EU REformulation MOnitoring (EUREMO)
Feasibility study for a monitoring system on reformulation initiatives for salt, sugars and fat

Final Report

Written by ICF S.A.

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Abstract

Food reformulation initiatives have an instrumental role to play in improving public health outcomes. They involve the modification of manufactured foods to improve their nutritional value by reducing the presence of harmful ingredients including salt, sugar and saturated fat. Healthy food environments have been identified as a key component in preventing obesity which, despite national and pan-European efforts, continues to be a significant public health challenge. As part of these efforts, reformulation initiatives have been implemented in several European countries.

However, monitoring their effectiveness and progress is a challenge due to resource constraints and differences between available nutrition composition databases. Overcoming these constraints by creating a sustainable and transferable monitoring system is vital for assessing the effectiveness of reformulation activities.

This study develops and tests a monitoring process for assessing the impact of reformulation initiatives on a range of 'nutrients of interest/concern' by collecting primary data on the composition of over 45,000 processed food and drink products available for purchase by the general public in 16 European countries. In addition, the study provides support to national public authorities to implement reformulation initiatives by organising workshops, twinning actions and scientific and technical support to reformulation initiatives.

Abrégé

Les initiatives de reformulation des aliments ont un rôle déterminant à jouer dans l'amélioration des résultats en matière de santé publique. Ils impliquent la modification des aliments manufacturés pour améliorer leur valeur nutritionnelle en réduisant la présence d'ingrédients nocifs, notamment le sel, le sucre et les graisses saturées. Des environnements alimentaires sains ont été identifiés comme un élément clé dans la prévention de l'obésité qui, malgré les efforts nationaux et paneuropéens, continue d'être un défi de santé publique important. Dans le cadre de ces efforts, des initiatives de reformulation ont été mises en œuvre dans plusieurs pays européens.

Cependant, le suivi de leur efficacité et de leurs progrès est un défi du fait de ressources limitées et de différences entre les bases de données sur la composition nutritionnelle étant disponibles. Surmonter ces contraintes en créant un système de suivi durable et transférable est essentiel pour évaluer l'efficacité des activités de reformulation.

Cette étude développe et teste un processus de suivi pour évaluer l'impact des initiatives de reformulation sur une gamme de 'nutriments d'intérêt / préoccupants' en collectant des données primaires sur la composition de plus de 45 000 produits alimentaires et boissons transformés disponibles à l'achat par le grand public dans 16 pays européens. En outre, l'étude fournit un soutien aux autorités publiques nationales pour mettre en œuvre des initiatives de reformulation en organisant des ateliers, des actions de jumelage et un soutien scientifique et technique aux initiatives de reformulation.

Executive summary

This report presents the results of a study commissioned by the European Commission's Health and Digital Executive Agency (HaDEA) to test the feasibility of a European monitoring system on reformulation initiatives for salt, sugars and fat.

Background and context

Food reformulation initiatives have an instrumental role to play in improving public health outcomes. They involve the modification of manufactured foods to improve their nutritional value by reducing the presence of harmful ingredients including salt, sugar and saturated fat. Healthy food environments have been identified as a key component in preventing obesity which, despite national and pan-European efforts, continues to be a significant public health challenge.

In this context, European countries have explored and implemented different reformulation policies, both mandatory and voluntary, to encourage food manufacturers to reformulate their products. Evidence suggests that there is still variation in approaches and that some countries are currently more successful – or have more concrete policies – than others for tackling the high content of some nutrients in food. Reformulation has not been a straightforward process in some countries due to technical, economic, legal and cultural difficulties. The main challenge for manufacturers and other parts of industry is avoiding consumer rejection of reformulated products which could result from significantly altered flavours or textures. Legislation relating to food products can present a challenge to reformulation strategies for some industries but could be also seen as an opportunity to create a level playing field and prevent consumer backlash.

Monitoring reformulation activities is an important element for changing the current obesogenic food environment and creating a healthier one by reducing the presence of harmful nutrients in processed foods and drinks. However, monitoring their effectiveness and progress is a challenge due to resource constraints and differences between available nutrition composition databases. Overcoming these constraints by creating a sustainable and transferable monitoring system is key to assess the effectiveness of reformulation activities.

An initial pilot test carried out by the European Joint Action on Nutrition and Physical Activity (JANPA), which developed a monitoring system in three European countries (France, Austria and Romania) demonstrated that a sustainable and efficient Europe-wide monitoring system may be possible to implement with limited financial resources.

Objectives

The objectives of this EUREMO study (EU REformulation MOnitoring (EUREMO): Feasibility study for a monitoring system on reformulation initiatives for salt, sugars and fat) are twofold:

- Objective 1 – **Develop and test a monitoring system** for assessing the impact of reformulation initiatives on salt, sugar and fat.
    - Systematically collect nutritional information on processed food and drink products available for purchase by the general public in selected European countries and record the data in an interoperable dataset.
- Objective 2 – **Provide support to national public authorities** to implement reformulation initiatives.
    - Workshops for countries with little experience in reformulation initiatives, but who have the capacity to organise and pursue national initiatives.

- Twinning actions for countries who can benefit from learning about an initiative in another country, either because they are planning a similar initiative or because they face similar challenges.
- Scientific and technical support to help countries to draft or implement reformulation initiatives.

Scope and method

The study involved two distinct but interrelated tasks which were aligned with the study objectives above and were run in parallel.

Monitoring system

The development of a monitoring system involved creating a nutrition composition database with information on processed food and drink products collected across European countries which can be used as a tool to monitor the effectiveness of implemented reformulation initiatives on product composition.

The monitoring system covers selected countries and product categories as follows:

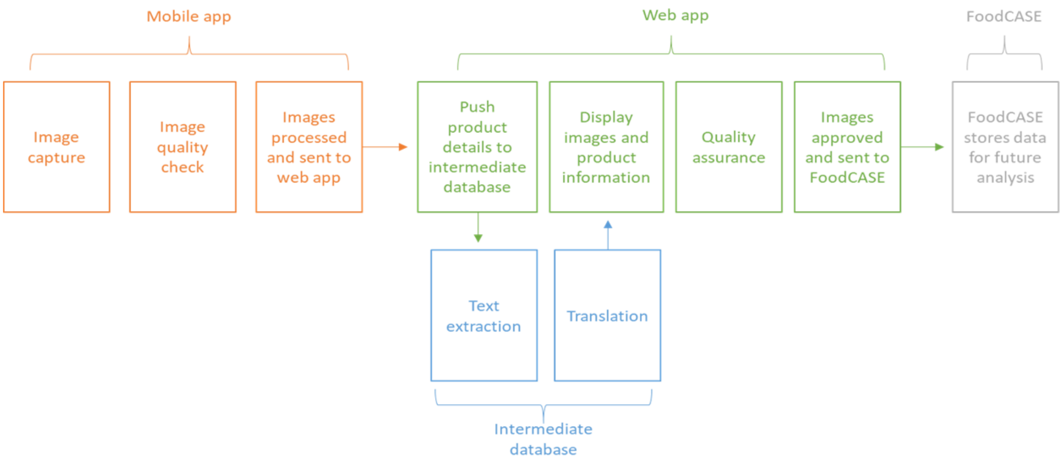
- Sixteen European countries (Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Romania, Slovenia and the United Kingdom).
- Fourteen product categories (sugar-sweetened beverages; sugar-sweetened dairy and dairy imitates; breakfast cereals; bread and bread products; confectionary; cakes and biscuits; ready meals and soups; savoury snacks and crisps; sauces and condiments; sugar-sweetened desserts, ice cream; canned fruits and vegetables; meat and fish products; cheeses; and energy drinks and sport drinks).

The approach and detailed methodology for this task involved the following component activities.

<u>Development of tools for data collection and storage</u>

The development of tools for data collection and storage relied on the use of an existing database tool (FoodCASE) and the development of a mobile app, web app and intermediate database to support the data collection process.

Rather than capture and enter data manually, the approach deployed an innovative technological solution to automate the capture of product information.



<u>Definition of the sample</u>

Market research data was used to define a sample that:

- Covers at least 50% of the market share in each country.

- Provides a representative baseline within each country for the evaluation of nutritional composition.

Product information/data was collected primarily within supermarkets to ensure the comprehensive coverage of selected subcategories.

Additional steps as part of the definition of the sample included:

- Defining the product subcategories – the starting point was the nomenclature used in the JANPA study ('Oqali') which was then amended to reflect the pan-European nature of the study and improvements to Oqali since JANPA.
- Selecting the product subcategories to be covered in the study – the subcategories selected for the sample were those that, together, constituted a minimum 50% of the market share for that product category.
- Selecting sample retailers – locations for data collection were chosen for each country based on retailer market share information.

Data collection

The data collection task involved several key steps:

- Negotiating with retailers – retailers in each country were approached to determine whether they could share existing product information or whether they would grant the study team access to one of their stores for data collection.
- Recruiting/training fieldworkers – fieldworkers were recruited before being trained and onboarded for use of the phone app to collect data.
- Collecting data – this was primarily done via visits to retailers, but in some cases because of Covid-19 (which restricted access to some supermarkets in some countries), the products had to be purchased from retailers, and in two cases retailers provided partial/full data.

Data cleaning and quality assurance

The next step in the methodology involved extracting accurate information from the photos taken during the data collection task so that it can be entered into the database of food composition data. The task therefore involved entry of the data and verification that the data was accurate.

The process for conducting checks involved adherence to several sequential and consistent steps outlined in a data cleaning and quality assurance protocol, a copy of which can be found in an annex to this report.

Data reclassification

The Terms of Reference (ToR) for this study specified that "*The methods used for this data collection shall be based on the methodology being developed and tested by JANPA and respective lessons learned*." In practice, this meant that this study should use a product nomenclature/categorisation that was consistent with that used for JANPA, which was the Oqali nomenclature.

In practice, Oqali was amended to reflect the pan-European nature of the study and improvements to Oqali since JANPA. It was agreed that the Best ReMaP nomenclature – which constitutes an 'amended Oqali' – was the most appropriate nomenclature to classify the EUREMO data against.

This nomenclature was the 'endpoint' to focus on (in terms of data analysis and reporting), but data collection involved different nomenclature. In terms of the nomenclature used for the collection of data:

- Global Data product categories/subcategories were used to identify which product subcategories in a given country represented at least 50% of sales in a given product category.
- Global Data product categories/subcategories were then mapped to a more detailed set of EUREMO product categories/subcategories (to guide fieldwork in practice and how fieldworkers should categorise products).
- These EUREMO product categories/subcategories were then mapped to the Oqali product categories/ subcategories and a set of Oqali amended product categories/subcategories.

In terms of the nomenclature used for analysing and reporting the data:

- EUREMO product categories/subcategories were mapped to the Best ReMaP nomenclature.
- Data were then reclassified based on: (a) a manual reclassification process (for more complex data); and (b) an automated reclassification process (for less complex data) based on rules/procedures

<u>Data analysis</u>

Descriptive data analysis was undertaken to provide an overview of the dataset for the benefit of stakeholders in individual countries and at a European level.

Additional analysis was conducted to compare food composition of same brand products (identical brand; identical packaging) to identify and assess the scale of any dual quality issues within the sample of products and across the countries covered. Further, weighted analysis was undertaken to observe whether and to what extent mean values of nutrient content per product group and category in each country varied once the data were adjusted to reflect purchasing and consumption habits.

The (non-exhaustive) analysis focuses on comparing minimum/maximum/ mean/median values for 'nutrients of concern/interest' across product categories and countries. These nutrients of concern/interest are based on available nutritional data across the product categories, as well as previous data categorisation and collection efforts for common nutritional references (including national initiatives and the 2017 report by the Joint Action on Nutrition and Physical Activity (JANPA)).

Support to national public bodies

The support to individual countries was given through three main instruments.

<u>Mapping of reformulation activities</u>

The purpose of the mapping exercise was to provide an updated view of existing reformulation initiatives implemented by competent authorities in individual countries.

This exercise involved preparing a data collection template and conducting desk research to compile the relevant information for policies in all European countries. An online survey was then undertaken with national competent authorities to provide inputs into the mapping exercise and to collect expressions of interest to participate in activities under this task.

Data collected from the survey and the desk research were triangulated and assessed for completeness. Where gaps in information were identified, follow-up questions and clarifications were directed to national competent authority contacts, and additional desk research was carried out. Synthesis and reporting were then carried out to produce a mapping of national reformulation activities report.

<u>Workshops and Twinning Actions</u>

The purpose of this task was to organise Workshops and Twinning Actions aimed at supporting the implementation of reformulation initiatives in individual countries. They aimed at helping officials from four different countries to improve their understanding of the challenges and benefits associated with reformulation initiatives by learning from the experiences of others.

Workshops were targeted at those countries that had little experience in reformulation initiatives, but who had the capacity to organise and pursue national initiatives, and who expressed their interest in participating to this type of activity.

Twinning Actions were targeted at countries who appeared to benefit from learning about an initiative undertaken elsewhere, either because they were planning a similar initiative or because they faced similar challenges. The selection of countries was also done based on the interest expressed in participating to this type of activity (and collected through the aforementioned survey).

<u>Scientific and technical support networks</u>

The study provided two countries with tailored support in view of supporting their national ongoing/planned reformulation initiatives. The support was adapted to the specific needs of the national authorities.

Interest to participate in these activities was expressed by a total of 14 countries (Austria, Belgium, Bulgaria, Croatia, Cyprus, Denmark, Estonia, Greece, Hungary, Malta, Poland, Romania, Slovenia and Spain). This information was gathered through the survey and complemented by follow-up interviews. In the interview process, two countries withdrew interest (Cyprus and Denmark).

Methodological challenges

Several methodological challenges were encountered throughout the life of the study, almost all of which were directly related to the impact of Covid-19. Specifically, the tasks associated with data cleaning, quality assurance, analysis and reporting took considerably longer than anticipated and, in some cases, required a change in methodological approach to achieve the desired outcome.

The impact of Covid-19 on this contract can be summarised as follows:

- Shortages of certain products on supermarket shelves, which led to repeated visits to supermarkets over a longer time period and subsequent delays.
- Temporary or permanent revocation of access permissions for supermarkets, which created further delays to completion and, in some cases, a change in approach (i.e. online purchasing).
- An unforeseen and unanticipated level of turnover among fieldworkers given the uncertainty associated with the volume and timing of fieldwork.
- Unforeseen and unanticipated problems with the reliability and functionality of the phone apps (partly related to multiple operating system updates over a longer period of time than was anticipated).

In addition to the impact of Covid-19 on the nature and timing of the study’s methodological approach, there were other challenges faced in relation to the reclassification of data and the subsequent uploading of data into FoodCASE which are described within this report.

Results

Monitoring system

The monitoring system database contains 46,695 products. Primary data was collected for approximately 34,000 individual products across the 15 countries in the sample. Data for approximately 13,000 additional individual products was added for France which was sourced directly from the Oqali database.

Extensive data and statistical information on the composition of the monitoring system database can be found in Section 3 of this report.

The results of the data analysis are presented in Section 4 of this report. Not all product categories are analysed given the overall size of the dataset and the desire to limit the overall length and volume of analysis presented herein. Selection of the above product categories was based on their alignment with the five priority groups of Best-ReMaP (bread products; fresh dairy products; delicatessen meat; soft drinks; and breakfast cereals) as well as their relevance for consumption based on the product basket of the Joint Research Centre's consumer footprint.

The analysis of the food composition data includes an assessment of the distribution of nutritional content across Europe as well as comparative assessments of the nutrient content of the categories as well as selected products.

Support to national public bodies

A workshop was held in Greece, for which the discussion focused on technical aspects requiring government support for the Greek food industry to reformulate products, especially SMEs. Examples of approaches and possible solution were presented in the workshop, to support SMEs.

A Twinning Action was organised between Malta and France to discuss effective strategies for achieving reformulation for salt, sugar and fat, especially within small- and medium-size enterprises and local food producers.

Finally, scientific and technical support networks were established in Slovenia and Romania. In Slovenia, the topics discussed were: current reformulation strategies and potential adaptations to food reformulation, opportunities and obstacles encountered, and definition of national targets. The conclusion was that Slovenia needs to develop a strategy that is focused and is tailored to the national context. In Romania, two meetings were held. The first meeting focused on understanding the needs of Romania and exploring basic design principles behind developing a national reformulation plan for the country. The second meeting focused on cooperation with SMEs in reformulation with a view to providing the Romanian authorities with tools and knowledge on how reformulation with SMEs has worked in other countries and what were the challenges.

Conclusions and recommendations

An important aspect of the study is to present conclusions and recommendations surrounding the sustainability of a European food monitoring system, including how and under what conditions the EUREMO database could be updated, and the baseline methodology replicated, in future.

Concluding remarks

The EUREMO study piloted a monitoring system which involved developing and deploying an innovative approach to gathering nutritional information and data on almost 47,000 products consumed by European citizens. Such a monitoring system could be replicated in future to provide an ongoing approach for tracking reformulation initiatives for salt, sugars and fat over time.

The Best-ReMaP Joint Action will build on EUREMO by sharing and promoting best practice on implementing a standardised European monitoring system for processed food reformulation. Part of this involves supporting individual countries to monitor the impact of food reformulation initiatives over time, as well as creating a food information database to monitor the impact of food reformulation. The data collected by EUREMO – and later those collected by Best ReMaP – will be reposited at FABLE (Food And Beverages Labels Explorer), that is being developed by the Joint Research

Centre of the European Commission. This will ensure and maximise access to and usability of the data by policy makers, researchers and the public.

Despite the EUREMO study's use of innovative methodological tools and techniques (including the development and use of software applications and data science techniques for automating otherwise manual processes), the underlying principle of gathering data on food and drink products through fieldwork will always involve certain inefficiencies. Such inefficiencies could be overcome through the development of a monitoring system which compels or incentivises European retailers to provide product information directly in a consistent format to allow comparisons of nutritional content across products and countries over time as part of a comprehensive monitoring approach to reformulation initiatives.

Recommendations for a future monitoring system

Based on the above reflections regarding the relative merits of the EUREMO approach, including the challenges faced and the extent to which these were associated with the extraordinary and unanticipated impacts of the Covid-19 pandemic, the study presents the following recommendations for how a future monitoring system could look, including the extent to which the EUREMO methodological approach should or could be retained for future exercises:

- <u>Recommendation 1</u>: where it is impractical or unfeasible to gather widespread data and information for all processed food and drink products available for purchase, a sampling approach should be used based on consumption data to ensure that a future monitoring system focuses on the most highly consumed products for which reformulation initiatives have the potential to make the greatest impact on health outcomes.
- <u>Recommendation 2</u>: a future monitoring system should include a mapping exercise to link the format/nomenclature of the resulting dataset with previous exercises (JANPA, EUREMO). This will facilitate comparisons of nutrient values over time when monitoring the impact of reformulation initiatives on nutrient values. Such a mapping exercise should also ensure a direct link between the nomenclature of the final/resulting dataset and the data used as an input to the exercise to guide any sampling approach taken (as relevant).
- <u>Recommendation 3</u>: undertake further exploratory work to assess the feasibility and relative merits of alternative data collection approaches, including web scraping and encouraging/mandating retailers to provide such data directly to national competent authorities. This would likely improve the efficiency with which data are collected as part of a future monitoring system compared to the data collection approaches deployed under EUREMO (involving fieldwork).
- <u>Recommendation 4</u>: if a future monitoring system relies on data provided directly by retailers, an agreement should be reached on a consistent approach to data cleaning and quality assurance by the retailers themselves prior to submission. Should a future monitoring system instead rely on the collection of data from retailers through fieldwork, a transparent and comprehensive quality assurance system which draws on data science techniques should be developed and deployed to ensure the accuracy and quality of the final dataset.

Résumé

Ce rapport présente les résultats d'une étude commandée par l'Agence exécutive pour la santé et le numérique (HaDEA) de la Commission européenne pour tester la faisabilité d'un système européen de suivi des initiatives de reformulation pour le sel, les sucres et les matières grasses.

Contexte

Les initiatives de reformulation des aliments ont un rôle déterminant à jouer dans l'amélioration des résultats en matière de santé publique. Ils impliquent la modification des aliments manufacturés pour améliorer leur valeur nutritionnelle en réduisant la présence d'ingrédients nocifs, notamment le sel, le sucre et les graisses saturées. Des environnements alimentaires sains ont été identifiés comme un élément clé dans la prévention de l'obésité qui, malgré les efforts nationaux et paneuropéens, continue d'être un défi de santé publique important.

Dans ce contexte, les pays européens ont exploré et mis en œuvre différentes politiques de reformulation, à la fois obligatoires et facultatives, pour encourager les fabricants de produits alimentaires à reformuler leurs produits. Les preuves suggèrent qu'il existe encore des variations dans les approches et que certains pays ont actuellement plus de succès - ou des politiques plus concrètes - que d'autres pour lutter contre une teneur trop élevée en certains nutriments dans les produits alimentaires. La reformulation n'a pas été un processus simple dans certains pays, en raison de difficultés techniques, économiques, juridiques et culturelles. Le principal défi pour les fabricants et les autres maillons de la chaine industrielle est d'éviter le rejet par les consommateurs de produits reformulés aux saveurs ou textures ayant pu être considérablement modifiées. La législation relative aux produits alimentaires peut présenter un défi pour les stratégies de reformulation de certains secteurs industriels, mais pourrait également être considérée comme une opportunité pour créer des conditions de concurrence équitables et empêcher une réception négative par les consommateurs.

Le suivi des activités de reformulation est un élément important pour changer l'environnement alimentaire obésogène actuel et en créer un plus sain en réduisant la présence de nutriments nocifs dans les aliments et les boissons transformés. Cependant, le suivi de leur efficacité et de leurs progrès est un défi en raison de ressources limitées et des différences entre les bases de données sur la composition nutritionnelle étant disponibles. Surmonter ces contraintes en créant un système de suivi durable et reproductible est essentiel pour évaluer l'efficacité des activités de reformulation.

Un premier projet pilote mené par l'Action conjointe européenne sur la nutrition et l'activité physique (JANPA), qui a développé un système de suivi dans trois pays européens (France, Autriche et Roumanie) a démontré qu'un système de suivi durable et efficace à l'échelle européenne peut être mis en œuvre avec des ressources financières limitées.

Objectifs

Les objectifs de cette étude EUREMO (en anglais, 'EU REformulation Monitoring' (EUREMO): Étude de faisabilité d'un système de suivi des initiatives de reformulation pour le sel, les sucres et les matières grasses) sont doubles:

- Objectif 1 – **Développer et tester un système de suivi** pour évaluer l'impact des initiatives de reformulation sur le sel, le sucre et les matières grasses.
  - Recueillir systématiquement des informations nutritionnelles sur les produits alimentaires et les boissons transformés disponibles à l'achat par le grand public dans certains pays européens et enregistrer les résultats dans une base de données interopérable.

- Objectif 2 – **Appuyer les autorités publiques nationales** pour mettre en œuvre des initiatives de reformulation.
  - Des ateliers pour les pays qui ont peu d'expérience dans les initiatives de reformulation, mais qui ont la capacité d'organiser et de maintenir des initiatives nationales.
  - Actions de jumelage pour les pays qui peuvent bénéficier de l'apprentissage d'une initiative dans un autre pays, soit parce qu'ils planifient une initiative similaire, soit parce qu'ils sont confrontés à des défis similaires.
  - Appui scientifique et technique pour aider les pays à esquisser ou à mettre en œuvre des initiatives de reformulation.

Portée et méthode du projet

L'étude impliquait deux tâches distinctes mais interdépendantes, alignées sur les objectifs de l'étude ci-dessus et exécutées en parallèle.

Système de suivi

Le développement d'un système de suivi a impliqué la création d'une base de données sur la composition nutritionnelle, avec des informations sur les produits alimentaires et les boissons transformés collectées dans les pays européens et pouvant être utilisées comme un outil pour suivre l'efficacité des initiatives de reformulation mises en œuvre sur la composition des produits.

Le système de suivi couvre les pays et catégories de produits sélectionnés suivants:

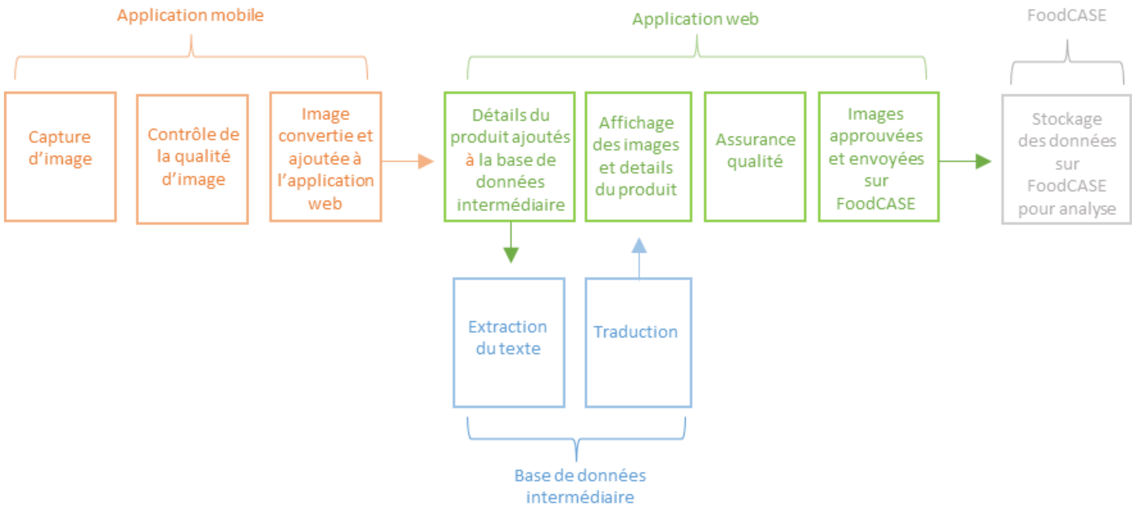
- Seize pays européens (Autriche, Belgique, Bulgarie, Danemark, Estonie, Finlande, France, Grèce, Hongrie, Italie, Lituanie, Malte, Portugal, Roumanie, Slovénie et Royaume-Uni).
- Quatorze catégories de produits (boissons sucrées; produits laitiers sucrés et imitations de produits laitiers; céréales pour petit-déjeuner; pain et produits de boulangerie; confiserie; gâteaux et biscuits; plats cuisinés et soupes; snacks salés et chips; sauces et condiments; desserts sucrés, glaces; fruits et légumes en conserve; produits à base de viande et de poisson; fromages; boissons énergisantes et boissons sportives).

L'approche et la méthodologie détaillée de cette tâche impliquaient les activités suivantes.

<u>Développement d'outils de collecte et de stockage de données</u>

Le développement d'outils de collecte et de stockage de données s'est appuyé sur l'utilisation d'un outil de base de données existant (FoodCASE) et le développement d'une application mobile, d'une application Web et d'une base de données intermédiaire pour soutenir le processus de collecte de données.

Plutôt que d’enregistrer et de saisir manuellement les données, l'approche a déployé une solution technologique innovante pour automatiser la capture des informations sur les produits.



Définition de l'échantillon

Les données de l'étude de marché ont été utilisées pour définir un échantillon:

- Couvrant au moins 50% des parts de marché dans chaque pays.
- Fournissant une référence représentative dans chaque pays pour l'évaluation de la composition nutritionnelle.

Les informations/données sur les produits ont été collectées principalement dans des supermarchés pour assurer la couverture complète des sous-catégories sélectionnées.

Les étapes supplémentaires dans le cadre de la définition de l'échantillon comprenaient:

- La définition des sous-catégories de produits – le point de départ était la nomenclature utilisée dans l'étude JANPA ("Oqali") qui a ensuite été modifiée pour refléter la nature paneuropéenne de l'étude et les améliorations apportées à Oqali depuis JANPA.
- La sélection des sous-catégories de produits à couvrir dans l'étude – les sous-catégories sélectionnées pour l'échantillon étaient celles qui, ensemble, constituaient au moins 50% des parts de marché pour cette catégorie de produits.
- La sélection d'échantillons de détaillants – les lieux de collecte des données ont été choisis pour chaque pays en fonction des informations sur les parts de marché des détaillants.

Collecte de données

La tâche de collecte de données comportait plusieurs étapes clés:

- La négociation avec les détaillants – les détaillants de chaque pays ont été approchés pour déterminer s'ils pouvaient partager les informations existantes sur les produits ou s'ils accorderaient à l'équipe de l'étude l'accès à l'un de leurs magasins pour la collecte de données.
- Le recrutement/la formation des agents de terrain – les agents de terrain ont été recrutés avant d'être formés et intégrés pour l'utilisation de l'application mobile pour collecter des données.
- La collecte de données – principalement via des visites chez les détaillants, mais dans certains cas à cause du Covid-19 (qui a restreint l'accès à certains supermarchés dans certains pays), les produits ont dû être achetés auprès de

détaillants, et dans deux cas, les détaillants ont fourni des données partiales ou complètes.

<u>Nettoyage des données et assurance qualité</u>

L'étape suivante de la méthodologie consistait à extraire des informations précises des photos prises lors de la tâche de collecte de données afin qu'elles puissent être entrées dans la base de données sur la composition des aliments. La tâche impliquait donc la saisie des données et la vérification de l'exactitude de ces données.

Le processus de réalisation des contrôles impliquait le respect de plusieurs étapes séquentielles et cohérentes décrites dans un protocole de nettoyage des données et d'assurance qualité, dont une copie se trouve en annexe au présent rapport.

<u>Reclassification des données</u>

Les termes de référence (ToR) de cette étude spécifiaient que "*les méthodes utilisées pour cette collecte de données doivent être basées sur la méthodologie développée et testée par JANPA et les enseignements respectifs*". En pratique, cela signifiait que cette étude devait utiliser une nomenclature/catégorisation de produits cohérente avec celle utilisée pour JANPA, à savoir la nomenclature Oqali.

Dans la pratique, Oqali a été modifié pour refléter la nature paneuropéenne de l'étude et les améliorations apportées à Oqali depuis JANPA. Il a été convenu que la nomenclature Best ReMaP – qui constitue un 'Oqali modifié' – était la nomenclature la plus appropriée pour classer les données EUREMO.

Cette nomenclature était le 'point final' sur lequel se concentrer (en termes d'analyse de données et de rapport), mais la collecte de données impliquait une nomenclature différente. En ce qui concerne la nomenclature utilisée pour la collecte des données:

- Les catégories/sous-catégories de produits 'Global Data' ont été utilisées pour identifier, dans un pays donné, les sous-catégories de produits qui représentaient au moins 50% des ventes dans une catégorie de produits donnée.
- Les catégories/sous-catégories de produits Global Data ont ensuite été mises en correspondance avec un ensemble plus détaillé de catégories/sous-catégories de produits EUREMO (pour guider le travail de terrain dans la pratique et la manière dont les agents de terrain devaient catégoriser les produits).
- Ces catégories/sous-catégories de produits EUREMO ont ensuite été mises en correspondance avec les catégories/sous-catégories de produits Oqali et un ensemble de catégories/sous-catégories de produits Oqali modifiées.

En termes de nomenclature utilisée pour analyser et rapporter les données:

- Les catégories/sous-catégories de produits EUREMO ont été mises en correspondance avec la nomenclature Best ReMaP.
- Les données ont ensuite été reclassifiées sur la base: (a) d'un processus de reclassification manuel (pour les données plus complexes); et (b) un processus de reclassification automatisé (pour les données moins complexes) basé sur des règles/procédures.

<u>L'analyse des données</u>

Une analyse descriptive des données a été entreprise pour fournir une vue d'ensemble de la base de données, avec pour bénéficiaires les acteurs dans chaque pays et au niveau européen.

Une analyse supplémentaire a été menée pour comparer la composition alimentaire des produits d'une même marque (marque identique; emballage identique) afin d'identifier et d'évaluer l'ampleur de tout problème de double qualité / double standard au sein de l'échantillon de produits et dans les pays couverts. En outre, une analyse pondérée a été menée pour observer si et dans quelle mesure les valeurs moyennes de la teneur en nutriments par groupe et catégorie de produits dans chaque pays variaient une fois les données ajustées pour refléter les habitudes d'achat et de consommation.

L'analyse (non-exhaustive) se concentre sur la comparaison des valeurs minimales/maximales/moyennes/médianes des ‘nutriments d’intérêt / préoccupants’ dans les catégories de produits et les pays couverts. Ces nutriments d'intérêt/préoccupants sont basés sur les données nutritionnelles disponibles dans les catégories de produits, ainsi que sur les efforts antérieurs de catégorisation et de collecte de données pour les références nutritionnelles communes (y compris les initiatives nationales et le rapport de 2017 de l'Action conjointe sur la nutrition et l'activité physique (JANPA)).

Appui aux organismes publics nationaux

Le soutien aux différents pays a été apporté par le biais de trois instruments principaux.

Recensement des activités de reformulation

Le but de l'exercice de recensement était de fournir une vue actualisée des initiatives de reformulation existantes mises en œuvre par les autorités compétentes dans chaque pays.

Cet exercice a impliqué la préparation d'un modèle de collecte de données et la réalisation d'une recherche documentaire pour compiler les informations pertinentes pour les politiques dans tous les États membres. Une enquête en ligne a ensuite été entreprise auprès des autorités nationales compétentes pour apporter des contributions à l'exercice de recensement et pour recueillir les manifestations d'intérêt à participer aux activités relevant de cette tâche.

Les données recueillies à partir de l'enquête et de la recherche documentaire ont été recoupées et évaluées sur leur exhaustivité. Dans le cas où certaines informations ont pu être identifiées comme lacunaires, des questions de suivi et des demandes de clarification ont été adressées aux contacts des autorités nationales compétentes, et des recherches documentaires supplémentaires ont été effectuées. Une synthèse et un compte-rendu ont ensuite été réalisés pour produire un rapport recensant les des activités de reformulation par pays.

Ateliers et actions de jumelage

L'objectif de cette tâche était d'organiser des ateliers et des actions de jumelage visant à appuyer la mise en œuvre d'initiatives de reformulation dans chaque pays. Ils visaient à aider les responsables de quatre pays différents à améliorer leur compréhension des défis et des avantages associés aux initiatives de reformulation en apprenant des expériences de chacun.

Les ateliers étaient destinés aux pays qui avaient peu d'expérience dans les initiatives de reformulation, mais qui avaient la capacité d'organiser et de poursuivre des initiatives nationales, et qui ont exprimé leur intérêt à participer à ce type d'activité.

Les actions de jumelage ciblaient les pays qui semblaient pouvoir bénéficier d'informations sur une initiative entreprise ailleurs, soit parce qu'ils planifiaient une initiative similaire, soit parce qu'ils étaient confrontés à des défis similaires. La sélection des pays a également été faite sur la base de l'intérêt exprimé à participer à ce type d'activité (et collecté via l'enquête susmentionnée).

<u>Réseaux d'appui scientifique et technique</u>

L'étude a fourni à deux pays un appui sur mesure en vue de soutenir leurs initiatives nationales de reformulation en cours/prévues. Le soutien a été adapté aux besoins spécifiques des autorités nationales.

Un total de 14 pays (Autriche, Belgique, Bulgarie, Croatie, Chypre, Danemark, Estonie, Grèce, Hongrie, Malte, Pologne, Roumanie, Slovénie et Espagne) ont manifesté leur intérêt à participer à ces activités. Ces informations ont été recueillies par le biais de l'enquête et complétées par des entretiens de suivi. Lors des entretiens, deux pays ont rétracté leur intérêt (Chypre et Danemark).

Défis méthodologiques

Plusieurs défis méthodologiques ont été rencontrés tout au long de l'étude, dont presque tous étaient directement liés à l'impact du Covid-19. Plus précisément, les tâches associées au nettoyage des données, à l'assurance qualité, à l'analyse et à la production de rapports ont pris beaucoup plus de temps que prévu et, dans certains cas, ont nécessité un changement d'approche méthodologique pour atteindre le résultat souhaité.

L'impact du Covid-19 sur ce contrat peut être résumé ainsi:

- Des pénuries de certains produits dans les rayons des supermarchés, qui ont entraîné des visites répétées dans les supermarchés sur une plus longue période et des retards subséquents.
- La révocation temporaire ou permanente des autorisations d'accès pour les supermarchés, ce qui a entraîné des retards supplémentaires dans l'achèvement et, dans certains cas, un changement d'approche (c'est-à-dire l'achat en ligne).
- Un niveau de roulement imprévu parmi les travailleurs sur le terrain, compte tenu de l'incertitude associée au volume et au temps du travail sur le terrain.
- Des problèmes imprévus quant à la fiabilité et la fonctionnalité des applications mobiles (en partie liés à de multiples mises à jour du système d'exploitation sur une période plus longue que prévue).

En plus de l'impact du Covid-19 sur la nature et le calendrier de l'approche méthodologique de l'étude, d'autres défis ont été rencontrés au sujet de la reclassification des données et du téléchargement ultérieur des données dans FoodCASE, qui sont décrits dans ce rapport.

Résultats

Système de suivi

La base de données du système de suivi contient 46,695 produits. Des données primaires ont été collectées pour environ 34,000 produits individuels dans les 15 pays de l'échantillon. Des données pour environ 13,000 produits individuels supplémentaires ont été ajoutées pour la France, provenant directement de la base de données Oqali.

Des données détaillées et des informations statistiques sur la composition de la base de données du système de suivi sont données en section 3 de ce rapport.

Les résultats de l'analyse des données sont présentés à la section 4 du présent rapport. Toutes les catégories de produits ne sont pas analysées compte tenu de la taille globale de l'ensemble de données et de la volonté de limiter la longueur et le volume de l'analyse présentée ici. La sélection des catégories de produits ci-dessus a été basée sur leur alignement avec les cinq groupes prioritaires de Best-ReMaP (pain; produits laitiers frais; charcuterie; boissons gazeuses; et céréales de petit-déjeuner) ainsi que sur leur pertinence basée sur le panier de produits réalisé par le

Centre commun de recherche dans le cadre de leurs travaux sur l'empreinte des consommateurs.

L'analyse des données sur la composition des aliments comprend une évaluation de la distribution du contenu nutritionnel à travers l'Europe ainsi que des évaluations comparatives du contenu nutritionnel des catégories et des produits sélectionnés.

Appui aux organismes publics nationaux

Un atelier s'est tenu en Grèce, pour lequel la discussion a porté sur les aspects techniques nécessitant un soutien gouvernemental à l'industrie alimentaire grecque pour reformuler les produits, en particulier pour les petites et moyennes entreprises (PME). Des exemples d'approches et de solutions possibles pour soutenir les PME ont été présentés dans l'atelier.

Une action de jumelage a été organisée entre Malte et la France pour discuter de stratégies efficaces pour parvenir à une reformulation du sel, du sucre et des matières grasses, en particulier pour les PME et les producteurs alimentaires locaux.

Enfin, des réseaux de soutien scientifique et technique ont été créés en Slovénie et en Roumanie. En Slovénie, les sujets abordés étaient: les stratégies de reformulation actuelles et les adaptations potentielles à la reformulation des aliments, les opportunités et les obstacles rencontrés, et la définition d'objectifs nationaux. La conclusion était que la Slovénie devait développer une stratégie ciblée et adaptée au contexte national. En Roumanie, deux réunions ont eu lieu. La première réunion s'est concentrée sur la compréhension des besoins de la Roumanie et l'exploration des principes de conception de base pour l'élaboration d'un plan national de reformulation. La deuxième réunion a porté sur la coopération avec les PME dans la reformulation, avec pour objective de fournir aux autorités roumaines des outils et des connaissances sur le fonctionnement de la reformulation avec les PME dans d'autres pays, ainsi que les défis rencontrés.

Conclusions et recommandations

Un aspect important de l'étude consiste à présenter des conclusions et des recommandations sur la durabilité d'un système européen de suivi des produits alimentaires; y compris comment et dans quelles conditions la base de données EUREMO pourrait être mise à jour et la méthodologie de base reproduite à l'avenir.

Remarques finales

L'étude EUREMO a piloté un système de suivi qui impliquait le développement et le déploiement d'une approche innovante de collecte d'informations et de données nutritionnelles sur environ 47 000 produits consommés par les citoyens européens. Un tel système de suivi pourrait être reproduit à l'avenir pour fournir une approche continue de suivi des initiatives de reformulation pour le sel, les sucres et les matières grasses au fil du temps.

Des travaux sont déjà en cours via l'action commune Best-ReMaP pour s'appuyer sur l'étude EUREMO en partageant et en promouvant les meilleures pratiques sur la mise en œuvre d'un système de suivi européen normalisé pour la reformulation des aliments transformés. Ceci inclut notamment d'aider individuellement les pays à suivre l'impact des initiatives de reformulation des aliments dans le suivre, ainsi qu'à créer une base de données d'informations sur les aliments pour surveiller l'impact de la reformulation des aliments. Les données collectées par EUREMO - et plus tard celles collectées par Best ReMaP - seront déposées dans FABLE (Food And Beverages Labels Explorer), qui est développé par le Centre commun de recherche de la Commission européenne. Cela garantira et maximisera l'accès aux données et leur utilisation par les décideurs, les chercheurs et le public.

Malgré l'utilisation par l'étude EUREMO d'outils et de techniques méthodologiques innovants (y compris le développement et l'utilisation d'applications web et de techniques de science des données pour automatiser des processus autrement manuels), le principe sous-jacent de la collecte de données sur les produits alimentaires et les boissons par le biais d'un travail de terrain impliquera toujours certaines inefficacités. Ces inefficacités pourraient être surmontées grâce au développement d'un système de suivi obligeant ou incitant les détaillants européens à fournir directement des informations sur les produits dans un format cohérent pour permettre des comparaisons du contenu nutritionnel entre les produits et les pays au fil du temps, dans le cadre d'une approche de suivi globale des initiatives de reformulation.

Recommandations pour un futur système de suivi

Sur la base des réflexions ci-dessus concernant les mérites relatifs de l'approche EUREMO, y compris les défis rencontrés et la mesure dans laquelle ceux-ci étaient associés aux impacts exceptionnels et imprévus de la pandémie de Covid-19, l'étude présente les recommandations suivantes sur la manière dont un futur système de suivi pourrait être envisagé, y compris la mesure dans laquelle l'approche méthodologique EUREMO devrait ou pourrait être retenue pour les exercices futurs:

- <u>Recommandation 1</u>: lorsqu'il est irréaliste ou impossible de recueillir des données et des informations à grande échelle pour tous les produits alimentaires et boissons transformés disponibles à l'achat, une approche d'échantillonnage doit être utilisée sur la base de données de consommation, pour garantir qu'un futur système de suivi se concentre sur les produits les plus consommés; produits pour lesquels les initiatives de reformulation ont le potentiel d'avoir le plus grand impact en matière de santé.

- <u>Recommandation 2</u>: un futur système de suivi devrait inclure un exercice de recensement pour lier le format/nomenclature de la base de données obtenue avec les exercices précédents (JANPA, EUREMO). Cela facilitera les comparaisons des valeurs nutritives au fil du temps lors du suivi de l'impact des initiatives de reformulation sur les valeurs nutritives. Un tel exercice de recensement devrait également assurer un lien direct entre la nomenclature de la base de données obtenue/finale et les données utilisées pour renseigner l'exercice ayant guidé toute approche d'échantillonnage adoptée (le cas échéant).

- <u>Recommandation 3</u>: des travaux de recherche supplémentaires devraient être entrepris pour évaluer la faisabilité – et les mérites relatifs – d’approches alternatives de collecte de données, y compris le ‘web scraping’ et l’idée d’encourager/d’obliger les détaillants à fournir ces données directement aux autorités nationales compétentes. Cela améliorerait probablement l'efficacité avec laquelle les données sont collectées dans le cadre d'un futur système de suivi par rapport aux approches de collecte de données déployées dans le cadre d'EUREMO (impliquant un travail de terrain avec les détaillants).

- <u>Recommandation 4</u>: dans le cas où un futur système de suivi s'appuierait sur des données fournies directement par les détaillants, un accord devrait être conclu sur une approche cohérente du nettoyage des données et d'assurance qualité par les détaillants eux-mêmes avant la soumission de ces données. Si un futur système de suivi devait plutôt reposer sur la collecte de données auprès des détaillants par le biais d'un travail de terrain, un système d'assurance qualité transparent et complet s’appuyant sur des techniques de science des données devrait être développé et déployé pour garantir l'exactitude et la qualité de la base de données finale.

1. Introduction

This is the Final Report for the 'Feasibility study for a monitoring system on reformulation initiatives for salt, sugars and fat' as contracted by the European Commission via the European Health and Digital Executive Agency (HaDEA).

This introductory section describes the background to, and context for, the study before discussing the rationale for undertaking this study. It finishes by describing the structure for the rest of this report.

1.1 Policy context on food reformulation in Europe

European countries have explored and implemented different reformulation policies, both **mandatory** and **voluntary**, to encourage food manufacturers to reformulate their products. The term "reformulation" entails the modification of manufactured foods to improve their nutritional value. This can be achieved either by removing specific harmful ingredients entirely (e.g. partially hydrogenated fats or trans fats) or reducing the quantities of others (notably salt, sugar, and saturated fat).

Reformulation initiatives are designed to reduce consumption of harmful ingredients (salt, sugar, fat) and, therefore, reduce associated incidences of illness and disease. The World Health Organisation (WHO) has recommended salt reduction, for example, as one of the most cost-effective mechanisms for preventing non-communicable diseases (NCDs)[1]. In this context, reformulation initiatives can have a positive impact on progress towards the United Nation's (UN's) Agenda for Sustainable Development and associated Sustainable Development Goals (SDGs). This is particularly relevant for SDG Goal 3 on 'Good Health and Well-being' and its targets surrounding reductions in premature mortality from non-communicable diseases[2]. In addition, food reformulation initiatives support the implementation of the EU's Farm to Fork Strategy and, specifically, accelerating Europe's transition to a more sustainable food system which ensures access to nutritious food. The Strategy cited the reformulation of food products as an area where the Commission would be seeking commitments from food companies and organisations to promote healthy, sustainable diets[3]. Finally, food reformulation has a role to play in helping to prevent cancer. Europe's Beating Cancer Plan[4] identifies reformulation initiatives as an important part of the solution to the problem of unhealthy diets, obesity and physical inactivity linked to the prevention of cancer.

The EU and individual countries remain committed to reformulation to tackle obesity and non-communicable diseases.

Certain **mandatory** actions have been implemented at EU level through EU legislation. Regulation (EU) No 1169/2011[5] on the provision of food information to consumers, applicable since December 2016, requires the mandatory declaration of the salt content and other nutrients in prepacked foods. And in April 2019 a

[1] Better food and nutrition in Europe: a progress report monitoring policy implementation in the WHO European Region: http://www.euro.who.int/__data/assets/pdf_file/0005/355973/ENP_eng.pdf?ua=1

[2] https://www.un.org/sustainabledevelopment/health/

[3] Farm to Fork Strategy: For a fair, healthy and environmentally-friendly food system, https://ec.europa.eu/food/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf

[4] Communication from the Commission to the European Parliament and the Council: Europe's Beating Cancer Plan, https://eur-lex.europa.eu/resource.html?uri=cellar:8dec84ce-66df-11eb-aeb5-01aa75ed71a1.0002.02/DOC_1&format=PDF.

[5] Regulation on the provision of health information to consumers: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:304:0018:0063:EN:PDF

regulation was adopted setting a 2% legal limit on the amount of industrial trans fats in the total fat content of processed food[6].

Other EU actions take a **voluntary** approach. One of the main foundations for the development of voluntary reformulation approaches across the EU was the 2007 White Paper: A Strategy for Europe on Nutrition, Overweight and Obesity[7]. Among the initiatives foreseen within the White Paper was a proposal to explore the potential to use food reformulation initiatives to reduce levels of 'nutrients of concern/interest' (such as fat, saturated and trans fats, salt and sugar) over time. Following publication of the White Paper, discussions were held within the EU High-Level Group (HLG)[8] regarding the reduction of salt. As a result, in 2008, the EU Framework for National Salt Initiatives was developed which established a common vision for a European approach towards salt reduction through reformulation[9]. In 2011, the HLG agreed to build on this initiative by establishing the EU Framework for National Initiatives on Selected Nutrients which resulted in the EU Framework for National Initiatives on Fats and Energy with a focus on reduced consumption of fats and sugars[10].

Subsequently, there have been several initiatives, in addition to the European Joint Action on Nutrition and Physical Activity's (JANPA, 2015-2017) work programme[11], relating to monitoring and sharing of reformulation best practice in which Member States have been involved. Furthermore, the Council Conclusions on Food Product Improvement in 2016 called for Member States to have national reformulation plans by 2017.

These framework agreements are voluntary. They are meant to help Member States to implement and evaluate reformulation initiatives and product improvement at National Level. However, Member States can and do establish other priorities for reformulation in different food groups, which reflect national specificities, culture and other public health reasons.

Current documentation and results suggest that there is still variation in approaches and that some European countries are currently more successful – or have more concrete policies – than others for tackling the high content of some nutrients in food. It is evident that reformulation has not been a straightforward process in some European countries due to technical, economic, legal and cultural difficulties. The main challenge for manufacturers and other elements of the industry is avoiding consumer rejection of reformulated products which could result from significantly altered flavours or textures. Legislation relating to food products can present a challenge to reformulation strategies for some industries but could be also seen as an opportunity to create a level playing field and prevent consumer backlash.

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[6] Commission Regulation amending Annex III to Regulation (EC) No 1925/2006 of the European Parliament and of the Council as regards trans fat, other than trans fat naturally occurring in fat of animal origin.

[7] Strategy on nutrition, overweight and obesity-related health issues (europa.eu) (https://ec.europa.eu/health/nutrition-and-physical-activity/overview/strategy-nutrition-overweight-and-obesity-related-health-issues_en).

[8] The EU High Level Group (HLG) on nutrition and physical activity is a group of European government representatives led by the European Commission (see: EU Framework for National Initiatives on Selected Nutrients, https://ehnheart.org/projects/974:eu-framework-for-national-initiatives-on-selected-nutrients.html?msclkid=8775b743cd3011ecab158520e47f1da6).

[9] EU Framework for National Salt Initiatives (https://ec.europa.eu/health/ph_determinants/life_style/nutrition/documents/salt_initiative.pdf).

[10] EU Framework for National Initiatives on Selected Nutrients, file:///C:/Users/29668/Downloads/euframework_national_nutrients_en_0.pdf.

[11] Based on the French OQALI (Observatoire de la Qualité de l'ALImentation / Observatory of Food Quality) system, the Joint Action defined and piloted in three Member States (AT, FR, RO) an effective and inexpensive monitoring methodology for food reformulation, which enabled comparisons of the nutritional content of food and beverages within and between countries.

1.2 The rationale for this study

Monitoring reformulation activities is an important element for changing the current obesogenic food environment and creating a healthier one by reducing the presence of harmful ingredients in processed foods and drinks. Healthy food environments have been identified as a key component in preventing obesity, which despite national and EU efforts continues to be a significant public health challenge. As part of these efforts, reformulation initiatives have been implemented in several European countries.

However, monitoring their effectiveness and progress is a challenge due to resource constraints and differences between available nutrition composition databases. Overcoming these constraints by creating a sustainable and transferable monitoring system is key to assess the effectiveness of reformulation activities.

An initial pilot test carried out by JANPA which developed a monitoring system in three European countries (FR, AT, RO) demonstrated that a sustainable and efficient EU-wide monitoring system may be possible to implement with limited financial resources (see box below).

European Joint Action on Nutrition and Physical Activity (JANPA)

The Joint Action across Europe on Nutrition and Physical Activity (JANPA) was implemented over the period 2015-2017 and sought to contribute to halting the rise of overweight – and obesity in – children and adolescents in EU Member States by 2020.

JANPA was originally proposed by the HLG and was expected to make a direct contribution to the EU Action Plan on Childhood Obesity 2014-2020.

Work package 5 (WP5) of JANPA focused on the gathering and use of nutritional information on foods. It was led by the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) given that France had deployed a monitoring tool to track the nutritional composition of different food products at the brand level.

WP5 included a pilot study which was implemented in two countries (Austria and Romania) with two categories of products widely consumed by children: breakfast cereals and non-alcoholic beverages. The objectives were to collect nutritional information on food products sold in shops and present comparisons between countries, by testing the French "OQALI" approach used since 2008 (for monitoring changes in the supply of processed foods available on the French market).

The study demonstrated that the methodology used in OQALI was adaptable to other European countries with minor modifications.

Following the completion of JANPA in 2017, the European Commission issued a call for tenders on reformulation with the intention to develop a reformulation monitoring tool, harmonised at European level. On the basis of the OQALI/JANPA model, it was anticipated that products could be closely monitored by collecting all of the nutrition information shown on their packaging (nutritional values, ingredients, serving sizes, claims, labels, logos, etc.). As a result of this call for tenders, this EUREMO study was commissioned.

Source: European Joint Action on Nutrition and Physical Activity JANPA (https://www.anses.fr/en/content/european-joint-action-nutrition-and-physical-activity-janpa).

The purpose of this EUREMO study is to build upon the JANPA work and increase its scale and scope to pilot an economical and comprehensive monitoring system that can be used and replicated by European countries' competent authorities.

The development of a monitoring system involved creating a nutrition composition database with information on processed food and drink products collected across European countries which can be used as a tool to monitor the effectiveness of implemented reformulation initiatives on product composition. At the same time the monitoring system will be used as a tool to compare products between European countries and identify potential issues of dual quality in products sold under the same branding and packaging across European countries, which has increasingly become a contentious issue in the EU.

Considering the policy context presented above, the rationale for this project is to test an EU-wide monitoring system of reformulation initiatives and evaluate its feasibility in terms of efficiency and cost-effectiveness. The study is intended to support European countries to successfully implement reformulation activities on salt, sugars and fat. To achieve this aim, ICF was commissioned by HaDEA to develop a monitoring process for reformulation initiatives through the development of a dataset of nutritional information on processed food and drink products available for purchase by the public in European countries.

The data collected by EUREMO will be reposited at FABLE (Food And Beverages Labels Explorer), that is being developed by the Joint Research Centre of the European Commission. This will ensure and maximise access to and usability of the data by policy makers, researchers and the public.

In parallel with this study, the 'Best-ReMaP' initiative will build on both EUREMO and JANPA by sharing and promoting best practice on implementing a standardised European monitoring system for processed food reformulation (see box below)[12].

Best-ReMaP

Best-ReMaP is a Europe-wide Joint Action involving several elements over the period 2020-2023 designed to improve the quality of food supplied across Europe.

In relation to food reformulation and associated monitoring, Best-ReMaP will:

- assist Member States to produce a snapshot of food currently offered to consumers at national markets and with this food snapshot methodology offer an opportunity to monitor the impact of national regulations aimed at decreasing the salt, sugar and fat contents of processed food; and
- create a Food Information Database to ensure the sustainability of data collection on food reformulation (i.e. changing and regulating the food composition that can be offered on the market) at the EU and national levels and of monitoring trends in food reformulation.

Work package 5 (WP5) of Best-ReMaP is focused on processed food monitoring and reformulation. Under WP5, Best-ReMaP will:

- Develop guidelines on processed food supply and reformulation monitoring:
    - Five processed food categories have been selected for monitoring by assessing the contribution of different food groups to nutrient intakes (fat, saturated fat, sugars, salt). Best-ReMaP seeks to improve the efficiency and sustainability of monitoring efforts by exploring new sources of data and new technologies.
    - Develop technical guidelines for monitoring the processed food supply and reformulation.

[12] Best-ReMaP (https://bestremap.eu/aboutus/)

- Launch a European branded food database. Best-ReMaP aims to establish a sustainable European system to facilitate and monitor processed food reformulation.
- Implement snapshots of available food products. Based on the Oqali methodology, Best-ReMaP will seek to collect and standardise the nutritional information (i.e. composition, ingredients and portion size) of processed foods, provided on food labels. At a later point and using the same methodology, Best-ReMaP will collect nutritional data provided on food labels of processed foods and analyse trends by comparing data with the first snapshot.
- Promote food reformulation. Best-ReMaP will assess differences in nutritional content over time and identify reformulation best practices.

Source: Best-ReMaP (https://bestremap.eu/aboutus/).

The remainder of this report describes the approach to the study and presents the findings and outputs from all study tasks, before drawing conclusions regarding the feasibility and sustainability of continuing with such a monitoring system.

1.3 Structure of this report

This report is structured as follows:

- Section 2 summarises the main aspects of the study methodology.
- Section 3 introduces the food composition database.
- Section 4 presents the analysis of food composition data;
- Section 5 summarises the public health impact analysis;
- Section 6 presents the mapping of national reformulation initiatives;
- Section 7 describes the workshops and twinning actions;
- Section 8 describes the scientific and technical support networks; and
- Section 9 presents study conclusions.

Supporting material is presented in annexes.

2. Study methodology

This section provides a summary of the study methodology, covering both main tasks of the study:

- **Develop and test a monitoring process** for assessing the impact of reformulation initiatives on salt, sugar and fat by collecting primary data on the composition and nutritional information on processed food and drink products available for purchase by the general public in 16 European countries.
- **Provide support to European countries' public authorities** to implement reformulation initiatives by organising workshops, twinning actions and scientific and technical support to reformulation initiatives.

This section describes the methodological approach to both tasks, before discussing methodological challenges and limitations.

2.1 Pilot test of monitoring system for reformulation initiatives

This task involved conducting a pilot test of a monitoring system for reformulation initiatives. This task was structured into three sub-tasks:

- The collection of nutritional information on food products and the construction of a dataset covering all relevant product categories, as well as descriptive analysis of the data collected and identification of differences in food composition for same brand products.
- The collection of information on the market share of food products. This task was tightly articulated to the first task above and helped to define the sampling strategy for the collection of food composition data.
- The in-depth analysis of the dataset from the first task above. This was the main analytical task of the project and delivered estimates of the public health impact of implementing the three annexes to the EU framework for national initiatives on selected nutrients.

The methodological approach for each of these sub-tasks is presented below.

2.1.1 Collection of nutritional information on food products

The data collection task sought to produce a snapshot of food composition information for products available to consumers at supermarkets and retail stores in at least 16 countries (as listed in the study Terms of Reference (ToR)).

The approach and detailed methodology for this task involved the following component activities:

- development of tools for data collection and storage;
- definition of the sample;
- data collection; and
- data entry, cleaning and quality control.

These are described in turn below.

2.1.1.1 Development of tools for data collection and storage

This task involved developing a set of tools to enable the collection and storage of data from mandatory nutrition declarations, ingredients lists and voluntary declarations on food packaging. Tools were designed to allow for rapid and efficient data collection and to enable the platform used for storing data to support the detailed and effective monitoring of reformulation initiatives.

Our approach to the development of tools for data collection relied on the use of an existing database tool (FoodCASE) and the development of a mobile app, web app and intermediate database to support the data collection process.

FoodCASE

All data collected is being imported into FoodCASE[13], an existing database application that is designed specifically for the storage and analysis of food composition data. In this project, one FoodCASE installation is being used so that all data are stored centrally and harmonised in a single tool, which provides several classification and export functionalities. The Commission will be provided with access to FoodCASE to provide visibility on the outputs.

FoodCASE follows the EuroFIR standard on the structure and detail of food composition data. It also supports LanguaL and FoodEx2 coding and can include information in different languages. This makes it ideal for storage of food composition data of the kind that will be collected in this project.

Crucially, FoodCASE allows food composition data to be structured in ways that support subsequent analysis. As an example, food composition information collected in two separate years is handled as two separate datasets. This enables a comparison of nutrient values over time, so that reformulation activities can be monitored and checked. This 'versioning' feature can also be used to clearly distinguish between other data records, such as for individual countries.

Developing new applications

To deliver the objectives of this data collection task, and to enable the efficient capture of a significant volume of food composition information, ICF invested in the development of new applications for the capture and automated extraction and processing of data from photos of food labels. These applications enabled the structured collection of data so that it could then be transferred into the database.

An iOS and Android compatible app were developed to enable the collection of data from food products in shops and supermarkets using images and text extraction software. A web app was developed to work in parallel with this functionality, allowing collected product data to be stored, viewed and edited by ICF analysts before being incorporated into FoodCASE.

The iOS/Android shopping app was used to capture the images of food products in shops from which data was collected. It facilitated the converting of these images into the required digital processed image format for text extraction and translation.

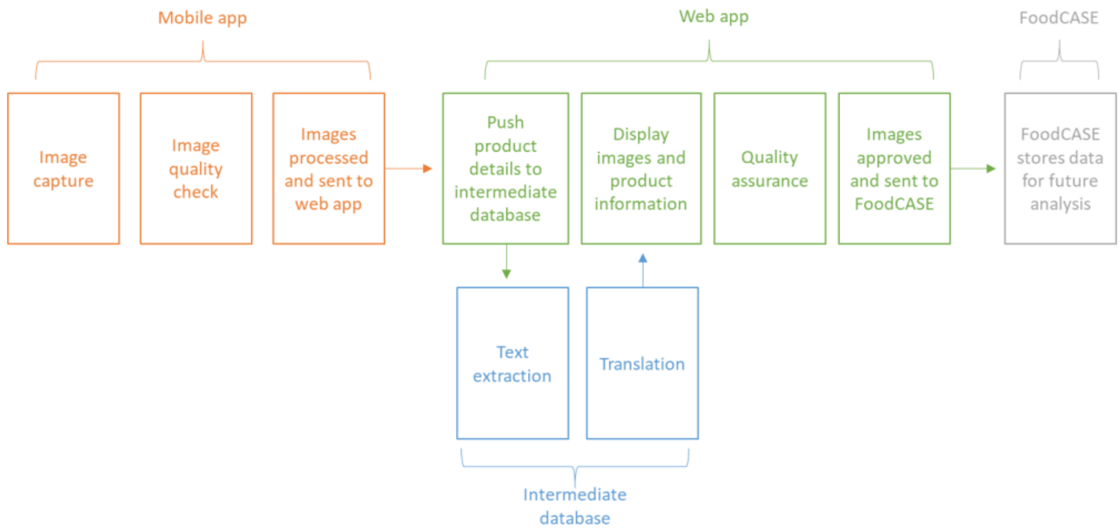
The web app worked in conjunction with the iOS/Android app. It pushed the processed images to an intermediate database, which used optical character recognition (OCR) ABBYY API to identify and extract text from images. A translation API then automatically translated any non-English text into English before it was stored. Translation of food composition data into English was necessary to enable the assessment of differences in food composition for same brand products.

Extracted and translated text was displayed within the web app and members of the study team have been able to quality assure and edit the information before sending it to FoodCASE.

A simplified overview of how the tools were used is presented below in Figure 1.

[13] Further information on FoodCASE is available here: https://foodcase.org/.

Figure 1. Workflow summary



2.1.1.2 Definition of the sample

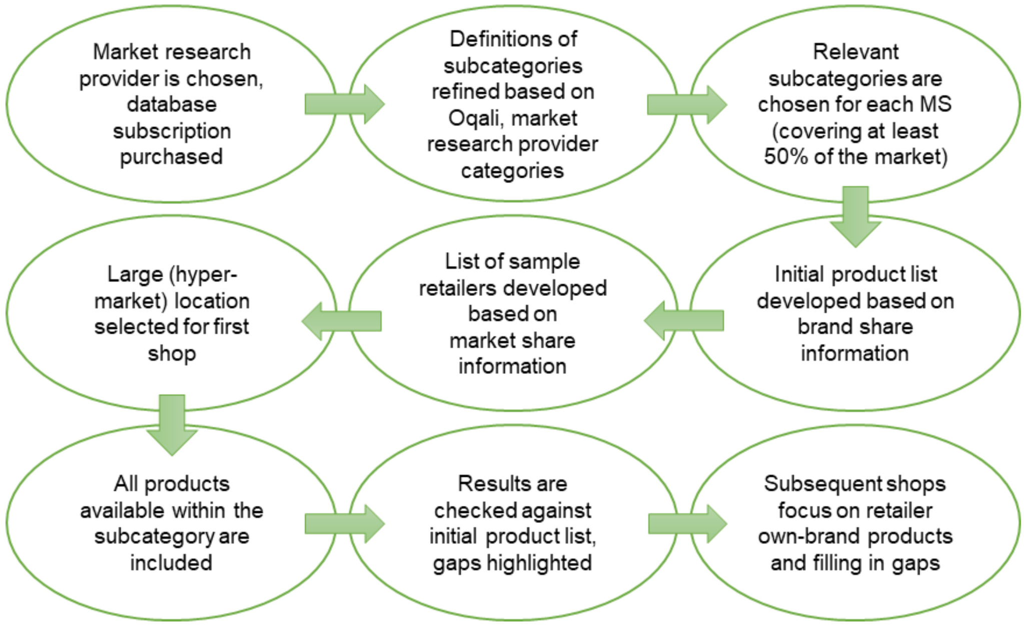
Once the data collection tools had been developed, the next step involved developing a sample of products that covered at least 50% of product sales within a specified product category and European country and provides a representative baseline within each European country for the evaluation of nutritional composition.

ICF used commercially available market data provided by Global Data to inform the sample specification. The sample was defined based on information about market share and the food supply of each European country for each relevant category.

The sample focused on those European countries and product categories indicated in the ToR (further details available in Section 3.1).

A consistent approach to sample definition was used across all European countries, while ensuring that the sample defined was tailored and appropriate for each country and category. Figure 2 provides an overview of the process followed.

Figure 2. Approach to sample specification



Note: references to 'MS' (Member State) in the above chart includes all European countries within the study sample, including the UK.

Defining the subcategories

The starting point for the subcategories used was the Oqali database in France. These same subcategories were used for the JANPA study, so this allows results to remain comparable.

As the Oqali definitions were developed with the French market in mind, they needed to be revised and amended. Some subcategories needed to be combined with others and some additional subcategories were included. The final list of subcategories aims to be both generic enough to be applicable across countries and specific enough to contribute to a meaningful analysis.

Further details of the approach used to define the subcategories are set out later in this section.

Selection of the subcategories to be covered in the study

Once the subcategories were defined, the next step was to identify for which subcategories within each product category data would be collected in each European country. The subcategories selected for the sample were those that, together, constituted at a minimum 50% of the market share for that category. By setting 50% as a minimum threshold, however, the actual subcategories chosen generally constituted slightly more than 50% of the category market.

Subcategories were chosen for each European country based on market share information at the subcategory level. This ensured that the sample selected for each European country was as representative as possible of national consumption. This means that the subcategories chosen for one European country do not always match those chosen for another European country, but in each instance, they are appropriate and meaningful for the relevant country.

Selection of sample retailers

Locations for data collection were chosen for each European country based on the retailer market share information. The sampling strategy aimed to ensure that most of the retail market was covered and that this includes discounters and other retail channels frequented by different socio-economic and demographic groups. For some countries with more fragmented retail sectors, achieving a true majority proved challenging.

Table 1 below summarises the details of retailers from whom data was collected in each country. As discussed further below, data was primarily collected instore by fieldworkers, but in some cases it was collected via online shopping (where instore access was not possible, resulting in products being purchased and delivered to fieldworker homes for scanning/processing) and in a small number of cases data was provided directly by retailers.

Table 1. Retailers from whom product information was collected, and method of collection, by country

Country	Retailer	Data collection method
Austria	Interspar Wien-Trillerpark	Instore
	Hofer	Instore
	Billa	Data sharing
	Penny	Data sharing
Belgium	Delhaize	Online
	Carrefour	Instore
	Aldi	Instore
	Lidl	Instore
Bulgaria	Lidl	Instore
	Fantastico	Instore
	Billa	Instore
	Kaufland	Instore
Denmark	One Stop Bilka	Instore
	Kvickly Store	Instore
	REMA1000	Instore
Estonia	Maxima XXX	Instore
	Prisma	Instore
	Coop	Instore
	Rimi	Instore
Finland	Prisma	Instore
	Lidl	Instore
	K-Citymarket	Instore
Greece	AB	Instore
	MyMarket	Instore
	Lidl	Instore

Country	Retailer	Data collection method
Hungary	TESCO BEDAORS	Instore
	Lidl	Instore
	CBA	Online
Italy	Eurospin	Instore
	Esselunga	Instore
	CRAI	Instore
	Conad	Online
	Coop	Online
Lithuania	Maxima XXX	Instore
	IKI	Instore
	RIMI	Instore
Malta	Smart B'kara	Instore
	Lidl	Instore
	PAMA	Instore
Portugal	Continente Telharias	Instore
	Aldi	Instore
	Pingo Doce	Instore
	Auchan	Instore
Romania	Lidl	Instore
	Carrefour	Instore
	Auchan	Online
Slovenia	Interspar	Instore
	Mercator Šiška	Instore
	Hofer	Instore
	Lidl	Instore
UK	Tesco	Instore
	Aldi	Instore
	Asda	Online
	Morrisons	Online

2.1.1.3 Data collection

The next task involved collecting primary data from food labels for all the product categories included in this project. The process involved collecting nutritional composition information and pictures of the packaging for each product included in the project.

This task relied principally on primary data collection in-store which was conducted by country researchers. The JANPA methodology also obtained some data directly from retailers and manufacturers and, as part of this study, some retailer data was provided directly for the UK and Austria.

Prior to collecting the data, time was invested to prepare the tools for the task, such as shopping lists, mobile app and web app (as discussed above) so that the process could be carried out as smoothly and efficiently as possible.

For France, as alluded to above and as was done in the JANPA study, data was taken directly from the Oqali database rather than collected in the field.

Concurrent to preparing the tools for the task, time was spent recruiting and training country researchers so that the process of collecting data was as efficient and consistent as possible.

The data was collected by first visiting a large location (a hypermarket, where possible) of one of the largest retailer chains. All products from each listed subcategory were included in the sample. The products collected in this initial shop were checked against the product list developed using market share information, ensuring that all products from major national and international brands were collected.

Retailer and manufacturer negotiations

Before starting the collection of data through fieldwork, retailers were approached in each of the participating European countries to determine whether they would be willing to share existing product information they hold for inclusion in the database, or alternatively whether they would agree to grant access to one of their stores for data collection.

Fieldworker recruitment and training

Fieldworkers were recruited through ICF's network of contacts, which extends across the EU, according to a set of criteria related to: (a) their reliability in undertaking fieldwork; (b) their fluency in the language of the European country in which they were undertaking fieldwork and also in English; (c) their mobility in being able to travel to/from the retail outlets at which they were tasked with collecting data; and (d) whether they had their own smartphone to use for data collection, and a secure internet connection.

Training sessions for the fieldwork were conducted via webinar. Ahead of the training, a training pack was provided to fieldworkers. It included information and instructions regarding the:

- food products targeted and their specifications;
- stores at which the fieldworkers should locate those food products;
- data collection sheet to be filled out after each store visit;
- example photographs of target products, annotated to show the different information that needs to be captured; and
- FAQ and corresponding answers regarding store visits, photographing of products, and use of the ICF-designed applications.

The collection of data

Although two retailers provided data directly to the study team, most product information was collected through store visits arranged with retailers.

Arrangements were made with retailer organisations to obtain their approval for fieldwork to go ahead at selected stores, and the retailer organisations then instructed the local management of each store accordingly. Fieldworkers confirmed by telephone with the local management of each store the time and date of each store visit.

Fieldworkers went through their list of products and used their smartphone application to take photos of each product within scope, collecting first all products in scope in one major retail outlet, and then collecting additional own brand products from additional retail store.

Country researchers took at least four photos of each product label:

- **One photo of the front of the pack**, which captured information on health claims, package size and portion size[14]. This picture was used as a source for the manual entry of data that could not be extracted automatically. This picture includes elements of the packaging subject to IP rights and, as such (and as agreed with the Commission), this picture will not be part of the final dataset submitted to the Commission.
- **One photo of the ingredients list**, which was processed through the OCR API to extract the information automatically. To guard against capturing information outside the label, the fieldworkers were asked to zoom in on the ingredients list when taking the photo and, if necessary, crop the photo afterwards.
- **One photo of the nutrition table**, which was also processed through the OCR API to extract all relevant information automatically. To guard against capturing information outside the label, the fieldworker was again asked to zoom in on the nutrition table when taking the photo and, if necessary, crop the photo afterwards.
- **One photo of the manufacturer's contact information** (email address, telephone and fax numbers, physical address) for future use. To guard against capturing information outside the label, the fieldworker was asked to zoom in on the manufacturer's contact information when taking the photo.

Photos were taken while fieldworkers were visiting the store, as they worked their way through the product list and the relevant sections of the store. Fieldworkers were working offline, and the application on their smartphone enabled them to assess the quality of the picture taken before moving on to another product. Further processing of the photos was carried out by the fieldworker afterwards, while they were online.

2.1.1.4 Data entry, cleaning and quality control

The next step in the methodology involved extracting accurate information from the photos taken during the preceding task so that it can then be entered into the database of food composition data. The task therefore involved entry of the data and verification that the data was accurate.

As outlined above, information from the photos of food products was entered either manually or automatically depending on the nature of the information. Information in a highly structured format, such as the ingredients list and the nutrition table, was entered automatically. Other information was entered manually.

The process of entering data automatically relied on an ICF-developed web application which enabled members of the study team to see on screen all the data extracted automatically from the photos. Errors in the extraction of the data could then be corrected by comparing the text extracted automatically and the text as it appears on the photo. This tool for data checks was accessible to fieldworkers and

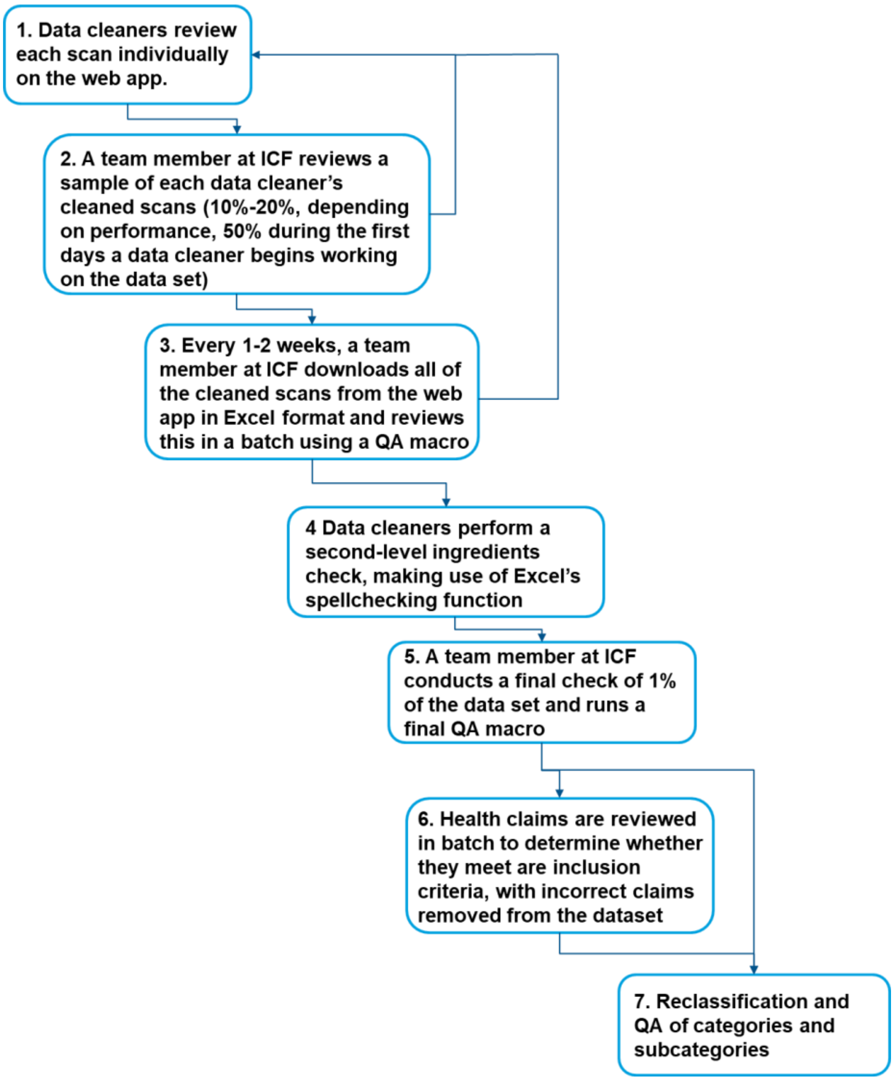
[14] Typically, information on these parameters was presented on the front of the packaging. Where some or all of it did not appear on the front but on other parts of the packaging, then country researchers took photographs of those other parts.

to a team of ICF staff undertaking QA checks before the data was pushed to FoodCASE.

Members of the study team used the applications provided to extract text attributes from the photos. The text was extracted in the original language, both automatically for ingredients and nutrients data, and manually for other data items. It was then translated through a translation application into English. Text and photos are then pushed to FoodCASE.

The process for conducting checks involved adherence to several sequential and consistent steps outlined in a data cleaning and quality assurance protocol, a copy of which is in Annex 1. A summary of those steps is presented below in Figure 3.

Figure 3. Workflow for the overall data cleaning and quality assurance process



Product nomenclature and data reclassification

Within the study ToR, it was specified that "The methods used for this data collection shall be based on the methodology being developed and tested by the Joint Action on Nutrition and Physical Activity (JANPA) and respective lessons learned. Derivations from this methodology shall be exceptional, well justified and in written agreement with the contracting authority."

In practice, this meant that ICF should use a product nomenclature/categorisation that was consistent with that used for JANPA, which was the Oqali nomenclature. Oqali was established in 2008 by the French Ministries of Agriculture, Health and

Consumer Affairs and it is being run jointly by ANSES (a subcontractor to ICF under this EUREMO study) and INRA.

In response to the ToR, ICF noted that although Oqali would constitute the starting point for the EUREMO product nomenclature, as the Oqali definitions were developed with the French market in mind, they would need to be revised and amended. It was noted that the Oqali system was missing some key subcategories from other European countries. Specifically, the issues with the Oqali nomenclature included a lack of subcategories in certain areas covered by EUREMO (e.g. "Baked beans", "Liquid stocks", "Pickles", "Mustards" and certain meat products), while in other areas, Oqali was more detailed than EUREMO to reflect certain subcategories that are present in the French market but not in other markets. Examples of this include the concept of "superior" chocolate, which exists in the French market but is not commonly used elsewhere, combining multiple mousse/pate subcategories into one, combining certain crisps subcategories to better reflect the European market, and grouping certain meat products e.g. types of similar pork products.

