression "measurement scale".	τυπική σχέση (π.χ. διάταξη, διάστημα ή λόγος) μεταξύ μιας ιδιότητας (π.χ. ένταση μιας αισθητηριακής αντίληψης) και των αριθμών που χρησιμοποιούνται για την παράσταση των τιμών της ιδιότητας (π.χ. αριθμοί που έχουν καταχωρηθεί από τους αξιολογητές ή προέρχονται από τις αποκρίσεις των αξιολογητών) Σημείωση 1: Ο όρος «κλίμακα» χρησιμοποιείται ευρέως ως συνώνυμος με τον όρο «κλίμακα μέτρησης».	4.29.2
103.	modality , noun, sensory modality , noun	τροπικότητα , ουσ., αισθητηριακή τροπικότητα , ουσ.	sensations mediated by any of the sensory systems, for example auditory, taste, olfaction, touch, somesthesia or visual modality	αισθήματα που διαμεσολαβούνται από οποιοδήποτε αισθητηριακό σύστημα ΠΑΡΑΔΕΙΓΜΑΤΑ: Από το σύστημα ακοής, γεύσης, όσφρησης, αφής, σωματειαίσθησης ή όρασης	2.11
104.	moisture ¹	υγρασία , ουσ.	perception of moisture content of a food by the tactile receptors in the mouth and also in relation to the lubricating properties of the product Note Reflects not only the total amount of moisture perceived but the type, rate and manner of release or absorption.	αντίληψη της περιεχόμενης ποσότητας υγρασίας ενός τροφίμου από τους απτικούς υποδοχείς στο στόμα και επίσης σε σχέση με τις λιπαντικές ιδιότητες του προϊόντος Σημείωση 1: Αντικατοπτρίζει όχι μόνο τη συνολική ποσότητα υγρασίας που γίνεται αντιληπτή αλλά τον τύπο, τον ρυθμό και τον τρόπο απελευθέρωσης ή απορρόφησης.	3.56
105.	moisture ² , noun moistness , noun	υγρότητα , ουσ.	surface textural attribute that describes the perception of water absorbed by or released from a product Note The main adjectives	επιφανειακό χαρακτηριστικό υφής που περιγράφει την αντίληψη του νερού που απορροφάται ή απελευθερώνεται από ένα προϊόν Σημείωση 1: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά	3.57

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
			<p>corresponding to different levels of moistness are as follows:</p> <p>Surface attributes:</p> <ul style="list-style-type: none"> — "dry": absence, e.g. cream cracker; — "moist": moderate level, e.g. peeled apple; — "wet": high level, e.g. water chestnut, oyster. <p>Body attributes:</p> <ul style="list-style-type: none"> — "dry": absence, e.g. cream cracker; — "moist": moderate level, e.g. apple; — "juicy": high level, e.g. orange; — "succulent": high level, e.g. meat; — "watery": water-like perception, e.g. watermelon. 	<p>επίπεδα υγρότητας είναι τα εξής:</p> <p>Επιφανειακά χαρακτηριστικά υφής:</p> <ul style="list-style-type: none"> — «ξηρός»: απουσία υγρασίας, π.χ. κράκερ, — «ελαφρώς υγρός»: μέτριο επίπεδο, π.χ. αποφλοιωμένο μήλο, — «υγρός»: υψηλό επίπεδο, π.χ. κινέζικο νεροκάστανο, στρείδι. <p>Χαρακτηριστικά σώματος:</p> <ul style="list-style-type: none"> — «στεγνός»: απουσία υγρασίας, π.χ. κράκερ, — «ελαφρώς υγρός»: μέτριο επίπεδο, π.χ. μήλο, — «ζουμερός»: υψηλό επίπεδο, π.χ. πορτοκάλι, — «χυμώδης»: υψηλού επιπέδου, π.χ. κρέας, — «υδαρής»: που μοιάζει με νερό, π.χ. καρπούζι. 	
106.	mouthfeel, noun	στοματαίσθημα, ουσ.	<p>mixed experience derived from sensations in the mouth that relate to physical or chemical properties of a stimulus</p> <p>Note Assessors differentiate the physical sensations (e.g. density, viscosity, particulate) as texture properties and the chemical sensations (e.g. astringency, cooling) as flavour properties.</p>	<p>μεικτή εμπειρία που προέρχεται από αισθήματα στο στόμα που σχετίζονται με φυσικές ή χημικές ιδιότητες ενός ερεθίσματος</p> <p>Σημείωση 1: Οι αξιολογητές διαφοροποιούν τα φυσικά αισθήματα (π.χ. πυκνότητα, ιξώδες, διαμόρφωση) ως ιδιότητες υφής και τα χημικά αισθήματα (π.χ. στυφότητα, ψύξη) ως ιδιότητες οσμώσεως.</p>	3.62
107.	neutral, adjective	ουδέτερος -η -ο, επιθ.	describes a product without any distinct characteristic	περιγράφει ένα προϊόν χωρίς κανένα διακριτό χαρακτηριστικό	3.70
108.	note, noun	νότα, ουσ.	distinctive and identifiable feature of an odour or flavor	διακριτικό και αναγνωρίσιμο γνώρισμα μιας οσμής ¹ ή οσμώσεως	3.28
109.	objective method, noun	αντικειμενική μέθοδος, ουσ.	any method in which the effects of personal opinions are minimized	οποιαδήποτε μέθοδος με την οποία ελαχιστοποιείται η επίδραση προσωπικών απόψεων	4.1
110.	odorant, noun	οσμητικό, ουσ.	substance whose volatiles can be perceived by the olfactory organ (including nerves)	ουσία της οποίας οι πτητικές εκπομπές μπορούν να γίνουν αντιληπτές από το οσφρητικό όργανο (συμπεριλαμβανομένων των νεύρων)	1.35
111.	odorimetry, noun	οσμομετρία, ουσ.	measurement of the odour properties of substances Note 1 to entry: Refers to the products	μέτρηση των οσμητικών ιδιοτήτων των ουσιών Σημείωση 1: . Αναφέρεται στα προϊόντα.	1.34
112.	odour, noun	οσμή ¹ , ουσ.	sensation perceived by means of the olfactory organ in sniffing certain volatile substances	αίσθημα που γίνεται αντιληπτό μέσω του οσφρητικού οργάνου όταν οσφραινόμαστε ορισμένες πτητικές ουσίες	3.18

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
113.	off-flavour , noun	αποκλίνουσα οσμόγευση , ουσ.	atypical flavour often associated with deterioration or transformation of the product	άτυπη οσμόγευση που συχνά συνδέεται με αλλοίωση ή μεταβολή του προϊόντος	3.21
114.	off-note , noun	αποκλίνουσα νότα , ουσ.	atypical note often associated with deterioration or transformation of the product	άτυπη διαβάθμιση που συχνά σχετίζεται με αλλοίωση ή μεταβολή του προϊόντος	3.29
115.	off-odour , noun	αποκλίνουσα οσμή , ουσ.	atypical odour often associated with deterioration or transformation of the product	άτυπη οσμή ¹ (3.18) που συχνά συσχετίζεται με αλλοίωση ή μεταβολή του προϊόντος	3.19
116.	olfactometer , noun	οσφρησιόμετρο , ουσ.	apparatus used to present olfactory stimuli to assessors under reproducible conditions	συσκευή που χρησιμοποιείται για την παρουσίαση οσφρητικών ερεθισμάτων στους αξιολογητές κάτω από αναπαραγώγιμες συνθήκες	1.33
117.	olfactometry , noun	οσφρησιμετρία , ουσ.	measurement of the response of assessors to olfactory stimuli Note 1 to entry: Refers to the assessors.	μέτρηση της απόκρισης των αξιολογητών σε οσφρητικά ερεθίσματα Σημείωση 1: Αναφέρεται στους αξιολογητές.	1.32
118.	olfactory , adjective	οσφρητικός , επίθ.	pertaining to the sense of smell	σχετικός με την αίσθηση της οσφρησης	2.14
119.	opacity , noun opaque , adjective	αδιαφάνεια , ουσ. αδιαφανής , επίθ.	not allowing the passage of light	ιδιότητα ενός υλικού να μην επιτρέπει τη διέλευση του φωτός Σημείωση 1: Το αντίστοιχο επίθετο είναι αδιαφανής .	3.39
120.	ordinal scale , noun	διατακτική κλίμακα , ουσ.	scale in which the order of the values allocated corresponds to the order of the intensities perceived for the property being assessed	κλίμακα στην οποία η σειρά των τιμών που κατανέμονται αντιστοιχεί στη σειρά των εντάσεων που γίνονται αντιληπτές για την ιδιότητα που αξιολογείται	4.36
121.	organoleptic , adj	οργανοληπτικός -ή -ό , επίθ.	relating to an attribute perceptible by the senses, i.e. to an attribute of a product	που έχει σχέση με ένα χαρακτηριστικό προϊόντος αντιληπτό μέσω των αισθήσεων	1.4
122.	paired comparison test , noun	δοκιμή ζευγαρωτής σύγκρισης , ουσ.	method in which stimuli are presented in pairs for comparison on the basis of some defined criteria	μέθοδος κατά την οποία τα ερεθίσματα παρουσιάζονται κατά ζεύγη για σύγκριση με βάση καθορισμένα κριτήρια	4.17
123.	palatability , noun	ευγευστότητα , ουσ.	quality of a product which makes it pleasant to eat or drink	ιδιότητα ενός προϊόντος που το καθιστά ευχάριστο στη βρώση ή πόση	1.30
124.	palate cleanser , noun cleansing , adjective	καθαριστικό ουρανίσκου , ουσ. καθαριστικός -ή -ό , επίθ.	product that removes any lingering residue from the mouth EXAMPLE Water, cream crackers.	πρόϊον που αφαιρεί τυχόν υπολείμματα από το στόμα ΠΑΡΑΔΕΙΓΜΑ: Νερό, κράκερ	3.64
125.	panel consensus , noun	συναίνεση ομάδας , ουσ.	agreement among assessors regarding terminology and intensity of product characteristics	συμφωνία μεταξύ των αξιολογητών που αφορά την ορολογία και την ένταση των χαρακτηριστικών προϊόντος	1.11
126.	panel training , noun	κατάρτιση ομάδας , ουσ.	series of sessions in which assessors are oriented to the tasks to be completed by a sensory panel in assessing particular	σειρά συνεδριών κατά τις οποίες οι αξιολογητές μισούνται στις εργασίες που πρέπει να επιτελεί μια αισθητηριακή ομάδα κατά την αξιολόγηση συγκεκριμένων	1.10

