The Greek National Survey on Health and Nutrition (the HYDRIA Project)

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EU-FORA European Food Risk Assessment Fellowship Programme

Με τη συγχρηματοδότηση της Ευρωπαϊκής Ένωσης

Υδρία

ΔΙΑΤΡΟΦΗ & ΥΓΕΙΑ ΤΟΥ ΕΛΛΗΝΙΚΟΥ ΠΛΗΘΥΣΜΟΥ

Υγεία, ΔιατΡοφή, ΙΑτρική

"*HYDRIA. Program and targeted action on the health and nutrition of the Greek population: development and implementation of methodology and documentation*".

The HYDRIA survey was **implemented by the Hellenic Health Foundation (HHF)** in collaboration with the Hellenic Ministry of Health and the Center for Disease Control & Prevention in Greece.

Co-financed by the European Union (European Social Fund) and national resources.

http://www.hhf-greece.gr/hydria.html

http://www.hhf-greece.gr/hydria-nhns.gr/index_eng.html

Development of methods and procedures

Based on the experience of our participation in :

- the network of the European Health Examination Surveys (EHES-Pilot Joint Action, 2009-2011), coordinated by the National Institute for Health and Welfare (Helsinki, Finland) and supported by DG-SANTE of the European Commission (www.hhf-greece.gr/ehes_GR.htm)

- the pilot phase of the EU-MENU *(What's on the menu in Europe)* initiative of the European Food Safety Authority - PANEU (http://www.nut.uoa.gr/paneugr.html)

Study Aim and Objectives

Evaluate the **health status**, **dietary** and **lifestyle choices** of the population in Greece

- To collect **high-quality data**, from a **representative sample** of the population in Greece, on **health**, **diet** and **lifestyle habits**, **comparable at an international level**
- To extract **information on important health indicators** of the population for **enriching** the Health Charter of the Ministry of Health
- To exploit the accumulated information for the development and evaluation of **policies to protect and promote public health**
- To develop a **strategic plan** for undertaking of future studies
- To establish an **integrated network, based on local health centers**, for the long-term collection of health, diet and lifestyle data

Sampling frame

- Sampling frame- ELSTAT-covered the 13 regions, 51 prefectures

  Two-staged stratified random sampling

  1st stage - primary sampling unit (PSU) being the municipal/local community
  2nd stage - final unit being the individual

- Stratification criteria- geographic division of the country and the degree of urbanisation of the permanent residential area; selection was made by gender and age group

- ELSTAT provided with a distribution of an "anonymised" sample of individuals living in private households -frequency distribution across areas (municipal or local communities), sex (males, females) and age groups (18-24, 25-34, 35-44, 45-54, 55-64, 65-74, and 75+)

- Convert the "anonymised" distribution - individuals in each selected PSU randomly approached through access to a list of randomly generated phone numbers

Martimianaki et al. 2018, Epidemiol Biostat Public Health

Survey Sample

- 8,000 individuals, 18 years and over, permanently resident in Greece (2011 population census)

- **Exclusion** - collective households, institutions, households with members on diplomatic missions

- 50% response rate - representative sample of 4011 individuals, (1,873 males and 2,138 females)

- The age and gender distribution
47%, 53% –**HYDRIA** vs 48% and 52% **GREEK POPULATION** (males, females)

- Weighting factors
2011 Greek census (sampling design and the response rate by geographical region, degree of urbanisation, gender and age group

Communication-Appointment setting

1st telephone contact ➡ Invitation to participate

2nd telephone contact ➡ Appointment setting

Appointments

- At selected place close to the residence of participants
- Most convenient day (Monday to Sunday), (Morning, Afternoon or Evening), accounting for seasonal and weekly variation
- Scheduled by the coordinating centre, using an automated system allowed scheduling at different sites simultaneously - allowing tracking the record of each participant's appointment (booked, postponed or cancelled)
- Appointments were confirmed at the same day or a day prior to the scheduled appointment date

Data collection-Examination sites

- Mainly included local health centers

  - Public premises (town hall, peripheral doctors' office)
  - Teaching premises (colleges, libraries, gymnastic halls),
  - Open care community centres for the elderly
  - Community clinics
  - Mobile health care unit with facilities (somatometric measurements, personal interviews, blood drawing and processing)