Therefore, the JANPA methodology (based on Oqali definitions) was adhered to as far as possible, but some amendments were necessary. Further, the Oqali system was too challenging to use for the purposes of data collection (in terms of providing fieldworkers with practical guidance on which products to collect data on in supermarkets), even though it was used for the analysis phase (with amendments – as noted above).

Nomenclature used for data collection

The approach to data collection was guided by information on the market share of products in different categories across European countries (to ensure consistency with the requirements of the ToR). As noted earlier, this market share data was sourced from Global Data. The Global Data nomenclature does not match the Oqali product category/subcategory definitions. Consequently, it was necessary to use a simplified nomenclature for the data collection.

In practice, the approach involved the following steps:

- The Global Data product categories/subcategories were used to identify which products data needed to be collected on to satisfy the ToR requirements (i.e. which subcategories in a given European country represented at least 50% of sales in a given product category).
- These Global Data product categories/subcategories were then mapped to a more detailed set of EUREMO product categories/subcategories (to guide fieldwork in practice and how fieldworkers should categorise products).
- These Global Data product categories/subcategories and the EUREMO product categories/subcategories (used to guide the fieldwork) were then mapped to the Oqali product categories/subcategories and a set of Oqali amended product categories/subcategories.

To comply with the requirement for the EUREMO product categories to be consistent with JANPA (i.e. the Oqali nomenclature), 'EUREMO Oqali' subcategories were developed based on considerations of the EUREMO ToR categories, the Global Data categories, and the Oqali categories and subcategories. These differed from the subcategories used in fieldwork, as the ICF team believed it would be too challenging and too time consuming for fieldworkers to categorise products according to these subcategories. For example, some subcategories rely on nutritional information, such as the amount of sugar or fat in the product. As such, it was anticipated that some reclassification work would be necessary, regardless of the final nomenclature used.

Nomenclature used for analysis and reporting

It was decided to use the Best-ReMaP nomenclature, where possible, to analyse and report the EUREMO data. This is because the Best-ReMaP nomenclature is essentially a pan-EU version of Oqali, with amendments to reflect the pan-EU nature of the EUREMO study as well as improvements identified as a result of the JANPA experience.

In practice, this involved three primary steps:

- Mapping the Best-ReMaP nomenclature (product categories and subcategories) onto the EUREMO nomenclature. This was done as part of a broader process to link all relevant nomenclature (Global Data categories; EUREMO fieldwork categories; Oqali; EUREMO final categories; and Best-ReMaP).
- For data that falls within the five priority groups according to Best-ReMaP (cereals; soft drinks; dairy products; delicatessen meats; bread products), and for data that is more challenging to reclassify, or where a high level of error is identified in the initial categorisation of products by fieldworkers, this is reclassified to align with the Best-ReMaP nomenclature using a manual approach or a dedicated reclassification procedure.
- For all other data, the data was reclassified to align with Best-ReMaP using an automated approach (informed by ICF's data science team). This was based on a detailed mapping of the nomenclature used to conduct EUREMO fieldwork and Best-ReMaP, which showed clear alignment between EUREMO and Best-ReMaP for many subcategories. The approach taken would be as following:

The final list of product categories and subcategories is presented in Section 3 of this report.

2.1.2 Collection of information on market share of food products

2.1.2.1 Purpose

The purpose of this task was to collect information on the market share of product subcategories that was robust enough to be used both for selecting the sample and producing an analysis of categories weighted by subcategory.

Market share data was used at several points in the study. It was used first to develop the list of products and inform the sampling approach. Towards the end of the study, it was used to weight the data collected and provide an analysis of the information considering market share.

The use of market share data ensures that both the data collected and the subsequent analysis appropriately reflects what the public actually purchases and consumes, rather than simply what is available. This way, the relative significance of the data can be determined and information can be used to provide a more accurate picture of the public health impacts.

2.1.2.2 Approach

The first step in collecting market share data was to purchase a database subscription from a market research firm. There are several options for purchasing this data and each data provider offers a different level of coverage. The study team used data from Global Data. Global Data's offering provides significantly more detail and granularity. As the subcategories used for this project are similarly detailed, it was helpful to use the most detailed product market share data to facilitate the matching process. Conversations were held between ICF, ANSES and the JRC to discuss the different options and the comparative merits of each. Given the increased level of granularity offered by Global Data, it was agreed jointly with JRC and with SANTE/CHAFEA that Global Data was the more suitable market research provider and, hence, the study team purchased a subscription to Global Data data.

This provided information on the market share (by volume and by value) in each of the European countries at a subcategory level, along with information on the brand share within categories.

The database only provided information on market share at a subcategory level and at a brand share level. Product-level market share information is available for a significantly higher cost from some research providers, but this was outside the scope of the budget of the current study. As such, ICF adopted a methodology based on the use of market share data at subcategory level.

The use of market share data at subcategory and brand share levels comes with certain caveats.

Firstly, market share data providers receive their information from a variety of sources. This may include information from retailers, from manufacturers and in some instances, from national statistics and surveys. For all countries, the data is merely an estimate of actual market share and is subject to uncertainty.

Secondly, information on market share differs in accuracy between European countries, depending on the nature of the retail market and the sources used to determine market share. How uncertain the accuracy of the data is will therefore vary between countries and categories.

2.1.3 In-depth analysis of the dataset

Once all data had been cleaned, quality assured and reclassified, the study team performed descriptive data analysis to provide an overview of the dataset for the benefit of stakeholders in individual countries and at European level.

2.1.3.1 Descriptive statistics analysis

The descriptive data analysis and visualisation was done in Microsoft Excel as data collected was already available in an Excel format and the programme provided an appropriate tool for data analysis.

The data analysis was conducted by a team of ICF staff proficient in descriptive statistics and the use of Excel. The analysis focused on nutrients of concern/interest for each product category. Based on the available nutritional data across the product categories, as well as previous data categorisation and collection efforts for common nutritional references (including European country initiatives and the 2017 report by the Joint Action on Nutrition and Physical Activity (JANPA)), the following nutrient categories were defined as being of interest/concern across the various product categories: fats, saturated fats, sugars, protein, salt, dietary fibres and polyols. The table below identifies the extent to which these nutrients were of interest/concern for each product category[15].

Table 2. Nutrients of concern/interest

EUREMO Category	Fat	Saturated fatty acids	Sugars	Protein	Salt	Dietary fibres[16]	Polyols[17]
Bread and bread products	✓	✓	✓		✓	✓	✓
Breakfast cereals	✓	✓	✓		✓	✓	✓
Cakes and biscuits	✓	✓	✓		✓	✓	✓

[15] Table 1 includes more than 14 product categories. This is because the product categories have been further disaggregated to reflect differences in the nutrients of concern/interest by product type.

[16] Labelling is not mandatory

[17] idem

EUREMO Category	Fat	Saturated fatty acids	Sugars	Protein	Salt	Dietary fibres[16]	Polyols[17]
Canned fruits and vegetables			✓	✓[18]	✓[19]	✓[20]	
Cheeses	✓	✓	✓	✓	✓		
Confectionery	✓	✓	✓		✓	✓	✓
Sauces	✓	✓	✓		✓		✓
Confectionery	✓	✓	✓		✓	✓	✓
Bread and bread products; Savoury snacks	✓	✓	✓		✓	✓	✓[21]
Meat and fish	✓	✓	✓	✓	✓		
Sugar-sweetened dairy; Ice cream, desserts	✓	✓	✓	✓[22]	✓		✓
Meat and fish; Ready meals - pizzas; Ready meals - chilled	✓	✓	✓	✓	✓	✓[23]	
Ice cream, desserts (for select frozen desserts)	✓	✓	✓		✓	✓[24]	✓
Ready meals - pizzas (frozen); Ready meals - frozen	✓	✓	✓	✓	✓	✓	
Sugar-sweetened beverages (not collecting vegetable juice)			✓		✓[25]	✓	✓
Sauces	✓	✓	✓	✓	✓	✓	✓
Ice cream, desserts	✓	✓	✓		✓		✓
Savoury snacks (crisps); Ready meals - frozen	✓	✓	✓		✓		

[18] Baked beans only

[19] idem

[20] Baked beans only

[21] Bread only

[22] For fresh products but not for ice creams - based on the understanding that there is no scope to reformulate protein content in ice creams

[23] For ready meal categories only

[24] Potentially relevant for frozen desserts that are not ice creams

[25] Vegetable juice

EUREMO Category	Fat	Saturated fatty acids	Sugars	Protein	Salt	Dietary fibres[16]	Polyols[17]
Ready meals - ambient	✓	✓	✓	✓	✓	✓	
Ready meals - chilled	✓	✓	✓	✓	✓	✓	
Sugar-sweetened beverages (not collecting plant-based beverages)	✓[26]	✓[27]	✓		✓	✓	✓
Ready meals - soups	✓	✓	✓	✓	✓	✓	

The analysis presents the following information:

- the overall number of products included and their distribution between sub-categories;
- minimum, maximum, median and mean values of nutrient content (in grams per 100 grams) per product group and category in each country, presented using box-plot charts;
- discrepancies that exist in nutrient contents in the same product groups or categories between countries; and
- EU-level comparisons to indicate the mean value for each of the relevant nutrients within each country.

Section 4 presents the findings of the analysis on the predefined list of product groups, product categories and product sub-categories for nutrients of concern/interest.

2.1.3.2 Weighted analysis

Market share data was used to provide a weighted analysis at category level by using sales volume data to adjust category averages. This analysis was done in Excel using the market share information used to determine the sampling strategy.

The purpose of the weighted analysis was to observe whether and to what extent mean values of nutrient content (in grams per 100 grams) per product group and category in each European country varied once the data were adjusted to reflect purchasing and consumption habits. That is, the weighted analysis shows how category averages vary when greater weight is given to the average nutrient content of food and drink products that are more highly consumed within a given country.

The approach used for the weighted analysis is summarised in the box below.

Approach to weighting category average values of nutrient content

The method used to weight the product category mean values for nutrient content involved drawing on the Global Data market share data used to inform the sampling approach for the data collection exercise.

Specifically, the steps involved in weighting the data were as follows:

- Compile market share data per category and country for the subcategories for which data were collected in each country.

[26] Plant-based beverages

[27] Idem

Example: Product category 'A' in country '1' included four subcategories:

- *Subcategory 'A1', for which the market share was 46%.*
- *Subcategory 'A2', for which the market share was 19%.*
- *Subcategory 'A3', for which the market share was 18%.*
- *Subcategory 'A4', for which the market share was 17%.*

Data was collected in the first two subcategories only (A1 and A2) to meet the requirement of collecting data on product subcategories that constituted a market share of at least 50%.

- Derive weights based only on the products in the final dataset sample.

Example: The total of the market shares in product category 'A' in country '1' is 65% (i.e. 46% for subcategory 'A1' + 19% for subcategory 'A2'). Therefore:

The weight for subcategory 'A1' = market share (%) for subcategory 'A1' ÷ sum of market shares (%) for only those subcategories where data was collected (subcategories 'A1' and 'A2')

The weight for subcategory 'A1' = 46% ÷ 65% = 71%

The weight for subcategory 'A2' = market share (%) for subcategory 'A2' ÷ sum of market shares (%) for only those subcategories where data was collected (subcategories 'A1' and 'A2')

The weight for subcategory 'A2' = 19% ÷ 65% = 29%

- Calculate the weighted product category mean values for nutrient content by applying the weights to the subcategory mean values.

Example: Calculate the weighted mean average amount of nutrient 'Φ' in each subcategory:

Weighted average amount of nutrient 'Φ' in subcategory 'A1' = unweighted average amount of nutrient 'Φ' in subcategory 'A1' x 71%

Weighted average amount of nutrient 'Φ' in subcategory 'A2' = unweighted average amount of nutrient 'Φ' in subcategory 'A2' x 29%

Sum the weighted average amounts of nutrient 'Φ' in subcategories 'A1' and 'A2' to derive the weighted average amount of nutrient 'Φ' in product category 'A'.

Section 4 presents the findings of the weighted analysis on the predefined list of product categories for nutrients of concern/interest. When interpreting the results of the weighted analysis, it should be taken into account that it was not always possible for the study team to confirm/substantiate the completeness, comparability and consistency of the Global Data market share data across all product categories and countries.

2.1.3.3 Comparative assessment of the same products in different countries

The analysis presented in this report also includes an assessment of differences in composition between products sold across different European countries marketed under seemingly identical branding and packaging (both branded and private label products).

Identical branding was not the only criterion for products to qualify for the assessments of differences in composition. Rather, this study adopted a similar rationale and definition of comparability to the JRC's EU harmonised testing methodology for the assessment of food quality characteristics. That methodology included only products marketed under both same packaging and branding in its testing programme.

Consequently, ICF focused initially on a sample of products with identical branding, but then reviewed the scanned photos of those products to ensure that the packaging was also identical. This was to ensure that the comparative assessment of products identified only those products where consumers across different European countries could reasonably expect that they were purchasing identical products with the same nutritional composition.

The step-by-step approach to the comparative assessment can be summarised as follows:

- Identify products sold under the same brand and name across multiple European countries in the dataset for each product category. Due to sample size and resource constraints, the assessment took a sampling approach and considered three products per category. The three categories chosen were those with the largest number of occurrences in the dataset across the different European countries in the sample.
- Verify visually the comparability between products sold under the same brand and name in different European countries by comparing the photos of the front of the product packaging collected for the database to assess how similar their packaging is.
- Compare the mean values for all nutrients of concern/interest for the products to assess any differences found in product nutrition.
- Include the outcome of the assessment in this report highlighting (if detected) the presence and scale of dual quality issues across products.

The study team notes that the risk of detecting 'false' dual quality issues – that is, the risk that the nutritional composition data for an identical product is collected at different times across countries such that there is a risk that the data simply reflects the 'old' recipe in one country and the 'updated' recipe in another – was heightened because of Covid-19. This is because, as described further in Section 2.3 below, Covid-19 created considerable delays in the study timetable and, as such, this created greater scope for changes to take place in the formulation of products over time which might impact the comparative assessment. Consequently, as part of the comparative assessment, this report also confirms the time (month, year) at which the data was collected in the different European countries.

2.2 Support to European countries' public authorities

The aim of this task was to support European countries with the implementation of reformulation initiatives to reduce levels of salt, saturated fats and sugar.

As recognised by the Council of the EU (2016), some EU countries are more advanced than others in the drafting of benchmarks and the implementation of reformulation initiatives. This suggests a need for support in certain countries, and the potential to enable the exchange of practices. The support to European countries was given through three main instruments:

- mapping of reformulation activities;
- the organisation of workshops and twinning actions; and
- the provision of scientific and technical support to reformulation initiatives.

2.2.1 Mapping of reformulation activities

The purpose of the mapping exercise was to provide an updated view of existing reformulation initiatives implemented by competent authorities in European countries.

A data collection template was prepared, to compile the relevant information for policies in all European countries.

Desk research was conducted, limited to documentation no older than 2 years before the beginning of the study. Sources with the widest geographical reach were initially reviewed, to then increasingly narrow geographical reach of the sources, to identify relevant policies for each European country.

An online survey with European countries' National Competent Authorities was then carried out, aiming to provide inputs into the mapping exercise, and to collect expressions of interest to participate in activities under this task. The survey asked for information on the focus areas contained in the data collection template for each food reformulation initiative reported. The survey was distributed by email to contacts at the Competent Authority in each European country between May and June 2019, with targeted reminder emails sent to contacts for where a response had not been received for the country. In total 31 contacts from 27 European countries responded to the survey.

Data collected from the survey and the desk research were triangulated and assessed for completeness. Where gaps in information were identified, follow-up questions and clarifications were directed to NCA contacts, and additional desk research was carried out.

Using the data collection template, identified food reformulation initiatives were analysed at both national- and EU-level. Focus areas for the analysis were:

- trends by country;
- types of reformulation initiatives;
- target product categories and nutrients;
- trends in mandatory, voluntary and co-regulated initiatives;
- food reformulation targets;
- types of monitoring and evaluation mechanism used; and
- impacts of the food reformulation initiatives.

The synthesis and reporting sub-task were then carried out to produce the *Mapping of national reformulation activities report*, which is presented/summarised in Section 6 of this report.

2.2.2 Workshops and Twinning Actions

The purpose of this task was to organise Workshops and Twinning Actions aimed at supporting the implementation of reformulation initiatives in European countries. They aimed at helping officials from four different European countries to improve their understanding of the challenges and benefits associated with reformulation initiatives by learning from the experiences of others.

Workshops were targeted at those European countries that had little experience in reformulation initiatives, but who had the capacity to organise and pursue national initiatives, and who expressed their interest in participating to this type of activity.

Twinning Actions were targeted at European countries who appeared to benefit from learning about an initiative undertaken elsewhere, either because they were planning a similar initiative or because they faced similar challenges. The selection of countries was also done based on the interest expressed in participating to this type of activity (and collected through the aforementioned survey).

For this task, the project team worked closely with EuroFIR to select relevant experts, and with EuroFIR and Sciensano to help define the content of the events. In addition, experts from ANSES also participated in one Twinning Action.

According to the mutual learning principles highlighted at proposal stage:

- interested European countries were assigned to specific types of events or activities based on their experience, needs and capacity;
- European countries' authorities were asked to identify and reflect on their needs, challenges and operational realities;
- participants were encouraged to reflect on what they learnt and plan follow-up actions to ensure that the learning was disseminated across their organisation and the insights/knowledge gained used to inform strategic/change priorities; and
- participants took an active role in the facilitation and structure of the activities to develop ownership of the topic area, and to stimulate openness and dialogue between peers.

The findings and conclusions from the Workshops and Twinning Actions are presented in Section 7 of this report. The remainder of this section describes in more detail the methodological approach to these activities.

2.2.2.1 Selection criteria

Twenty-six European countries expressed their interested in taking part in either the Workshops or the Twinning Actions. Based on the interest expressed, the identified needs, and follow-up discussions with the national authorities, the European countries selected for these activities - and agreed with HaDEA - were the following:

- Greece and Croatia for the Workshops; and
- Malta and Hungary for the Twinning Actions.

2.2.2.2 Organising the Workshops and Twinning Actions

Regular bilateral conversations were organised with country authorities' representatives, to offer support and illustrate the objectives and characteristics of each activity, and to:

- discuss what types of experts might be of interest to the European country;
- discuss and agree a proposal of dates for the event;
- discuss the format and content of the agenda; and
- discuss possible venue and hotel accommodation options[28].

Bilateral discussions were also organised with (EUROFIR and SCIENSANO) experts ahead of the conversations with the European countries' authorities, and/or directly with the MS authorities, depending on the single activities. The topics to be the focus of the meetings were selected based on the needs and requests of the European countries' authorities.

2.2.2.3 Impact of Covid-19 pandemic and of lockdown measures on activities

The Covid-19 pandemic and resulting lockdown measures had a serious impact on the timing and organisation of the meetings. Initially the project team tried to

[28] At the initial stages at least, as later the meetings had to be organised online.

postpone the discussions to be able to organise face to face meetings. Then, when it became clear that the lockdown measures would last much longer, all the meetings where re-organised to take place online.

This happened smoothly for some countries' activities (Workshop with Greece and Twinning Action between Malta and France), but less for others (Workshop with Croatia and Twinning Action between Hungary and Austria). Further details on this are provided below.

Croatia (Workshop)

After a series of calls organised between the Croatian authorities[29] and ICF (and EUROFIR) experts, the topic agreed to be the focus of the meeting was the following: '*Taxation of sugar, an opportunity to reduce sugar content in food'.* A series of key questions to address during the meeting was identified by the project team, in agreement with MS's authorities.

However, given the Covid-19 pandemic and subsequent lock-down measures, the meeting had to be put on hold. When a few months later the project team suggested to organise the meeting in an online format (as this appeared to be the only option remaining), the Croatian authorities didn't show an interest any more in taking part in the activity.

At that stage (in December 2021) it was not possible for the project team to find an alternative European country with an interest in the identified topic, nor to change the topic to focus on. Therefore, the Workshop with Croatia did not take place, and no other Workshop could be organised to replace this meeting.

Hungary-Austria (Twinning Action)

After a series of discussions with the Hungarian and Austrian authorities, the focus topic for the Twinning Action was identified to be the following: '*Processed food reformulation monitoring-improvement of data collection and utilisation of gathered branded food data'*, and the *scraping tool and 'Food in the Spotlight' website* put in place by the Austrian Agency for Health and Food Safety (AGES).

The agenda had been drafted and agreed by the Hungarian and Austrian representatives. The meeting had to take place in Budapest, at the premises of the Hungarian National Institute of Pharmacy and Nutrition and was supposed to last two days. The Austrian representatives from AGES were foreseen to travel to Hungary, as well as one representative from the project team.

The initial date agreed for the meeting was May 2020, however, following the Covid-19 pandemic and lock-down measures, the date had to be postponed three times: first to June 2021, then to (21st and 22nd) October 2022, and at last to (1st and 2nd) December 2020.

The delays on Task 1 data collection also had some repercussions on the organisation of the meeting, as the Austrian authorities expected the presentation of the results of Task 1 data collection to be delivered at the meeting, and the data collected on Austria to be presented in that instance.

In November 2021 the preparation from the Hungarian colleagues was almost completed and the list of participants identified. However, issues with the Austrian experts (AGES) subcontract emerged and halted the preparation of the foreseen event[30].

Given that it was not possible to solve the contractual issues mentioned above, the meeting could not take place in the end. Also, similarly to what happened with

[29] Croatian Institute of Public Health.

[30] These issues related to objections by AGES to a few clauses in the subcontract with ICF.

Croatia, the timing of the events described above, and the specificity of the topic didn't allow the project team to reorganise a new meeting with an alternative European country.

The Hungarian authorities were invited to participate to the Twinning Action between Malta and France, but they declined the invitation.

The remaining activities that took place (Workshop with the Greek authorities, and Twinning Action between the Maltese and French authorities) are described in the following sections.

2.2.2.4 Online meetings in place of physical meetings

As mentioned above, the meetings were originally planned as face-to-face events to be organised in the host countries. However, due to the Covid-19 pandemic and subsequent restrictions, these meetings were moved to an online format, in agreement with the national authorities and with HaDEA.

All meetings were organised on MS Teams. The study team prepared guidance to use the online tool which were provided to the participants with sufficient time ahead of the online events. Besides, to avoid issues or delays during the event, drop-in sessions were organised 1-3 days before for each event, to check with participants their connections and MS Teams functionalities.

The discussion time was adjusted in each event to allow a greater space for discussion. The events were recorded for note taking purpose, and to avoid fatigue and increase engagement, each event included one or two breaks in the form of coffee break and/or lunch breaks.

2.2.3 Scientific and technical support networks

The EUREMO study provided two European countries with tailored support in view of supporting their national ongoing/planned reformulation initiatives. The support was adapted to the specific needs of the countries' authorities.

Interest to participate in these activities was expressed by a total of 14 European countries (Austria, Belgium, Bulgaria, Croatia, Cyprus, Denmark, Estonia, Greece, Hungary, Malta, Poland, Romania, Slovenia, and Spain). This information was gathered through the survey and complemented with some follow-up interviews. In the interview process, two European countries withdrew interest (Cyprus and Denmark).

The findings and conclusions from the scientific and technical support networks are presented in Section 8 of this report. The remainder of this section describes in more detail the methodological approach to these activities.

2.2.3.1 Objectives of scientific and technical support networks

The support networks started in November 2019 and lasted until May 2021. The project experts provided support to the National Institute of Public Health of Slovenia (NIJZ) and the National Institute of Public Health of Romania.

The objectives of these networks were to:

- explore efficient measures to stimulating reformulation and uptake of reformulated products;
- explore efficient measures for a better cooperation with among different stakeholders;
- support with the implementation of reformulation initiatives. Discuss previous work on reformulation done, other relevant existing policies and initiatives to improve nutrition and health;
- draft benchmarks for the National Reformulation Strategy; and

- facilitate knowledge sharing and assessment of good practices.

2.2.3.2 Selection criteria

European countries were selected based on interest in exchanging experiences with other European countries and learning from others regarding reformulation initiatives. The criteria for the selection were also whether these European countries had little or no experience in reformulation initiatives and if countries had lower GDP. The shortlisted list was discussed with the WHO in view of their work conducted on food reformulation.

After assessing each country against the eligibility criteria, the following shortlist was identified: Estonia, Romania and Slovenia. The other countries were excluded as the support they sought did not fall within the scope of this task of the Study "Scientific and technical support networks". The Estonian authorities, despite being chased multiple times, were not able to provide concrete information regarding the potential support and were therefore excluded from this action.

Resulting from this analysis, the EUREMO team proposed Slovenia and Romania to receive the support of Technical Networks. Slovenia was selected based on the nature of the support requested (long-term support for the design and implementation of the National Action Plan on Reformulation) and thus, the potential long-term sustainability of results. In addition, the country had confirmed a political commitment from the Ministry of Health towards this initiative and proposed to provide additional funding if needed.

Romania was selected considering their demonstrated limited experience in food reformulation, low GDP and a strong interest in receiving tailored-made support, that could lead to the design and implementation of reformulation initiatives. The country confirmed a political commitment from the Ministry of Health (reported by the National Institute of Public Health).

2.2.3.3 Organising the twinning action

Similarly, to the Workshops and Twinning Action, regular bilateral conversations were organised with country authorities, to illustrate the objectives and characteristics of each activity, and to:

- discuss what types of experts might be of interest to the European country;
- agree on a proposal of dates for the event;
- discuss the format and content of the agenda; and
- find possible venues and hotel accommodation options[31].

Bilateral discussions were also organised with (EUROFIR and SCIENSANO) experts ahead of the conversations with the European countries' authorities, and/or directly with the European countries' authorities, depending on the single activities. The topics to be the focus of the meetings were selected based on the needs and requests of the European countries' authorities.

2.3 Challenges encountered and methodological limitations

Several methodological challenges were encountered throughout the life of the study, almost all of which were directly related to the impact of Covid-19. Specifically, the tasks associated with data cleaning, quality assurance, analysis and reporting took considerably longer than anticipated and, in some cases, required a change in methodological approach to achieve the desired outcome.

[31] At the initial stages at least, as later the meetings had to be organised online.

The impact of Covid-19 on this contract can be summarised as follows:

- **Covid-19 had a direct and significant impact on the timelines for the data collection task.** This task was significantly delayed due to:
  - Shortages of certain products on supermarket shelves because of Covid-19 (i.e., a combination of supply chain issues and bulk/panic buying by some consumers), which required repeat visits to supermarkets over a longer period of time.
  - Several supermarkets did not allow the study team to access their stores. In some cases, the study team had previously received permission to access certain stores (and data collection had commenced) but this was revoked. In other cases, those permissions were never granted due to governmental and/or supermarkets restrictions. Some supermarkets temporarily stopped the study team from entering supermarkets for the purposes of data collection (creating delays of varying lengths), while others permanently stopped the team from accessing their stores. In combination, this prevented the study team from being able to visit stores for the purposes of data collection, which resulted in long delays and, in some cases, a change in approach (purchasing products online, which created further delays as the study team had to plan and manage the logistics of creating online shopping baskets, sending batches of products to fieldworkers' homes to scan, and then arranging for the appropriate disposal of products to create the physical space for more batches of products to be delivered).
- **Covid-19 had a subsequent and indirect impact on the timelines for the data collection task (and subsequent tasks).** The direct delays to the data collection process described above led to subsequent delays in the contract because of two factors:
  - The study team experienced an unforeseen and unanticipated level of turnover among fieldworkers. Although a degree of attrition in the fieldwork team was anticipated and planned for, the delays in data collection caused by Covid-19 (and the resulting governmental and supermarket restrictions) led to a significant increase in the level of turnover in fieldworkers as many left to find alternative employment due to the uncertainty surrounding when fieldwork could recommence in some supermarkets. This turnover created extensive delays because of the additional time required to advertise for and recruit new fieldworkers, and the subsequent time required to train and onboard them.
  - ICF experienced problems with the reliability and functionality of its phone-based apps (used for data collection) due to repeated updates and upgrades in mobile phone operating systems and software over time. While the study team built-into the contract some contingency and mitigations to allow for slippage in the timetable (and the impact this could have on the functionality of the phone-based apps due to changes in phone operating systems/software over time), the unforeseen and unanticipated delays in data collection as a result of Covid-19 meant that the extent, nature and frequency of upgrades and updates to operating systems/software could not be planned for and hence there were delays while ICF's app development team sought to update/ fix the functionality of the phone-based apps towards the end of the data collection phase, adding further delay.

In addition to the impact of Covid-19 on the nature and timing of ICF's methodological approach, there were other challenges faced in relation to the reclassification of data. As alluded to above, the reclassification of data involved mapping multiple nomenclature to one another to facilitate both the data collection and data analysis tasks, which was complex and time consuming. The reclassification of data according to the EUREMO final nomenclature (which reflects, as far as possible, the Best-ReMaP nomenclature) was also challenging and resulted in some amendments/additions at the subcategory level.

Despite these challenges, this study produced a comprehensive and highly-detailed dataset that covers almost 47,000 individual products and which was subjected to rigorous quality assurance checks. Consequently, the methodological challenges faced during the study did not compromise the final dataset and analytical findings.

3. Overview of the food composition database

This section introduces the food composition database including, but not limited to, its final form in terms of countries, product categories, number of products and data fields.

3.1 Introduction

As noted in Section 2 of this report, the definition of the database sample was based on the countries and product categories defined in the study ToR.

This amounted to 16 countries (Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France[32], Greece, Hungary, Italy, Lithuania, Malta, Portugal, Romania, Slovenia and the United Kingdom).

The product categories chosen covered all categories listed in the study ToR, although in some cases these were grouped together as joint categories (Table 3).

Table 3. Product category revisions

Category from ToR	Corresponding project category
Sugar-sweetened beverages	Sugar-sweetened beverages
Sugar-sweetened dairy and dairy imitates	Sugar-sweetened dairy and dairy imitates
Breakfast cereals	Breakfast cereals
Bread and bread products	Bread and bread products
Confectionary	Confectionary
Bakery products (e.g. cakes and cookies)	Bakery products (e.g. cakes and cookies)
Ready meals (including ready to prepare products like dry soups, dried mashed potatoes, rice mixture)	Ready meals and soups (including ready to prepare products like dry soups, dried mashed potatoes, rice mixture)
Soups	
Savoury snacks	Savoury snacks and crisps
Crisps, savoury snacks	
Sauces (including ketchup)	Sauces (including ketchup), condiments
Sauces, condiments, spices	
Sugars-sweetened desserts, ice cream and topping;	Sugar-sweetened desserts, ice cream and topping
Canned fruits and vegetables	Processed fruits and vegetables
Potato products	
Meat products	Meat and fish products
Fish products	
Cheeses	Cheeses
Energy drinks and sport drinks	Energy drinks and sport drinks

[32] It was agreed that data would not be collected for France and, instead, existing data for France would be provided to ICF directly by its subcontractor on this study, ANSES.

This sample constitutes a relatively comprehensive coverage of packaged food categories that may pose public health concerns in relation to nutritional content. Within each of these product categories, the study team focused on products suitable for reformulation. For example, for 'meat and fish' products, the focus was only on products that had undergone processing involving the addition of salt, sugar or fat. Uncooked products or product subcategories that are otherwise considered to have a low impact on nutrient intake (e.g. spices) were not included in the study.

3.2 Overview of the database

3.2.1 Total products

An overview of the final product sample in terms of the total number of products for which data was collected in each country and product category is presented overleaf in Table 4.

The database contains 46,695 products. Primary data was collected for approximately 34,000 individual products across the 15 countries in the sample. Data for approximately 13,000 additional individual products was added for France which was sourced directly from the Oqali database rather than collected in the field, as this is the most complete data available (see box below).

Food composition data for France

Food composition data for France was sourced directly from ANSES (French Agency for Food, Environmental and Occupational Health & Safety) via the Oqali (The Nutrition Department of the French Observatory of Food Quality) database, rather than via fieldwork with retailers. This was designed to reflect the fact that the data from ANSES was the most complete data available in terms of the scope of products covered. Despite this, the French data does exclude some data fields, which reflects the agreements ANSES has with stakeholders in which, for data collected before 2019, ANSES is not permitted to transfer all collected data.

Compared to the data for other countries in the sample, the French data excludes producer name, product name, brand and health claims. All other data fields are provided for the French data: category; subcategory; ingredients; nutrient name and value; reference weight and unit; and weight, servings and portion size.

Table 4. Total number of products in dataset, by country and product category

	Bread and bread products	Breakfast cereals	Cakes and biscuits	Canned fruits and vegetables	Cheeses	Confec-tionery	Energy drinks & Sports drinks	Ice Creams, Desserts	Meat and fish	Ready meals	Sauces	Savoury snacks	Sugar-sweetened beverages	Sugar-sweetened dairy and dairy imitates	Total
Romania	47	91	179	6	20	92	33	27	93	46	56	91	59	78	918
Bulgaria	44	56	184	0	115	397	9	166	101	87	71	96	85	65	1476
Malta	49	286	86	1	84	164	37	73	170	113	101	155	111	135	1565
Italy	36	66	184	9	37	188	7	213	130	157	325	85	92	131	1660
Hungary	48	143	211	9	65	238	38	157	212	257	249	107	82	157	1973
Estonia	58	120	137	15	146	247	1	231	391	243	136	76	44	174	2019
Denmark	111	146	171	14	98	422	34	135	339	75	348	27	59	30	2009
Lithuania	126	103	115	11	80	303	66	186	312	78	203	159	160	134	2036
Belgium	65	75	243	42	28	344	39	158	323	81	207	116	83	126	1930
Portugal	51	105	340	7	90	396	20	172	72	226	118	142	100	326	2165
United Kingdom	112	121	181	27	130	128	37	103	175	363	398	112	173	171	2231
Greece	159	114	267	10	295	360	24	124	247	157	360	234	121	134	2606
Slovenia	132	91	429	15	286	293	57	387	134	316	393	223	111	136	3003
Austria	174	211	169	42	395	383	41	38	511	198	374	159	187	263	3145
Finland	362	89	314	30	226	438	95	732	726	671	444	194	284	308	4913
France	296	349	1545	45	635	998	61	2910	1155	2156	667	638	675	916	13046
TOTAL	1870	2166	4755	283	2730	5391	599	5812	5091	5224	4450	2614	2426	3284	46695

3.3 Scope of the database

The database captures product information across a range of different fields. Table 5 below summarises the information collected and captured.

Table 5. Product information included in the database

Collected product information	Description
Store name	Name of retailer
Country	Country of retailer/store
Language	Source language and English translation
Category	14 pre-defined categories
Subcategory	442 pre-defined subcategories
Producer name	Name of product manufacturer/producer
Product name	Source language and English translation
Brand	Product brand name
Product Ingredients	Source language and English translation
Product nutrient	Value and unit
Reference weight	Value and unit
Prepared	Assigned as TRUE or FALSE
Health claims	Source language and English translation
Net weight	Value and unit
Portion size	Value and unit
Servings per pack	How many servings included in each pack
Market share	Including Type
Scan date	Including scan time

4. Descriptive analysis of food composition data

4.1 Overview

This section presents the findings from the analysis of selected product categories from the dataset of nutritional information on processed food and drink products widely available for purchase by the public in selected European countries.

The analysis focuses on the relevant nutrient contents in the EU for the following product categories:

- Breakfast cereals
- Canned fruits and vegetables
- Sugar-sweetened beverages, energy and sports drinks
- Sugar-sweetened dairy, dairy imitates and ice cream desserts
- Ready meals – pizzas
- Ready meals – soups
- Bread and bread products
- Meat and fish

Not all product categories were analysed given the overall size of the dataset (almost 47,000 products across 14 different categories) and the desire to limit the overall length and volume of analysis presented herein. Selection of the above product categories was based on their alignment with the five priority groups of Best-ReMaP (bread products; fresh dairy products; delicatessen meat; soft drinks; and breakfast cereals) as well as their relevance for consumption based on the product basket of the Joint Research Centre's consumer footprint[33].

The following analysis of the food composition data includes an assessment of the distribution of nutritional content across Europe as well as comparative assessments of the nutrient content of the categories as well as selected products.

4.2 Breakfast cereals

4.2.1 European overview

Overall, data from 16 countries (Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Romania, Slovenia and the UK) were collected and analysed within the category of breakfast cereals. Altogether, 2,166 products were identified belonging to 17 sub-categories in the breakfast cereals product category.

The breakdown of the products within the subcategories are shown in the following table (in absolute values) and chart (in percentages). These indicate that breakfast cereal products more commonly fall into the "chocolate-flavoured cereals", "honey/ caramel cereal," and "sweet cereal flakes" sub-categories at European level.

Table 6. Europe: subcategories within the food group of breakfast cereals

Subcategories	Number of products
Chocolate-flavoured cereals	464
Honey/caramel cereals	309
Sweet cereal flakes	274

[33] JRC (2017): Consumer Footprint. Basket of Products indicator on Food, https://publications.jrc.ec.europa.eu/repository/handle/JRC107959

Subcategories	Number of products
Filled Cereals	221
Traditional muesli flakes	167
Cereal flakes with chocolate_nuts	97
Crunchy fruit muesli	96
Crunchy chocolate muesli	90
High-fibre cereals (other)	84
High-fibre cereals (flakes)	71
Cereal flakes with fruit	57
Crunchy muesli with nuts or seeds	55
High-fibre fruit cereals (flakes)	54
Cereals without added sugar (flakes)	41
Cereals without added sugar (other)	36
Chocolate and caramel cereals	33
High-fibre fruit cereals (other)	17
TOTAL	**2,166**

Figure 4. Europe: subcategories within the food group of breakfast cereals (%)

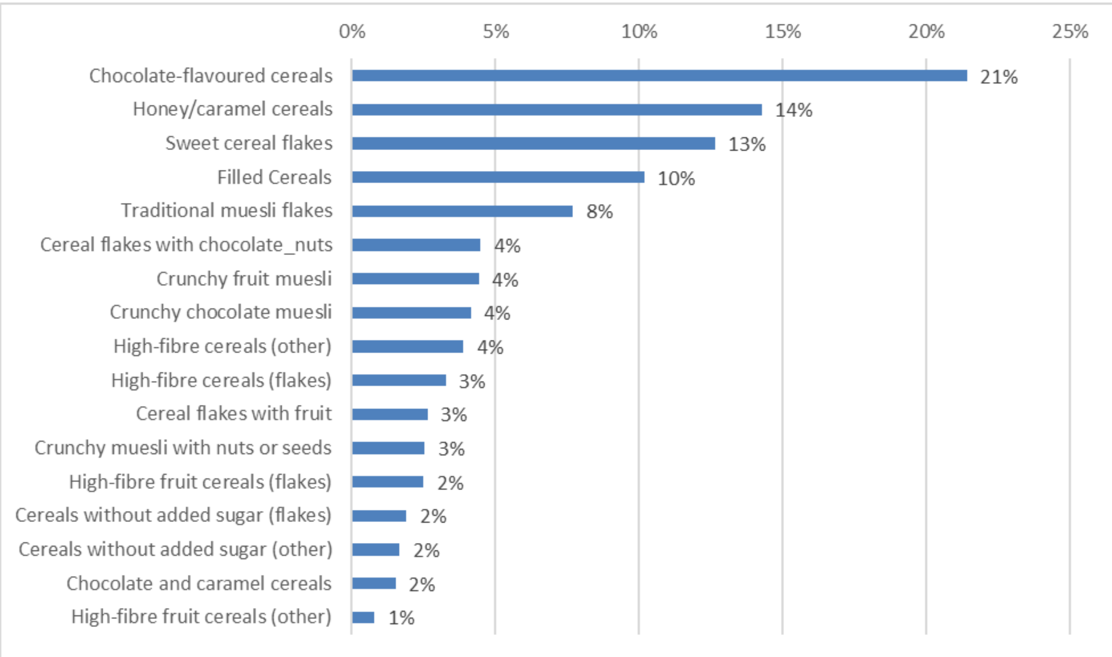


Table 7. Composition of each country's sample – breakfast cereals

	Cereal flakes with chocolate_nuts	Cereal flakes with fruit	Cereals without added sugar (flakes)	Cereals without added sugar (other)	Chocolate and caramel cereals	Chocolate-flavoured cereals	Crunchy chocolate muesli	Crunchy fruit muesli	Crunchy muesli with nuts or seeds	Filled cereals	High-fibre cereals (flakes)	High-fibre cereals (other)	High-fibre fruit cereals (flakes)	High-fibre fruit cereals (other)	Honey/caramel cereals	Sweet cereal flakes	Traditional muesli flakes
Austria	4	1	10	2	2	18	34	20	23	8	4	4			16	14	51
Belgium	6	2	1	2	3	23				10	3	2	4		13	6	
Bulgaria	3	1	1			23				9	4		4		8	3	
Denmark		1		11	1	9	15	28	7		1			1	21	21	30
Estonia	3	1	1	3		18	10	14	5	10	1	1			19	12	24
Finland	1	2	1	3	1	20				6	6	20	5	6	9	9	
France	28	10	7	6	11	92				64	6	3	15		56	51	
Greece	12	6	1			43				13		1			23	15	
Hungary	8	4	1		3	24	11	3	2	14	1				10	17	45
Italy	2	4	3	1		16				6	1				14	19	
Lithuania	5		1		3	29				14	7	4	1	2	21	16	
Malta	10	11	4	4	2	53	11	18	15	22	19	23	13	3	31	37	10
Portugal	4	5	2		4	35				10	5	3	2		25	10	
Romania	5		4		2	17	9	13	3	6	3	2	3		12	5	7
Slovenia	3	3	4	1	1	30				15	3				11	20	
UK	3	6		3		14				14	7	21	7	5	22	19	
Total	**97**	**57**	**41**	**36**	**33**	**464**	**90**	**96**	**55**	**221**	**71**	**84**	**54**	**17**	**311**	**274**	**167**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

The below table shows that data on breakfast cereals were collected between November 2019 to September 2021, this may inform the interpretation of differences in nutritional content.

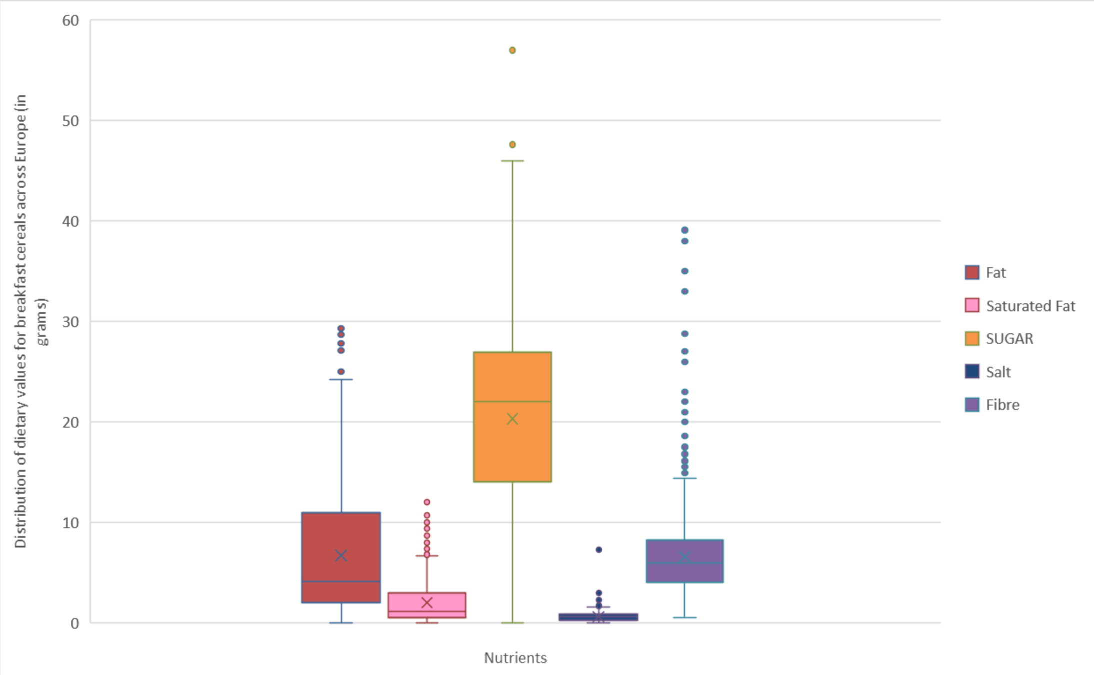
Table 8. Dates for data collection, by country – breakfast cereals

	Jan 2018	Nov 2019	Dec 2019	Feb 2020	Mar 2020	Apr 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Mar 2021	Apr 2021	May 2021	Jul 2021	Aug 2021	Sep 2021	Nov 2021	Dec 2021	Jan 2022
Austria		57	31			9											33	81	
Belgium		41					15	18			1								
Bulgaria							55			1									
Denmark				74	28		44												
Estonia								86	36										
Finland		67		14			8												
France	349																		
Greece				85	14		15												
Hungary				118					21			4							
Italy			11				41					1	13						
Lithuania								44	19					40					
Malta					29		18	1	93					75	58	12			
Portugal				70						32		3							
Romania				18	2				6			5		59		1			
Slovenia				65			3		23										
UK			21		25							41	3						31
Total	**349**	**165**	**63**	**444**	**98**	**9**	**199**	**149**	**198**	**33**	**1**	**54**	**16**	**174**	**58**	**13**	**33**	**81**	**31**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

In terms of the distribution of the nutritional content of these products across Europe (depicted in the box plot below)[34], the highest variety was observed in fibre content, while saturated fat and sugar values had less pronounced differences. In relation to fat content, most products fell within a specific range.

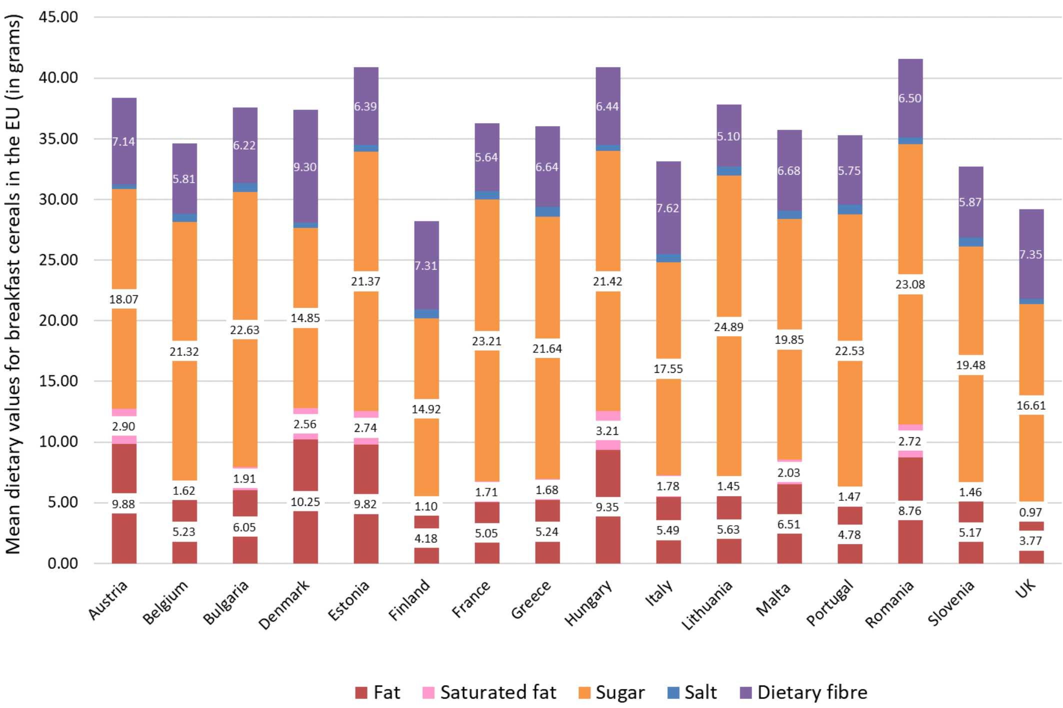
Figure 5. Distribution of dietary values for breakfast cereals in Europe



In terms of nutritional variety between the countries, products showed similar distribution ranges (as depicted in the figure overleaf).

[34] The box-and-whisker plot summarises the dataset of dietary values across key nutrient categories (i.e. fat, saturated fat, sugar, salt and dietary fibre) for breakfast cereals in the EU. The bars located at the low-end and high-end of the 'whiskers' represent minimum and maximum dietary values respectively; the 'cross' sign within each box represents mean/ average values; and the horizontal line within each box relates to median or middle values. The remaining data points (generally located outside of each box) represent 'outliers' - i.e., dietary values that differ significantly from the rest of the dataset. Values are all measured in grams.

Figure 6. Comparative look at the nutrient content of breakfast cereals in Europe



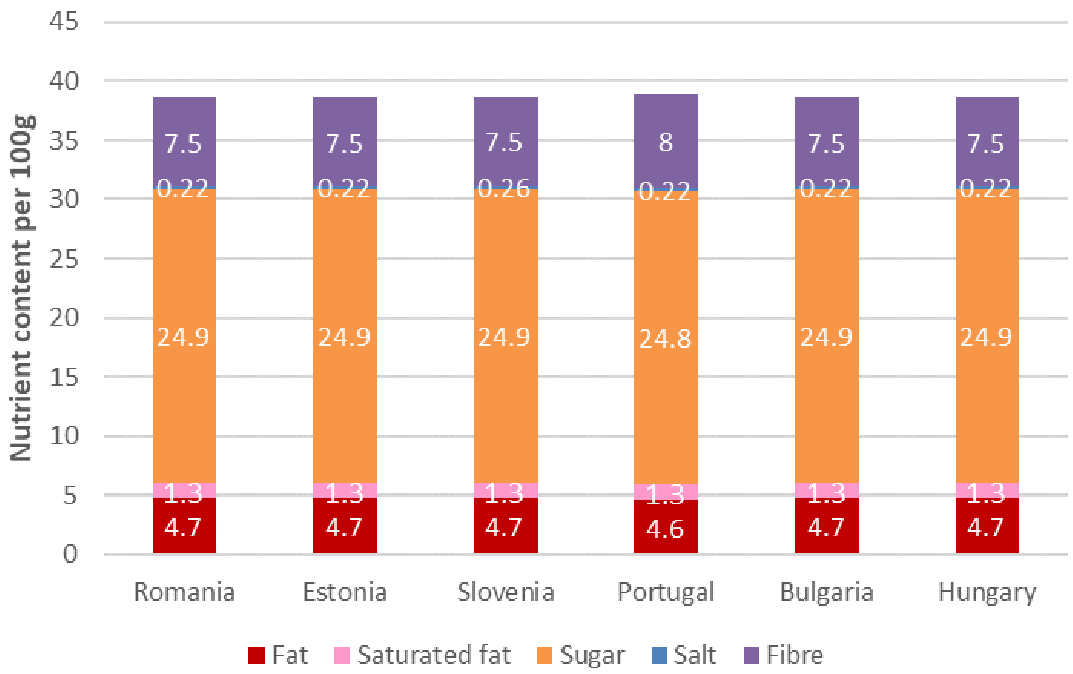
4.2.2 Comparative assessment of specific products across European countries

A comparative analysis on nutrient content was carried out to identify the extent to which manufacturers may adapt their product composition in different European countries. The selection criteria used to identify relevant products included:

- availability of the same product across multiple countries;
- products from the largest subcategories within the food group (highest number of products); and
- market share of the manufacturer or retailer in Europe and in the relevant countries (based on Eurostat and industry statistics).

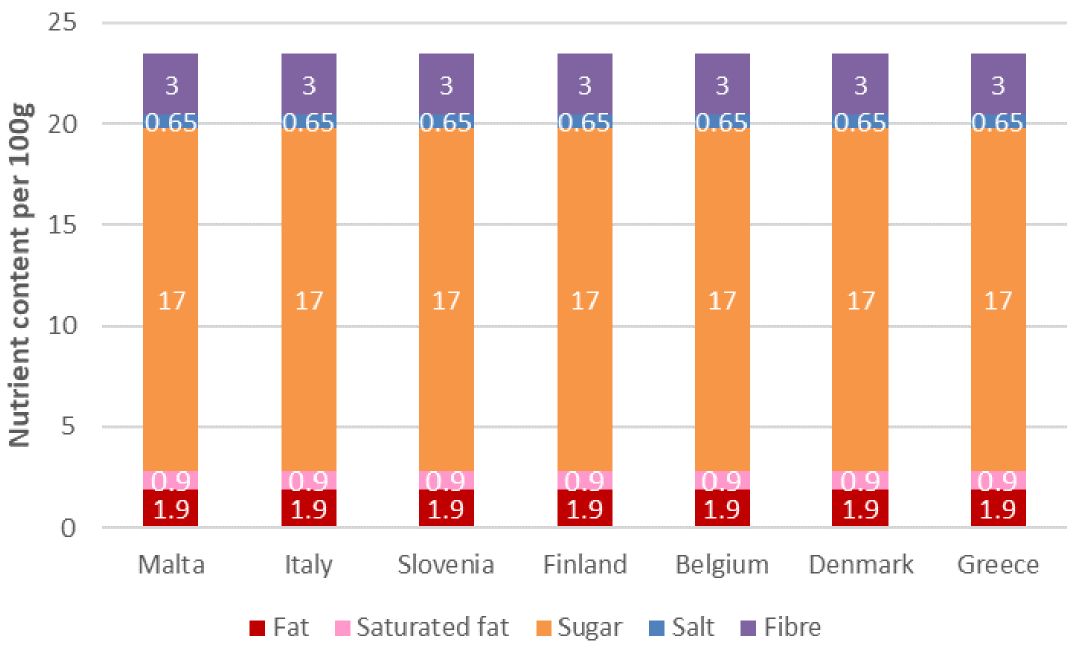
Within the breakfast cereals category three products were selected, Nestlé’s Chocapic, Kellogg's Coco Pops (both from the subcategory of chocolate flavoured cereals), and Lidl’s own brand Special Flakes - Bran Flakes with whole grain.

Figure 7. Dietary values (grams per 100 grams) for Nestlé's Chocapic cereals across European countries



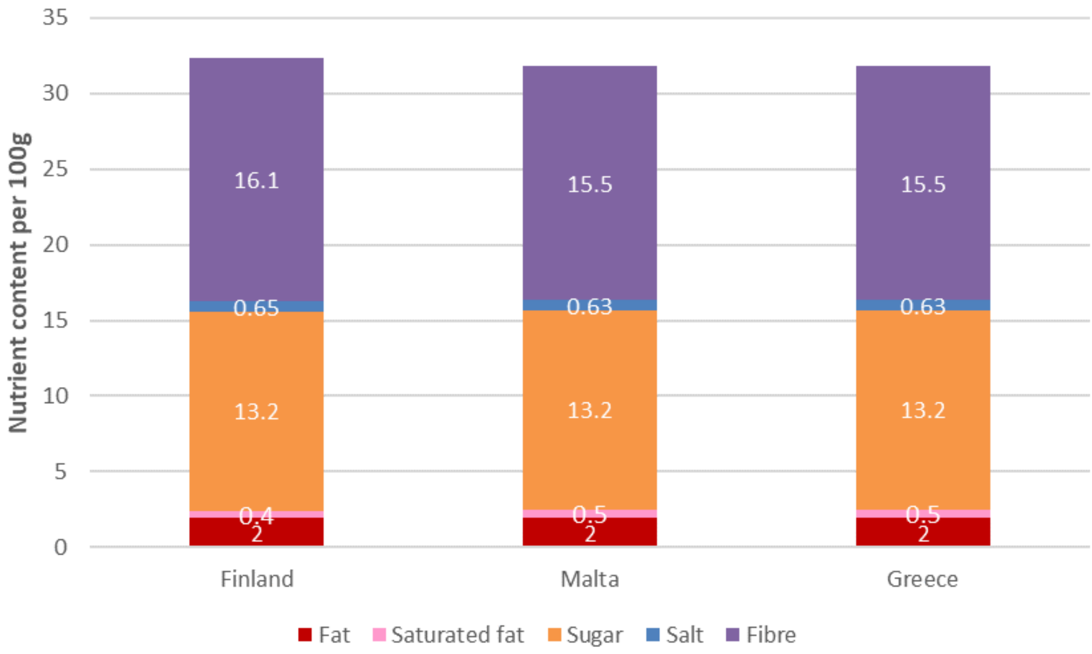
The analysis of Nestlé's Chocapic cereals across six European countries revealed similar values except in Slovenia, where salt contents were slightly higher (by 0.06 grams), and in Portugal, where the product had slightly lower fat and sugar content (by 0.1 gram each time), and noticeably higher fibre content (by 0.5 grams).

Figure 8. Dietary values (in grams) for Kellogg's 'Coco Pops' rice-shaped cereals across European countries



The above analysis of Kellogg's 'Coco Pops' rice-shaped cereals (as opposed to other variations under the 'Coco Pops' label) across seven European countries revealed the exact same dietary values for all.

Figure 9. Dietary values (in grams) Lidl's 'Special Flakes – Bran Flakes with whole grain' cereals across European countries



The analysis of Lidl's 'Special Flakes – Bran Flakes with (78%) whole grain', across three European countries revealed similar data, except that the product in Finland displayed slightly lower saturated fat content (by 0.1 gram), and slightly higher salt and fibre contents (by 0.02 grams and 0.6 grams respectively).

4.2.3 Subcategory analysis

A subcategory level analysis was conducted to identify potential differences in mean nutrient levels. Given there are over 400 subcategories within the dataset, it was necessary to select a sample of subcategories to analyse. Subcategories were selected/generated on the basis of:

- how well the subcategory aligned with Best-ReMaP subcategories (to facilitate future comparisons between the two separate exercises); and
- how many products were available within each subcategory for analysis and comparison (i.e. subcategories with higher number of products were favoured).

The subcategory analysis is presented in the two charts below, both comparing nutrient levels between different subcategories but whereas one compared nutrients between different product types (e.g. cereals and mueslis), the other looked at nutritional differences between subcategories of similar composition (e.g. cereals).

Figure 10. Comparing nutrients between subcategories of different composition

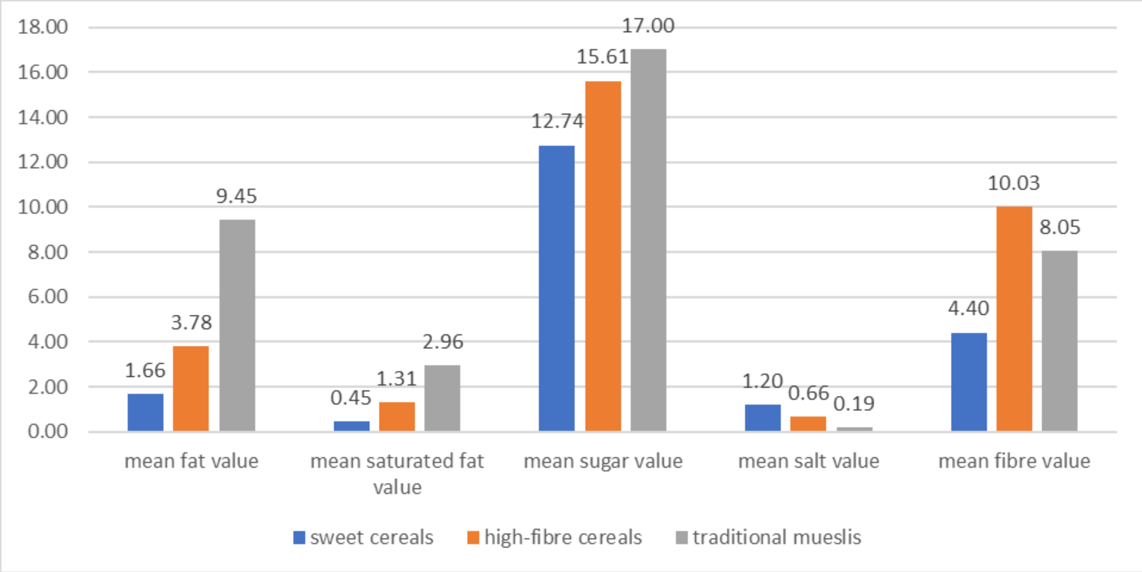
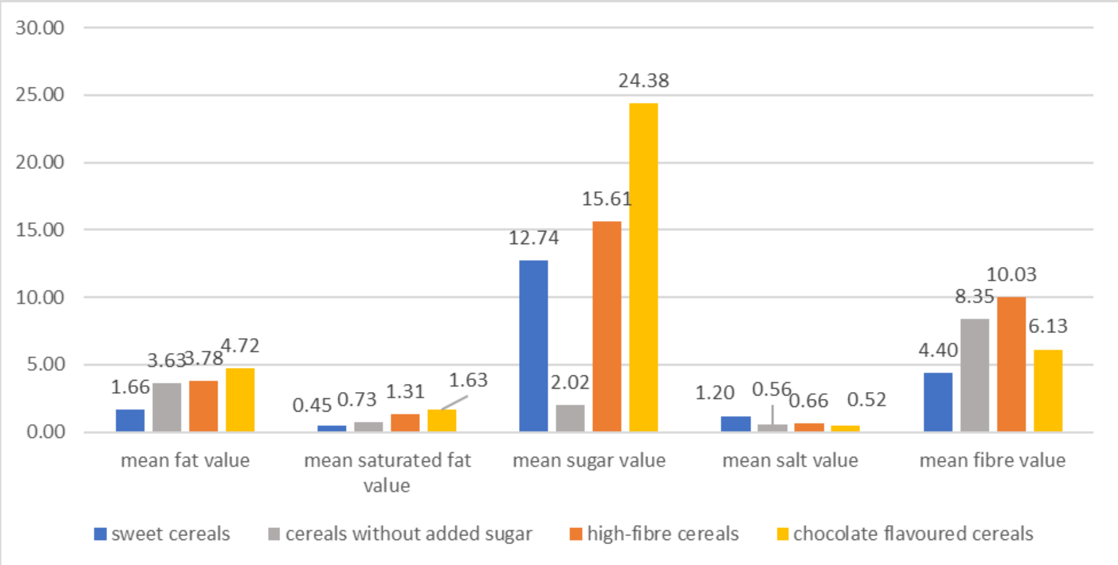


Figure 11. Comparing nutrients between subcategories of similar composition



4.2.4 Weighted analysis

Weighted analysis was undertaken to observe whether and to what extent mean values of nutrient content per category in each country varied once the data were adjusted to reflect purchasing and consumption habits. That is, the weighted analysis shows how category averages vary when greater weight is given to the average nutrient content of food and drink products that are more highly consumed within a given country.

Table 9 below presents details of the product subcategories for which data was collected in each country, and the weight given to each subcategory when calculating weighted category averages. The product subcategories listed below are based on the Global Data product subcategories (as the market share data from Global Data, which is used to weight the analysis, uses these product subcategories). Where a value is left blank, it indicates that data was not collected against that product subcategory in a country. Further information on the method used to derive subcategory weights and calculate weighted category nutrient values was included in Section 2.1.3.2.

Table 9. Weights given to each subcategory – breakfast cereals

Subcategory	AT	BE	BG	DK	EE	FI	FR	IT	LT	MT	PT	RO	SI	UK
Flakes	32%	63%	35%	30%	41%	35%	64%	62%	52%	41%	80%	40%	63%	60%
Other Cold RTE Cereals	9%	37%	65%	5%	25%	65%	36%	38%	48%	29%	20%	4%	37%	40%
Muesli	59%			64%	34%					30%		56%		

Table 10 below presents the results of the weighted analysis. It compares unweighted and weighted mean values of relevant nutrient content per category in each country where data was collected under more than one subcategory.

Table 10. Comparing weighted and unweighted mean nutrient values (in grams) – breakfast cereals

Country	Weighted/ unweighted	Fat	Saturated fatty acids	Sugars	Salt	Dietary fibres
Austria	**Weighted**	8.97	2.69	16.22	0.45	6.93
	Unweighted	9.88	2.90	18.07	0.41	7,14
Belgium	**Weighted**	4.22	1.55	18.88	0.77	5.83
	Unweighted	5.23	1.62	21.32	0.66	5.81
Bulgaria	**Weighted**	6.11	1.94	22.66	0.80	6.05
	Unweighted	6.05	1.91	22.63	0.77	6.22
Denmark	**Weighted**	10.50	2.68	14.71	0.50	9.37
	Unweighted	10.25	2.56	14.85	0.42	9.30
Estonia	**Weighted**	6.45	2.03	13.71	0.61	4.87
	Unweighted	9.82	2.74	21.37	0.57	6.39
Finland	**Weighted**	3.96	1.06	14.63	0.75	7.16

Country	Weighted/ unweighted	Fat	Saturated fatty acids	Sugars	Salt	Dietary fibres
	Unweighted	4.18	1.10	14.92	0.72	7.31
France	**Weighted**	4.07	1.53	20.04	0.86	5.54
	Unweighted	5.05	1.71	23.21	0.68	5.64
Italy	**Weighted**	4.41	1.40	15.99	0.71	7.20
	Unweighted	5.49	1.78	17.55	0.68	7.62
Lithuania	**Weighted**	4.87	1.38	21.92	0.82	4.57
	Unweighted	5.63	1.45	24.89	0.72	5.10
Malta	**Weighted**	7.31	2.29	19.49	0.69	6.62
	Unweighted	6.51	2.03	19.85	0.67	6.68
Portugal	**Weighted**	3.36	1.19	17.08	0.97	5.88
	Unweighted	4.78	1.47	22.53	0.75	5.75
Romania	**Weighted**	8.82	2.72	18.42	0.57	2.49
	Unweighted	8.77	2.72	23.08	0.54	6.50
Slovenia	**Weighted**	3.94	1.06	15.93	0.90	5.69
	Unweighted	5.17	1.46	19.48	0.75	5.87
UK	**Weighted**	3.26	0.91	16.61	0.50	6.87
	Unweighted	3.77	0.97	16.61	0.47	7.35

Note: Greece and Hungary were excluded from the weighted analysis as reference data in the Global data file was incomplete for these countries.

4.3 Canned fruits and vegetables

4.3.1 European overview

Overall, data from 15 countries (Austria, Belgium, Denmark, Estonia, Finland, France Greece, Hungary, Italy, Lithuania, Malta, Portugal, Romania, Slovenia and the UK) were collected and analysed within the category of canned fruits and vegetables. Altogether 283 products were identified belonging to four main sub-categories, these are:

- preserved fruit in fruit juice;
- preserved fruit in syrup;
- preserved fruit in water; and
- baked beans.

The breakdown of the products within the subcategories are shown in the following table (in absolute values) and chart (in percentages). These indicate that canned fruits and vegetables more commonly fall into the "preserved fruits in syrup" and "preserved fruits in fruit juice" sub-categories.

Table 11. Europe: subcategories within the food group of canned fruits and vegetables

Subcategories	Number of products
Preserved fruits in syrup	183
Preserved fruits in fruit juice	64
Baked beans	29
Preserved fruit in water	7
TOTAL	**283**

Figure 12. Europe: subcategories within the food group of canned fruits and vegetables (%)

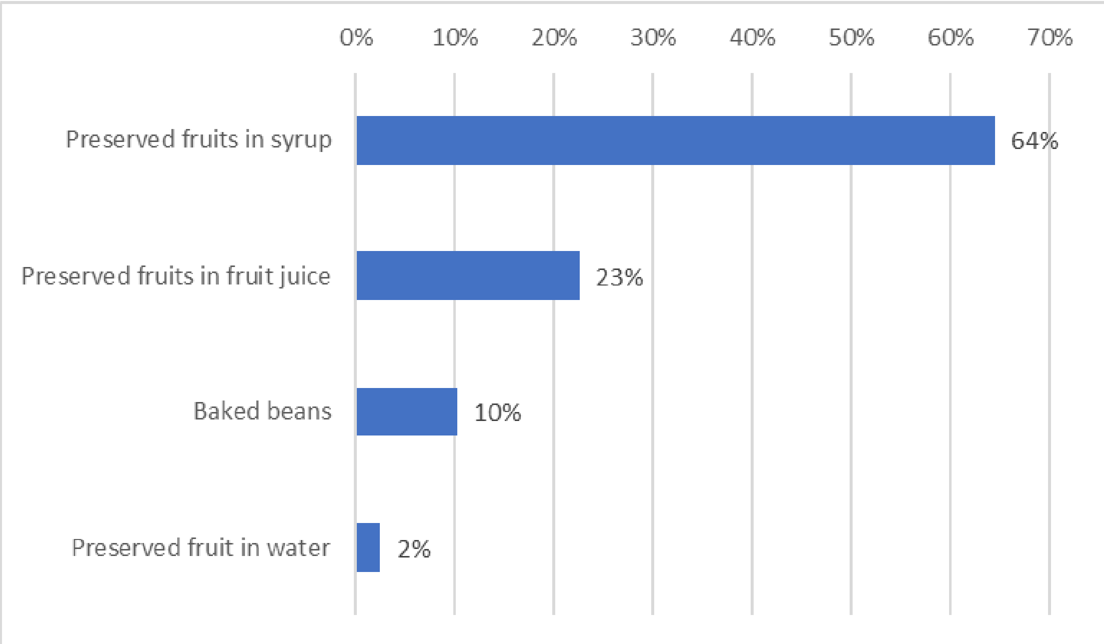


Table 12. Composition of each country's sample – canned fruits and vegetables

	Baked beans	Preserved fruits in fruit juice (apricots)	Preserved fruits in fruit juice (fruit cocktail)	Preserved fruits in fruit juice (other)	Preserved fruits in fruit juice (peaches)	Preserved fruits in fruit juice (pears)	Preserved fruits in syrup (fruit cocktail)	Preserved fruits in syrup (other)	Preserved fruits in syrup (peaches)	Preserved fruits in syrup (pears)	Preserved fruits in water (fruit cocktail)	Preserved fruits in water (peaches)
Austria			4	13			7	18				
Belgium			8		6	1	7		9	7	2	2
Denmark					3	1	3		5	2		
Estonia			2		2	1	1		7	2		
Finland		2	4		6	3	7		6	1		1
France					3	1			23	18		
Greece			1		2		3		3			1
Hungary							4		4			1
Italy			1				4		3	1		
Lithuania							3		6	2		
Malta									1			
Portugal									6	1		
Romania								4	2			
Slovenia	2								10	3		
UK	21											
Total	**23**	**2**	**20**	**13**	**22**	**7**	**39**	**22**	**85**	**37**	**2**	**5**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

The below table shows that data on canned fruits and vegetables were collected between December 2019 and May 2021, which may inform the interpretation of differences in nutritional content.

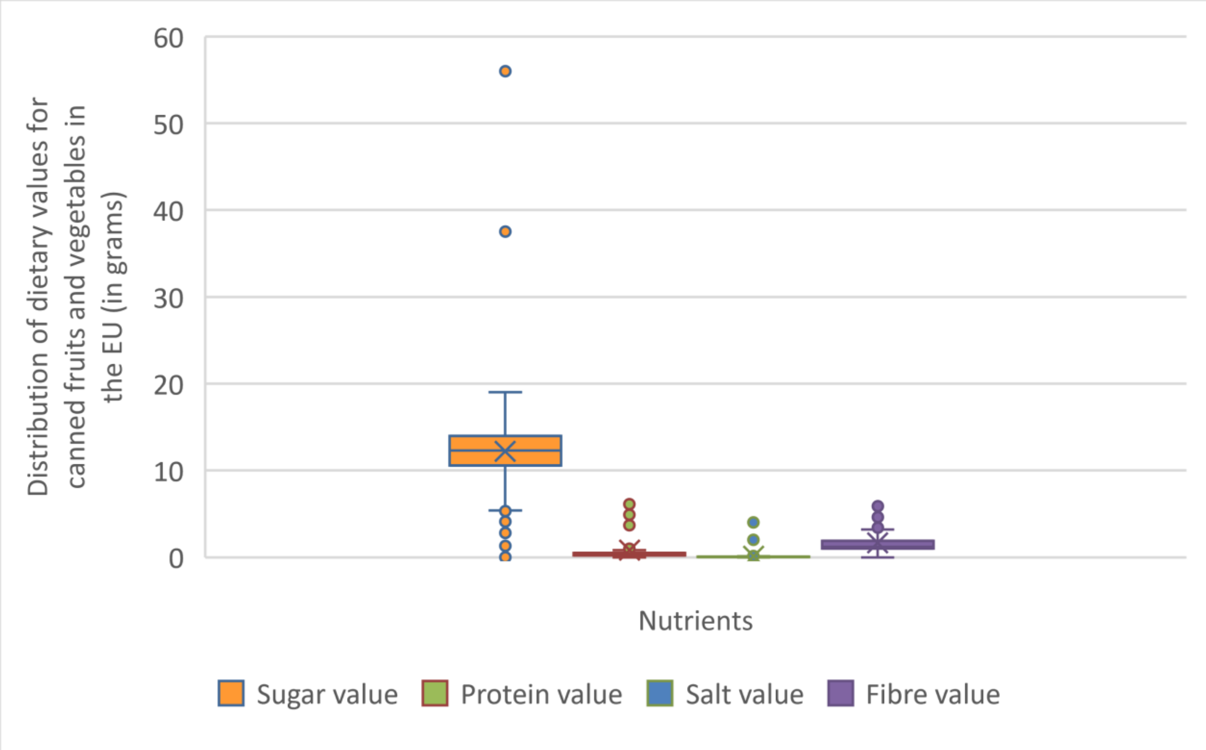
Table 13. Dates for data collection, by country – canned fruits and vegetables

	Jan 2017	Nov 2019	Dec 2019	Feb 2020	Mar 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Mar 2021	Apr 2021	May 2021	Jul 2021	Aug 2021	Nov 2021	Dec 2021	Jan 2022
Austria		15														22	5	
Belgium		24				3	10				5							
Denmark				8	4	2												
Estonia							13	2										
Finland		15		4		11												
France	45																	
Greece					10													
Hungary				6				3										
Italy			1			4							3					1
Lithuania							5	3						3				
Malta							1											
Portugal					3				1	2		1						
Romania				3								3						
Slovenia					9	1		5										
UK			9	2	2							7			1			
Total	**45**	**54**	**10**	**23**	**28**	**21**	**29**	**13**	**1**	**2**	**5**	**11**	**3**	**3**	**1**	**22**	**5**	**1**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

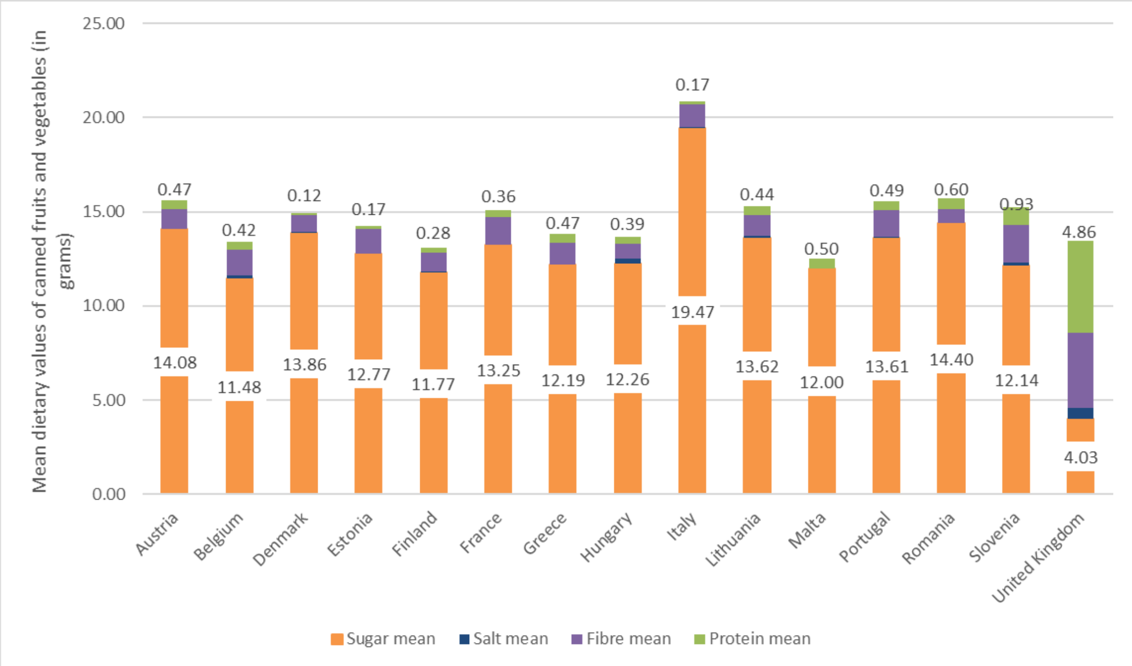
In terms of their nutritional content, most canned fruit and vegetable products shared similar distributions (as depicted in the box plot below). Only a few of the products analysed were found to have higher-than-average nutritional values.

Figure 13. Distribution of dietary values for canned fruits and vegetables in Europe



The chart below depicts differences in nutritional content within the canned fruits and vegetables product category among countries. Differences in nutritional content for canned fruits are not significant across most countries, except in the case of Italy for sugar content and Slovenia for salt, dietary fibre and protein content respectively. In the case of vegetables, specifically baked beans products in two countries were analysed; these are Slovenia and the UK. Baked bean products in the UK had, on average, 3g higher salt content per 100 grams than those in Slovenia.