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
			product(s), which may include relevant product characteristics, standard rating scales, techniques of evaluation and terminology	προϊόντων Σημείωση 1: Η αξιολόγηση μπορεί να περιλαμβάνει σχετικά χαρακτηριστικά προϊόντος, πρότυπες κλίμακες κατάταξης, τεχνικές αποτίμησης και ορολογία.	
127.	perception, noun	αντίληψη, ουσ.	awareness of the effects of single or multiple sensory stimuli	επίγνωση των επιδράσεων ενός ή πολλών αισθητηριακών ερεθισμάτων	2.3
128.	persistence, noun	επιμονή, ουσ.	related to a response to a stimulus over a measurable period of time	αχτείζεται με απόκριση σε ερέθισμα σε όλη τη διάρκεια μιας μετρήσιμης χρονικής περιόδου	3.67
129.	physical cooling, noun	φυσικό ψύχος, ουσ.	sensation of reduced temperature experienced as a result of exposure to thermally cold substances, to substances, that have a negative heat of solution, such as crystalline sorbitol, or to substances, that evaporate rapidly, such as acetone or alcohol Note 1 to entry: The duration of the sensation is usually limited to the time of direct contact with the stimulus.	αίσθημα μειωμένης θερμοκρασίας που εμφανίζεται ως αποτέλεσμα της έκθεσης σε ψυχρές ουσίες, σε ουσίες που έχουν αρνητική θερμότητα διάλυσης, όπως η κρυσταλλική σορβιτόλη ή σε ουσίες που εξατμίζονται γρήγορα, όπως η ακετόνη ή το αλκοόλ Σημείωση 1: Η διάρκεια του αισθήματος συνήθως περιορίζεται στον χρόνο της άμεσης επαφής με το ερέθισμα.	3.15
130.	physical heat, noun	φυσική θερμότητα, ουσ.	sensation experienced as a result of exposure to thermally hot substances such as water above 48 °C Note 1 to entry: The duration of the sensation is usually limited to the time of direct contact with the stimulus.	αίσθημα που εμφανίζεται ως αποτέλεσμα της έκθεσης σε θερμές ουσίες όπως το νερό πάνω από 48 °C Σημείωση 1: Η διάρκεια του αισθήματος συνήθως περιορίζεται στον χρόνο της άμεσης επαφής με το ερέθισμα.	3.17
131.	preference test, noun	δοκιμή προτίμησης, ουσ.	test to assess preference between two or more samples	δοκιμή για την αξιολόγηση της προτίμησης μεταξύ δύο ή περισσότερων δειγμάτων	4.28
132.	preference, noun	προτίμηση, ουσ.	selection, by an assessor, of one stimulus or product over others in a given set based on hedonic criteria	επιλογή, από έναν αξιολογητή, ενός ερεθίσματος ή ενός προϊόντος έναντι άλλων σε ένα δεδομένο σύνολο, βασισμένη σε κριτήρια αρέσκειας	1.24
133.	product, noun	προϊόν, ουσ.	matter, edible or otherwise, which can be evaluated by sensory analysis EXAMPLE: Food products, cosmetics, textile fabrics.	υλικό, φαγώσιμο ή μη, που μπορεί να αξιολογηθεί με αισθητηριακή ανάλυση ΠΑΡΑΔΕΙΓΜΑ: Τρόφιμα, καλλυντικά, υφάσματα	1.15
134.	psychophysical method, noun	ψυχοφυσική μέθοδος, ουσ.	procedure for establishing relationships between measurable physical stimuli and sensory responses	διαδικασία για τη δημιουργία σχέσεων μεταξύ μετρήσιμων φυσικών ερεθισμάτων και αισθητηριακών αποκρίσεων	4.15
135.	psychophysics, noun	ψυχοφυσική, ουσ.	study of relationships between measurable stimuli and the corresponding sensory responses	μελέτη των σχέσεων μεταξύ μετρήσιμων ερεθισμάτων και των αντίστοιχων αισθητηριακών αποκρίσεων	1.31

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
136.	pungency , noun pungent , adjective	πικαντικότητα πικάντικος -η -ο, επιθ.	sharp sensation of the buccal and nasal mucous membranes, e.g. as caused by vinegar, mustard, horseradish	οξύ αίσθημα της στοματικής και της ρινικής βλεννογόνου μεμβράνης, π.χ. όπως προκαλείται από ξίδι, μουστάρδα, χρένο/ραπανάκι Σημείωση 1: Το αντίστοιχο επίθετο είναι πικάντικος .	3.13
137.	qualitative sensory profile , noun	ποιοτικό αισθητηριακό προφίλ , ουσ.	description of the sensory attributes of a sample but without intensity values	περιγραφή των αισθητηριακών χαρακτηριστικών ενός δείγματος αλλά χωρίς τιμές έντασης	4.23
138.	quality factor , noun	παράγοντας ποιότητας , ουσ.	one feature or characteristic chosen among others to assess the overall quality of a product	ένα γνώρισμα ή χαρακτηριστικό που επιλέχθηκε μεταξύ άλλων για την αξιολόγηση της συνολικής ποιότητας ενός προϊόντος	1.37
139.	quality , noun	ποιότητα , ουσ.	collection of features and characteristics of a product, process or service that confer its ability to satisfy stated or implied needs	σύνολο γνωρισμάτων και χαρακτηριστικών ενός προϊόντος, μιας διεργασίας ή μιας υπηρεσίας που συνεισφέρουν στην ικανότητά του/της να ικανοποιεί δηλωμένες ή υπονοούμενες ανάγκες	1.36
140.	quantitative sensory profile , noun	ποσοτικό αισθητηριακό προφίλ , ουσ.	description of a sample consisting of both attributes and their intensity values	περιγραφή ενός δείγματος που αποτελείται από δύο χαρακτηριστικά και τις τιμές έντασής τους	4.23
141.	random errors , noun	τυχαία σφάλματα , ουσ.	(sensory analysis) unpredictable errors which average to zero	(αισθητηριακή ανάλυση) απρόβλεπτα σφάλματα που δίνουν μέση τιμή μηδέν	4.40
142.	ranking , noun	κατάταξη , ουσ.	method in which a series of two or more samples is presented at the same time and arranged in order of intensity or degree of some designated attribute	μέθοδος κατά την οποία δύο ή περισσότερα δείγματα παρουσιάζονται ταυτόχρονα και διατάσσονται κατά σειρά έντασης ή βαθμού κάποιου καθορισμένου χαρακτηριστικού	4.4
143.	rating , noun	διαβάθμιση σε κλίμακα , ουσ. κλιμακωτή διαβάθμιση , ουσ.	method of measuring on an ordinal scale where the magnitude of each perception is denoted by one of a number of possible categories	μέθοδος μέτρησης σε διατακτική κλίμακα όπου το μέτρο κάθε αντίληψης δηλώνεται με μία από ένα πλήθος δυνατές κατηγορίες	4.6
144.	ratio scale , noun	κλίμακα λόγων , ουσ.	scale which has the properties of an interval scale but for which, in addition, the ratio between the values allocated to two stimuli is equal to the ratio between the perceived intensities of these stimuli	κλίμακα που έχει τις ιδιότητες μιας κλίμακας διαστημάτων, για την οποία όμως επιπλέον ο λόγος μεταξύ των τιμών που κατανέμονται σε δύο ερεθίσματα είναι ίσος με τον λόγο μεταξύ των αντιληπτών εντάσεων αυτών των ερεθισμάτων	4.38
145.	receptor , noun	υποδοχέας , ουσ.	specific part of a sense organ which responds to a particular stimulus	συγκεκριμένο μέρος ενός αισθητήριου οργάνου που αποκρίνεται σε ένα ιδιαίτερο ερέθισμα	2.1
146.	recognition threshold , noun	κατώφλιο αναγνώρισης , ουσ.	minimum physical intensity of a stimulus for which an assessor will assign the same descriptor each time it is presented Note 1 to entry: The term "threshold" is always used with a qualifying term.	ελάχιστη φυσική ένταση ερεθίσματος για την οποία ένας αξιολογητής θα προσδώσει τον ίδιο χαρακτηρισμό κάθε φορά που του παρουσιάζεται Σημείωση 1: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο.	2.26