Data collection - Procedures

First interview

- Signing informed consent
- Pulse measurement, blood pressure
- Health and lifestyle questionnaire
- Food Propensity Questionnaire- nonquantitative
- Eating out choices questionnaire (past month)
- 24-hour dietary recall (web based software application, HHF Nutrition Tool)
- Somatometric assessment,
  (standing height, body weight, waist and hip circumference, body fat)
- Collection of blood samples (stored in -80^{o}C)

Second Interview

- 15-30 days, 2nd 24h dietary recall (via telephone)

Data collection - Non-dietary information

Health and Lifestyle Questionnaire *(CAPI-computer assisted personal interview)*

- Personal characteristics (date of birth, residential area)
- Socio-demographic information(education, occupation status, employment)
- Lifestyle choices (smoking, physical activity)
- Health status (perceived health, medical history), Health determinants
- Medications, Supplements

Data collection – Dietary information

Food propensity questionnaire *(CAPI-computer assisted personal interview)*

- short, non-quantitative questionnaire interviewer-administered

- frequency of consuming foods and dietary supplements in the previous year

- 88 food groups/items
  14 dietary supplements

- identify consumers - non-consumers

- correct the distribution of sporadic measurement values

Food list covers:
- population's whole diet
- items important for:
  - risk assessment
  - nutrition monitoring
  - country-specific public health priorities

Data collection – Dietary information

Eating Out Questionnaire *(CAPI-computer assisted personal interview)*

- Usual consumption of food, beverages and soft drinks outside home, per meal
- The most recent feed outside home during the previous month (day of the week, place of consumption)
- Justification of the choice
- Changes in the frequency of eating out-of-home during the past year

Data Collection - Other Measurements

- Pulse measurement
- Blood pressure
- Height
- Weight
- Body Fat
- Waist circumference
- Hip circumference
- Collection of blood samples (20ml, centrifuged, aliquoted, temporarily stored at 20°C, transported (styrofoam boxes) in dry ice, storage at deep freeze (-80°C)
- Blood analysis (total and HDL cholesterol, glucose, glycosylated haemoglobin, creatinine, uric acid, total proteins, total calcium, transaminases (ALT / SGPT, AST/SGOT, vitamin D)

Standardized procedures according to the European coordination center for HES

Results sent by post / somatometric information

http://www.ehes.info/EHES_pilot.htm

Data collection - Dietary information

24-HDR HHF- Nutrition Tool

- web-based automated, interviewer-administered application developed by the HHF
- collects and codes dietary intake making use of the Multiple Pass Method (Am J Clin Nutr 2003; 77, 1171– 8)
- developed, tested, evaluated for its feasibility, PILOT-PANEU, EHES-Pilot
- validated through 24-hour urinary collections (creatinine, nitrogen, potassium)

https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/sp.efsa.2013.EN-508

24-HDR HHF - Nutrition Tool

Food List

- Food list (1782 food items)
- 10.000 food items provided from a big supermarket chain were scrutinized for adding new items existing on the market
- Items identified during the pilot study were also included
- Food classification in accordance to FoodEx 2 and Langual core groupings

24-HDR HHF- Nutrition Tool
Recipe List

- Recipes – (homemade, ready to cook, ready to eat, new)
- The recipe list was based on Greek traditional recipes as published on the ‘COMPOSITION TABLES OF FOODS AND GREEK DISHES’
- Standard Greek recipes found in popular recipe books and web sites
- International standard recipes found at web sites
- Recipes reported during the pilot phase

http://www.hhf-greece.gr/tables/Home.aspx?l=en

24-HDR HHF- Nutrition Tool
Facets-Descriptors-Other databases

- Facets can be defined as a series of questions
- Descriptors as the possible answers, which further define the characteristics of a given food item
- 23 facets introduced to record food characteristics (origin, physical state, cooking method, preservation method, sweetening agent, fat content, brand name, packaging material, etc.)
- Facet-descriptors in alignment with those of FoodEx2
- Database with (raw to cook factors, edible/inedible, fat absorbed, density coefficients (foods and recipes), brand names