Figure 14. Comparative look at the nutrient content of canned fruits and vegetables at the European level



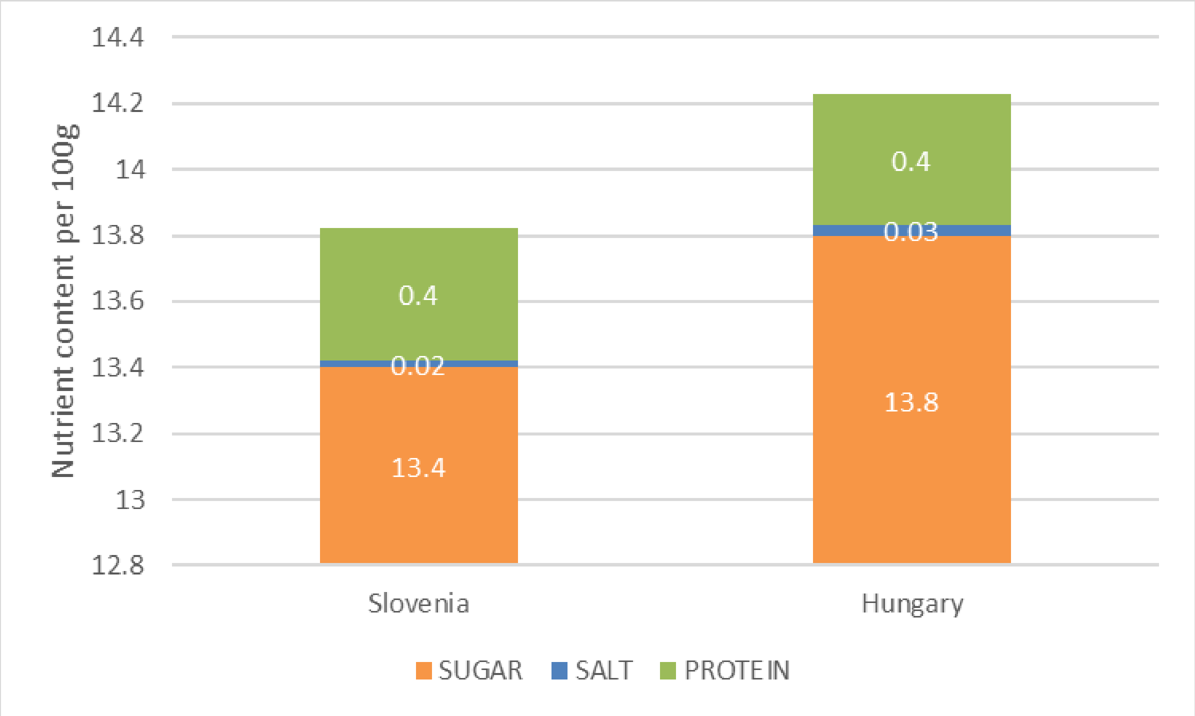
4.3.2 Comparative assessment of specific products across European countries

A comparative analysis on nutrient content was carried out to identify the extent to which manufacturers may adapt their product composition in different European countries. The selection criteria used to identify relevant products included:

- availability of the same product across multiple countries;
- products from the largest subcategories within the food group (highest number of products);
- market share of the manufacturer or retailer in Europe and in the relevant European countries (based on Eurostat and industry statistics).

Within the canned fruits and vegetables category, Lidl's own-brand product was selected from the subcategory of preserved fruits in syrup (peaches). Due to the limited number of overall products in the category, it proved particularly challenging to find the same items across multiple European countries.

Figure 15. Dietary values (grams per 100 grams) for Lidl's Preserved fruits in syrup (peaches) across two European countries



The analysis of Lidl's own-brand preserved fruit in syrup (peach) showed higher content values in Hungary than Slovenia, with differences of 0.4g and a 0.1g for sugar and salt content respectively.

4.3.3 Subcategory analysis

The subcategory analysis is presented in the two charts below, both comparing nutrient levels between different subcategories but whereas one compared nutrient values between different product types (e.g. different fruits), the other looked at nutritional differences between subcategories of similar composition.

Figure 16. Comparing nutrients between products of different composition

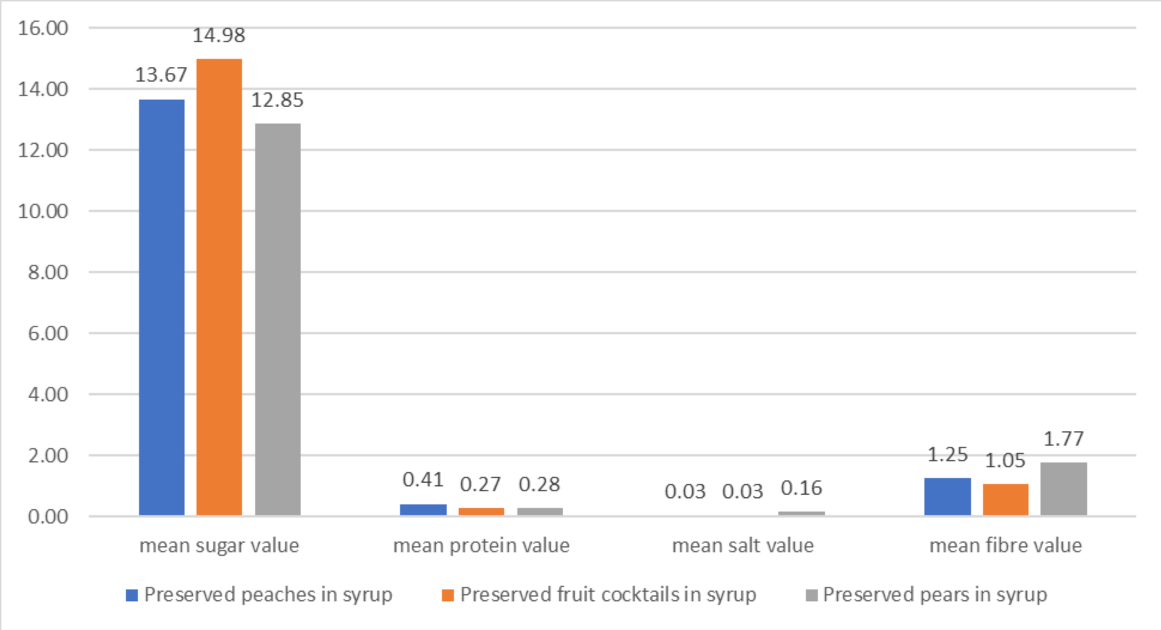
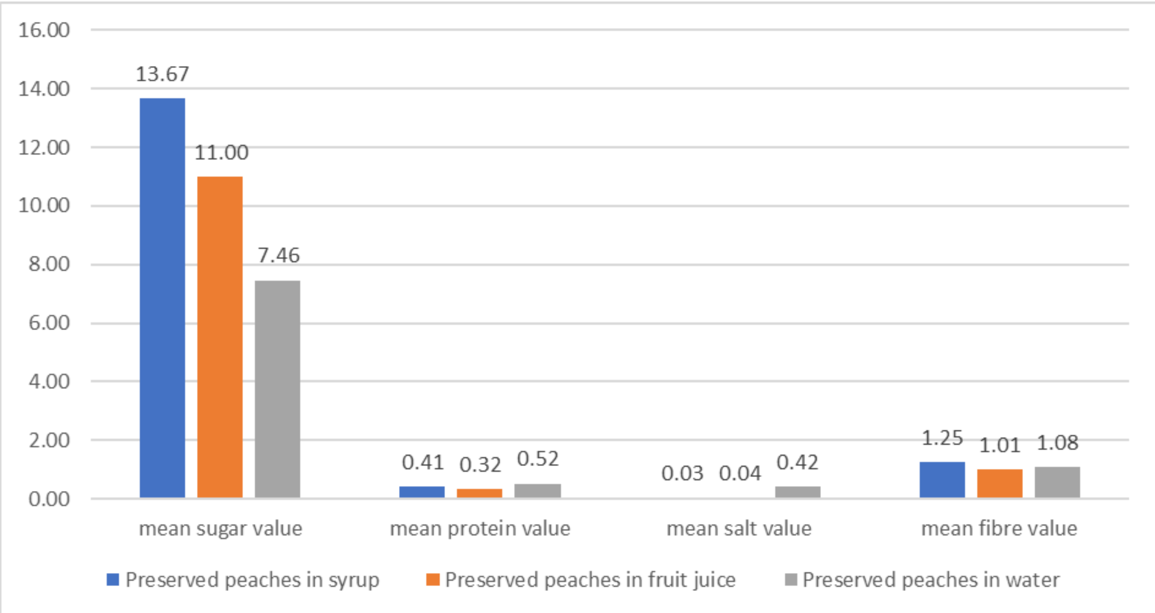


Figure 17. Comparing nutrients between subcategories of peaches



4.3.4 Weighted analysis

Weighted analysis was undertaken to observe whether and to what extent mean values of nutrient content per category in each country varied once the data were adjusted to reflect purchasing and consumption habits. That is, the weighted analysis shows how category averages vary when greater weight is given to the average nutrient content of food and drink products that are more highly consumed within a given country.

Table 14 below presents details of the product subcategories for which data was collected in each country, and the weight given to each subcategory when calculating weighted category averages. The product subcategories listed below are based on the Global Data product subcategories (as the market share data from Global Data, which is used to weight the analysis, uses these product subcategories). Where a value is left blank, it indicates that data was not collected against that product subcategory in a country. Further information on the method used to derive subcategory weights and calculate weighted category nutrient values was included in Section 2.1.3.2.

Table 14. Weights given to each subcategory – canned fruits and vegetables

Subcategory	AT	BE	DK	EE	FI	FR	GR	HU	IT	LT	MT	PT	RO	SI	UK
Apricots					22%			26%							
Fruit cocktail	29%	20%	33%		29%		48%	25%	17%						
Other canned fruit	71%												60%		
Peaches		44%	37%		28%	59%	52%	29%	26%			57%	40%		
Pears		36%	30%		21%	41%		21%	21%			43%			
Baked beans									35%						100%

Note: data availability in the Global Data was not sufficient to calculate a weight correction for Estonia, Lithuania, Malta, and Slovenia.

Table 15 below presents the results of the weighted analysis. It compares unweighted and weighted mean values of relevant nutrient content per category in each country where data was collected under more than one subcategory.

Table 15. Comparing weighted and unweighted mean nutrient values (in grams) – canned fruits and vegetables

Country	Weighted/ unweighted	Sugar	Salt	Fibre	Protein
Austria	**Weighted**	14.05	0.03	1.01	0.46
	Unweighted	14.08	0.03	1.02	0.47
Belgium	**Weighted**	11.85	0.21	1.41	0.40
	Unweighted	11.48	0.13	1.37	0.42
Denmark	**Weighted**	13.64	0.10	0.54	0.09
	Unweighted	13.86	0.10	0.85	0.12
Finland	**Weighted**	11.36	0.03	1.07	0.31

Country	Weighted/ unweighted	Sugar	Salt	Fibre	Protein
	Unweighted	11.77	0.03	1.01	0.28
France	**Weighted**	13.25	0.02	1.46	0.36
	Unweighted	13.25	0.02	1.47	0.36
Greece	**Weighted**	12.14	0.02	1.13	0.46
	Unweighted	12.19	0.01	1.15	0.47
Hungary	**Weighted**	12.32	0.23	0.82	0.38
	Unweighted	12.26	0.24	0.80	0.39
Italy	**Weighted**	11.33	0.01	0.75	0.11
	Unweighted	19.47	0.03	0.98	0.19
Portugal	**Weighted**	13.08	0.02	1.49	0.49
	Unweighted	13.61	0.03	1.43	0.49
Romania	**Weighted**	14.28	0.02	0.74	0.59
	Unweighted	14.40	0.02	0.70	0.60
UK	**Weighted**	4.03	0.53	4.02	4.86
	Unweighted	4.03	0.53	4.02	4.86

Note: Estonia, Lithuania, Malta, and Slovenia were excluded from the weighted analysis as data was collected for only one product subcategory in these countries.

4.4 Sugar-sweetened beverages, energy and sports drinks

4.4.1 European overview

Overall, data from 16 countries (Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Romania, Slovenia and the UK) were collected and analysed within the category of sugar-sweetened beverages and energy and sports drinks. Altogether 3025 products were identified belonging to 26 sub-categories.

The breakdown of the products within the subcategories are shown in the following table (in absolute values) and chart (in percentages). These indicate that sugar-sweetened beverages more commonly fall into the "sugar-sweetened fruit beverages (carbonated)," "sugar-sweetened energy drinks" and "sugar-sweetened fruit beverages (still)" sub-categories.

Table 16. Europe: subcategories within the food group of sugar-sweetened beverages, energy and sports drinks

Subcategories	Number of products
Sugar-sweetened fruit beverages (still)	415
Sugar-sweetened fruit beverages (carbonated)	388
Sugar-sweetened energy drinks	294
Colas without added sugar	219
Fruit beverages without added sugar (carbonated)	186
Sugar-sweetened and artificially-sweetened fruit beverages (carbonated)	174
Sugar-sweetened colas	163
Sugar-sweetened tonics and bitters	155
Energy drinks without added sugar	137
Flavoured sugar-sweetened beverages (carbonated)	137
Flavoured beverages without added sugar (carbonated)	106
Fruit beverages without added sugar (still)	105
Sugar- and artificially-sweetened energy drinks	91
Nectars	88
Flavoured sugar- and artificially-sweetened beverages (carbonated)	79
Sugar-sweetened and artificially-sweetened colas	61
Sugar-sweetened and artificially-sweetened fruit beverages (still)	52
Sugar-sweetened and artificially-sweetened tonics and bitters	43
Sugar-sweetened and artificially-sweetened energy drinks	42
Tonics and bitters without added sugar	31
Sugar-sweetened sports drinks	24
Sugar-sweetened and artificially-sweetened energy drinks	11

Subcategories	Number of products
Sugar-sweetened tea beverages	8
Flavoured beverages without added sugar (still)	7
Flavoured sugar-sweetened beverages (still)	6
Flavoured sugar- and artificially-sweetened beverages (still)	2
Total	**3025**

Figure 18. Europe: share of the main subcategories within the food group of sugar-sweetened beverages

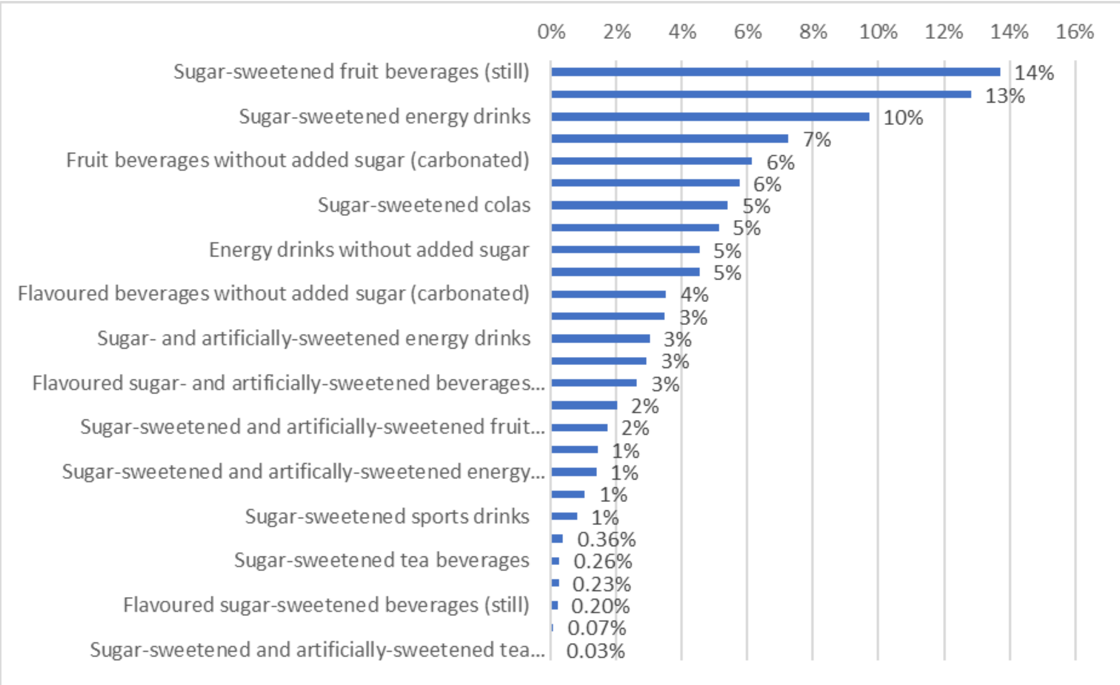


Table 17. Composition of each country's sample – sugar-sweetened beverages, energy and sports drinks

	Colas without added sugar	Energy drinks without added sugar	Flavoured beverages without added sugar (carbonated)	Flavoured beverages without added sugar (still)	Flavoured sugar- and artificially-sweetened beverages (carbonated)	Flavoured sugar- and artificially-sweetened beverages (still)	Flavoured sugar-sweetened beverages (carbonated)	Flavoured sugar-sweetened beverages (still)	Fruit beverages without added sugar (carbonated)	Fruit beverages without added sugar (still)	Nectars	Sugar- and artificially-sweetened energy drinks	Sugar- and artificially-sweetened colas	Sugar- and artificially-sweetened fruit beverages (carbonated)	Sugar- and artificially-sweetened fruit beverages (still)	Sugar- and artificially-sweetened tea beverages	Sugar- and artificially-sweetened tonics and bitters	Sugar-sweetened colas	Sugar-sweetened energy drinks	Sugar-sweetened fruit beverages (carbonated)	Sugar-sweetened fruit beverages (still)	Sugar-sweetened sports drinks	Sugar-sweetened tea beverages	Sugar-sweetened tonics and bitters	Tonics and bitters without added sugar
Austria	7	6	7		4		20	1	9	4		5	2	3	2			18	30	61	32			17	
Belgium	15	7	3		8		6		8			13	1	12			4	8	12	10		7		7	1
Bulgaria	13	1	17		12		6		7			2	2	3			1	8	6	7				5	4
Denmark		9			1		7					8		4			1	5	17	28				13	
Estonia	2		1		1		10	2					1	4			1	9	1	10	1			2	
Finland	3	41	8	2	4		30	1	16	26		18	8	9	4			11	33	42	103	3		16	1
France	86	7							56	25		11	23	27	17		9	41	43	99	270			19	3
Greece	15	4	3		3		13		13		17	10	1	12			2	9	10	31				1	1
Hungary	15	8	15		7		2		6			14	3	19			3	3	16	6				2	1
Italy	7		6		3		14		9				2	8			2	8		23		7		9	1
Lithuania	7	7			12		10		1		71	14	5	11				10	45	23				10	
Malta	14	14	14		8		8		16			7	3	14			7	8	14	6		2		11	2
Portugal	9	5	3	3	6		3		3	10		6	3	25	20		1	5	9	1	2			5	1
Romania	5	2	2		5		2		2			11	1	5				10	20	21				4	2
Slovenia	11	11	5				6	2	8	1		8	1	2	2	1		10	38	20	7		8	26	1
UK	10	15	22	2	5	2			32	39		17	5	16	7		12					5		8	13
Total	**219**	**137**	**106**	**7**	**79**	**2**	**137**	**6**	**186**	**105**	**88**	**144**	**61**	**174**	**52**	**1**	**43**	**163**	**294**	**388**	**415**	**24**	**8**	**155**	**31**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

The below table shows when data on sugar-sweetened beverages were collected given this may inform the interpretation of differences in nutritional content.

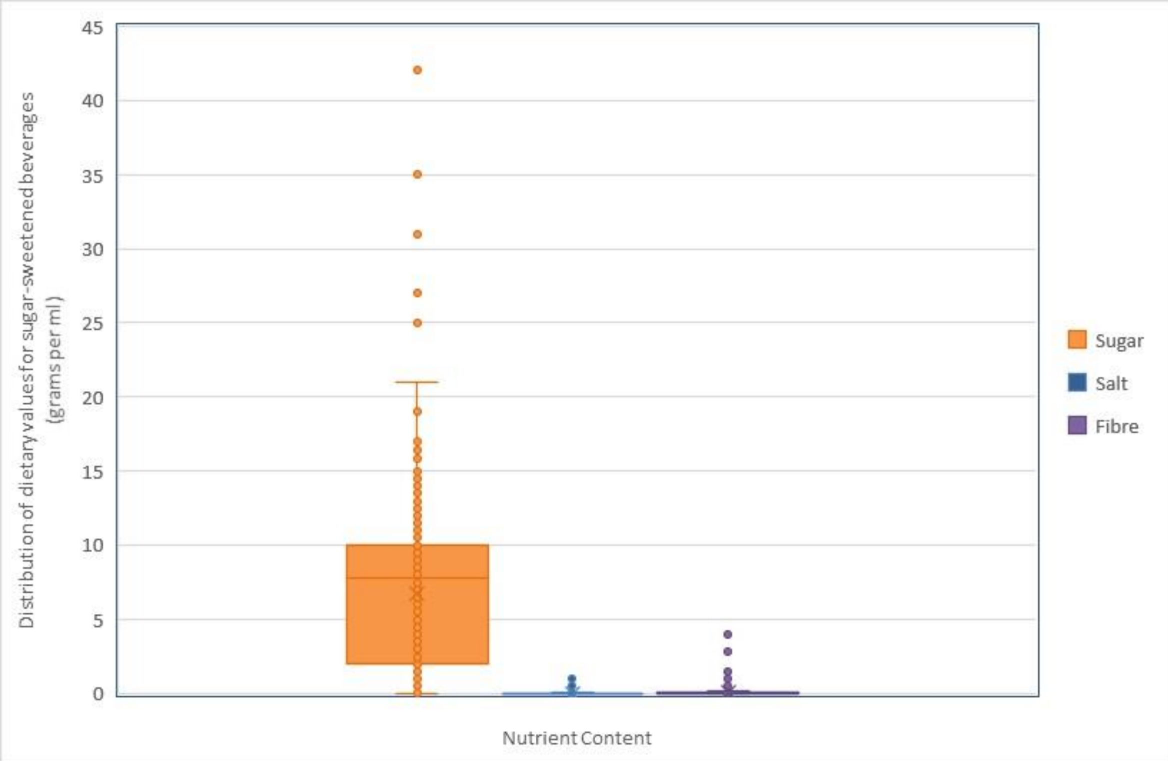
Table 18. Dates for data collection, by country – sugar-sweetened beverages and energy, sports drinks

	Jan 2013	Nov 2019	Dec 2019	Feb 2020	Mar 2020	Apr 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Mar 2021	Apr 2021	May 2021	Jul 2021	Aug 2021	Nov 2021	Dec 2021	Jan 2022
Austria		128			16											17	67	
Belgium		85				1		29			7							
Bulgaria							93			1								
Denmark				82	5		6											
Estonia								44	1									
Finland		225	57	33			23	41										
France	736																	
Greece				121	9		15											
Hungary				95					16			9						
Italy			6				75	7					11					
Lithuania								66	116					44				
Malta							19	68				2		57	2			
Portugal					86					22		7		5				
Romania				20					2					70				
Slovenia				69	47		13	25	14									
UK			61		28							66	8		19			28
Total	**736**	**438**	**124**	**420**	**191**	**1**	**244**	**280**	**149**	**23**	**7**	**84**	**19**	**176**	**21**	**17**	**67**	**28**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

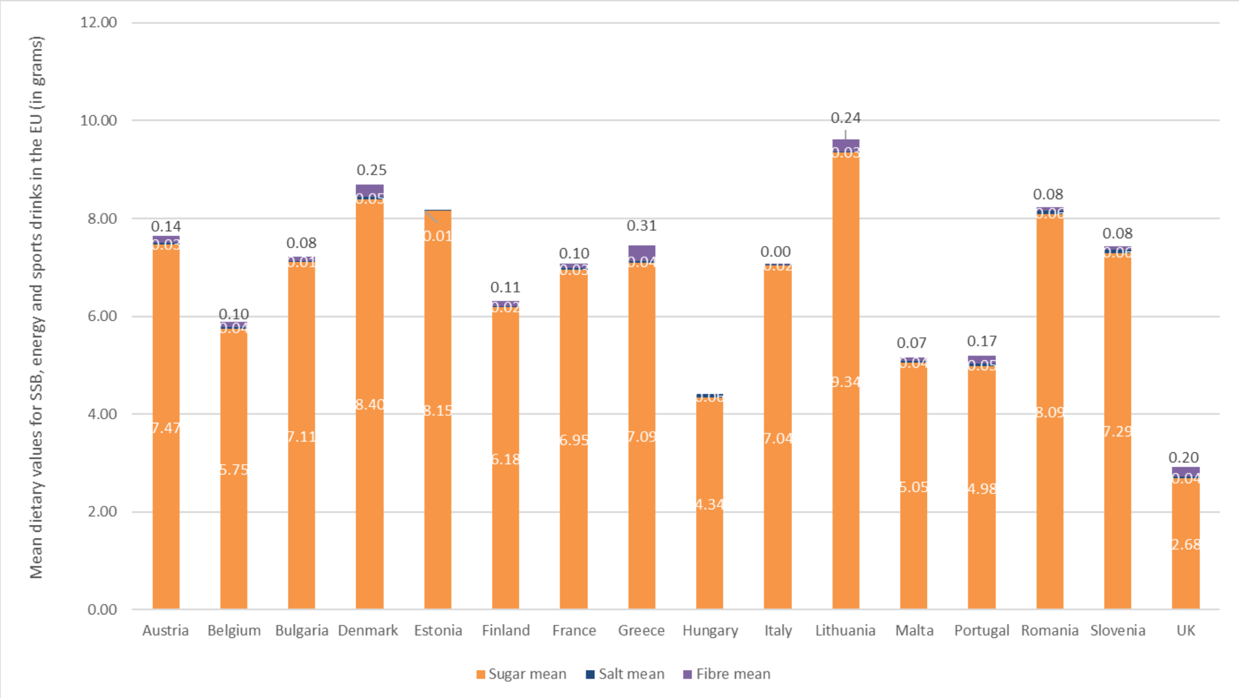
The nutritional content of scanned products fell within specific ranges with the exception of sugar which had shown larger variations compared to salt and fibre content levels as indicated in the figure below.

Figure 19. Distribution of dietary values for sugar-sweetened beverages, energy and sports drinks in Europe (grams per 100 grams)



With regard to differences in mean nutritional content values between countries, there is a small variation in sugar content. Lithuania has the highest average sugar content of sugar-sweetened beverages, energy and sports drinks with 9.34 grams per 100 millilitres. This is more than three times higher than that of the UK, which is 2.68 grams.

Figure 20. Comparative look at sugar-sweetened beverage, energy and sports drinks nutrient content at the European level



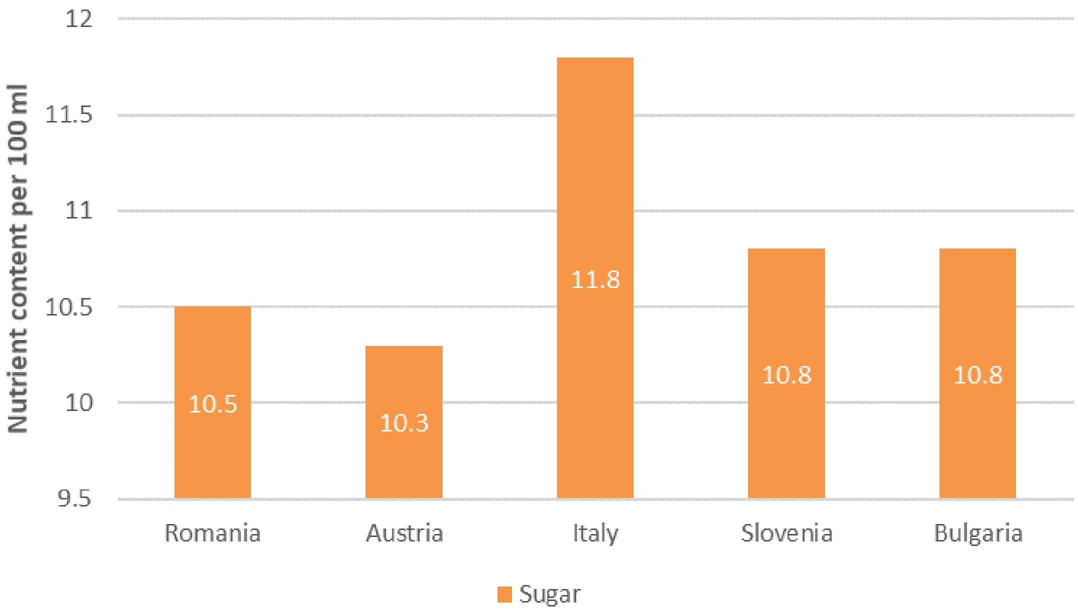
4.4.2 Comparative assessment of specific products across European countries

A comparative analysis on nutrient content was carried out to identify the extent to which manufacturers may adapt their product composition in different European countries. The selection criteria used to identify relevant products included:

- availability of the same product across multiple countries;
- products from the largest subcategories within the food group (highest number of products);
- market share of the manufacturer or retailer in Europe and in the relevant country (based on Eurostat and industry statistics).

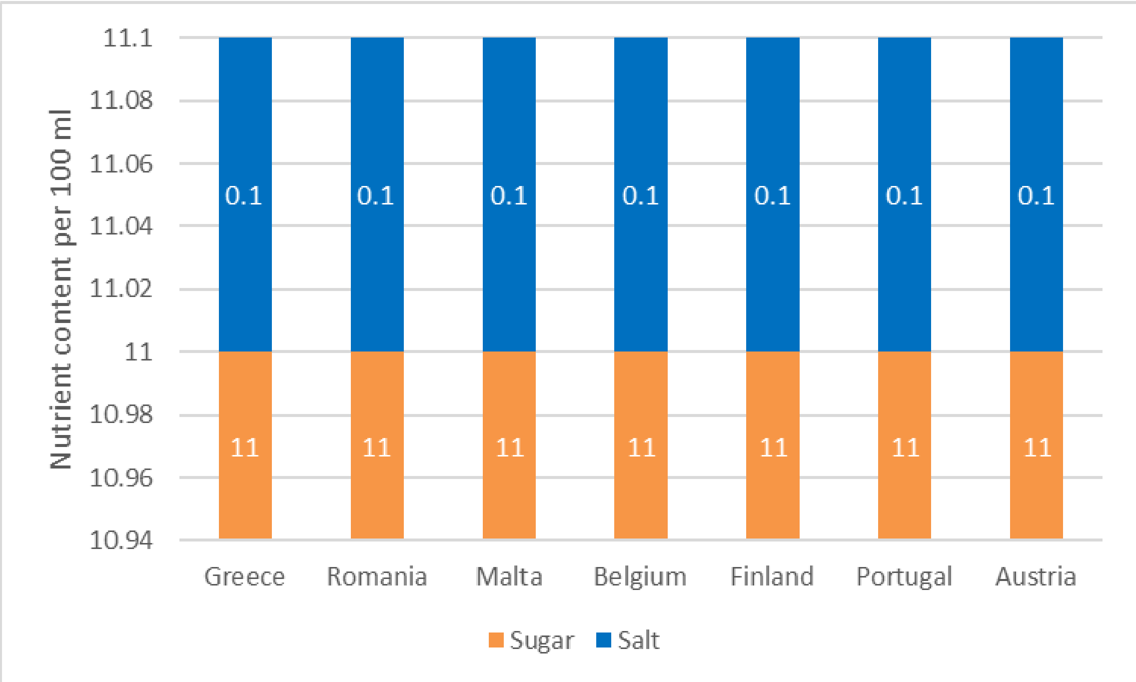
Within the sugar-sweetened beverages, energy and sports drinks category two products were selected, Fanta Orange (from the subcategory sugar-sweetened fruit beverages carbonated) and Red Bull (from the subcategory energy drinks).

Figure 21. Dietary values (in grams) for Fanta Orange across European countries



Sugar was the only measurable nutrient in the product, which showed variations across the five European countries. The lowest sugar content (10.3 grams per 100 ml) was observed in Austria and the highest (11.8 grams per 100 ml) in Italy, amounting to a 1.5 grams per 100 ml difference between the products.

Figure 22. Dietary values (in grams) for Red Bull energy drink across European countries



The analysis of the Red Bull energy drink revealed the same dietary values across seven European countries.

4.4.3 Subcategory analysis

A subcategory level analysis was conducted to identify potential differences in mean nutrient levels. The rationale for selecting the subcategories was based on the:

- alignment of the subcategory with Best-ReMaP;
- number of available products for comparison (subcategories with the highest number of products).

The subcategory analysis produced two charts both comparing nutrient levels between different subcategories but whereas one compared nutrients between different product types (e.g. colas, nectars, tonics etc.), the other looked at nutritional differences between subcategories of similar composition.

Figure 23. Comparing nutrients between subcategories of different composition

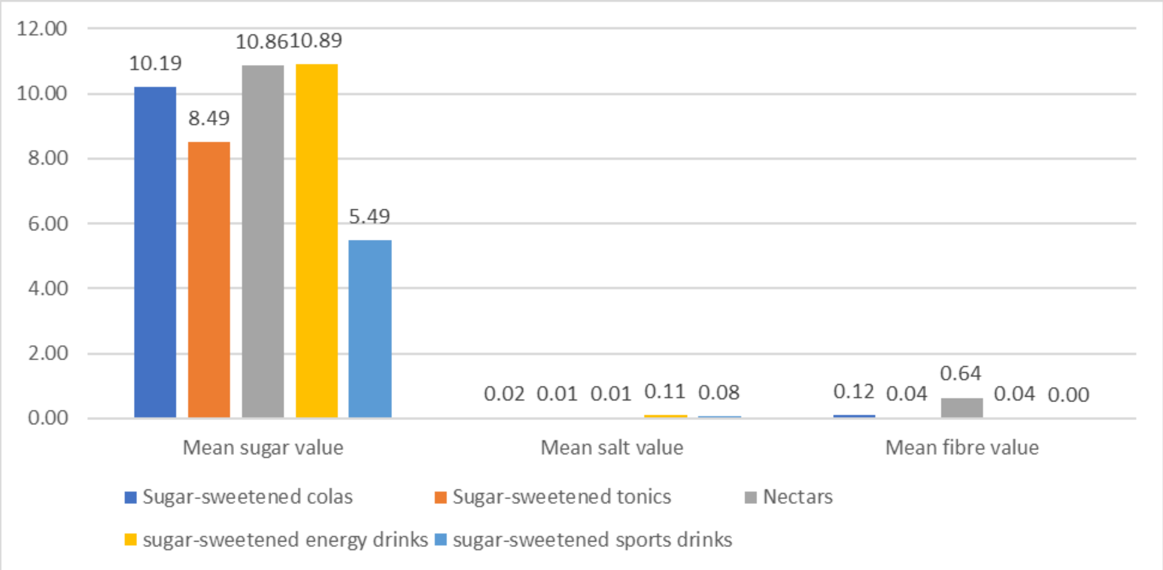
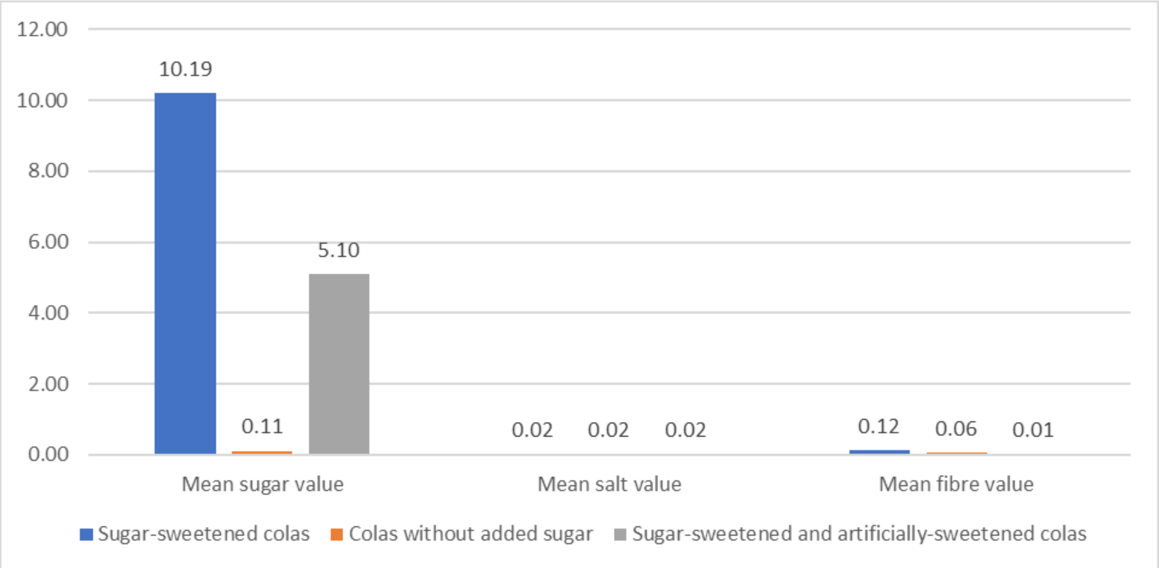


Figure 24. Comparing nutrients between subcategories of similar composition (colas)



4.4.4 Weighted analysis

Weighted analysis was undertaken to observe whether and to what extent mean values of nutrient content per category in each country varied once the data were adjusted to reflect purchasing and consumption habits. That is, the weighted analysis shows how category averages vary when greater weight is given to the average nutrient content of food and drink products that are more highly consumed within a given country.

Table 19 below presents details of the product subcategories for which data was collected in each country, and the weight given to each subcategory when calculating weighted category averages. The product subcategories listed below are based on the Global Data product subcategories (as the market share data from Global Data, which is used to weight the analysis, uses these product subcategories). Where a value is left blank, it indicates that data was not collected against that product subcategory in a country. Further information on the method used to derive subcategory weights and calculate weighted category nutrient values was included in Section 2.1.3.2.

Table 19. *Weights given to each subcategory – sugar-sweetened beverages*

Subcategory	AT	BE	BG	DK	EE	FI	FR	GR	HU	IT	LT	MT	PT	RO	SI	UK
Carbonates	93%	100%	100%	100%	77%	84%	83%	89%	100%	100%	83%	100%	81%	100%	55%	91%
Iced/RTD Tea Drinks															16%	
Nectars								11%			17%					
Still drinks	7%				23%	16%	17%						19%		28%	9%

Table 20 below presents the results of the weighted analysis. It compares unweighted and weighted mean values of relevant nutrient content per category in each country where data was collected under more than one subcategory.

Table 20. *Comparing weighted and unweighted mean nutrient values (in grams) – sugar-sweetened beverages*

Country	Weighted/ unweighted	Sugars	Salt	Dietary fibres
Austria	**Weighted**	7.16	0.02	0.20
	Unweighted	7.47	0.03	0.20
Belgium	**Weighted**	5.37	0.02	0.05
	Unweighted	5.74	0.03	0.09
Bulgaria	**Weighted**	3.92	0.02	0.08
	Unweighted	3.92	0.02	0.08
Denmark	**Weighted**	9.11	0.03	0.25
	Unweighted	9.11	0.03	0.25
Estonia	**Weighted**	8.02	0.00	0.00

Country	Weighted/ unweighted	Sugars	Salt	Dietary fibres
	Unweighted	8.02	0.01	0.00
Finland	**Weighted**	7.24	0.01	0.03
	Unweighted	6.18	0.02	0.11
France	**Weighted**	5.90	0.02	0.09
	Unweighted	6.76	0.02	0.10
Greece	**Weighted**	6.78	0.02	0.07
	Unweighted	6.92	0.02	0.31
Hungary	**Weighted**	3.69	0.06	0.00
	Unweighted	4.34	0.06	0.00
Italy	**Weighted**	7.21	0.01	0.00
	Unweighted	7.21	0.01	0.00
Lithuania	**Weighted**	8.46	0.01	0.14
	Unweighted	9.30	0.01	0.27
Malta	**Weighted**	4.35	0.02	0.10
	Unweighted	4.35	0.02	0.10
Portugal	**Weighted**	4.59	0.04	0.19
	Unweighted	4.32	0.04	0.17
Romania	**Weighted**	7.45	0.02	0.10
	Unweighted	7.45	0.02	0.10

Country	Weighted/ unweighted	Sugars	Salt	Dietary fibres
Slovenia	**Weighted**	6.78	0.03	0.24
	Unweighted	6.59	0.03	0.20
UK	**Weighted**	2.01	0.02	0.14
	Unweighted	2.52	0.02	0.19

4.5 Sugar-sweetened dairy and dairy imitates, ice cream desserts

4.5.1 European overview

Overall, data from 16 countries (Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Romania, Slovenia and the UK) were collected and analysed within the category of sugar-sweetened dairy and dairy imitates, ice cream desserts. Altogether 9,096 products were identified belonging to 47 sub-categories. The category of ice cream desserts contained 26 subcategories, while sugar-sweetened dairy and dairy imitates had 21 subcategories.

The breakdown of the products within the subcategories are shown in the following table (in absolute values) and chart (in percentages). These indicate that the highest number of products within the ice cream dessert category fall within the 'luxury bulk ice-cream' subcategory, whereas for sugar-sweetened dairy and dairy imitates, the 'classic sweet yoghurts (fruited, set)' subcategory.

Table 21. Europe: subcategories within the food group of sugar-sweetened dairy and dairy imitates, ice cream desserts

Subcategories	Number of products
Ice cream desserts	**5,812**
Luxury bulk ice cream	917
Bulk ice cream	820
Ice cream cones > or = 80ml	538
Ice cream sticks > or = 80ml	525
Dessert creams and jellied milks	465
Frozen ice cream desserts for sharing	283
Sundae and frozen desserts	261
Ice cream sticks < 80ml	245
Egg-based fresh desserts	209
Other fresh desserts	208
Fresh desserts with cereals	174
Bulk sorbet	155
Mini ice cream sticks	143
Ice cream bars and mini bars	135
Ice cream tubs > or = 80ml	128
Water or fruit ices	106
Fresh soy desserts	83
Fresh light and/or artificially-sweetened desserts	81
Ice cream cones < 80ml	76
Mini ice cream cones	74
Sorbet tubs	49
Sorbet cones	43

Subcategories	Number of products
Sorbet sticks	39
Ice cream tubs < 80ml	33
Other fresh plant-based desserts	20
Trifles	2
Sugar-sweetened dairy and dairy imitates	**3,284**
Classic sweet yoghurts (fruited, set)	1373
Gourmet sweet yoghurts (fruited, set)	487
Classic sweet yoghurts (flavoured, set)	248
Classic sweet yoghurts (flavoured, set)	193
Gourmet sweet yoghurts (flavoured, set)	182
Artificially-sweetened yoghurts (fruited, set)	177
Classic sweet yoghurts (drinkable)	158
Gourmet sweet yoghurts (flavoured, set)	90
Soy-based yoghurts (set)	63
Artificially-sweetened yoghurts (fruited, set)	61
Flavoured milk drinks (chocolate)	54
Other plant-based yoghurts (set)	47
Artificially-sweetened yoghurts (drinkable)	42
Artificially-sweetened yoghurts (flavoured, set)	40
Artificially-sweetened yoghurts (flavored, set)	24
Classic sweet fresh cheeses	19
Artificially-sweetened fresh cheeses	17
Gourmet sweet yoghurts (drinkable)	4
Soy-based yoghurts (drinkable)	3
Gourmet sweet fresh cheeses	1
Other plant-based yoghurts (drinkable)	1
TOTAL	**9,096**

Figure 25. Europe: share of the main subcategories within the food group of ice cream desserts

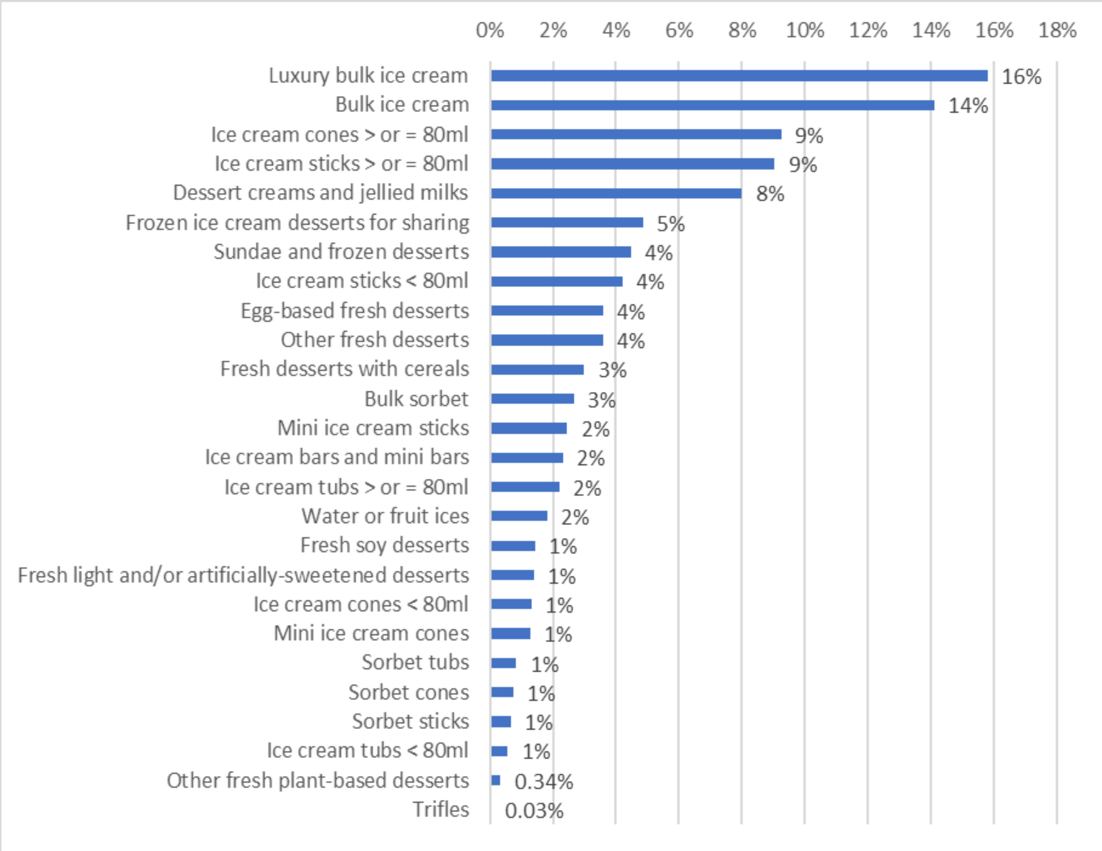


Figure 26. Europe: share of the main subcategories within the food group of sugar-sweetened dairy and dairy imitates

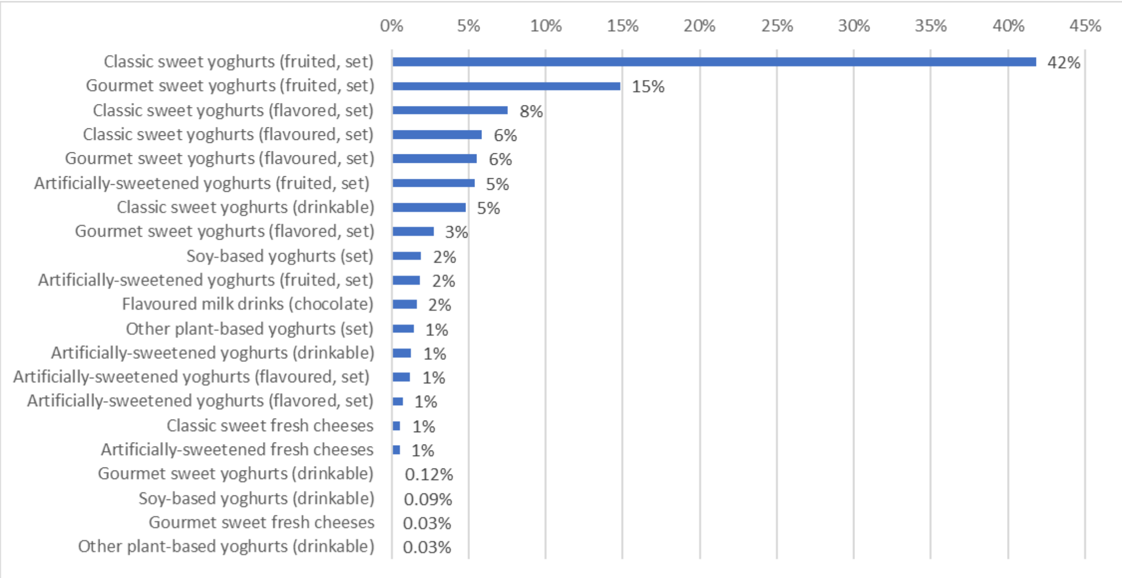


Table 22. Composition of each country's sample – sugar-sweetened dairy and dairy imitates

	Artificially-sweetened fresh cheeses	Artificially-sweetened yoghurts (drinkable)	Artificially-sweetened yoghurts (flavoured, set)	Artificially-sweetened yoghurts (fruited, set)	Classic sweet fresh cheeses	Classic sweet yoghurts (drinkable)	Classic sweet yoghurts (flavoured, set)	Classic sweet yoghurts (fruited, set)	Flavoured milk drinks (chocolate)	Gourmet sweet fresh cheeses	Gourmet sweet yoghurts (drinkable)	Gourmet sweet yoghurts (flavoured, set)	Gourmet sweet yoghurts (fruited, set)	Other plant-based yoghurts (drinkable)	Other plant-based yoghurts (set)	Soy-based yoghurts (drinkable)	Soy-based yoghurts (set)
Austria		9	1	7		22	25	125				25	31	1	7		10
Belgium				16			14	42	17			5	24		2		6
Bulgaria							6	39				5	15				
Denmark			1	7			3	18									1
Estonia		4	1	6	5	41	2	72			2	10	31				
Finland	17	12	2	6	14	45	13	125		1		6	27		31	1	9
France			24	58			248	335				90	161				
Greece			3	9			14	67	8			10	19		4		
Hungary				10			7	91	17			12	20				
Italy				4			18	65				20	18				6
Lithuania				3			10	95				16	8				2
Malta			1	15			23	73	2			12	9				
Portugal		17	23	56		33	47	69			2	28	37			2	12
Romania				2		17	4	38				6	11				
Slovenia				4			3	92	10			9	19				
UK			8	35			4	27				18	58		4		17
Total	**17**	**42**	**64**	**238**	**19**	**158**	**441**	**1373**	**54**	**1**	**4**	**272**	**488**	**1**	**48**	**3**	**63**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

Table 23. Composition of each country's sample – ice cream desserts

	Bulk ice cream	Bulk sorbet	Dessert creams and jellied milks	Egg-based fresh desserts	Fresh desserts with cereals	Fresh light and/or artificially-sweetened desserts	Fresh soy desserts	Frozen ice cream desserts for sharing	Ice cream bars and mini bars	Ice cream cones < 80ml	Ice cream cones > or = 80ml	Ice cream sticks < 80ml	Ice cream sticks > or = 80ml	Ice cream tubs < 80ml	Ice cream tubs > or = 80ml	Luxury bulk ice cream	Mini ice cream cones	Mini ice cream sticks	Other fresh desserts	Other fresh plant-based desserts	Sorbet cones	Sorbet sticks	Sorbet tubs	Sundae and frozen desserts	Trifles	Water or fruit ices
Austria	28		1													10										
Belgium	35							4	8	5	16		26	3	5	38		7						11		
Bulgaria	44		16					4	8	2	10	8	19			62		3				2		6		
Denmark	29							6	8	1	7	4	20			46	2							10		2
Estonia	58							2	12	12	33	20	21	1	5	58	1	1						7		
Finland	67		84		34	48	13	30	16	4	127	22	57	1	6	179	5	4	10	5				19		
France	183	153	328	209	131	30	62	208	35	7	212	119	191	18	93	216	53	97	189	14	43	35	31	154		99
Greece	25		34		8	3	8									38			7	1						
Hungary	42	2	1			1		13		6	6	13	17			35	4	3				1	10	4		1
Italy	57							2	4	6	29	3	32		8	29	3	6				3	7	23		1
Lithuania	32								13	15	29	42	19		1	30								5		
Malta	9		10		1	1	6	3	13	11	4	1	14			7		2	4				1	5		3
Portugal	42		2				5		7	3	20		31		1	47	2	12	1					7		
Romania	13							2	1		3		2			6										
Slovenia	135		24		5			5	5	2	28	11	51		9	93	2	7	1			1		9		
UK	21		1					4	5	2	13	1	19	10		22	2	1		2				1	2	
Total	**820**	**155**	**501**	**209**	**179**	**83**	**94**	**283**	**135**	**76**	**537**	**244**	**519**	**33**	**128**	**916**	**74**	**143**	**212**	**22**	**43**	**42**	**49**	**261**	**2**	**106**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

The below table shows that data on sugar-sweetened dairy and dairy imitates, ice cream desserts were collected between November 2019 and October 2021, as this may inform the interpretation of differences in nutritional content.

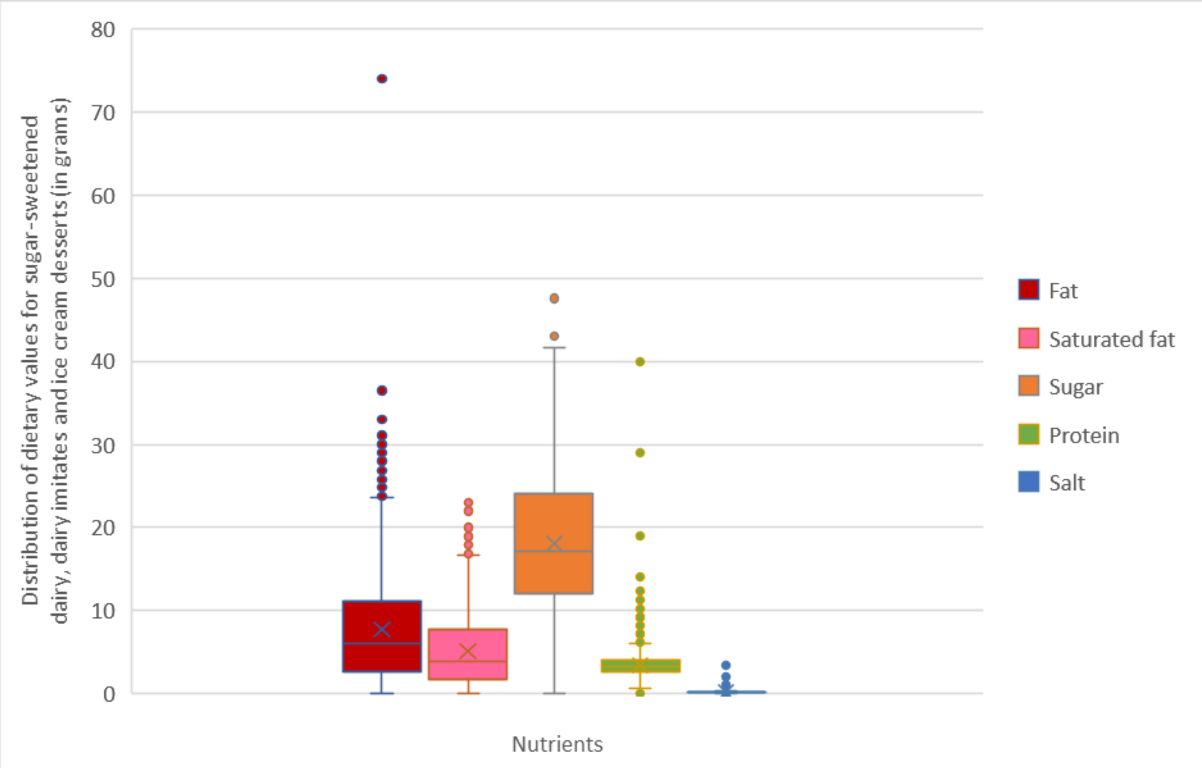
Table 24. Dates for data collection, by country – sugar-sweetened dairy and dairy imitates; ice cream desserts

	Jan 2015	Jan 2017	Nov 2019	Dec 2019	Feb 2020	Mar 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022
Austria			21	122		7															79	73	
Belgium								86					1	140	57								
Bulgaria							246	1		2													
Denmark					98	1	65	1															
Estonia								226	179														
Finland			29	375		69	23	50			179	64			251								
France	1947	1879																					
Greece					97	96	65																
Hungary					262	3			51														
Italy							212	37							35	60							
Lithuania								85	126								109						
Malta								55	45					7				70	5	48			
Portugal						169		66	71	125	19			53			3						
Romania					32	27			5									41					
Slovenia					104	158	23	123	106		11												
UK				140	16	32								49	3			17					20
Total	**1947**	**1879**	**50**	**637**	**609**	**562**	**634**	**730**	**583**	**127**	**209**	**64**	**1**	**249**	**346**	**60**	**112**	**128**	**5**	**48**	**79**	**73**	**20**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

In terms of their nutritional content, most products within the sugar-sweetened dairy and dairy imitates and ice cream desserts category shared similar distributions. As such, a wide variation in nutritional content values was generally observed across scanned products (see box plot below). A couple of outlier values were recorded across products, notably for sugar and protein content.

Figure 27. Distribution of dietary values for sugar-sweetened dairy and dairy imitates, ice cream desserts in Europe (grams per 100 grams)



Regarding differences between countries, i.e., in terms of mean nutritional values, products showed considerable fluctuations in sugar content between the various countries. Mean sugar content for the food group was lowest in Denmark with 8.9 grams per 100 grams and the highest in Lithuania with 19.6 grams per 100 grams. Denmark also had the lowest fat and saturated fat content with 1.8 grams for mean fat and 1.1 grams for mean saturated fat. Products in the United Kingdom recorded the highest mean fat and saturated fat content with 10.8 grams and 7.7 grams respectively.

Figure 28. Comparative look at the nutrient content of sugar-sweetened dairy and dairy imitates at the European level

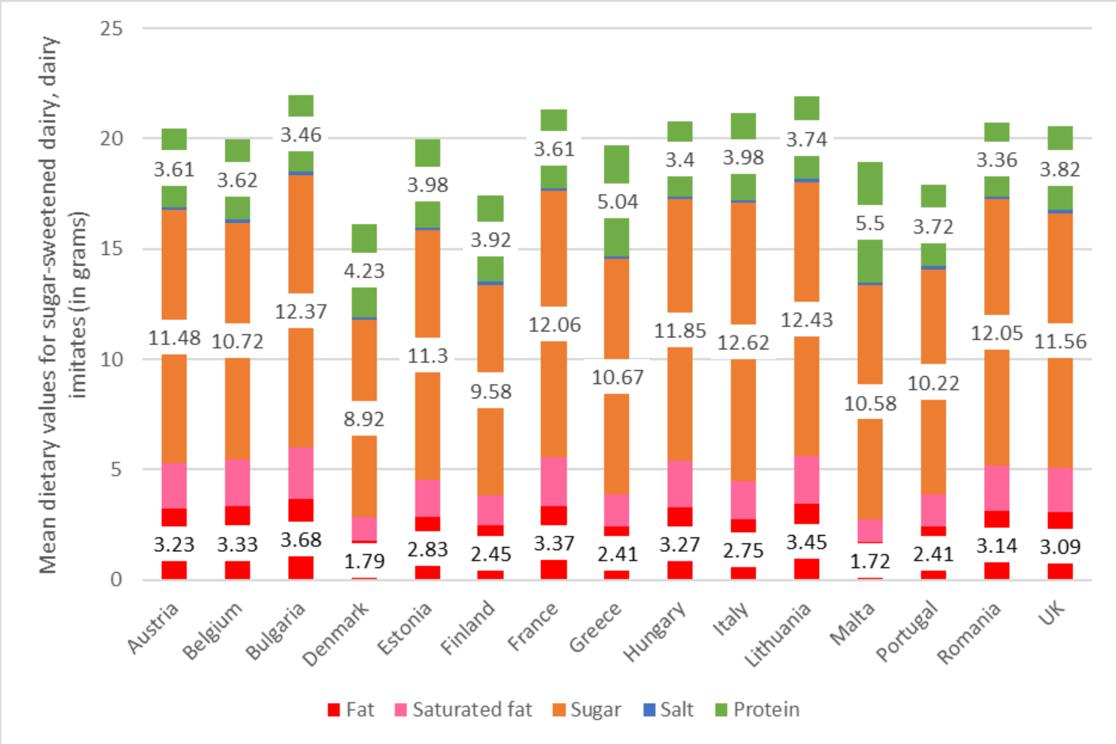
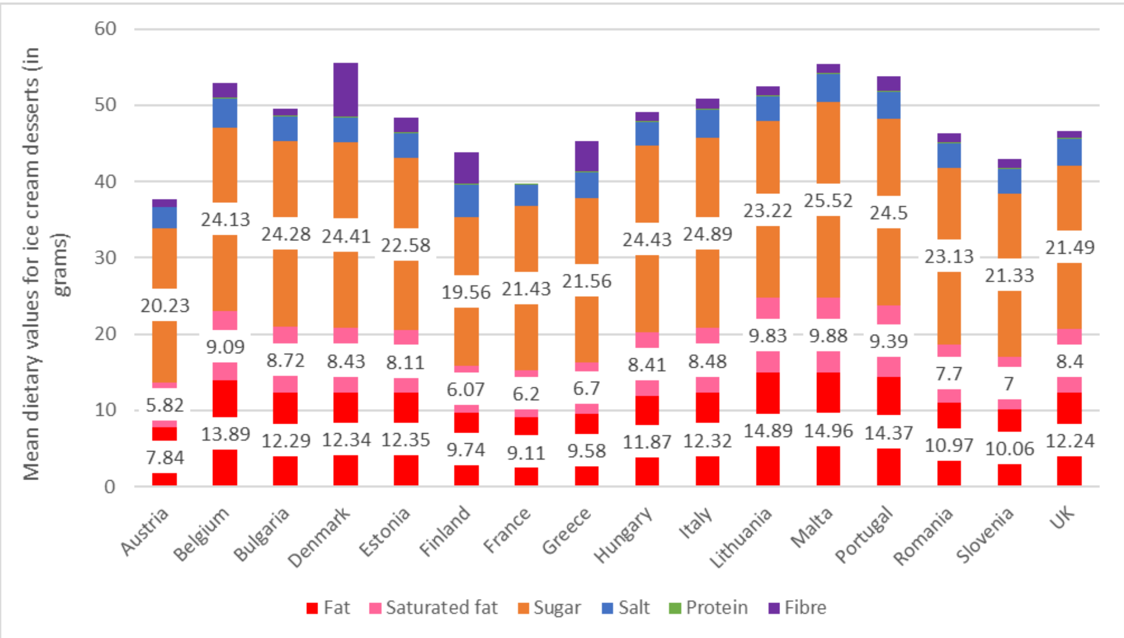


Figure 29. Comparative look at the nutrient content of ice cream desserts at the European level



4.5.2 Comparative assessment of specific products across European countries

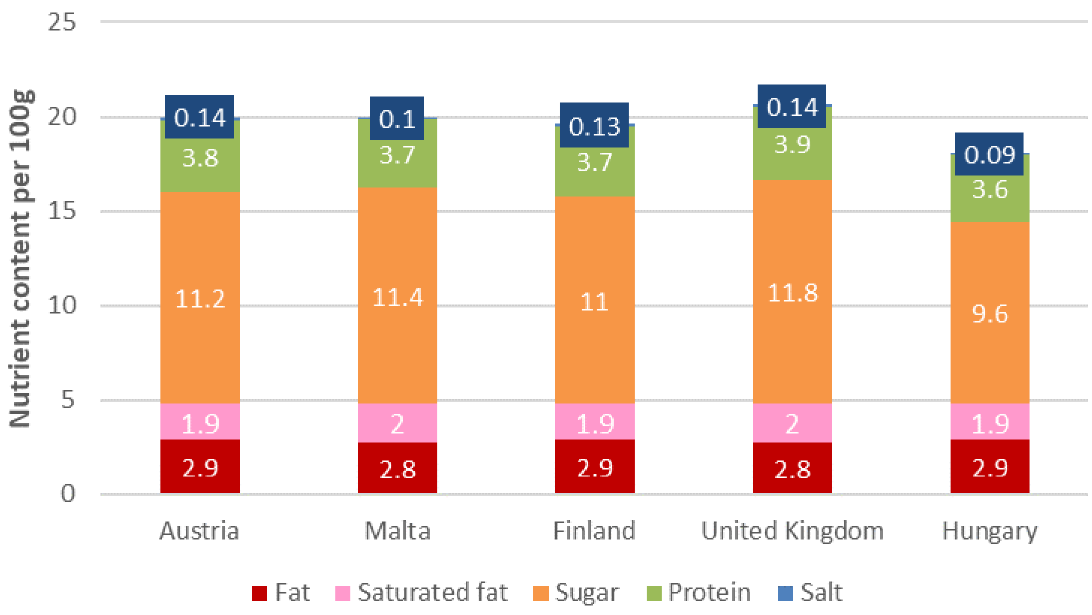
A comparative analysis on nutrient content was carried out to identify the extent to which manufacturers may adapt their product composition in different European countries. The selection criteria used to identify relevant products included:

- availability of the same product across multiple countries;
- products from the largest subcategories within the food group (highest number of products);
- market share of the manufacturer or retailer in Europe and in the relevant country (based on Eurostat and industry statistics).

To assess nutrient variations between European countries, Danone's Activia strawberry yoghurt values were compared. The product belongs to the largest subcategory - classic sweet yoghurts (fruited, set) - within sugar-sweetened dairy and dairy imitates. This subcategory includes 42% of the listed food group products.

The product's nutrient content showed little variations, most noticeable were the differences in sugar content, which varied between the countries observed. The lowest was observed in Hungary 9.6 grams (per 100 grams) and the highest in the UK, 11.8 grams (per 100 grams). Sugar content variations, however, may be due to the specific fruit variations used in the product. For all other nutrients slight variations were observed within the range of 0.1 – 0.3 grams.

Figure 30. Dietary values for Danone Activia strawberry yoghurts in European countries



4.5.3 Subcategory analysis

The subcategory analysis is presented in the two charts below, both comparing nutrient levels between different subcategories but whereas one compared nutrients between different product types (e.g. plant-based, soy-based and sugar-based yoghurts), the other looked at nutritional differences between subcategories of similar composition (sugar-sweetened yoghurts).

Figure 31. Comparing nutrients between subcategories of different composition (sugar-sweetened dairy and dairy imitates)

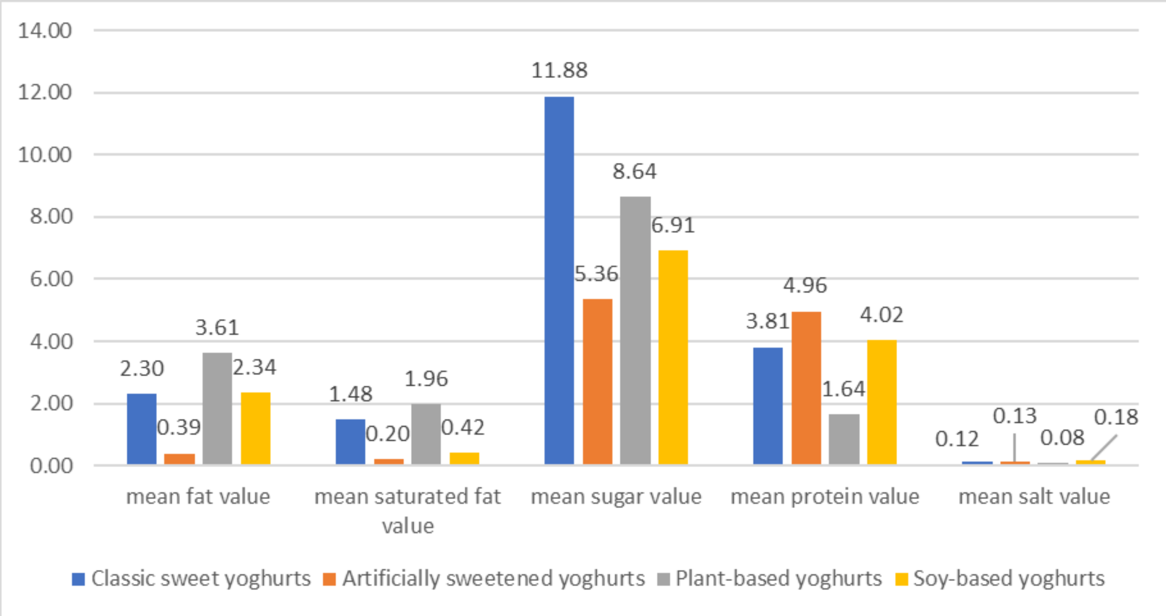


Figure 32. Comparing nutrients between subcategories of different composition (ice cream desserts)

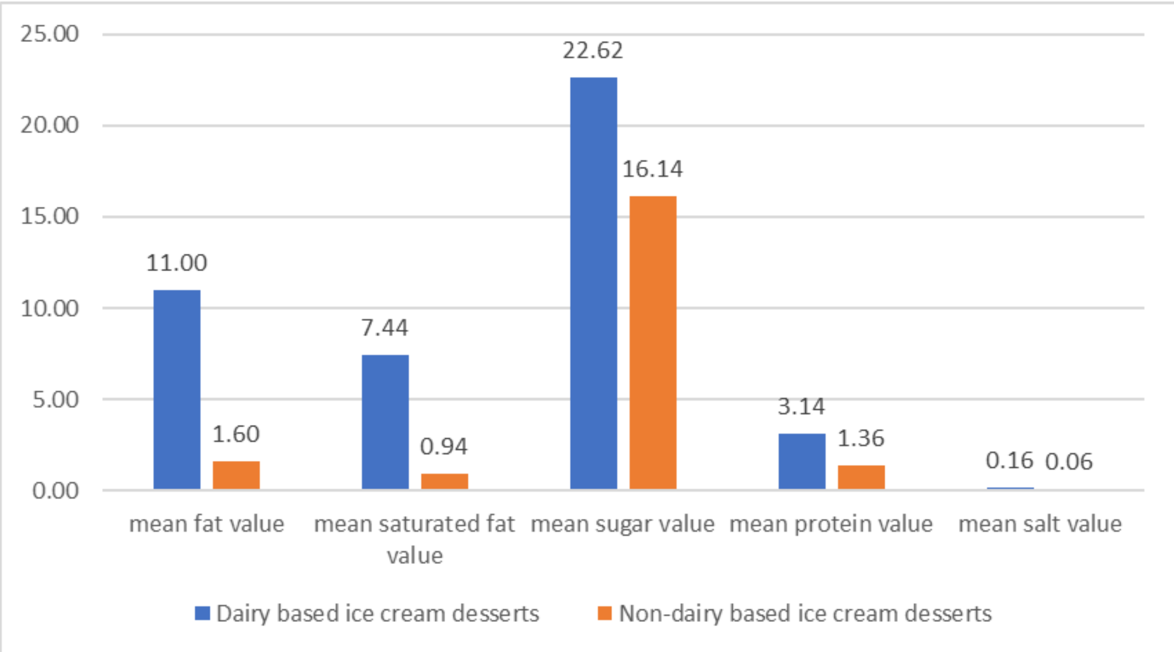


Figure 33. Comparing nutrients between subcategories of similar composition (sugar-sweetened dairy and dairy imitates)

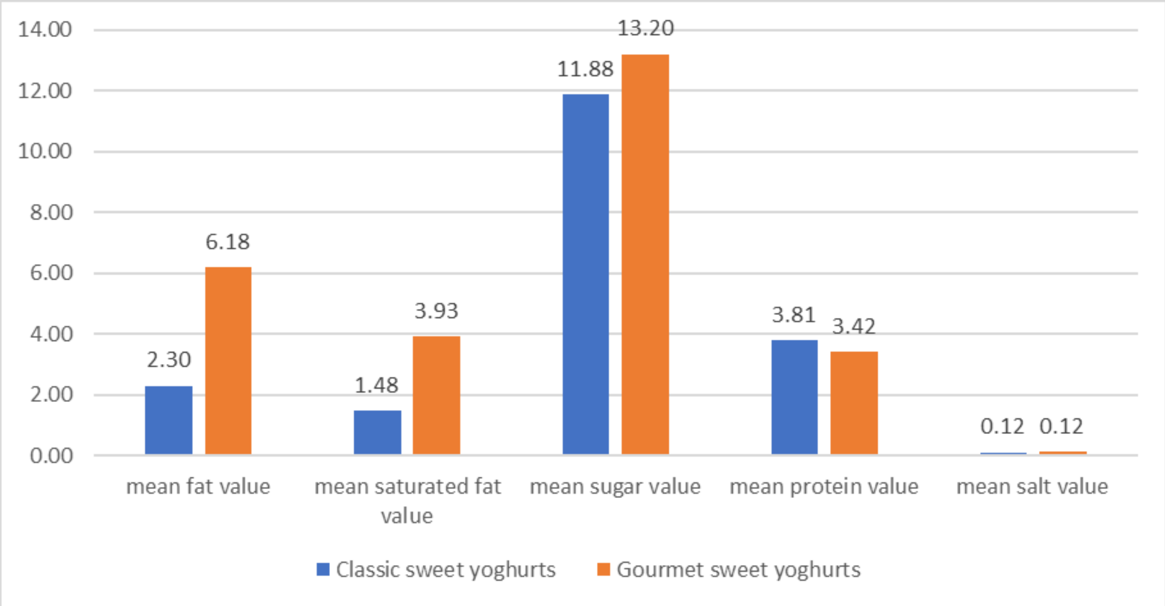
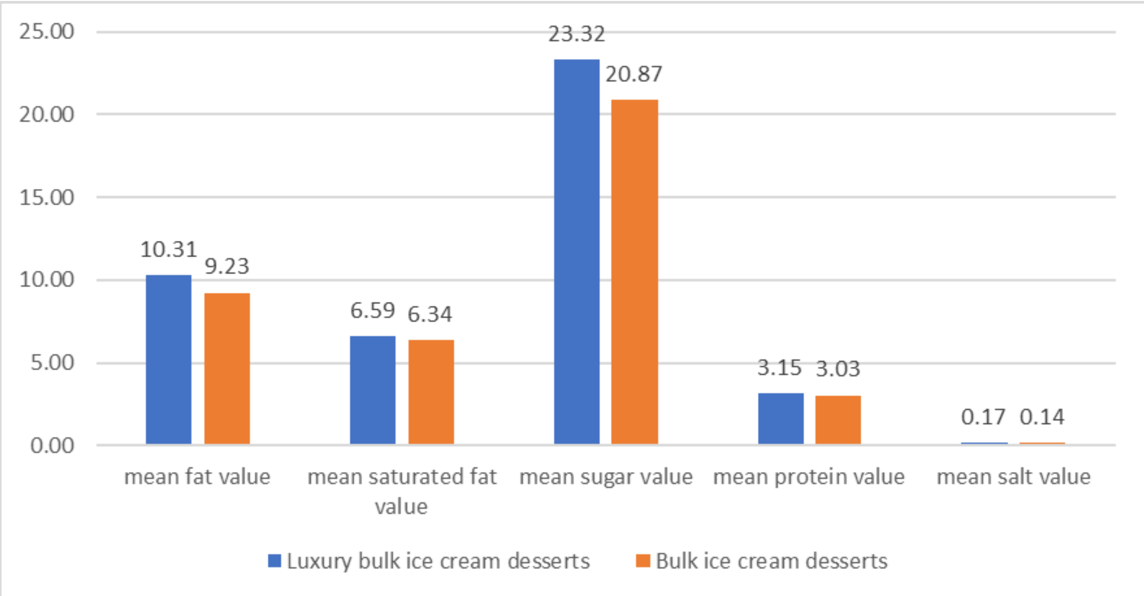


Figure 34. Comparing nutrients between subcategories of similar composition (ice cream desserts)



4.5.4 Weighted Analysis

Weighted analysis was undertaken to observe whether and to what extent mean values of nutrient content per category in each country varied once the data were adjusted to reflect purchasing and consumption habits. That is, the weighted analysis shows how category averages vary when greater weight is given to the average nutrient content of food and drink products that are more highly consumed within a given country.

The table below presents details of the product subcategories for which data was collected in each country, and the weight given to each subcategory when calculating weighted category averages. The product subcategories listed below are based on the Global Data product subcategories (as the market share data from Global Data, which is used to weight the analysis, uses these product subcategories). Where a value is left blank, it indicates that data was not collected against that product subcategory in a country. Further information on the method used to derive subcategory weights and calculate weighted category nutrient values was included in Section 2.1.3.2.

Table 25. Weights given to each subcategory – sugar-sweetened dairy and dairy imitates

Subcategory	AT	BE	BG	DK	EE	FI	FR	GR	HU	IT	LT	MT	PT	RO	SI	UK
Drinkable Yogurt	28%				62%	14%							62%	28%		
Flavored Spoonable Yogurt (Set)	18%	5%	33%	72%	9%	59%	71%	46%	66%	62%	61%	46%	25%	15%	55%	13%
Fruited Spoonable Yogurt (Set)	54%	56%	67%	28%	15%	18%	29%	14%	16%	38%	39%	25%	13%	56%	37%	87%
Flavored Quark					13%	8%										
Chocolate Dairy Only Flavored Milk Drinks		39%						40%	19%			29%			8%	
Drinkable Yogurt	28%				62%	14%							62%	28%		

The following table below presents the results of the weighted analysis. It compares unweighted and weighted mean values of relevant nutrient content per category in each country where data was collected under more than one subcategory.