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
147.	reference point, noun	σημείο αναφοράς, ουσ.	selected value (of one or several attributes or of a product) against which samples are assessed	επιλεγμένη τιμή (ενός ή περισσοτέρων αντιληπτών χαρακτηριστικών ενός προϊόντος) ως προς την οποία αξιολογούνται τα δείγματα	1.19
148.	reference sample, noun	δείγμα αναφοράς, ουσ.	stimulus/substance, sometimes different from the material under test, carefully selected to define or illustrate an attribute or a specified level of a given attribute to which all others are to be compared	ερέθισμα/ουσία, μερικές φορές διαφορετικά από το υπό δοκιμή υλικό, προσεκτικά επιλεγμένα για να ορίσουν ή απεικονίζουν ένα αντιληπτό χαρακτηριστικό ή ένα προκαθορισμένο επίπεδο ενός δεδομένου αντιληπτού χαρακτηριστικού με το οποίο πρόκειται να συγκριθούν όλα τα άλλα	1.21
149.	reference scale, noun	κλίμακα αναφοράς, ουσ.	scale in which reference samples are used to define an attribute or specific intensities of a given attribute	κλίμακα στην οποία χρησιμοποιούνται δείγματα αναφοράς για να ορίσουν ένα χαρακτηριστικό ή συγκεκριμένες εντάσεις ενός δεδομένου χαρακτηριστικού	4.32
150.	response scale, noun	κλίμακα απόκρισης ουσ.	means (e.g. numerical, verbal or pictorial) by which an assessor registers a quantitative response NOTE 1 In sensory analysis, this is a device or tool to capture the reaction of an assessor to some property such that it can be converted into numbers. NOTE 2 The term "scale" is widely used as being equivalent to the expression "response scale".	μέσο (π.χ. αριθμητικό, λεκτικό ή εικονογραφικό) με το οποίο ένας αξιολογητής καταχωρεί μια ποσοτική απόκριση Σημείωση 1: Στην αισθητηριακή ανάλυση, αυτό είναι μια διάταξη ή ένα εργαλείο για τη λήψη της αντίδρασης ενός αξιολογητή σε κάποια ιδιότητα έτσι ώστε αυτή να μπορεί να μετατραπεί σε αριθμούς. Σημείωση 2: Ο όρος «κλίμακα» χρησιμοποιείται ευρέως ως συνώνυμο με τον όρο «κλίμακα απόκρισης».	4.29.1
151.	saltiness, noun salty taste, noun	αλμυρότητα, ουσ., αλμυρή γεύση, ουσ.	basic taste produced by dilute aqueous solutions of various substances such as sodium chloride	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα διάφορων ουσιών όπως το χλωριούχο νάτριο	3.6
152.	sample, noun, sample of product, noun	δείγμα, ουσ., δείγμα προϊόντος, ουσ.	specimen or aliquot of product presented for assessment	δοκίμιο ή κλάσμα προϊόντος που παρουσιάζεται για αξιολόγηση	1.16
153.	saturation, noun	κορεσμός, ουσ.	dimension of colour that describes its purity Note 1 to entry: If highly saturated, a colour appears to be pure hue — free of gray; if low in saturation, a colour appears to have a great deal of gray. Note 2 to entry: The equivalent Munsell term is "chroma".	διάσταση του χρώματος που περιγράφει την καθαρότητά του Σημείωση 1: Ένα πολύ κορεσμένο χρώμα φαίνεται να έχει καθαρή απόχρωση — χωρίς καθόλου γκρι. Ένα χρώμα με χαμηλό κορεσμό φαίνεται να έχει πολύ γκρι. Σημείωση 2: Ο ισοδύναμος όρος Munsell είναι «chroma».	3.34
154.	scale, noun	κλίμακα, ουσ.	term applicable to either a response scale or a measurement scale	κλίμακα απόκρισης ή κλίμακα μέτρησης	4.29
155.	score sheet/card, noun	βαθμοδέλτιο, ουσ.	ballot	φύλλο/κάρτα βαθμολόγησης	4.48

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
156.	score, noun	βαθμός, ουσ.	value assigned which describes the specific location of a stimulus material in the possible range of intensities for that attribute NOTE To score a food is to rate its properties on a scale or according to some numerically defined sense of criteria.	εκχωρούμενη τιμή που περιγράφει τη συγκεκριμένη θέση ενός διεγερτικού υλικού στο πιθανό εύρος εντάσεων για αυτό το χαρακτηριστικό Σημείωση 1: Η βαθμολόγηση ενός τροφίμου γίνεται μέσω της τοποθέτησης των ιδιοτήτων του σε κλίμακα ή σύμφωνα με κάποια αριθμητικά καθορισμένη έννοια κριτηρίων.	4.47
157.	scoring, noun	βαθμολόγηση, ουσ.	evaluation of a product (or of attributes of a product) by assigning numbers that have some mathematical relationship to the product or attributes being evaluated	αξιολόγηση ενός προϊόντος (ή των χαρακτηριστικών ενός προϊόντος) με εκχώρηση αριθμών που έχουν κάποια μαθηματική σχέση με το προϊόν ή τα χαρακτηριστικά που αξιολογούνται	4.7
158.	screening, noun	διαλογή, ουσ.	preliminary selection procedure	διαδικασία προκαταρκτικής επιλογής	4.8
159.	selected assessor, noun	επιλεγμένος αξιολογητής, ουσ.	assessor chosen for his/her ability to perform a sensory test	αξιολογητής που έχει επιλεγεί για την ικανότητά του να εκτελέσει αισθητηριακές δοκιμές	1.6
160.	sensation, noun	αίσθημα, ουσ.	psychophysiological reaction, resulting from sensory stimulation	ψυχοφυσιολογική αντίδραση, που προκύπτει από αισθητηριακή διέγερση	2.4
161.	sensitivity, noun	ευαισθησία, ουσ.	ability to perceive, identify and/or differentiate, qualitatively and/or quantitatively, one or more stimuli by means of the sense organs Note 1 to entry: In French, this term should be differentiated from the term "sensibilité", which refers to the level of ability to discriminate (see 2.10).	ικανότητα αντίληψης, αναγνώρισης και/ή διαφοροποίησης, ποιοτικά και/ή ποσοτικά, ενός ή περισσότερων ερεθισμάτων με τη βοήθεια των αισθητήριων οργάνων	2.5
162.	sensory adaptation, noun	αισθητηριακή προσαρμογή, ουσ.	temporary modification of the sensitivity of a sense organ due to continued and/or repeated stimulation	προσωρινή μεταβολή της ευαισθησίας ενός αισθητήριου οργάνου λόγω συνεχιζόμενου και/ή επαναλαμβανόμενου ερεθίσματος	2.6
163.	sensory analysis, noun	αισθητηριακή ανάλυση, ουσ.	science involved with the assessment of the organoleptic attributes of a product by the senses	επιστήμη που ασχολείται με την αξιολόγηση των οργανοληπτικών χαρακτηριστικών ενός προϊόντος μέσω των αισθήσεων	1.1
164.	sensory assessor, noun	αισθητηριακός αξιολογητής, ουσ.	any person taking part in a sensory test Note 1 to entry: A naive assessor is a person who does not meet any particular criterion. Note 2 to entry: An initiated assessor has already participated in a sensory test.	πρόσωπο που μετέχει σε αισθητηριακή δοκιμή Σημείωση 1: Αμήτος αξιολογητής είναι το πρόσωπο που δεν πληροί συγκεκριμένα κριτήρια. Σημείωση 2: Μημένος αξιολογητής είναι το πρόσωπο που έχει ήδη συμμετάσχει σε αισθητηριακή δοκιμή.	1.5
165.	sensory fatigue, noun	αισθητηριακή κόπωση, ουσ.	form of sensory adaptation in which a decrease in sensitivity occurs	μορφή αισθητηριακής προσαρμογής κατά την οποία επέρχεται ελάττωση της ευαισθησίας	2.7

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
166.	sensory panel , noun	αισθητηριακή ομάδα , ουσ.	group of assessors participating in a sensory test	ομάδα αξιολογητών που συμμετέχουν σε αισθητηριακή δοκιμή	1.9
167.	sensory profile , noun	αισθητηριακό προφίλ , ουσ.	description of the sensory properties of a sample, consisting of the sensory attributes in the order of perception, and with assignment of an intensity value for each attribute NOTE A generic term for any type of profile, whether full or partial, trademarked or not.	περιγραφή των αισθητηριακών ιδιοτήτων ενός δείγματος, που αποτελείται από τα αισθητηριακά χαρακτηριστικά κατά σειρά αντίληψης και με εκχώρηση τιμής έντασης για κάθε χαρακτηριστικό Σημείωση 1: Γενικός όρος για οποιοδήποτε τύπο προφίλ, πλήρες ή μερικό, με εμπορικό σήμα ή όχι.	4.25
168.	sensory , adj	αισθητηριακός -ή -ό , επιθ.	relating to the use of the senses, i.e. to the experience of a person	που έχει σχέση με τη χρήση των αισθήσεων, δηλ. με την εμπειρία ενός προσώπου	1.2
169.	somesthesia , noun	σωματαιοσθησία , ουσ., σωματαιοσθηση , ουσ.	sensations of pressure (touch), temperature, and pain perceived by the receptors located in the skin and lips, including oral mucosa, tongue and periodontal membrane Note 1 to entry: Do not confuse with kinaesthesia (2.24).	αισθήματα πίεσης (αφή), θερμοκρασίας και πόνου που γίνονται αντιληπτά από υποδοχείς που βρίσκονται στο δέρμα και στα χείλη, καθώς και στη στοματική βλεννογόνο, στη γλώσσα και στην περιοδοντική μεμβράνη Σημείωση 1: Να μην συγχέεται με την κιναισθησία (2.24).	2.22
170.	sourness , noun sour taste, noun	ξινότητα , ουσ., ξινάδα , ουσ. ξινή γεύση , ουσ.	gustatory complex sensation, generally due to presence of organic acids Note 1 to entry: In some languages "sour" is not a synonym for "acid". Note 2 to entry: Sometimes this term has a negative hedonic sense.	σύνθετο γευστικό αίσθημα, που οφείλεται γενικά στην παρουσία οργανικών οξέων Σημείωση 1: Σε κάποιες γλώσσες το «ξινό» δεν είναι συνώνυμο του «οξύ». Σημείωση 2: Μερικές φορές αυτός ο όρος δείχνει δυσαρέσκεια.	3.4
171.	standard illuminant , noun	πρότυπο φωτιστικό , ουσ.	colorimetric illuminant relating to the range of artificial or natural lights defined by the International Lighting Commission (CIE)	χρωματομετρικό φωτιστικό που σχετίζεται με το εύρος των τεχνητών ή φυσικών φωτών που ορίζεται από τη Διεθνή Επιτροπή Φωτισμού (CIE)	4.45
172.	stimulus threshold , noun, detection threshold , noun	κατώφλιο ερεθίσματος , ουσ., κατώφλιο ανίχνευσης , ουσ.	minimum value of a sensory stimulus needed a sensation Note 1 to entry: The term "threshold" is always used with a qualifying term. Note 2 to entry: The sensation need not be identified.	ελάχιστη τιμή ενός αισθητηριακού ερεθίσματος που χρειάζεται για την πρόκληση ενός αισθήματος Σημείωση 1: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο. Σημείωση 2: Το αίσθημα δεν χρειάζεται να ταυτοποιηθεί.	2.25
173.	stimulus , noun	ερέθισμα , ουσ.	that which excites a receptor	φυσικό αίτιο που διεγείρει ένα αισθητήριο όργανο και προκαλεί το αντίστοιχο αίσθημα	2.2
174.	subjective method , noun	υποκειμενική μέθοδος , ουσ.	any method based on personal opinions	οποιαδήποτε μέθοδος βασίζεται σε προσωπικές απόψεις	4.2
175.	sub-threshold , adjective	υποκατωφλιακός , επιθ.	pertains to a stimulus intensity below the type of threshold under consideration	αναφέρεται σε ένταση ερεθίσματος χαμηλότερη από τον υπό θεώρηση τύπο κατωφλίου	2.29