The HHF Nutrition Tool – Initial list

The HHF Nutrition Tool – Detailed list

TV/PC/Games

- ΜΠΡΙΑΜ (ΜΠΡΙΑΜ) - Σπιτική Συνταγή
  ® Σπιτικό/ημιέτοιμο, γνωστό λίπος ® Ναι ® Φρέσκο
  - ΠΑΤΑΤΕΣ ΝΕΑΣ ΣΟΔΕΙΑΣ ► Φρέσκο ► Σάρκα ► Ψητό στο φούρνο (με λίπος) ► Χωρίς πέτσα/φλούδα ► 94,23gr
  - ΝΤΟΜΑΤΑ Γ.Κ. ► Φρέσκο ► Ψητό στο φούρνο (με λίπος) ► 35,33gr
  - ΜΕΛΙΤΖΑΝΕΣ Γ.Κ. ► Φρέσκο ► Ψητό στο φούρνο (με λίπος) ► 19,79gr
  - ΠΙΠΕΡΙΑ ΠΡΑΣΙΝΗ - ΦΛΑΣΚΑ ► Φρέσκο ► Ψητό στο φούρνο (με λίπος) ► 20,02gr
  - ΚΟΛΟΚΥΘΑΚΙΑ ► Φρέσκο ► Ψητό στο φούρνο (με λίπος) ► 47,70gr
  - ΚΡΕΜΜΥΔΙ ΞΕΡΟ ► Φρέσκο ► Ψητό στο φούρνο (με λίπος) ► 15,02gr
  - ΕΛΑΙΟΛΑΔΟ Γ.Κ. ► 23,56gr
  - ΜΑΙΝΤΑΝΟΣ ► Φρέσκο ► Ψητό στο φούρνο (με λίπος) ► 2,36gr
- ΨΩΜΙ
  - ΨΩΜΙ ΓΙΑ ΤΟΣΤ ΟΛΙΚΗΣ ΑΛΕΣΕΩΣ ► Μη εφαρμόσιμη μέθοδος μαγειρέματος ► Χωρίς ζέσταμα ► Χωρίς εφαρμογή ► Χωρίς εφαρμογή ► Τσάντα / Δίχτυ / Σακουλάκι ► Πλαστικό ► ΚΑΡΑΜΟΛΕΓΚΟΣ ► Συμβατικό ► Αδυναμία προσδιορισμού ► Μη εμπλουτισμένο / Μη ενισχυμένο ► Με αλάτι ► Αδυναμία προσδιορισμού ► Σπιτικό (προμήθεια σπιτιού), γ.κ. ► 50,00gr

Απογευματινό 18:05 Καφετέρια / Μπαρ / Pub

- ΧΥΜΟΣ ΠΟΡΤΟΚΑΛΙ
  - ΧΥΜΟΣ ΠΟΡΤΟΚΑΛΙ ► Υγρό ► Χωρίς πρόσθετη γλυκαντική ύλη / Χωρίς ζάχαρη ► Μη εμπλουτισμένο / Μη ενισχυμένο ► Μπουκάλι ► Tetrabrik / Tetrapack (πολυστρωματικό υλικό) ► ΗΒΗ ► Συμβατικό ► Σπιτικό (προμήθεια σπιτιού), γ.κ. ► 425,00gr