Table 26. Comparing weighted and unweighted mean nutrient values (in grams) – sugar-sweetened dairy and dairy imitates

Country	Weighted/ unweighted	Fat	Saturated fat	Sugar	Salt	Protein
Austria	**Weighted**	2.77	1.75	11.12	0.11	3.46
	Unweighted	3.23	2.04	11.48	0.12	3.61
Belgium	**Weighted**	2.94	1.91	10.15	0.12	3.53

Country	Weighted/ unweighted	Fat	Saturated fat	Sugar	Salt	Protein
	Unweighted	3.33	2.15	10.72	0.13	3.62
Bulgaria	**Weighted**	3.92	2.45	12.39	0.14	3.61
	Unweighted	3.68	2.32	12.37	0.13	3.46
Denmark	**Weighted**	1.57	0.89	8.75	0. 13	4.41
	Unweighted	1.79	1.07	8.92	0.14	4.23
Estonia	**Weighted**	2.02	1.26	10.95	0.10	4.42
	Unweighted	2.83	1.73	11.30	0.11	3.98
Finland	**Weighted**	2.90	1.39	9.30	0.11	3.89
	Unweighted	2.45	1.36	9.58	0.11	3.92
France	**Weighted**	3.39	2.19	11.89	0.11	3.59
	Unweighted	3.37	2.19	12.06	0.12	3.61
Greece	**Weighted**	2.22	1.41	9.98	0.13	5.32
	Unweighted	2.41	1.47	10.67	0.12	5.04
Hungary	**Weighted**	4.18	2.65	13.28	0.14	3.47
	Unweighted	3.27	2.14	11.85	0.13	3.40
Italy	**Weighted**	3.03	1.88	12.81	0.11	4.10
	Unweighted	2.75	1.73	12.62	0.11	3.98
Lithuania	**Weighted**	4.46	2.81	13.50	0.13	3.58
	Unweighted	3.45	2.16	12.43	0.12	3.74

Country	Weighted/ unweighted	Fat	Saturated fat	Sugar	Salt	Protein
Malta	**Weighted**	2.12	1.25	10.33	0.11	5.09
	Unweighted	1.72	1.05	10.58	0.10	5.50
Portugal	**Weighted**	1.82	1.07	9.74	0.11	3.34
	Unweighted	2.41	1.46	10.22	0.12	3.72
Romania	**Weighted**	3.02	1.99	12.01	0.12	3.34
	Unweighted	3.14	2.07	12.05	0.12	3.36
UK	**Weighted**	4.08	2.60	12.61	0.12	3.99
	Unweighted	3.09	1.99	11.56	0.12	3.82

Table 27. Weights given to each subcategory – ice cream, desserts

Subcategory	AT	BE	BG	DK	EE	FI	FR	GR	HU	IT	LT	MT	PT	RO	SI	UK
Other Dairy-Based Desserts							22%								16%	
Impulse Ice Cream - Single Serve - Dairy-Based*		32%	22%	16%	38%	36%	24%		21%	16%	53%	64%	49%	55%	33%	29%
Impulse Ice Cream - Single Serve - Water-Based*				11%			2%		2%	7%		10%				
Take-Home and Bulk Ice Cream - Dairy-Based*	100%	68%	78%	73%	62%	64%	44%	100%	50%	78%	47%	25%	51%	45%	51%	71%
Take-Home and Bulk Ice Cream - Water-Based*							8%		27%							

Note: Categories marked with an asterisk were derived from two Global Data categories, with the market share data summed to derive the relevant subcategory weights

The table below presents the results of the weighted analysis. It compares unweighted and weighted mean values of relevant nutrient content per category in each country where data was collected under more than one subcategory.

Table 28. Comparing weighted and unweighted mean nutrient values (in grams) – ice cream desserts

Country	Weighted/ unweighted	Fat	Saturated fat	Sugar	Salt	Protein	Fibre
Austria	**Weighted**	7.84	5.82	20.23	2.69	0.10	0.91
	Unweighted	7.84	5.82	20.23	2.69	0.10	0.91

Country	Weighted/ unweighted	Fat	Saturated fat	Sugar	Salt	Protein	Fibre
Belgium	**Weighted**	13.10	8.43	23.38	3.69	0.17	1.94
	Unweighted	13.89	9.09	24.13	3.76	0.17	1.89
Bulgaria	**Weighted**	11.41	8.10	23.92	3.13	0.17	0.90
	Unweighted	12.29	8.72	24.28	3.22	0.17	0.91
Denmark	**Weighted**	10.46	7.07	23.66	2.83	0.14	3.73
	Unweighted	12.34	8.43	24.41	3.17	0.16	7.03
Estonia	**Weighted**	12.13	7.96	22.52	3.19	0.16	2.04
	Unweighted	12.35	8.11	22.58	3.22	0.16	1.88
Finland	**Weighted**	11.27	6.98	22.22	3.62	0.19	4.07
	Unweighted	9.74	6.07	19.56	4.13	0.18	4.11
France	**Weighted**	9.05	6.10	21.71	2.78	0.14	0.00
	Unweighted	9.11	6.20	21.43	2.87	0.14	0.00
Greece	**Weighted**	9.58	6.70	21.56	3.31	0.15	3.98
	Unweighted	9.58	6.70	21.56	3.31	0.15	3.98
Hungary	**Weighted**	10.35	7.56	23.60	2.65	0.11	1.27
	Unweighted	11.87	8.41	24.43	3.11	0.13	1.14
Italy	**Weighted**	10.02	6.86	23.94	3.53	0.16	1.15
	Unweighted	12.32	8.48	24.89	3.67	0.18	1.29
Lithuania	**Weighted**	13.99	9.23	23.25	3.15	0.15	1.14

Country	Weighted/ unweighted	Fat	Saturated fat	Sugar	Salt	Protein	Fibre
	Unweighted	14.89	9.83	23.22	3.23	0.15	1.15
Malta	**Weighted**	14.14	9.34	25.21	3.49	0.16	1.01
	Unweighted	14.96	9.88	25.52	3.68	0.17	1.17
Portugal	**Weighted**	14.71	9.64	24.70	3.50	0.17	1.73
	Unweighted	14.37	9.39	24.50	3.49	0.18	1.81
Romania	**Weighted**	12.16	8.70	24.42	3.46	0.13	0.49
	Unweighted	10.97	7.70	23.13	3.23	0.12	1.10
Slovenia	**Weighted**	9.24	6.40	18.57	2.75	0.12	1.03
	Unweighted	10.06	7.00	21.33	3.22	0.14	1.21
UK	**Weighted**	10.07	6.98	20.14	3.13	0.20	0.70
	Unweighted	12.24	8.40	21.49	3.40	0.19	0.94

4.6 Ready meals – pizzas

4.6.1 European overview

Overall, data from 16 countries (Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Romania, Slovenia and the UK) were collected and analysed within the category of ready meals -pizzas. Altogether 1,644 products were identified belonging to 17 sub-categories.

The breakdown of the products within the subcategories are shown in the following table (in absolute values) and chart (in percentages). These indicate that the highest number of products fell into the following three subcategories, "frozen delicatessen-meat pizzas", "frozen margarita pizzas" and "frozen ham and cheese pizzas".

Table 29. Europe: subcategories within the food group of ready meals- pizzas

Subcategories	Number of products
Frozen delicatessen-meat pizzas	297
Frozen ham and cheese pizzas	220
Frozen cheese pizzas	204
Frozen margarita pizzas	193
Chilled ham and cheese pizzas	121
Chilled delicatessen-meat pizzas	114
Frozen vegetable pizzas	92
Chilled cheese pizzas	73
Other frozen meat-based pizzas	73
Frozen seafood pizzas	70
Frozen bolognese meat pizzas	59
Chilled vegetable pizzas	52
Chilled meat-based pizzas	39
Other chilled pizzas	14
Other Subcategory	9
Frozen cheese and ham pizzas	7
Other Frozen pizzas	7
TOTAL	**1,644**

Figure 35. Europe: share of the main subcategories within the food group of ready meals- pizzas

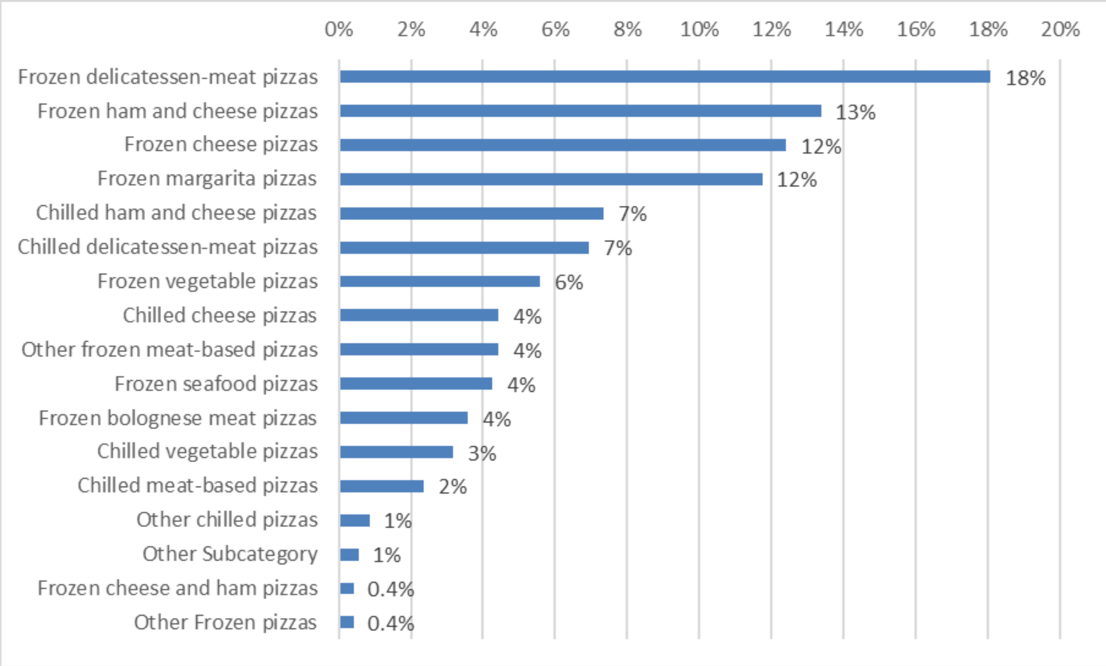


Table 30. Composition of each country's sample – ready meals: pizzas

	Chilled cheese pizzas	Chilled delicatessen-meat pizzas	Chilled ham and cheese pizzas	Chilled meat-based pizzas	Chilled vegetable pizzas	Frozen bolognese meat pizzas	Frozen cheese pizzas	Frozen delicatessen-meat pizzas	Frozen ham and cheese pizzas	Frozen margarita pizzas	Frozen seafood pizzas	Frozen vegetable pizzas	Other chilled pizzas	Other frozen meat-based pizzas	Other frozen pizzas
Austria	1	7	2		2		2	28	9	16	6	7	2	5	
Belgium	2	5	3	3	8	2	6	6	5	8	1	1	1	1	
Bulgaria		1					6	18	6	6	1	1		1	
Denmark	2	1	3			8	2	22	5	5	1	9		4	
Estonia		2	5	2	1	3	3	11	16	4		4		6	
Finland	1	5	9	8	3	10	14	49	17	17	5	14	2	11	
France	39	60	72	3	7	30	117	47	88	33	38	16		20	
Greece		1	2	1	3		5	11	13	11		4			
Hungary	1	1	2	1		1	11	25	14	6	1	2		3	
Italy	8	1	2		6		5	6	7	32	4	10	1		4
Lithuania	1					2	3	9	6	3		1		4	
Malta	3	4	4	1	4		5	7	5	17	4	8	3	6	
Portugal	4	4	13	7	1	2	8	23	23	16	7	6	1	3	
Romania							1	6	2	3	1				
Slovenia		2			1		5	14	8	13	1	4			3
UK	11	22	4	13	16	1	11	18	4	3		6	4	10	
Total	**73**	**116**	**121**	**39**	**52**	**59**	**204**	**300**	**228**	**193**	**70**	**93**	**14**	**74**	**7**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

The below table shows when data on ready meals – pizzas were collected given this may inform the interpretation of differences in nutritional content.

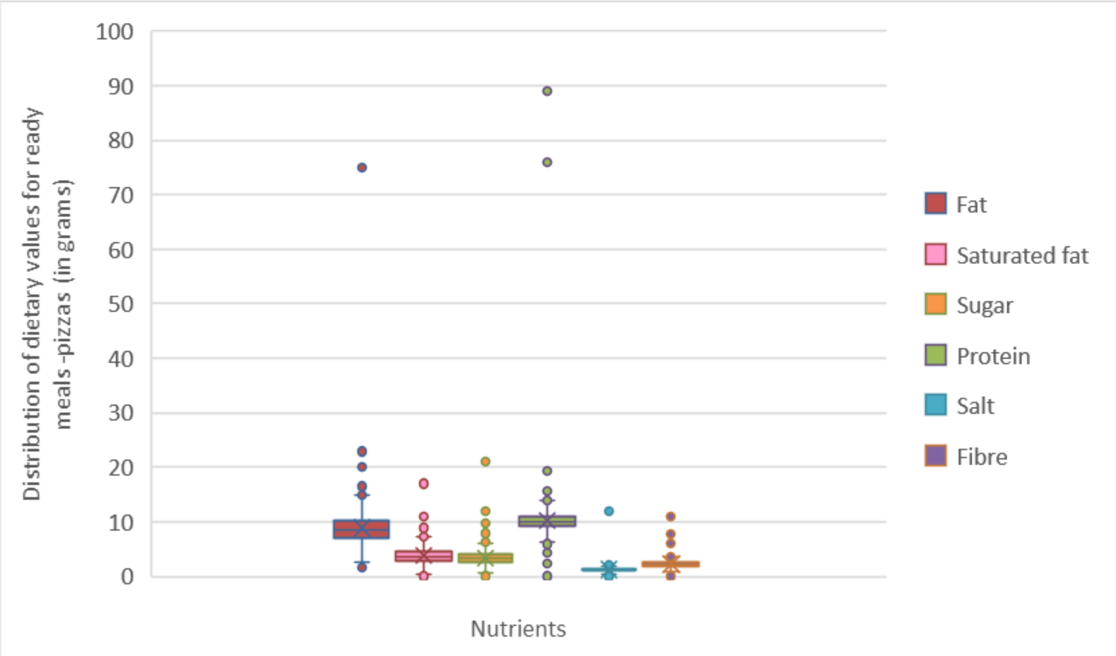
Table 31. Dates for data collection, by country – ready meals - pizzas

	Jan 2015	Feb 2020	Mar 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Apr 2021	May 2021	Jul 2021	Aug 2021	Sep 2021	Nov 2021	Dec 2021	Jan 2022
Austria		37												16	34	
Belgium					33				19							
Bulgaria				16	24											
Denmark		34		28												
Estonia					32	25										
Finland		27	14	8						116						
France	570															
Greece			35	16												
Hungary		45				21			2							
Italy				49		20				5	12					
Lithuania						29										
Malta				17								18	36			
Portugal						87	13	4		14						
Romania			7			1			5							
Slovenia					25	24		2								
UK		43							49	10		11				10
Total	**570**	**186**	**56**	**134**	**114**	**207**	**13**	**6**	**75**	**145**	**12**	**29**	**36**	**16**	**34**	**10**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

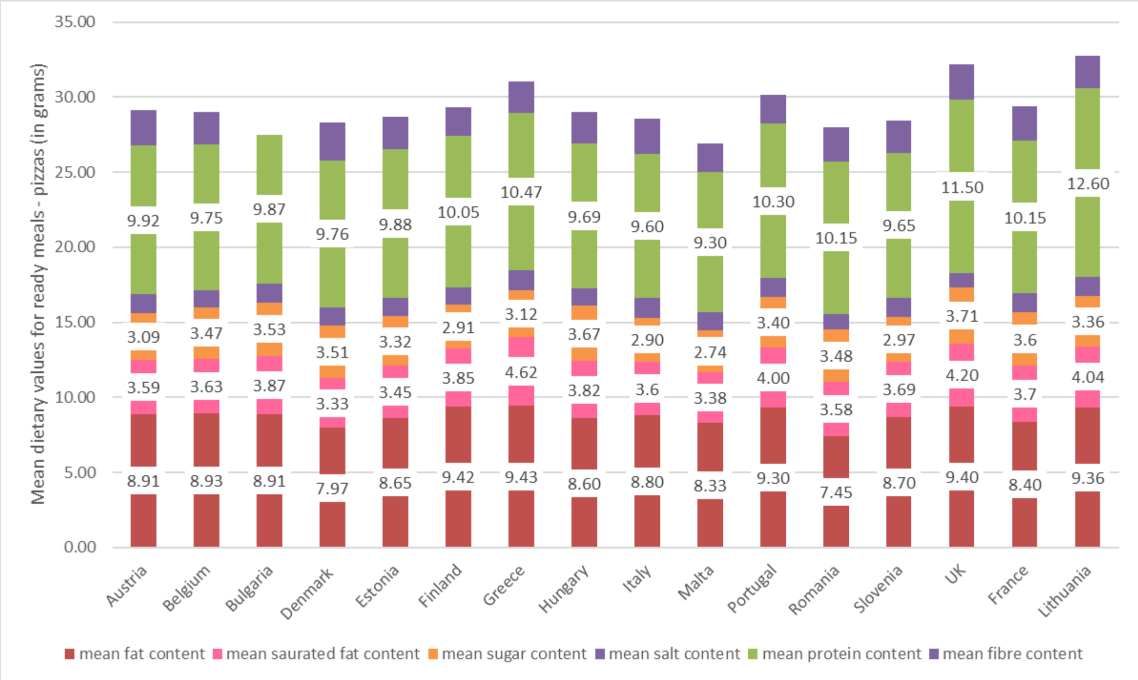
The nutritional content of scanned products fell within specific ranges with little variety for saturated fat, sugar, salt or fibres and only a couple of products with outstanding fat and protein values as shown in the figure below.

Figure 36. Distribution of dietary values for ready meals - pizzas in Europe (grams per 100 grams)



With regard to differences between countries in terms of mean nutritional values, fluctuations were seen in fat and protein content. Whereas saturated fat, salt and fibre contents showed 1-1.5 gram difference between the countries. Products in Greece and Finland showed the highest mean fat content with 9.43 and 9.42 grams respectively. The highest mean protein content was shown in Lithuania with 12.6 grams, with the UK being the second highest with 11.39 grams per 100 grams. Differences in consumer preferences for toppings could account for some of these fluctuations.

Figure 37. Comparative look at the nutrient content of ready meals - pizzas at the European level



4.6.2 Comparative assessment of specific products across European countries

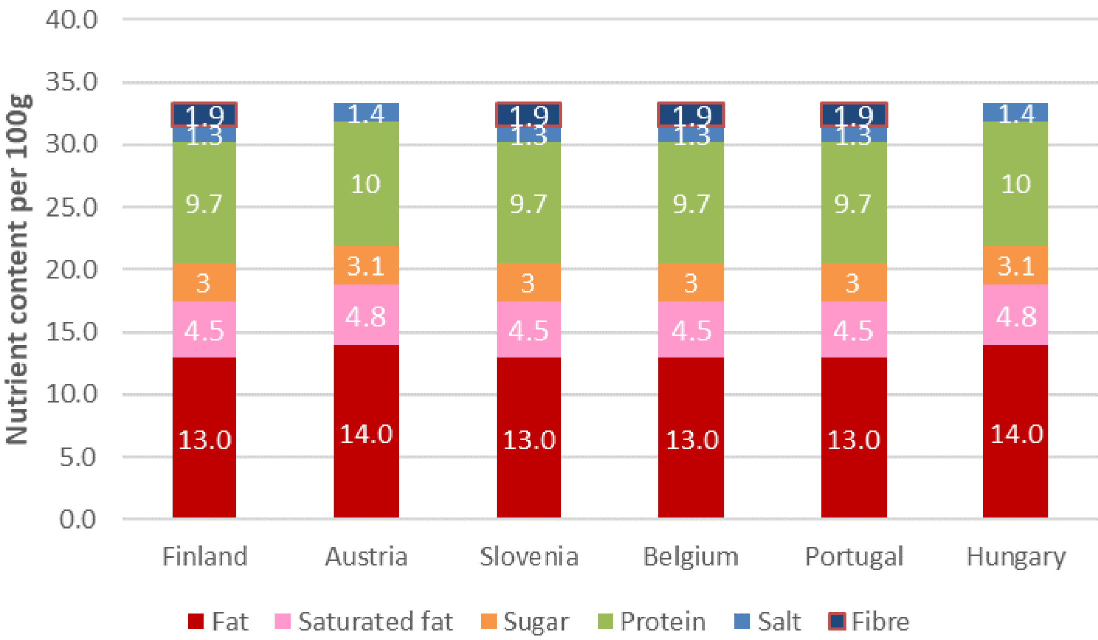
A comparative analysis on nutrient content was carried out to identify the extent to which manufacturers may adapt their product composition in different European countries. The selection criteria used to identify relevant products included:

- availability of the same product across multiple countries;
- products from the largest subcategories within the food group (highest number of products);
- market share of the manufacturer or retailer in Europe and in the relevant country (based on Eurostat and industry statistics).

The product comparative assessment looked at the nutrient values of two Dr. Oetker frozen pizzas. The first one, Ristorante Salami Pizza belongs to the subcategory of frozen delicatessen-meat pizzas, this is the largest subcategory of the food group making up 24% of all products in the sample database. The analysis looked at the nutrient composition of the product in six European countries.

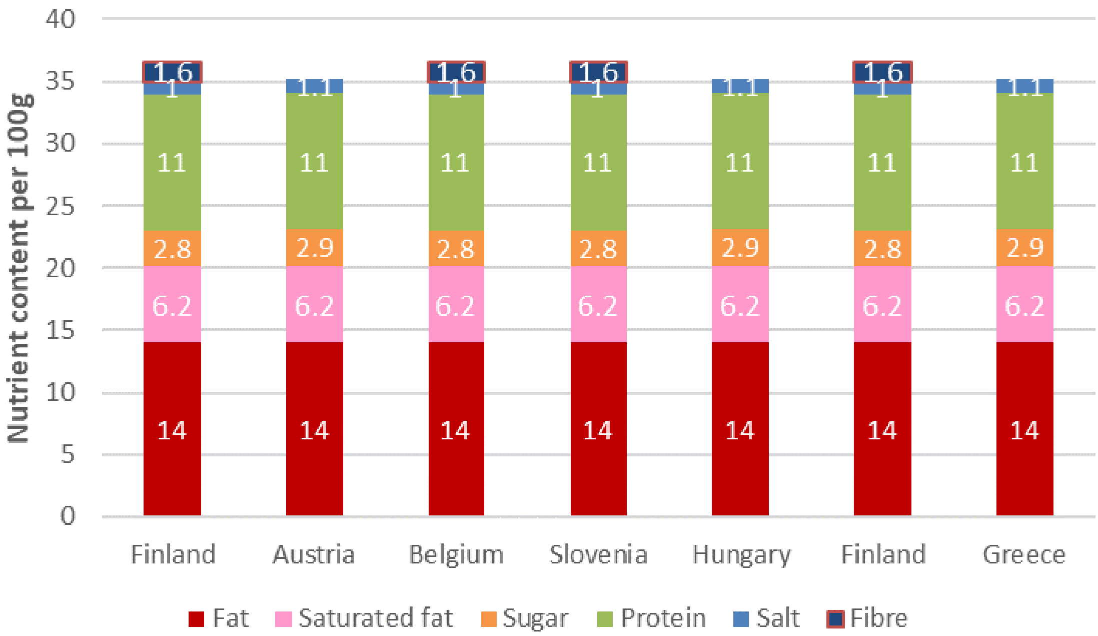
Products had identical nutrient values in Finland, Slovenia, Belgium and Portugal, while they had similarly variations of all nutrients in Austria and Hungary. These variations included slightly higher values for fat and saturated fat content; 1 and 0.3 grams respectively. Marginally higher values for sugar, protein and salt,0.1, 0.3 and 0.1 grams respectively; whilst fibre contents were missing from the label.

Figure 38. Dietary values (in grams) for Dr. Oetker Ristorante Salami Pizza across European countries



The second product comparison looked at the dietary values of Dr. Oetker four cheese pizzas in European countries. The product had identical values for the European countries with the exception of fibres, for which values were missing (either from the label or from the product itself) in Austria, Greece and Hungary.

Figure 39. Dietary values (in grams) for Dr. Oetker Four Cheese Pizza across European countries



4.6.3 Subcategory analysis

The subcategory analysis is presented in the two charts below, both comparing nutrient levels between different subcategories but whereas one compared nutrients between different product types (e.g. meat and ham and cheese pizzas), the other looked at nutritional differences between subcategories of similar composition (delicatessen-meat pizzas).

Figure 40. Comparing nutrients between subcategories of different composition

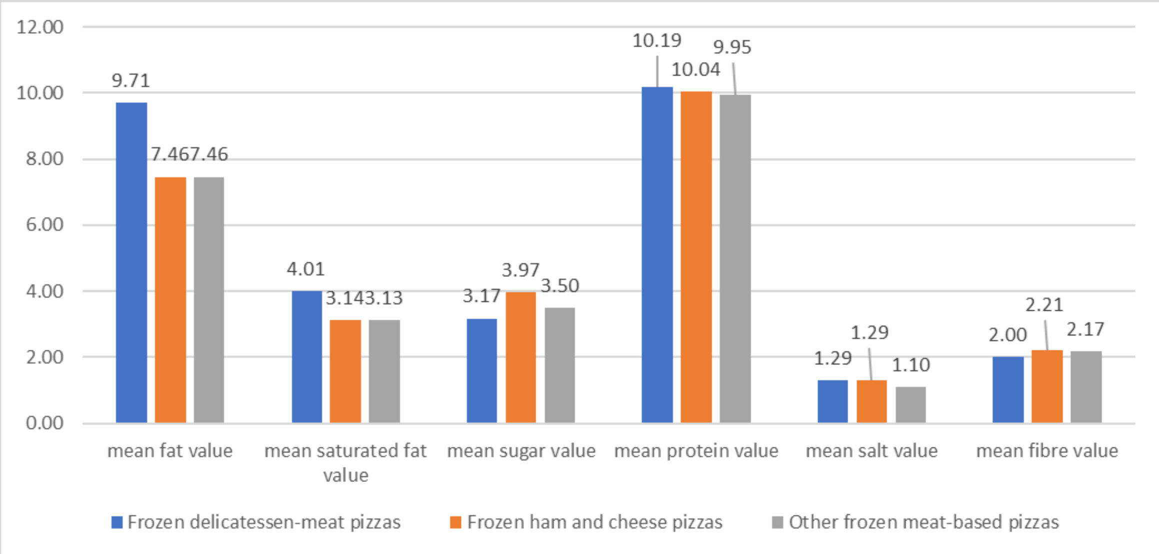
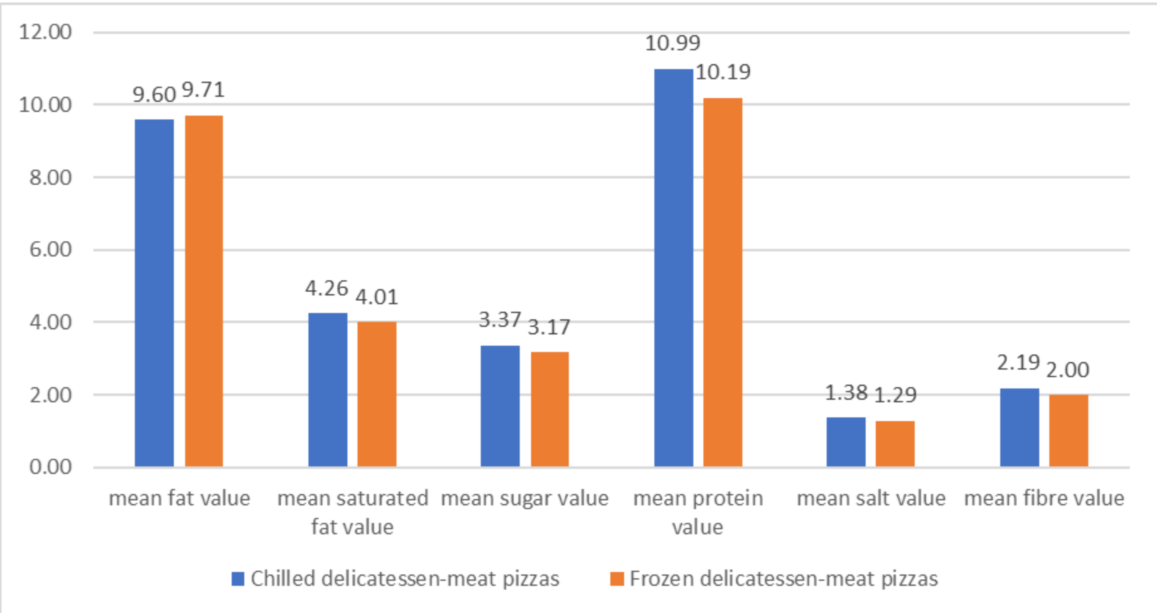


Figure 41. Comparing nutrients between subcategories of similar composition



4.6.4 Weighted Analysis

Weighted analysis was undertaken to observe whether and to what extent mean values of nutrient content per category in each country varied once the data were adjusted to reflect purchasing and consumption habits. That is, the weighted analysis shows how category averages vary when greater weight is given to the average nutrient content of food and drink products that are more highly consumed within a given country.

The table below presents details of the product subcategories for which data was collected in each country, and the weight given to each subcategory when calculating weighted category averages. The product subcategories listed below are based on the Global Data product subcategories (as the market share data from Global Data, which is used to weight the analysis, uses these product subcategories). Where a value is left blank, it indicates that data was not collected against that product subcategory in a country. Further information on the method used to derive subcategory weights and calculate weighted category nutrient values was included in Section 2.1.3.2.

Table 32. Weights given to each subcategory – ready meals – pizzas

Subcategory	AT	BE	BG	DK	EE	FI	FR	GR	HU	IT	LT	MT	PT	RO	SI	UK
Chilled pizzas	38%	20%	57%	31%	13%	55%	76%	12%	20%	17%	41%	38%	34%	5%	54%	53%
Frozen pizzas	62%	80%	43%	69%	87%	45%	24%	88%	80%	83%	59%	62%	66%	6%	46%	47%

The following table below presents the results of the weighted analysis. It compares unweighted and weighted mean values of relevant nutrient content per category in each country where data was collected under more than one subcategory.

Table 33. Comparing weighted and unweighted mean nutrient values (in grams) – ready meals – pizzas

Country	Weighted/ unweighted	Fat	Saturated fat	Sugar	Salt	Protein	Fibre
Austria	**Weighted**	8.71	3.49	3.25	10.02	1.29	2.58
	Unweighted	8.91	3.59	3.09	9.92	1.29	2.35
Belgium	**Weighted**	8.52	3.51	3.61	9.71	1.08	2.13
	Unweighted	8.93	3.63	3.47	9.75	1.10	2.12
Bulgaria	**Weighted**	9.50	3.89	3.56	10.00	1.13	
	Unweighted	8.91	3.87	3.53	9.87	1.30	
Denmark	**Weighted**	7.87	3.29	3.11	10.06	1.17	
	Unweighted	7.97	3.33	3.51	9.76	1.21	
Estonia	**Weighted**	8.64	3.41	3.30	9.84	1.24	2.13
	Unweighted	8.65	3.45	3.32	9.88	1.24	2.20
Finland	**Weighted**	9.23	3.57	2.76	10.35	1.16	2.05
	Unweighted	9.42	3.85	2.91	10.05	1.16	1.96
France	**Weighted**	8.10	3.83	3.49	10.39	1.28	2.31

Country	Weighted/ unweighted	Fat	Saturated fat	Sugar	Salt	Protein	Fibre
	Unweighted	8.40	3.70	3.50	10.10	1.22	2.20
Greece	**Weighted**	9.50	4.64	3.14	10.43	1.33	2.11
	Unweighted	9.43	4.62	3.12	10.47	1.33	2.07
Hungary	**Weighted**	8.59	3.86	3.77	9.70	1.18	2.12
	Unweighted	8.60	3.82	3.67	9.69	1.15	2.11
Italy	**Weighted**	8.64	3.71	2.83	9.55	1.28	2.63
	Unweighted	8.60	3.30	2.80	9.70	1.30	2.10
Lithuania	**Weighted**	10.18	4.68	3.40	12.71	1.23	2.07
	Unweighted	9.20	4.00	3.60	10.00	1.20	2.10
Malta	**Weighted**	8.35	3.42	2.77	9.34	1.26	1.91
	Unweighted	8.33	3.38	2.74	9.30	1.24	1.92
Portugal	**Weighted**	9.38	4.14	3.39	10.43	1.29	1.81
	Unweighted	9.30	4.07	3.42	10.30	1.25	1.86
Romania	**Weighted**	9.25	4.17	3.69	11.39	0.98	2.38
	Unweighted	9.20	3.95	3.50	11.40	0.99	2.40
Slovenia	**Weighted**	9.61	3.59	3.55	9.99	1.26	2.07
	Unweighted	8.70	3.69	2.97	9.65	1.27	2.15
UK	**Weighted**	9.12	4.11	3.63	11.22	0.97	2.39
	Unweighted	9.20	3.95	3.50	11.40	0.99	2.40

4.7 Ready meals – soups

4.7.1 European overview

Overall, data from five countries (Bulgaria, Estonia, Finland, Slovenia and the UK) were collected and analysed within the category of ready meals -soups. Altogether 424 products were identified belonging to 39 sub-categories.

The breakdown of the products within the subcategories are shown in the following table (in absolute values) and chart (in percentages). These indicate that the subcategory of meat-based soups including ambient, dehydrated/instant variant contained the highest number of products, followed by green vegetable or cabbage soups and mushroom soups.

Table 34. Europe: subcategories within the food group of ready meals- soups

Subcategories	Number of products
Meat-based soups (ambient)	59
Starchy soups (ambient)	27
Tomato soups (ambient)	27
Meat-based soups (dehydrated/instant)	25
Soups with pasta and meat or fish (dehydrated/instant)	24
Mushroom soups (dehydrated/instant)	23
Other soups (dehydrated/instant)	23
Green vegetable or cabbage soups (ambient)	22
Mixed vegetable soups (ambient)	17
Soups with pasta (dehydrated/instant)	17
Tomato soups (dehydrated/instant)	15
Meat-based soups (chilled)	12
Other soups (ambient)	12
Broths (ambient)	11
Fish or seafood soups (chilled)	11
Green vegetable or cabbage soups (chilled)	9
Onion soups (dehydrated/instant)	8
Green vegetable or cabbage soups (dehydrated/instant)	7
Mixed vegetable soups (dehydrated/instant)	7
Mushroom soups (ambient)	7
Carrot soups (ambient)	6
Tomato soups (chilled)	6
Mixed vegetable soups (chilled)	5
Starchy soups (chilled)	5
Asparagus soups (dehydrated/instant)	4
Fish or seafood soups (ambient)	4
Pumpkin soups (dehydrated/instant)	4

Subcategories	Number of products
Starchy soups (dehydrated/instant)	4
Fish or seafood soups (dehydrated/instant)	3
Mushroom soups (chilled)	3
Other soups (chilled)	3
Pumpkin soups (ambient)	3
Soups with pasta (ambient)	3
Asparagus soups (ambient)	2
Carrot soups (chilled)	2
Cold soups (ambient)	1
Leek soups (dehydrated/instant)	1
Onion soups (ambient)	1
Pumpkin soups (chilled)	1
TOTAL	**424**

Figure 42. Europe: share of the main subcategories within the food group of ready meals- soups

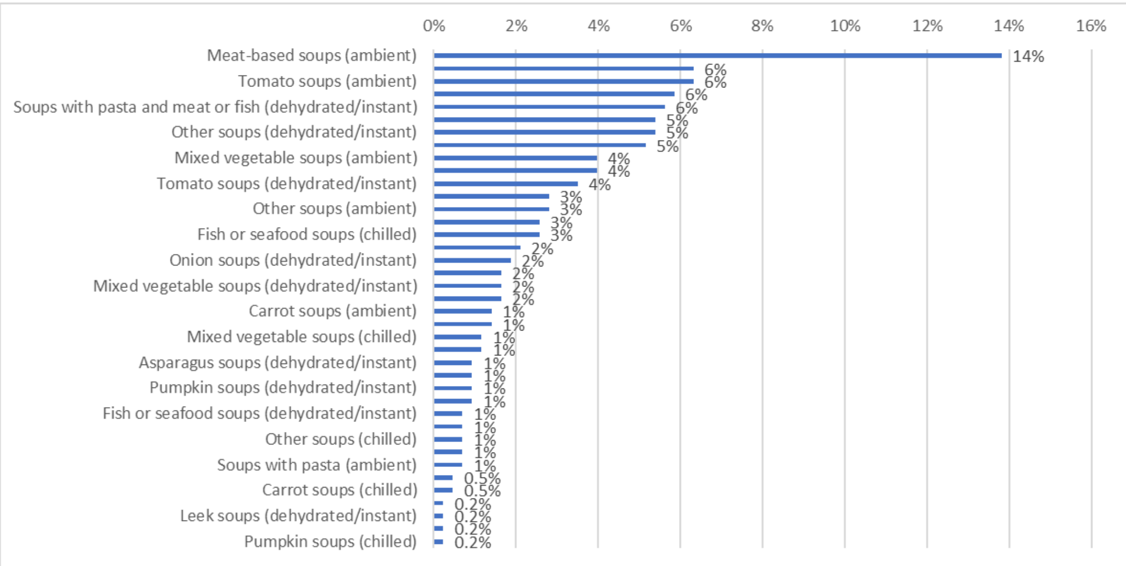


Table 35. Composition of each country's sample – ready meals: soups

	Asparagus soups (ambient)	Asparagus soups (dehydrated / instant)	Broths (ambient)	Carrot soups (ambient)	Carrot soups (chilled)	Cold soups (ambient)	Fish or seafood soups (ambient)	Fish or seafood soups (chilled)	Fish or seafood soups (dehydrated/instant)	Green vegetable or cabbage soups (ambient)	Green vegetable or cabbage soups (chilled)	Green vegetable or cabbage soups (dehydrated/instant)	Leek soups (dehydrated/instant)	Meat-based soups (ambient)	Meat-based soups (chilled)	Meat-based soups (dehydrated/instant)	Mixed vegetable soups (ambient)	Mixed vegetable soups (chilled)	Mixed vegetable soups (dehydrated/instant)	Mushroom soups (ambient)	Mushroom soups (chilled)	Mushroom soups (dehydrated/instant)	Onion soups (ambient)	Onion soups (dehydrated/instant)	Other soups (ambient)	Other soups (chilled)	Other soups (dehydrated/instant)	Pumpkin soups (ambient)	Pumpkin soups (chilled)	Pumpkin soups (dehydrated/instant)	Soups with pasta (ambient)	Soups with pasta (dehydrated/instant)	Soups with pasta and meat or fish (dehydrated/instant)	Starchy soups (ambient)	Starchy soups (chilled)	Starchy soups (dehydrated/instant)	Tomato soups (ambient)	Tomato soups (chilled)	Tomato soups (dehydrated/instant)
Austria														2																									
Bulgaria																12			3			6					2									1			1
Estonia						1	2			6				14			2								2			1						2			1		
Finland			6		2			11	3	13	9	1		8	12	8	4	5	1	1	3	5		8	2	3	10	1	1		1	1	1	3	5	2	10	6	5
Slovenia		4										6	1			5			3			12					11			4		16	23			1	1		9
UK	2		5	6			2			3				37			11			6			1		8			1			2			22			15		
Total	**2**	**4**	**11**	**6**	**2**	**1**	**4**	**11**	**3**	**22**	**9**	**7**	**1**	**61**	**12**	**25**	**17**	**5**	**7**	**7**	**3**	**23**	**1**	**8**	**12**	**3**	**23**	**3**	**1**	**4**	**3**	**17**	**24**	**27**	**5**	**4**	**27**	**6**	**15**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

The below table shows that data on ready meals –soups were collected between December 2019 and May 2021, as this may inform the interpretation of differences in nutritional content.

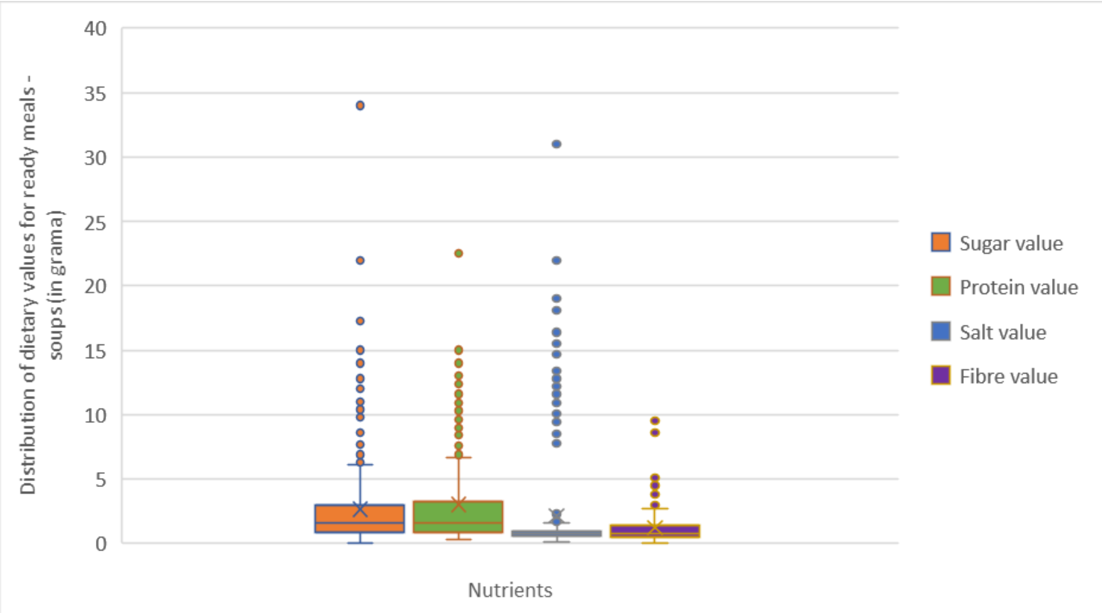
Table 36. Dates for data collection, by country – ready meals - soups

	Dec-2019	Feb-2020	Mar-2020	Sep-2020	Oct-2020	Nov-2020	Dec-2020	Apr-2021	May-2021
Bulgaria					25				
Estonia					18	11	2		
Finland	6	120	6	11					8
Slovenia					80	16			
United Kingdom		66						18	23
Total	**6**	**186**	**6**	**11**	**123**	**27**	**2**	**18**	**31**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

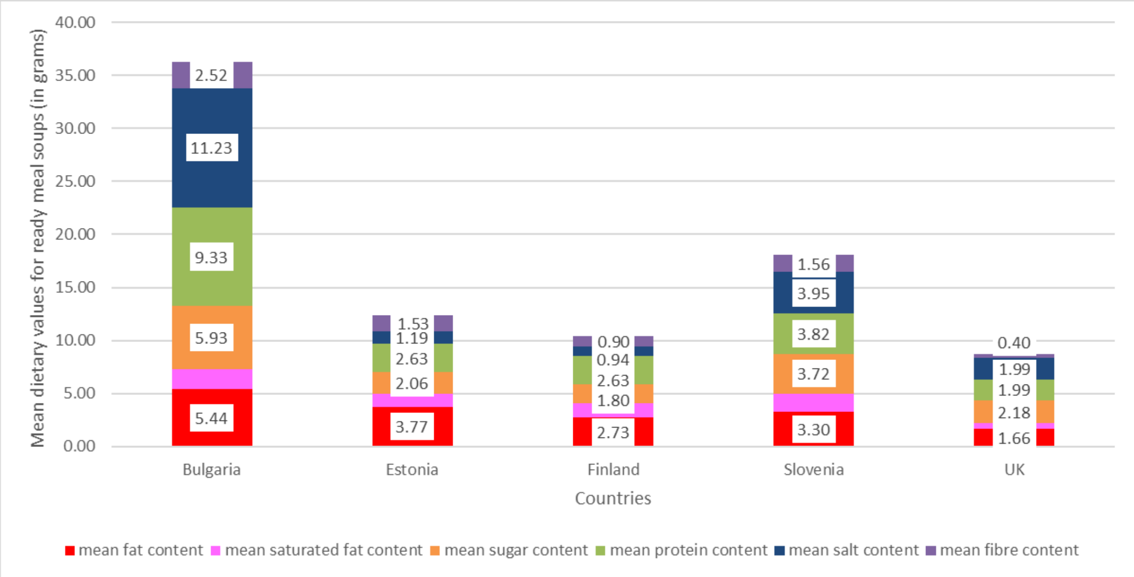
The nutritional content of scanned soup products showed a higher degree of variation compared with other food groups. The types of ingredients (vegetables, meat or a mix of both) used in the products may have contributed to the varying numbers of nutrient values, as shown in the figure below.

Figure 43. Distribution of dietary values for ready meals - soups in Europe (grams per 100 grams)



With regard to differences between countries in terms of mean nutritional values, apart from saturated fat content, the levels of all other nutrients varied significantly between the countries. Owing to the various consumer preferences regarding soup ingredients, particularly regarding the ratio of vegetables to meat, Bulgarian products showed a significantly higher protein content, 9.33 grams compared to the UK value of 1.96 gram per 100 grams. Sugar and salt values were also considerable higher in Bulgarian products, which had a mean average of 11.23 grams of salt and 5.93 grams of sugar. The second highest salt and sugar content, 3.95 and 3.72 grams, was observed in Slovenian products.

Figure 44. Comparative look at the nutrient content of ready meals -soups at the European level



A detailed breakdown of the individual nutrients can be found in the separate Final Report Annex containing the Country-level analysis.

4.7.2 Comparative assessment of specific products across European countries

Due to the high-degree of country (market) specific products among ready meals - soups, it was not possible to conduct a comparative assessment of the same products across multiple European countries. No specific products were found in the sample that were sold under the same brand, by the same manufacturer using the same ingredients in more than one country.

4.7.3 Subcategory analysis

The subcategory analysis is presented in the two charts below, both comparing nutrient levels between different subcategories but whereas one compared nutrients between different product types (e.g. different types of soups), the other looked at nutritional differences between subcategories of similar composition (tomato soups).

Figure 45. Comparing nutrients between subcategories of different composition

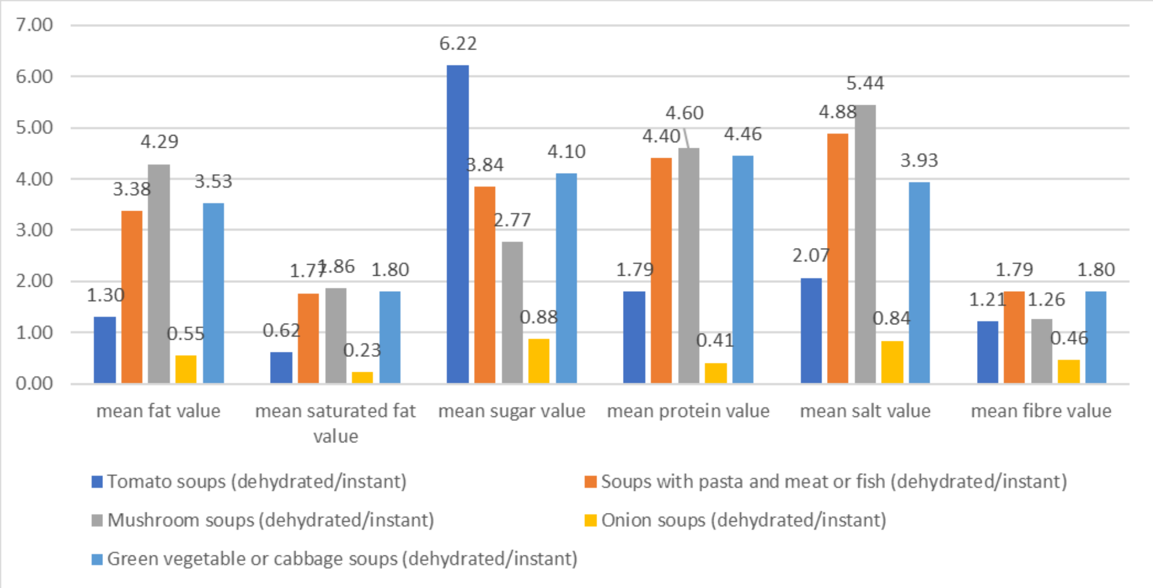
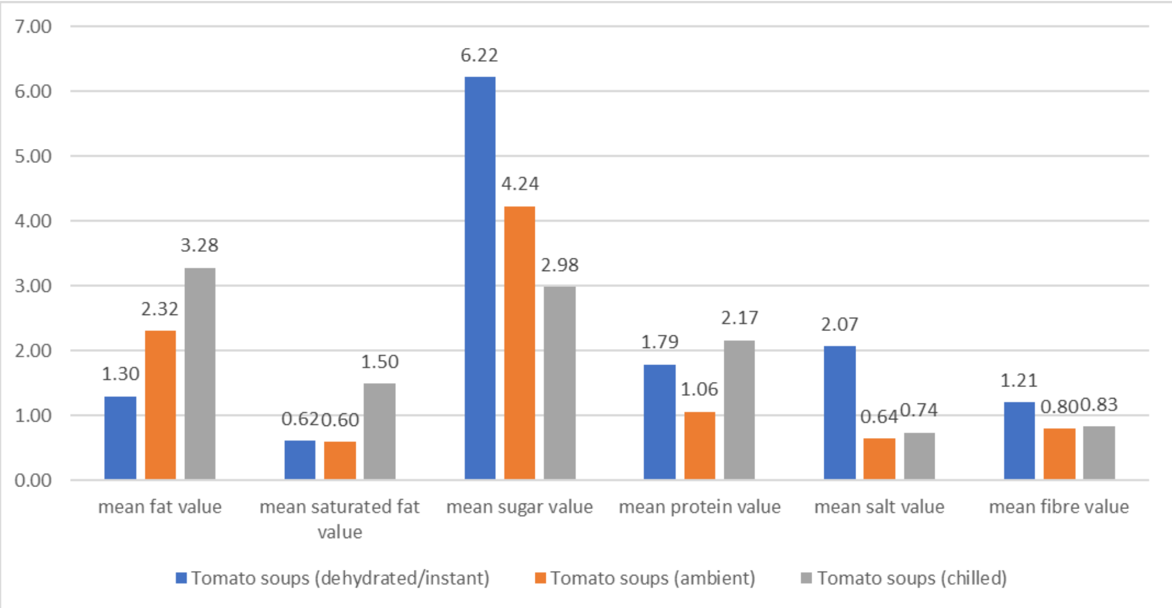


Figure 46. Comparing nutrients between subcategories of similar composition



4.7.4 Weighted Analysis

Weighted analysis was undertaken to observe whether and to what extent mean values of nutrient content per category in each country varied once the data were adjusted to reflect purchasing and consumption habits. That is, the weighted analysis shows how category averages vary when greater weight is given to the average nutrient content of food and drink products that are more highly consumed within a given country.

The table below presents details of the product subcategories for which data was collected in Finland, which was the only country for which data was collected in more than one subcategory (and, hence, it was the only country for which the weighted analysis is relevant), as well as the weight given to each subcategory when calculating weighted category averages. The product subcategories listed below are based on the Global Data product subcategories (as the market share data from Global Data, which is used to weight the analysis, uses these product subcategories). Further information on the method used to derive subcategory weights and calculate weighted category nutrient values was included in Section 2.1.3.2.

Table 37. Weights given to each subcategory – ready meals- soups

Subcategory	Finland
Ambient Soup	11%
Chilled Soup	9%
Instant Soup	0.2%

The table below presents the results of the weighted analysis. It compares unweighted and weighted mean values of relevant nutrient content per category in each country where data was collected under more than one subcategory.

Table 38. Comparing weighted and unweighted mean nutrient values (in grams) – sugar-sweetened dairy and dairy imitates

Country	Weighted/ unweighted	Fat	Saturated fat	Sugar	Salt	Protein	Fibre
Finland	**Weighted**	0.43	0.32	0.39	0.55	0.16	0.23
	Unweighted	2.73	1.37	1.80	2.24	0.94	0.90

4.8 Bread and bread products

4.8.1 European overview

Overall, data from 16 countries (Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Romania, Slovenia and the UK) were collected and analysed within the category of bread and bread products. Altogether 1,870 products were identified belonging to 22 sub-categories.

The breakdown of the products within the subcategories are shown in the following table (in absolute values) and chart (in percentages). These indicate that the subcategory of Pre-packaged breads (wholemeal/grain loaves) contained the highest number of products, followed by Wholemeal/grain sandwich breads.

Table 39. Europe: subcategories within the food group of bread and bread products

Subcategories	Number of products
Pre-packaged breads (wholemeal/grain loaves)	397
Wholemeal/grain sandwich breads	275
Plain white sandwich breads	265

Subcategories	Number of products
Pre-packaged breads (other loaves)	200
Pre-packaged breads (rolls)	197
Crispbreads/crisprolls	128
Pre-packaged breads (plain white loaves)	96
Hamburger/hot dog buns (white)	68
Pre-baked breads (rolls)	56
Salted crackers (plain)	33
Pre-baked breads (baguettes)	24
Other breads	23
Salted crackers (other flavours)	22
Hamburger/hot dog buns (other)	17
Hamburger/hot dog buns (wholemeal)	13
Pre-packaged breads (other loaves)	12
Breadsticks	11
Croissants	8
Other sandwich breads	7
Pre-packaged breads (baguettes)	7
Salted crackers (cheese flavoured)	7
Tortilla breads and wraps	4
TOTAL	**1,870**

Figure 47. Europe: share of the main subcategories within the food group of bread and bread products

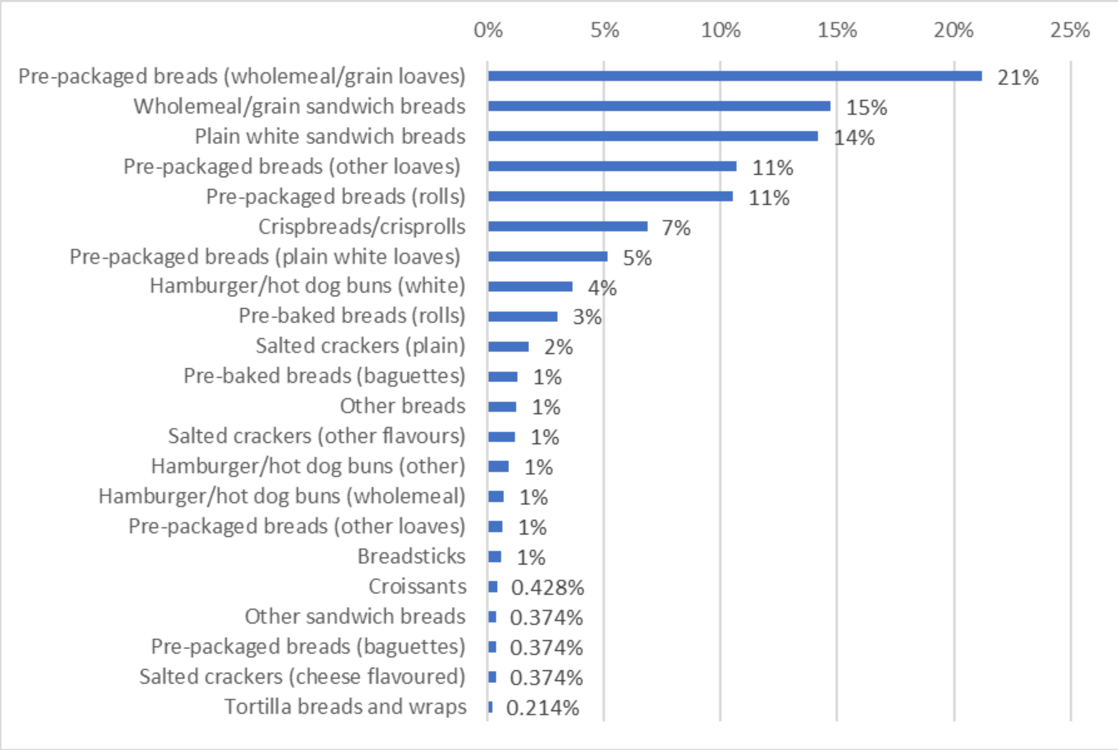

0%
5%
10%
15%
20%
25%
Pre-packaged breads (wholemeal/grain loaves) 21%
Wholemeal/grain sandwich breads 15%
Plain white sandwich breads 14%
Pre-packaged breads (other loaves) 11%
Pre-packaged breads (rolls) 11%
Crispbreads/crisprolls 7%
Pre-packaged breads (plain white loaves) 5%
Hamburger/hot dog buns (white) 4%
Pre-baked breads (rolls) 3%
Salted crackers (plain) 2%
Pre-baked breads (baguettes) 1%
Other breads 1%
Salted crackers (other flavours) 1%
Hamburger/hot dog buns (other) 1%
Hamburger/hot dog buns (wholemeal) 1%
Pre-packaged breads (other loaves) 1%
Breadsticks 1%
Croissants 0.428%
Other sandwich breads 0.374%
Pre-packaged breads (baguettes) 0.374%
Salted crackers (cheese flavoured) 0.374%
Tortilla breads and wraps 0.214%

Table 40. Composition of each country's sample – bread and bread products

	Breadsticks	Crispbreads / crisprolls	Croissants	Hamburger / hot dog buns (other)	Hamburger / hot dog buns (white)	Hamburger / hot dog buns (wholemeal)	Other breads	Other sandwich breads	Plain white sandwich breads	Pre-baked breads (baguettes)	Pre-baked breads (rolls)	Pre-packaged breads (baguettes)	Pre-packaged breads (other loaves)	Pre-packaged breads (plain white loaves)	Pre-packaged breads (rolls)	Pre-packaged breads (wholemeal / grain loaves)	Salted crackers (cheese flavoured)	Salted crackers (other flavours)	Salted crackers (plain)	Tortilla breads and wraps	Wholemeal / grain sandwich breads
Austria				2	5				14	3	11	5	60	5	10	53					11
Belgium									8		9		7	9	5	23					5
Bulgaria									3		1			11		21					8
Denmark				3	8	8			3				31	4	26	15					13
Estonia								1	4		1		14	7		26					5
Finland		125						2	5		4		21	2	97	74					32
France				9	29	1		3	124	20	22		4	1		13					71
Greece	11		5				23		15					2		18	4	13	18	4	46
Hungary									6				13	4		13					12
Italy					9				14	2											11
Lithuania									17			2	2	23	2	67					13
Malta					5	1			12					3	10	5					13
Portugal					10	2			7				14			17					1
Romania									3				26			6					12
Slovenia		3	3					1	23		3		5	4	24	19	3	9	15		20
UK				1	1	1			2				9	9	14	13					1
Total	**11**	**128**	**8**	**15**	**67**	**13**	**23**	**7**	**260**	**25**	**51**	**7**	**206**	**84**	**188**	**383**	**7**	**22**	**33**	**4**	**274**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

The below table shows when data on *bread and bread products* were collected given this may inform the interpretation of differences in nutritional content.

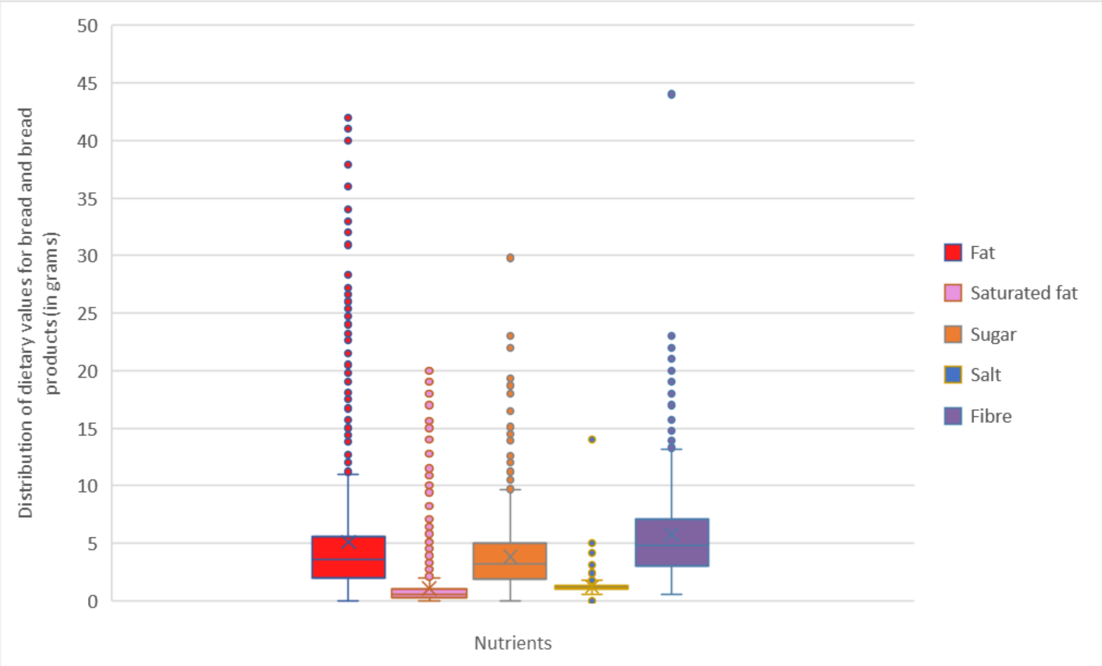
Table 41. Dates for data collection, by country – bread and bread products

	Jan 2012	Nov 2019	Dec 2019	Feb 2020	Mar 2020	Apr 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Apr 2021	May 2021	Jul 2021	Aug 2021	Nov 2021	Dec 2021	Jan 2022
Austria				74												90	15	
Belgium		27					17	22										
Bulgaria							44											
Denmark				89	17		5											
Estonia								31	27									
Finland			183	39	122		18											
France	297																	
Greece				61	74		24											
Hungary				44								4						
Italy			9			3	7	8				2	7					
Lithuania								91	4					31				
Malta								8	23			3				15		
Portugal					37					5	1	8						
Romania					6							1			40			
Slovenia				90			9		33									
UK															29			22
Total	**297**	**27**	**192**	**397**	**256**	**3**	**124**	**160**	**87**	**5**	**1**	**18**	**7**	**31**	**69**	**105**	**15**	**22**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

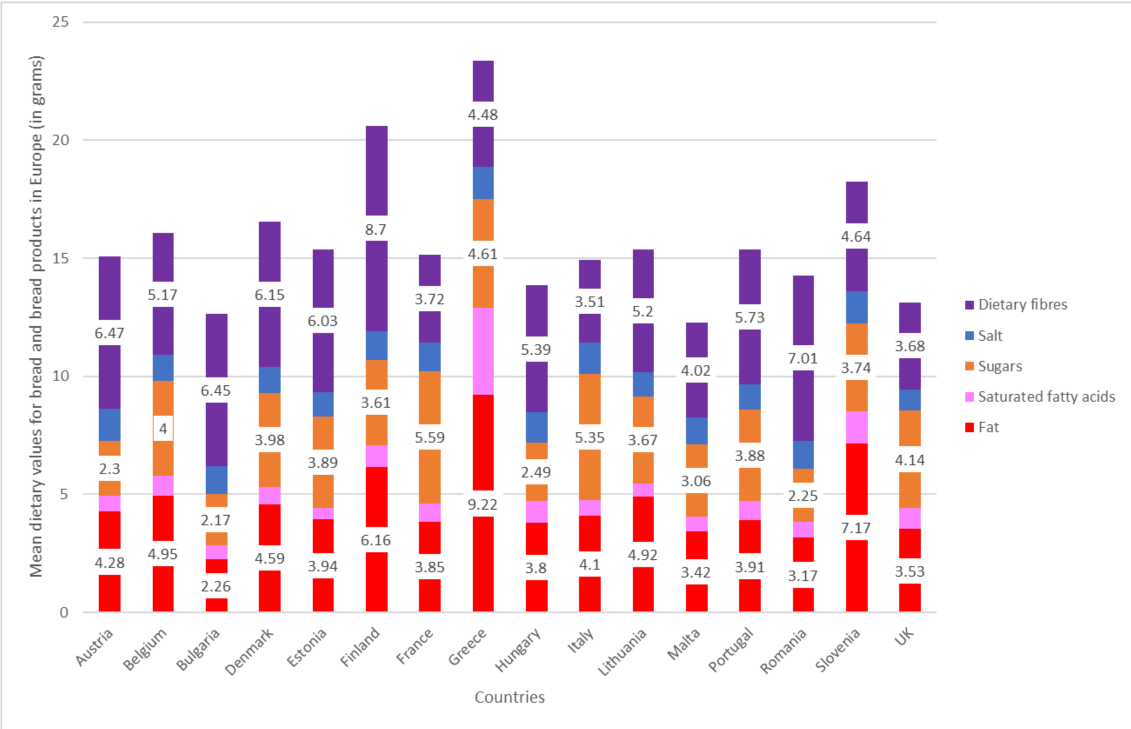
The nutritional content of scanned bread products showed a higher degree of variation particularly with regard to fat content. Apart from salt, which showed moderate variations between the subcategories all other nutrients, sugar, saturated fat and fibre, had shown significant variability.

Figure 48. Distribution of dietary values for bread and bread products (grams per 100 grams)



With regard to differences between countries in terms of mean nutritional values, apart from saturated fat content, the levels of all other nutrients varied significantly between the countries. Greece had shown the highest fat content values, whereas in terms of sugar content Italian bread products were leading and in terms of fibre content Finnish products were the highest.

Figure 49. Comparative look at the nutrient content of bread and bread products at the European level



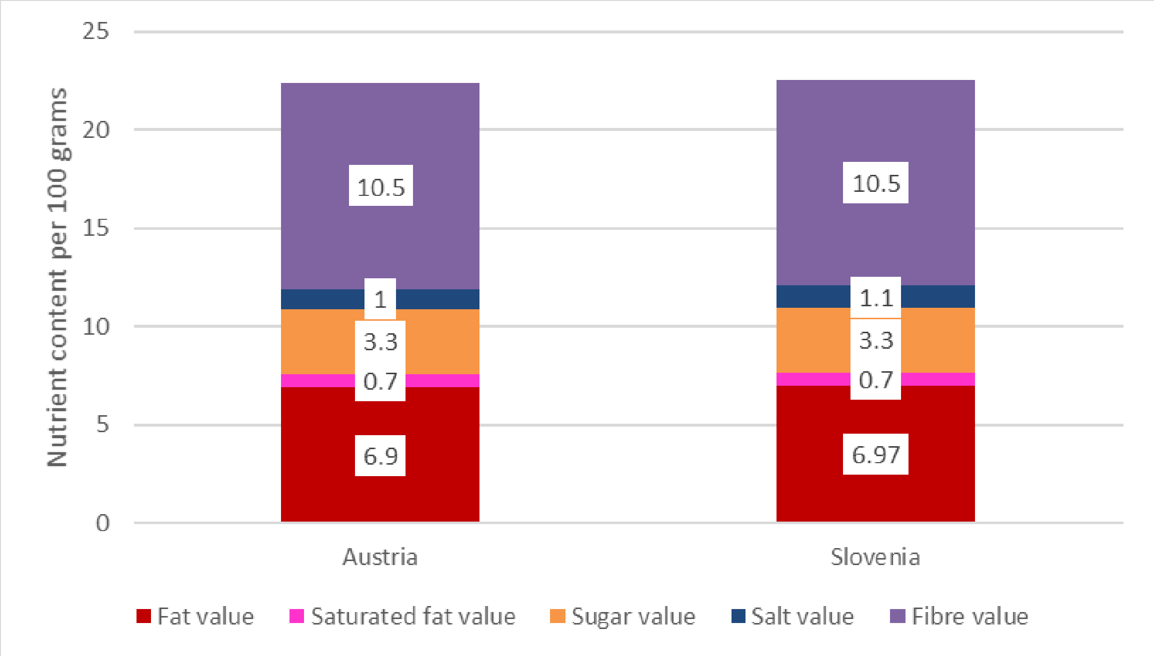
4.8.2 Comparative assessment of specific products across European countries

A comparative analysis on nutrient content was carried out to identify the extent to which manufacturers may adapt their product composition in different European countries. The selection criteria used to identify relevant products included:

- availability of the same product across multiple countries;
- products from the largest subcategories within the food group (highest number of products);
- market share of the manufacturer or retailer in Europe and in the relevant country (based on Eurostat and industry statistics).

There were limited number of identical products registered in multiple countries in the bread and bread products category. Instead, locally produced food items were found to be dominating in this category. There were several examples of products sold in two neighbouring countries, in which case – as the example below shows - the products contained identical levels of nutrients.

Figure 50. Dietary values (in grams) for Harry's ryebread across European countries



4.8.3 Subcategory analysis

The subcategory analysis is presented in the two charts below, both comparing nutrient levels between different subcategories but whereas one compared nutrients between different product types (e.g. white vs wholegrain bread), the other looked at nutritional differences between subcategories of similar composition (white breads).

Figure 51. Comparing nutrients between subcategories of different composition

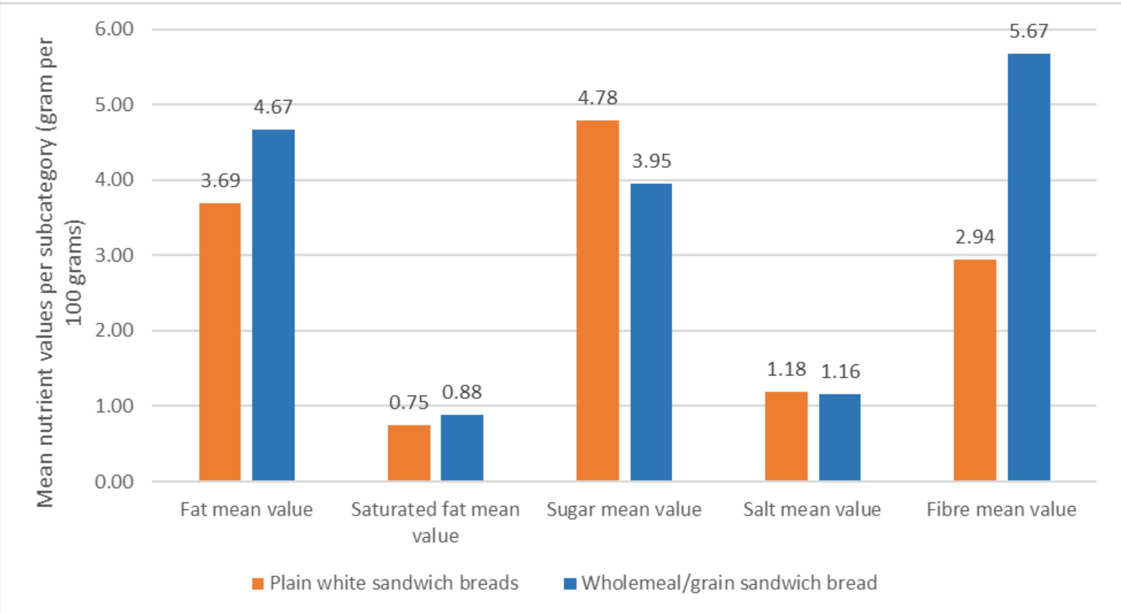
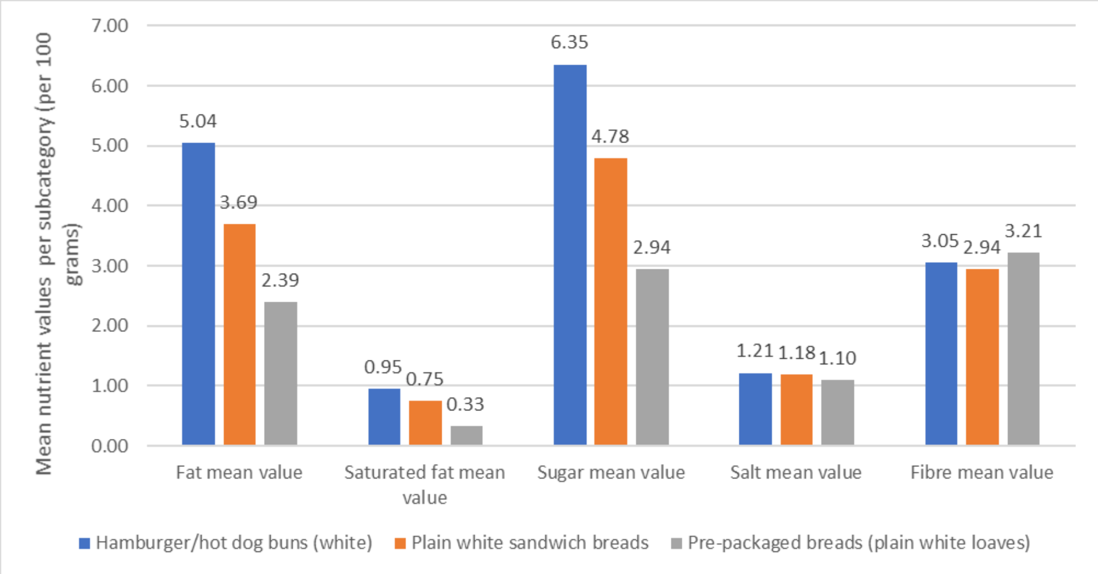


Figure 52. Comparing nutrients between subcategories of similar composition



4.8.4 Weighted analysis

Weighted analysis was undertaken to observe whether and to what extent mean values of nutrient content per category in each country varied once the data were adjusted to reflect purchasing and consumption habits. That is, the weighted analysis shows how category averages vary when greater weight is given to the average nutrient content of food and drink products that are more highly consumed within a given country.

Table 42 below presents details of the product subcategories for which data was collected in each country, and the weight given to each subcategory when calculating weighted category averages. The product subcategories listed below are based on the Global Data product subcategories (as the market share data from Global Data, which is used to weight the analysis, uses these product subcategories). Where a value is left blank, it indicates that data was not collected against that product subcategory in a country. Further information on the method used to derive subcategory weights and calculate weighted category nutrient values was included in Section 2.1.3.2.

Table 42. Weights given to each subcategory – bread and bread products

Subcategory	AT	BE	BG	DK	EE	FI	FR	GR	HU	IT	LT	MT	PT	RO	SI	UK
Baguettes	16%						16%			27%						
Rolls	14%	28%	40%	32%	21%	23%	18%		31%		25%	25%	24%	19%	25%	25%
Burger Buns	16%			20%			14%			17%		21%	16%			31%
Ciabatta										22%						
Loaves	34%	24%	22%	20%	44%	38%	31%	40%	47%		43%	29%	31%	45%	41%	23%
Sandwich Slices	20%	49%	37%	28%	35%	36%	21%	35%	22%	34%	33%	24%	28%	36%	24%	22%
Croissants								1%							1%	
Crispbreads, Crisprolls etc.						3%										
Bread Sticks								1%								
Plain Crackers								5%							4%	
Cheese-Flavoured Crackers								1%							2%	
Other Crackers								3%							2%	
Other Breads								14%								

Table 43 below presents the results of the weighted analysis. It compares unweighted and weighted mean values of relevant nutrient content per category in each country where data was collected under more than one subcategory.

Table 43. Comparing weighted and unweighted mean nutrient values (in grams) – bread and bread products

Country	Weighted/ unweighted	Fat	Saturated fatty acids	Sugars	Salt	Dietary fibres
Austria	**Weighted**	3.95	0.72	2.98	1.35	5.34
	Unweighted	4.28	0.67	2.30	1.37	6.47
Belgium	**Weighted**	4.51	0.89	4.28	1.15	4.92
	Unweighted	4.95	0.85	4.00	1.10	5.17
Bulgaria	**Weighted**	2.37	0.55	1.50	1.05	4.73
	Unweighted	2.26	0.58	2.17	1.18	6.45
Denmark	**Weighted**	4.58	0.78	4.26	1.08	5.42
	Unweighted	4.59	0.73	3.98	1.11	6.15
Estonia	**Weighted**	3.73	0.42	3.60	1.01	5.13
	Unweighted	3.94	0.48	3.89	1.03	6.03
Finland	**Weighted**	3.99	0.60	3.11	1.09	6.56
	Unweighted	6.16	0.93	3.61	1.21	8.70
France	**Weighted**	3.04	0.56	4.32	1.31	4.16
	Unweighted	3.85	0.77	5.59	1.23	3.72
Greece	**Weighted**	5.47	1.83	4.28	1.30	5.65
	Unweighted	9.22	3.69	4.61	1.36	4.48
Hungary	**Weighted**	3.84	0.87	2.51	1.27	5.51
	Unweighted	3.80	0.91	2.49	1.27	5.39
Italy	**Weighted**	3.18	0.56	4.54	1.38	3.14

Country	Weighted/ unweighted	Fat	Saturated fatty acids	Sugars	Salt	Dietary fibres
	Unweighted	4.10	0.66	5.35	1.32	3.51
Lithuania	**Weighted**	5.57	0.55	4.21	1.08	4.40
	Unweighted	4.92	0.55	3.67	1.03	5.20
Malta	**Weighted**	3.50	0.68	3.35	1.22	3.98
	Unweighted	3.42	0.63	3.06	1.14	4.02
Portugal	**Weighted**	3.61	0.75	3.83	1.05	4.96
	Unweighted	3.91	0.80	3.88	1.06	5.73
Romania	**Weighted**	3.42	0.74	2.33	1.20	6.60
	Unweighted	3.17	0.67	2.25	1.18	7.01
Slovenia	**Weighted**	5.43	1.03	3.23	1.29	4.93
	Unweighted	7.17	1.34	3.74	1.37	4.64
UK	**Weighted**	3.07	0.89	3.76	0.83	3.78
	Unweighted	3.53	0.89	4.14	0.89	3.68

4.9 Meat and fish

4.9.1 European overview

Overall, data from 16 countries (Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Romania, Slovenia and the UK) were collected and analysed within the category of meat and fish products. Altogether 5,091 products were identified belonging to 32 sub-categories.

The breakdown of the products within the subcategories are shown in the following table (in absolute values) and chart (in percentages). These indicate that the subcategory of sausages contained the highest number of products, followed by cooked pork ham and roast (packaged).