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
176.	supra-threshold , adjective	υπερκατωφλιακός , επιθ.	pertains to a stimulus intensity above the type of threshold under consideration	αναφέρεται σε ένταση ερεθίσματος υψηλότερη από τον υπό θεώρηση τύπο κατωφλίου	2.30
177.	sweetness , noun sweet taste, noun	γλυκύτητα , ουσ. γλυκιά γεύση, ουσ.	basic taste produced by dilute aqueous solutions of natural or artificial substances such as sucrose or aspartame	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα φυσικών ή τεχνητών ουσιών όπως η σακχαρόζη ή η ασπαρτάμη	3.7
178.	synergism , noun	συνεργισμός , ουσ.	joint action of two or more stimuli, whose combination elicits a level of sensation in excess of that expected from a simple addition of the effects of each stimulus taken separately Note 1 to entry: See also antagonism (2.35).	συνδυασμένη δράση δύο ή περισσότερων ερεθισμάτων των οποίων ο συνδυασμός προκαλεί στάθμη αισθήματος υψηλότερη από αυτή που αναμένεται από την απλή άθροιση των επιδράσεων κάθε ερεθίσματος όταν λαμβάνεται χωριστά Σημείωση 1: Βλέπε επίσης και ανταγωνισμός (2.35).	2.36
179.	tactile somesthetic receptor , noun	απτικός σωματοαισθητικός υποδοχέας , ουσ.	receptor located in the skin of the tongue, mouth or throat, which perceives geometrical characteristics as reflected in the appearance of the food product	υποδοχέας που βρίσκεται στο δέρμα της γλώσσας, του στόματος ή του λαιμού και αντιλαμβάνεται γεωμετρικά χαρακτηριστικά όπως αυτά αντικατοπτρίζονται/παρουσιάζονται στην εμφάνιση του τροφίμου	2.23
180.	taint , noun	μόλυσμα , ουσ.	taste or odour foreign to the product originating from external contamination	γεύση ή οσμή ξένη προς το προϊόν που προέρχεται από εξωτερική μόλυνση	3.23
181.	taste , noun	γεύση , ουσ.	sensations perceived by the taste organ when stimulated by certain soluble substances Note 1 to entry: The term "taste" should not be used to designate the combination of gustatory, olfactory and trigeminal sensations which are designated by the term "flavour" (see 3.20). If, in informal language, the term is used in this sense, it should always be associated with a qualifying term, e.g. "musty taste", "raspberry taste", "corky taste".	αίσθημα αντιληπτό από το όργανο της γεύσης όταν αυτό ερεθίζεται από ορισμένες διαλυτές ουσίες Σημείωση 1: Ο όρος "γεύση" δεν πρέπει να χρησιμοποιείται για να καταστήμαίνει τον συνδυασμό αισθημάτων γεύσης, όσφρησης και τριδύμου (του τριδύμου νεύρου) που καταστημαίνεται από τον όρο "οσμόγευση" (βλ. 3.20). Εάν, σε ανεπίσημη γλώσσα, ο όρος χρησιμοποιείται με αυτή την έννοια, θα πρέπει πάντα να συσχετίζεται με έναν προαδιοριστικό όρο, π.χ. "γεύση μούχλας", "γεύση βατόμουρου", "γεύση φελλού".	2.12
182.	taster , noun	δοκιμαστής , ουσ.	assessor, selected assessor or expert who evaluates the organoleptic attributes of a food product, mainly with the mouth Note 1 to entry: The term "assessor" is usually preferred.	αξιολογητής, επιλεγμένος αξιολογητής ή ειδικός που εκτιμά τα οργανοληπτικά χαρακτηριστικά ενός τροφίμου, κυρίως με το στόμα Σημείωση 1: Συνήθως, προτιμάται ο όρος «αξιολογητής».	1.13
183.	tasting , noun	γευστική δοκιμή , ουσ.	sensory assessment of a food product in the mouth	αισθητηριακή αξιολόγηση ενός τροφίμου στο στόμα	1.14

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
184.	terminal threshold , noun	τερματικό κατώφλιο , ουσ.	minimum value of an intense sensory stimulus above which no difference in intensity can be perceived Note 1 to entry: The term "threshold" is always used with a qualifying term.	ελάχιστη τιμή ενός έντονου αισθητηριακού ερεθίσματος πάνω από την οποία δεν μπορεί να γίνει αντιληπτή καμιά διαφορά έντασης Σημείωση 1: Ο όρος «κατώφλιο» χρησιμοποιείται πάντοτε με έναν προσδιοριστικό όρο.	2.28
185.	test portion , noun	μερίδα δοκιμής , ουσ.	portion of the test sample which is directly tested by the assessor	μέρος δείγματος δοκιμής που δοκιμάζεται απευθείας από τον αξιολογητή	1.18
186.	test sample , noun	δείγμα δοκιμής , ουσ.	sample of the material under test	δείγμα του υπό δοκιμή υλικού	1.17
187.	texture profile , noun	προφίλ υψής ουσ.	qualitative or quantitative sensory profile of the texture of a sample	ποιοτικό ή ποσοτικό αισθητηριακό προφίλ της υψής ενός δείγματος	4.27
188.	texture , noun	υφή , ουσ.	all of the mechanical, geometrical, surface and body attributes of a product perceptible by means of kinaesthesia and somesthesia receptors and (where appropriate) visual and auditory receptors from the first bite to final swallowing Note 1 to entry: Over the course of mastication, perception is influenced by the physical transformations that occur from contact with the teeth and palate and mixture with saliva. Auditory information may contribute to judgement of texture and may predominate with dry products. Note 2 to entry: The "mechanical attributes" are those related to the reaction of the product to stress. They are: hardness, cohesiveness, viscosity, elasticity and adhesiveness. The "geometrical attributes" are those related to the size, shape and arrangement of particles within a product. They are: denseness, granularity and conformation. The "surface attributes" are those related to the sensations produced in the mouth by moisture and/or fat in and near the surface of the product. The "body attributes" are those related to the sensations produced in the mouth by moisture and/or	το σύνολο των μηχανικών, γεωμετρικών, επιφανειακών και σωματικών χαρακτηριστικών ενός προϊόντος που γίνονται αντιληπτά μέσω υποδοχέων κιναισθησίας και σωματισθησίας και (όπου χρειάζεται) οπτικών και ακουστικών υποδοχέων από την πρώτη εισαγωγή στο στόμα έως την τελική κατάποση Σημείωση 1: Κατά τη διάρκεια της μάσησης, η αντίληψη επηρεάζεται από τις φυσικές μεταβολές που συμβαίνουν από την επαφή με τα δόντια και τον ουρανίσκο και την ανάμειξη με το σάλιο. Οι ακουστικές πληροφορίες μπορεί να συμβάλλουν στην κρίση της υψής και μπορεί να κυριαρχούν στα ξηρά προϊόντα. Σημείωση 2: Τα μηχανικά χαρακτηριστικά σχετίζονται με την αντίδραση του προϊόντος στην καταπόνηση και είναι: η σκληρότητα, η συνεκτικότητα, το ιξώδες, η ελαστικότητα και η προσφυσικότητα. Τα γεωμετρικά χαρακτηριστικά σχετίζονται με το μέγεθος, το σχήμα και τη διευθέτηση των σωματιδίων μέσα σε ένα προϊόν και είναι: η πυκνότητα, η κοκκιότητα και διαμόρφωση. Τα επιφανειακά χαρακτηριστικά σχετίζονται με τα αισθήματα που παράγονται στο στόμα από την υγρασία και/ή το λίπος μέσα και κοντά στην επιφάνεια του προϊόντος. Τα σωματικά χαρακτηριστικά σχετίζονται με τα αισθήματα που παράγονται στο στόμα από την υγρασία και/ή το λίπος που περιέχονται στο προϊόν και με τον τρόπο με τον οποίο τα εν λόγω συστατικά απελευθερώνονται.	3.41