Δείπνο 21:00 Σπίτια φίλων / οικογένεια - Με παρέα

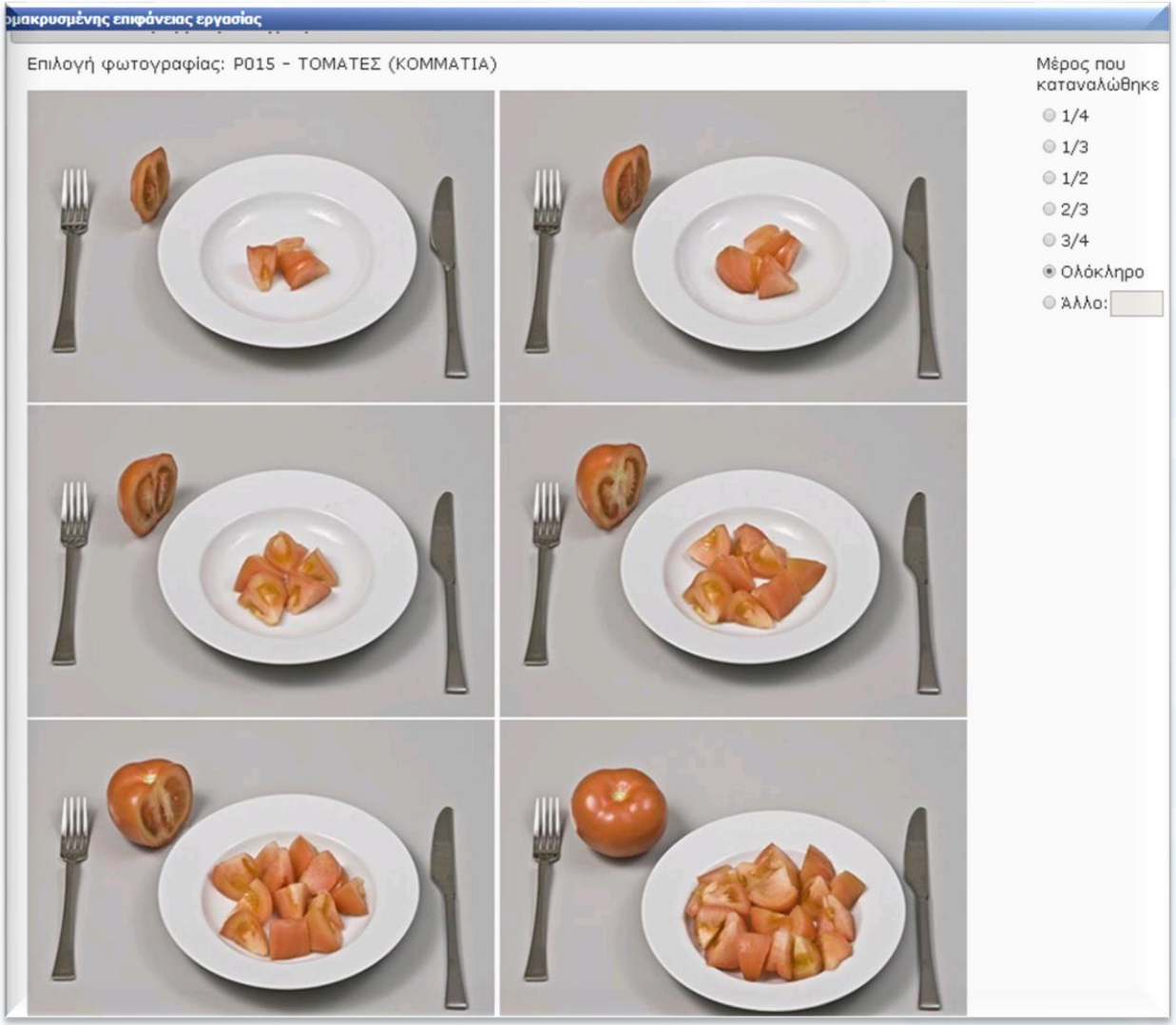
- ΣΑΛΑΤΑ ΝΤΟΜΑΤΑ
  - ΝΤΟΜΑΤΑ Γ.Κ. ► Φρέσκο ► Χωρίς συσκευασία / Χύμα ► Χωρίς εφαρμογή ► Οργανικό / Βιολογικό ► ΚΡΗΤΗ ► Σάρκα ► Χωρίς πέτσα/φλούδα ► Ωμό, μη επεξεργασμένο ► Χωρίς ζέσταμα ► Σπιτικό (προμήθεια σπιτιού), χωρίς λίπος ► 154,00gr
- ΕΛΑΙΟΛΑΔΟ
  - ΕΛΑΙΟΛΑΔΟ ΕΞΤΡΑ ΠΑΡΘΕΝΟ ► Μπουκάλι ► Γυαλί ► Χωρίς εφαρμογή ► Αδυναμία προσδιορισμού ► Συμβατικό ► Αδυναμία προσδιορισμού ► Σπιτικό (προμήθεια σπιτιού), γ.κ. ► 14,00gr
- ΠΑΞΙΜΑΔΙ
  - ΠΑΞΙΜΑΔΙ ΤΥΠΟΥ ΝΤΑΚΟΣ ΠΑΡΑΔΟΣΙΑΚΟ Γ.Κ. ► Αδυναμία προσδιορισμού ► Χωρίς πρόσθετη γλυκαντική ύλη / Χωρίς ζάχαρη