Table 44. Europe: subcategories within the food group of meat and fish

Subcategories	Number of products
Sausages	1620
Cooked pork ham and roast (packaged)	681
Cured ham	506
Pork belly and bacon (packaged)	462
Pate	236
Chilled smoked_salmon_trout	197
Chilled seafood tapas	173
Salami	135
Dried, smoked or cured pork	129
Chilled smoked salmon and trout	110
Canned cooked meats	104
Chilled plain Surimi	101
Chilled burgers	68
Dried, smoked or cured beef	65
Chilled battered or breaded fish	62
Saucisson sec	52
Poultry ham and roast (packaged)	51
Chilled shrimps	42
Other smoked fish	42

Subcategories	Number of products
Chilled meatballs	40
Chilled fish roe	38
Chilled taramasalata	36
Other cured meats	35
Chilled filled Surimi	18
Chilled mussels	18
Chilled shrimp	18
Chilled seafood terrines	17
Other fermented meats	11
Chilled cooked meats (pork)	10
Chilled breaded meats	8
Filled surimi	3
Total	**5,091**

Figure 53. Europe: share of the main subcategories within the food group of meat and fish products

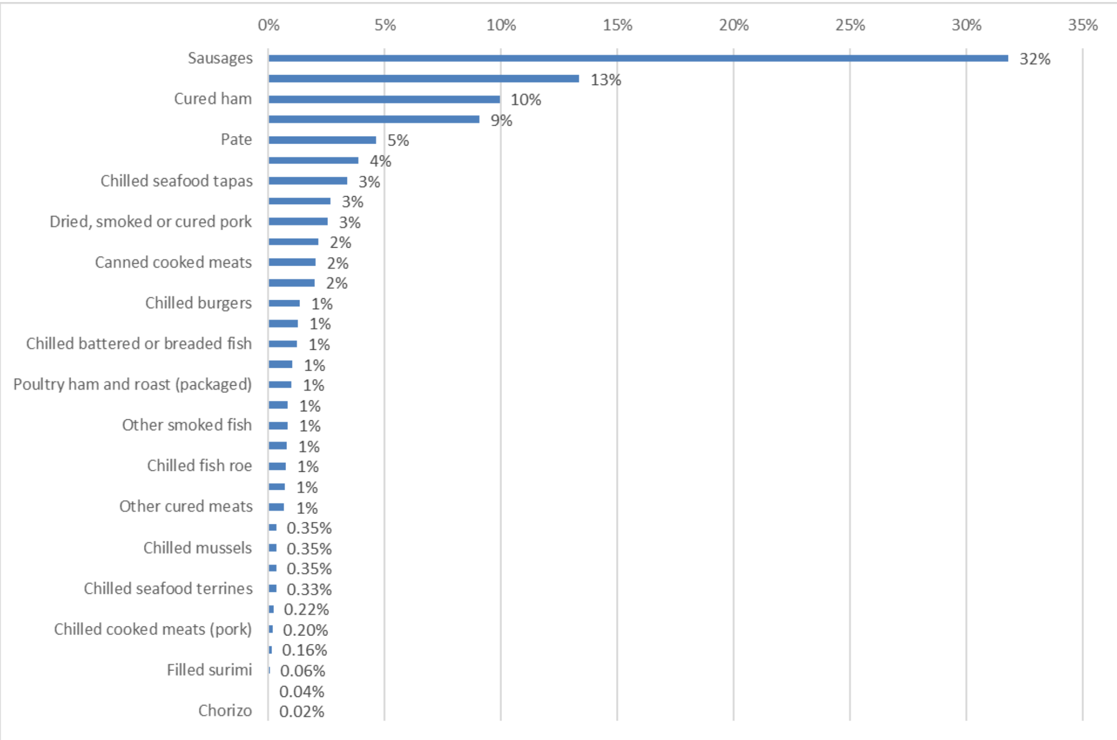


Table 45. Composition of each country's sample – meat and fish products

	Canned cooked meats	Chilled battered or breaded fish	Chilled breaded meats	Chilled burgers	Chilled cooked meats (pork)	Chilled filled Surimi	Chilled fish roe	Chilled grills	Chilled meatballs	Chilled mussels	Chilled plain Surimi	Chilled seafood tapas	Chilled seafood terrines	Chilled shrimp	Chilled smoked salmon and trout	Chorizo	Cooked pork ham and roast (packaged)	Cured ham	Dried, smoked or cured beef	Dried, smoked or cured pork	Filled surimi	Other cured meats	Other fermented meats	Other smoked fish	Pate	Pork belly and bacon (packaged)	Poultry ham and roast (packaged)	Salami	Saucisson sec	Sausages
Austria																	107	64	9	6		1			53	34				239
Belgium	2				4												57	58	6	12					35	48	42			59
Bulgaria	1																18	10	1	1					34					36
Denmark									12								54	16	14	21		1			34	22				165
Estonia	26	2		2	5		5			4	13	61			12		38	14	2	8	3	2		9		24				161
Finland		20		29			6	2	23	1	2	75		18	56		105	26	3	3		6	11	2	33				52	253
France		34			1	18	24			12	80	5	17	42	197		244	144		16		8		17		121				143
Greece		2					3			1	5	9			9		34	17	2	6				7		12		39		98
Hungary				4														36		8		5				32		31		96
Italy									3									44	16	11		2				23				31
Lithuania	36	4									1	23	2		37			20	7	15		8		7	32	21				104
Malta	5			28													21	18	5	3		1				19	9			61
Portugal									1								3	12		10		1				25				20
Romania	5															1		8		4					15			32		28
Slovenia	20			5					1									13		3						20		33		39
UK	9		8															7		2						62				87
Total	**104**	**62**	**8**	**68**	**10**	**18**	**38**	**2**	**40**	**18**	**101**	**173**	**19**	**18**	**114**	**1**	**681**	**507**	**65**	**129**	**3**	**35**	**11**	**42**	**236**	**463**	**51**	**135**	**52**	**1620**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

The below table shows when data on *meat and fish products* were collected given this may inform the interpretation of differences in nutritional content.

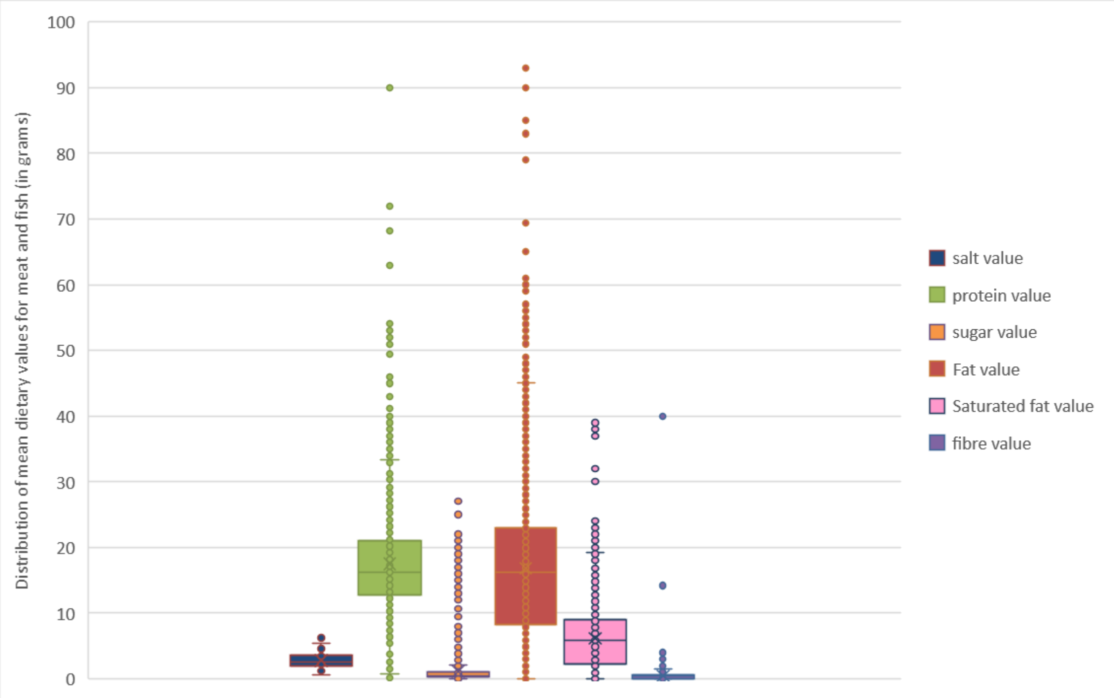
Table 46. Dates for data collection, by country – meat and fish products

	Jan 2013	Jan 2015	Jan 2016	Dec 2019	Feb 2020	Mar 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022
Austria				118		75														313	5	
Belgium							40	68				2	213									
Bulgaria							39	62														
Denmark					222	105	12															
Estonia								7	299	85												
Finland				51		23	93	29	253	50	144			83								
France	677	412	34																			
Greece					2	168	77															
Hungary					118			52	33				9									
Italy							86	13							25	6						
Lithuania									261							3	48					
Malta							46	4					4				2	52	58	4		
Portugal						16				15	18		23									
Romania						53			1				39									
Slovenia						22	28		84													
UK				46									46	45			31					7
Total	**677**	**444**	**34**	**215**	**342**	**462**	**421**	**235**	**931**	**150**	**162**	**2**	**334**	**128**	**25**	**9**	**81**	**52**	**58**	**317**	**5**	**7**

Note: shading reflects the number of products for which data was collected (i.e. darker shading means a higher number of products).

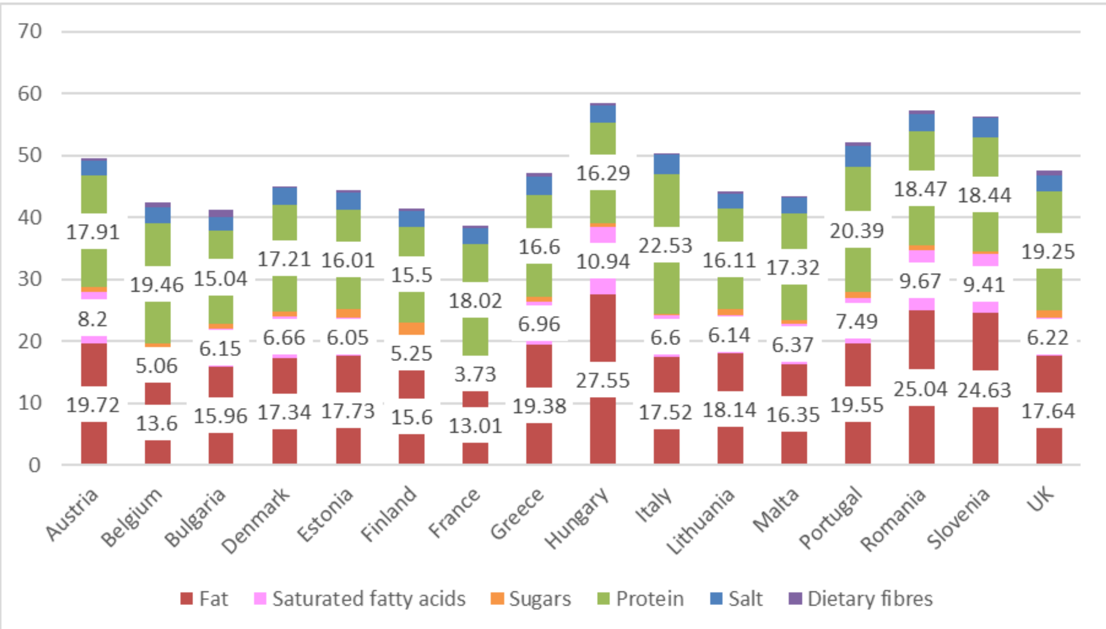
The nutritional content of scanned bread products showed a higher degree of variation particularly with regard to fat and protein content. All other nutrients, salt, sugar, saturated fat and fibre, had shown moderate variability.

Figure 54. Distribution of dietary values for meat and fish (grams per 100 grams)



With regard to differences between countries in terms of mean nutritional values, apart from saturated fat content, the levels of all other nutrients varied significantly between the countries. Greece had shown the highest fat content values, whereas in terms of sugar content Italian bread products were leading and in terms of fibre content Finnish products were the highest.

Figure 55. Comparative look at the nutrient content of meat and fish products at the European level



4.9.2 Comparative assessment of specific products across European countries

A comparative analysis on nutrient content was carried out to identify the extent to which manufacturers may adapt their product composition in different European countries. The selection criteria used to identify relevant products included:

- availability of the same product across multiple countries;
- products from the largest subcategories within the food group (highest number of products);
- market share of the manufacturer or retailer in Europe and in the relevant country (based on Eurostat and industry statistics).

There were no identical products registered in multiple countries in the database under meat and fish products category. Instead, locally produced food items were found to be dominating in this category.

4.9.3 Subcategory analysis

The subcategory analysis is presented in the two charts below, both comparing nutrient levels between different subcategories but whereas one compared nutrients between different product types (e.g. different types of meat), the other looked at nutritional differences between subcategories of similar composition (pork).

Figure 56. Comparing nutrients between subcategories of different composition

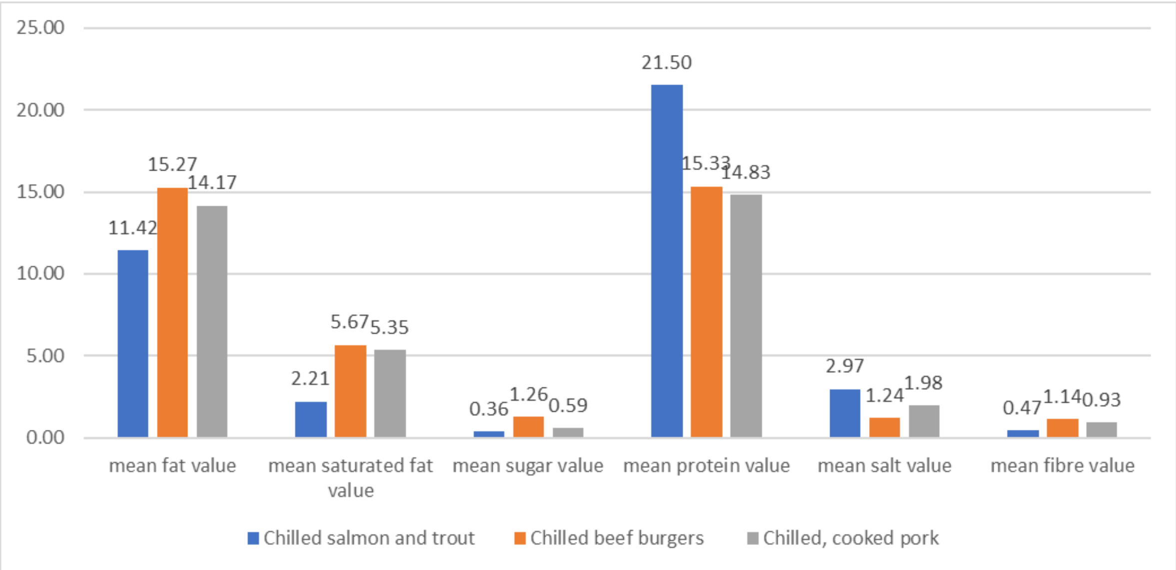
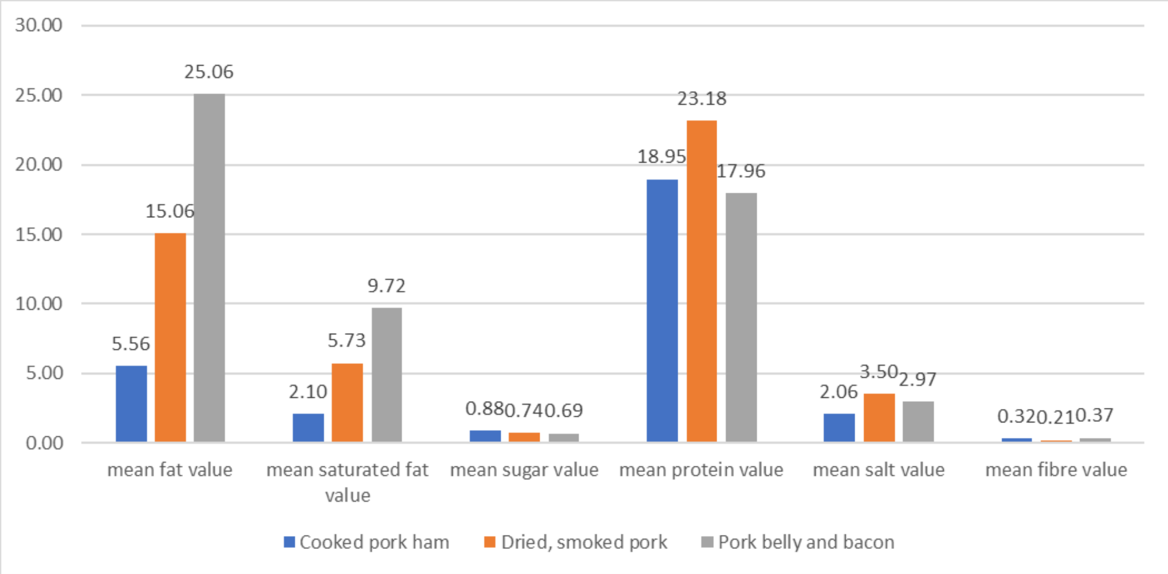


Figure 57. Comparing nutrients between subcategories of similar composition



4.9.4 Weighted analysis

Weighted analysis was undertaken to observe whether and to what extent mean values of nutrient content per category in each country varied once the data were adjusted to reflect purchasing and consumption habits. That is, the weighted analysis shows how category averages vary when greater weight is given to the average nutrient content of food and drink products that are more highly consumed within a given country.

Table 47 below presents details of the product subcategories for which data was collected in each country, and the weight given to each subcategory when calculating weighted category averages. The product subcategories listed below are based on the Global Data product subcategories (as the market share data from Global Data, which is used to weight the analysis, uses these product subcategories). Where a value is left blank, it indicates that data was not collected against that product subcategory in a country. Further information on the method used to derive subcategory weights and calculate weighted category nutrient values was included in Section 2.1.3.2.

Table 47. Weights given to each subcategory – meat & fish

Subcategory	AT	BE	BG	DK	EE	FI	FR	GR	HU	IT	LT	MT	PT	RO	SI	UK
Chilled Packaged Fish & Seafood – Processed*					23%	8%	27%	44%			47%					
Ambient Meat		20%	25%		12%						11%	14%		14%	10%	20%
Bacon	18%	20%		24%	12%		41%	10%	22%	37%	9%	16%	19%		13%	37%
Burgers & Grills					14%	18%			47%			7%	25%		28%	
Meatballs				33%		13%				38%	10%	19%	17%		25%	
Coated Portions	10%															19%
Sausages	17%	11%	13%	15%	25%	16%	11%	10%	20%	11%	13%	6%	7%	12%	17%	21%
Cured Meats	8%	4%	20%	2%	7%	10%	5%	7%	9%	14%	0%	5%	14%	9%	5%	3%
Chorizo														9%		
Pepperoni														12%		
Salami								0%	2%					17%	2%	
Other (Fermented Meats)						2%								10%		
Pâtés	10%	6%	24%	2%		14%					8%	4%		17%		
Chicken (Cooked Meats - Packaged)		16%										14%				
Pork (Cooked Meats - Packaged)	37%	23%	17%	24%	7%	19%	16%	30%				15%	18%			

Note: The names of subcategories with an asterisk do not align exactly with the Global Data nomenclature, but there is a clear match.

Table 48. Comparing weighted and unweighted mean nutrient values (in grams) – meat & fish

Country	Weighted/ unweighted	Fat	Saturated fatty acids	Sugars	Protein	Salt	Dietary fibres
Austria	**Weighted**	17.87	7.47	1.15	18.56	2.36	0.48
	Unweighted	19.72	8.20	0.92	17.91	2.39	0.48
Belgium	**Weighted**	12.78	4.77	0.84	19.24	2.14	0.63
	Unweighted	13.60	5.06	0.93	19.46	2.60	0.73
Bulgaria	**Weighted**	12.37	4.77	0.52	16.86	2.40	0.92
	Unweighted	15.96	6.15	0.73	15.04	2.16	1.30
Denmark	**Weighted**	16.75	6.48	0.77	16.37	2.30	0.22
	Unweighted	17.34	6.66	0.79	17.21	2.74	0.34
Estonia	**Weighted**	18.29	6.37	1.22	16.83	2.42	0.40
	Unweighted	17.73	6.05	1.47	16.01	2.67	0.40
Finland	**Weighted**	14.59	5.17	1.55	15.70	2.16	0.80
	Unweighted	15.60	5.25	2.21	15.50	2.46	0.45
France	**Weighted**	16.25	5.47	0.87	17.19	2.45	0.42
	Unweighted	13.01	3.73	0.92	18.02	2.56	0.39
Greece	**Weighted**	16.04	4.42	0.77	15.30	2.78	0.51
	Unweighted	19.38	6.96	0.76	16.60	2.82	0.58
Hungary	**Weighted**	24.10	8.91	1.19	13.73	2.25	0.16
	Unweighted	27.55	10.94	0.58	16.29	2.81	0.23
Italy	**Weighted**	20.65	7.66	0.35	18.19	2.52	0.09

Country	Weighted/ unweighted	Fat	Saturated fatty acids	Sugars	Protein	Salt	Dietary fibres
	Unweighted	17.52	6.60	0.30	22.53	3.17	0.10
Lithuania	**Weighted**	17.89	5.41	0.91	14.58	2.66	0.27
	Unweighted	18.14	6.14	0.97	16.11	2.46	0.41
Malta	**Weighted**	13.41	5.31	0.73	17.99	2.67	0.15
	Unweighted	16.35	6.37	0.66	17.32	2.54	0.22
Portugal	**Weighted**	14.06	5.98	1.13	18.05	2.65	0.51
	Unweighted	19.55	7.49	0.84	20.39	3.36	0.49
Romania	**Weighted**	23.76	9.13	0.72	18.47	2.71	0.33
	Unweighted	25.04	9.67	0.79	18.47	2.82	0.44
Slovenia	**Weighted**	17.07	6.70	0.51	14.46	1.70	0.31
	Unweighted	24.63	9.41	0.54	18.44	3.00	0.29
UK	**Weighted**	17.12	5.36	0.82	20.78	2.54	0.73
	Unweighted	17.64	6.22	1.06	19.25	2.62	0.79

4.10 Stakeholder feedback on data analysis

Feedback was sought from stakeholders on the initial data analysis and emerging findings associated with the dataset of nutritional information.

Two forms of consultation were undertaken with stakeholders:

- **Consultation on a draft analytical report.** Written feedback was invited over a two-week period on a draft report containing descriptive statistics data analysis for a sample of product categories and countries from the dataset.
- **Workshop to discuss the findings emerging from the draft analytical report.** Following the circulation of the draft analytical report to stakeholders, an online workshop was held to discuss the approach and the emerging findings from the report.

Both forms of consultation engaged with a range of stakeholders, including: HaDEA; DG SANTE; JRC, EFSA; ANSES; national competent authorities; and other interested parties.

4.10.1 Consultation on draft analytical report

Very few comments were received on the draft analytical report. One comment made reference to the UK's exit from the EU and, consequently, it questioned the most appropriate way to present data for the UK (i.e. as it is no longer an EU Member State) and how European average figures should be calculated. In terms of the presentation of this report, the analysis within the report has been updated to include 'Europe' rather than 'EU' averages, although the underlying basis for calculation has not been changed (i.e. it still takes into account the UK figures).

Another comment related to the French product data (sourced directly from ANSES) and clarifying within the report whether and how it differs from the rest of the dataset (i.e. in terms of how it was collected).

4.10.2 Workshop to discuss emerging findings

A two-hour online workshop was held on 25 February 2022 with around 25 stakeholders. The workshop agenda covered the following items:

- Background and objectives
- Methodology
- Progress to date
- Emerging findings
- Next steps
- Sustainability of the monitoring system

The primary focus of the discussion was on the methodology and emerging findings, with some discussion of the sustainability of the monitoring system.

A summary of the key points of feedback raised during the workshop is set out in Table 49 below, along with how the ICF study team have responded to the feedback.

Table 49. Summary of workshop feedback

Agenda item	Key points of feedback	ICF responses to feedback
Methodology	One stakeholder asked about the feasibility of countries replicating the EUREMO methodology in the future. They also found it	The feasibility and sustainability of the EUREMO methodology in the

Agenda item	Key points of feedback	ICF responses to feedback
	interesting to see that retailers showed goodwill in certain countries (Austria, UK).	future is discussed in Section 9 of this report.
	One stakeholder sought additional detailed information surrounding the Best-ReMaP and EUREMO nomenclatures and the differences between the two.	ICF noted that the work on the nomenclature was extremely demanding. The final EUREMO nomenclature is consistent with Best-ReMaP, although there have been some changes at a sub-category level.
	One stakeholder asked if more in-depth data for European countries (from Global Data) can be shared.	ICF agreed to look into this but suggested it was unlikely due to software licensing constraints.
Emerging findings	One stakeholder suggested that the analysis should compare data between subcategories rather than by categories, and the analysis of nutritional content per subcategory rather than by category.	Subcategory analysis methodology developed and sample analysis being prepared
Sustainability of the monitoring system	A Slovenian stakeholder suggested that, currently in Slovenia, the food processing industry provides the relevant food monitoring data. The Commission noted that it had been discussing the possibility of including this requirement in the food information legislation, but that this would take time to implement and, in the meantime, projects such as EUREMO are necessary to help stakeholders get there. The Commission also noted that the process of retailers supplying labels to health authorities has	This was an iterative discussion which helped to shape the discussion presented in Section 9 of this report.

Agenda item	Key points of feedback	ICF responses to feedback
	already been established in EU legislation (Food Supplements Directive). There should be legislative provisions according to which national authorities can require retailers or manufacturers to provide these data, but only for specific categories.	

5. Public health impact analysis

This section presents the study team's work associated with the health impact analysis.

5.1 Background

The purpose of this sub-task within the EUREMO project is to estimate the public health impacts of a full, partial and minimal implementation of the three annexes of the EU Framework for national initiatives on selected nutrients (salt, added sugars and saturated fat), to be achieved by 2012 for salt and by 2020 for added sugars and saturated fat and to be continued from that point on. The annexes can support European countries with the design, implementation and evaluation of reformulation and product improvement strategies in the context of their public health policies to reduce overweight and obesity, and nutrition-related non-communicable diseases in the general population and especially in children. They are meant as a tool for the benefit and voluntary use of European countries. European countries may focus their initiatives also on other target nutrients, food categories and strategies to bring intakes in line with recommended levels to fit national specificities. In addition, it is understood that a reinforcement of policies at European country level may both contribute to and be supported by stronger concerted action at EU level.

For **salt**, there is an EU framework for national salt initiatives. The salt reduction targets proposed are the result of two salt expert meetings in 2008 aiming at achieving a common vision for a general European approach towards salt reduction. The overall goal of the EU framework on salt reduction is to contribute towards reduced salt intake at population level in order to achieve the national or WHO recommendations. Data from European countries bring to light that the current salt intake levels are clearly exceeding the WHO maximum limit of 5 g (or 2 gram sodium) per day. A high salt intake is among the factors increasing the risk of developing certain chronic diseases. In some European countries the current national data may be insufficient to judge the magnitude of the problem. In other cases, national data might show that the population salt intake is close to the WHO recommended maximum level. To consolidate the mapping of the situation, it is possible for European countries to carry out 24h urinary sodium excretion surveys. However, even if the picture is not fully clear yet, engaging in salt reduction was seen as a 'no regrets' move.

For **sugars**, added sugars provide energy but do not significantly contribute other nutrients to a person's diet.

The overall goal of Annex II of the EU Framework for National Initiatives on Selected Nutrients on added sugars is to contribute towards achieving population intake levels and dietary patterns in line with the national, EFSA and the World Health Organization (WHO) recommendations. According to EFSA, there is some evidence that high intakes of sugars in the form of sugar-sweetened beverages contributes to weight gain. Additionally, the positive relationship of consumption of sugars-containing foods to dental caries, weight gain and micronutrient intake should be considered when establishing nutrient goals for populations and recommendations for individuals and when developing food-based dietary guidelines. Several European countries have established recommendations for added sugars to less or not more than 10% of the total energy intake (similar to the WHO recommendation), while other European countries recommend higher or lower maximum intakes, 15 and 5%, respectively. Currently EFSA is reviewing the evidence for causal links with various diseases.

For **saturated fat**, the overall goal of Annex I of the EU Framework for National Initiatives on Selected Nutrients on saturated fat is to contribute towards achieving population intake levels and dietary patterns in line with the national, the European Food Safety Authority (EFSA) and the World Health Organization (WHO) recommendations. According to EFSA the intake of saturated fat is recommended to be as low as possible within the context of a nutritionally adequate diet. Diets high in saturated fat are associated with an increased risk of cardiovascular diseases. Data from European countries bring to light that the current average intake levels for saturated fat are clearly exceeding WHO recommendations of less than 10 % of the energy intake, in nearly all European countries.

5.2 Approach

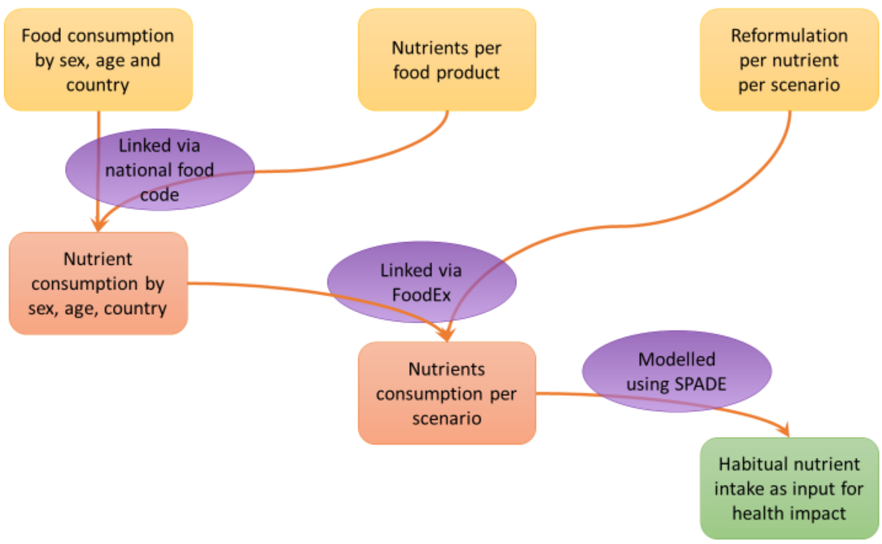
The scenarios of a full, partial and minimal implementation of the three annexes of the EU Framework for national initiatives on selected nutrients involve a what-if analysis to produce an estimated public health impact, for instance, as measured in DALYs (European Commission 2011). The scenarios include a two-step approach. First, the effects on habitual daily nutrient intake of food reformulation are assessed followed by the modelling of the impact of daily nutrient intake on the risk of certain chronic diseases (see Figure 58).

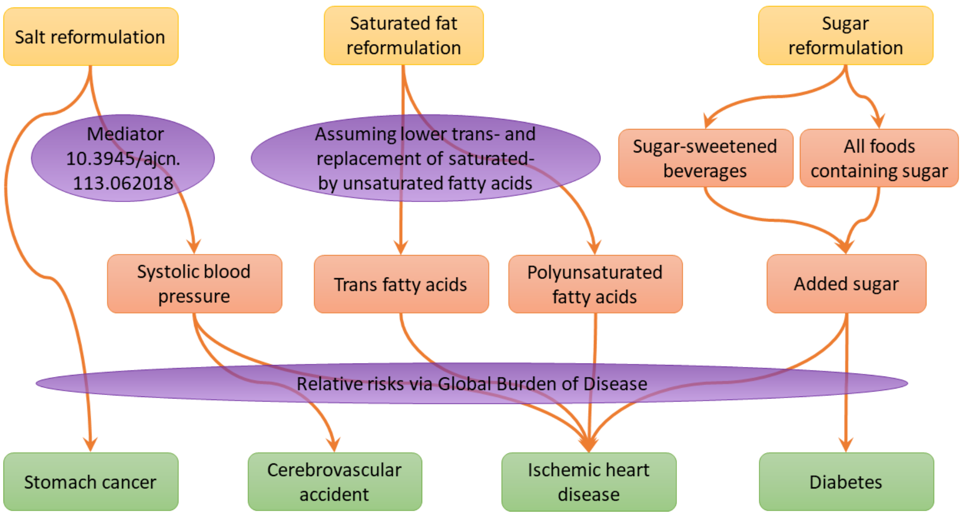
This analysis is used to estimate the public health impact of the reformulation initiatives on selected nutrients. It focuses on sodium (salt), saturated fatty acids (SFA), sugars. The analysis for sugars contains two alternatives, one focusing only on sugar-sweetened beverages (SSB) and the other including all added-sugar contents of foods. The analysis covers four countries: Denmark, France, Czechia and the Netherlands

Our approach for this task is structured into the following steps:

- Task 1 Development of scenarios;
- Task 2 Collection of suitable data on dietary (sodium, sugars, SSB, SFA) intake, food consumption and food composition;
- Task 3 Estimation of daily habitual dietary intake for the different scenarios for each nutrient;
- Task 4 Modelling of public health impact (using Dynamo-HIA); and
- Task 5 Reporting (this report)

Figure 58. Proposed schemes for the causal effect of reformulation of foods for salt (sodium), saturated fatty acids and added sugars (via sugar-sweetened beverages or for all foods containing added sugars) on the risk of chronic diseases.





In the scenarios of sodium and SFA, the focus is on food groups with a high contribution to the daily intake of the selected nutrients. Food coding of FoodEx2 is used to perform food categorisation for the scenarios. The scenarios for added sugars are modelled twice, once via the sugar content of sugar-sweetened beverages (SSB) and again via added sugars for all types of foods combined (see Figure 58).

A prerequisite to calculate public health impact is that the foods consumed are linked to disease risk, directly or indirectly, via the intake of nutrients, and that these risks can be quantified. For this, the study team relied on the evidence provided by Global Burden of Disease (GBD) (www.healthdata.org/gbd). The health conditions analysed are those for which relative risks are found in the GBD database (see the bottom of Figure 58).

5.2.1 Development of scenarios (task 1)

The scenarios were developed starting from the information from the Annexes as well as the information on the risk of chronic diseases from the GBD.

Food coding of FoodEx2 was used to perform food categorisation for the scenarios to be calculated as explained above.

Sodium

<u>From the Annex</u>

At the European level, a benchmark for overall sodium reduction of **a minimum of 16% in 4 years** (or 4% per year for taste adaptation) against the individual baseline levels in 2008 has been established, applicable to all food products as well as to food consumed in restaurants and catering facilities such as canteens.

To effectively reduce sodium intake, it is proposed to concentrate activities at a limited number of food categories. Twelve have been identified (Bread, Soups, Catering meals, Meat products, Breakfast cereals, Restaurant meals, Cheeses, Fish products, Sauces, condiments, spices, Ready meals, Crisps, savory snacks, Potato products) and European countries select at least 5 categories among them for their national plans. National benchmarks and plans could differ, e.g. if one focus food group is already very low in sodium then another category may be selected. It is suggested that priority is given to food categories that commonly represent major sources of sodium in average diets.

Most European countries prefer to work on the food categories: bread, meat products, cheeses and ready meals.

Association with chronic disease risk

From sodium intake, the relative risk for cerebrovascular accident (CVA) and ischemic heart disease (IHD) are modelled through its effects on systolic blood pressure, using previous experiences, while an effect on stomach cancer is directly available from the GBD database. Changes in sodium content were calculated according to the information described in Table 50. For all food groups not included in the scenarios, food contents and consumption are considered similar as in the reference situation.

Table 50. Scenarios for sodium via several food sources

	Start date	End date	Reference	Minimal impleme-ntation	Partial implemen-tation	Full implementation
Sodium	2008	2012	No reformulat-ion (sodium content +/- 2008)	Min. 16% In sodium content levels of: 1. Bread*	Min 16% In sodium content levels of: 1. Bread* 2. Meat products** 3. Cheese***	Min. 16% In sodium content levels of: 1. Bread* 2. Meat products** 3. Cheeses*** 4. Fish products 5. Breakfast cereals 6. Soups 7. Sauces 8. Crisps, savory snacks 9. Potato products 10. Ready meals, catering meals, restaurant meals If contribution of food group to intake is at least 3% Excl. condiments & spices

*Bread (contributes together with cereals 15-31% of sodium intake(13) and bread is most targeted food for reformulation(14))

**Meat products (together with fish and poultry 15-22%, meat is often targeted food for reformulation(14))

***Cheeses (dairy 7-16%) is often targeted food for reformulation(14))

Saturated fatty acids

From the Annex

It is proposed in the Annex to set a general benchmark for SFA reduction of a minimum of 5% in 4 years and a minimum of an additional 5% reduction by 2020 against the individual baseline levels at the end of 2012.

It is suggested that priority is given to food categories that commonly represent major sources of saturated fat in European diets.

For different food categories different benchmarks may be set.

According to the GBD, there are no direct effects of SFA on diseases. Direct effects are reported for trans fatty acids (TFA) and poly-unsaturated fatty acids (PUFA). An option for food reformulation is to reduce total fat contents of foods, such as dairy and cheese. This will reduce SFA as well as TFA as well as PUFA. Another option is to replace solid (high in SFA) by liquid fats (high in PUFA). In this case a reduction of SFA is likely to be offset by an increase in PUFA within a similar food e.g. a cake or a plant-based margarine instead of butter. It is assumed that SFA health outcomes are achieved via the reduction in TFA and/or PUFA intake and the replacement of SFA by PUFA.

To select food groups, the study team selected the foods contributing most to SFA intake (dairy (including cheese) (in the minimal, partial and full implementation scenario), sweet and savoury snacks (in the partial and full implementation scenario), fats and oils (in the full implementation scenario) and for the feasibility to change PUFA and TFA content via food reformulation (see supplement 1, crude analyses of contents available in the Dutch food composition table Nevo-online). Analyses included ready meals (sometimes mixed dishes, disaggregated into separate ingredients).

For the minimal implementation scenario. For dairy products (including cheese), it was assumed that the consumption of similar lower fat products leads to a decrease in the total amount of fat and consequently to a lower SFA, TFA and PUFA intake. This is the minimal implementation scenario: lower fat in dairy (incl cheese), -25% SFA, -25% TFA, -25% PUFA

In the partial implementation scenario, in addition to the lower fat in dairy (including cheese), an assumption was included for sweet and savoury snacks. A replacement of SFA with PUFA rich fats was assumed -25% SFA, -25% TFA, +40% PUFA.

In the full implementation scenario, assumptions were added for fats and oils, in addition to the ones for dairy and cheese and sweet and savoury snacks. For fats, oils, and margarines a replacement of SFA with PUFA rich fats was assumed: -40% SFA, -40% TFA, +40% PUFA.

Although meat is an important contributor to SFA intake, meat products group SFA, PUFA and TFA was considered similar compared with the reference. Within a certain meat category, companies do not specifically reformulate, and clearly label, for fatty acid like the lower fat options for dairy and cheese.

For all other food groups not included in the scenarios, food contents and consumption were considered similar as in the reference situation.

It was assumed that the reduction in one ingredient will not lead to higher levels of another ingredient (e.g. sugar, protein, alcohol), although energy content may change.

See Table 51 for the scenarios taken into account.

Table 51. Scenarios for saturated fatty acids via several food sources

	Start date	End date	Reference	Scen 1:Minimal implementation	Scen 2: Partial implementation	Scen 3: Full implementation
Saturated fatty acids	2011	2020	No reformulation (composition data +/- 2012),	Lower fat options for dairy. (including cheese) **1. Dairy and cheese products*** (lower fat options are also lower in TFA and PUFA), assumption -25% of intake via these foods	Lower fat options for dairy (including cheese) And replacement by (poly)unsaturated fats in snacks and sweets **1.Dairy and cheese products*** **2. Sweet and savory snacks, sweets **PUFA instead of SFA**	Lower fat options for dairy (including cheese) And replacement by (poly)unsaturated fats in snacks and sweets and fats, oils and margarines **1.Dairy and cheese products*** **2. Sweet and savory Snacks, sweets**** **3. Fats, oils and margarines (PUFA instead of SFA)** If contribution of the food group to intake is at least 3%

*Milk including dairy products contributes 18-30% of saturated fat intake(13)

** Snacks and sweets contribute 18-26% of saturated fat intake(13)

Added Sugars

From the Annex

It is proposed to set a general benchmark for added sugars **reduction of a minimum of 10% by 2020** in food products against the European country baseline levels at the end of 2015 or **to move towards 'best in class' levels.** These are the lowest levels identified in food products in the EU in the same category.

It is suggested that priority is given to food categories that commonly represent major sources of added sugars in European countries' diets, that have a high public health impact or that are recommended to be consumed. The scenarios to be calculated are in Table 52.

Added sugars values were not available in the food composition databases of the Netherlands and France. For these countries, total sugar (mono- and disaccharide) intake was first calculated for the Netherlands and France and assumed that added sugars content (from various food sources) was 50% of total sugars intake, except for SSB where 100% of added sugars was assumed. These assumptions rely on the reported daily intake of total sugar and added sugar in adults were used from (see in Table 53). For Denmark and Czechia data on added sugar was available. In the scenario’s, added sugars are just removed and not replaced by another energy-providing nutrient, so total energy intake will be reduced as well after reformulation.

Table 52. Scenarios for added sugars via sugar-sweetened beverages and total added sugar (several food sources)

	Start date	End date	Reference	Minimal implementation	Partial implementation	Full implementation
Sugar-sweetened Beverages scenario	2015	2020	**No reformulation** No change in consumption of SSB	10% reduced consumption (g/day) of SSB = -10% added sugar from SSB	20% reduced consumption (g/day) of SSB = -20% added sugar from SSB	40% reduced consumption (g/day) of SSB = -40% added sugar from SSB
Added sugar	2015	2020	**No reformulation** (sugar content +/- 2015)	Leave out -10%, added sugar	Leave out -20%, added sugar	Leave out -40%, added sugar

Table 53. Sugar intake in France and the Netherlands

		Total sugar (g/day)	Added sugars (g/day, % of total sugar)	Added sugars from soft drinks (g/day,% of total sugar)
Netherlands	Total	116.9	76 (65%)	est. 17 (14%)
	Men	125.5	83.9 (67%)	22 (17%)
	Women	108.3	68.2 (63%)	12 (11%)
France	Total	91.1	45.4 (50% of total sugar)	est 4.0 (4%)
	Men	97.9	49.6 (51% of total sugar)	5.0 (5%)
	Women	84.8	41.6 (49% of total sugar)	2.9 (3%)

Association with chronic disease risk

For **sugar-sweetened beverages** (SSB) relative risks data are available for modelling from the GBD.

For scenarios on added sugar (all foods, including SSBs) (see also Table 52), relative risk data for chronic disease risk are not available yet. The assessments for total (and added) sugar by EFSA are underway.

The effect on disease risk (IHD and diabetes) was modelled by changing the consumption of SSBs (with -10%, -20%, -40%) by using the relative risks from the GBD. It is likely that the risk for chronic disease is related to the sugars (or energy) content of the SSBs and is mediated by its effect on energy intake and BMI.

5.2.2 Collection of food consumption and food composition data (task 2)

Four European countries were selected with suitable nutrient (sodium, sugar and SFA via TFA and PUFA) intake data before or at the start of the implementation period of the annexes (2008-2015) (see in Table 53). Therefore, the baseline intake data were preferably from 2008 or as close to 2008 as possible. However, based on availability of dietary intake data the exact year may vary between countries. Via the data selection a balanced geographic coverage (south, east, north, west) of Europe was achieved.

From these data, the study team extracted the proportion of sugar, sodium and saturated fatty acid attributable to the foods that are subjected to the policies and interventions described in the three annexes of the EU Framework for national initiatives on selected nutrients.

Table 54. Food consumption data to be used in the EUREMO modelling task 1.3.

Country	Survey	Time period	Population age	N	N male, female
Netherlands	The National Diet and Nutrition Survey	2007-2010	18-69	2230	1114 male, 1116 female
Denmark	The Danish National Survey on Diet and Physical Activity	2005-2008	18-75	2025	932 male, 1093 female
Czechia	Czechia National Food Consumption Survey	2003-2004	18-90	1869	873 male, 996 female
France	Individual and National Study on Food Consumption 2	2006-2007	18-79	2624	1087 male, 1537 female.

5.2.3 Calculation of daily habitual dietary intake for the different scenarios for each nutrient (Task 3)

The study team calculated nutrients daily intakes for the baseline (reference) and the scenarios agreed in Task 1 (see also Figure 58). Food consumption was assessed for multiple days (2 to 7) over a 24hr period. These were measured either consecutively using a diet record (this is the case for Denmark and France) or non-consecutively distributed over several weeks using two replicates of 24-h recall (as applied in Czechia and the Netherlands). In this analysis, dietary intake from all available days were used. For intake calculations country specific food codes were used to link food composition to food consumption data, except for Denmark where the FoodEx2 coding was used.

Subsequently, the programme SPADE was used to extract their habitual nutrient exposure. This analysis assumes that daily exposure is a multilevel process where individuals have a habitual intake, determined by their sex and age, on top of which daily fluctuations occur. SPADE removes these daily fluctuations which results in an exposure distribution which is narrower than the original survey data.

Food coding of FoodEx2 was used to perform food categorisation for the scenarios to be calculated as explained earlier.

For sodium intake calculations, it is assumed that the quantity of sodium added during preparation and at the table does not change. When data are not provided, it is assumed that 0,72 gram sodium (1,8 gram salt VCP 2007-2010) is added for discretionary sodium intake in the reference as well as in the scenarios.

Mean energy intake in kilo calorie per day per country and sex were used to calculate the percentual contribution of SFA, PUFA, TFA and added sugars to total energy in each country. Fatty acids provide 9 kcal per gram and added sugars provide 4 kcal per gram.

5.2.4 Modelling of public health impact (Task 4)

To estimate the public health impact, a link was established between nutrient intake and health conditions. The health conditions analysed are those for which relative risks can be found in the GBD database. For sodium, this included stomach cancer, CVA and IHD (see the lower part of Figure 58). For added sugar, diabetes and IHD are included. And for SFA, the study team focused on the link with IHD via the changes in PUFA and TFA. All relative risks are reported in Table 55.

Given the habitual nutrient intake and the relative risks, the incidence and prevalence of the diseases could be calculated. In turn, this affects mortality and life expectancy. Life expectancy may be split into two parts; the years a person lives without any disability and the years, usually near the end of life, when a person lives with some form of disability. In general, a healthier lifestyle due to product reformulation leads to a higher life expectancy. The length of time with disability may decrease because of a later onset of disability, but it may also increase due to a later onset of death.

The public health impact of the different scenarios was quantified in terms of an individual's life expectancy at birth. This can easily be calculated under the assumption that the impact of the reformulation occurs instantaneously and that it affects a person's entire life. This removes the need to account for differing lengths of the intervention depending on age. Although a simplification, it likely will not change the final conclusion. In addition, it allows for an easier comparison between the four countries, removing some dependency on demography.

Life expectancy is expressed in the number of days gained compared with the reference scenario. This metric was chosen because it can be compared between countries, as it does not depend on the population size of a country. Estimated life expectancies for the three scenarios were compared with life expectancies as calculated for the reference scenario. The scenario leading to a higher gain in life expectancy will be the one delivering the highest public health benefits. Results are expressed as average per capita in a certain country. In those parts of the population that have high intakes effects on life expectancy gained is expected to be more pronounced,

Gains in life expectancy were calculated using the Dynamo HIA model (www.dynamo-hia.eu). DYNAMO-HIA is a software tool that quantifies the health impact of policies influencing health determinants. Dynamo-HIA models use partial micro-simulation to assess the effect of the risk-factor exposure over time in a population. Thus, in this case, it simulated the effect of exposure for a large number of persons, each having their own nutrient intake over life. DYNAMO-HIA requires that nutrient intake can be linked to disease incidence through a relative risk from the nutrient on disease.

Data on the related diseases, mortality and disability weights are required and is obtained from the Global Burden of Disease database as described. For added sugar in other foods than beverages, relative risks are not available from the GBD and results from an ongoing review of EFSA are not yet available. As a first analysis, the study team calculated only the health impact of added sugar in SSBs, available from GBD. As a sensitivity analysis, added sugars were included in other foods, assuming they have the same effect as those in SSBs. However, this is a rather strong assumption, and this should be considered when looking at those results. The relative risks are directly from GBD and do not include BMI (or overweight) extra as an intermediate, although some of the effects might be through reduced BMI.

The Dynamo HIA model is freely available for use. The availability of nutrient intake data (from food consumption and food composition data) varies by country. Data on disease prevalence, incidence and disease-related mortality and population size are downloaded from the GBD database.

Many input data, including the relative risks, contain error margins depicting uncertainty in their measurement. These could be included in sensitivity analyses, but doing so would not add much. The model is largely linear, so any change in the input will have an equivalent effect on the output. For example, if the relative risks were half the size, the number of days of gained life expectancy would be approximately half.

Table 55. Relative risk for associations between exposure (sodium, TFA and PUFA, added sugars via SSB and via all types of foods) and outcome mortality of chronic diseases, example at age of 65.

	Relative risk per dosage at age 65			
	Stomach cancer	**CVA**	**IHD**	**Diabetes**
Sodium	1.206 per gram sodium	1.102 - 1.124 per gram sodium	1.103 - 1.125 per gram sodium	
TFA			1.037 - 1.046 per gram TFA	
PUFA			0.994 per gram PUFA	
Added sugar from SSB (and all types of foods, for sensitivity analysis)			1.124 per gram sugar	1.141 per gram sugar

5.3 General results

Table 56 shows the mean energy intake in kilocalorie per day by country and sex. People in Czechia have the highest mean kilocalorie intake per day and people in France the lowest amount, compared to the other countries, with a mean kilocalorie intake of 2,512 and 1,945, respectively. This difference is also seen when stratified by sex. In all participating counties, males have a higher energy intake compared to females.

Table 56. Mean energy intake kcal/day per country and sex

	Netherlands	**Denmark**	**Czechia**	**France**
Both	2,299	2,168	2,512	1,945
Male	2,645	2,487	3,085	2,280
Female	1,954	1,897	2,011	1,709

5.4 Average consumption per FoodEx2 group and nutrient content

This paragraph describes the input data for consumption and composition as provided by the countries databases. This data was used to calculate dietary intakes and life expectancy changes.

5.4.1 Sodium

For each country, the average daily consumption per FoodEx2 group and sodium content per 100g, is show in Table 57.

Sodium content per FoodEx2 group per 100 grams differs by country. 'Soups (dry mixture uncooked)' have the highest sodium content per 100 grams with 5.6 grams, however this product is only coded in the data in Czechia, while other countries code Soup (ready to eat). While 'Sausages, 'Preserved fat tissues' and 'Fish and seafood processed', contain the most sodium per 100 gram in the Netherlands, France and Denmark, respectively.

Because the consumption of 'Leavened bread and similar' is the highest in all countries and sodium content per 100 grams is relatively high, this group contributes most to the sodium intake for the four countries.

Table 57. Average consumption per FoodEx2 group per day (g) and sodium content per 100g for each country

	Consumption per day (g)				Sodium content per 100g			
Foodex2 group	**NL**	**DK**	**CZ**	**FR**	**NL**	**DK**	**CZ**	**FR**
Leavened bread and similar	132.4	145.9	147.3	95.5	0.5	0.5	0.5	0.7
Processed and mixed breakfast cereals	1.8	3.1	1.3	1.8	0.3	0.7	0.9	0,3
Processed whole meat products	19.2	12.3	13.8	12.3	0.9	1.4	1.1	0.9
Preserved fat tissues	0.0	0.0	1.0	1.0	n.a.	n.a.	1.0	1.6
Sausages	11.0	13.0	54.2	13.5	1.0	1.3	1.0	1.0
Meat specialties	1.9	7.7	4.5	1.9	0.8	0.8	1.0	0.5
Canned-tinned meat	0.9	0.0	0.9	0.0	0.8	n.a.	1.1	n.a.
Fish and seafood processed	8.1	0.4	5.0	8.3	0.6	1.5	0.3	0.6
Cheese	42.1	35.9	30.2	43.9	0.7	0.8	0.8	0.4
Soups (dry mixture uncooked)	0.0	0.0	1.0	0.0	n.a.	n.a.	5.6	n.a.
Soups (ready-to-eat)	57.7	1.6	0.4	85.8	0.3	0.3	1.1	0.2
Fried or extruded cereal or root-based	7.7	2.5	4.5	0.8	0.7	0.6	0.0	0.8
Savoury sauces	15.9	7.8	7.3	6.3	0.8	0.7	0.8	0.7
Salad dressing	1.9	0.5	0.1	6.2	0.7	0.7	0.5	1.0

Foodex2 group	Consumption per day (g)				Sodium content per 100g			
	NL	DK	CZ	FR	NL	DK	CZ	FR
Finger food	0.0	0.0	0.0	4.5	n.a.	n.a.	n.a.	0.6

5.4.2 Saturated Fatty Acids

Table 58 and Table 59 shows the average daily consumption and food composition data per FoodEx2 group, for each country for SFA as well as for TFA and PUFA.

SFA content per FoodEx2 group per 100 grams differs by country. 'Animal and vegetable fats and oils and primary derivatives thereof' have the highest SFA content per 100 grams in all countries. The same is seen for PUFA and TFA content per 100 grams.

When combining consumption per day and SFA, PUFA and TFA content per 100 grams, Milk and dairy products contribute largely to the intake of the fatty acids.

Table 58. Average consumption per FoodEx2 group per day (g) and SFA content per 100g from food composition tables in each country

Foodex2 group	Consumption per day (g)				SFA content per 100g			
	NL	DK	CZ	FR	NL	DK	CZ	FR
Fine bakery wares	50.5	9.4	41.6	56.0	6.4	8.4	7.1	8.8
Milk and dairy products	358.6	369.7	166.3	207.5	3.0	2.7	3.9	3.9
Confectionery including chocolate	17.1	18.6	3.9	6.2	9.0	9.2	15.4	12.4
Animal and vegetable fats and oils and primary derivatives thereof	26.8	30.3	40.4	23.2	18.0	36.0	31.4	30.6
Fried or extruded cereal or root-based products	7.7	2.5	4.5	0.8	6.1	13.6	0.6	8.8
Finger food	n.a.	n.a.	n.a.	4.5	n.a.	n.a.	n.a.	7.4
Meat and meat products	114.3	109.3	145.9	103.3	5.6	5.1	6.6	4.6

Table 59. Average consumption per FoodEx2 group per day (g) and PUFA and TFA content per 100g from food composition tables in each country

Foodex2 group	Consumption per day (g)				PUFA content per 100g				TFA content per 100g			
	NL	DK	CZ	FR	NL	DK	CZ	FR	NL	DK	CZ	FR
Fine bakery wares	50.5	9.4	41.6	56.0	1.6	4.0	2.9	1.5	0.67	0.09	0.68	0.52
Milk and dairy products	358.6	369.7	166.3	207.5	0.2	0.1	0.2	0.2	0.14	0.19	0.36	0.32
Confectionery including chocolate	17.1	18.6	3.9	6.2	1.9	0.7	1.2	1.9	0.05	0.06	0.17	0.21
Animal and vegetable fats and oils and primary derivatives thereof	26.8	30.3	40.4	23.2	21.6	13.4	21.0	15.4	0.91	1.52	1.93	1.66
Fried or extruded cereal or root-based products	7.7	2.5	4.5	0.8	5.0	3.0	2.3	3.6	0.09	0.00	0.01	0.08
Finger food	n.a.	n.a.	n.a.	4.5	n.a.	n.a.	n.a.	2.0	n.a.	n.a.	n.a.	0.78
Meat and meat products	114.3	109.3	145.9	103.3	1.6	1.3	2.2	1.3	0.18	0.10	0.14	0.25

5.4.3 Sugars (via sugar-sweetened beverages)

Reduction of sugar intake is achieved via sugar-sweetened beverages. Table 60 shows the average daily consumption per FoodEx2 group and added sugar content per 100g, per country. People in the Netherlands consume the highest amount (306 grams pp per day) of 'Water based beverages' per day and people in France consume the lowest quantity (55 grams pp per day).

Added sugar content of water-based beverages per 100 grams vary as well. On the FoodEx2 group level, sugar contents of water-based beverages in Czechia are 35% higher than in the Netherlands.

When combining consumption per day and added sugar content per 100 grams, "Water based beverages" (for example soft drinks) contribute largely to added sugar intake.

Table 60. Average consumption per FoodEx2 group per day (g) and added sugar content per 100g for each country

	Consumption per day (g)				Sugar content per 100g			
Foodex2 group	**NL**	**DK**	**CZ**	**FR**	**NL**	**DK**	**CZ**	**FR**
Water based beverages	305.9	140.7	100.9	55.2	6.9	7.2	9.3	8.4
Beverages concentrates	18.5	12.2	1.6	7.7	12.6	31.2	65.9	15.5
Fruit nectars (min. 25-50% fruit as defined in EU legislation)	6.2	0.0	0.0	1.7	12.7	n.a.	n.a.	11.1

5.5 Nutrient intake per scenario

5.5.1 Sodium

Table 61 shows the median daily sodium intake for the reference situation and after minimal, partial or full implementation of the scenarios, per country. The difference between the full implementation the reference scenario is comparable between the Netherlands and Czechia and between Denmark and France, for the total population. At the median the difference is between 0.2 and 0.3 gram of sodium per day (0.5-0.75 g salt per day). At median intake, in all scenarios including the full implementation, sodium intake exceeds the recommended WHO intake of max 2 gram per day. In the minimal and partial implementation scenario, differences with the reference are less pronounced as expected.

Sodium intakes are higher in the men than in women in all countries. The difference between the full implementation and the reference scenario also differs by sex. The median the difference between full implementation compared to the reference, is (0.1-0.2 g sodium per person per day) larger for men than for women in each country (Table 62).

Table 61. Daily total sodium intake (g/day) (median (P50) and interquartile range of P25-P75) for each scenario, for the total population

	NL			DK			CZ			FR		
	p25	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**
Reference	2.6	3.3	4.2	3.0	3.8	4.9	4.1	5.5	7.2	2.4	3.2	4.1
Minimal	2.5	3.2	4.0	2.9	3.7	4.8	4.0	5.4	7.1	2.3	3.1	4.0
Partial	2.4	3.1	3.9	2.8	3.6	4.6	4.0	5.3	6.9	2.3	3.0	3.9
Full	2.4	3.0	3.8	2.8	3.6	4.6	3.9	5.3	6.8	2.3	3.0	3.8
Difference (full vs. reference)	-0.2	-0.3	-0.4	-0.2	-0.2	-0.3	-0.2	-0.3	-0.4	-0.1	-0.2	-0.3

*incl. 0.71 g/day discretionary sodium

Table 62. Daily total sodium intake (g/day) (median (P50) and interquartile range of P25-P75) for each scenario* by sex.

	NL						DK						CZ						FR					
	men			women			men			women			men			women			men			women		
	p25	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**
Reference	2.9	3.7	4.6	2.3	3.0	3.6	3.4	4.4	5.6	2.8	3.4	4.3	5.4	6.8	8.5	3.6	4.6	5.8	2.8	3.7	4.7	2.2	2.9	3.7
Minimal	2.8	3.6	4.4	2.3	2.9	3.5	3.3	4.3	5.4	2.7	3.3	4.1	5.3	6.6	8.3	3.5	4.5	5.7	2.7	3.5	4.5	2.2	2.8	3.6
Partial	2.8	3.5	4.3	2.2	2.8	3.4	3.2	4.1	5.3	2.6	3.2	4.0	5.1	6.4	8.0	3.4	4.5	5.6	2.7	3.5	4.4	2.1	2.8	3.5
Full	2.7	3.4	4.2	2.2	2.7	3.4	3.2	4.1	5.2	2.6	3.2	4.0	5.1	6.4	8.0	3.4	4.4	5.5	2.6	3.4	4.3	2.1	2.7	3.4
Difference (full vs. reference)	-0.2	-0.3	-0.4	-0.2	-0.2	-0.3	-0.2	-0.3	-0.4	-0.2	-0.2	-0.3	-0.3	-0.4	-0.5	-0.2	-0.2	-0.3	-0.2	-0.3	-0.4	-0.1	-0.2	-0.3

*incl. 0.71 g/day discretionary sodium

5.5.2 Saturated Fatty Acids

Table 63 shows the median daily SFA intake for the reference and after minimal, partial or full implementation of the scenario, per country.

The reference SFA intake in Czechia is 37 g/day in Denmark, France and the Netherlands 29-30 gram per day. The percentage of energy from SFA was 1.8-4.1% higher than 10 percent of energy (as recommended by WHO) in each country. In the minimal implementation compared to the reference situation fat content was reduced by about 1% in each country. For the partial implementation scenario, a reduction of -2% was seen in Czechia and -1% for the other countries. In the full implementation scenario, a reduction of -3% was seen in France and Denmark and a reduction of -2% for the other two countries.

It was assumed that energy intake remained the same after reformulation. In the full implementation scenario, the percentage of energy from SFA was lower than 10 percent of energy for the Netherlands and France.

SFA intakes are higher in the men than in women in all countries. The difference between the full implementation and the reference scenario also differs by sex. The median the difference between full implementation compared to the reference, is larger for men than for women in each country (Table 64).

Table 65 shows the median daily PUFA intake for the reference and after minimal, partial or full implementation of the scenario, per country. The reference PUFA intake is highest in Czechia and the Netherlands, 16.2 and 14.9 g/day respectively, both corresponding to 5.8% of energy. Also, the difference between the full implementation of the scenario and the reference situation is higher for Czechia and the Netherlands (3.7 and 2.6 g/day or 1.3% and 1.1% of energy) compared to the other two countries, 1.3 (Denmark) and 1.6 g/day (France), corresponding to a 0.6% energy reduction for both countries. The reference intake is higher for men than for women in each country (Table 66). The difference in PUFA intake between the full implementation compared to the reference situation, is larger for men than for women, although less pronounced in Denmark and France.

The median daily TFA intake for the reference situation and after minimal, partial or full implementation of the scenario, per country is shown in Table 67. The reference TFA intake is highest in Czechia, 2.68 g/day (or 21.6 kcal/day or 1.0 percent of energy) and lowest in Denmark (1.07 gram per day or 0.4 percent of energy) and the Netherlands (1.14 gram per day or 0.4 percent of energy). At a 2,512 kcal diet, Czechia (1.0 percent of energy from TFA) matches the WHO recommendation of max 1 percent of energy from TFA. Other countries had TFA intakes below, in line with EFSA's recommendation to achieve as low contents as possible.

In the minimal implementation compared to the reference situation TFA content was reduced by 0.1% in Chechia and Demark but did not change in the other two countries. For the partial implementation scenario, no further change was seen. In the full implementation scenario, a reduction of -0.2% was seen in France and Chechia and a reduction of -0.1% was seen for the other two countries.

The difference between the full implementation of the scenario and the reference situation is largest for Czechia (-0.49 g/day), lowest for the Netherlands, -0.27 g/day. The difference between the full scenario implementation compared to the reference situation (Table 68), is larger for men than for women in the Netherlands and France. The difference is comparable for the other two countries.

Table 63. Daily SFA intake (g/day) (median (P50) (% of Energy (E%)) and interquartile range of P25-P75) for each scenario, for the total population.

	NL			DK			CZ			FR		
	p25	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**
Reference	21.5	30.2 (11.8E%)	42.3	20.0	29.2 (12.1E%)	42.1	22.0	37.2 (13.3E%)	46.8	20.4	30.4 (14.1E%)	42.5
Minimal	19.7	27.8 (10.9E%)	38.6	18.1	27.0 (11.2E%)	39.0	20.0	33.6 (12.0E%)	44.9	19.2	28.4 (13.1E%)	40.0
Partial	18.9	26.7 (10.5E%)	36.9	17.9	26.3 (10.9E%)	38.1	19.3	32.5 (11.6E%)	43.3	18.5	27.2 (12.6E%)	38.0
Full	17.2	24.0 (9.4E%)	33.4	15.6	22.3 (9.3E%)	31.8	18.7	31.4 (11.3%)	36.3	16.2	23.7 (11.0E%)	33.1
Difference (full vs. reference)	-4.3	-6.2 (-2.4E%)	-8.9	-4.4	-6.9 (-2.8E%)	-10.3	-3.3	-5.8 (-2.0E%)	-10.5	-4.2	-6.6 (-3.1E%)	-9.4

% The percentage of energy from SFA.

Table 64. Daily SFA intake (g/day) (median (P50) and interquartile range of P25-P75) for each scenario* by sex.

	NL						**DK**						**CZ**						**FR**					
	men			women			men			women			men			women			men			women		
	p25	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**P75**
Reference	25.4	35.0	47.1	18.3	26.1	36.0	24	35.4	50	17.9	25.7	35.2	28.7	40.2	54	19	27.7	38.9	24.2	35.0	48.4	18.5	27.4	38.2
Minimal	23.7	32.2	43.6	16.7	23.8	33.2	22.2	32.6	47	16.3	23.5	32.3	27.6	38.7	52.4	17.9	26.1	36.9	22.7	32.8	45.4	17.3	25.6	35.9
Partial	22.8	31.0	41.5	16.0	22.9	31.2	21.9	31.9	45.9	15.9	22.9	31.7	27.0	38.0	51.3	17.3	25.2	36	21.9	31.5	43.1	16.7	24.5	34.1
Full	20.8	28.0	37.6	14.7	20.8	28.3	18.9	27.1	37.4	13.9	19.5	26.5	23.0	32.3	43.0	14.5	21	29.3	19.4	27.9	38	14.6	21.2	29.4
Difference (full vs. reference)	-4.6	-7.0	-9.5	-3.6	-5.3	-7.7	-5.1	-8.3	-12.6	-4	-6.2	-8.7	-5.7	-7.9	-11	-4.5	-6.7	-9.6	-4.8	-7.1	-10.4	-3.9	-6.2	-8.8

Table 65. Daily PUFA intake (g/day) (median (P50 (% of Energy (E%))) and interquartile range of P25-P75) for each scenario. for the total population.

	NL			DK			CZ			FR		
	p25	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**
Reference	9.8	14.9(5.8E%)	22.3	7.7	11.0(4.6E%)	15.4	10.5	16.2(5.8E%)	23.4	6.3	10.1(4.7E%)	15.6
Minimal	9.9	15.0(5.9E%)	22.4	7.8	11.0(4.6E%)	15.5	10.6	16.2(5.8E%)	23.5	6.4	10.2(4.7E%)	15.7
Partial	10.3	15.7(6.1E%)	23.2	7.8	11.2(4.6E%)	15.9	10.8	16.7(6.0E%)	24.1	6.6	10.6(4.9E%)	16.3
Full	11.4	17.5(6.9E%)	26.2	8.6	12.6(5.2E%)	18.0	12.6	19.9(7.1E%)	28.5	7.0	11.4(5.3E%)	18.0
Difference (full vs. reference)	1.6	2.6(-1.1E%)	4.0	0.9	1.6(0.6E%)	2.6	2.1	3.7(1.3E%)	5.2	0.8	1.3(0.6E%)	2.5

% The percentage of energy from PUFA.

Table 66. Daily PUFA intake (g/day) (median (P50) and interquartile range of P25-P75) for each scenario* by sex.

	NL						DK						CZ						FR					
	men			women			men			women			men			women			men			women		
	p25	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**P75**
Reference	12.1	17.8	26.1	8.3	12.4	18.2	9.1	13.0	17.9	6.8	9.6	13.1	14.0	19.7	27.2	8.6	13.2	19.5	7.2	11.2	16.8	5.7	9.2	14.5
Minimal	12.2	18.1	26.2	8.4	12.5	18.3	9.2	13.1	18.1	6.9	9.7	13.2	14.1	19.8	27.3	8.7	13.3	19.7	7.3	11.3	17.0	5.8	9.3	14.7
Partial	12.6	18.7	27.2	8.8	13.1	19.1	9.3	13.3	18.4	7.0	9.8	13.5	14.3	20.3	27.9	8.9	13.6	20.2	7.6	11.8	17.6	6.0	9.8	15.1

	NL						DK						CZ						FR					
	men			women			men			women			men			women			men			women		
	p25	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**P75**
Full	14.1	21.0	30.9	9.7	14.5	21.4	10.3	14.9	21.1	7.6	11.0	15.1	16.3	23.7	33.1	10.4	16.1	24.6	8.1	12.7	19.3	6.4	10.6	17.0
Difference (full vs. reference)	2.0	3.2	4.8	1.4	2.1	3.2	1.1	1.9	3.1	0.8	1.4	2.1	2.4	4.0	5.9	1.7	2.9	5.1	0.9	1.4	2.5	0.7	1.3	2.4

Table 67. Daily TFA intake (g/day) (median (P50 (% of Energy (E%)) and interquartile range of P25-P75) for each scenario. for the total population.

	NL			DK			CZ			FR		
	p25	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**
Reference	0.68	1.14(0.4E%)	1.87	0.65	1.07(0.4E%)	1.70	1.87	2.68(1.0E%)	3.72	1.17	1.89(0.9E%)	2.81
Minimal	0.61	1.03(0.4E%)	1.70	0.53	0.91(0.4E%)	1.49	1.78	2.54(0.9E%)	3.51	1.07	1.73(0.8E%)	2.60
Partial	0.59	0.99(0.4E%)	1.62	0.53	0.91(0.4E%)	1.48	1.76	2.49(0.9E%)	3.43	1.03	1.66(0.8E%)	2.48
Full	0.53	0.87(0.3E%)	1.44	0.48	0.78(0.3E%)	1.23	1.54	2.19(0.8E%)	2.96	0.92	1.46(0.7E%)	2.20
Difference (full vs. reference)	-0.15	-0.27(-0.1E%)	-0.43	-0.17	-0.29(-0.1E%)	-0.47	-0.33	-0.49(-0.2E%)	-0.76	-0.25	-0.43(-0.2E%)	-0.61

% The percentage of energy from TFA.

Table 68. Daily TFA intake (g/day) (median (P50) and interquartile range of P25-P75) for each scenario* by sex.

	NL						DK						CZ						FR					
	men			women			men			women			men			women			men			women		
	p25	**p50**	**p75**	**p25**	**P50**	**P75**	**p25**	**p50**	**p75**	**p25**	**P50**	**P75**	**p25**	**p50**	**p75**	**p25**	**P50**	**P75**	**p25**	**p50**	**p75**	**p25**	**P50**	**P75**
Reference	0.81	1.31	2.07	0.59	1.00	1.65	0.75	1.23	2.05	0.58	0.96	1.47	2.17	3.03	4.11	1.68	2.40	3.30	1.36	2.18	3.21	1.07	1.71	2.52
Minimal	0.72	1.17	1.88	0.53	0.89	1.50	0.63	1.06	1.79	0.48	0.80	1.28	2.06	2.86	3.91	1.59	2.29	3.12	1.25	1.99	2.96	0.98	1.57	2.33
Partial	0.71	1.15	1.80	0.52	0.86	1.42	0.62	1.05	1.79	0.48	0.80	1.27	2.04	2.79	3.81	1.57	2.22	3.03	1.21	1.92	2.83	0.95	1.51	2.22
Full	0.62	1.01	1.60	0.46	0.76	1.29	0.55	0.91	1.45	0.43	0.70	1.05	1.80	2.48	3.29	1.39	1.95	2.64	1.07	1.71	2.52	0.83	1.32	1.96

	NL						**DK**						**CZ**						**FR**					
	men			women			men			women			men			women			men			women		
	p25	**p50**	**p75**	**p25**	**P50**	**P75**	**p25**	**p50**	**p75**	**p25**	**P50**	**P75**	**p25**	**p50**	**p75**	**p25**	**P50**	**P75**	**p25**	**p50**	**p75**	**p25**	**P50**	**P75**
Difference (full vs. reference)	-0.19	-0.30	-0.47	-0.13	-0.24	-0.36	-0.20	-0.32	-0.60	-0.15	-0.26	-0.42	-0.37	-0.55	-0.82	-0.29	-0.45	-0.66	-0.29	-0.47	-0.69	-0.24	-0.39	-0.56

5.5.3 Sugar

5.5.3.1 Sugar-sweetened beverages

Table 69 shows the mean daily added sugar intake via SSB for the reference situation and after minimal, partial or full implementation of the scenarios, per country. Since SSB are not consumed regularly on a daily basis by the total population, the habitual median consumption is zero, therefore the mean is shown.

The intake of sugar via SSB in reference scenario is highest in the Netherlands (24.2 g/day or 4.2 percent of energy) and lowest for France (6.0 g/day or 1.2 percent of energy). In addition, the difference in sugar intake via SSB between the full implementation of the scenario and the reference situation is highest in the Netherlands and lowest in France.

The difference in added sugar intake via SSB between a full implementation compared to the reference situation is larger for men than for women (Table 70). The difference is the highest for the Dutch men and women.

5.5.3.2 Total added sugar

Table 71 shows the median daily total added sugar intake (through all foods, including SSBs). For the Netherlands and France this is calculated via total sugar intake. Added sugar in the reference scenario is the highest in the Netherlands (59.1 g/day or 10.3 percent of energy) and around 37 gram per day (or 7 percent of energy) for the other countries. Added sugar intake in the Netherlands is higher than the maximum intakes of 10 percent of energy as recommended by WHO. In the other countries added sugar intakes are below this recommended value.

Also, the difference between the full implementation and the reference scenario is larger in the Netherlands (23.6 g/day) and around 15 g/day the other three countries.

The median reference intake is larger for men than for women in each country (Table 72). The difference in added sugar intake between a full implementation compared to the reference scenario is larger for men than for women. The difference is the largest for the Dutch men and women and roughly similar for the other countries by sex.

Table 69. Mean daily added sugar (g/day) via SBB consumption for each scenario*. E%=percent of Energy

	NL	DK	CZ	FR	NL	DK	CZ	FR
	mean	mean	mean	mean	meanE%	meanE%	meanE%	meanE%
Reference	24.2	13.9	10.5	6.0	4.2	2.6	1.7	1.2
Minimal	21.8	12.5	9.4	5.4	3.8	2.3	1.5	1.1
Partial	19.4	11.1	8.4	4.8	3.4	2.0	1.3	1.0
Full	14.5	8.3	6.3	3.6	2.5	1.5	1.0	0.7
Difference (full vs. reference)	-9.7	-5.6	-4.2	-2.4	-1.7	-1.0	-0.7	-0.5

Table 70. Mean daily added (g/day) sugar via SBB consumption for each scenario*.

	NL		DK		CZ		FR	
	mean		mean		mean		mean	
	men	women	men	women	men	women	men	women
Reference	29.7	18.7	15.9	12.1	13.2	8.1	8.1	4.6
Minimal	26.7	16.9	14.3	10.9	11.9	7.3	7.3	4.1
Partial	23.8	15.0	12.7	9.7	10.6	6.5	6.5	3.7
Full	17.8	11.2	9.6	7.3	7.9	4.8	4.9	2.7
Difference (full vs. reference)	-11.9	-7.5	-6.3	-4.8	-5.3	-3.3	-3.2	-1.9

Table 71. Daily added sugar intake (g/day) (median (P50 (% of Energy (E%)) and interquartile range of P25-P75) for each scenario, for the total population. weighed

	NL			DK			CZ			FR		
	p25	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**	**p25**	**p50**	**p75**
Reference	38.2	59.1 (10.3E%)	89.7	16.6	37.4 (6.9E%)	66.3	13.3	33.2 (5.3E%)	60.4	26.4	40.3 (8.3E%)	58.1
Minimal	34.3	53.2 (9.3E%)	80.8	15.0	33.7 (6.2E%)	59.7	12.0	29.9 (4.8E%)	54.4	23.8	36.3 (7.5E%)	52.3
Partial	30.5	47.3 (8.2E%)	71.8	13.3	29.9 (5.5E%)	53.1	10.6	26.6 (4.2E%)	48.4	21.2	32.3 (6.6E%)	46.5
Full	22.9	35.5 (6.2E%)	53.8	10.0	22.4 (4.1E%)	39.8	8.0	19.9 (3.2E%)	36.3	15.9	24.2 (5.0E%)	34.9
Difference (full vs. reference)	-15.3	-23.6 (-4.1E%)	-35.9	-6.6	-15.0 (-2.8E%)	-26.5	-5.3	-13.3 (-2.1E%)	-24.1	-10.5	-16.1 (-3.3)	-23.2

% The percentage of energy from added sugar.

Table 72. Daily added sugar intake (g/day) (median (P50) and interquartile range of P25-P75) for each scenario* by sex.

	NL						**DK**						**CZ**						**FR**					
	men			women			men			women			men			women			men			women		
	p25	**p50**	**p75**	**p25**	**p50**	**P75**	**p25**	**p50**	**P75**	**p25**	**p50**	**P75**	**p25**	**p50**	**P75**	**p25**	**p50**	**P75**	**p25**	**p50**	**P75**	**p25**	**p50**	**P75**
Reference	41.2	67.1	102.8	35.7	53.1	78.3	17.4	39.6	71.0	15.9	35.1	61.8	15.0	35.3	67.4	11.5	30.7	56.7	27.1	43.2	64.1	26.1	38.7	54.7
Minimal	37.1	60.4	92.5	32.1	47.8	70.5	15.7	35.7	63.9	14.3	31.6	55.6	13.5	31.8	60.6	10.3	27.7	51.1	24.4	38.9	57.7	23.5	34.9	49.2
Partial	33.0	53.6	82.3	28.6	42.4	62.6	14.0	31.7	56.8	12.7	28.1	49.4	12.0	28.3	53.9	9.2	24.6	45.4	21.7	34.6	51.3	20.9	31.0	43.8
Full	24.7	40.2	61.7	21.4	31.8	47.0	10.5	23.8	42.6	9.6	21.0	37.1	9.0	21.2	40.4	6.9	18.4	34.0	16.2	25.9	38.4	15.7	23.2	32.8
Difference (full vs. reference)	-16.5	-26.9	-41.1	-14.3	-21.3	-31.3	-6.9	-15.8	-28.4	-6.3	-14.1	-24.7	-6	-14.1	-27	-4.6	-12.3	-22.7	-10.9	-17.3	-25.7	-10.4	-15.5	-21.9

5.6 Total life expectancy

5.6.1 General

The average life expectancy in 2008 varies between 77.7 years (Czechia) and with 81.3 yr (France) (Table 73). Women have on average a higher life expectancy in all countries compared to men.

Table 73. Life expectancy at birth, total and with(out) disability in years per person per country.