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
			fat in the substance of the product and the way in which these constituents are released.		
189.	to smell, verb	οσφραίνομαι, ρήμα	to perceive or to attempt to perceive an odour	αντιλαμβάνομαι ή προσπαθώ να αντιληφθώ μια οσμή ¹	2.15
190.	touch, noun	αφή, ουσ.	tactile sense	αίσθηση κατά την οποία οτιδήποτε γίνεται αντιληπτό μέσω επαφής με το δέρμα	2.16
191.	translucency, noun translucent, adjective	ημιδιαφάνεια, ουσ. ημιδιαφανής, επίθ.	allowing light to pass but not allowing images to be distinguished	ιδιότητα ενός υλικού να επιτρέπει τη διέλευση του φωτός και όχι τη διάκριση εικόνων Σημείωση 1: Το αντίστοιχο επίθετο είναι ημιδιαφανής .	3.38
192.	transparency, noun) transparent, adjective	διαφάνεια, ουσ. διαφανής, επίθ.	allowing light to pass and distinct images to appear	ιδιότητα ενός υλικού να επιτρέπει τη διέλευση του φωτός και τη διάκριση εικόνων Σημείωση 1: Το αντίστοιχο επίθετο είναι διαφανής .	3.37
193.	triangle test, noun	τριγωνική δοκιμή ουσ.	method of discrimination testing involving the simultaneous presentation of three coded samples, two of which are identical, and in which the assessor is asked to select the sample perceived as different	μέθοδος δοκιμής διάκρισης που περιλαμβάνει την ταυτόχρονη παρουσίαση τριών κωδικοποιημένων δειγμάτων, δύο από τα οποία είναι πανομοιότυπα, και στην οποία ο αξιολογητής καλείται να επιλέξει το δείγμα που γίνεται αντιληπτό ως διαφορετικό	4.18
194.	trigeminal sensations, noun, oro-nasal chemesthesis, noun	αισθήματα τριδύμου, ουσ., στοματορρινική χημειοαισθησία, στοματορρινική χημειοαισθηση, ουσ.	sensations resulting from irritation caused by chemical stimuli in the mouth, nose or throat EXAMPLE: Pungency from horseradish.	σύνολο αισθημάτων που δημιουργούνται από ερεθισμό ο οποίος προκαλείται από χημικά ερεθίσματα στο στόμα, στη μύτη ή στον λαιμό ΠΑΡΑΔΕΙΓΜΑ: Πικαντικότητα από ραπανάκι.	2.19
195.	true value noun	αληθής τιμή ουσ.	(sensory analysis) particular value which assessments are intended to estimate	ιδιαιτερή τιμή στην εκτίμηση της οποίας αποσκοπούν οι αξιολογήσεις	4.44
196.	umami, noun	ουμάμι, ουσ.	basic taste produced by dilute aqueous solutions of a certain kind of amino acid or nucleotide such as monosodium glutamate or disodium inosinate	βασική γεύση που παράγεται από αραιά υδατικά διαλύματα ενός συγκεκριμένου είδους αμινοξέος ή νουκλεοτιδίου όπως το γλουταμινικό μονονάτριο ή το ινσινικό δινάτριο	3.9
197.	unipolar scale, noun	μονοπολική κλίμακα, ουσ.	scale with only one descriptor at one of the ends	κλίμακα με μόνο έναν περιγραφέα σε ένα από τα άκρα	4.35
198.	viscosity, noun	ιξώδες, ουσ.	mechanical textural attribute relating to resistance to flow Note 1 It corresponds to the force required to draw a liquid from a spoon over the tongue, or to spread it over a substrate. Note 2 The main adjectives corresponding to different levels of viscosity are:	μηχανικό χαρακτηριστικό υψής που σχετίζεται με την αντίσταση στη ροή Σημείωση 1: Αντιστοιχεί στη δύναμη που απαιτείται για να τραβηχτεί ένα υγρό από ένα κουτάλι με τη γλώσσα ή να απλωθεί σε ένα υπόστρωμα. Σημείωση 2: Τα κύρια επίθετα που αντιστοιχούν σε διαφορετικά επίπεδα ιξώδους είναι: — «ρευστός»: χαμηλό επίπεδο, π.χ. νερό,	3.48

	Αγγλικός όρος	Ελληνικός όρος	Αγγλικός ορισμός	Ελληνικός ορισμός	Κωδικός
			<ul style="list-style-type: none"> — "fluid": low level, e.g. water; — "thin": moderate level, e.g. olive oil; — "unctuous" or "creamy": moderate level, e.g. double cream, heavy cream; — "thick" or "viscous": very high, e.g. sweetened condensed milk, honey. 	<ul style="list-style-type: none"> — «λεπτόρρευτος»: μέτριο επίπεδο, π.χ. ελαιόλαδο, — «κρεμώδης»: μέτριο επίπεδο, π.χ. κρέμα γάλακτος με υψηλά λιπαρά, — «παχύρρευτος»: πολύ υψηλό επίπεδο, π.χ. ζαχαρούχο συμπυκνωμένο γάλα, μέλι. 	
199.	vision, noun	όραση, ουσ.	sense of sight	αίσθηση κατά την οποία γίνονται αντιληπτά ερεθίσματα μέσω των οφθαλμών	2.17

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Λεξικό της Νέας Ελληνικής Γλώσσας (ΛΝΕΓ), Γ. Μπαμπινιώτης

Μείζον Ελληνικό Λεξικό (ΜΕΙΖΟΝ), Τεγόπουλος – Φυτράκης

Χρηστικό Λεξικό της Νεοελληνικής Γλώσσας (ΧΛΝΕΓ), Ακαδημία Αθηνών, Χ. Χαραλαμπίδης

Μέγα Λεξικόν Όλης της Ελληνικής Γλώσσας, Δ. Δημητράκος

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Konstantinos Giannoutsos, Danai Ioanna Koukoumaki, Malamatenia Panagiotou, Konstantinos Gkatzionis

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1 **The effect of modern claim related to packaging sustainability on the sensory perception of**
2 **traditional Greek rusks (paximathi)**

3 Konstantinos Giannoutsos†, Danaï Ioanna Koukoumakī†, Malamatenia Panagiotou†,
4 Konstantinos Gkatzionis*

5 *Laboratory of Consumer and Sensory Perception of Food & Drinks, Department of Food Science*
6 *and Nutrition, School of the Environment, University of the Aegean, Metropolitē Ioakeim 2,*
7 *Myrina, 81400, Lemnos, Greece*

8 †*These authors contributed equally*

9 **Corresponding author: Konstantinos Gkatzionis: kgkatzionis@aegean.gr*

10 **Abstract**

11 Extrinsic product cues have been reported to affect consumers' perception of food. The aim
12 of the study was to investigate how consumer acceptability and emotional responses to
13 traditional Greek rusks (paximathi) was affected by the sustainability of biodegradable and
14 edible packaging. The experimental design consisted of three sessions. First, rusks were
15 assessed with the use of a 7-point hedonic scale and CATA questionnaire without packaging
16 in blind (tasting only), then in conventional (polypropylene) and biodegradable packages and
17 finally after providing information on the sustainability of conventional, biodegradable and
18 'edible' packages. Results showed that information on packaging sustainability affected
19 sensorial perception of the rusks and this was heavily driven by positive emotions. However,
20 its influence was balanced by the negative effect of its sound. The findings provide evidence
21 that communication on packaging sustainability, as external product cue connected to

22 consumers' food choices, must be designed taking into consideration the impact of packaging
23 on the sensorial perception of the physicochemical properties of its material.

24 **Keywords**

25 product cues, biodegradable, polypropylene, edible packaging, CATA

26 **1. Introduction**

27 Consumers' perception is a determining factor for a product's popularity and is influenced by
28 intrinsic as well as extrinsic product cues (Krishna & Elder, 2021). Intrinsic cues refer to
29 product characteristics such as texture, aroma, and flavor, whereas extrinsic cues are
30 associated with characteristics outside of the product such as brand, price, packaging, and
31 information (Gunaratne et al., 2019). The influence of extrinsic cues is particularly interesting
32 in the case of traditional products, where there is little space for change in recipe, as well as
33 in intrinsic cues during production and trading.

34 Although intrinsic product cues have been researched extensively as regards their effect on
35 consumer acceptance, the study of extrinsic cues is a developing area and requires careful
36 consideration. A number of studies have recently shown that external product cues can be
37 equally important in influencing the sensory perception of food (Piqueras-Fiszman and
38 Spence, 2015). Examples of product extrinsic factors that have proven to impact the sensory
39 perception of food are brand name and sounds, nutrition and ingredient labels, price, package
40 design, label size, lighting and even social context (Krishna & Elder, 2021; Wang et al., 2019;
41 Symmank, 2019; and Malekpour et al., 2022).

42 Recent research shows that product information is another important external product cue
43 with direct effect on consumers' acceptance. A study on crisps reported visual and verbal

44 information on packaging to have an effect on sensory as well as non-sensory aspects and
45 willingness to buy (Rebollar et al., 2017). In another study, informational attributes about
46 freshness, shelf life, convenience and taste of fresh cod affected consumers' evaluations
47 (Heide & Olsen, 2017). Product designation of origin (PDO) labelling (Savelli et al., 2021),
48 organic food information (Asioli et al., 2018), brand information (Schouteten et al., 2017) and
49 various packaging information (Włodarska et al., 2019) influenced the sensory perception of
50 products.

51 Environmental awareness has grown and people internationally have become more sensitive
52 to issues affecting the environment. A recent global survey by the United Nations
53 Development Programme (UNDP) (2021) revealed that there is strong support for action
54 across different countries and research has shown that consumers are willing to pay more for
55 sustainable packaging (Herrmann et al., 2022). Given the importance of packaging for food
56 and its widespread use, it would be very useful to investigate how information on sustainable
57 packaging affects consumers' perception of food. It has been suggested that, as consumers
58 are likely to judge a food product and its packaging as a whole, any information linked to it
59 prior to consumption may create expectations as regards quality and sensory perception
60 (Pramudya & Seo, 2019). Previous research has shown that information on packaging can
61 affect consumers' emotional responses and that emotional attachment to food influences
62 repeated purchases (Gunaratne et al., 2019).

63 The increased interest in focusing on total consumer experience when examining consumer
64 responses to food, has led to the development of various instruments to capture emotional
65 responses elicited by food, beyond sensory liking (e.g., sensory evaluation, acceptance, liking,
66 hedonic or preference measurements). Ways to assess food related emotions include

67 numerous measurement methods and instruments. These are grouped into explicit and
68 implicit methods depending on the way of assessment. The literature review confirms the
69 dominance of explicit methods to investigate emotional responses in relation to food (Lagast
70 et al., 2017). Implicit measurements such as facial expression, brain activity, eye movements
71 etc, have been applied less; however, their use is increasing due to the wider accessibility of
72 the technologies, and the evolution of interdisciplinary techniques that offer new and
73 promising approaches to capture emotional responses.

74 Frequently, explicit methods of emotions measurement are based on a list of emotional terms
75 that can be checked (i.e., selected) or rated in a questionnaire [check-all-that-apply (CATA)
76 /rate-all-that-apply (RATA)]. The emotional lexicon can be predefined, consumer-defined, or
77 a combination of both.