24-HDR HHF- Nutrition Tool
Quantification

- standard units
- household measures
- food pictures (174 food picture for adults, 68 food pictures for young children
- photographs of usual tableware

24-HDR HHF- Nutrition Tool Food Atlas

Food picture example



Food picture evaluation

Public Health Nutrition: page 1 of 8 doi:10.1017/S1368980016000227

Evaluation of a digital food photography atlas used as portion size measurement aid in dietary surveys in Greece

Androniki Naska[1,2], Elisavet Valanou[2], Eleni Peppa[2], Michail Katsoulis[2], Anastasia Barbouni[3] and Antonia Trichopoulou[2,*]

[1]Department of Hygiene, Epidemiology and Medical Statistics, School of Medicine, National and Kapodistrian University of Athens, Athens, Greece: [2]Hellenic Health Foundation, Kaisareias 13 & Alexandroupoleos, GR-115 27 Athens, Greece: [3]Department of Public and Administrative Health, National School of Public Health, Athens, Greece

Submitted 1 September 2015: Final revision received 19 January 2016: Accepted 25 January 2016

Abstract

Objective: To evaluate how well respondents perceive digital images of food portions commonly consumed in Greece.

Design: The picture series was defined on the basis of usual dietary intakes assessed in earlier large-scale studies in Greece. The evaluation included 2218 pre-weighed actual portions shown to participants, who were subsequently asked to link each portion to a food picture. Mean differences between picture numbers selected and portions actually shown were compared using the Wilcoxon paired signed-rank test. The effect of personal characteristics on participants' selections was evaluated through unpaired *t* tests (sex and school years) or through Tukey–Kramer pairwise comparisons (age and food groups).

Setting: Testing of participants' perception of digital food images used in the Greek national nutrition survey.

Subjects: Individuals (*n* 103, 61 % females) aged 12 years and over, selected on the basis of the target population of the Greek nutrition survey using convenience sampling.

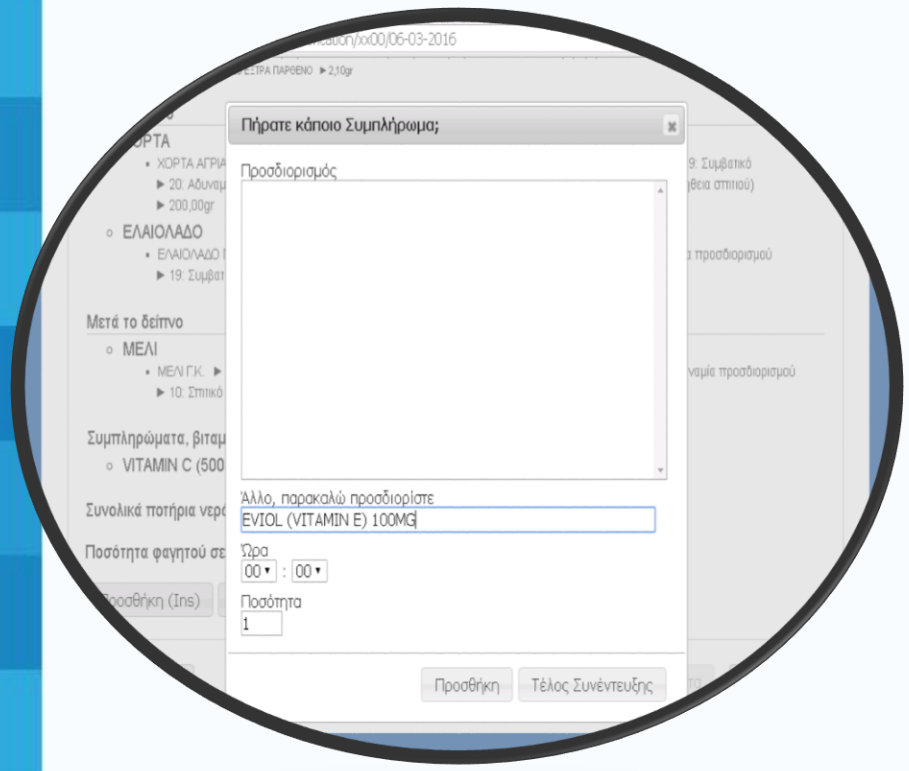
Results: Individuals selected the correct or adjacent image in about 90% of the assessments and tended to overestimate small and underestimate large quantities. Photographs of Greek traditional pies and meat-based pastry dishes led participants to perceive the amounts in the photos larger than they actually were. Adolescents were more prone to underestimating food quantities through the pictures.