	Reference age			With disability			Without disability		
	Total	Men	women	Total	Men	Women	Total	Men	Women
Netherlands	80.3	78.1	82.4	11.2	10.1	12.3	69.1	68.0	70.1
Denmark	78.9	76.7	81.0	10.8	9.8	11.7	68.1	66.9	69.3
Czechia	77.7	74.5	80.9	11.3	10.6	12.0	66.4	63.9	68.9
France	81.3	77.9	84.6	10.8	9.5	12.1	70.5	68.4	72.5

5.6.2 Salt reformulation scenarios

Table 74 shows the estimated effect in total life expectancy gained at birth in days after minimal, partial or full implementation of the sodium reformulation scenarios. The average total life expectancy gained for the full implementation for salt reformulation scenario's is between 12.8 days in France and 18.1 days in Czechia. The life expectancy gained increases with the different gradients of implementation. Only in Czechia, women's total life expectancy gained is equal or more compared to men. For the three other countries, men gained more in total life expectancy. The majority (76-87%) of the days of life expectancy gained is without disabilities.

Table 74. Estimated effect in total life expectancy gained and life expectancy (LE) without disability gained, in days after partial, minimal or full implementation of the EU reformulation initiative for sodium.

	NL			**DK**			**CZ**			**FR**		
	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total LE												
Minimal	7.7	9.5	5.8	6.1	7.7	4.5	8.2	8.2	8.2	5.3	7.1	3.4
Partial	12.7	15.5	9.8	12.5	16.3	8.7	16.8	16.7	16.9	9.3	12.3	6.3
Full	15.9	19.3	12.4	13.9	18.0	9.8	18.1	17.8	18.4	12.8	16.3	9.3
LE without disability												
Minimal	6.4 (83%)	4.8	8.0	5.1 (84%)	6.5	3.7	6.3 (77%)	6.3	6.3	4.4 (83%)	6.0	2.8
Partial	10.6 (83%)	8.1	13.1	10.5 (84%)	13.8	7.2	12.8 (76%)	12.7	12.9	7.8 (84%)	10.4	5.2
Full	13.3 (84%)	10.3	16.2	11.6 (83%)	15.2	8.0	13.8 (76%)	13.5	14.1	10.8 (84%)	13.9	7.7

% life expectancy gained without disabilities

5.6.3 TFA and PUFA reformulation

Sugar reformulation

The estimated total life expectancy gained after partial, minimal or full implementation of the EU reformulation initiative for added sugar via SBB (Table 75) or other sugar containing foods (Table 76) is shown.

The total life expectancy gained in the full implementation compared with the reference scenario for SSB varies from 3.7 days in France to 6.5 days the Netherlands (Table 75). In the minimal and partial implementation scenario the days gained are proportional to the level of the intervention.

In all countries, men gain more life expectancy compared to women. The life expectancy gained is all without disability. A small part from the life expectancy with disability is replaced by life expectancy without disability (up to 1 day). This is because added sugar has a strong effect on diabetes, a disease which does not have a high mortality rate, but is associated with disability.

For total added sugar, the life expectancy gain by the full implementation scenario varies from 12-13 days in France and Denmark to 17 days in the Netherlands and Czechia (Table 76). In all countries men gain more life expectancy compared to women.

Table 75. Estimated effect in total life expectancy gained and life expectancy (LE) without disability gained and life expectancy without disability gained, in days after partial, minimal or full implementation of the EU reformulation initiative for added sugar via SSB.

	NL			**DK**			**CZ**			**FR**		
	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total LE												
Minimal	1.3	1.6	0.9	1.3	1.6	1.0	1.1	1.7	0.4	0.8	1.2	0.4
Partial	2.7	3.6	1.8	2.7	3.3	2.1	2.3	3.6	0.9	1.7	2.5	0.9
Full	6.5	8.9	4.0	5.9	7.2	4.5	4.9	7.8	1.9	3.7	5.5	1.9
LE without disability												
Minimal	1.4 (108%)	1.8	1.0	1.6 (123%)	1.9	1.2	1.2 (109%)	1.8	0.5	0.9 (113%)	1.3	0.5
Partial	3.1 (115%)	4.0	2.2	3.3 (122%)	3.9	2.6	2.4 (104%)	3.8	1.0	1.9 (112%)	2.7	1.0
Full	7.3 (112%)	9.8	4.8	6.9 (117%)	8.4	5.4	5.2 (106%)	8.2	2.1	3.9 (105%)	5.7	2.0

% life expectancy gained without disabilities

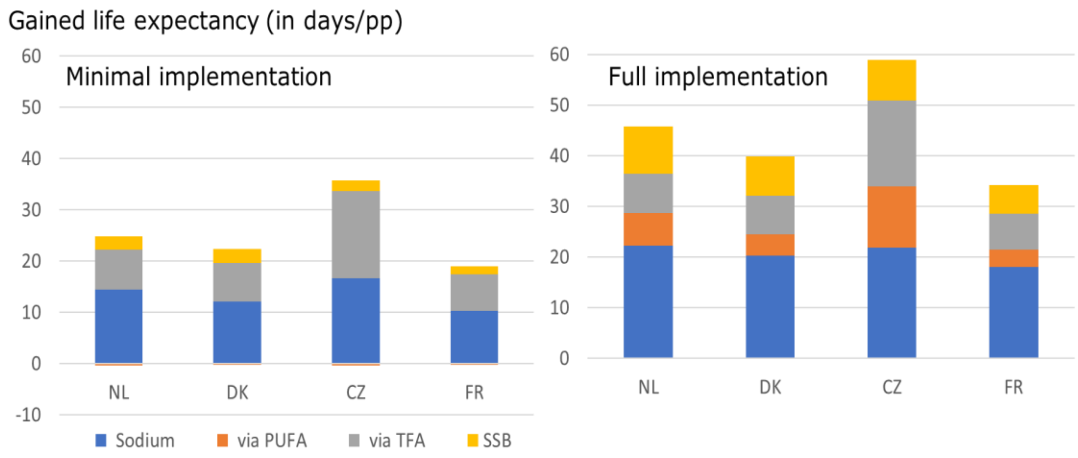
Table 76. Estimated effect in total life expectancy gained and life expectancy (LE) without disability gained, in days after partial, minimal or full implementation of the EU reformulation initiative for added sugar via sugar containing foods including SSB.

	NL			**DK**			**CZ**			**FR**		
	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total LE												
Minimal	3.2	3.6	2.8	2.9	3.4	2.4	4.1	5.1	3.1	3.1	3.9	2.2
Partial	7.0	8.1	5.9	6.1	7.0	5.1	8.3	10.5	6.1	6.2	7.9	4.4
Full	16.8	21.0	12.5	12.7	14.8	10.5	17.0	21.9	12.1	12.5	16.1	8.8
LE without disability												
Minimal	3.6 (113%)	3.9	3.3	3.5 (121%)	4.0	2.9	4.3 (105%)	5.3	3.3	3.2 (103%)	4.0	2.4
Partial	8.0 (114%)	9.0	6.9	7.1 (116%)	8.1	6.1	8.9 (107%)	11.0	6.7	6.5 (105%)	8.2	4.8
Full	18.9 (113%)	23.1	14.7	14.9 (117%)	17.2	12.5	18.1 (106%)	23.0	13.1	13.2 (106%)	16.8	9.5

5.6.4 Discussion

Figure 59 summarizes the results of this study taking the sum of the life expectancies gained, for all nutrients under study and per scenario. When fully implemented, the sum of the reformulation measures to reduce salt, sugar and improved fat content of diets will increase life expectancy per person varying from 34 (France) to 59 days (Czechia). In case of a minimal implementation this sum of gained life expectancy ranges from 19 (France) to 35 days (Czechia). Most (for salt and fat) or all (for sugar-sweetened beverages) of the gained life expectancy is without disability. The magnitude at which the full reformulation increases life expectancy differs by nutrient, by country and by *gender.*

Figure 59. Sum of gained life expectancy (in days/pp) in minimal and full scenario



This modelling project has been carried out in 2020. The initiatives for food reformulation as presented in the Annexes (1, 2, 7) have different start and end dates: 2008-2012 for salt reformulation, 2012-2020 (for saturated fatty acids) and 2015-2020 for sugars. Data of food consumption and food composition used in the analyses were from the start of the reformulation periods. Changes in food consumption as well as food composition may have occurred until now. For example, between 2007-2010 and 2012-2016, in the Netherlands, consumption of SSB reduced with 49 grams for adults and 58 grams in children and this resulted in lower intakes of mono- and disaccharides (around 1 percent of energy less for adults). The most recent French food consumption data of 2014-2015 showed a difference in intake, compared to the data from 2006-2007. Median sodium, PUFA and SFA intake decreased between the two surveys with 0.2, 1.1 and 0.2 grams, respectively.

The Danish food consumption data of 2011-2013 showed a difference in SFA, PUFA, TFA, sodium and added sugars intake, compared to the intakes reported here from 2005-2008. Median SFA, PUFA, TFA and added sugars intake were higher: 6.8, 3.0, 0.23 and 3.6 grams, respectively. Sodium intake was 0.2 grams lower.

For the scenarios, it was assumed that all foods within the defined food category are reformulated according to the new targets. This is a stringent assumption. In real life, especially with the voluntary nature of reformulation in most countries, only a part of the foods will reach the targets. In that case, the impact will be smaller than those calculated here. On the other hand, the targets were set per food group, so some products in the food group might achieve more to compensate for the others that do not reformulate. In this case, the actual effect will be in line with the calculated values

According to the estimates in the scenarios the intake of **sodium** will be reduced by 0.3 gram/day (0.75 gram salt/day) with full implementation of the EU annexes, starting at 0.1 gram (or 0.25 gram salt) per day with minimal implementation and by 0.2 gram (or 0.5 gram salt) at partial implementation.

For salt intake, most reports on food reformulation efforts, including a report by the European Commission do not provide sufficient information on quantitative effect of e.g. salt reduction after reformulation other than a summary of initiatives. As measured by 24h urine excretion, a limited number of countries observed a significant decrease in sodium intakes at the population level, whereas in most countries no change was observed. In the countries observing a significant decrease in sodium, the decrease of sodium per day was on average −0.46 (19). Netherlands was among the countries without significant changes. Starting from implemented salt reduction strategies based on all countries, a meta-analysis showed a sodium intake reduction of -0.23 g/day (95%CI. -0.36 to -0.1). This is similar to the salt reduction range between the minimal and full implementation category in the current study, while the partial implementation scenario lies somewhere in between. The approach to reduce salt intake might differ per country and not only include food reformulation, but also measures to choose less salty foods and add less salt during cooking or at the table.

The UK has been quite successful in reformulating foods for salt contents achieving a reduction of 0.36 gram sodium (or 1 g salt)/day as part of the salt reduction programme. Alonso et al calculated 702.960 life years gained by such a reduction for the period 2019-2050 (32 years) in the population of England aged 19 and older. The English adult population comprises roughly of 42 million persons, so the gain per person corresponds to around 6 days. This is less than the 10-16 days estimated for the minimal implementation scenario for sodium and far less than the 18-22 days calculated for the full implementation scenario. The calculations of Alonso et al. start from the actual reduction of sodium as observed in 24h urine, which is a 'golden' standard for estimates of salt intake. In the study, the calculation focused on the *potential* reduction when all foods in a certain food category are assumed to be reformulated according to the targets of -16% in the Annex. In real life, a 16% reduction might be achieved in some countries, for some foods, but probably not for all. Another reason might be that the gain in the study of Alonso et al. is calculated for an open cohort over a period of around 32 years, including many subjects who will not reach ages in which they can be expected to be vulnerable for the adverse health outcomes caused by salt. In contrast, the change in mortality was calculated over an entire lifetime, in which most will reach such ages.

For **saturated fatty acid** reformulation, not many successful reformulation efforts are reported to lead to a reduction of intake. In addition, the GBD does not provide RR for associations with chronic disease, so the study team had to model effects via TFA and PUFA. The reformulation of dairy (including cheese) in the minimal implementation scenario acts via replacing high fat dairy products with the lower fat variant, which in turn, also leads to a lower energy content. This is distinctly different from the reformulation of sweet and savory snacks (added in the partial implementation scenario) and fats and oils (added in the full implementation scenario) via the replacement of high saturated (and TFA) solid fats (mostly animal based) for poly-unsaturated fatty acids. Current average intake levels for saturated fat are clearly exceeding WHO recommendations of less than 10 % of the energy intake or EFSA's recommendation to have dietary SFA contents as low as possible. In the full implementation scenario, the percentage of energy from SFA was lower than 10 percent for all countries. However, note that the full implementation scenario also leads to a difference of 15-24% in SFA compared to the reference. More than the 10% reduction aimed for in the corresponding Annex.

The strongest evidence for improved public health is for reformulation of PUFA and trans fatty acids intake which is associated with cardiovascular diseases. Meta-analyses showed a TFA intake reduction of -1.2 g/day (95% CI. -1.79 to -0.61), which would be diets without TFA in 3 of 4 countries. In the results full implementation of the annexes reaches, on average, a -0.5 gram TFA reduction, a combination of ruminant and industrial TFA. For TFA, at least industrially produced, it must be noted that food composition data used might have changed in recent years. By now (transition period ended 1 April 2021) all food placed on the EU market have to comply with the legal limit of 2g industrially produced (so ruminant sources are not concerned) TFA/100g fat.

Evidence for improved public health from added sugar is only available for sugar consumed via **sugar-sweetened beverages**. Effects of reformulation of other products could only be done in the form of a sensitivity analysis, where it was assumed that added sugar in other products would yield the same effect. It was assumed that the added sugar in sugar-sweetened beverage (as well as the sugars in other foods in the sensitivity analysis) was not replaced by other drinks (or other ingredients in foods). Therefore, besides a sugar reduction, a calorie reduction was assumed which may have caused the observed effects. Of the four countries, the reformulation of SSB has the largest impact in the Netherlands, with a life expectancy gain of 9 days per person. Consumption of SSB in the Netherlands is high, although decreasing in recent years. Voluntary agreements in the Netherlands like in the EU annexes might have empowered these effects. The scenarios in the Annexes involve a reduction of sugar contents up to 40% (or -3 to -4 gram/100 ML). Mostly, agreements of reformulations of SSB foods imply a number of actions besides sugar reduction of regular varieties of SSB, such as increasing the sales volume of low energy (via reduced sugar) drinks and/or reduce portion/package size. These broader definitions of food reformulation imply that consumers' food choice should be changed to improve dietary intake. As noted, for sugar, EFSA's nutrition experts are attempting to set a tolerable upper intake level for total/added/free dietary sugars if the available data allow it. This scientific advice is underway and will help national authorities to establish recommendations on the consumption of dietary sugars and to update food-based dietary guidelines.

Results were also compared with those of the GBD study. The GBD study calculates effects of hypothetical scenarios where the intake of a food or nutrient is fixed at its optimal level. Whether such a level is feasible in practice is not considered. The GBD calculated loss of roughly 700 DALY per 100.000 population for high salt intake in high income countries. In the metrics, this is approximately 2.5 days per person for each year of exposure. In this calculation it was assumed that sodium intake in every one was reduced to 3 g (1–5) per day. This is a much larger reduction than the one in this study; on the other hand, the study team calculated the effect of a lifelong reduction in intake, while the GBD study only considers the effect of intake in a single calendar year on future disease and mortality. The GBD study estimate for reducing the intake of sugar-sweetened beverages to 3 g (0–5) per day in high income 150 DALY/100.000 population or half a day was calculated. Compared to the situation where PUFA are increased to 11% (9–13) of total daily energy and TFA is reduced to 250 mg (200–300) per day, a loss roughly 200 DALY/100.000 or 0.7 days were calculated for high income countries. Like in this study, the effect of salt reduction was highest. However, in the full reformulation scenario the relative difference between the gain of salt reduction and that of the other reformulation strategies was smaller.

Strengths and limitations

The study undertaken is one of the first studies to link dietary intakes and food reformulation plans within the European region to estimated public health impacts for different countries. This ex-post evaluation shows that potential policies to improve food products could be different for different EU countries. For example, the TFA content of foods might be an area for improvement in Czechia, while in other countries intakes are within recommendations. In the Netherlands, efforts to reduce sugar intake via SSB could improve life expectancy without disability especially for men. For the four countries, the methods for calculating the impact on dietary intake and public health impacts were similar and scenarios were based on the same food classification (FoodEx2). This is a prerequisite for a fair comparison and a strength of the current study.

The life expectancy gained was calculated in a similar way for each country. DYNAMO-HIA calculates a disability-weighted number of days gained from reformulation. When this reformulation is maintained over a lifetime. This is close to the concept of the DALY, where one calculates a reduction in the number of disability weighted life years lost (DALY) by applying the intervention to a population in a single year and estimating how many deaths and incident disease cases are prevented in that year. Each prevented death or disease reduces the years lost from death or disease respectively and added up they give the reduction in DALYs. There are some subtle differences with the DYNAMO-HIA approach. First, DYNAMO-HIA also includes mortality and disease avoided in later years of life assuming that the intervention stays in place, while the Burden of Disease DALY only calculates the effect of reducing exposure in a single calendar year. Second, DYNAMO-HIA takes competing mortality and morbidity into account. Lastly, DALYs are usually given in numbers for the entire population instead of per person. When comparing countries, as in this report, the latter is not appropriate, as the number of DALYs gained will mostly reflect the population size of the country.

The quality of the data will determine the strength of the analyses. Quality of data may differ between countries, e.g. the quality and completeness of food composition data might have influenced the results.

A limitation of the overall evaluation could be that this study's analyses were performed ex post instead of ex-ante. The calculations preferably are carried out before food policies are implemented to know the potential public health impact. This could be a recommendation for the design of future food policies.

5.6.5 Conclusion

Public health can be improved via food reformulations although the magnitude at which the full implementation increases life expectancy differs by nutrient, by country and by gender. This modelling study shows the potential impact on dietary intake and life expectancy in four countries, which can be used in ex post evaluation and preferably ex ante policy development.

When fully implemented, a combination of reformulation measures to reduce salt, sugar and improve fat content of diets increased life expectancy varying from 34 (France) to 59 days (Czechia). In case of a minimal implementation, this varies from 19 (France) to 35 days (Czechia). Most (for salt and fat) or all (for sugar-sweetened beverages) of the gained life expectancy is without disability.

6. Mapping of national reformulation initiatives

This section presents the results of a mapping exercise to identify current and planned food reformulation initiatives taking place in the EU.

6.1 Background

The objective of this exercise was to inform an assessment of the food reformulation policy environment for each European country and collect and assess European countries' interest in workshops and twinning actions (the results of which are presented in Section 7) as well as interest in receiving scientific and technical support to reformulation initiatives (covered in Section 8).

This section presents the results of the mapping exercise, including the methodological approach used. The results are set out according to the analysis of key characteristics, including trends by country, initiative type and nutrients targeted.

This section also includes a full examination of the food reformulation initiatives that are planned or currently in place for each individual European country through 28 country fiches. Whereas the level of detail per country varies, this information has been gathered through a series of data collection methods as described below. The results provide publicly available information on reformulation initiatives at the time of writing.

6.2 Methodology

The mapping exercise used a two-stage approach. Desk research was conducted to identify food reformulation initiatives in place across European countries. A survey of National Competent Authorities asked about ongoing and planned initiatives. The survey was also used to collect expressions of interest in planned workshops, twinning actions, and scientific and technical support networks. Those are summarised in Annex 8.

For a food reformulation initiative to be considered within the scope of the study, it had to fit into the following criteria:

- the initiative specifically aimed to drive food reformulation; and
- the initiative was planned, ongoing, or ended within the two years prior to the beginning of the study (from March 2017 to March 2019).

6.2.1 Desk research

A data collection template was developed and subsequently tested for its efficacy. The template was used to collect information for each identified food reformulation initiative on:

- the design of the initiative, including factors such as whether it relied on voluntary or mandatory participation or co-regulation, what type of incentives or disincentives were used (taxation, penalties, labelling etc.) and how transition periods were organised;
- nutrients and any specific food categories targeted;
- how targets and objectives were set as part of the initiative, including any public health targets, benchmarks for reformulation and any transitional benchmarks;
- how these targets and their achievement have been monitored and evaluated, including any available results and outputs of this monitoring and evaluation;
- overall results of the initiative, including any public health impacts, net changes in product composition, and impacts on industry and distribution;

- overall transferability of the initiative, in terms of its success (or failure) linked to any particular characteristics, and design factors relevant for potential transferability; and
- researcher judgement of the depth and quality of the sources available on the initiative.

The search strategy for the desk research involved searches using key words and a review of identified relevant sources. The list of key words increased during the study as different types of initiatives were identified and the sources reviewed.

Table 77. Key words used for initial searches

Key words used	Reformulation initiatives; European countries/Europe; reformulating food products; food reformulation strategies/plans; recipe and product reformulation; national food reformulation policy; food reformulation legislation; improving food/drink product composition; dietary health; nutrient intake; healthy food/diet initiatives; processed foods; sugar, trans fats, saturated fats and salt; obesity and dietary health; food initiatives; food product improvement; sugar/salt/fat reduction/ban; food marketing restrictions; food advertising restrictions/ban; food labelling; food/drink taxes; food/drink subsidies; sugar/salt/fat restrictions; food labelling requirements; food marketing restrictions; food advertising restrictions; food reformulation targets; nutrient ban/ restrictions; nutrient requirements; salt/sugar/fat tax/subsidy/ban; nutrient labelling; TFAs; trans fatty acids; maximum nutrient limit; restriction/ban on salt/fat/sugar in drinks/food; healthy food/drink logos/packaging.

The individual sources used are listed in Annex 4. An overview of sources that were reviewed based on geographical scope is provided in Table 78.

Table 78. Types of sources reviewed

Geographical scope	Sources
International	WCRF NOURISHING Database; WHO publications (including *Better food and nutrition in Europe: a progress report monitoring policy implementation in the WHO European Region* and *Mapping salt reduction initiatives in the WHO European region* and country-specific publications such as *"Health in all policies" approach to improve nutrition in Portugal*), and WHO Network reports (such as *What is the evidence on the policy specifications, development processes and effectiveness of existing front-of-pack food labelling policies in the WHO European Region?*); Food industry news sources (e.g. FoodBev Media and Food Navigator).
EU	Published EU research (e.g. *Best practices of the Member States in food reformulation*, 2016); EACEA National Policies Platform (e.g. Healthy lifestyles and healthy nutrition);

Geographical scope	Sources
	The Study on the implementation of the EU Action Plan on Childhood Obesity 2014-2020; Joint Research Centre (JRC), including the Health Promotion and Disease Prevention Knowledge Gateway which includes information on health promotion and disease prevention for nutrients including fat, salt and sugar; and publications such as *Sugar content in selected foods in the EU* (2018); European Commission best practice portal.
National	National government websites and research publications; National public health organisation websites; National research institute websites; NGO and interest group websites; Industry and lobby group websites; National news sources.

Where initiatives that had been studied or evaluated were identified, further searches were carried out to find any associated scientific literature. Databases such as EBSCO, NCBI and Research Gate were used to access relevant published journal articles.

6.2.2 EUREMO survey

In conjunction with the desk research, an online survey was developed to gather information directly from National Competent Authorities (NCA). The survey asked for information on the focus areas contained in the data collection template for each food reformulation initiative reported. Respondents could report multiple initiatives and routing within the survey allowed questions to be tailored based on whether an initiative was ongoing or planned.

The survey was distributed by email to contacts at the Competent Authority in each European country between May and June 2019, with targeted reminder emails sent to contacts for where a response had not been received for the European country. In total 31 contacts from 27 European countries responded to the survey.[35] No response was received from the NCA in France. The survey tool can be found at Annex 9.

6.2.3 Analysis and gap-filling interviews

Data collected from the survey and the desk research were triangulated and assessed for completeness. Where gaps in information were identified, follow-up questions and clarifications were directed to NCA contacts through email and telephone correspondence, and additional desk research was carried out.

Using the data collection template, identified food reformulation initiatives were analysed at both national- and EU-level. Focus areas for the analysis were:

- trends by country;
- types of reformulation initiatives;

[35] There were three responses from contacts in Greece, two from Estonia and two from Finland. There was one response from each of the remaining Member States excluding France.

- target product categories and nutrients;
- trends in mandatory, voluntary and co-regulated initiatives;
- food reformulation targets;
- types of monitoring and evaluation mechanism used; and
- impacts of the food reformulation initiatives.

Findings from each of these focus areas are outlined in the study results in Section 6.3.

6.3 Results

This sub-section presents a summary of the types of reformulation initiatives mapped, their geographical coverage, nutrients of focus and overarching trends on results.

6.3.1 Overview

Through the desk research and survey of national experts, 55 different initiatives have been identified. The vast majority of these operate in a single country (52 initiatives). Three initiatives operate across multiple European countries, and all of which are labelling initiatives:

- The Keyhole Logo (three MS identified)
- The Choices Programme (four MS identified)
- Nutri-score (two MS identified[36])

Allowing for the multiple appearances of the above initiatives, a total of 61 initiatives have been identified of which 51 are ongoing; seven are under development and three have been discontinued. Of those that were no longer running, two of these are in individual countries that had been part of the Choices Programme: Belgium recently moved to the Nutri-score system and Netherlands is currently exploring alternatives.

6.3.2 Temporal scope and geographical coverage

Of the 61 initiatives identified, around a third (19) are 'new', starting from 2018 onwards, or still under development. Less than half (28) have been operating for five years or more[37]. Five have been running since at least 2005.

The European countries with the greatest number of initiatives are UK (6), Denmark (5), and Portugal (4). Luxembourg is the only country in which there are no reformulation initiatives either ongoing or planned. The EUREMO survey response from a Luxembourgish representative states that this is because such initiatives are deemed infeasible as the majority of food products are imported into the country.

Table 79 shows the initiatives identified for each country.

Table 79. Initiatives by country – summary table

Country	Number of initiatives	Detail
UK	6	2006: Salt Reduction Programme 2007: Advertising restrictions of products high in fat, sugar and salt (HFSS) in children's media

[36] Spain have also recently adopted this system however due to its very recent nature this has not been included

[37] Since at least 2014

Country	Number of initiatives	Detail
		2013: Traffic light system 2016: Sugar Reduction Programme 2018: Soft Drinks Industry Levy 2018: Calorie Reduction Programme
Denmark	5	2003: Trans fatty acids regulation 2008: Danish Whole Grain Logo 2009: Keyhole logo 2011: The 'Salt List' Under development: Public-private partnership on food reformulation
Portugal	4	2017: Sugar Tax 2018: *Menos sal, mesmo sabor-certificado de excelência* (Certificate of Excellence) 2019: Portuguese Food reformulation Plan 2019: Salt in bread
Austria	3	2009 (live): Trans fatty acids regulation 2011 (live): National Salt Reduction initiative Under development: Austrian Reformulation Strategy
Belgium	3	2008 (ceased): The Choices Programme 2012 (live): Convention for a balanced diet "Convention Equillibre" (industry led) 2018 (live): Nutri-score
Finland	3	1980: Labelling the salt content in foods 2000: Better Choice 2017: Nutrition Commitment System
Hungary	3	2011: Act CIII of 2011 on the Public Health Product Tax 2012: Food reduction initiative in bread 2014: Trans fat ban
Ireland	3	2003: Salt Reduction Programme 2016: Reformulation roadmap 2018: Sugar-sweetened Drinks Tax (SSDT)
Lithuania	3	2010: Healthy Nutrition System in Children Education Institutions and Hospitals 2017: Keyhole logo 2018: Food business agreements with Ministry of Health

Country	Number of initiatives	Detail
Czech Republic	2	2011: The Choices Programme 2016: Platforma pro reformulace (PPR)
Estonia	2	2018: Soda Tax Under development: Food reformulation plan
France	2	2012: "Soda tax" - tax on sugar in drink 2017: Nutri-score
Italy	2	2009: Salt reduction strategy 2015: Improvement of the nutritional characteristics of food products
Latvia	2	2012: Regulation of Cabinet of Ministers Regulations 2016: Regulations Regarding the Maximum Permitted Amount of Trans Fatty Acids in Food Products
Malta	2	2016: Reduction of salt content in bread 2018: Yoghurt reformulation for kids
Netherlands	2	2006 (ceased): The Choices Programme 2014: National Agreement to Improve Product Composition 2014-2020
Poland	2	2008: The Choices Programme 2017: Agreement with industry
Slovenia	2	2010: National action plan for reducing the salt intake - ANSOL 2018: Restrictions on trans fatty acids in food
Spain	2	2017 (ceased): Sugary drinks tax (in the region of Catalonia only) 2017: Collaboration PLAN for the improvement of the composition of food and beverages and other measures 2020
Bulgaria	1	Under development: Food reformulation
Croatia	1	2015: The "Healthy Living" Guarantee Mark
Cyprus	1	Under development: Salt reformulation
Germany	1	Under development: The National Strategy for Reduction and Innovation for Sugar, Fats and salt in finished products
Greece	1	2018: Action Plan on Reformulation
Romania	1	2010: Collaboration Protocol for Reformulation regarding fats, sugar and salt
Slovakia	1	Under development: Initiative to reduce salt, sugar, fat

Country	Number of initiatives	Detail
Sweden	1	1989: Keyhole logo
Luxembourg	0	Not applicable
Total	61	

6.3.3 Types of reformulation initiatives

The initiatives identified have been categorised by reference to the typology shown in Table 80.

Table 80. Reformulation approaches

Types of initiatives	Sub-type	Definition
Setting limits or targets on nutrients	Maximum nutrient limit/ restriction/ ban	A maximum limit specifying the content of a nutrient permitted in a food category designed to encourage food reformulation. This includes bans (i.e. maximum content of the nutrient is 0).
	Reformulation targets	A target for the quantity of a nutrient or a relative reduction target of the average nutrient content in a specific food category designed to encourage food reformulation to a healthier composition.
Economic approaches	Subsidies	Any financial benefit provided by a government which aims at driving food reformulation. Items may not receive a benefit on health reasons, for example products with added sugars. Subsidies may be grants or tax concessions.
	Taxes	A government imposed surcharge on a nutrient of concern (i.e. saturated fat, sodium, sugar) or a food considered to be unhealthy[38], designed to encourage food reformulation.
Labelling	Front-of-pack labelling	Simplified and summarised information on the nutritional aspects of packaged foods designed to encourage food reformulation. It includes summary indicators or graphical symbols of nutrient or other components (i.e. wholegrain) content in a food.
Marketing restrictions	Market/advertising restrictions	A form of control on the eligibility of foods or beverages to be marketed/advertised designed to encourage food reformulation, including through the use of explicit targets/limits for nutrients.

[38] *In the context of this document, we consider that "less healthy food options" refers to foods that contain high levels of nutrients for which there is evidence that excess consumption in European populations might influence diet-related adverse health conditions: total fat, saturated fatty acids, trans-fatty acids, sugars and salt. The set of these nutrients may vary according to national specificities. (European Commission, Action Plan on Childhood Obesity, February 2014)*

Types of initiatives	Sub-type	Definition
Restrictions on food provision	Restrictions on food provision in specific settings	Restrictions on specific food types, food categories, portion sizes, or nutrient compositions in settings such as workplaces, hospitals or schools, designed to encourage food reformulation.

Table 81 shows that all but one initiative uses a single approach to reformulation, with over half (35) setting limits or targets on nutrients. Labelling and economic approaches are also adopted by several European countries. There does not appear to be any geographical pattern to the data (i.e. certain areas of Europe favouring certain approaches).

Of the 15 initiatives that use labelling, nine of these are part of the three multi-country initiatives (The Keyhole Logo; The Choices Programme; Nutri-score). The Keyhole Logo appears to be the earliest of the three initiatives, having been implemented in 1989 by Sweden and subsequently launched as a Nordic label and adopted by Denmark (2009) and Lithuania (2014) as well as non-EU countries (Norway; Iceland and Macedonia).

The Choices Programme, developed by the Choices International Foundation, was set up in the Netherlands in 2006 and subsequently implemented in Belgium (2008), Poland (2008) and Czech Republic (2011). After ten years, Belgium has unofficially ceased this programme and moved to the Nutri-score labelling system instead. Netherlands also disengaged from the programme in 2018 due to a lack of consumer awareness of the system and is currently exploring alternatives.

The Nutri-score system is the most recent of the multi-country labelling initiatives. It was developed by France in 2017 and being currently implemented in Belgium. Spain[39] has also approved its use and it is starting to be deployed.

Table 81. Initiatives by reformulation approach

Approach	Number of initiatives	Number of different initiatives	Number of countries
Setting limits or targets on nutrients	35	35	23
Labelling	15	9	12
Economic approaches	7	7	7
Restrictions on food provision	2	2	2
Labelling and setting limits or targets on nutrients	*1*	*1*	*1*
Marketing/ Advertising restrictions	1	1	1
Total	61	55	N/A

[39] Not included in current report

6.3.4 Product category trends and identification of nutrients of focus

More initiatives target multiple nutrients (36 initiatives) than target a single nutrient (25 initiatives). Countries with four or more initiatives tend to have more single-nutrient initiatives. Where European countries have one or two initiatives these tend to focus on multiple nutrients (19 initiatives) rather than single nutrients (7 initiatives).

Of the seven initiatives that are currently under development, all but one tackle multiple nutrients, suggesting that European countries are seeking comprehensive reformulation solutions that cut across multiple nutrients.

The majority of labelling initiatives target multiple nutrients (12 initiatives). For initiatives that set limits or targets on nutrients there is a fairly even split, with 18 focussing on single nutrients and 17 on multiple nutrients.

Table 82 maps initiatives to the nutrients they target. This shows that salt is the most frequently targeted (by 45 initiatives) and sugar second (41 initiatives). Where countries only have one initiative, all cover salt and all but one target sugar. Across the countries investigated, all have at least one initiative that targets salt and all but Cyprus and Slovenia have at least one initiative targeting sugar[40]. Four initiatives focus solely on salt in bread products.

Table 82. Initiatives by nutrients targeted

Nutrient Type	Number of initiatives (out of 61)	Number of different initiatives (out of 57)
Salt	45	39
Sugar	41	35
Saturated Fat	24	18
Trans fat	23	18
Fibre	15	9
Energy	11	8
Artificial sweeteners	12	10
Wholegrain	10	8
Total fats	7	7
Proteins	2	1
Calorie	3	3
Other[41]	4	4

Figure 60 shows the distribution of initiative types for the most targeted nutrients (salt, sugar, saturated fat and trans fats)[42]. Setting limits or targets on nutrients is the most common approach used to drive reformulation in salt, trans fat and sugar, followed by labelling. For saturated fats, there is an equal split between initiatives setting limits or targets on nutrients, and labelling. Economic approaches tend to be utilised when targeting sugar. With the exception of Hungary's Public Health Product

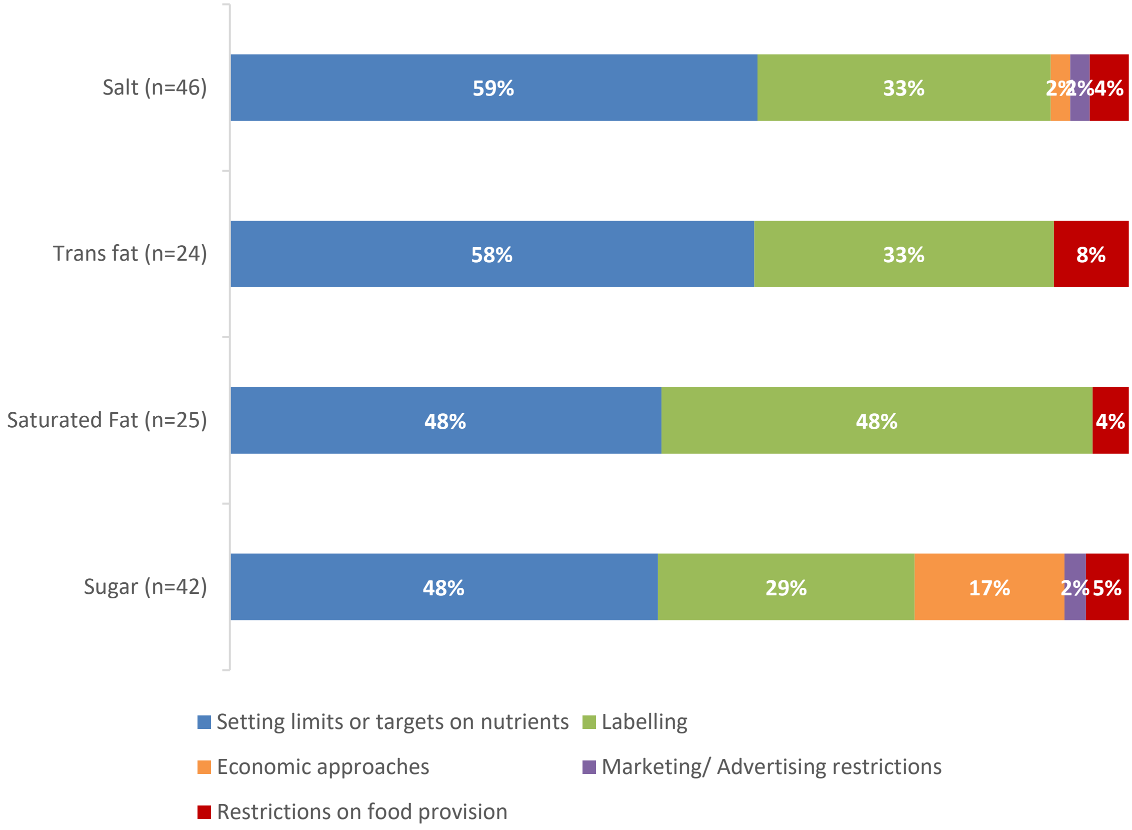
[40] Excluding Luxembourg which does not have any reformulation initiatives

[41] Caffeine, Vitamins, Vegetables and Carbohydrates

[42] The initiative that used a combination of setting limits or targets on nutrients and labelling, has been counted within both and targeted all four nutrients

Tax, the seven initiatives tackling sugar via economic approaches are taxes on sugary drinks.

Figure 60. Breakdown of the nutrients targeted by reformulation approach type



6.3.5 State-industry relationships

The initiatives vary in terms of the role of the State and the industry. In mandatory initiatives the State imposes measures on the industry. In co-regulation initiatives the State and the industry work together. In voluntary initiatives the industry takes the initiative and/or retains the discretion to act or not.

Of the initiatives assessed (n=61), 19 are mandatory, 6 are co-regulation and 36 are voluntary.

6.3.5.1 Mandatory initiatives

Nineteen initiatives are mandatory, of which:

- 8 relate to setting limits or targets on nutrients;
- 7 relate to economic approaches;
- 1 relates to food labelling;
- 2 relate to food provision; and
- 1 relates to marketing/advertising restrictions

Of these, 5 focus on trans fats only, 4 focus on sugar, 3 on salt and 7 on a range of nutrients of concern/interest. For trans fats, most of the mandatory initiatives relate to limits on content or bans, while for sugar most of the mandatory initiatives are taxes on sugar-sweetened beverages. The taxes vary in the drinks they apply to (some cover artificially sweetened drinks while others do not), the tax level (as a percentage of value) and the type of tax (volumetric, tiered volumetric, ad valorem tax).

For sodium, one mandatory initiative – the Public Health Product Tax in Hungary – relies on taxation to drive reformulation.

6.3.5.2 Co-regulation initiatives

All 6 of the co-regulation initiatives relate to setting limits or targets on nutrients. Various nutrients of concern/interest (salt, sugar and trans fats) are covered.

The co-regulation initiatives are found in the United Kingdom, Greece, Portugal and Czech Republic. A recent example of co-regulation is the structured reformulation approach by Public Health England in the United Kingdom under which a range of initiatives sit. For example, the Sugar Reduction Programme aims to reduce the amount of sugar in the foods that contribute most to children's intakes by 20% by 2020, with a 5% reduction in the first year. A report on the first year's target showed it was not met. A 2% reduction for retailers own-brand and manufacturer branded products was achieved and 5 out of 8 measured food categories showed some reductions in sugar content.

6.3.5.3 Voluntary initiatives

Of the 35 voluntary initiatives, 20 relate to setting limits or targets on nutrients, 14 relate to food labelling[43] and one is a combination of the two. Thirty-two focus on salt (N=32), either salt only or in combination with other nutrients of concern/interest. Twenty-six initiatives focus on sugar.

In many countries targets have been set for industry to reduce the salt and/or sugar content of various food product categories without threat of legislation or other accountability mechanisms. Other countries have implemented voluntary front-of-pack labelling systems, such as Nutri-score. It is currently not possible for European countries to implement a mandatory front-of-pack labelling system.

6.3.6 Target setting

About 60% of the reformulation initiatives documented in this report are part of a broader nutrition and health plan or strategy. Few countries have initiatives with clear public health or more specifically nutrient intake targets. Some countries refer to the voluntary targets set out in the World Health Organization non-communicable diseases (NCDs) action plan[44] such as the aim to reduce premature mortality by 25% and to stop the rise of obesity.

Most initiatives refer to broader and unspecific goals such as helping consumers make healthier food choices, encouraging the food industry to reformulate their products, bringing food and nutrient intakes closer to targets set in food-based dietary guidelines, or reducing consumption of sugary drinks or obesity.

6.3.6.1 Explicit reformulation targets

The table below shows the specific reformulation targets set by European countries for the different initiatives, food categories and nutrients of concern/interest. Not all countries or initiatives have set specific reformulation targets. In such cases, the initiatives refer to broader aims to encourage the industry to reformulate their products.

[43] Nine of these are part of one of the three multi-country initiatives

[44] Global Action Plan for the Prevention and Control of NCDs 2013-2020: https://www.who.int/nmh/events/ncd_action_plan/en/

Table 83. Reformulation targets identified in European countries

Country	Initiative	Target	Food groups covered
Salt			
Austria	National Salt Reduction initiative	15% reduction from 1.4 to 1.2 g/100g or from 2% to 1.7% (based on 1kg of flour) by 2015	Bread and common pastries
Croatia	Healthy Living National Project	A 25% reduction by 2019	Meat products
Germany	The National Strategy for Reduction and Innovation for Sugar, Fats and salt in finished products	1.25 grams per 100g by 2025 General aim to cut salt levels	Pizzas Breads
Italy	Salt reduction strategy	15% reduction over four years from 2009 15% reduction from 2011 10% reduction from 2012 10% reduction from 2014	Breads 'Gnocchi' products' Pasta/rice/frozen meals Soups and vegetables/legumes puree
Hungary	Salt in bread reduction	Three steps: - before 1 January 2015 NaCl content minimum 1,5% (m/m), maximum 2,8% (m/m); - from 1 January 2015 minimum 1,3% (m/m), maximum 2,5% (m/m); - 1 January 2018 minimum 1,3% (m/m), maximum 2,35% (m/m)	Bread and bread products
Portugal	Portuguese Food reformulation Plan	1 grams per 100 g (to be achieved by 2021) 0.9 grams per 100g (to be achieved by 2023) 0.3 g/100g (to be achieved by 2023) 12% reduction by 2022 12% reduction by 2022 12% reduction by 2022	Breads Ready meals Ready-to-eat soups Pizzas Breakfast cereals Savoury snacks
Slovenia	National action plan for reducing	Reduction by 4% per year (baseline year: 2010) in food products	Bakery products Bread and bread products

Country	Initiative	Target	Food groups covered
	the salt intake - ANSOL		Canned fruits and vegetables Meat products
Spain	Collaboration PLAN for the improvement of the composition of food and beverages	Reductions by 10% by 2020 considering baseline of 2016: 10% reduction 16% reduction 16% reduction 6.7% reduction 13.8% reduction	 Ready meals Meat products Sauces Cream soups Savoury snacks
UK	Salt reduction programme	To date, four sets of targets have been published (2006, 2009, 2011 and 2014)	76 specific food groups contributing the most salt to the population's intake
(Industrial) Trans fat			
Austria	Trans fatty acids regulation	2 grams per 100g of total fat content (multi-ingredient processed foods with total fat below 20% 4/100g of total fat; processed food with total fat content below 3% 10/100g of total fat)	Fats and oils; other foodstuffs containing fats and oils as an ingredient, as well as fats and oils used for deep-frying.
Denmark	Trans fatty acids regulation	2 grams per 100g in eatable oils and fats	All fats and oils as product or ingredient
Hungary	Trans fatty acids regulation	2 grams 100g fat in foods	All food products
Latvia		2 grams per 100g total fat 10 grams per 100g total fat for food products with less than 3% of total fat 4 grams per 100g total fat for food products with 3-20% of total fat	All food products with some exceptions
Portugal	Portuguese Food reformulation Plan	2 grams per 100g of fat	margarine/shortening
Saturated fat			

Country	Initiative	Target	Food groups covered
Belgium	Convention for a balanced diet	2.5% reduction 3% reduction	Chocolate products Biscuits and cakes
Spain		Reductions by 10% by 2020 considering baseline of 2016: 10% reduction 10% reduction 5% reduction 5% reduction 10% reduction	Ready meals Meat products Cakes and pastries Biscuits Savoury snacks
Sugar			
Belgium	Convention for a balanced diet (voluntary)	5% reduction 3% reduction 4% reduction 4% reduction	Soft drinks Dairy Plant-based products Breakfast cereals
Germany	The National Strategy for Reduction and Innovation for Sugar, Fats and salt in finished products (voluntary)	20% reduction by 2025 15-20% reduction by 2025 10% reduction by 2025	Breakfast cereals Soft drinks Children’s yoghurts
Portugal	Portuguese Food reformulation Plan	10% reduction	Sweet products
Spain	Collaboration PLAN for the improvement of the composition of food and beverages	Reductions by 10% by 2020 considering baseline of 2016: 10% added sugar reduction 10% added sugar reduction 5% added sugar reduction 10% added sugar reduction 10% added sugar reduction 5% added sugar reduction	Dairy Meat products Cakes and pastries Breakfast cereals Fruit nectars

Country	Initiative	Target	Food groups covered
		18% added sugar reduction 5% added sugar reduction 5% added sugar reduction 10% added sugar reduction	Pre-packaged bread Sauces Biscuits Ice-cream Sugar-sweetened beverages
UK	Sugar reduction programme	20% reduction by 2020, with 5% in the first year (Aug 16-17) By 2021, reducing sugar by 5% By 2021, reducing sugar by 20%	Breakfast cereals, chocolate confectionary, sweet confectionary, yogurts and fromage frais, ice cream, lollies and sorbets, sweet spreads and sauces, cakes, biscuits, puddings, and morning goods such as croissants and buns Juices Milk and milk-based substitutes
Energy			
UK	Energy reduction programme	20% reduction in calories by 2024 Cap to 150 calories	product categories that contribute significantly to children's calorie intakes (up to the age of 18 years) all juice based drinks likely to be consumed in a single occasion, including blended juice (e.g. juice from multiple fruits or vegetables), smoothies and mono-juices

6.3.6.2 Intake targets

Some initiatives have specific population intake targets which they seek to achieve via reformulation.

Salt

Most of the countries with initiatives that set public health targets aim to reduce salt intake (which is one of the nine global targets within the WHO NCD monitoring framework)[45]. For example:

- **Croatia** has set a target to reduce table salt intake by 16% and to gradually reduce population salt intake by on average 4% per year, from the current 11.6 grams per day to 9.3 grams per day over the period 2015-2019. Croatia aims to reduce the overall population salt intake to 5 grams per day by 2025;
- **Finland** has set a target to reduce salt intake by 20% by the year 2020, compared with the level in the Findiet 2012 survey. The long-term target is to ensure that the salt content of the products that are central to salt intake comply with the Better Choice Heart Symbol criteria;
- **Slovenia** aims to reduce population salt intake by 5% by 2020 (baseline year: 2007);
- In **Norway** the average salt intake in the population was 10 grams per day in 2010. The goal is to reduce the average salt intake to 8 grams per day by 2021, and to 7 grams per day by 2025. The long-term goal is 5 grams of salt per day;
- In **Ireland**, the Food Safety Agency recommended through its "Salt and Health" report that an achievable (not necessarily optimal) salt intake target for the Irish population is 6 grams per day;
- **Lithuania, Slovakia, Portugal** and **Norway** aim to reduce salt intake by 30% by 2025 such as specified in by the WHO global NCD target. Portugal additionally aimed to reduce salt intake by 16% by 2021. Norway additionally aims to reduce salt intake by 15% by 2018.

Sugar

Some countries have set targets to reduce sugar intake:

- Lithuania aims to reduce sugar intake by 10% by 2020;
- Slovakia aims to reduce sugar intake by 10% by 2025;
- Portugal has set a target to reduce the daily sugar intake to 50 g/day and a maximum of 25 g/day for minors by 2020 and to reduce sugar consumption by10-20% by 2021.

Trans fat

Hungary has adopted the WHO target of reducing population trans fat intake to less than 1% of total daily energy intake. Lithuania has set a target to reduce population intake of saturated fat by 10% by 2020 while Slovakia has a target to reduce total fat intake by 10% by 2025.

No targets to reduce population intake of saturated fat or energy were identified in EU countries.

6.3.6.3 Other

Some initiatives have set criteria for the nutrients of concern/interest, such as in relation to taxes or front-of-pack labelling. These may also stimulate reformulation towards meeting the specific criteria. Examples are:

- Healthy Living Guarantee Mark: Croatia
- Keyhole logo: Denmark, Sweden, Lithuania, Iceland, Norway
- High salt and low salt content warnings: Finland
- Whole-grain logo: Denmark
- Traffic Lights: UK

[45] Global Monitoring Framework: https://www.who.int/nmh/global_monitoring_framework/gmf2_large.jpg?ua=1

- Nutri-score: Belgium, France
- Sugar-sweetened beverage taxes: Estonia, France, Hungary, Ireland, UK

6.3.7 Types of monitoring and evaluation mechanisms used

The amount of information that could be obtained on how initiatives are monitored and/or evaluated varied. Where information was provided, monitoring was typically led by an official authority (Government Ministry, agency or designated organisation). One exception is Belgium's "*Convention Equillibre*" (Convention for a balanced diet), an initiative that involves collaboration between the Ministry of Health, The Federation of the Belgian Food Industry (FEVIA) and the Belgian Federation for Commerce and Services (COMEOS). This is monitored by the two industry associations and whilst they welcome additional monitoring by authorities, no information has been found on the results. Poland's "Agreement with Industry" is also monitored by industry.

6.3.7.1 Initial compliance

For two of the labelling initiatives, whilst there does not appear to be ongoing monitoring, products must go through an initial compliance process in order to be awarded the certified logo:

- The Choices Programme is a trademarked logo that can be used on food and drink products with low levels of salt, added sugar, saturated and trans fats. It operates in the Czech Republic, Poland. It operated previously in Belgium and Netherlands but has been discontinued in both countries. This initiative requires that a product is independently verified as having met the criteria prior to being permitted to use the logo. It is unclear whether any follow-up monitoring is conducted after that point.
- Portugal's *Menos sal, mesmo sabor-certificado de excelência* (Certificate of Excellence), awards a stamp to bread products that contain less than one gram of salt per 100g. Before products are approved, they are monitored for up to six months and samples are tested by the National Health Institute Doctor Ricardo Jorge (Instituto Ricardo Jorge) at two different time periods.

6.3.7.2 Urine testing

Some of the initiatives for which salt is a nutrient of interest use urine testing. These tend to be as part of wider salt intake reduction objectives of the country rather than being conducted solely as part of evaluating the initiative in question. For instance, Denmark has monitored salt intake of the population through single spot urine tests every four years since 1999. This technique was developed and validated by the Danish Research Centre for Prevention and Health and is suitable to use amongst the Caucasian population. In Italy, 24-hour urine collection has been conducted periodically to monitor daily average dietary intake of sodium, potassium and iodine per capita in the population.

6.3.7.3 Databases

Food composition databases have been used to monitor reformulation initiatives. In some cases, these were existing resources whereas in others they appear to have been a direct output of the initiative.

The French Nutri-score system utilises the Observatory on Nutritional Food Quality (OQALI) database. Companies using the Nutri—Score system are required to send the nutritional composition of their products to OQALI who collect data about food products more widely within France through partnerships with industry.

The Netherlands' "National Agreement to Improve Product Composition 2014-2020" sets voluntary agreements with representatives from the food industry. To monitor progress and changes to food composition, the National Institute for Public Health and the Environment (RIVM) use LeDa, the countries national food product database, as well as data provided by industry.

As part of Austria's Reformulation Strategy, a food database called Food under the Microscope (*Lebensmittel unter der Lupe*) was developed. This will be used as a monitoring tool. The database holds food composition data provided by industry and data collected in stores and from retailer websites.

6.3.7.4 Testing products

Whilst many of the initiatives use food composition data provided by industry or collected in store, samples of products have been tested to monitor and evaluate some initiatives. For example:

- Ireland's Salt Reduction Programme involves the testing of salt and potassium levels from selected samples. Initially measures were based on single samples but accuracy has since been increased by testing a minimum of three samples of each product, ensuring that batch numbers and/or shelf life declarations are each different. The Food Safety Authority of Ireland (FSAI) recognises that no universal method for measuring salt and potassium levels exists, and different methodologies varying in accuracy and applicability are applied to different type of products. This is not controlled for within the reporting of monitoring results.
- The presence of trans fat has been tested in food products in Austria, Denmark, Germany, Hungary and Latvia as part of their reformulation initiatives. For instance, in 2018, 50 Danish and imported products were tested by Denmark's Ministry of Environment and Food as part of their Trans Fatty Acids Regulation. In Latvia, the "Regulation regarding the maximum permitted amount of trans fatty acids in food products" is monitored by the Food and Veterinary service (FVS) and as part of compliance monitoring, they conducted laboratory analysis of more than 60 food samples in 2018.

6.3.7.5 External data sources

External data sources, such as sales volume data or data from population dietary intake surveys, are also reported as having been used to measure progress of initiatives. For example:

- Denmark’s Whole Grain Logo uses Nielsen data to monitor product sales.
- Finland's "Labelling the Salt Content in Foods" initiative uses data from two national surveys:

1. FinDiet, which measures dietary habits and nutrient intake;
2. FinHealth, which measures health and wellbeing.

6.3.8 Demonstrated impacts

The amount of information obtained from the EUREMO survey, desk research, and gap-filling interviews on the outputs, outcomes and impacts of initiatives varied greatly. Below are examples of some of the initiatives that are found to be particularly successful, demonstrating outcomes and impacts:

Country: Denmark

Initiative Name: Trans Fatty Acids Regulation

Time Period: 2003-ongoing

Brief Description: Denmark was the first country in the world to introduce restrictions on the use of trans fatty acids. The regulation set a maximum limit of 2% for artificial trans fat content in all oils and fats within food products.

Findings: The intake of industrial trans fat is now "virtually eliminated".[46] In 2003, 253 products were sampled. In 2005, following the implementation of the policy, 148 products were tested. The 2005 results found that trans fat had been either reduced or eliminated from products that previously were high in trans fat[47]. More recently, a news article from 2018 reported that testing of 50 Danish as well as imported products by the Ministry of Environment and Food, found only one product (imported) was over the limit[48].

The regulation was found to have wider health impacts. Death from coronary heart disease decreased by 70% between 1980 and 2009; the largest reduction across the European Union. The decline was particularly steep between 2000 and 2009 in Denmark compared to other European countries, suggestive of the legislation being a contributing factor[49].

Restrepo and Rieger (2016) compared Denmark's annual CVD-related death rate to what it would have been without the policy by using synthetic control methods. Their modelling suggested that three years following policy implementation, CVD-related deaths reduced by 14.2 per 100,000 people on an annual basis compared to the synthetic control[50].

Country: Denmark

Initiative Name: Danish Whole Grain Logo

Time Period: 2008-ongoing

Brief Description: The Danish whole grain logo is trademark registered with the Danish Veterinary and Food Administration and the Danish Whole Grain Partnership and indicates a high whole grain content and low fat, sugar and salt content. The Danish whole grain partnership aims to increase wholegrain intake using the logo as well as wider work such as events to make wholegrain consumption the norm. The logo seeks to encourage both reformulation and new product development. In 2019, the partnership won "EUs Best Case-certificate" for their work.

Findings: The logo was launched on 150 products in 2009 and by 2017 800 products were carrying the logo.

A survey conducted by the partnership found an increase in the average wholegrain intake from 36 grams in 2007 (i.e. just before the implementation of the initiative) to 63 grams in 2014. More recent data suggests that this has since increased to 82g, exceeding the national daily recommended intake of 75g[51].

In 2008, less than one in ten (6%) of the Danish population were eating the recommended 75 grams of wholegrain per day. This increased to three in ten (30%)

[46]Consumer protection through a legislative ban on industrially produced *trans* fatty acids in foods in Denmark: https://www.tandfonline.com/doi/full/10.1080/17482970601069458

[47] The effect of the regulation on trans fatty acid content in Danish food:

https://www.ncbi.nlm.nih.gov/pubmed/16713397

[48] EU should follow our trans fat ban success: https://www.foodnavigator.com/Article/2018/06/21/EU-should-follow-our-trans-fat-ban-success-Denmark

[49] As cited in Better food and nutrition in Europe: a progress report monitoring policy implementation in the WHO European Region: http://www.euro.who.int/__data/assets/pdf_file/0005/355973/ENP_eng.pdf?ua=1

[50] Denmark's Policy on Artificial Trans Fat and Cardiovascular Disease:

https://www.ncbi.nlm.nih.gov/pubmed/26319518

[51] https://fuldkorn.dk/english/

in 2014. Amongst children, this number rises from 7% to 43%.[52] More recently, it has been found that half the population are eating the recommended daily amount.

It is, however, unclear how many products were reformulated as part of the initiative and how many are new. The work of the partnership has also involved various campaigns to make the consumption of wholegrain the norm. It is thus unclear how much of the change in intake can be attributed directly to reformulated products.

Country: Hungary

Initiative Name: Public Health Product Tax (PHPT)

Time Period: 2011- ongoing

Brief Description: The initiative is an excise tax applied to products that have proven health risks when consumed and only applies to pre-packaged, non-staple foods.

Findings: The initiative was found to be effective in driving reformulation, with 40% of companies that sold 'unhealthy' food products changing their recipes to reduce or eliminate the target nutrients by 2012.

The initiative also influenced consumer behaviour. A 2014 survey found that 7-16% of consumers of unhealthy food products switched to a cheaper, often healthier product after introduction of the tax, and 5-16% consumed less of the unhealthy products after the legislation. Overall, 30% reduced their consumption of packaged sweets, 22% reduced their consumption of energy drinks and 19% reduced their consumption of soft drinks.[53]

Country: Ireland

Initiative Name: Salt Reduction Programme

Time Period: 2003-ongoing

Brief Description: This is one of the earliest salt specific reformulation initiatives identified. It is led by the Food Safety Authority of Ireland (FSAI) and seeks to voluntarily reduce salt content in processed foods.

Findings: Data suggest statistically significant changes in salt content in a wide range of products. For instance, salt was reduced by 36-71% in four types of cooking sauces[54] and by 38-63% in six types of products within breakfast cereals.

- **Soup:** 12-33% reduction in three products and no significant difference in one between 2005 and 2017
- **Ready meals:** 22-32% reduction in three products and no significant difference in three between 2004 and 2009/201455
- **Cooking sauces:** 36-71% reduction in four products and no significant difference in one between 2004 and 2016
- **Snacks:** 45% reduction in one product and no significant difference in six between 2006 and 2011/201656

[52] https://www.fuldkorn.dk/media/179349/the-evolution-of-the-whole-grain-partnership-in-denmark.pdf
[53] Findings reported by Hungarian NCA in the survey.
[54] Carbonara, Curry, Sweet & Sour and Black bean
[55] Date varies between different product types within this category
[56] Date varies between different product types within this category

- **Processed meats:** 11-27% reduction in three products and no significant difference in one between 2004 and 2015
- **Bread products:** 13-29% reduction in three products and no significant difference in two between 2003 and 2018 (2011-2018 for one insignificant product)
- **Breakfast cereals:** 38-63% reduction in six products and no significant difference in one between 2003 and 2015
- **Spreadable fats:** 27-29% reduction in two products and no significant difference in ten between 2007 and 2015
- **Natural cheese:** 4-11% reduction in two products and no significant difference in two between 2009 and 2018
- **Processed cheeses:** 21-39% reduction in four products and no significant difference in one between 2009 and 2014.

Country: UK

Initiative Name: Salt Reduction Programme

Time Period: 2006-ongoing

Brief Description: A voluntary initiative with salt reduction targets being set by Public Health England for industry to meet primarily through food reformulation. The World Action on Salt and Health (WASH) was set up in 2005 and aims to replicate the initiative's success in countries worldwide.

Findings: Whilst there has been mixed progress in terms of targets being met, overall, since the implementation of the initiative, salt intake in the UK fell 11% between 2006 and 2014.

6.3.9 Observations on industry engagement and participation.

Most initiatives have some industry involvement to support development regardless of whether they are voluntary, co-regulation or mandatory in nature. The level of information available on this varies. For about 20 initiatives, no relevant detail could be found on how industry is, or is intended to be, engaged. Given that half of these are voluntary initiatives, this is likely down to a lack of available documentation on this matter as opposed to no engagement work being conducted.

For mandatory initiatives, there are some examples of industry feedback being crucial in shaping the initiative. As a result of industry consultation, Austria's mandatory Trans Fatty Acids Regulation set different trans fat limits based on total fat content, rather than a single upper limit. In Estonia, the Soda Tax was amended to include dairy beverages following soft drink manufacturers appealing to the EU. Others report consulting with industry prior to introducing mandatory initiatives. For instance, Hungary gathered views as part of the development of the mandatory Public Health Product Tax and France consulted with industry prior to introducing the Soda Tax but it is less clear how this helped shape the initiative itself.

By definition, voluntary and co-regulation initiatives rely on industry participation. For those, public authorities may rely on industry associations and representative bodies to provide input into the design of the initiative, or its monitoring. In the case of Ireland's Salt Reduction Programme, there appeared to be a strategic attempt to prioritise engagement with companies whose product reformulation would have the largest impact on reducing salt intake. Similarly, for the UK Calorie Reduction Programme, consultation started with 21 businesses spanning the food chain, based on market share. Other initiatives are likely to have taken a similar approach although this is not always explicitly stated.

Unlike other initiatives, the UK Sugar Reduction Programme documentation included a dedicated report describing how stakeholders were engaged. This paper states that the following activities were conducted:

- "May/June 2016 – 40 meetings with each of the market leaders in the nine categories and NGOs to inform early thinking
- November/December 2016 – joint industry and NGO category specific meetings to discuss initial sugar reduction proposals on sugar level guidelines and calorie and portion size caps
- December to March 2017 – further series of meetings with individual businesses and NGOs to discuss the programme
- December to January 2017 – written comments on PHE's sugar level guidelines and calorie or portion size cap invited
- January to February 2017 – further stakeholder meetings to discuss the format of the baseline analyses"[57]

Some initiatives describe more formalised ongoing engagement with industry. For instance, industry representatives are participating in the advisory board of Germany's "National Strategy for Reduction and Innovation for Sugar, Fats and Salt in finished products", currently under development. Spain's "Collaboration Plan for the improvement of the composition of food and beverages and other measures 2020" involves several committees that support the initiative which industry sits on. There may well be many other initiatives with similar formats but this may not have been explicitly specified in the documentations reviewed.

As described in section 1.3.7, most monitoring is carried out by public authorities. This typically involves the authorities issuing requests to participating industry members to submit data. By contrast, in the case of Belgium's Convention for a balanced diet "Convention Equillibre" initiative, the responsibility for monitoring falls on the two industry associations collaborating on the initiative. Romania's "Collaboration Protocol for Reformulation regarding fats, sugar and salt" also places an additional responsibility on its food industry representative which is not specified in most other initiatives. They are also involved in education and promotion of the initiative.

Information on specific engagement challenges is limited. The UK Salt Reduction Programme had limited success with the out of home and takeaway sector. Ireland's Salt Reduction Programme reported difficulties reaching the food service sector.

Industry may also actively oppose initiatives. For example, in July 2016, prior to the implementation of the Sugar-sweetened Drinks Tax, the Irish Beverage Council produced a document arguing against it, stating that it would have financial implications on customers, industry and the economy[58]. There has also been opposition to UK's traffic light labelling system by industry and European countries that have argued that the system can have negative consequences on the marketing of certain products[59].

57 Sugar Reduction and Wider Reformulation Programme Stakeholder engagement: May 2016 to March 2017: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/604332/Sugar_reduction_stakeholder_engagement_2016_to_2017.pdf

58 Sugar tax: All cost, no benefit: http://cdn.thejournal.ie/media/2016/08/ibc-budget-2017-submission.pdf

59 UK traffic light labelling should be mandatory: https://www.foodnavigator.com/Article/2016/09/20/UK-traffic-light-labelling-should-be-mandatory-LG

7. Workshops and twinning actions

This section presents all relevant information associated with the Workshops and twinning actions.

7.1 Methodology

The purpose of this task was to organise Workshops and Twinning Actions aimed at supporting the implementation of reformulation initiatives in European countries. They aimed at helping officials from four different European countries to improve their understanding of the challenges and benefits associated with reformulation initiatives by learning from the experiences of others.

Workshops were targeted at those European countries that had little experience in reformulation initiatives, but who had the capacity to organise and pursue national initiatives, and who expressed their interest in participating to this type of activity.

Twinning Actions were targeted at European countries who appeared to benefit from learning about an initiative undertaken elsewhere, either because they were planning a similar initiative or because they faced similar challenges. The selection of countries was also done on the basis of the interest expressed in participating to this type of activity (and collected through the aforementioned survey).

For this task, the project team worked closely with EuroFIR to select relevant experts, and with EuroFIR and Sciensano to help define the content of the events. In addition, experts from ANSES also participated in one Twinning Action.

According to the mutual learning principles highlighted at proposal stage:

- interested European countries were assigned to specific types of events or activities based on their experience, needs and capacity;
- European countries’ authorities were asked to identify and reflect on their needs, challenges and operational realities;
- participants were encouraged to reflect on what they learnt and plan follow-up actions to ensure that the learning was disseminated across their organisation and the insights/knowledge gained used to inform strategic/change priorities;
- participants took an active role in the facilitation and structure of the activities to develop ownership of the topic area, and to stimulate openness and dialogue between peers.

7.1.1 Selection criteria

26 European countries expressed their interested to take part in either the Workshops or the Twinning Actions. On the basis of the interest expressed, the identified needs, and follow-up discussions with the national authorities, the European countries selected for these activities - and agreed with HaDEA - were the following:

- Greece and Croatia, for the Workshops;
- Malta and Hungary for the Twinning Actions.

7.1.2 Organising the Workshops and Twinning Actions

Regular bilateral conversations were organised with country authorities’ representatives, to offer support and illustrate the objectives and characteristics of each activity, and to:

- discuss what types of experts might be of interest to the European country;
- discuss and agree a proposal of dates for the event;
- discuss the format and content of the agenda;

- discuss possible venue and hotel accommodation options[60].

Bilateral discussions were also organised with (EUROFIR and SICENSANO) experts ahead of the conversations with the European countries' authorities, and/or directly with the MS authorities, depending on the single activities. The topics to be the focus of the meetings were selected on the basis of the needs and requests of the European countries' authorities.

7.1.3 Impact of Covid-19 pandemic and of lock-down measures on Task 2 activities

The covid-19 pandemic and resulting lock-down measures had a serious impact on the timing and organisation of the meetings. Initially the project team tried to postpone the discussions, in order to be able to organise face to face meetings. Then, when it became clear that the lock-down measures would last much longer, all the meetings where re-organised to take place online.

This happened smoothly for some countries' activities (Workshop with Greece and Twinning Action between Malta and France), but less for others (Workshop with Croatia and Twinning Action between Hungary and Austria). Further details on this are provided below.

7.1.4 Croatia (Workshop)

After a series of calls organised between the Croatian authorities61 and ICF (and EUROFIR) experts, the topic agreed to be the focus of the meeting was the following: 'Taxation of sugar, an opportunity to reduce sugar content in food'. A series of key questions to address during the meeting was identified by the project team, in agreement with MS's authorities.

However, given the Covid-19 pandemic and subsequent lock-down measures, the meeting had to be put on hold. When a few months later the project team suggested to organise the meeting in an online format (as this appeared to be the only option remaining), the Croatian authorities didn't show an interest any more in taking part in the activity.

At that stage (in December 2021) it was not possible for the project team to find an alternative European country with an interest in the identified topic, nor to change the topic to focus on. Therefore, the Workshop with Croatia did not take place, and no other Workshop could be organised to replace this meeting.

7.1.5 Hungary-Austria (Twinning Action)

After a series of discussions with the Hungarian and Austrian authorities, the focus topic for the Twinning Action was identified to be the following: 'Processed food reformulation monitoring-improvement of data collection and utilisation of gathered branded food data', and the scraping tool and 'Food in the Spotlight' website put in place by the Austrian Agency for Health and Food Safety (AGES).

The agenda had been drafted and agreed by the Hungarian and Austrian representatives. The meeting had to take place in Budapest, at the premised of the Hungarian National Institute of Pharmacy and Nutrition, and was supposed to last two days. The Austrian representatives from AGES were foreseen to travel to Hungary, as well as one representative from the project team.

The initial date agreed for the meeting was May 2020, however, following the Covid-19 pandemic and lock-down measures, the date had to be postponed three times:

[60] At the initial stages at least, as later the meetings had to be organised online.

[61] Croatian Institute of Public Health.

first to June 2021, then to (21st and 22nd) October 2022, and at last to (1st and 2nd) December 2020.

The delays on Task 1 data collection also had some repercussions on the organisation of the meeting, as the Austrian authorities expected the presentation of the results of Task 1 data collection to be delivered at the meeting, and the data collected on Austria to be presented in that instance.

In November 2021 the preparation from the Hungarian colleagues was almost completed and the list of participants identified. However, issues with the Austrian experts (AGES) subcontract emerged, and halted the preparation of the foreseen event62.

Given that it was not possible to solve the contractual issues mentioned above, the meeting could not take place in the end. Also, similarly to what happened with Croatia, the timing of the events described above, and the specificity of the topic didn’t allow the project team to reorganise a new meeting with an alternative European country.

The Hungarian authorities were invited to participate to the Twinning Action between Malta and France, but they declined the invitation.

The remaining activities that took place (Workshop with the Greek authorities, and Twinning Action between the Maltese and French authorities) are described in the following sections.

7.1.6 Online meetings instead of physical ones

As mentioned above, the meetings were originally planned as face-to-face events, to be organised in the host countries. However, due to the COVID-19 pandemic and subsequent restrictions, these meetings were moved to an online format, in agreement with the national authorities and with HaDEA.

All meetings were organised on MS Teams. The study team prepared guidance to use the online tool which were provided to the participants with sufficient time ahead of the online events. Besides, in order to avoid issues or delays during the event, drop-in sessions were organised 1-3 days before for each event, in order to check with participants their connections and MS Teams functionalities.

The discussion time was adjusted in each event to allow a greater space for discussion. The events were recorded for note taking purpose, and in order to avoid fatigue and increase engagement, each event included one or two breaks in the form of coffee break and/or lunch breaks.

7.2 Workshop: Greece

7.2.1 Organising the workshop

ICF and experts worked on the preparation of the workshop, carrying out background research and contacting partners and industry representative for information, to find the most relevant good practices and most relevant topics to present at the meetings. A questionnaire was sent by the Greek representatives to national stakeholders, to collect information on reformulation initiatives undertaken and issues encountered. The information collected was used to prepare the agenda for the meeting.

The Workshop was organised online on 15th January 2021. The discussion focused on:

[62] These issues related to objections by AGES to a few clauses in the subcontract with ICF.

- technical areas requiring government support for the Greek food industry to reformulate high salt, sugar and fat foods;
- actions for improving public information on HFSS foods; and
- areas where national standards could be redrafted to reduce levels of sugar, salt and fats in HFSS foods offered in public institutions.

7.2.1.1 Workshop summary

The Greek Ministry of health representative presented the context of non-communicable diseases (NCDs) in Greece, and its connection with food reformulation. The Greek representative provided the EU policy background of food reformulation and presented the Greek National Action Plan on Food Reformulation and its main objective - the reduction in content of salt, trans fatty acids and added sugars. The Ministry representative then presented the types of actions that could be taken regarding food reformulation.

Before the approval of the Action Plan, Greece had already in place:

- a Strategy for Salt Reduction (Hellenic food Authority), which was illustrated later in the Workshop;
- decisions of the Supreme Chemical Council of the State, about the minimum content on artificial sweeteners, non-alcoholic beverages, and maximum content of trans fatty acids; and
- national legislation on Nutritional Standards for specific foods offered in schools, nurseries.

Regarding public awareness the following actions were undertaken:

- a leaflet to inform in primary health care settings on salt content; and
- recommendations for school preferred foods, with less sugar, salt and fats for children.

In Greece the food industry had already engaged in actions such as salt reduction (in cheese, cured meats, bread), sugar reduction (in dairy products, bread, biscuits, soft drinks, juices), sugar elimination (in packaged bread and soft drinks), fat reduction actions (Total fat and SFA reduction and elimination of trans fat) and other actions. However, they encountered difficulties in reformulation; these were in particular: changes in food taste in products reformulated; initially some technical issues with reducing salt in bread. On the contrary, some of the actions undertaken were successful:

- experience R&D;
- cooperation between industry and universities;
- gradual reductions of salt and sugar in certain products was undertaken to maintain consumer acceptance;
- education of consumers, actions on consumer's awareness of healthier products;
- promotion of healthier options of products within the portfolio of a company; and
- introducing new recipes of reformulated products to be as close as possible to the taste consumers are looking for.

The main issues discussed in Greece with regard to reformulation have been the following:

- tools to collect food data information;

- identification of foods and/or nutrients that need to be reformulated or further reformulated;
- setting targets and if these should be voluntary or mandatory;
- SMEs involvement; and
- monitoring systems.

The Ministry of Health also noted that there were difficulties in reformulating traditional foods.

The most important risk factors contributing to death and disability rates in Greece – except for tobacco – are high blood pressure and dietary risks. High prevalence of hypertension has been identified in the two national diet surveys as a national health problem. Food intake of products high in nutrients of concern/interest has been regarded as a major risk factor, although not the only one. Various studies showed that salt intake among the Greek population was high, and perceptions of salt being bad were low. A survey also found that Greeks do not read the label information on products.

The Memorandum of Understanding on salt reduction and TFA elimination signed between the Hellenic Food Authority and the Hellenic Chef's club was presented as a success story. The Hellenic Food Authority also provides a guide for herbs as a substitute of salt; it was reported that a reduction of 30% of salt was achieved.

Challenges were identified by the Hellenic Food Authority in further salt reduction. Some industry stakeholders noted that technological constraints impede further salt reduction. However, solutions have been found to this. The food industry feared that reduced salt content in products would be rejected by the consumers. There were also doubts among the food industry and the public about scientific evidence, casted by scientific articles using flawed methodologies. But there are actions that have been successful (for example on Trans Fatty Acids).

The Federation of Hellenic Food Industries presented their views and action taken on food reformulation; a holistic approach to monitor and participate in the relevant EU actions was promoted, and voluntary actions taken. They started to monitor the progress of Greek industry in reduction of salts, sugars and saturated fats and on portions reduction and control. The development of new products was also achieved, with improved nutritional profile (between 2010-2018) for almost 600 products.

The EUREMO experts presented aspects that are important to consider in carrying reformulation: technological requirements, perceptions of consumers. Regarding the latter, three important aspects were underlined: good taste, texture, perception of the product taste by consumers. The involvement of industry and retailers was also mentioned in setting reformulation strategies (e.g. target values).

In achieving reformulation, the project team emphasised that cooperation and coordination between science, industry and government is also important. Some nutrients are harder to reformulate than others, and this should be taken into account when setting targets. Examples of existing guidelines and tools for the food industry were provided.[63]

[63] Sugar reduction: achieving the 20% https://www.gov.uk/government/publications/sugar-reduction-achieving-the-20; Food and Drink Federation's Reformulation Guide - Spotlight on Sugars Small and medium sizes enterprises Toolkit, IGD UK https://www.igd.com/social-impact/health/reformulation; Scottish Food and Drink Federation's Reformulation for Health Guidance for SMEs; German "Lebensmittelverband" https://www.lebensmittelverband.de/de/lebensmittel/inhaltsstoffe/reformulierung-reduktion; Food Drink Europe Product formulation & innovation https://www.eatandlivewell.eu/product-formulation-and-innovation/.

The project team presented ways to tackle obesity and particularly childhood obesity through reformulation. Actions to address overweight are mentioned in the European Food and Nutrition Action Plan 2015-2020: e.g., food reformulation, fiscal measures, nutrient labelling, marketing of food and non-alcoholic beverages. Further reformulation initiatives are present all over the world and various approaches and measures (government-led to voluntary agreements, use of limits, or logo) were used.

An example of how sugar intake reduction has been achieved in the UK was presented. Within the UK's Public Health England (PHE) guidelines, nine categories were developed that affect children's sugar intake. Another example in the UK is the tax on sugar beverages, which achieved good results. As a consequence, the intake of sugar by adolescents by reduced by 17%. Besides 70% of beverages products in the market are now low-calorie or non-caloric drinks, reducing the sugar intake even further. Changes in consumers' behaviour was also achieved in the non-alcoholic beverage market.

The EUREMO experts introduced the EU Health Claims regulation and the approved nutrition claims. THE EU Health Claims regulation establishes that in order to use reductio claims, at least the reformulated product must contain 30% less than similar non-reduced (nutrient) food products. This has been regarded as problematic by industry and national authorities.

7.2.1.2 Discussions

The Greek Ministry of Health noted the need for surveys on market shares, and on people's consumption. Hence, integrating consumers in the conversations and actions is key. For example, consumers are not educated on labels, and little has been done around that. If a new regulation is put in place, it needs to ensure that the consumers can understand the new rules put in place.

The Greek food industry opposed to the idea of taxes, but supported other actions.

The discussion followed on reformulation of Products of defined origin (e.g., feta) as they have to have some characteristics, e.g. feta has to have specific fat and moisture. However, the EUREMO project team mentioned that salt cold be reduced.