78 Lists of emotions and emotion measurement tools have been developed for a wide variety of
79 products, such as wine [e.g., (Danner et al., 2017; Ferrarini et al., 2010; Mora et al., 2018; Silva
80 et al., 2014)], coffee [e.g., (Bhumiratana et al., 2014; Hu & Lee, 2019; Labbe et al., 2015)], beer
81 [e.g., (Beyts et al., 2017; Chaya et al., 2015; Desira et al., 2020; Orth et al., 2004; van Zyl &
82 Meiselman, 2015)], but also general non food-specific lists and tools, such as EsSense Profile
83 (King & Meiselman, 2010; Nestrud et al., 2016), EmoSemio (Spinelli et al., 2015; Spinelli et
84 al., 2014), Global Profile (Spinelli et al., 2019), EmoSensory Wheel (Schouteten et al., 2015,
85 2017), Empathic Food Test (Geier et al., 2016), Emotional Circumplex Model (Jaeger et al.,
86 2018). The EsSense Profile is a commercially used emotion measurement tool applied
87 internationally, translated in various languages, used as the basis for new measurement tools,
88 and it is concise relatively to others (Panagiotou & Gkatzionis, 2022).

89 Traditional products could be more susceptible to the influence of sustainability claims as
90 regards packaging due to limited changes in their production process. To our knowledge, the
91 interaction between information, packaging, and food is an area that has received limited
92 attention.

93 Paximathia are rusks of Greek origin, common in Greece, a central component of the
94 Mediterranean diet, and widely exported to numerous countries. In recent years, paximathia
95 of several Greek regions were accredited PDO status and the profile of the product was
96 standardised. Efforts have been made to modernise their packaging and add sustainability
97 features. The aim of the study was to test how sustainable packaging information affects: (a)
98 consumers' acceptability and (b) emotional responses to paximathia. To assess sensory
99 perception of paximathia in relation to packaging, samples were assessed on hedonic scales
100 and CATA questionnaires. The objective of the study was to identify how packaging affected
101 liking of taste and emotional reactions. Responses under informed conditions on packaging
102 were compared to uninformed tasting

103 **2. Materials and methods**

104 **2.1 Samples, stimuli and experimental design**

105 The study was conducted in three parts as previously described by Gunaratne et al. (2019)
106 with slight modifications. First, under blind conditions to study the effect of sensory
107 characteristics of paximathi on the sensory perception by consumers without packaging.
108 Second, under packaging conditions to study the effect of packaging characteristics on
109 consumers' visual perception of rusks. Third, under informed conditions to study the
110 combined effect of sensory and packaging characteristics on consumers' sensory perception.
111 The duration of all sessions in total was 30 minutes, with two 5-minute breaks in between.

112 Paximathia, Greek rusks (hereafter referred to as rusks) were supplied by a commercial
113 producer in Lemnos, Greece. Their nutritional value was: (per 100g) 17g fat, 64g
114 carbohydrates, 3.8g fibre, 11g protein and 1.1g salt. Each rusk was 4cm x 3cm and weighted
115 ~ 30 g. Conventional packaging film was made from polypropylene (PPL) with 1.7 mm
116 thickness and size of 30cm x 10cm and biodegradable was made from polylactic acid (PLA)
117 and of the same size and thickness. Packaging films were obtained from commercial retailers:
118 Plastimak (PPL) and Clear Bags (PLA). Foot sealer Tahipack THP-350 was used for the sealing
119 of packages, and each package contained three rusks.

120

121 **2.2 Participants**

122 One hundred and four (N=104) participants, 75% women and 25% men, were recruited for
123 the study, aged between 18 – 80 years old. They were recruited via e-mail, phone, or in person
124 communication. All participants were consumers of bakery products and rusks; however,
125 there were no prerequisites for participation such as consumption frequency or liking.
126 Participants were not informed that the objective of the study was to assess the impact of
127 packaging sustainability on the sensory perception of food. The experimental procedures
128 were approved for ethics by the Department of Food Science and Nutrition at the University
129 of Aegean. The sessions were carried out in individual sensory booths at the Laboratory of
130 Consumer and Sensory Perception of Food & Drinks of the University of the Aegean. The
131 booths were closed sensory analysis cabins ensuring soundproofing. Room temperature was
132 controlled at 22 °C and testing in booths operated under white lighting conditions.

133

134 **2.3 Blind Condition**

135 Under blind conditions, the participants' sensory perception of each rusk sample was tested
136 without packaging or information. Consumers received verbal and written instructions before
137 they were led into the testing room. They were informed that they would receive rusk
138 samples to taste. The samples (3 rusks) were provided on a white plate. After tasting the
139 samples, participants assessed overall liking using a 7-point hedonic scale (1= dislike
140 extremely to 7= like extremely). Subsequently, they reported their emotions by selecting the
141 most suitable terms in a CATA questionnaire based on EsSense Profile (King and Meiselman,
142 2010).

143 In this study, a Greek lexicon-based emotion measurement tool was used to measure
144 emotions elicited by rusks. The lexicon in Greek and the respective tool was developed based
145 on the EsSense Profile methodology (King and Meiselman, 2010) as a guide (unpublished
146 work). This choice was made based on the fact that EsSense Profile is a tool commercially
147 used internationally, translated in various languages, used as the basis for new measurement
148 tools (Panagiotou & Gkatzionis, 2022).

149 The Greek tool consisted of 33 emotions elicited by food consumption in general, namely:
150 sensual, optimistic, relieved, unrestrained, energetic, grateful, happy, pleased, pleasant,
151 calm, satisfied, cheerful, whole, privileged, healthy, relaxed, glad, good-looking, stressed,
152 weak, disgusted, cheerless, unsatisfied, disappointed, dissatisfied, guilty, angry, tired,
153 nervous, ashamed, resentful, sad, uninterested. To this list, 4 food-specific emotions were
154 added, based on research, related to rusks and crackers consumption: self-restrained,
155 prudent, condescending, lonely. Participants could also add emotions if they wished to the
156 list of 37 terms.

158 **2.4 Packaging Condition**

159 It has been reported that the sense of touch is an important factor in the evaluation and
160 decision-making regarding purchase and product usage (Pramudya & Seo, 2019). After a short
161 break, participants received verbal and written instructions about the next session. This
162 session aimed to investigate the direct effect of packaging on the sensory perception of the
163 product. Consumers examined rusks in two different packaging materials without tasting the
164 rusks. Participants were asked to assess the two different packages, without receiving any
165 further information regarding their packaging materials or rusk. Packaging consisted of two
166 materials: conventional plastic (polypropylene) and biodegradable (polylactic acid). Samples
167 were coded with different random three-digit numbers and were filled with 3 rusks which
168 were the same with the blind condition. Both packages were completely transparent and
169 identical in shape and size. Consumers were instructed to evaluate each sample separately by
170 handling it with their hands for approximately 30 seconds. Participants were instructed not
171 to open or taste the product inside. After examining each sample, participants were asked to
172 assess overall liking using a hedonic scale and emotions by using a CATA questionnaire, the
173 same as used under blind conditions.

174
175 **2.5 Informed Condition**

176 Following a short break, participants received verbal and written instructions for the third
177 session. Participants were instructed to evaluate rusks packed in three different packages.
178 The first was conventional plastic (polypropylene), the second was biodegradable (polylactic
179 acid), and the third was communicated to the consumers as 'edible' packaging; however, it

180 was the same as the biodegradable package. The consumers were not informed that the rusks
181 in the three packages were identical. Written and verbal information was provided to all
182 participants about the differences between the three packaging options and about the
183 potential environmental benefits of the biodegradable and edible packages. More specifically,
184 participants were informed that the conventional packaging consisted of plastic materials, its
185 usage is associated with negative environmental impact and that the sustainable and the
186 edible packaging was more easily degradable. Samples were coded with different random
187 three-digit numbers and included 3 rusks each. Consumers were instructed to evaluate each
188 sample separately by opening the package and tasting the rusk in it. After examination of each
189 sample, participants were asked to assess overall liking using a hedonic scale and emotions
190 using a CATA questionnaire as described in the previous conditions. Water was provided to
191 the participants to cleanse their palate between samples. Samples were presented in random
192 order.

193 194 **2.6 Statistical Analysis**

195 Overall liking data were analysed with one-way analysis of variance (ANOVA). Mean
196 comparisons were performed using Tukey's HSD test adjustment at significance level $\alpha=0.05$
197 ($P\leq 0.05$). CATA data were analysed with correspondence analysis (CA) and Principal
198 Component Analysis (PCA) in order to explore relationships among the selected emotion-
199 based terms and between the different conditions. Cochran's Q test was carried out for
200 elucidating differences between the frequencies of the selected emotion-based CATA terms.
201 Significance was tested at a significance level of 0.05. All statistical analyses were performed
202 using XLSTAT software (Version, 2018.1., Addinsoft).

203

204 3. Results**205 3.1 Consumer liking under different evaluation conditions**

206 The results of liking evaluation were expressed on a 7-point hedonic scale (Table 1). Rusk
207 samples evaluated under blind condition scored the highest level of liking, while the sample
208 with claim of 'edible' package in the informed condition received a similar liking score.
209 Samples in both conventional and biodegradable packaging received lower liking scores than
210 rusks free of packaging; however, the liking of rusks in edible packaging was similar to the
211 product without packaging.

212 In the second session, the products were evaluated externally with no tasting of the rusks,
213 and the conventional packaging was strongly preferred compared to biodegradable.
214 However, during the informed condition, when consumers received information about the
215 environmental impact of each packaging, the biodegradable sample scored higher than the
216 conventional one, while the 'edible' scored the highest (albeit differences were not
217 statistically significant).

218

219 3.2 Emotional profiles of samples under different evaluation conditions

220 Emotion-based terms in the form of a CATA questionnaire were presented to the participants
221 in order to provide insight into consumer perception of the samples. Under the blind
222 condition, the terms 'pleased' (51.9%), 'calm' (44.2%) and 'healthy' (30.7%) were chosen with
223 the highest frequency (Table 2). Under the packaging condition, for the conventional package,
224 the most frequently chosen term was 'calm' (43.2%), whereas for the biodegradable package,
225 the most frequently selected terms were 'nervous' (38.4%), 'unsatisfied' (29.8%) and
226 'worried' (28.8%).