Conclusions: The digital food atlas appears generally suitable to be used for the estimation of average food intakes in large-scale dietary surveys in Greece. However, individuals who consistently consume only small or only large food portions may have biased perceptions in relation to others.

Keywords
Digital photo database
Portion size estimation
HYDRIA

https://www.cambridge.org/core/journals/public-health-nutrition/article/evaluation-of-food-photographs-assessing-the-dietary-intake-of-children-up-to-10-years-old/ACD017814E3760285F35752BDBF570AA

24-HDR HHF- Nutrition Tool- Additional information



- Special diet
- Special occasion
- Eating circumstances (main courses)
- Same/ More/Less than usual consumption
- Total water consumption
- Supplement type
  - brand name
  - time of administration
  - quantity

24-HDR HHF- Food Composition tables

- Greek food composition table included in the e-book

http://www.eurofir.org/food-information/food-composition-databases/eurofir-aisbl-e-book-collection/

- Chemical analyzed foods, traditional recipes, fishes, cheeses form other national sources.

- McCance and Widdows, CoFID, 6th edition

FoodEx2 classification and description system

Coding of consumption data according to the FoodEx2 classification

HHF-Nutrition tool facets and descriptors provide a good context to describe food in sufficient detail and are in alignment with the facets/ descriptors of FoodEx2

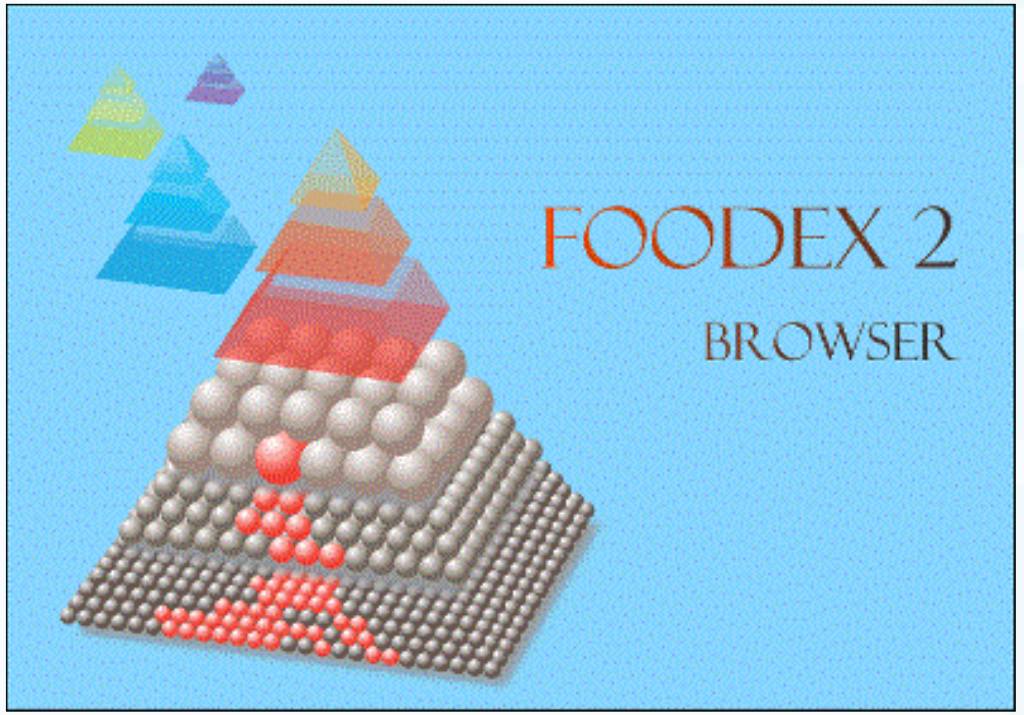
However, the coding of consumption data according to the FoodEx2 was challenging due to the complexity and structure of both databases

WHAT IS THE FOODEX?

A comprehensive food classification and description system for exposure assessment.