In view of the EUREMO project team Greece is working towards food reformulation however more support to SMEs would be beneficial, especially regarding technical aspects. This support could be by funding research.

7.2.2 Outcomes of the workshops

The Workshop discussion focused on: technical aspects requiring government support in order for the Greek food industry to reformulate products, especially SMEs. Examples of approaches and possible solution were presented in the Workshop, to support SMEs. One of the objectives of the discussion was also to make them aware of the support available and the existing examples of successful actions.

It was considered important that Greece keeps focusing on actions that can improve public information on HFSS foods, (population education campaigns) and on front of package labelling (public awareness campaigns). There are also areas where the national standards can be redrafted, to reduce levels of sugar, salt and fats in HFSS foods offered in public schools.

The nutrient priority in the Greek National Action Plan for reformulation were salt, added sugars, saturated fats and trans fats, however more data is needed to check what foods are the biggest contributors to these nutrients.

7.2.3 Feedback on the workshop

Following the organisation of the workshop, the Greek authorities carried out a short questionnaire with the participants to assess the Workshop. All responding participants evaluated the workshop as satisfactory or very satisfactory, highlighting that the workshop allowed them to exchange of substantial information. The material presented was considered by the participants as clear; participants also appreciated the answers to their questions. Participants welcomed the diversity of attendees to the workshop, which included public bodies, universities and food industry. These discussions indicated that co-responsible bodies are aware and willing to cooperate.

The respondents mentioned that it was relevant and helpful that the presentations and discussions covered an extensive range of food reformulation issues and actions already taken by the Greek food industry. Besides, they valued the examples of measures and practices implemented in other countries.

7.3 Twinning action: Malta - France

The EUREMO project team organised a number of conversations with the Maltese authorities to discuss the scope and objectives of the meeting. Upon request, the French colleagues offered to provide their expertise to the Maltese authorities, so the meeting could be organised. Given that the event was meant to build upon Task 1 results, it was the last one to be organised, on 28 January 2022. The one-day event was divided in two sessions, one in the morning and one int the afternoon.

The topic selected for the Twining Action was the following: effective strategies for achieving reformulation for salt, sugar and fat, especially within small- and medium-size enterprises and local food producers.

7.3.1 Morning session summary

A representative from the Maltese Health promotion and disease prevention presented the results from the National Food consumption Survey on dietary habits done with the Maltese population. The purpose of carrying out this survey was to develop tailored national diet guidelines through the identification of the types and amounts of food consumed, and to explore the nutritional content and quality of food in Malta. The method used was a 24-hour dietary recall in targeted population using the Maltese version of the Globodiet software[64] to collect data on all food and beverages intake for one day. Training was provided by the Lyon International agency for cancer, for the Maltese colleagues (National food consumption team). The database built with the results of the above-mentioned survey includes food recipe description and quantification. The results of the survey were presented at the meeting, and the conclusions were that sugar intake was high, vegetables consumption and fibre intake were low, and there is potential to reduce fat intake among the Maltese population. These results prompted two voluntary reformulation initiatives: one focusing on the reduction of salt in Maltese bread (Maltese Hobza); and a second initiative focusing on reformulation of yogurt for children.

The EUREMO project team presented the methodology and tasks undertaken as part of Task 1 and provided preliminary results of the filed work undertaken in Malta. The project team explained that the outputs of Task 1 would be a database of products which will allow for comparison with previous and future work on.

A brief discussion followed about product health claims in Malta and it was asked whether the developed tool (data collection app) would be available for future use

[64] International computerised 24 h dietary recall method developed at the International Agency for Research on Cancer (IARC), WHO. It is a computerised tool for detailed recall of all items a person has eaten and drunk during the previous 24 hours. This instrument was developed and is maintained by IARC, WHO. GloboDiet is the only available software package that has been constructed to provide standardized individual food consumption data for adults in different European populations. GloboDiet enables the description and quantification of all items consumed, selected from 1500–3000 foods and 150–450 recipe ingredients specific to each country. The software automatically codes food items and recipe ingredients and calculates nutrient intake.

(future field research). It was clarified by the EUREMO project team that the data collection app is not a deliverable of the project.

Monitoring of salt, sugar, fat content

The French Observatory of Food Quality (within the remit of the Ministry of Agriculture, Health and Consumer Affairs) presented the 'Oqali' tool, which is used to monitor processed food quality and follow nutritional changes over time in France. The tool was created in collaboration with manufacturers and retailers, and it was established to facilitate data collection. Similar to the methodology used in Task 1 of the EUREMO project, the monitoring system collects data available on the products' package. The French Observatory of Food Quality analysed the data to produce studies on specific food sectors and other thematic studies. Results showed a significant amount of product renewal between the different monitoring exercises. For example, the results showed a decrease in saturated fatty acid content between 2009 and 2011, showing that products have been reformulated, and important removal of processed products. The results also showed an evolution on the nutritional composition on products, although limited to some products. It was considered that the product changes had a significant impact on nutrients intake.

The French Observatory of Food Quality also mentioned that 'Oqali' had been useful to determine thresholds. Furthermore, products using Nutri-score have been monitored since 2018. They mentioned that they would produce a study comparing products using Nutri-score and those that do not, to assess the impact of Nutri-score on the food offer.

Food Reformulation Strategy: collective agreements of voluntary commitments (focus on sugars), front-of-pack nutrition labelling

A representative from the French Ministry of Food and Agriculture, Food policy office presented the objectives of the National Programme on Food and Nutrition (2019), as well as the Food Reformulation Strategy. The former has been in place for 5 years and seeks to: decrease the burden of chronic disease and promote the use of good food choices favouring consumers' good health; to reduce inequalities and promote inclusive food supply and enhance the French gastronomy.

The National Programme includes two plans: the Food National Programme (FNP 3) and the Nutrition and Health National Programme (PNNS 4). The FNP 3 is led by the Ministry of Agriculture and Food and seeks to promote healthy and sustainable diets. It is based on incentivising policies for the agri-food sector focusing on three axes: social justice, reducing food waste and food education and two levels, collective catering and territorial food projects. The PNNS 4 focuses on improving health of the population through promoting physical activity and healthy diets. It also includes actions to: improve food dietary behaviours, reduce social health inequalities, reduce sedentarism and increase physical activities.

The food reformulation strategy in France comprises a set of different measures to encourage food reformulation and the improvement of the food supply quality. Fiscal policies (on sweetened beverages), information to consumers on innovation and improvement of products (Nutri-score), and collective agreements with voluntary commitments (agreements with food industry operators). The representative from the French Ministry of Food and Agriculture underlined that an evaluation of these agreements showed that these were not ambitious enough to observe a noticeable impact on the quality of the food offer, they recommended and have more ambitious goals.

Another representative from the Ministry of health, Food and nutrition office, further explained that the **Collective Agreements** included the signature of 37 nutritional charters (2008-2016) and six collective agreements (2013-2016). These improved the food quality offer, but with insufficient results; therefore, a Parliamentary inquiry report was produced recommending to pass a law to set targets in the content of priority nutrients (sugar, salt, saturated and trans fat), by food category. The result was a Roadmap of the General State of Food. A collective agreement based on scientific expertise from the French Agency for Food Environment and Occupational Health & Safety (ANSES) was adopted, with two complementary objectives: to improve nutritional quality, and promoting the food sector sustainability. The agreements have different signatories representing more than 80% of the market share for a food category. The agreements include commitments with professionals, inter-professional organisations, and big food producers.

Regarding the improvement of food nutritional quality, the signatories are engaged based on the thresholds set by ANSES in at least one of the nutrients, they have to choose a threshold that is ambitious enough, and must include at least 5% decrease (for bad nutrients) or increase (for good nutrients). There cannot be a compensation with other unfavourable nutrient additives. Regarding sustainability, these commitments include the option to promote of the sustainability of food sector (e.g., organic label, fair trade, etc). Furthermore, a mid-term and final external evaluation of the agreements will be carried out. If the assessment is negative, regulatory measures will be considered.

A good example in France has been bread reformulation. France authorities committed to achieve WHO recommendations to reduce salt consumption in 30% by 2025. To achieve this, a new collective agreement was signed with professionals from the bakery sector. The aim is to progressively reduce salt content in various types of bread, and to include all professionals from the sector: artesian, bakers, industrial bakeries, millers, and distributors.

Front-of pack nutrition labelling (Nutri-score)

In a presentation on Nutri-score, a summary graded color-coded to explain nutritional quality of foods, it was explained that it provides consumers with easy and quick information on the nutritional content of food. Nutri-score has been validated by different studies as effective in discriminating food products, and as a good tool to encourage innovation and reformulation to improve nutritional quality.

Nutri-score implementation is monitored by the Oqali team. The impact of Nutri-score on the nutritional content is assessed, however results are on available for now, as the data collecting process is ongoing. A 3-year assessment report published in February 2021 shows and increase of food operators committing to using Nutri-score. Other European countries (e.g., Belgium, Germany, Spain, Switzerland) also apply the Nutri-score and France is cooperating with those countries to support the implementation.

Discussion

A question was posed by the EUREMO project team, to steer discussion. It was asked what the consequences are if food operators do not respect the agreements. Representatives from the French Government explained that, if results from audits showed negative outcomes, the corresponding authority will request operators to provide compensatory measures; if insufficient the authority will publish a decision if not sufficient the agreement is cancelled and communicated.

A Maltese government representative was interested on measuring impact of the different national actions. The French government representative mentioned that measuring impact was challenging, that's why in France chose to focus on measuring progress towards the achievement of the 5% rule looking at intake, instead of looking at the health impacts per se.

A Maltese government representative asked if the agreements have prompted food reformulation. A representative from the French National Food Safety National Agency clarified that results show that many new products are present in the market, however it is hard to determine if the changes are attributable to the Agreements.

The Maltese government representative recognised that in small countries like Malta many products come from oversees and asked about the feasibility of including importers in such agreements. The French representative noted the difficulties in reaching overseas producers and mentioned that the agreements in France were concluded with French producers.

The French representatives asked how salt reduction in bread was achieved in Malta. The Maltese representative explained that reformulation was initiated by some local producers and then other bakeries joined the initiative. The bakery sector made progressive changes over time, and this ensured consumers' acceptance of the new products. It was underlined that the progressive changes help to educate people.

The EUREMO project teams asked the French officials to explain how the process of engaging food producers in discussions was, especially with small producers. A French representative explained that small producers in France are organised in unions, and SMEs receive guidelines from these organisations. However, it was acknowledged that reaching to small producers was a difficult task. Progressive changes in products were considered as very important; the three-year roadmap agreement established different thresholds over time, in order to have small impact on taste.

An issue raised by a French representative was the fear of some producers have to reformulate, while others believe there is no demand. Some producers decide to reformulate, but to not communicate it to consumers.

The Maltese representatives mentioned that collective agreements may solve these problems, and pointed out that when reformulation happens in the majority of the market, then other food operators are pushed to make an effort.

It was asked to the Maltese representatives what foods would be the targeted in the Maltese market. They explained that the next steps will be to target sugar reduction in local products (possibly). The main focus will also be to educate the general population on healthy diets and healthy habits.

7.3.2 Afternoon session summary

The afternoon session was attended by the Maltese representatives, French representatives, HaDEA, a large French food producer, and the Maltese food industry. The focus of this session was to provide advice to improve the nutrient content of food products.

The representative from the French industry gave some tips to achieve nutritional goals. This approach focused on five steps and advise were presented for each of them: companies need to know where they stand, to start their reformulation. This starts by building a database with all their products and competitors' products. Monitor what is going to be done and set monitor periods is necessary, as well as setting clear achievable goals. Reformulation is an internal team effort, which means working in parallel with marketing and operation teams. Marketing is important as it is needed to explain and communicate changes to consumers, as well as engaging with external stakeholders (suppliers, academia, experts).

When resources are available it is important that companies listen to the consumer. A step-by-step approach was also recommended, as consumers need time to adapt to reformulated products.

7.3.2.1 Discussion

A few questions were prepared by the Maltese authorities, to steer the discussion:

<u>Questions for the French industry presentative</u>:

- What marketing strategies are effective in ensuring that reformulation does not negatively affect sales?

- What steps need to be taken in preparation for initiating and implementing reformulation?

<u>Questions for the Maltese industry representative</u>:

- Are there any experiences on reformulation that you would like to share?
- What challenges do we face in Malta within the food and beverage industry to start reformulation and health improvement of food products?
- What support do you need to start reformulation of products?

A Maltese authority representative asked to the French industry representative about the reaction of consumers to one reformulated product in different countries. They wanted to know whether consumers reacted differently (acceptance/rejection). The Maltese authority also asked if any analysis of the consumers purchasing behaviours was done (e.g. consumers moving to other brands). The French food producer representative explained that this type of analysis is not undertaken. The results in different products are purely based on observation.

A French authority representative asked what the proportion of reformulated food product was to comply with Nutri-score. The French industry explained that there were a few products that needed to be reformulated according to Nutri-score. It was clarified that before adopting Nutri-score their company had used another quality score, which was not very different, so the impact of adopting Nutri-score was not very big.

The EUREMO project team asked if industry participants from Malta would like to explain any difficulties they experience in reformulation.

A Maltese food and beverages industry representative mentioned that in their experience, the technical expertise and know-how to reformulate seems to be available in Malta among big producers. However, industry believes initiatives need to be supported by national authorities; for example, national education initiatives to promote healthier diets/ lifestyle. The Maltese food industry representative explained that in the case of soft drinks, the two large producers in Malta have committed to reduce sugar content by 10% in addition to what the parent companies are doing in terms of sugar reduction at a global level. They also mentioned that small countries with small markets would need technical assistance and financial support.

The French industry producer agreed with the Maltese food industry representative that if the demand for less sugary products does not exist, education of the general population towards healthier dietary habits is necessary. They also highlighted the importance to working with stakeholders.

A French authority representative mentioned that there has been an evolution of consumer demands regarding transparency on food content in France. Consumers are now more aware of what they are eating, they are more aware of the connection between food consumption and health.

A question was asked by the EUREMO project team to understand what have been the factors that prompted reformulation to happen, was it because consumers' consumption changed, or because reformulation has been initiated by national authorities.

The French industry representative mentioned that information on consumption is made available by national or supra-national surveys. This helps understand where consumption of certain nutrients is too high or insufficient.

A Maltese representative mentioned that the way forward in Malta is to work with producer to reformulate products, but without promoting it to the public. The Maltese authority acknowledged that this would entail a lot of work between food producers, public health authorities, etc.

The French authorities reminded that in the collective agreements SMEs are represented by professional federations/ professional unions of food business operators. Through these federations, operators can benefit from the help of other food operators, when they do not have the necessary technical skills and resources.

7.3.3 Outcomes of the twinning action

The Maltese authorities highlighted that Malta should aim to collaborate with food producers, as well with international partners in the EU on reformulation. They explained that next steps will be to target sugar reduction in local products, and to educate the general population on healthy diets and healthy habits.

7.3.4 Feedback on the Twinning action

The Maltese authorities provided their feedback on the meeting. They praised the presentations made and highlighted that the discussion gave the participants the opportunity to gather practical examples of reformulation measures from a more experienced country. However, the low attendance of industry representatives was viewed as a missed opportunity to collaborate with food producers and to introduce voluntary agreements in food reformulation. Nevertheless, they will disseminate the results of the EUREMO project to the Maltese chamber of commerce and use this opportunity to build a dialogue with industry stakeholders.

8. Scientific and technical support networks

This section presents all relevant information associated with the scientific and technical support networks under this task.

8.1 Methodology

In the context of the organisation of the Scientific and technical support networks, the EUREMO study team provided two European countries with tailored support in view of supporting their national ongoing/planned reformulation initiatives. The support was adapted to the specific needs of the MS authorities.

Interest to participates in these activities was expressed by a total or 14 MS (Austria, Belgium, Bulgaria, Croatia, Cyprus, Denmark, Estonia, Greece, Hungary, Malta, Poland, Romania, Slovenia, and Spain). This information was gathered through the survey and complemented with some follow-up interviews. In the interview process, two MS withdrew interest (Cyprus and Denmark).

8.1.1 Objectives

The support networks started in November 2019 and lasted until May 2021. The project experts provided support to the National Institute of Public Health of Slovenia (NIJZ) and the National Institute of Public Health of Romania.

The objectives of these networks were to:

- Explore efficient measures to stimulating reformulation and uptake of reformulated products;
- Explore efficient measures for a better cooperation with among different stakeholders;
- Support with the implementation of reformulation initiatives. Discuss previous work on reformulation done, other relevant existing policies and initiatives to improve nutrition and health;
- Draft benchmarks for the National Reformulation Strategy;
- Facilitate knowledge sharing and assessment of good practices.

8.1.2 Selection criteria

European countries were selected on the basis of interest in exchanging experiences with other European countries and learning from others regarding reformulation initiatives. The criteria for the selection were also whether these European countries had little or no experience in reformulation initiatives and if countries had lower GDP. The shortlisted list was discussed with the WHO in view of their work conducted on food reformulation.

After assessing each country against the eligibility criteria, the following shortlist was identified: Estonia, Romania and Slovenia. The other countries were excluded as the support they sought did not fall within the scope of Task 2.3 of the Study "Scientific and technical support networks". The Estonian authorities, despite being chased multiple times, were not able to provide concrete information regarding the potential support, and were therefore excluded from this action.

Resulting from this analysis, the EUREMO team proposed Slovenia and Romania to receive the support of Technical Networks. Slovenia was selected based on the nature of the support requested (long-term support for the design and implementation of the National Action Plan on Reformulation) and thus, the potential long-term sustainability of results. In addition, the country had confirmed a political commitment from the Ministry of Health towards this initiative and proposed to provide additional funding if needed.

Romania was selected considering their demonstrated limited experience in food reformulation, low GDP and a strong interest in receiving tailored-made support, that could lead to the design and implementation of reformulation initiatives. The country confirmed a political commitment from the Ministry of Health (reported by the National Institute of Public Health).

8.1.3 Organising the scientific and technical support networks

Similarly to the Workshops and Twinning actions, organised regular bilateral conversations were organised with country authorities, to illustrate the objectives and characteristics of each activity, and to:

- discuss what types of experts might be of interest to the European country;
- agree on a proposal of dates for the event;
- discuss the format and content of the agenda;
- find possible venues and hotel accommodation options65.

Bilateral discussions were also organised with (EUROFIR and SICENSANO) experts ahead of the conversations with the European countries' authorities, and/or directly with the MS authorities, depending on the single activities. The topics to be the focus of the meetings were selected on the basis of the needs and requests of the European countries' authorities.

8.2 Slovenia

8.2.1 Setting up the network

The Slovenian authorities have over 10 years of experience in addressing food reformulation, in particular in the reduction of salt intake, promoting health education and the improvement of health status through the increase of physical activity, and developing national dietary guidelines for different target population groups. Several EU frameworks[66] guided the authorities' action in the prioritisation of food reformulation. In fact, Slovenia put in place an *Action plan for the reduction of salt,* which ran from 2010 to 2020.

Several conference calls were organised with the Slovenian authorities[67] and with the experts. The agreed objective of the Network was to support the Slovenian authorities in the development of the *National reformulation strategy 2020 – 2030*.

Given the COVID-19 pandemic and consequent travel restrictions, the two meetings were postponed at first, and then it was agreed to organise them.

To prepare for the first meeting, the Slovenian representatives sent the project team a proposal (focus of the discussion, expectations from the meeting, and participants' list), which was further developed by the project team, with the support of the experts. The Slovenian representatives also shared an updated version of the Draft National Reformulation Strategy 2020-2030, in advance of the meeting.

The first on-line meeting with Slovenia took place on 28th May 2020 and focused on presenting the background of reformulation in Slovenia, the current strategy in place and challenges and obstacles encountered. The objective of this meeting was for Slovenian officials to discuss reformulation options and experiences from other EU countries; and for the EUREMO team to present initial thoughts on the Slovenian Draft Reformulation Strategy.

The second online meeting took place on 8th December 2020 and focused on: understanding the opportunities and barriers of food reformulation in Slovenia; and

[65] At the initial stages at least, as later the meetings had to be organised online.

[66] European Food and Nutrition Action Plan 2015-2020 (World Health Organisation); EU programme on Nutrition and Health on Selected nutrients (Annex 1 and 2); Implementation of the EU framework for reducing salt intake. Result of the study by MS; Conclusions of the council of the EU on Employment, Social Policy, Health and Consumer Affairs; EU action on childhood obesity, 2010-2014. EU framework for National Initiatives on selected of nutrients;JANPA Methodology

[67] The National Institute of Public Health of Slovenia (NIJZ).

on exchanging views with the stakeholders (public authorities, NGOs and industry representatives). The objectives of the second meeting were to hear the views of stakeholders and allow them to further engage in the reformulation process.

The topics discussed were in particular: current reformulation strategies and potential adaptations to food reformulation, opportunities and obstacles encountered, and definition of national targets. More advice and suggestions were sought by the Slovenian officials to the EUREMO experts; the ICF experts shared their views in writing after the meeting.

The Slovenian representatives were satisfied with the support received by the project team and did not want to organise any additional meetings.

8.2.2 Meeting one summary - 28th May 2020

The first meeting was attended by the EUREMO project team and experts, officials from the National Institute of Public Health of Slovenia (NIJZ) and policy makers. The meeting was attended by fourteen participants.

8.2.2.1 The Slovenian Draft Reformulation Strategy

A representative from the NIJZ presented the priorities of the Draft Reformulation Strategy, which were: to set target variables to reduce the intake of priority nutrients and benchmarks for certain food categories; to identify target food groups and population groups; and to involve stakeholders in the reformulation activities.

The strategic objectives of the Strategy were: to reduce the intake of saturated fats, sugars and salt and the content of trans fats. Specific targets were set on sugar (i.e. to reduce the prevalence of population with frequent intake of sweetened beverages, sweets, and candies by 15%) and on salt (i.e. to reduce the intake of salt by 15 %). The Slovenian Action Plan was based on data coming mostly form one study: The Slovenian Menu 2018 (SI.Menu 2018), a dietary study following the EU Menu methodology. Within this study data was collected on[68] salt intake in different populational age groups. Another study also showed evidence on the salt intake of Slovenian adult population. This study used a dietary intake 24-hour recall method.

According to the project team, the Slovenian priorities should focus on benchmarking major food categories that are commonly present major sources of salt (bread and bakery products, pastry, meat products, pickled vegetables, ready to eat food, and cheese products), sugar (beverages, cakes, muffins, pastry, dairy products), and saturated fats.

Slovenian officials highlighted that key design principles to stimulate food reformulation proposed in the strategy were to:

- involve stakeholders in the reformulation activities, including a broad partnership with industry, food providers (trade, catering), local communities, media, health sector, educational institutions and universities, research organisations, consumers organisations and NGOs; and
- have an inter-ministerial working group as a steering committee;

8.2.2.2 Examples of reformulation strategies from other European countries

Experts from the project team presented interesting examples of food reformulation measures. See Table 84 below.

[68] National Institute of Public Health (2019) Various aspects of nutrition of the population of Slovenia aged 3 months to 74 years. Available at https://www.nijz.si/sl/publikacije/razlicni-vidiki-prehranjevanja-prebivalcev-slovenije

Table 84. Examples of experiences in reformulation in European countries

Country	Type of measure	Measure	Results (if available)
Finland	Voluntary agreement	**Food industry commitments towards reformatting their products**	(No information on the results presented)
	Labelling (voluntary measure)	"**Better choice" heart symbol**: To be used in products that represent the healthier choice in their category. Based on fat and salt content (sugar and fibre for some products). Used in food products and catering services.	(No information on the results presented)
	Labelling (mandatory measure)	"**Heavily salted" label**[69] Food high in salt content must be labelled Covers categories that present essential sources of salt in the Finnish population and set benchmarks.	"Very effective" in reducing salt content in several product categories (including bread, sausages)
Sweden	Labelling (voluntary measure)	**Keyhole logo**[70] **"Healthy choices made easy**" To be used in products that represent the healthier choice in their category (based on having less and healthier fat, less sugar, less salt and/or more fibre and wholegrain) This logo is also used in Denmark, Norway, Iceland, Lithuania and Macedonia.	(No information on the results presented)
Hungary	Tax[71]	**Tax on food products based on their risk for health**, covering sugar, salt and caffeine, and to be paid if the thresholds are exceeded.	The tax has driven food reformulation; 40% of companies have changed the

[69] Finish regulation: https://finlex.fi/fi/laki/alkup/2014/20141010

[70] The Keyhole: Healthy choices made easy': http://norden.diva-portal.org/smash/get/diva2:700822/FULLTEXT01.pdf

[71] Law on public health product tax: https://net.jogtar.hu/jogszabaly?docid=A1100103.TV

Country	Type of measure	Measure	Results (if available)
			recipes of their products[72]
	Standard setting	**Standards for bread** (2012) restricting the salt content	Monitored by the National Food Chain Safety Office, but no detail was presented in terms of results.
Portugal	Regulation[73]	Regulatory restrictions of the amount of salt in bread	Recently the Portuguese Bakery Association signed an agreement with the Ministry of Health to reduce salt content in bread
Denmark	Labelling	Danish Wholegrain logo, which indicates a high whole grain content and low fat, sugar and salt content.	(No information on the results presented)
UK	Guideline	2017 Public Health England's technical guidelines for the food industry on sugar reduction – which focused on sugar reduction and included nine broad food categories that are the key contributors to the sugar intake among children. This programme aimed to achieve 20% reduction of all these products by 2020.	(No information on the results presented)

Key to all initiatives was to define targets that are well monitored, including short- and long-term targets.

[72] Good practice brief – public health product tax in Hungary: http://www.euro.who.int/__data/assets/pdf_file/0004/287095/Good-practice-brief-public-health-product-tax-in-hungary.pdf?ua=1. Assessment of the impact of a public health product tax - Hungary (published in 2016, impact assessment conducted in 2014): http://www.euro.who.int/en/countries/hungary/publications/assessment-of-the-impact-of-a-public-health-product-tax-hungary-2016

[73] PT legislation establishing Salt limits in bread: https://dre.pt/pesquisa/-/search/493513/details/maximized

A detailed presentation on different front packaging labelling (FOPL) experiences in other countries was delivered by the project team (e.g. Nutri-score), and a comparison of these initiatives was provided. However, the presenters noted the lack of studies showing results on the impacts of FOPL.

8.2.2.3 EUREMO experts' comments on the Draft Reformulation Strategy

The expectations of the Slovenian authorities in the strategy were to: set goals, target values, benchmarks on the prioritised nutrients and to achieve proper stakeholder communication and engagement, and to understand the methodology for a monitoring system. If a national monitoring system cannot be put in place, the authorities could rely on EU initiatives, for example the monitoring system designed in Task 1 of the EUREMO study, as well as other EU initiatives (e.g. JANPA, Best RE-Map).

The EUREMO experts noted that the current draft of the Reformulation Strategy did not include sufficient level of detail on the monitoring and evaluation of the strategy. The experts highlighted that monitoring is a key aspect that needs to be addressed and further developed; they indicated that Slovenia should focus on creating benchmarks and key performance indicators (KPIs). The national dietary survey was regarded as an option; however, it was recommended to carry out similar surveys more frequently.

- The Slovenian authorities also need to ensure that there is regular funding/support from the government on this aspect (e.g. the French Oqali database, provides an ongoing monitoring). The methodology used in the EUREMO project can be a starting point for the monitoring system.
- Regarding the population groups to focus on, it was suggested to follow the successful example of other countries. For example, in Canada, toddlers are the focus group. This could be done in Slovenia as well and include limiting advertisement for kids.
- The Slovenian authorities underlined that labelling is important for Slovenia, although the industry has not been very supportive of front of packaging labelling. The National Programme on Nutrition and Health Enhancing Physical Activity 2015-2025 includes a scheme for easier recognition and choice of healthy foods. The national project addresses additional voluntary food labelling at the national level, namely the establishment of criteria for such a scheme.
- Regarding benchmarking, examples from the UK and other successful examples were indicated as a useful starting point.

8.2.2.4 Following steps

Slovenia shared the revised Draft Reformulation Strategy for the EUREMO project experts to work on. The experts provided comments and suggested the topics that should be addressed in the discussion: key population groups, monitoring, key food groups, stakeholder experiences, benchmarking and target values withing the Strategy. Following check-ups were settled and the EUREMO experts developed a concept note for the second meeting organised within this network.

8.2.3 Meeting two summary - 08th December 2020

The meeting was attended by 40 participants including different Slovenian institutions such as the Ministry of Heath, Ministry of Agriculture, Forestry and Food, and the National Institute of Public Health (NIJZ). Representatives from the food industry, consumer associations, research organisations and the EUREMO project team experts.

The Slovenian Ministry of Health highlighted that increasing levels obesity need an urgent response in Slovenia. The second National Health Programme (2015-2025) includes strategic objectives related to food reformulation, aimed at reducing obesity and overweight, by reducing the intake of saturated fats and trans fats, sugars and salt (the trans fats were the object of a regulation from 2018 setting the limits in food).

The NIJZ, presented a brief overview of activities carried out in Slovenia in the field of food reformulation since 2016, and illustrated the draft National Reformulation Strategy and data on dietary intakes of selected nutrients (salt, sugars and fats). The NIJZ pointed out that to achieve the objectives of the National Health Programme, it would be important to understand the advantages/opportunities and obstacles that stakeholders may have.

To gather the information from various stakeholders a questionnaire was send a few days in advance of the workshop to the participants. The results of the survey were presented during the workshop.

8.2.3.1 Learnings from reformulation

The EUREMO project team presented aspects to consider in carrying reformulation: technological requirements and perceptions of consumers. Regarding the latter, three important aspects were underlined: good taste, texture, liking the product enough to try it again or recommend it. The involvement of industry and retailers was also underlined in setting reformulation strategies (e.g. setting target values).

In achieving reformulation, the EUREMO project team emphasised that cooperation and coordination between science, industry and government is important. Some nutrients are harder to reformulate than others, and this should be taken into account when setting targets. Examples of existing guidelines and tools for the food industry were provided.[74]

The project team presented ways to tackle obesity and particularly childhood obesity through reformulation. EU-level actions to address overweight were mentioned, from the European Food and Nutrition Action Plan 2015-2020 (food reformulation, fiscal measures, nutrient labelling, marketing of food and non-alcoholic beverages). Further reformulation initiatives were presented, from non-EU countries, using different approaches and measures (e.g., government-led to voluntary agreements, use of limits, or logos).

The UK initiative *'2017 Public Health England's technical guidelines for the food industry on sugar reduction'* was presented, which led to sugar intake reduction among consumers. After the measure was introduced, the UK food industry had three choices: food reformulation, reduction of portion size/calories or influencing consumer behaviour towards healthier alternatives.

Another example from the UK was the tax on sugar beverages, which led to a 17% reduction in the intake of sugar amongst adolescents. Furthermore, 70% of beverage products in the market are now low-calorie or non-caloric drink, which allowed to reduce sugar intake even further. However, the tax did not affect the size of the market of non-alcoholic beverages, which remained the same as producer created less sugary alternatives.

[74] Public Health England (2017) Sugar reduction: achieving the 20%, available at: https://www.gov.uk/government/publications/sugar-reduction-achieving-the-20; Food and Drink Federation's Reformulation Guide - Spotlight on Sugars Small and medium sizes enterprises Toolkit, IGD UK https://www.igd.com/social-impact/health/reformulation; Scottish Food and Drink Federation's Reformulation for Health Guidance for SMEs; German "Lebensmittelverband", available at: https://www.lebensmittelverband.de/de/lebensmittel/inhaltsstoffe/reformulierung-reduktion; Food Drink Europe Product formulation & innovation, available at: https://www.eatandlivewell.eu/product-formulation-and-innovation/.

It was noted that when extending reformulation to other categories of food, more technical problems are expected. Research shows that price differences must be of at least 20% to be economically sensitive to consumers.

The Slovenian authorities expressed concerns on the tax example in the UK, adding that this approach was experimented in Slovenia, but it was not well accepted by industry.

8.2.3.2 EU legal context of claims

The EUREMO experts introduced the background of the EU Regulation on Nutrition and Health Claims [75] . This EU Regulation was passed due to an increase in the number of nutrition and health claims made on foods at the time.

In annex to this Regulation, possible claims are listed, as well as the conditions to apply them. The regulation requires that, in order to apply such claims, the reduction must be of 30% for a given nutrient.

Some participants noted that this makes is difficult for food producers to highlight progress.

A discussion followed on solutions that industry can use to show reformulation efforts and gradual reduction of specific nutrients; an example mentioned was the use of logos to show that the food producer is reformulating a product.

The above-mentioned EU regulation includes nutritional profiles and defines their intended use. However, it was noted that there are some misunderstandings of what these nutritional profiles are and how they could be used. The purpose of this regulation is to inform consumers of good and bad foods (i.e. those with high content on certain nutrients: fat, salt, sugar); the latter cannot have health claims.

8.2.3.3 Discussion on reformulation

The EUREMO experts introduced a series of questions of to steer the discussion:

- Which nutrients should be the focus of reformulation? What are the advantages, disadvantages, opportunities and risks?
- What options exist to decrease intake? Reformulation, taxes/subsidies, labelling, education - What else?
- Which foods should be reformulated?
- How to set targets for reduction in nutrient levels?
- How should progress be measured?
- For all questions it was asked to consider: what criteria/data/information the participants would base their decisions on; what the role of the government and/or industry should be; and whether the actions should be mandatory or co- or self-regulation.

Representatives from the Slovenian food industry noted the success in reformulating soft drinks, thanks to the goals set in the National Strategy they achieved reduction in sugar for soft drinks. Following, goals were set for dairy products, and finally the salt content in bakery products was reduced.

The food industry noted that labelling process is an issue; also, they rejected taxation. However, they were in favour of a transparent food reformulation, carried out step by step in collaboration with the government.

[75] Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods, available at: https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32006R1924 .

The NIJZ noted that food reformulation could be promising for certain food categories, but not for all (e.g., for ultra-processed foods). In their view, the focus for Slovenia should be in food reformulation of products that are consumed in high quantity by the population. They noted that for that for each priority nutrient, food categories should also be identified, hence those food categories that are highly consumed by the population. This last statement was also supported by the Slovenian Nutrition Institute.

The Slovenian Nutrition Institute also showed data on the reformulation progress of the beverage drinks, showing that most beverages decreased the content of sugar in recent years, but less in the last decade. Besides, increases of still water and energy drink consumption was noted.

The EUREMO experts continued to discuss target values and the importance to monitor progress in reformulation towards those targets. Target values should also consider the context and be adjusted to it. Monitoring progress allows to identify what areas to focus on.

Consumer preferences have been studied in Slovenia; results show that consumers find it difficult to identify healthy choices, or are confused by the information provided (e.g., labels), and perceive reformulation as advertising. Prices and taste are still important decision-making factors.

The Ministry of Agriculture, Forestry and Food noted that coordination of messages is very important. Also, the Steering group at the Ministry of Health was mentioned, which includes all stakeholders in the field of reformulation, which could coordinate communication activities.

A research institution explained that results from inhouse-conducted research show that consumers are a very heterogeneous group, some are actively reaching for products with a changed composition, while some do not care. In a published review a stepwise approach to reformulation was suggested, together with education and communication to raise consumers' awareness.

To support this, the Nutrition Institute noted that results from research conducted showed that 40% of Slovenian consumers do not find sugar or salt content important.

A step-by-step approach was also supported by a cereal food producer and a representative of the soft-drink industry; sugar gradual reduction instead of a substitution with sweeteners was preferred, as the latter were not likely to be accepted by Slovenian consumers. Some producers mentioned that they would rather not declare gradual reductions ("silent reformulation") as they do not want consumer to pay attention to it.

8.2.3.4 Conclusions

It was concluded that, to be successful, food reformulation should be done in cooperation with all stakeholders, including food producers.

In addition to focusing on the categories that contribute the most to the intake of individual nutrients, particular importance should be given to foods for which a particular nutrient can be reduced relatively easily, such as sugar in soft drinks. It was also noted that, in guiding reformulation, it is necessary to consider for which nutrient and in which categories of food the most gain can be obtained, to quantify this gain and thus deciding which foods to reformulate. The project team mentioned that the DALY[76] could be used to make this calculation and to support decisions.

[76] The disability-adjusted life year, a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death.

It was mentioned by the food industry representatives that cooperation with the Ministry of Health and the NIJZ has long been established, and that the main contributors to sugar intake have been determined; voluntary commitments were based on this.

8.2.4 Outcomes of the meetings

It was concluded that Slovenia needs to develop a strategy that is focused and is tailored to the national context. The Slovenian Representatives mentioned that they have data to support national decisions. The project team pointed out that Slovenia can further answer the question of which foods to reformulate by:

- setting specific objectives and knowing how to measure progress; progress can be measured on the basis of available data;
- looking at studies that run regularly and at EU projects in place; and
- following the developments at the EU level (e.g., High Level Group on nutrition progress monitoring mechanism).

EUREMO experts also noted that successful monitoring of progress in reformulation includes good cooperation with industry, which provides regular information on food composition.

Different sources for monitoring were mentioned:

- OPEN: national food composition database (some data are missing on micronutrients in individual food categories)
- CLAS database: declared nutrient content of prepacked foods.
- Reformulation is currently commercially driven and smaller producers are usually less innovative than multinationals. It is therefore important to analyse the Slovenian market (e.g., the composition of food) to understand where Slovenia stands, and where to focus on. The EUREMO experts acknowledged that reviewing the food market situation is a difficult task.

The support offered through the Support Network and the discussions had in the different meetings were by used the NIJZ to prepare the next steps in their national reformulation strategy. Further suggestions were provided in writing by the EUREMO experts after the meeting.

The project team recommended that Slovenia should focus on products high in fat, sugary and salt. Trans fat is covered by EU-Regulation but help to industry in trans fat replacements may be needed. Regarding the products to focus, the EUREMO experts recommended to firstly focus on liquid-based foods, as the sugar could be removed and replaced with intense sweeteners and water. They regarded yogurts and gel-based foods more difficult to reformulate. They also noted that the Slovenia strategy should focus on easy wins; for example, targeting sugar reduction in high sugar confectionary, breakfast cereals, sweet bread-based snack, jams. In general, they recommended those cases where substitution of sugar or/and fat could be done with fibre.

In setting targets the EUREMO experts recommended more research on consumption data and compare consumption/intake levels to recommendations. The focus should be on those products consumed by targeted individuals and to check acceptable levels.

The EUREMO project team also pointed that support to meet the Nutrition and Health Claims Regulation might be needed. They also recommended the use of front of packaging labelling (e.g. Nutri-score) to identify and communicate reformulation).

8.2.5 Feedback on the scientific and technical support network

Feedback from National Institute of Public Health from Slovenia highlighted the valuable expertise, experiences, lessons learned of the experts involved in this scientific and technical support network. Discussions on the situation in Slovenia helped guiding the focus towards a tailored national approach.

Following the organisation of the Scientific and technical support network, the Slovenian authorities carried out a questionnaire with the participants. The event helped them gather stakeholder to discuss and collect comments that would guide the preparation of the new Slovenian National Reformulation Plan. The results from this questionnaire can be found in Annex 2. The questionnaire also addressed the different options/processes to implement reformulation efforts, such as setting nutrient targets, monitoring process. The questionnaire also addressed the consumer perceptions and additional measures to support reformulation (labelling, taxes, etc. Finally, stakeholders were asked whether they would be interested in being involved in the preparation of a new national plan.

8.3 Romania

8.3.1 Setting up the network

European Union efforts have (funding activities, publishing frameworks on selected nutrients and regulations) prompted food reformulation in Romania. Romania has participated, and is currently participating, in EU-level activities (JANPA, EUREMO, Best-REMAP) aiming to monitor the Romanian retail food marked and reformulated products. The Romania authorities have been active in encouraging national/local food industry in to get involved in reformulation, however they highlighted this is one of their biggest difficulties and therefore priority.

Agreements on food reformulation (salt and sugar reduction) were signed between the authorities and the Romanian food industry. This took the form of a voluntary protocol, that was signed in 2010 (and lasted until 2017). However, in practice, evaluations have shown that this protocol did not achieve its intended purposes. Although several companies took action, they represent only a minority of the Romanian food industry.

The Romanian authorities highlighted the difficulties in reformulating traditional products that sometimes are protected (e.g., Traditional Speciality guaranteed (TSG) highlights the traditional aspects, such as the way the product is made or its composition)

Several conference calls were organised between the project team and the Romanian authorities, to agree on the need for support and specific objectives. Given the COVID-19 emergency, the Romanian representatives asked to suspend the organisation of the physical meeting. Discussions were initially put on hold and the meetings had to be postponed several times. An agreement was then reached to organise the meetings online, which took place in October 2020 and May 2021.

As anticipated by the Romanian authorities, the main issue encountered within this Support Network was the involvement of the Romanian SMEs. Notwithstanding the multiple efforts made both by the authorities and the EUREMO project team, it was not possible to involve the Romanian SMEs in the discussions. However, the project team was able to secure presentations and discussions around good examples of reformulation of traditional products and examples of initiatives involving SMEs.

8.3.2 First online Meeting - 22nd October 2020

The meeting was attended by 40 participants from different Romanian institutions, such as the National Institute of Public Health (NIPH), the Ministry of Health and the Ministry of Agriculture. Research organisations, representatives from the industry attended as well.

The first meeting focused on understanding the needs of Romania and exploring basic design principles behind developing a national reformulation plan for the country. The meeting included presentations, a joint discussion with technical experts, Ministry officials and stakeholders (industry representatives and researchers), to help the EUREMO experts understand the Romanian context.

A NIPH representative presented the history and concept of food reformulation. One definition of reformulation was provided: "*changing the content of nutrients in processed foods either by reducing the content of negative elements, or by increasing the content of beneficial nutrients*". This definition recommends increasing the amount of beneficial nutrients in foods such as whole grains and unsaturated fats, while reducing the high levels of 'bad' nutrients such as: sodium, saturated fats, sugar, which have a negative effect on the metabolism.

EU efforts on Food reformulation

The European Council opinions from 2014 to 2018[77] indicated that food reformulation was a mean to achieve a Healthy Europe. Romania participated in different EU Commission and Council efforts/strategies to make reformulation a priority[78]. A Romanian official presented the legal context of food reformulation in Europe, which prompted the participation of Romania in collaborative initiatives on food reformulation: three EU level projects were presented, including the current EUREMO project, and the Joint Action on Nutrition and Physical Activity 2015-2017 (JANPA). Romania is also participating in the Joint Action Best-REMAP project (2020-2024); started at the end of 2020 and the NIPH is involved on Work Package 5 – Processed Food Monitoring and Reformulation.

Romanian national experience on reformulation

The first voluntary protocol was signed by the Romanian authorities with the industry in 2010, and it focused on salt. In 2012 sugar and fats were incorporated as well. Extended until 2017, the protocol aimed to improve people's health by developing a national strategy to reduce consumption of salt, sugar, and saturated fats. This voluntary protocol included:

- setting up a coordinating working group;
- elaborating an action plan to evaluate the situation, and to educate and inform consumers on reformulation activities; and
- evaluating and monitoring of the action implemented.

Results from evaluations carried out at two moments (2011 and 2018) showed that the objectives were not achieved, with some product categories showing an increase in salt content; salt reduction was achieved on the other hand in ready-to-eat products. Education measurers didn't prove to be effective in achieving a reduction of the above-mentioned nutrients in homemade foods.

The NIPH underlined that the National Food reformulation Strategy in Romania should aim for a comprehensive approach (e.g. including cheaper and more expensive products). The NIPH further highlighted the importance of collaboration

[77] Council Conclusion on Nutrition and Physical Activity (2014), Council Conclusions on Food Product Improvement (2016), Council Conclusions on Childhood Obesity (2017), Council Conclusions on "Healthy nutrition for children: The healthy future of Europe (2018)

[78] - 2008-2015 EU Frameworks for National Initiatives, Approaches on salt, saturated fat and added sugar.

- 2007 Strategy for Europe on Nutrition, Overweight and Obesity related issues

- EU Framework for National Slat Initiatives

- SAFA (annex 1, 2012) and sugar (annex in 2015)

- 2014-2020 Action Plan on Childhood Obesity (APCO) of different stakeholders in preparing and carrying out food reformulation in Romania. THE NIPH noted that issues arise when putting reformulation actions into practice; for example, the opposition of some consumers in buying "reformulated products" has led to stealth reformulation[79]. The NIPH highlighted that in the case of salt, reformulation has proven to be feasible and cost-effective in reducing salt intake.

The EUREMO team presented the UK sugar reduction initiative, as a mean to reduce obesity. Other examples from other European countries and Norway were provided: voluntary agreements, use of logos, legislation (e.g. including legal content limits) and EU Commission projects. Good results were achieved by these measures. There are also other third country good examples of sugar tax in Australia, USA and Mexico.

A brief discussion between representatives from the NIPH and EUREMO project team focused on sugar taxation. The NIPH pointed out that a sugar levy/taxation measure should not be considered in Romania, as previous attempts had been unsuccessful when proposed in the Romanian Parliament.

Presentation of best practices of Mediterranean countries

The EUREMO team illustrated several measures put in place in other European countries having a strong local food tradition and legal protections on some of these foods - similarly to Romania. See Table 85 below for more details.

Table 85. Successful examples in Mediterranean countries in achieving food reformulation

Italy	Spain	Portugal
Guadagnare Salute: a voluntary initiative to reduce salt content in bread and ready-to-eat pasta. Results: Voluntary involvement of COOP supermarket chain: MoU[80] for branded products: Salt reduction in bread and ready-to-eat meals. This initiative also achieved: Removal of trans fat in COOP products Removal of palm oil Commitment to not add sugars to products for children.	2020 Collaboration plan for the improvement of the composition of food and beverages and other measures, focused on young people. Results: mid-term evaluation showed 45.5 % of the targets set were achieved.	Integrated Strategy for the Promotion of Healthy Eating (EIPAS). Its main goal was to achieve salt, sugar and trans fatty acid reduction by 2020. The initiative includes a seal of excellence for products low in salt.

[79] Stealth reformulation: products reformulated do not advertise the reductions to avoid consumers not buying them

[80] MoU: Memorandum of Understanding.

Italy	Spain	Portugal
2015 EXPO Memorandum, signed by the Ministry of Health and the food industry focusing on children protection. Results: reformulation achieved for: cereals and sweets, yogurt, and fermented milk trans fat reduced in ice-creams Partially achieved for beverages (non-alcoholic)	NAOS initiative (Spanish strategy for nutrition, physical activity and prevention of obesity).	
	AECOSAN initiative on trans fatty acid content in food. This initiative also addressed traditional products, although the results were not as positives as for other products.	
	A Royal Decree is in place establishing limits in salt content in bread by 2022 the limits will be 1.31 grams per 100 grams of bread (finished product).	

It was explained that reformulation of traditional products is complex, as these products are protected by legislation. Some products – as for instance pesto, mortadella, or panettone - have been reformulated in Italy, Spain and Portugal. However, in the last two countries, the reformulation of these products was not as successful as in the Italian example.

Government representatives commented that bread is highly consumed in Romania, and the amount of salt in bread has been lowered in collaboration with industry. It was also noted that some consumers may be adding salt to products having a reduced salt content.

The Ministry of Health of Romania summarised the efforts made around nutrition and food reformulation to improve people’s health. The actions under the Romanian National Health Strategy aimed at producing effective health promotion and reducing the burden of non-communicable diseases (NCDs). They included an Action Plan (2014-2020) composed of education and awareness raising interventions to change consumers' behaviour and training of key personnel (e.g. primary care, healthcare professionals).

Public authorities highlighted education and information interventions were highlighted as key actions, if adapted to specific target groups (as young people and vulnerable groups). An example of these type of actions is the project "I live healthy too"[81] developed by the PRAIS Foundation in collaboration with the Ministry of Health, Ministry of Education, Romalimenta (food industry association).

The Ministry of Health periodically assessed the amount of salt and sugar on food products and has established collaborative protocols with the food industry since 2010. Besides, the national monitoring programme for determinants of the living and working environment, carried out under the National Health Programme, includes activities such as the assessment of nutritional status/diet of the population, of the salt intake from foods and the sugar content in different food categories.

A representative from Bioresource, a food research institute, illustrated their involvement in strategies and projects focusing on food reformulation[82], and their results. It was highlighted that sensory and safety aspects need to be further researched; a few barriers and challenges were identified to food reformulation: technical issues in the reduction of salt and sugar (e.g. affecting the shelf life of a product), threats to food safety (e.g. using substitutes with a shorter use history). Bioresource pointed out the high costs of reformulation and the implications for SMEs, which need support in the reformulation process. Updated or new voluntary agreements between authorities and food operators would be needed to enhance reformulation. Another issue noted was consumers' confusion when different messages on food products are given (e.g. confusion around additives). To tackle this, short discussions concluded it would be important to carry out food education initiatives, especially using a bottom-up approach (e.g. educating children to have an effect on parents).

A representative from the Romanian food industry presented the experiences and examples of reformulation carried out in Romania. These included actions to achieve the reduction in the sugar, e.g., in soft drinks, and portions' reduction. Other actions included: supporting campaigns to promote healthy lifestyles, labelling, limiting advertisement, and banning soft drinks in schools. The food industry mentioned that salt reduction was achieved for added salt in bakery products in Romania. In general sugar, salt and fat reduction was achieved by multinational companies for their products.

The food industry representative also highlighted that successful reformulation should be gradual, considering the integrity of the product and technological barriers. Cultural differences should be considered, as well as consumer perceptions. In their view, the most effective tools in achieving reformulation are public campaigns and consumers education.

Discussion and next steps

A representative from the NIPH pointed out that more industries should be involved in reformulation**,** especially from dairy and meat sectors, as they are currently missing.

[81] The project started in 2011 and included educational campaigns and health promotion activities in 252 schools across the country, reaching 180,000 pupils.

[82] An example was the *Salux* project, which included the participation of 11 MS and 15 partners, and focused on reformulation of salt, sugar and fat. Website of the project: http://www.salux-project.eu/en/docs/clearing-house/documents/salux-brochure-romania-88/1-15

EUREMO experts highlighted the importance of prompting more research on food reformulation to look for possible alternatives to salt and sugar. Data from the above-mentioned EU projects (JANPA, EUREMO, REDMAP), or the EFSA food consumption database may be helpful to understand more about Romania's population diet. Understanding the current situation and assess how successful reformulation actions have been over the last years is also important. The project team discussed ways to support SMEs to reformulate, to provide an inspiration to Romanian actors on what could be done.

Labelling was recognised by the different participants and project team as an important strategy to support reformulation, (smart labelling examples such as Nutri-score were mentioned by the EUREMO project team). They explained that using front of label packaging has the potential to save consumers' time when looking for healthy options.

The NIPH noted that it would be better to focus on reformulation of everyday products, commonly found on supermarkets, such as diary and meat products.

8.3.3 Second online meeting - 12th May 2021

The meeting was attended by 28 participants, including the project team, experts and representatives from research organisations having experience with SMEs reformulation, the Romanian authorities (NIPH) and industry associations. Participants from the Maltese government also joined the meeting, given their interest in the topic discussed.

The focus of the meeting was the cooperation with SMEs in reformulation, and the aim was to provide the Romanian authorities with tools and knowledge on how reformulation with SMEs has worked in other countries and what were the challenges.

The key questions to address were the following:

- How to better reach to and interact with SMEs when it comes to reformulation.
- How to persuade SMEs to try reformulation.
- How to advise SMEs to reach out for scientifical and technical solutions.
- How to help them keep cost under control.

The NIPH explained that multi-national food companies, supermarket chains are involved in food reformulation, however, a lot of food is produced by SMEs around the country. In the organisation of this event different national or European level SME organisations were invited to participate. However, they were reluctant to participate, and rejected the invitation. The NIPH noted that in Romania SMEs are not willing to participate because they are afraid that participating in this type of meeting would imply some form of commitment to reformulation. Another concern for SMEs is the costs that reformulation involves.

8.3.3.1 Examples of food reformulation in SMEs

Bioresources, presented the needs for food reformulation and funding options to support food reformulation at national level. Across Europe most reformulation initiatives were of voluntary nature, and the support provided to SMEs was very small. The most relevant actions in which SMEs have been involved was the reduction of salt in bakery products.

The main challenges to reformulation for SMEs were also presented: lack of scientific knowledge and expertise, high costs, issues related with products' shelf-life, packaging and labelling requirements, training needs of staff, equipment required, difficulties in understanding regulation claims. Furthermore, there is no specific funding in Romania for research in food reformulation and there is a lack of collaboration between SMEs and research centres. Support to food reformulation educational campaigns should be provided and communication to the consumers should be carried out. Clear guidance on food reformulation is also needed.

The Serbian Institute for Medical Research[83], explained that mandatory (maximum limits of key ingredients, taxes, labelling) or voluntary approaches (agreements with industry) can be used. Other ways of reformulation were also introduced: fortification[84] and biofortification[85]. Other nutrients that can also be added: dietary fibres, vitamins, minerals (e.g., iron), good fatty acids (Omega 3), polyphenols, etc.

Food reformulation can place SMEs in a good market position, given that consumers demand better products. Reformulated products can be promoted, either by marketing or through nutritional claims. At EU level there have been initiatives involving SMEs, particularly fortification. Examples of reformulated products from the CHANCE[86] project were provided (bread, ham, ketchup, mozzarella, and berry cake), explaining how reformulation was achieved for each of these products. It was recommended that a multidisciplinary approach should be implemented - comprising science and technology research as well as involvement of SMEs.

The Federation of Hellenic Food Industries presented an overview of their priorities and key actions. It was highlighted that the involvement of all stakeholders is important. A committee was created made up of experts in the area of nutrition, quality and safety, with the objectives of: promoting a holistic approach, monitoring reformulation, participating in relevant EU and national initiatives, undertaking actions and joining volunteering commitments. As a results, around 900 products showed an improved nutritional profile; this was achieved mostly through product reformulation, new product placed in the market and portions’ reduction.

Federation of Hellenic Food Industries noted the importance to share good practices and expertise with SMEs, developed by authorities, the food sector and the academic community. They pointed to ways to achieve the achieve the uptake by SME through dissemination of information through synergies and training, facilitating access to finance and funding to SMEs and supporting to investment on new technologies.

A presentation from the Spanish Institute of Food Science, technology and Nutrition (CSIC) showcased the work done on meat and meat products. The objective was to improve the quality and safety of meat and meat products and to develop healthier products.

Three ways to develop healthier food products were highlighted: genetic modification, reformulation, and actions regarding the processing, storage, and consumption conditions.

Regarding meat products’ reformulation, the strategies put in place was to reduce a component with a negative health effect and incorporate a good component. The Institute focused on salt and fat reduction. Salt was reduced by adding seaweed (salt as reduced by 30%) and magnesium was added. Sensorial tests were carried out and showed that the products were liked by consumers.

It was also explained how to achieve a reduction of fats. The function of fat in the product needs to be considered, not only from a sensorial point of view, but also in

[83] Centre of research excellence in nutrition and metabolism, University of Belgrade, Serbia

[84] Addition of a nutrient to improve/enrich/accommodate nutritional quality of food.

[85] The process of increasing the micronutrient content of a food crop through selective breeding, generic modification, or use of enriched fertilizers.

[86] Chance project: Low cost technologies and traditional ingredients for the production of affordable, nutritionally correct foods improving health in population groups at risk of poverty. Available at: https://cordis.europa.eu/project/id/266331.

terms of functionality. The lipid content is reduced by another ingredient, e.g. water, and the fatty acids profile is replaced by another healthier fat alternative (e.g. olive oil).

8.3.3.2 Roundtable discussion

A roundtable discussion was organised, composed of all presenters and EUREMO project experts. The below questions guided the discussion:

How to present reformulation as a necessity when it is not enforceable by law?

- What are the advantages for the company? (Long term and short term)
- How to get SMEs involved in reformulation (Why should they do it?)
- How to reformulate while keeping the costs down?
- How to communicate reformulation to the public, as a way to raise awareness and bust sales?
- Where can they reach for help (logistic/technical support, funding - e.g., European programs to apply to, etc.)

The discussion started by asking the Maltese representatives what have their experience in reformulation been. Results from a national consumption survey showed that between 2015 and 2017, the intakes of sugar needed to be reduced and fibres intake increased. Two reformulation initiatives were put in place, one focusing on salt reduction of bread, and the other on reduction of sugar content in yogurt. Besides, legislation was introduced to regulate food procurement in schools which required dairy products to meet low sugar content requirements, thus this legislation may have prompted reformulation of dairy products (yogurts) to happen. Bakers informed consumers that taste would not be affected by salt reduction in bread.

The Spanish Institute of Food Science, technology and Nutrition (CSIC) representative noted that SMEs should reformulate and innovate to maintain or improve their position in the market, as new consumer needs and trends emerge (e.g. vegetarian vegan consumers).

The representative from the Serbian Institute for Medical Research explained that the success of the project with SMEs came from: the enthusiasm shown by SMEs given that the project was a joint effort; the size of the SMEs participating; and the funding available.

NIPH mentioned that in their experience SMEs only reacted when a legislation was put in place, while voluntary agreements weren't seen as successful.

The EUREMO experts mentioned that while legislation can be used, there is still room for public education and other actions. It was also noted that SMEs will respond if there is demand for products.

A participant mentioned that in the case of sugar, a control mechanism should be put in place, as sugar is hidden in many products. Replacing sugar with other nutrients can decrease the quality of the product from a nutritional point of view.

The NIPH declared their support to Nutri-score, however in their view there are still aspects which could be improved to get the right assessment; for example, a drink with high sugar content may have the same assessment as olive oil. This was regarded as distracting to the consumer.

8.3.4 Outcomes of the meetings

It was recommended that Romania continued to be involved in data driven projects to monitor reformulation. Besides there is still room for improvements of voluntary agreements industry to steer reformulation and incentivise food reformulation. The

EUREMO project team recommended that supporting research (technically supporting them) especially to SMEs is important.

Regarding the types of products that the focus should be on, are those that are daily consumed foods (those local/traditional foods) which if reformulated may have a greater impact in population health. Reformulation should also focus on adding good nutrients rather than only reducing, if possible, this could be done at the same time.

Examples presented in the different meetings, on the experience of industry (SMEs) in reformulating could be good examples. For example, there are similarities between the Spanish examples on reformulation of meat products and the Romanian meat industry. However, the involvement of SMEs is still difficult, and support should be given to bring them in the conversations and support them to undertake actions, paired with larger industry or research institutes. Initially the focus could be in motivating SMEs to reformulation following recent and future trends e.g. food sustainability.

8.3.5 Feedback on the scientific and technical support network

The Romanian public health authority praised the valuable inputs the experts provided to their national initiatives on reformulation. The results of this network will be used to raise awareness around the need to food reformulation and to promote small changes with small enterprises and targeting niche markets. However, they noted that due to the COVID-19 pandemic, and to worsen economic challenges, they foresee limited outcomes for the time being.

8.4 Task 2 conclusions

Task two of the EUREMO project focused on providing support to six European countries' public authorities (Greece, Slovenia, Romania, Malta, Croatia and Hungary) to implement reformulation initiatives. Several interactions between the EUREMO project team and the national authorities were crucial to select and define the content of each action. Senior experts brought their expertise in the planning and facilitation of the events. The support and recommendations provided by the senior experts was regarded by the national authorities as very useful.

The meetings were organised using different formats. Presentations were made by the EUREMO project team and experts, or by invited presenters (reformulation experts, national authorities, industry representatives, research organisations); experts provided good examples of food reformulation actions and tips to implement them across the different EU geographies. These examples were very welcomed by European countries' national authorities. The examples presented showed that the most successful actions towards reformulation are hard measures such as legislation (banning or limiting the content of a nutrient in food products) or taxes (excise duties, levies). However, these are mostly rejected by the food industry. Furthermore, in some countries it may be difficult to reach an agreement to pass the laws to enforce them at national level.

Voluntary actions on the other hand have been the most used tools to achieve reformulation in many European countries. However, these actions have been regarded by many stakeholders as insufficient. Collective agreements on the other hand appear to be successful in involving the food industry in reformulation, even though more time is needed to fully assess their achievements.

The main issue remains how to involve the entire food industry sector in discussions with the National authorities, in particular SMEs, which need specific support for food reformulation, both in terms of technical expertise and financial resources.

Voluntary reformulation actions take place when industry seeks to satisfy the demands of consumers. However, when this demand does not exist, reformulation actions need to be complemented by education initiatives on healthy habits/lifestyle to the population.

For those European countries that have little experience in reformulation, it is important to participate in activities such as EU funded projects (JANPA, EUREMO, Best-ReMaP) and benefit from their results. In particular, monitoring activities can help European countries understand their situation (both in terms of food consumption and food production), evaluate the progress made, and introduce the most appropriate reformulation initiatives adapted to their needs.

9. Sustainability of an EU food monitoring system

This section presents conclusions and recommendations surrounding the sustainability of an EU food monitoring system, including how and under what conditions the EUREMO database could be updated, and the baseline methodology replicated, in future.

9.1 Relative merits of the EUREMO approach

The EUREMO study designed and piloted a large-scale food reformulation monitoring system comprising of extensive data collection, data cleaning/quality assurance and data reclassification to produce a comprehensive and highly detailed dataset covering almost 47,000 individual food and drink products from across Europe.

An innovative data collection approach was developed and deployed comprising of phone- and web-based software applications which enabled product information to be collected via scanning product labels in supermarkets using smart phones, with the resulting images then converted into text and data which would populate a final dataset of product information. The methodological approach was designed to ensure that the final dataset captured products which were the most highly consumed across Europe at the time and, hence, had the greatest potential to impact widely on consumers via reformulation initiatives. The end result is a baseline dataset for monitoring the impacts of reformulation initiatives over time. The data collected by EUREMO will be reposited at FABLE (Food And Beverages Labels Explorer), that is being developed by the Joint Research Centre of the European Commission. This will ensure and maximise access to and usability of the data by policy makers, researchers and the public.

Despite the innovative methodological approach taken, the EUREMO study faced several challenges, as noted in Section 2 of this report:

- Data collection challenges associated with shortages of certain products on supermarket shelves because of Covid-19.
- Data collection challenges associated with a lack of – delays in obtaining – supermarket permissions for the study team to enter stores for the purposes of collecting product data.
- Data collection challenges associated with the need to purchase some products online (where study team members were unable to enter supermarkets to collect data due to store closures and/or a lack of permission to enter stores for data collection), which created further delays and logistical challenges, especially where retailers had no online shopping offer.
- Data collection challenges associated with an unforeseen and unanticipated level of turnover among fieldworkers who collected product data from supermarkets. The churn in fieldworkers was largely a result of delays and uncertainty surrounding the timing and scale of required fieldwork due to Covid-related interruptions/delays.
- Data collection challenges associated with a lack of reliability and functionality in the ICF phone-based and web-based apps over time as repeated updates and upgrades in mobile phone operating systems and software over time undermined their reliability.
- Data analysis and reclassification challenges associated with finalising the study nomenclature against which the final dataset would be reported and analysed.
- Dataset finalisation challenges associated with technical (software/IT-related) problems and associated delays in uploading certain product data into the ICF web-based app and/or FoodCASE.

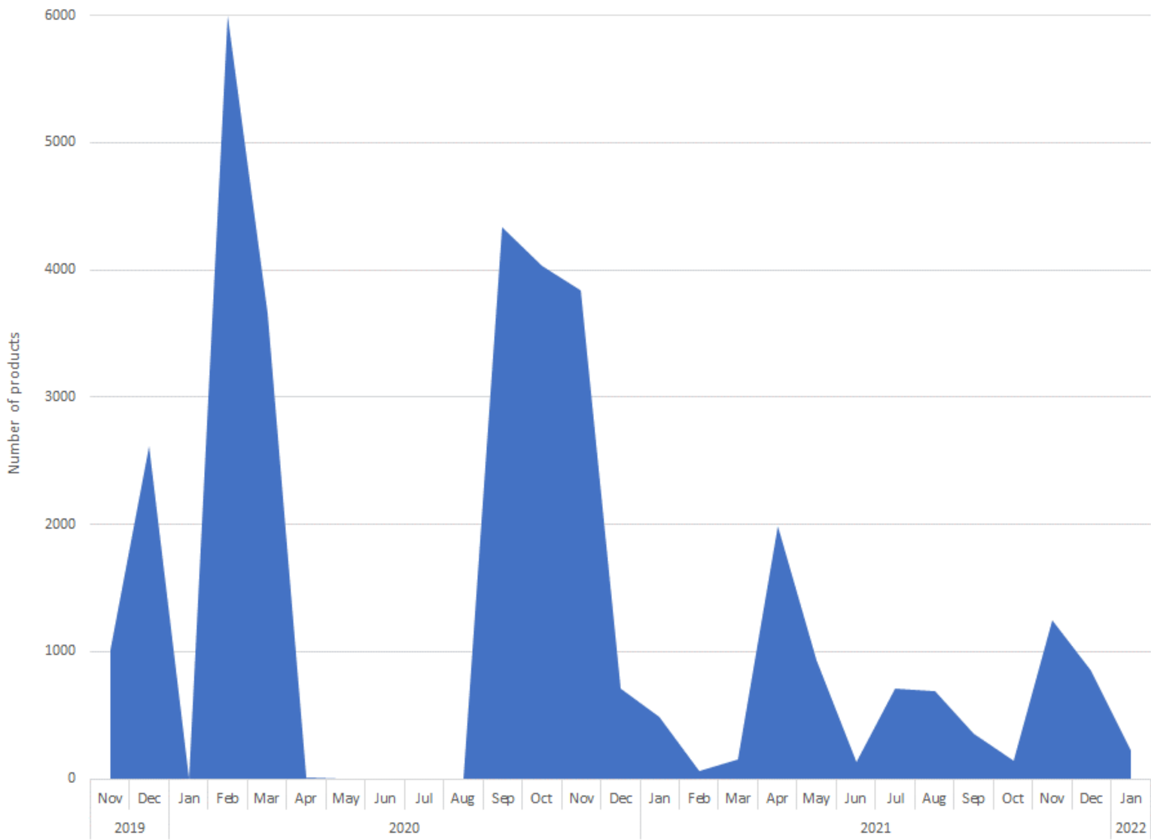
Several of these challenges reflected the impact (both direct and indirect) of the Covid-19 pandemic. Specifically, problems accessing supermarkets and finding available products for the purposes of data collection were a direct result of the pandemic. Similarly, the churn in the study team's fieldworker population resulted from the delays in data collection associated with Covid-19. These delays also impacted the functionality of ICF's software applications. Finally, considerable time and resource were invested in the reclassification of product data as the EUREMO study sought to position the dataset in a way which allowed comparisons with both the previous JANPA study and the forthcoming Best-ReMaP exercise. These delays and costs associated with data reclassification were not related to Covid.

Ultimately, a major impact of these Covid-19 related interruptions and delays was to delay considerably the finalisation of the data collection and reporting exercise. Moreover, these interruptions and delays meant that data were collected at different points in time, sometimes months apart. Figure 61 below indicates several distinct periods of disruption and delay as a direct or indirect result of Covid-19:

- April 2020 to August 2020. This period coincided with the first wave of national lockdowns across Europe, resulting in supermarket closures and/or the revocation of permissions to enter stores for the purposes of data collection.
- December 2020 to March 2021. This period coincided with a second wave of national lockdowns across Europe, resulting in the same impacts on data collection that had been experienced during the first wave of lockdowns.
- June 2021 to January 2022. While not as pronounced as the first two periods, the second half of 2021 in particular proved challenging to complete fieldwork, in part due to the knock-on effect of Covid-related delays on fieldworker churn and the stability and reliability of the phone-based apps used for data collection. It was also partly related to supermarkets not providing access for fieldworkers, with online shopping used as an alternative in some supermarkets. During this time, data was collected for fewer products and there were several months (June 2021 and October 2021 in particular) where data collection numbers fell considerably.

The overall impact was a significant reduction in the speed with which product data was collected and processed.

Figure 61. *Number of products for which data were collected, by month and year*



9.2 Recommendations for a future monitoring system

Based on the above reflections regarding the relative merits of the EUREMO approach, including the challenges faced and the extent to which these were associated with the extraordinary and unanticipated impacts of the Covid-19 pandemic, this section presents recommendations for how a future monitoring system could look, including the extent to which the EUREMO methodological approach should or could be retained for future exercises. The discussion below is structured around the following core methodological aspects:

- Product and country sampling.
- Product nomenclature and classification.
- Data collection.
- Data cleaning and quality assurance.

9.2.1 Product and country sampling

The approach taken to sample product categories in each country was sound and could be retained as part of a future monitoring system. The general principle of sampling products on the basis of their market share (i.e. consumption) in each country helps to ensure that the monitoring system captures the impacts of reformulation initiatives on the products that are most highly consumed and, hence, which can have the biggest health impacts on the general population when their nutritional content changes.

The market share data used in the EUREMO study came from a private provider, Global Data, and involved a paid licence fee to access the relevant data. In future, it may be possible to identify more cost-effective sources of market share data which could be used to inform decisions about product sampling in each country (i.e. to ensure that the products being monitored over time are those which are most highly consumed).

Recommendation 1: where it is impractical or unfeasible to gather widespread data and information for all processed food and drink products available for purchase, a sampling approach should be used based on consumption data to ensure that a future monitoring system focuses on the most highly consumed products for which reformulation initiatives have the potential to make the greatest impact on health outcomes.

9.2.2 Product nomenclature and classification

As noted above, the EUREMO study involved a considerable investment of time and resource to develop an agreed nomenclature for the final dataset. This was because there were several nomenclatures that needed to be taken into account at different stages in the study, as follows:

- Global Data nomenclature – this was the nomenclature associated with the market share data which was required to inform the EUREMO sampling approach.
- EUREMO fieldwork nomenclature – this was the nomenclature used to collect data from retailers. It was felt that the Global Data nomenclature was not optimal for the purposes of data collection and that the study fieldworkers required further clarity in the product categories they were being asked to gather data against.
- Oqali nomenclature – this was the nomenclature first used in the JANPA study and which the EUREMO Terms of Reference required the final EUREMO dataset to be consistent with.
- Best-ReMaP nomenclature – this is the nomenclature for the Best-ReMaP exercise. Ensuring consistency between the EUREMO final nomenclature and both Oqali and Best-ReMaP facilitates comparisons between the EUREMO data and the data produced by the earlier JANPA study and the Best-ReMaP exercise.
- EUREMO final nomenclature – this is the final set of product categories and subcategories used in the EUREMO dataset.

For any future monitoring system, a challenge is likely to be how best to link/reconcile the product nomenclature used in any market share data (used to guide the sampling approach) with the product nomenclature to be used for reporting the final dataset. Consequently, even if a future monitoring system uses the same nomenclature as EUREMO (or Best-ReMaP), if a sampling approach is taken based on market share data, and an alternative source of that market share data is chosen, it will be necessary to link the EUREMO final nomenclature (or Best-ReMaP nomenclature) with the nomenclature used in the market share data.

Recommendation 2: a future monitoring system should include a mapping exercise to link the format/nomenclature of the resulting dataset with previous exercises (JANPA, EUREMO). This will facilitate comparisons of nutrient values over time when monitoring the impact of reformulation initiatives on nutrient values. Such a mapping exercise should also ensure a direct link between the nomenclature of the final/resulting dataset and the data used as an input to the exercise to guide any sampling approach taken (as relevant).

9.2.3 Data collection

As noted above, the collection of data for EUREMO posed the biggest challenge to the study given the impact of Covid-19 on study timescales. Although EUREMO deployed innovative approaches to expedite as far as possible the data collection process, an approach based on collecting data on individual products from retailers (whether automated or manual) will involve a degree of inefficiency.

Much of the inefficiency associated with the data collection process could be addressed by a monitoring system which avoids fieldwork and instead relies on alternative methods for sourcing data directly, such as via web scraping or seeking retailer-provided data.

In relation to web scraping, there are a variety of potential advantages and disadvantages. Web scraping was not permitted under this contract and so further work would be required to determine whether and to what extent it could constitute an appropriate data collection tool as part of a future monitoring system.

In relation to retailer-provided data, it may be possible to design an approach that involves retailers submitting data directly to national competent authorities for the purposes of monitoring reformulation initiatives. A standard/common data collection tool could be developed for retailers to use such that they can submit the required data in a standard format periodically.

Although the upfront set-up costs of such an approach will likely be higher than continuing with the same approach developed and deployed by EUREMO, it will likely involve lower recurrent costs over time, albeit its overall efficacy will depend on uptake/compliance and arrangements to encourage/mandate participation. Specifically, further thought would be required on how to incentivise and encourage retailers to participate in the monitoring system and provide data that allows reformulation initiatives to be tracked over time. Unless retailers are mandated to provide such data, other incentives (including reputational incentives) would need to be considered to promote the monitoring system to retailers and to encourage uptake and participation.

Recommendation 3: further exploratory work should be undertaken to assess the feasibility – and relative merits of – alternative data collection approaches, including web scraping and encouraging/mandating retailers to provide such data directly to national competent authorities. This would likely improve the efficiency with which data are collected as part of a future monitoring system compared to the data collection approaches deployed under EUREMO (involving fieldwork with retailers).

9.2.4 Data cleaning and quality assurance

The EUREMO study also invested considerable time and resource into developing and implementing an approach to clean and quality assure the data collected by fieldworkers. This was necessary to identify and address any errors in the dataset that may have resulted from:

- Problems with the app translating images into text, and the resulting format of that text.
- Problems with data entry by fieldworkers, where certain data may have been entered in the incorrect field.
- Problems with translation of product information from national languages into English.

A monitoring system based on the collection of data from retailers via fieldworkers will require a transparent, consistent and credible data cleaning and quality assurance procedure. ICF used data science techniques alongside other checks to produce a high-quality and accurate dataset.

Conversely, a monitoring system which relies on data supplied directly by retailers is less likely to require any data cleaning and/or quality assurance. Such checks are likely to have been undertaken by the retailers themselves, and these arrangements could be confirmed and/or formalised as part of any monitoring system and process that draws on retailer data.

Recommendation 4: in the event that a future monitoring system relies on data provided directly by retailers, an agreement should be reached on a consistent approach to data cleaning and quality assurance by the retailers themselves prior to submission. Should a future monitoring system instead rely on the collection of data from retailers through fieldwork, a transparent and comprehensive quality assurance system which draws on data science techniques should be developed and deployed to ensure the accuracy and quality of the final dataset.

9.3 Concluding remarks

The EUREMO study piloted a monitoring system which involved developing and deploying an innovative approach to gathering nutritional information and data on approximately 47,000 products consumed by European citizens. Such a monitoring system could be replicated in future to provide an ongoing approach for tracking reformulation initiatives for salt, sugars and fat over time.

Work is already underway via the Best-ReMaP Joint Action to build on the EUREMO study by sharing and promoting best practice on implementing a standardised European monitoring system for processed food reformulation[87]. Part of this involves supporting European countries to monitor the impact of food reformulation initiatives over time, as well as creating a food information database to monitor the impact of food reformulation.

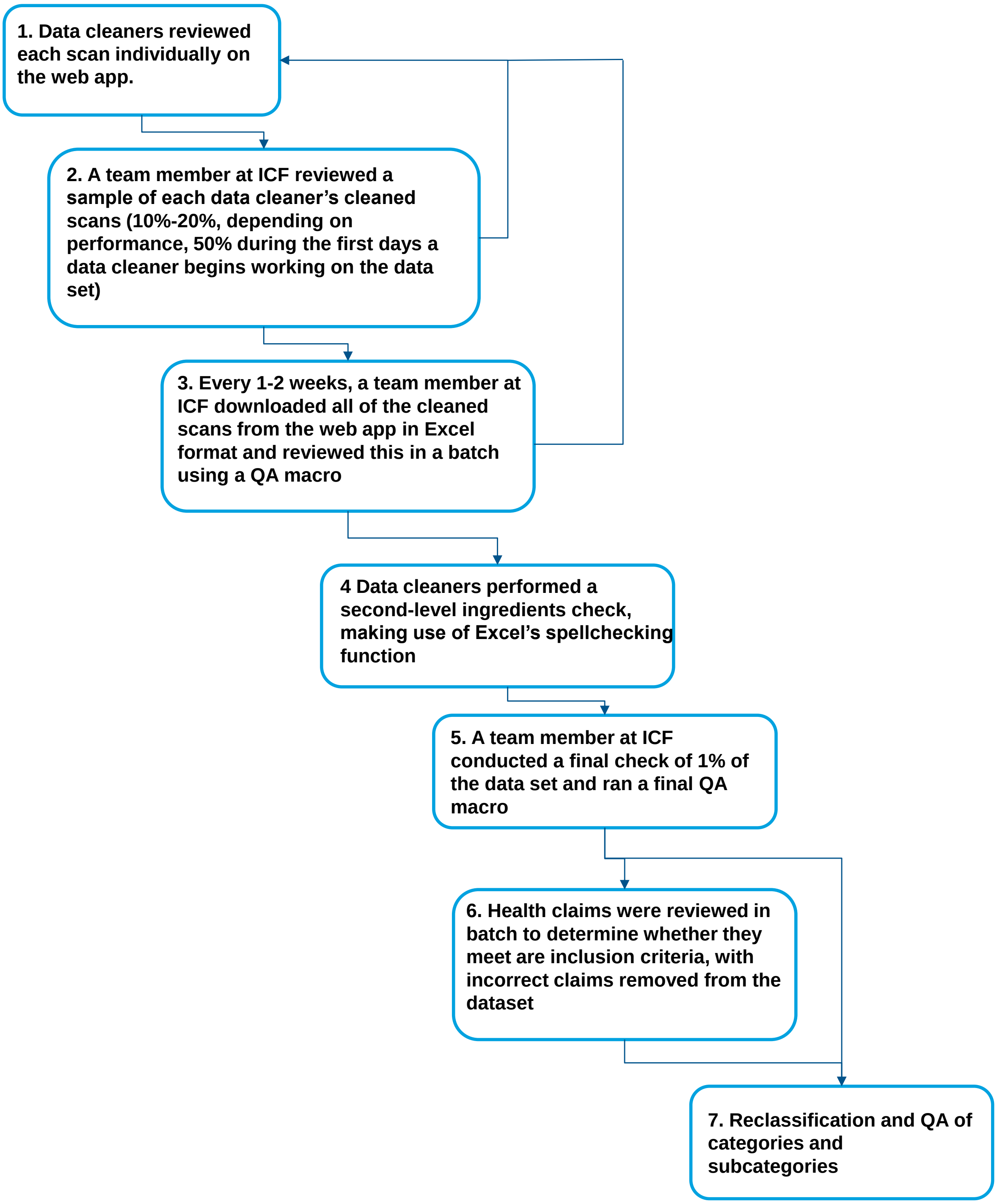
Despite the EUREMO study's use of innovative methodological tools and techniques (including the development and use of software applications and data science techniques for automating otherwise manual processes), the underlying principle of gathering data on food and drink products through fieldwork will always involve certain inefficiencies. Such inefficiencies could be overcome through the development of a monitoring system which compels or incentivises European retailers to provide product information directly in a consistent format to allow comparisons of nutritional content across products and countries over time as part of a comprehensive monitoring approach to reformulation initiatives.