227 Under the informed condition, for the conventional package, the terms with the highest
228 frequencies were 'pleased' (36.5%), 'satisfied' (33.6%) and 'calm' (32.6%). For the
229 biodegradable and 'edible' packages, the terms which were preferred most frequently were
230 'pleased' (40.3% and 50%, respectively), 'satisfied' (39.4% and 46.1%) and 'calm' (28.8% and
231 34.6%). However, this is in stark contrast, with the emotional profile formed for the
232 biodegradable package in the second part of the study which seemed to generate very
233 negative emotional reactions, and is in agreement with the comparison of liking scores
234 between informed and uninformed conditions.

235 Figure 1 shows the correspondence analysis (CA) and the association of the samples under
236 different evaluation conditions with emotion-based terms. The first (F1) and second
237 dimension (F2) accounted for 89.80% of the total data variability (79.56% and 10.24%
238 accordingly). Both the biodegradable and 'edible' packages, in the informed condition, were
239 grouped together and were heavily associated with terms such as 'optimistic', 'happy',
240 'joyful', 'healthy' and 'grateful'. The sample under blind conditions was also associated with
241 positive emotions, such as 'beautiful', 'pleasant', 'relaxed' and 'calm'; however, it was
242 grouped separately. Under packaging conditions, the biodegradable package stood in the
243 opposite direction and was strongly associated with negative emotions such as 'angry',
244 'worried' and 'nervous', unlike the conventional package, which was more associated with
245 positive emotions.

246 The results of the PCA (Figure 2) confirmed the positive relation between the biodegradable
247 and 'edible' packages under informed conditions and their association with positive emotion-
248 based terms, and the more negative emotional associations of the conventional packaging.
249 Likewise, for the biodegradable package, under the packaging conditions, PCA results

250 revealed that it stood in the opposite direction and was associated with negative emotions.
251 The samples under blind conditions and the conventional packaging under packaging
252 conditions were grouped separately.

253

254 **4. Discussion**

255

256 **4.1 Consumer liking under different evaluation conditions**

257 The results of liking evaluation revealed that packaging had a negative effect on the sensory
258 perception of the rusk. However, the lower liking of biodegradable packaging observed in the
259 second session was masked by the effect of its environmental benefit in the third session.
260 Participants' comments collected during the session, made it apparent that the package
261 labelled as 'edible' was perceived as the most environmentally friendly. Overall, expectations
262 generated by communicating packaging sustainability were not sufficient to make sustainable
263 packaging stand out, demonstrating that scoring was mainly sensory (taste) driven. This result
264 is in contrast to Włodarska et al., (2019) who showed that liking scores of various apple juices
265 were significantly affected by packaging information such as brand, type of production and
266 nutritional value. However, the type of information under examination in that study was
267 different. Research with yogurt revealed that brand information had an impact on the sensory
268 profile of the product without nevertheless influencing liking (Schouteten et al., 2017),
269 suggesting that liking scores alone may not be sufficient for the sensory assessment of foods.
270 Interestingly, another study (Magnier et al., 2016) reported that packaging sustainability did
271 not have an effect on the perception of product quality if the food was already perceived by
272 consumers as intrinsically sustainable. Therefore, it is possible that paximathia, as they are

273 considered a traditional product, may have been already perceived as inherently sustainable.
274 Thus, it was concluded that emotional profiling may be a more suitable tool for predicting
275 actual consumers' food choice. Research has shown that evoked emotions are considered to
276 be better predictors of food choice than liking scores alone (Dalenberg et al., 2014).

277

278 **4.2 Emotional profiles of samples under different evaluation conditions**

279 The results for the conventional and biodegradable packages, under the packaging condition,
280 indicate that the two packages caused diametrically opposing emotions to consumers.
281 However, under the informed condition, both biodegradable and 'edible' packages shared a
282 similar emotional profile. The stark contrast with the emotional profile formed for the
283 biodegradable package in the second part of the study could possibly be explained by the
284 notes collected from participants, where it became clear that this was due to the distinct
285 sound of polylactic acid (PLA) packaging film, a feature of the material which has also been
286 previously reported (Granato et al., 2022). Most importantly, this effect appears to be
287 completely masked under informed conditions for both the biodegradable and 'edible'
288 samples, indicating that claims of sustainability features result in higher satisfaction.

289 Our findings are in agreement with previous research on raisins and chocolate bars (Magnier
290 et al., 2016), and frozen cod fillets (Donato and D'Aniello, 2022), which showed that food
291 packed in sustainable packaging is perceived to be of higher quality. However, these studies
292 did not test products under different evaluation conditions to combine sensory with
293 emotional assessment. Magnier et al. (2016) compared packaging made of white plastic
294 (conventional) with sustainable package which had a recycled cardboard look and used raisins
295 and chocolate bars as food products. Other elements (i.e. brand, image, product description)

296 were the same for both packages. In the second study (Donato and D'Aniello, 2022),
297 participants were assigned at random to one of five experimental scenarios: a picture of a
298 pack of frozen cod fillets of a fictitious brand with (vs without) an eco-label and presenting (vs
299 not presenting) an ecological claim close to the eco-label. Results for the first study showed
300 that packaging sustainability positively influences the perceived quality of a food product,
301 however, this effect was moderated by the sustainability of the product. Specifically, when
302 food is already seen as sustainable, the sustainability of the package does not have an added
303 effect. In addition, perceived quality was mediated by the perceived naturalness of the
304 product. The second study also showed that quality is positively affected by food packages
305 presenting food-related eco-labels. According to the study's results, the presence of
306 ecological claims makes both food- and packaging-related eco-labels equally effective in
307 influencing consumers' food evaluations.

308

309 **5. Conclusion**

310 The results show that claims about package sustainability result in higher prevalence of
311 positive emotions. The results of this study add to previous research and provide insights on
312 the importance of sustainability as an external product cue. As we focused only on a particular
313 product category, bakery products, due to their widespread popularity in Greece, future
314 studies could confirm if the effect is reproducible in different food categories and cultural
315 contexts. Different packages could lead to very divergent and strong emotional reactions and
316 liking. Although biodegradable films are visually similar to PPL, other features, such as sound,
317 could equally affect their perception by the consumer. However, negative perceptions could
318 be completely reversed by information about their sustainability and their positive

319 environmental impact. Communication of information about the environmental sustainability
320 of packaging results in positive product-evoked emotions. Future studies could focus on the
321 direct impact of food packaging materials, as well as of specific packaging properties such as
322 sound and labelling, on the sensory evaluation of food. Although the objective of the present
323 study did not include the investigation of the effect of packaging sound, it became apparent
324 by the participants' comments that consumer perception was affected by it. The study
325 provides further evidence of the strong impact of external product cues on consumer
326 perception and shows that sustainability claims could be used as part of the strategy for
327 developing a product; however, such developments should be utilised after consideration of
328 the sensorial perception of the food in order to complement it.

329
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331 None.

332
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336

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530 **Table 1.** Mean consumer liking scores of samples evaluated in blind, packaging and informed
 531 conditions.

Condition-Sample	Liking Score
First session	
Blind condition	5.5 ^a
Second session	
Packaging condition-Conventional	4.9 ^b
Packaging condition -Biodegradable	3.4 ^c
Third session	
Informed condition -Conventional	4.7 ^b
Informed condition-Biodegradable	5.0 ^b
Informed condition -'Edible'	5.1 ^{ab}

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 533 * Different superscript letters indicate statistically significant difference according to Tukey
 534 (HSD) test for a confidence level of 95%.

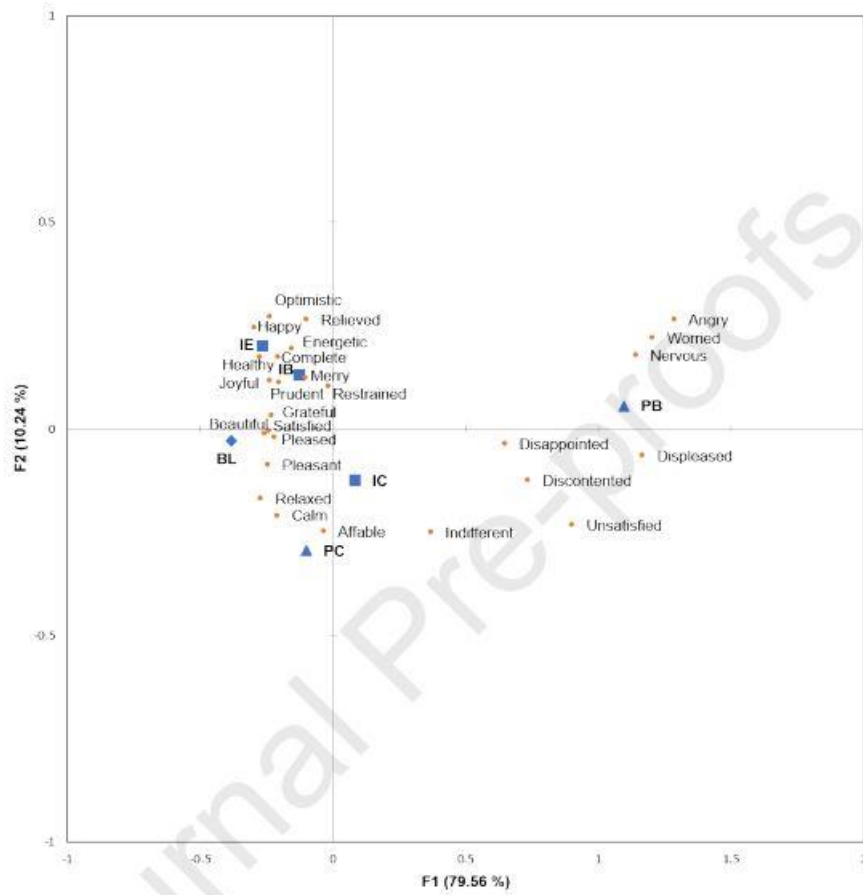
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Table 2. Frequency (%) with which emotion-based terms were used or generated by consumers in order to describe their emotional responses to samples under different evaluation conditions and results from Cochran's Q test for comparison between samples.