A common language

Developed and maintained by EFSA



EFSA FoodEx2 classification and description system

Principal elements

- 8 Hierarchies – (different views of the basic food list)

(Master, Reporting, Exposure, Pesticide residues, Zoonoses, Feed, Veterinary drugs residue, Botanicals)

- Exposure Hierarchy for Food Consumption Data
- **21 main food categories -** Core food list parent-child relationship

(Five group of terms graphically represented by a shape and colour code)

- Hierarchy term (blue pyramid),
- Generic terms by a white sphere,
- Non-specific terms by a yellow sphere,
- Core terms are represented by a red sphere
- Extended terms by a green sphere

- Facets (32)

TECHNICAL REPORT

APPROVED: 30 April 2015 PUBLISHED: 30 April 2015

The food classification and description system FoodEx2 (revision 2)

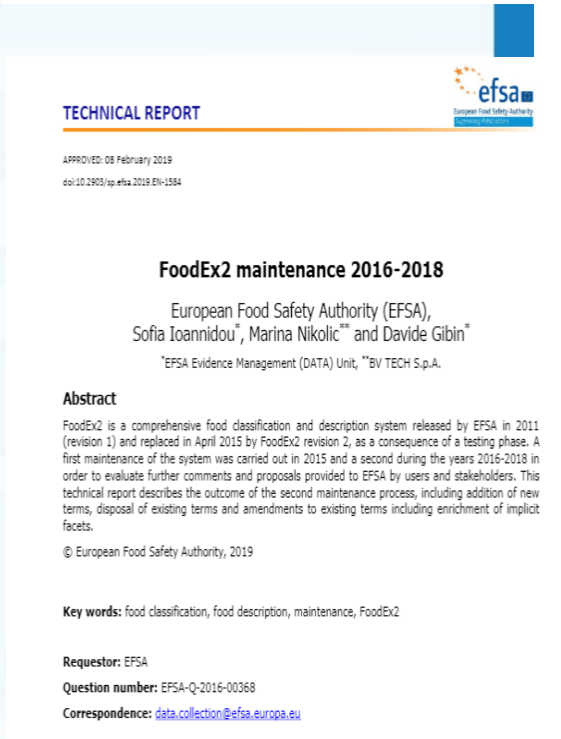
European Food Safety Authority

Abstract

FoodEx2 is a comprehensive food classification and description system aimed at covering the need to describe food in data collections across different food safety domains. After its first release in 2011, the system was broadly tested in various practical situations, allowing its evaluation and the identification of areas for improvement. As a consequence of this testing phase, FoodEx2 was reviewed and revised in order to match the needs expressed by the different users. In particular, the terminology was significantly expanded in the sections on raw commodities and natural sources, new hierarchies were added and the relationship between the terms and the most important facets was streamlined. This technical report, mainly aimed to data providers to EFSA, describes the revision of the system and also provides guidance for the harmonised use of the system and the quality control of the codes. Revision 2 of FoodEx2 replaces the revision 1.

Key words: food classification, food description, food groups, food categories, core list, extended list, facets

Requestor: EFSA
Question number: EFSA-Q-2014-00143
Correspondence: data.collection@efsa.europa.eu



TECHNICAL REPORT

APPROVED: 08 February 2019
doi:10.2903/sp.efsa.2019.EN-1584

FoodEx2 maintenance 2016-2018

European Food Safety Authority (EFSA),
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Abstract