CATA term	First session	Second session		Third session		
	Blind condition	Packaging condition - Conventional	Packaging condition - Biodegradable	Informed condition - Conventional	Informed condition - Biodegradable	Informed condition - 'Edible'
worried ¹	3.8 ^a	2.8 ^{abc}	28.8 ^{de}	4.8 ^{ab}	5.7 ^{abcd}	6.7 ^{abcd}
indifferent ¹	10.5 ^{abc}	26.9 ^{def}	26.9 ^{cde}	20.1 ^{bcd}	17.3 ^{bcddefg}	11.5 ^{abcdef}
weak ¹	0.9 ^a	0.9 ^{ab}	1.9 ^a	4.8 ^{ab}	0 ^a	0.9 ^{ab}
disgusted ¹	0 ^a	0 ^a	3.8 ^a	0.9 ^a	0.9 ^a	0 ^a
sensual ¹	3.8 ^a	0.9 ^{ab}	0.9 ^a	0.9 ^a	2.8 ^{ab}	3.8 ^{abc}
optimistic ¹	15.3 ^{abcd}	10.5 ^{abc}	5.7 ^a	8.6 ^{abc}	24 ^{gh}	25.9 ^{efgh}
moody ¹	0 ^a	3.8 ^{abc}	7.6 ^{ab}	3.8 ^a	0.9 ^a	2.8 ^{abc}
relieved ¹	3.8 ^a	6.7 ^{abc}	4.8 ^a	5.7 ^{ab}	6.7 ^{abcde}	18.2 ^{cdefgh}
unsatisfied ¹	4.8 ^a	12.5 ^{abcd}	29.8 ^{de}	15.3 ^{abc}	5.7 ^{abcd}	2.8 ^{abc}
disappointed ¹	1.9 ^a	4.8 ^{abc}	13.4 ^{abc}	10.5 ^{abc}	4.8 ^{bc}	5.7 ^{abcd}
uncontrollable ¹	2.8 ^a	2.8 ^{abc}	3.8 ^a	2.8 ^a	2.8 ^{ab}	1.9 ^{abc}
displeased ¹	0 ^a	5.7 ^{abc}	22.1 ^{bcd}	8.6 ^{abc}	3.8 ^{bc}	2.8 ^{abc}
restrained ¹	10.5 ^{abc}	8.6 ^{abc}	8.6 ^{ab}	15.3 ^{abc}	19.2 ^{cdefg}	15.3 ^{abcdefg}
energetic ¹	10.5 ^{abc}	5.7 ^{abc}	4.8 ^a	2.8 ^a	12.5 ^{abcdef}	9.6 ^{abcde}
guilty ¹	0.9 ^a	1.9 ^{ab}	3.8 ^a	6.7 ^{abc}	0 ^a	0 ^a
grateful ¹	9.6 ^{ab}	8.6 ^{abc}	2.8 ^a	8.6 ^{abc}	8.6 ^{abcdef}	14.4 ^{abcdefg}
happy ¹	9.6 ^{ab}	3.8 ^{abc}	1.9 ^a	7.6 ^{abc}	9.6 ^{abcdef}	14.4 ^{abcdefg}
pleased ¹	51.9 ^f	34.6 ^{fg}	12.5 ^{abc}	36.5 ^e	40.3 ⁱ	50 ^j
pleasant ¹	26.9 ^{cd}	18.2 ^{cde}	5.7 ^a	15.3 ^{abc}	21.1 ^{defg}	17.3 ^{bcddefg}
calm ¹	44.2 ^{ef}	43.2 ^e	11.5 ^{ab}	32.6 ^{de}	28.8 ^{ghi}	34.6 ^{hij}
angry ¹	0 ^a	0 ^a	13.4 ^{abc}	4.8 ^{ab}	3.8 ^{abc}	1.9 ^{abc}
satisfied ¹	58.6 ^f	32.6 ^{fg}	12.5 ^{abc}	33.6 ^{de}	39.4 ^{hi}	46.1 ^{ij}
affable ¹	6.7 ^a	16.3 ^{bcd}	5.7 ^a	14.4 ^{abc}	12.5 ^{abcdef}	10.5 ^{abcde}
merry ¹	11.5 ^{abc}	8.6 ^{abc}	6.7 ^a	7.6 ^{abc}	12.5 ^{abcdef}	15.3 ^{defgh}
tired ¹	0 ^a	0 ^a	3.8 ^a	0.9 ^a	0.9 ^a	0.9 ^{ab}
lonely ¹	1.9 ^a	2.8 ^{abc}	0.9 ^a	0 ^a	0 ^a	0 ^a
nervous ¹	1.9 ^a	4.8 ^{abc}	38.4 ^e	10.5 ^{abc}	12.5 ^{abcdef}	5.7 ^{abcd}
embarrassed ¹	0 ^a	0 ^a	1.9 ^a	3.8 ^a	0.9 ^a	0.9 ^{ab}
discontented ¹	0.9 ^a	4.8 ^{abc}	10.5 ^{ab}	6.7 ^{abc}	3.8 ^{abc}	2.8 ^{abc}
complete ¹	12.5 ^{abc}	8.6 ^{abc}	4.8 ^a	8.6 ^{abc}	15.3 ^{abcdefg}	18.2 ^{cdefgh}
privileged ¹	3.8 ^a	3.8 ^{abc}	0 ^a	0 ^a	2.8 ^{ab}	4.8 ^{abc}
sad ¹	0.9 ^a	0.9 ^{ab}	2.8 ^a	5.7 ^{ab}	0 ^a	2.8 ^{abc}
prudent ¹	7.6 ^{ab}	6.7 ^{abc}	2.8 ^a	7.6 ^{abc}	10.5 ^{abcdef}	12.5 ^{abcdef}
healthy ¹	30.7 ^{de}	9.6 ^{abc}	6.7 ^a	15.3 ^{abc}	22.1 ^{efg}	27.8 ^{fgh}
relaxed ¹	50 ^f	34.6 ^{fg}	9.6 ^{ab}	22.1 ^{cde}	24 ^{fgh}	29.8 ^{ghi}
joyful ¹	24 ^{bcd}	10.5 ^{abc}	6.7 ^a	10.5 ^{abc}	15.3 ^{abcdefg}	22.1 ^{defgh}
beautiful ¹	11.5 ^{abc}	9.6 ^{abc}	3.8 ^a	4.8 ^{ab}	6.7 ^{abcde}	12.5 ^{abcdef}
emotional arousal ²	0.9 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
impressed ²	0 ^a	2.8 ^{abc}	0 ^a	0 ^a	0 ^a	0 ^a
certain ²	0 ^a	0.9 ^{ab}	0 ^a	0 ^a	0 ^a	0 ^a
confused ²	1.9 ^a	3.8 ^{abc}	0.9 ^a	1.9 ^a	0.9 ^a	0 ^a
nostalgic ²	0 ^a	0 ^a	0.9 ^a	0 ^a	0 ^a	0 ^a
pessimistic ²	0 ^a	0 ^a	0.9 ^a	0.9 ^a	0 ^a	0 ^a

*Different superscript letters in columns indicate statistically significant difference ($P \leq 0.05$). Pairwise comparison was performed using the Critical difference (Sheskin) procedure. Additional emotion-based terms reported by participants are included in the table. ¹ Terms originally based on Essence profile

² Terms generated by consumers"



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539 **Fig. 1.** Correspondence analysis obtained from the blind, packaging and informed conditions.
 540 Evaluation conditions appear in blue (symbol: diamond (◊) for session one; triangle (▲) for
 541 session two; and square (■) for session three) while emotion-based terms appear in red color
 542 (symbol: bullet (•)). Only emotion-based terms with a selection frequency of $\geq 10\%$ under any
 543 condition were selected for the analysis.

544 * Blind condition: BL; Packaging condition -Conventional: PC; Packaging condition-
 545 Biodegradable: PB; Informed condition -Conventional: IC; Informed condition -Biodegradable;
 546 IB; Informed condition -'Edible'; IE.

547

571 Highlights

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- 573 • Communication of sustainability features resulted in the acceptability of the products
- 574 • Polypropylene was liked more than biodegradable packaging in uninformed
575 assessment
- 576 • False claim of 'edible' increased liking of biodegradable packaging.
- 577 • Diametrically opposing emotions for conventional vs. biodegradable packages with
578 CATA

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584 CRediT author statement

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586 **Konstantinos Giannoutsos:** Conceptualization, Methodology, Investigation, Writing - Original
587 Draft. **Danaï Ioanna Koukoumaki:** Conceptualization, Methodology, Investigation.
588 **Malamatenia Panagiotou:** Conceptualization, Methodology, Investigation. **Konstantinos**
589 **Gkatzionis:** Conceptualization, Supervision, Project administration, Funding acquisition.

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595 **Declaration of interests**

596

597 The authors declare that they have no known competing financial interests or personal
598 relationships that could have appeared to influence the work reported in this paper.

599

600 The authors declare the following financial interests/personal relationships which may be
601 considered as potential competing interests:

602

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Development Fund.

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604

9. **Research article “Development of a Greek emotion lexicon for the self-report and measurement of emotions elicited by foods: a case study of comparison with English and translated into Greek tools.” in *Journal of Sensory Studies* of Wiley by Panagiotou M., Gkatzioni A., Bountziouka V., Gkatzionis K. (under review)**

Journal of Sensory Studies
Original Article

Development of a Greek emotion lexicon for the self-report and measurement of emotions elicited by foods: a case study of comparison with English and translated into Greek tools.

Submission Status	Under Review	This submission is under consideration and cannot be edited. Further instructions will be emailed to you from ScholarOne. View Submission Overview
Manuscript ID	JOSS-OGA-23-0003	
Submitted On	3 January 2023 by MALAMATENIA PANAGIOTOU	
Submission Started	15 December 2022 by MALAMATENIA PANAGIOTOU	

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