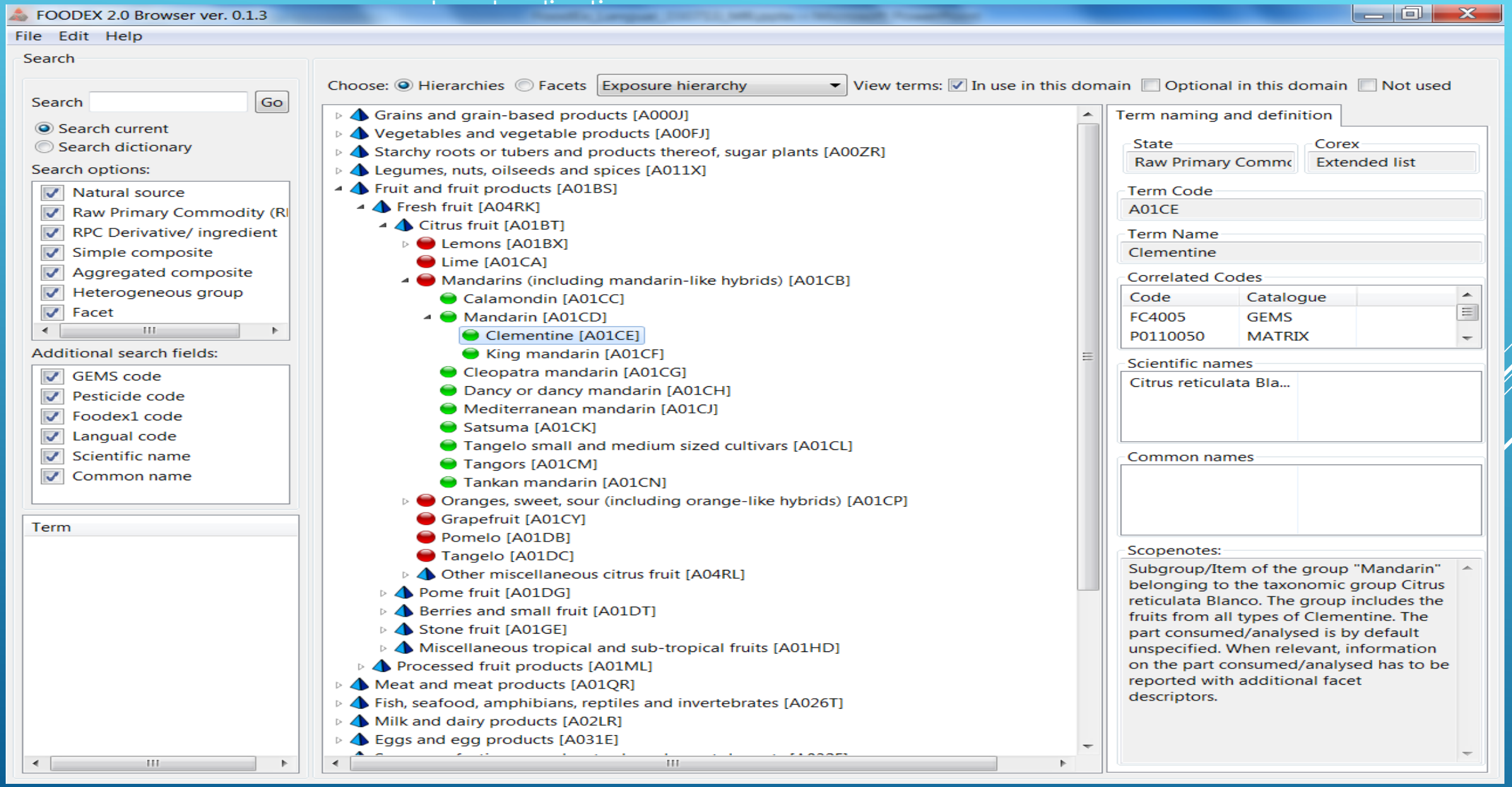
FoodEx2 is a comprehensive food classification and description system released by EFSA in 2011 (revision 1) and replaced in April 2015 by FoodEx2 revision 2, as a consequence of a testing phase. A first maintenance of the system was carried out in 2015 and a second during the years 2016-2018 in order to evaluate further comments and proposals provided to EFSA by users and stakeholders. This technical report describes the outcome of the second maintenance process, including addition of new terms, disposal of existing terms and amendments to existing terms including enrichment of implicit facets.

Key words: food classification, food description, maintenance, FoodEx2

Requestor: EFSA
Question number: EFSA-Q-2016-00368
Correspondence: data.collection@efsa.europa.eu

FoodEx2 browser tool

https://www.efsa.europa.eu/en/data/data-



Foodex 2 matching challenges

Coding and matching after data collection required an extra effort due to the complexity of both databases as well as discrepancies between their structure

More specifically:

- challenging to find a matching code for some items
- lack of national recipes - difficulties when the foods are part of a composite food
- disaggregated recipes in the Nutrition Tool, treated as one food in Foodex 2

The matching was semi-automatic as inconsistences between the two databases required manual checking and correction of discrepancies

Thank you very much
Find us online

Web page : www.hydria-nhns.gr

http://www.hhf-greece.gr/images/hydria-results-eng.pdf