[87] Best-ReMaP (https://bestremap.eu/aboutus/)

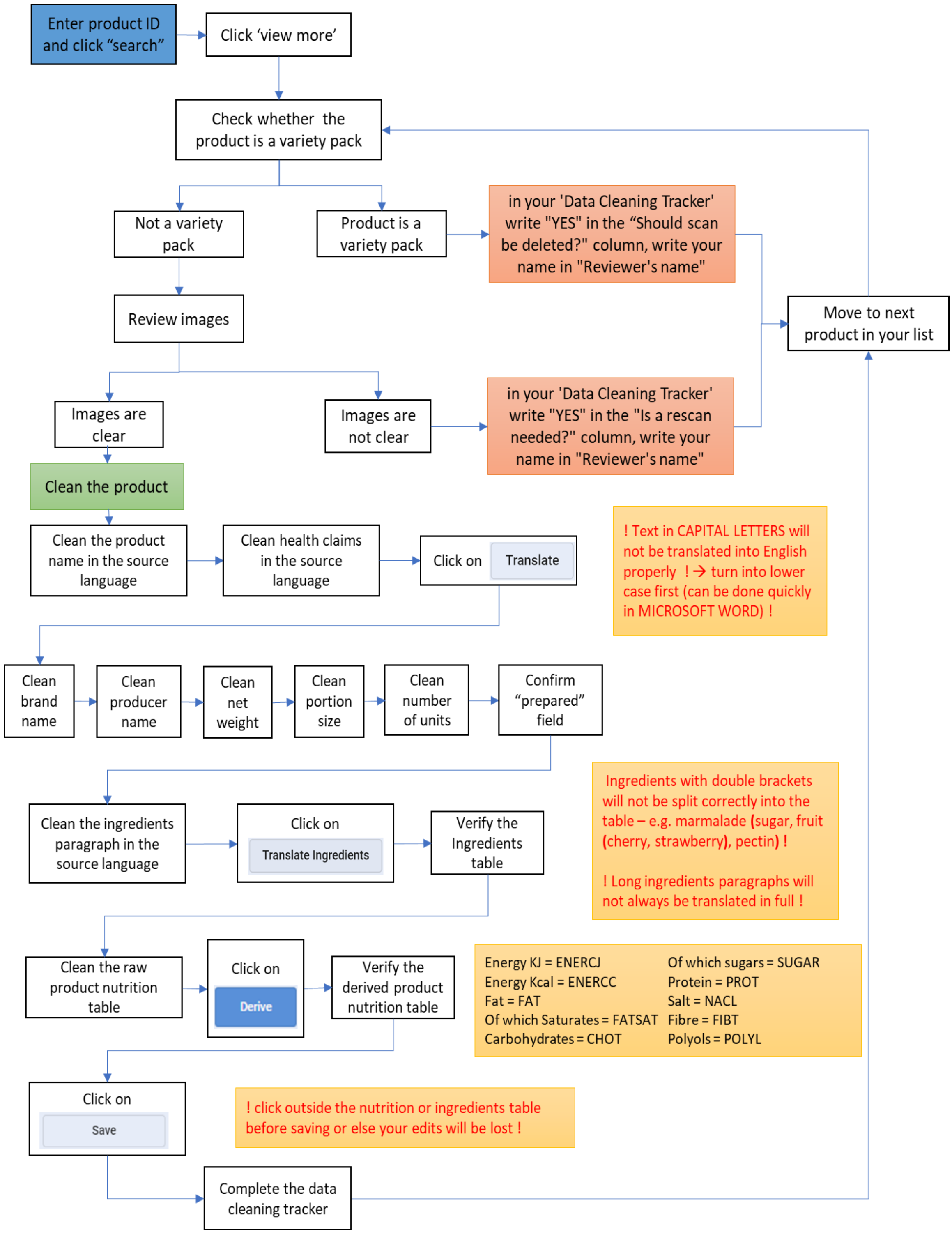
Annex 1 – Data cleaning and quality assurance protocol

This annex describes ICF's data cleaning and quality assurance protocol for the EUREMO study for data collected in store and through online purchasing. Data received from retailers did not go through this process as it is expected that this data will already be high quality, although the quality of the nutritional information was confirmed by running the QA macro on this data (i.e. step 5 of the process), and health claims and reclassification were performed on this data as applicable.

Figure 62. Workflow for the overall data cleaning and quality assurance process



Data cleaners review each scan individually, on the web app



Checklist for Step 1: Data cleaners review each scan individually

Field	Requirement
Images	Images are clear enough to clean and edit all required fields

Field	**Requirement**
	Exception: if producer/manufacturer information is not completely visible but can be completed using online information, a rescan is not needed.
Product name in the source language	Commercial name and legal name, separated by ";" Commercial name = the full name of the product as it appears on the front picture Legal name = the legal definition of the product as it appears above/before the list of ingredients
Translated product name	Automatically generated after pressing the translate button
Brand name	Brand name as shown on packaging
Producer/Manufacturer	The name and address and telephone/email/website in the source language
Net weight	Value AND unit (e.g. 220g) / if there are two values keep the bigger one
Portion size	If indicated on the pack: value AND unit If not indicated on the pack: leave blank
Number of units per pack	If indicated on the pack (can be a range e.g. 4-5) If not indicated on the pack: "1"
Health claims in the source language	If indicated on the pack
Translated health claims	All words from health claim translated
'Prepared' field	True = only if it is explicitly stated that the nutrition data is for the prepared / cooked product False = default
Product ingredients in the source language	All ingredients in order of listing on the label, one ingredient per row
Translated product ingredients	All ingredients in order of listing on the label, one ingredient per row
Raw product nutrition table	Value AND unit for all of the following nutrients: ENERCC, ENERCJ, CHOT, SUGAR, FAT, FATSAT, NACL If available: value AND unit for the following nutrients: FIBT, POLYL, PROT If stated on the packaging, “<” or “>” should be included "Trace" instead of value + unit when applicable

Field	Requirement
Derived product nutrition table	Value AND unit for all of the following nutrients: ENERCC, ENERCJ, CHOT, SUGAR, FAT, FATSAT, NACL If available: value AND unit for the following nutrients: FIBT, POLYL, PROT The flag value correctly reflects whether the value is as recorded (AR), less than (LT), more than (MT) or trace (TR).

Protocol for Step 1: Data cleaners reviewed each scan individually

Step 1: The data cleaner identified which scan they needed to review next in their data cleaning tracker, working through all scans in their tracker.

Step 2: The data cleaner identified the scan they needed to review and found this in the web app

Step 3: The data cleaner checked if the product is a variety pack or a test scan

If the product is a variety pack or the scan was a test scan, this was marked as to be deleted in the data cleaning tracker and a comment added explaining why it should be deleted.

Step 4: The data cleaner checked whether the images are clear

If the information for any field was **not visible across all the pictures**, the data cleaner marked it as to be rescanned in the data cleaning tracker and added a comment explaining why it should be rescanned.

If the information missing/not visible related to the producer/manufacturer name, a question mark ("?") was added in the rescan column of the data cleaning tracker and a comment added noting that the producer/manufacturer name needs to be checked. The ICF team then checked this and confirmed whether the scan needed to be rescanned or can be cleaned.

Step 5: The data cleaner cleaned the product name so it is in the format: Commercial name; Legal name

No quotation marks

Separate the commercial name and the legal name by;

Pictures to check: Front image; back/side images

Step 6: The data cleaner checked the health claims in the source language and made edits if necessary.

Picture to check: Health claims

Step 7: The data cleaner clicked the translate button and verified that all the text has been translated / no missing text.

Step 9: They then checked the brand name and made edits if necessary.

Picture to check: Front image

Step 10: The data cleaner checked the producer's name (both name and contact details) and made edits if necessary.

Picture to check: Producer

Step 11: The data cleaner checked the net weight and made edits if necessary.

Picture to check: Net weight

Step 12: The data cleaner checked the portion size and the number of units, and made edits if necessary.

This was left blank if not indicated on the pack.

Pictures to check: Ingredients (below the list of ingredients), nutrition table (second column or below table), front, voluntary declaration

Step 13: The data cleaner confirmed whether the "prepared" field was correct (this should be "false" by default)

This was changed to "true" **only** if the nutritional data explicitly states that the nutrition table corresponds to the product after it has been prepared/cooked.

Pictures to check: side/back, nutrition table (header)

Step 14: The data cleaner checked the ingredients paragraph in the source language (both text and punctuation).

Any text that is not an ingredient (e.g. allergen information, preparation instructions, the product name) was removed and spelling errors corrected.

Picture to check: Ingredients

Step 15: The data cleaner clicked on "translate ingredients" and verified that all the text has been translated / no missing text

If needed, the data cleaner made additional changes in paragraph in the source language and clicked on "Translate ingredients" again.

Step 17: The data cleaner made sure each ingredient is on a separate row in the ingredient table in the source language and made edits if necessary.

3. **Step 18**: The data cleaner made sure each ingredient is on a separate row in the ingredient in English and made edits if necessary.

Note: the web app is not able to properly transfer paragraph into tables when there are nested parentheses

E.g. "jam (sugar, fruit (cherry, strawberry), pectin)" will appear as:

Jam (sugar, fruit (cherry, strawberry),
pectin

Instead of as:

Jam (sugar, fruit (cherry, strawberry), pectin)

See FAQs on how to address this issue

Translations in the web app may be negatively affected by one ingredient being split over two lines in the source language paragraph.

E.g. the ingredients in box 1. may not translate as well as box 2.

Box 1. "chocolate (milk Fat, sugar)"	**Box 2.** "chocolate (milk fat, sugar)"

See FAQs on how to address this issue

Step 19: The data cleaner checked the raw product nutrition table (both value and unit for all nutrients listed in the table below)

Group A: Nutrients that should always appear in the extracted nutrition table	**Group B: Nutrients that should always appear in the extracted nutrition table if information is available**
Energy in kcal -> ENERCC Energy in kj -> ENERCJ Fat -> FAT Of which saturates -> FATSAT Carbohydrates -> CHOT Of which sugars -> SUGAR Salt -> NACL	Protein -> PROT Fibre -> FIBT Polyols -> POLYL

Value and unit should be listed together in the "value" column (e.g. 100kcal)

The data cleaner made additions, deletions and edits as necessary, including adding "<" or ">" symbols where indicated on the packaging

The data cleaner was instructed **not to worry** about the order of the nutrients

The data cleaner was instructed **not to worry** about removing spaces between the value and the unit (e.g. "100 kcal" and "100kcal" are both acceptable)

The data cleaner was instructed to ignore rows referencing nutritional values for nutrients other than those listed in the table above (**with the exception of monounsaturates and polyunsaturates which should be deleted**).

Picture to check: Nutrition table

Step 20: The data cleaner clicked on "derive" and checked the derived product nutrition table was correct, editing as needed

Step 22: The data cleaner pressed "save" to save the changes they made.

! Click OUTSIDE of the nutrition or ingredients table before saving !

! This is a crucial step – do this or else your edits will be lost !

Step 23: The data cleaner updated the data cleaning tracker by writing their name in the "Reviewer's name" column of the data cleaning tracker

If needed, comments were added in the "Comments" column of the data cleaning tracker

Once a week, a team member at ICF reviewed a sample of 10%-20% of each data cleaner's cleaned scans (50% during first days a data cleaner starts working on the dataset)

Step 1: Whole scan checks: An ICF staff member checked whether the data cleaning had been done in line with the data cleaning protocol by reviewing each field that the data cleaner should have cleaned (product name, health claims, brand name, producer name, net weight, portion size and number of units, "prepared" field, ingredients, nutrition table) for 5% of scans completed that week[88]. Any deviations from the protocol, including issues with the ingredients list as described in step 2, were recorded and fed back to the data cleaner.

Step 2: Ingredients checks: An ICF staff member checked whether the data cleaning of the ingredients list had been completed to an acceptable standard (i.e. an accurate representation of the text on the packaging with no spelling errors in the source language, and ensuring that all of the text has translated into English in the translation of the ingredients) by reviewing the source language and translated lists of ingredients, checking for "minor" errors (those that have not affected translation) and "major" errors (those that have affected translation) for a further 5% of scans completed that week. For experienced data cleaners who showed a good understanding of the process and ongoing high-quality work (i.e. no errors in their whole scan checks), step 2 may be skipped. Where errors are identified in subsequent checks, the QA team were instructed to reintroduce step 2.

Step 3: Detailed feedback was provided to data cleaners following checks, including asking them to make corrections as needed.

If more than 10% of scans checked contained major errors (errors affecting the quality of the data set that are not easily rectified in batch – major errors relate to inaccurate inputting of data and errors in ingredients lists that have affected translation), the QA team was instructed to increase to 10% whole scan checks and 10% ingredient list checks.

This could then be reduced back to 5% whole scan checks and 5% ingredients list checks when data cleaner's error rate reduced.

Where the level of error persists despite feedback and support for more than 2 weeks, the policy was that the data cleaner should be replaced.

Step 4: 25% of corrected scans were reviewed to ensure they were now error-free. Where errors persist, the QA team was instructed to ensure feedback is provided to data cleaner.

Every 1-2 weeks, a team member at ICF downloaded all cleaned scans from the web app in Excel format, and reviewed these in a batch using a QA macro

Step 1: The team member checked that each scan had information in the correct format for:

- net weight (no blanks + proper unit)
- number of units (blank only if the portion size is not blank, otherwise 1 or another integer)
- portion size (blanks only if number of units is 1 + proper unit)

[88] 50% for new data cleaners, and up to 10% for data cleaners with high levels of error in the previous week.

Step 2: Tests were performed on the nutrition table. For each product, the team member checked that:

- There is one and only one of the mandatory keywords.
- All nutrition values have a proper unit.
- The value of energy in KJ is at least four times larger than the value of energy in KCAL.
- There is less that 20g of salt per 100g.
- The amount of sugars is smaller or equal to the amount of carbohydrates.
- The amount of saturated fats is smaller or equal to the amount of total fats.
- The sum of carbohydrates, total fats, proteins and fibres is less than 120g.

Step 3: Where any issues were identified, the ICF team fed back to data cleaners and asked them to make specific changes.

Data cleaners performed a second-level ingredients check, making use of Excel's spellchecking function

This process was run at the end of the data cleaning process (i.e. once step 1 ("Data cleaners review each scan individually, on the web app") had been completed) for a given country. The primary aim was to ensure the ingredients list was as accurate as possible, rather than identifying possible issues with data cleaner performance. The process was as follows:

Step 1: An ICF staff member ran a macro to highlight any spelling errors in the ingredients list for both the source language and the translation.

Step 2: A data cleaner reviewed scans where the translation was highlighted (i.e. where there may be a problem with the translation) to check if there was a genuine error in either the source language, the translation, or both. In datasets where a particularly large number of potential errors are highlighted (i.e. more than around 800 errors, which is the amount that a data cleaner should be able to review in a week), data cleaners were instructed to focus on scans where potential errors are highlighted in both the source language and the translation. Where errors are identified, data cleaners made corrections.

A team member at ICF conducted a final check of 1% of the data set and ran a final QA macro

Following the process described under step 2 ("Once a week, a team member at ICF reviews a sample of 10%-20% of each data cleaner's cleaned scans (50% during first days a data cleaner starts working on the dataset)"), a team member at ICF conducted whole scan checks across 1% of the dataset.

Where fewer than 10% of the scans checked contained any errors, it was concluded that the dataset was of a satisfactory quality. Where more than 10% of the scans checked contained errors, any repeated issues observed were resolved and then a further 1% of the data was reviewed. As before, where fewer than 10% of scans contained errors, the dataset was determined to be of satisfactory quality, and where there were more than 10% errors, the team aimed to resolve any issues before doing a final 1% check. At this point, if more than 10% errors remained then the team checked a further 2% of the data (reaching 5% of the full dataset) and again assessed the level of error. Where it continued to be unsatisfactory, the policy was to notify HaDEA and propose steps to improve the quality (this was not necessary in practice).

For example, this could have included employing a new data cleaner to review the scans in full for a second time.

Before signing off the dataset, a final QA macro was also run. Any remaining apparent errors picked up at this stage were checked and/or explained. For example, apparent errors may persist where there is a mistake in the product packaging or if the product is unusual in some way, such as having a very high salt content.

Health claims were reviewed in batch to determine whether they met the inclusion criteria, with incorrect claims removed from the dataset

In instances of multiple health claims, a data cleaner manually reviewed the images collected to confirm that all health claims met the inclusion criteria of being on the front of the packaging and consistently format health claims to support additional QA and future analysis. It was not possible to manually review every product to ensure that health claims were taken from the front of the packaging.

QA of health claims was conducted by ICF's data science team in the first instance, who sought to match health claims against key terms. The list of key terms was informed by EU permitted wording on nutrition and health claims. This was then manually reviewed by a member of the ICF study team. Any incorrect health claims were removed from the dataset at this stage.

Reclassification of categories and subcategories

Our approach to reclassification began with "category sense checks". This involved using Excel formulas and simple filters to check whether products grouped under a certain category met basic requirements of belonging to that category. For example, the sense checks for sugar-sweetened beverages first checked that the ingredients list included water, and then checked that the product name included one of the key search terms that would be expected (such as "cola", "lemonade", "fruit", "soft drink"). For any products that do not meet these criteria, a member of staff at ICF reviewed the product and determined whether it belonged in the assigned category. If not, they assigned it to the most appropriate category, and if it did not fall into any of the EUREMO categories they recorded that it should be excluded from the dataset.

Following the category sense checks, the data was reclassified at subcategory level. The process that was followed depended on the category:

- For sugar-sweetened beverages, energy drinks & soft drinks, breakfast cereals and "desserts" (within the category "ice cream, desserts"), there were **dedicated procedures to reclassify the data**. The procedure used Excel filters and subcategory definitions to assign new subcategories to the data. Because this process does not rely on the assigned subcategory, it also acts as a quality assurance step.
- For bread products and meats (within "meat and fish"), reclassification work was largely **carried out by members of the study team**.
- For all other categories, **subcategory-level tests** were developed by ICF's data science team as far as possible to enable the assignment of new subcategories based on the characteristics of the product, including the product name, the ingredients, nutritional content and (for a small number of subcategories) the presence or content of health claims. On occasions where the test was not able to assign a subcategory, the team utilised the original subcategory assigned by the fieldworker. The results of these tests were then checked by members of the study team and amendments made where necessary to achieve as high a level of accuracy as possible.

This process is shown in the diagram below.

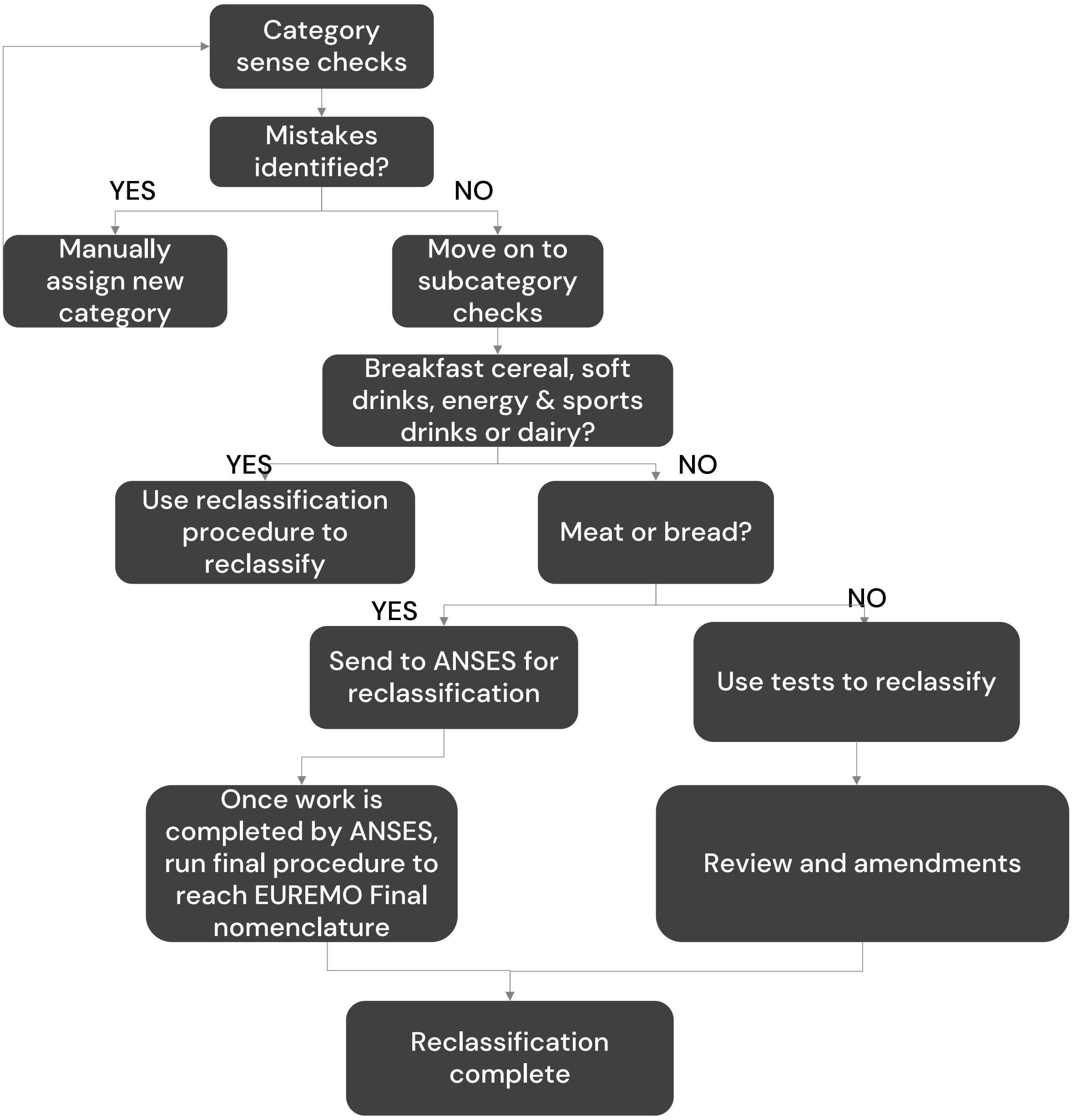

Category sense checks
Mistakes identified?
YES
NO
Manually assign new category
Move on to subcategory checks
Breakfast cereal, soft drinks, energy & sports drinks or dairy?
YES
NO
Use reclassification procedure to reclassify
Meat or bread?
YES
NO
Send to ANSES for reclassification
Use tests to reclassify
Once work is completed by ANSES, run final procedure to reach EUREMO Final nomenclature
Review and amendments
Reclassification complete

Table 86. QA protocol - summary

	Level	Method	Checker	Sample	Action if errors identified	Prescribed tolerance at this level	Notes/issue
Name	Primary	Visual check of photo to web app data for commercial name, legal name, translated name	Data cleaner	100%	Corrections made by data cleaner	0%	Legal and/or commercial name could be incorrectly entered, or details missed by fieldworker/data cleaner.
	Secondary	Visual whole scan check, comparing data to images.	ICF	5-10% (based on performance)	Data cleaner notified and asked to make further corrections.	<10%	Errors may exist within scans that are not part of the reviewed sample.
Brand	Primary	Visual check of photo to web app data for brand name	Data cleaner	100%	Corrections made by data cleaner	0%	Could be incorrectly entered or identified by fieldworker/data cleaner.
	Secondary	Visual whole scan check, comparing data to images.	ICF	5-10% (based on performance)	Data cleaner notified and asked to make further corrections.	<10%	Errors may exist within scans that are not part of the reviewed sample.

	Level	Method	Checker	Sample	Action if errors identified	Prescribed tolerance at this level	Notes/issue
Producer/manufacturer	Primary	Visual check of photo to web app data for producer/manufacturer and contact information	Data cleaner	100%	Corrections made by data cleaner	0%	Could be incorrectly entered or identified by fieldworker/data cleaner.
	Secondary	Visual whole scan check, comparing data to images.	ICF	5-10% (based on performance)	Data cleaner notified and asked to make further corrections.	<10%	Errors may exist within scans that are not part of the reviewed sample.
Weight	Primary	Visual check of web app data to product photo for net weight	Data cleaner	100%	Corrections made by data cleaner	0%	Errors may exist within scans that are not part of the reviewed sample.
	Secondary	Visual whole scan check, comparing data to images.	ICF	5-10% (based on performance)	Data cleaner notified and asked to make further corrections.	<10%	Errors may exist within scans that are not part of the reviewed sample.
	Tertiary	Excel-based check to ensure that weight value is a number and the unit value is one of a list of expected units.	ICF	100%	Data cleaner notified and asked to make further corrections.	0%	An acceptable but incorrect value and/or unit could be recorded.

	Level	Method	Checker	Sample	Action if errors identified	Prescribed tolerance at this level	Notes/issue
Number units per pack	Primary	Visual check of mobile app data to product photo for number of units per pack	Data cleaner	100%	Corrections made by data cleaner	0%	
	Secondary	Visual whole scan check, comparing data to images.	ICF	5-10% (based on performance)	Data cleaner notified and asked to make further corrections.	<10%	Errors may exist within scans that are not part of the reviewed sample.
	Tertiary	Excel-based check to ensure that a value for number of units has been entered, or "1" has been entered where this information is not included.	ICF	100%	Data cleaner notified and asked to make further corrections.	0%	This value could be incorrectly recorded, or missed by the fieldworker/data cleaner and incorrectly recorded as "1".
Portion size	Primary	Visual check of web app data to product photo for portion size	Data cleaner	100%	Corrections made by data cleaner	0%	
	Secondary	Visual whole scan check, comparing data to images.	ICF	5-10% (based on performance)	Data cleaner notified and asked to make	<10%	Errors may exist within scans that are not part of the reviewed sample.

	Level	Method	Checker	Sample	Action if errors identified	Prescribed tolerance at this level	Notes/issue
					further corrections.		
	Tertiary	Excel-based check to ensure that a value for portion size has been entered, unless the number of units has been recorded as 1, in which case it can be left blank.	ICF	100%	Data cleaner notified and asked to make further corrections.	0%	This value could be incorrectly recorded, or could be left blank mistakenly where the actual number of units is 1 and a portion size is given on the packaging.
Ingredients	Primary	Ingredients list in web app is compared to that in the photo	Data cleaner	100%	Corrections made by data cleaner	0%	
	Secondary	Visual whole scan check, comparing data to images. Visual checks of ingredients lists, comparing data to images.	ICF	5-10% (based on performance) 50% for new data cleaners declining to 5-10% based on performance	Return incorrect products to data cleaner for correction, or corrections made by ICF and feedback shared with data cleaner (depending on scale of error/difficulty of	<10%	Errors may persist in unchecked scans.

	Level	Method	Checker	Sample	Action if errors identified	Prescribed tolerance at this level	Notes/issue
					correcting). Review a sample of corrected scans to ensure corrections have been made as required.		
	Tertiary	Excel-based spellchecker	ICF	100%	Minor corrections made by ICF team, or data cleaner asked to make corrections where errors are more substantial.	0%	Incorrect but correctly spelt words would not be identified. Errors only in source language that did not lead to a translation issue may not be identified.
Nutrition table	Primary	Visual check of web app data to photo	Data cleaner	100%	Corrections made by data cleaner	0%	
	Secondary	Visual whole scan check, comparing data to images.	ICF	5-10% (based on performance)	Data cleaner notified and asked to make further corrections.	<10%	Errors may exist within scans that are not part of the reviewed sample.
	Tertiary	Excel-based checks to ensure nutrient names	ICF	100%	Data cleaner notified and asked to	0%	It is possible that an error is not picked up where a

	Level	Method	Checker	Sample	Action if errors identified	Prescribed tolerance at this level	Notes/issue
		are as expected and units are appropriate for the nutrient name. Integrity tests on exported nutritional data – e.g. salt < 20g/100g; xKJ > 4xKCAL.			investigate using photos and make further corrections as necessary.		value has been recorded incorrectly but conforms with our tests.
Category/sub-category	Primary	Excel-based checks of categories based on specified criteria (e.g. product composition, product name).	ICF	100%	ICF to recategorise incorrectly categorised scans	0%	May not be possible to identify errors based on information within the scan for some categories.
	Secondary	Mixed approach, including implementation of devised procedures for reclassifying in Excel based on aspects of the products (e.g. name, nutritional content and	ICF and ANSES	100%	N/A	N/A	These processes assign subcategories to products based on their characteristics. It is possible that additional manual reclassification may be needed for product types

	Level	Method	Checker	Sample	Action if errors identified	Prescribed tolerance at this level	Notes/issue
		ingredients); test-based reclassification; and manual reclassification.					originally anticipated to be reclassified using a test-based approach, depending on the complexity of the subcategories and the ability of tests to uphold these distinctions.
	Tertiary	"Automatic" reclassification using assigned subcategory, where there is one-to-one alignment between EUREMO Fieldwork and EUREMO Final subcategories, and comparison with secondary reclassification.	ICF	All applicable subcategories	Where poor alignment between the results of secondary reclassification and tertiary reclassification are found, secondary reclassification should be prioritised. However a high number of errors or trends in errors warrants further investigation.	<10%	It was expected that this check would return a fairly large error rate, and therefore it's value may be limited. Initially it was suggested to take a closer look where 10% or more of a given category has products where the subcategory assigned by the secondary level work does not match with the

	Level	Method	Checker	Sample	Action if errors identified	Prescribed tolerance at this level	Notes/issue
							"automatic" reclassification.
	Quarternary	1% check of classification	ICF	1%	Review of reclassification process for affected categories/subcategories and reclassification of products using updated method.	<10%	Errors may exist within scans that are not part of the reviewed sample.
Health claim	Primary	Visual check of health claims in mobile app to photo	Data cleaner		Corrects errors with text to reflect what is captured in image. Does not assess whether picture correctly identifies a health claim or if health claims are on the packaging but have been missed.	0%	Fieldworker may have missed health claim; data cleaner may miss health claim within images or record it incorrectly.
	Secondary	Visual whole scan check, comparing data to images.	ICF	5-10% (based on performance)	Data cleaner notified and asked to make	<10%	Errors may exist within scans that are not part of the reviewed sample.

	Level	Method	Checker	Sample	Action if errors identified	Prescribed tolerance at this level	Notes/issue
					further corrections.		
	Tertiary	Check to ensure health claims are on the front of the packaging for multiple health claims	Data cleaner	100% of scans with multiple health claims	Health claim removed or corrected	0%	Health claims that have not been initially picked up by fieldworker will not be identified. Health claims not reviewed manually in this round may be included incorrectly.
	Quarternary	Data science-based approach to identify and remove incorrect health claims from the dataset, complemented by manual checks for any more complex health claims.	ICF	100% of scans with health claims	Health claim removed or corrected	0%	Health claims that have not been initially picked up by fieldworker will not be identified. Health claims not reviewed manually in this round may be included incorrectly.

Annex 2 – Guidance notes: workshop and twinning action

Workshop

EUREMO

Workshop-Guidance note

Introduction

In the context of Task 2.2, the EUREMO study will **organise two workshops and two twinning actions supporting the implementation of reformulation initiatives in Member States**. These activities will take place in Member States that are already interested in pursuing national reformulation initiatives and organised in close collaboration with those responsible for policy development.

Aim of the workshop

The workshops will help officials from your country to improve their understanding of the challenges and benefits associated with different reformulation initiatives by learning from the experiences of others. The value of each of this event will be to bring together different stakeholders and experts who stand to learn from each other but who may not normally have the opportunity to do so.

Key features of the workshop

The workshop will be a **one-day event** and it will involve **up to 31 people**, namely:

- **Up to 23 Member State representatives** (this will include up to 20 participants from your Member State, and up to three additional participants from other Member States who may wish to participate and present their experience);
- **Up to three** members of the **ICF team for logistical support**, facilitation and note-taking;
- **Up to three experts**, who will deliver presentations during the workshop (provided by ICF);
- **One or two** representatives from **CHAFEA and/or DG SANTE**.

The workshop will be organised in your country).

ICF will **cover venue rental (of the venue) and catering expenses associated with the workshops**. ICF will also cover **travel, accommodation and subsistence expenses of the three experts and its own staff.** Workshops will be held in English.

Workshop responsibilities

Experts participating in the workshop

- Being available for discussions with the hosting Member State and project team;
- Presenting at the workshop;
- Actively contributing to the discussions at the workshop;
- Reflecting on the learning achieved during the workshop;
- Identifying any follow-up learning activities;
- Feeding the information from the workshop back to their colleagues;

- Reviewing the workshop report.

Hosting Member States:

- Identify own initial needs and interests to inform the development of the workshop agenda;
- Revise the content of the workshop, presented in the form of an agenda, with the support of the project team and CHAFEA;
- Assist the facilitating and chairing of the workshop;
- Present the relevant challenge or issue at the workshop;
- Actively contribute to the discussions at the workshop;
- Reflect on the learning achieved during the workshop;
- Identify any follow-up learning activities;
- Feed the information from the workshop back to colleagues in the relevant ministries/organisations;
- Review the workshop report (which will be prepared by ICF).

Project team

- Preparing an **initial draft of the meeting agenda**, with the hosting Member State;
- **Coordinating the preparation** and organisation of the workshop;
- **Liaising with CHAFEA, hosting Member State and expert participants** in relation to all aspects of the workshop (incl. travel and accommodation);
- Providing logistical and administrative support before, during and after the workshop;
- Preparing supporting documentation and onsite material (e.g. participant overview, practical information, name badges/ tents, delegate packs);
- **Identifying and commissioning the workshop experts**; coordinating the inputs of the experts before, during and after the event;
- Assisting with the facilitation and chairing of the workshop (if required)

Organization

Workshops will be organised in Greece and Croatia. Such workshops will have a thematic focus, to be determined jointly with the selected Member States, and aim to share knowledge on existing reformulation initiatives that are in place and have demonstrated results and impacts.

Background on the workshop hosts:

a) Greece

Greece has an ongoing Action Plan to define food reformulation benchmarks. It currently does not have food reformulation benchmarks for any nutrient. The lack of baseline data for the food groups has made it very difficult to set the benchmarks but the Greek authorities have experienced difficulties in initiating discussions with the industry, and especially with local producers. In this context, the country has expressed interest in receiving guidance on how to approach to industry, and traditional local producers in particular, as part of the process of defining and setting reformulation targets. Greece has expressed a strong interest in hosting the workshop to increase awareness among stakeholders at national and local level, and reflect on working with industry in this area.

b) Croatia

Croatia, through the Ministry of Heath, has expressed a strong interest in receiving support in the implementation of the 'Healthy Living Sign' (front of package-labelling that is intended to drive food reformulation). It is also keen on receiving technical support on collaboration with industry on food reformulation and taxation (for example, preparing technical documents for the Ministry of Health to suggest which kind of taxation is needed / which kind of products).

Twinning Actions

Twinning Actions -Guidance note

Introduction

In the context of Task 2.2, the EUREMO study will **organise two twinning actions supporting the implementation of reformulation initiatives in Member States**. These activities will take place in Member States that are already interested in pursuing national reformulation initiatives and organised in close collaboration with those responsible for policy development. Twinning actions will be **targeted at Member States that would benefit from learning about a specific reformulation initiative undertaken elsewhere,** either because they are planning a similar initiative or because they face similar challenges.

Aim of the twinning action

The twinning action will help officials from your country to learn about an initiative undertaken elsewhere, either because your country is planning a similar initiative or because you face similar challenges. The value of this event will be to bring together different stakeholders and experts who stand to learn from each other but who may not normally have the opportunity to do so. For this activity it is also important that both hosting and visiting MS have notable similarities in culture, situation and food supply.

Key features of the twinning action

ICF will support the twinning action that will consist of **one mission of up to two days**. For the mission **ICF will cover travel, subsistence and accommodation expenses** of:

- One Member State representative visiting another Member State;
- One ICF staff member to attend and facilitate the mission; and
- One expert (either EuroFIR or Sciensano) to provide technical support to the mission.

We assume that the **venue for the mission will be provided by the hosting Member State**.

Ultimately, the **planning and organisation of the twinning activities will be organised by the hosting Member States.** However, the study team will be available to also provide insight, suggestions and feedback on the type of activities that might be of use. An initial bilateral discussion will be held at the outset of the process and will be used to establish a common understanding of the intended purpose and goals of the twinning action. The plan for specific activities should be built around this shared understanding.

Responsibilities for designing and delivering the twinning action

Twinning action partner experts

- Being available for discussions with the hosting Member State and project team
- Being available to travel to the hosting Member State and participate in the planned activities for the period of time agreed
- Reflecting on the challenges encountered by the hosting Member State and preparing any relevant background information on their experiences in the form of handouts, presentations etc.
- Reflecting on the learning achieved during the twinning action
- Identifying any follow-up learning activities
- Feeding the information from the twinning action back to their colleagues
- Reviewing the twinning action report

Hosting Member States:

- Identify own **initial needs** and interests to inform the choice of the twinning partners;
- To determine the **time frame** most suitable for twinning activities to occur;
- To **organize the set of activities** and events to occur during the course of the twinning action;
- Reflect on the **learning achieved** during the twinning action;
- Identify any **follow-up learning activities**;
- Feed the information from the twinning action back to colleagues in the relevant ministries/organisations;
- **Review** the twinning action report (which will be prepared by ICF).

Project team

- **Reviewing the different options** for twinning partners and providing information on the potential benefits of each to the hosting Member State
- Providing **suggestions to the hosting Member State** on the types of activities it may be helpful to include twinning partners in
- **Liaising with CHAFEA, hosting Member State and expert participants** in relation to any logistical aspects of the twinning actions (including the reimbursement of travel and accommodation)
- **Identifying the twinning partner participants** and ensuring they are prepared and have capacity to participate
- Producing and publishing the twinning action report

Organisation

Potential twinning actions were identified based on the information provided by Member States through the project survey and initial follow-up discussions. These have been discussed with CHAFEA and DG SANTE following submission of this report.

Annex 3 – References: national reformulation initiatives

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Annex 5 – Supplementary information for scenarios on fatty acids as part of health impacts work

See below the scenarios proposed (% of changes at food group levels starting from g/100 gram). The percentage of change is based on half of (or the intermediate between) the difference in nutrient composition between the "best" and "worst", using indicator foods. Data on food consumption is from the Dutch food composition table (https://nevo-online.rivm.nl/).

<u>Reference situation</u>: fatty acid composition as in food composition tables

<u>Scenario minimal implementation</u>: lower fat dairy (incl cheese),

Indicator foods: Skim and full fat milk, and 30+ and full fat cheese.

Crude difference between best and worst in class for indicator foods milk (difference between skim and full fat milk) and cheese (difference between 30+ and full fat cheese)= difference in sum of fatty acids of -50%, which is assumed to translate to all types of fatty acids similarly: -50%SFA, -50%TFA, -50%PUFA

For the scenario minimal implementation the intermediate between best and worst in class of the indicator foods is: **-25%SFA, -25%TFA, -25%PUFA**

<u>Scenario partial implementation</u>: lower fat dairy (including cheese) (see in scenario minimal implementation), **and** replacement of saturated by (poly)unsaturated fatty acids for sweet and savory snacks -50%SFA, -50%TFA, +80%PUFA (crude difference between best and worst in class)

Indicator foods: cake and biscuits with or without butter, puff pastry with or without butter, different type of savory snacks with puff pastry.

For sweet and savory snacks, the intermediate between the best and worst in class is:

-25%SFA, -25%TFA, +40%PUFA

<u>Scenario full implementation</u>: lower fat dairy (including cheese) (see above), and replacement of saturated by (poly)unsaturated fatty acids for sweet and savory snacks (see above) and for fats, oils and margarines -80%SFA, -80%TFA, +80%PUFA (crude difference between best and worst in class)

Indicator foods: Butter-sunflower-rapeseed oil, margarines with fat content around 80%, margarine products (for cooking and baking), fat content around 60%.

Thus in scenario full implementation for oils and fats the intermediate between the best and worst in class is:

-40%SFA, -40%TFA, +40%PUFA

Annex 6 – Background data as part of health impacts work

https://nevo-online.rivm.nl/

For dairy (including cheese),

Lower (saturated) fat varieties instead of full fat.

Milk Differences "semi skim fat" compared with "full fat" based on sum of fatty acids=-56%, which is assumed to translate to all fatty acids similarly.

NEVO -code	Voedings middel	Food item	Vet totaal (g)	Som van de vetzuren (g)	Vetzuren totaal verzadigd (g)	Vetzuren totaal trans (g)	Vetzuren enkelv onverz cis (g)	Vetzuren meerv onverz (g)
279	Melk volle	Milk whole	3.4	3.2	2.2	0.1	0.7	0.1
86	Melk halfvolle	Milk semi-skimmed	1.4	1.4	0.9	0.0	0.3	0.0

Cheese Differences "30+ fat" compared with "full fat 48+" based on sum of fatty acids=-39%, which is assumed to translate to all fatty acids similarly.

NEVO -code	Voedings middel	Food item	Vet totaal (g)	Som van de vetzuren (g)	Vetzuren totaal verzadigd (g)	Vetzuren totaal trans (g)	Vetzuren enkelv onverz cis (g)	Vetzuren meerv onverz (g)
513	Kaas Goudse 48+ gem	Cheese Gouda 48+ average	30.5	28.6	19.8	0.8	6.4	0.9
1382	Kaas 30+ gem	Cheese 30+ average	18.5	17.4	12.1	0.5	3.9	0.5

For sweet and savory snacks

Replacement of fats rich in saturated fatty acids (cream, butter) by poly-unsaturated fatty acids (e.g. sunflower and rapeseed oil)

<u>Cake and cookies:</u>

Differences "without butter" compared with "with butter": -35% SFA, -50% TFA, +77% PUFA

NEVO -code	Voedings middel	Food item	Vet totaal (g)	Som van de vetzuren (g)	Vetzuren totaal verzadigd (g)	Vetzuren totaal trans (g)	Vetzuren enkelv onverz cis (g)	Vetzuren meerv onverz (g)

253	Cake z roombote r (without butter)	Cake wo butter	22.3	21.1	9.1	0.2	8.6	3.5
1969	Cake m roombote r (with butter)	Cake made w butter	22.7	21.0	14.2	0.4	5.5	0.8

NEVO -code	Voedings middel	Food item	Vet totaal (g)	Som van de vetzuren (g)	Vetzuren totaal verzadigd (g)	Vetzuren totaal trans (g)	Vetzuren enkelv onverz cis (g)	Vetzuren meerv onverz (g)
258	Koekje gem (without butter)	Biscuit average	20.1	19.0	9.2	0.2	5.1	1.8
1972	Koekje roombote r- gem (with butter)	Biscuits assorted w butter average	23.4	22.0	14.1	0.4	5.8	1.2

<u>Puff pastry</u>

Differences “without butter” compared with “with butter”: -70% SFA, -50% TFA, +90% PUFA

NEVO -code	Voedings middel	Food item	Vet totaal (g)	Som van de vetzuren (g)	Vetzuren totaal verzadigd (g)	Vetzuren totaal trans (g)	Vetzuren enkelv onverz cis (g)	Vetzuren meerv onverz (g)
265	Bladerde eg z roombote r, bereid (without butter)	Puff pastry wo butter baked	47.0	44.7	9.0	0.0	20.5	15.0
3076	Bladerde eg m roombote r, bereid (with butter)	Puff pastry w butter baked	47.0	44.2	31.0	0.9	10.5	1.4

Sweet and savory snacks with puff pastry

Differences lowest compared to highest SFA: -40% SFA, -90%(or**-50%?** (in further calculations) TFA, +84% PUFA

NEVO -code	Voedings middel	Food item	Vet totaal (g)	Som van de vetzuren (g)	Vetzuren totaal verzadigd (g)	Vetzuren totaal trans (g)	Vetzuren enkelv onverz cis (g)	Vetzuren meerv onverz (g)
250	Broodje amandel- (v bladerde eg)	Puff pastry filled with almond paste	23.0	21.8	6.0	0.1	10.8	4.5
266	Broodje saucijzen -	Snack sausage roll puff pastry	23.4	22.2	10.8	**1.1**	7.6	2.1
2553	Broodje kaas- v bladerde eg	Cheese pastry w puff pastry	44.7	42.3	10.5	0.2	18.5	13.1
3373	Broodje frikandel- bladerde egbasis	Snack roll puff pastry with Dutch sausage	21.2	20.1	10.7	0.0	7.1	2.3

Butter, sunflower, rapeseed oil. Differences lowest compared to highest SFA: -87% SFA, -80%TFA, +>100% PUFA

NEVO -code	Voedings middel	Food item	Vet totaal (g)	Som van de vetzuren (g)	Vetzuren totaal verzadigd (g)	Vetzuren totaal trans (g)	Vetzuren enkelv onverz cis (g)	Vetzuren meerv onverz (g)
308	Olie arachide-	Oil peanut	100.0	96.0	17.3	0.0	59.1	19.4
310	Boter ongezout en	Butter unsalted	81.2	76.3	**53.6**	1.5	18.2	2.4
317	Olie zonneblo em-	Oil sunflow er seed	99.5	95.5	10.6	0.0	28.1	56.7
3449	Olie koolzaad- /raapzaa d-	Oil rapesee d	99.9	95.9	**6.9**	0.3	60.2	28.3

Margarines, fat content around 80%

Differences lowest compared to highest SFA for high fat (around 80% fat): -74% SFA, -29%TFA, +83% PUFA

NEVO -code	Voedings middel	Food item	Vet totaal (g)	Som van de vetzuren (g)	Vetzuren totaal verzadigd (g)	Vetzuren totaal trans (g)	Vetzuren enkelv onverz cis (g)	Vetzuren meerv onverz (g)
1847	Margarine product kuipje Becel Original	Margarine product tub Becel Original	45.0	43.2	**8.5**	**0.5**	10.6	**23.9**
2062	Margarine 80% vet < 24 g verz vetz gezouten	Margarine 80% fat < 24 g saturates salte	80.0	76.8	18.9	0.7	25.4	32.2
2063	Margarine 80% vet > 24 g verz vetz gezouten	Margarine 80% fat > 24 g saturates salte	79.7	76.4	**33.1**	0.7	30.7	13.1
2064	Margarine product 70% vet <17 g verz vetz ongezouten	Margarine product 70% fat <17 g sat unsa	70.0	67.2	15.4	0.0	17.3	34.6
2072	Margarine product 60% vet <17 g verz vetz ongez	Margarine product 60% fat <17 g sat unsa	60.0	57.6	14.4	0.0	14.4	29.8
2077	Margarine vloeibaar 80% vet <17 g verz vetz gezouten	Margarine liq 80% fat <17 g saturates sa	81.6	78.3	**8.6**	0.5	41.4	27.0
2557	Margarine 80% vet > 24 g verz vetz ongezouten	Margarine 80% fat > 24 g sat unsalted	80.2	77.0	32.3	0.7	31.9	11.5

2558	Margarine vlb 80% vet< 17 g verz vetz ongezouten	Margarine liq 80% fat < 17g sat unsalted	82.0	78.7	8.9	0.5	31.3	37.7
2565	Margarine 80% vet < 24 g verz vetz ongezouten	Margarine 80% fat < 24 g sat unsalted	80.0	76.8	15.4	1.0	22.1	38.4

Margarine products (for cooking and baking), fat content around 60%

Differences lowest compared to highest SFA for high fat (at around 60%): -74% SFA, **-0?%** (-80%)TFA, +83% PUFA

NEVO -code	Voedings middel	Food item	Vet totaal (g)	Som van de vetzuren (g)	Vetzuren totaal verzadigd (g)	Vetzuren totaal trans (g)	Vetzuren enkelv onverz cis (g)	Vetzuren meerv onverz (g)
2711	Margarineproduct Albert Heijn Balans	Margarine product Albert Heijn Balans	45.0	43.2	9.5	0.0	11.0	24.0
2712	Margarineproduct vloeibaar <60% vet <17 g verz vet ongezouten	Margarine product liquid <60% fat <17 g	56.0	53.8	5.2	**0.0**	21.1	27.5
2713	Margarineproduct vloeibaar <60% vet <17 g verz vet gezouten	Margarine product liquid <60% fat <17 g	56.0	53.8	**4.3**	0.5	32.6	15.4
3152	Margarineproduct 60% vet >17g verz vetz gezouten	Margarine product 60% fat >17 g sat salt	59.0	56.6	**16.8**	0.5	13.4	26.9
3329	Margarineproduct	Margarine product	60.0	57.6	13.4	0.0	14.4	29.8

	Vita d'Or Bewust	Vita d'Or Bewust					
3337	Margarine vloeibaar 80% vet Blue Band	Margarine liquid 80% fat Blue Band	82.0	78.7	7.7	0.5	49.0	21.6
3338	Margarine vloeibaar 80% vet Becel Olijf	Margarine liquid 80% fat Becel Olijf	82.0	78.7	9.7	0.8	35.2	33.0
3339	Margarine vloeibaar 80% vet Vita d'Or Bewust	Margarine liquid 80% fat Vita d'Or Bewus	81.5	78.2	10.5	0.5	27.2	40.1
2711	Margarineproduct Albert Heijn Balans	Margarine product Albert Heijn Balans	45.0	43.2	9.5	0.0	11.0	24.0

Annex 7 – EUREMO survey: expressions of interest for workshops and twinning actions

The table below provides an extract of European countries' responses to the project's invitation to express interest in activities related to workshops and twinning actions.

Figure 1. Expression of interest-EUREMO survey results

	HIGH LEVEL WORKSHOPS/HLW_Q1A Please tick all that apply regarding your interest in participating:	TWINNING_Q1A
Austria	My institution would like to contribute to a workshop in another Member State	My institution is interested in hosting a twinning action and receiving guidance from another Member State
Belgium	My institution would like to contribute to a workshop in another Member State	My institution is interested in being a twinning partner and visiting another Member State to share my experience
Bulgaria	My institution would like to contribute to a workshop in another Member State	My institution is interested in being a twinning partner and visiting another Member State to share my experience
Croatia	My institution would like to host a workshop My institution would like to contribute to a workshop in another Member State	My institution is interested in being a twinning partner and visiting another Member State to share my experience
Czech Republic	My institution would like to contribute to a workshop in another Member State	I am not interested in participating in twinning actions
Cyprus	My institution would like to contribute to a workshop in another Member State	My institution is interested in being a twinning partner and visiting another Member State to share my experience
Denmark	My institution would like to contribute to a workshop in another Member State	My institution is interested in being a twinning partner and visiting another Member State to share my experience

	HIGH LEVEL WORKSHOPS/HLW_Q1A Please tick all that apply regarding your interest in participating:	**TWINNING_Q1A**
Estonia	My institution is not interested in participating in workshops	My institution is interested in hosting a twinning action and receiving guidance from another Member State
Finland	My institution would like to contribute to a workshop in another Member State	My institution is interested in being a twinning partner and visiting another Member State to share my experience
Germany	My institution is not interested in participating	My institution is not interested in participating
Greece	My institution would like to host a workshop / My institution would like to contribute to a workshop in another Member State	My institution is interested in hosting a twinning action and receiving guidance from another Member State
Hungary	My institution would like to contribute to a workshop in another Member State	My institution is interested in hosting a twinning action and receiving guidance from another Member State
Ireland	My institution would like to contribute to a workshop in another Member State	My institution is interested in being a twinning partner and visiting another Member State to share my experience
Italy	My institution would like to contribute to a workshop in another Member State	I am not interested in participating in twinning actions
Latvia	My institution would like to contribute to a workshop in another Member State/We would like to receive the invitations to workshop in order to evaluate to necessity to participate at workshop.	My institution is interested in being a twinning partner and visiting another Member State to share my experience
Lithuania	No, my institution is not interested in participating	I am not interested in participating in twinning actions

	HIGH LEVEL WORKSHOPS/HLW_Q1A Please tick all that apply regarding your interest in participating:	TWINNING_Q1A
Luxembourg	No, my institution is not interested in participating	I am not interested in participating in twinning actions
Malta	My institution would like to contribute to a workshop in another Member State	My institution is interested in hosting a twinning action and receiving guidance from another Member State
Netherlands	My institution is not interested in participating	-
Poland	My institution would like to contribute to a workshop in another Member State	I am not interested in participating in twinning actions
Portugal	My institution would like to contribute to a workshop in another Member State	My institution is interested in being a twinning partner and visiting another Member State to share my experience
Romania	a) My institution would like to host a workshop b) My institution would like to contribute to a workshop in another Member State	My institution is interested in hosting a twinning action and receiving guidance from another Member State
Slovenia	My institution would like to contribute to a workshop in another Member State	My institution is interested in hosting a twinning action and receiving guidance from another Member State
Spain	My institution would like to contribute to a workshop in another Member State	My institution is interested in being a twinning partner and visiting another Member State to share my experience
Sweden	My institution is not interested in participating in workshops	I am not interested in participating in twinning actions
UK	My institution would like to contribute to a workshop in another Member State	I am not interested in participating in twinning actions-We may be interested

	HIGH LEVEL WORKSHOPS/HLW_Q1A Please tick all that apply regarding your interest in participating:	TWINNING_Q1A
		in this; I am unable to give a definite answer at the moment

Annex 8 – Online questionnaire for National Competent Authorities and ministries regarding national reformulation initiatives

Background

ICF is conducting a study on behalf of the European Commission, focusing on food composition and food reformulation policies and monitoring. As part of this study, ICF and collaborating experts will support Member State public authorities in their implementation of reformulation initiatives. ICF will organise targeted workshops, twinning initiatives, and scientific and technical support. ICF will also collect food composition data in 16 Member States to monitor the impact of reformulation initiatives. ICF is a research and evaluation consultancy. ICF is working with support of ANSES, RIVM, EuroFIR, Sciensano and Premotec.

Objective of the questionnaire

The objective of this questionnaire is to **gather information on ongoing and planned reformulation initiatives in each Member State**. By answering this questionnaire, you will help ICF to build an inventory of experience in conducting food reformulation initiatives within the EU. You will also help ICF specify how it could support Member States to develop and implement reformulation initiatives.

We ask for concise responses to the questions in this survey. Where information on a reformulation initiative is available on a website or publicly available document, please provide the appropriate hyperlink in English.

Thank you for your support of this research.

At ICF we care about your personal and sensitive data. This survey is designed to be compliant with Regulation 2018/1725 and the General Data Protection Regulation (2016/679). This information sheet details how your data will be processed by ICF. All the data gathered in this survey will be stored by ICF in compliance with the Data Controller's Privacy Statement and the ICF Privacy Statement. The data will be anonymised and will only be presented in an aggregated manner. The data will be anonymised and will only be presented in an aggregated manner.

If you have any questions about this research, please email euremo@icf.com.

Contact details

Please provide your contact details:

- Your name:
- Your role:
- Email:
- Phone number:
- Member State:
- Name of organisation:
- Webpage of the organisation:

Food composition monitoring

The following questions aim to understand if and how branded food composition data may already be collected within each Member State. This information will help us adapt our food composition data collection to make sure it is complementary to what is already being done.

FCR_Q1. Is branded food composition data collected in your MS for monitoring purposes? *Food composition data includes details of the ingredients, type and amount*	a) Yes- in store b) Yes- data provided directly from retailers and/or manufacturers

of nutrients contained in the foods available for consumption within your Member State	*(please specify the name of the retailer/manufacturer)* c) Yes- other *(please specify)* d) No e) Don't know
FCR_Q2. If answered "yes" to q1 above: **Which food categories are covered?**	f) Bakery products g) Bread and bread products h) Breakfast cereals i) Canned fruits and vegetables j) Confectionary k) Energy drinks and sport drinks l) Meat products m) Potato products n) Ready meals o) Sauces condiments and spices p) Savoury snacks q) Sugar-sweetened beverages r) Sugar-sweetened dairy and dairy imitates s) Sugars-sweetened desserts, ice cream and toppings t) Other
FCR_Q3. If answered "yes" to q1 above: **How often is this data collected?**	u) Annually v) Bi-annually w) It was a one-off exercise x) Don't know
FCR_Q4. If answered "yes" to q1 above: **Please indicate who (organisation, contact person, email address and/or phone number) is responsible for monitoring food composition in your MS.**	*Open box*

Reformulation initiatives

The next set of questions relate to specific reformulation activities that are taking place or are planned in your country. We are interested in initiatives that are (or will be) initiated, promoted or endorsed by public authorities.

There are many different food environment initiatives. Among those, we are interested here in initiatives that aim to drive reformulation. In other words, reformulation is an intended objective of the policymakers who designed the initiative. This includes targets or limits on key nutrients (salt, sugar, fat), whether they are mandatory or voluntary.

To guide you, the table below provides a summary of reformulation initiatives that we are most interested in collecting information about.

Figure 2. Types of food reformulation initiatives relevant for this study

Types of initiatives	Sub-type	Definition
Food composition	Maximum nutrient limit/restriction/ ban	A maximum limit specifying the content of a nutrient permitted in a food category designed to encourage food reformulation. This includes bans (i.e. maximum content of the nutrient is 0).
	Reformulation targets	A target for the quantity of a nutrient or a relative reduction target of the average nutrient content in a specific food category designed to encourage food reformulation to a healthier composition.
Economic approaches	Subsidies	Any financial benefit provided by a government which aims at driving food reformulation. Items may not receive a benefit on health reasons, for example products with added sugars. Subsidies may be grants or tax concessions.
	Taxes	A government imposed surcharge on a nutrient of concern (i.e. saturated fat, sodium, sugar) or a food considered to be unhealthy[89], designed to encourage food reformulation.
Labelling	Front-of-pack labelling	Simplified and summarised information on the nutritional aspects of packaged foods designed to encourage food reformulation. It includes summary indicators or graphical symbols of nutrient or other components (i.e. wholegrain) content in a food.
Marketing restrictions	Market/advertising restrictions	A form of control on the eligibility of foods or beverages to be marketed/advertised designed to encourage food reformulation, including through the use of explicit targets/limits for nutrients.
Restrictions on food provision	Restrictions on food provision in specific settings	Restrictions on specific food types, food categories, portion sizes, or nutrient compositions in settings such as workplaces, hospitals or schools, designed to encourage food reformulation.

Please describe each reformulation initiative in the next few questions. Once information on one initiative is provided you will be given the option to add a response for another initiative.

RI_Q1a. Are any reformulation initiatives that have been initiated, promoted or endorsed by public authorities, taking place (or being planned) in your country?	y) Yes- ongoing *[Go to RI_Q2]* z) Yes- planning aa) No

[89] *We consider that "unhealthy food options" refers to foods that contain high levels of nutrients for which there is evidence that excess consumption in European populations might influence diet-related adverse health conditions: total fat, saturated fatty acids, trans-fatty acids, sugars and salt. The set of these nutrients may vary according to national specificities. (European Commission, Action Plan on Childhood Obesity, February 2014)*

RI_Q1b. Please explain why there are no reformulation initiatives taking place or being planned in your country.	
BOX 1 - If answered "Yes - ongoing" to RI_Q1a:	
RI_Q2. What is the name of the initiative?	*Open box*
RI_Q3a. Which public institutions/authorities are involved in this initiative? How?	*Open box*
RI_Q3b. Are other stakeholders involved?	Yes No
RI_Q3bi. If answered "yes" at RI_Q3b. **Which stakeholders are involved in this initiative? How are they involved?**	*Open box*
RI_Q3c. How is industry involved in the initiative?	bb) In the development of the initiative cc) In the implementation of the initiative dd) Other (please explain)
RI_Q3d Which food/drink sectors within the supply chain are involved?	**Food (please provide sub-sectors):** ee) Primary production ff) Manufacturing gg) Processing hh) Importers ii) Retail jj) Other **Drinks (please provide sub-sectors)** kk) Primary production ll) Manufacturing mm) Processing nn) Importers oo) Retail pp) Other
RI_Q4. Which nutrient(s), ingredients or related aspects are targeted by the initiative?	qq) Salt (sodium) rr) Trans fats ss) Saturated fats tt) (Added) Sugars

	uu) Artificial sweeteners vv) Fibre ww) Whole grains xx) Energy yy) Portion size zz) Other- please specify
RI_Q5. Which food categories are covered?	aaa) Bakery products bbb) Bread and bread products ccc) Breakfast cereals ddd) Canned fruits and vegetables eee) Confectionary fff) Energy drinks and sport drinks ggg) Meat products hhh) Potato products iii) Ready meals jjj) Sauces condiments and spices kkk) Savoury snacks lll) Sugar-sweetened beverages mmm) Sugar-sweetened dairy and dairy imitates nnn) Sugars-sweetened desserts, ice cream and toppings ooo) Other
RI_Q6a. What approach/tool(s) does the initiative rely on to encourage reformulation?	ppp) Food composition qqq) Economic approaches rrr) Labelling sss) Marketing restrictions ttt) Restrictions on food provisions uuu) Other (please specify)
RI_Q6b. Please provide more information on the approach/tool(s) of the initiative.	vvv) *Open box*
RI_Q7. Over what time period is the initiative being implemented? **- Please enter the initiative's start date below in the format dd/mm/yyyy.** **- Please enter the initative's end date below. If the initiative is being carried**	*Enter dates dd/mm/yyyy*

out over an open period, please select 'no end date'.	
RI_Q8. Is the initiative implemented in different phases?	www) Yes (please describe) xxx) No
RI_Q9. Is the initiative voluntary, or mandatory?	yyy) Voluntary zzz) Mandatory aaaa) Co-regulation bbbb) Other (please explain)
RI_Q9b. (If answered "voluntary" at RI_Q9): If the initiative is voluntary, when did industry sign up to it? (Please indicate if a rolling recruitment of individual firms is foreseen by selecting the relevant option - in that case multiple years can be selected)	Please select: cccc) 2019 dddd) 2018 eeee) 2017 ffff) Prior to 2017 gggg) Rolling recruitment *(please indicate the years that firms were recruited in the text box below)*
RI_Q9c (If answered "mandatory" at RI_Q9): If the initiative is mandatory, are there any enforcement mechanisms in place?	hhhh) Yes (please describe) iiii) No
RI_Q10a. What are the reformulation targets of the initiative (i.e. for a salt reduction initiative, what is the salt reduction target set by the initiative)?	*Open box* jjjj) No reformulation target kkkk) Don't know
RI_Q10b. What is the public health target/objective of the initiative (i.e. reducing salt intake by 30% by 2025)? **Please specify below (if implemented in different phases, please indicate the target for each phase).**	*Open box* llll) No public health target mmmm) Don't know
RI_Q11. Is the initiative part of a broader nutrition/health plan or strategy?	nnnn) Yes (please specify the name of plan/strategy and provide more information) oooo) No
RI_Q12a. How is the initiative monitored?	*Open box*
RI_Q12b. How much funding was dedicated by the government for monitoring of the initiative? (if any)	*Open box*
RI_Q12c. What data sources are used for monitoring and evaluation? (if any)	*Open box*

RI_Q13a. Has the impact of the initiative on public health, industry, and product composition been evaluated (or, will it be evaluated in the future)?	pppp) Yes (please specify how) qqqq) No
RI_Q13b. What is the modelled or measured impact of the initiative on public health (i.e. consumer behaviour, purchases, dietary habits)?	*Open box*
RI_Q13c. What is the modelled or measured impact of the initiative on the food and drink products concerned?	*Open box*
RI_Q13d. Has cost-effectiveness of the initiative been assessed?	rrrr) Yes (please specify) ssss) No tttt) Don't know
RI_Q13e. Were there any other findings from the evaluation?	uuuu) Yes (please specify) vvvv) No
RI_Q14a. Was the initiative successful? (based on the results of the evaluation if there was one, or based on overall results of the initiative)	wwww) Yes xxxx) No yyyy) Other
Q14b. Please provide more information on your answer above.	*Open box*
RI_Q15a. In your view, what factors played a role in the success/failure of the initiative?	*Open box*
RI_Q15b. In addition to the initiative, has other legislation in your country contributed to the initiative's success/failure?	zzzz) Yes (please explain how) aaaaa) No bbbbb) Don't know
RI_Q15c. What adjustments would make the initiative more effective?	*Open box*
RI_Q16. In your view could this initiative be successfully implemented in another Member State of the EU?	ccccc) Yes ddddd) No (please explain) eeeee) Don't know
RI_Q17. Please provide any links (website or document link) which provide information on the initiative described	*Open box*
RI_Q18. Who is the main technical contact point and institution for this initiative?	*Open box*

Please provide name of the institution, and a contact person including email address	
RI_Q19. Please provide any other relevant information and/or links concerning this initiative	*Open box*
RI_Q20. Would you like to add details of another reformulation initiative? If you select yes, you will be able to repeat these questions for another initiative.	*fffff)* Yes *[Return to RI_Q2]* ggggg) No

If answered "Yes - planning" to RI_Q1a:

BOX 2- If answered "yes-planning" to Q1	
P_Q2. What is the title / temporary name of the initiative?	*Open box*
P_Q3a. Which public institutions/authorities are involved in this initiative? How?	*Open box*
P_Q3b. Are other stakeholders involved?	hhhhh) Yes (please specify the types of organisations involved) iiiii) No
P_Q3c. How is industry involved in the initiative?	jjjjj) In the development of the initiative kkkkk) In the implementation of the initiative lllll) Other (please explain)
P_Q3d Which food/drink sectors within the supply chain are involved?	**Food (please provide sub-sectors):** **mmmmm)** Primary production nnnnn) Manufacturing ooooo) Processing ppppp) Importers qqqqq) Retail rrrrr) Other **Drinks (please provide sub-sectors)** sssss) Primary production ttttt) Manufacturing uuuuu) Processing vvvvv) Importers wwwww) Retail xxxxx) Other

P_Q4. Which nutrient(s), ingredients or related aspects will be targeted by the initiative?	yyyyy) Salt (sodium) zzzzz) Trans fats aaaaaa) Saturated fats bbbbbb) (Added) Sugars cccccc) Artificial sweeteners dddddd) Fibre eeeeee) Whole grains ffffff) Energy gggggg) Portion size *hhhhhh)* Other (please specify)
P_Q5. Which food categories will be covered?	iiiiii) Bakery products jjjjjj) Bread and bread products kkkkkk) Breakfast cereals llllll) Canned fruits and vegetables mmmmmm) Confectionary nnnnnn) Energy drinks and sport drinks oooooo) Meat products pppppp) Potato products qqqqqq) Ready meals rrrrrr) Sauces condiments and spices ssssss) Savoury snacks tttttt) Sugar-sweetened beverages uuuuuu) Sugar-sweetened dairy and dairy imitates vvvvvv) Sugars-sweetened desserts, ice cream and toppings wwwwww) Other
P_Q6a. Over what time period is the initiative planned to be implemented? **- Please enter the initiative's start date below.** **- Please enter the initiative's end date below. If the initiative is being carried out over an open period, please select 'no end date'.**	*Enter dates dd/mm/yyyy*

P_Q7. Will it be implemented in different phases?	xxxxxx) Yes (please describe) yyyyyy) No *zzzzzz)* Don't know
P_Q8a. Will the initiative be voluntary or mandatory?	aaaaaaa) Voluntary bbbbbbb) Mandatory ccccccc) Co-regulation ddddddd) Other (please explain)
P_Q8b. (If answered "voluntary" at P_Q8a) **If the initiative is voluntary, has industry already signed up to it, or if not, for when is this planned?**	eeeeeee) Yes fffffff) No (please specify when this is planned to take place) ggggggg) Rolling recruitment
P_Q9a. What will be the reformulation target of the initiative (i.e. for a salt reduction initiative, what is the salt reduction target set by the initiative)? **Please specify below (if implemented in different phases, please indicate the target for each phase).**	*Open box*
P_Q9b. What will be the public health target/objective of the initiative (i.e. reducing salt intake by 30% by 2025)? **Please specify below (if phased, indicate the target for each phase).**	*Open box*
P_Q10. What approach/tool(s) will the initiative rely on to encourage reformulation?	hhhhhhh) Food composition iiiiiii) Economic approaches jjjjjjj) Labelling kkkkkkk) Marketing restrictions lllllll) Restrictions on food provisions mmmmmmm) Other (please specify) Please provide more information
P_Q11. Is the initiative part of a broader nutrition/health plan or strategy?	nnnnnnn) Yes (please specify the name of plan/strategy) ooooooo) No
P_Q12. Will the initiative be monitored?	ppppppp) Yes (please specify how) qqqqqqq) No

P_Q13. Will the initiative be evaluated?	rrrrrrr) Yes (please specify how) sssssss) No
P_Q14a. What factors, specific to the national context, are being taken into account in the design of the initiative?	*Open box*
P_Q14b Are industry characteristics being taken into account in the design of the initiative?	ttttttt) Yes (please specify how) uuuuuuu) No
P_Q15. Please provide any links (website or document link) which provides information on the initiative described.	*Open box*
P_Q16. Who is the main contact person/institution for this initiative? **Please provide name of the institution, and a contact person including email address**	*Open box*
P_Q17. Please provide any other relevant information and/or links concerning this initiative	*Open box*
P_Q18. Would you like to add details of another planned reformulation initiative? If you select yes, you will be able to repeat these questions for another initiative.	*vvvvvvv)* Yes *[Return to P_Q2]* wwwwwww) No

Priorities for future reformulation actions

Please indicate your institution's priorities on future actions concerning specific nutrients, ingredients or related aspects of food reformulation. Future actions can include policy developments, funded projects, cooperation with other institutions/stakeholders. This will help us understand your institution's future priorities in this area, and tailor support (workshops, twinning actions, technical support) accordingly. In the next section of this questionnaire, you will have the opportunity to detail the type of support needed.

Please limit each of your responses to 200 characters or less.

Nutrient	Details of future priorities (if none, please leave blank)
a) Salt (sodium)	*(limit response to 200 characters)*
b) Trans fats	*(limit response to 200 characters)*

c) Saturated fats	*(limit response to 200 characters)*
d) (Added) Sugars	*(limit response to 200 characters)*
e) Artificial sweeteners	*(limit response to 200 characters)*
f) Fibre	*(limit response to 200 characters)*
g) Whole grains	*(limit response to 200 characters)*
h) Energy	*(limit response to 200 characters)*
i) Other	*(limit response to 200 characters)*

High level workshops, twinning actions and technical support

The workshops and twinning actions will be open to officials from ministries and other competent authorities and are intended to support the implementation of reformulation activities.

The specific purpose of the workshops and twinning actions will be discussed and developed with the respective Member States' authorities involved, and with the European Commission, based on the responses collected through this survey.

The purpose of the scientific and technical support will be to constitute a scientific and technical network to advise and support Member State authorities in the development of reformulation initiatives.

Q_PARTICIPATION

If your institution would like to participate in the high-level workshops and twinning actions planned under this EU project, or to receive scientific and technical support, please answer the question below.

- **Yes, my institution would like to participate**
- **No, my institution is not interested in participating (please specify the main reasons for this)** ***[exit survey if this option is selected]***

High Level Workshops

High Level Workshops will be organised in Member States that do not have a national reformulation plan for a particular nutrient of concern. They are intended to support the drafting and implementation of reformulation activities. Each workshop will focus on one Member State and will be targeted to its needs. It will be developed in cooperation with national authorities and relevant stakeholders. The workshops are intended for least 20 stakeholders and invitations will also be open to relevant stakeholders from the European Commission and other Member States.

ICF will organise and facilitate the workshop. The travel, subsistence and accommodation expenses of up to three relevant experts will be reimbursed. Member

States should be in the capacity to provide the venue and will give direction for the content of the workshop.

HLW_Q1a.
Please tick all that apply regarding your interest in participating:

- **My institution would like to host a workshop**
- **My institution would like to contribute to a workshop in another Member State**
- **My institution is not interested in participating in workshops**

HLW_Q1b. If appropriate, please provide more information regarding the choice(s) selected:

Open box

Twinning actions

Twinning actions involve the pairing of Member States to foster collaboration and mutual learning. These actions will be organised in Member States that do not have a national reformulation plan for a nutrient of concern. A representative of the national authority of one Member State, with experience of reformulation initiatives, will share their experience and know-how with representatives of another Member State.

ICF will assist in the selection of twinning partners. The travel, subsistence and accommodation expenses of one visiting Member State representative will be reimbursed for each twinning action. The hosting Member State will be responsible for organising and facilitating appropriate activities during the twinning actions. ICF and CHAFEA will provide recommendations and support in determining what types of activities might be helpful.

Twinning_Q1a.

Please tick your preferred option:

- **My institution is interested in hosting a twinning action and receiving guidance from another Member State**
- **My institution is interested in being a twinning partner and visiting another Member State to share my experience**
- **I am not interested in participating in twinning actions**

Twinning_Q1b.

If your institution is interested in receiving guidance from specific Member States, please identify them here:

Open end

Technical or scientific support networks

ICF will organise technical support for drafting or implementing reformulation initiatives, including the drafting of suggestions for benchmarks for food categories. This may involve the following actions:

- Draft scientifically-grounded benchmarks for reformulation for specific food categories that the national authorities can discuss and negotiate with other stakeholders;
- Draft and/or assist implementation of national reformulation initiatives;
- Prepare updates on scientific evidence for reformulation;
- Map stakeholders and reformulation initiatives;

- Facilitate knowledge sharing;
- Contribute to policy development and implementation on reformulation;
- Conduct research on good practices.

ICF will assist with the selection of network experts, including ensuring that experts do not have conflicts of interest (by means of a declaration on conflict of interest), and will provide the network with the organisation and facilitation of two meetings and a number of remote presentations on new research findings as they emerge. The networks will be supported by ICF for 36 months. For the networks to meet their objectives, they will require additional funding and support from the Member State(s) involved.

Support_Q1a.

My institution would like to apply for technical/scientific support

- **Yes**
- **No**

Support_Q1b. (If answered "Yes" at Support_Q1a)

Please provide more details regarding the type of support you require:

Open end

Q_Contact.

My institution agrees to be contacted by ICF to follow up this request.

xxxxxxx) **Yes**

yyyyyyy) **No**

Annex 9 – Subcategory analysis

The following tables indicate which subcategories were compared on the basis of their nutritional content within the individual food categories. The objective of the subcategory analysis was to identify the extent to which nutritional values differ between products of similar (e.g. fruit-based items) as well as those of different composition (due to, for example, the use of different raw materials).

Subcategories selected for the analysis are highlighted in blue. Subcategories were selected/generated on the basis of:

- how well the subcategory aligned with Best-ReMaP subcategories (to facilitate future comparisons between the two separate exercises); and
- how many products were available within each subcategory for analysis and comparison (i.e. subcategories with higher number of products were favoured).

Breakfast cereals	Share of the sample collected
Chocolate-flavoured cereals	21.9%
Honey/caramel cereals	14.2%
Sweet cereal flakes	12.4%
Filled Cereals	10.1%
Traditional muesli flakes	8.0%
Crunchy fruit muesli	4.6%
Cereal flakes with chocolate nuts	4.6%
Crunchy chocolate muesli	4.3%
High-fibre cereals (other)	3.3%
High-fibre cereals (flakes)	3.1%
Crunchy muesli with nuts or seeds	2.6%
Cereal flakes with fruit	2.5%
High-fibre fruit cereals (flakes)	2.4%
Cereals without added sugar (flakes)	2.0%
Chocolate and caramel cereals	1.6%
Cereals without added sugar (other)	1.6%
High-fibre fruit cereals (other)	0.8%

Canned fruits and vegetables	Share of the sample collected
Preserved fruits in syrup	65.1%
Preserved fruits in fruit juice	22.5%
Baked beans	10.0%
Preserved fruit in water	2.4%

Sugar-sweetened beverages	Share of the sample collected
Sugar-sweetened fruit beverages (still)	14.5%
Sugar-sweetened fruit beverages (carbonated)	13.5%
Sugar-sweetened energy drinks	10.3%
Colas without added sugar	7.4%
Fruit beverages without added sugar (carbonated)	5.9%
Sugar-sweetened colas	5.7%
Sugar-sweetened and artificially-sweetened fruit beverages (carbonated)	5.7%
Sugar-sweetened tonics and bitters	5.1%
Flavoured sugar-sweetened beverages (carbonated)	4.9%
Energy drinks without added sugar	4.4%
Flavoured beverages without added sugar (carbonated)	3.1%
Nectars	3.1%
Sugar- and artificially-sweetened energy drinks	2.7%
Flavoured sugar- and artificially-sweetened beverages (carbonated)	2.6%
Fruit beverages without added sugar (still)	2.3%
Sugar-sweetened and artificially-sweetened colas	2.0%
Sugar-sweetened and artificially-sweetened fruit beverages (still)	1.6%
Sugar-sweetened and artificially-sweetened energy drinks	1.5%
Sugar-sweetened and artificially-sweetened tonics and bitters	1.2%
Tonics and bitters without added sugar	0.8%

Sugar-sweetened sports drinks	0.7%
Sugar-sweetened and artificially-sweetened energy drinks	0.4%
Sugar-sweetened tea beverages	0.3%
Flavoured sugar-sweetened beverages (still)	0.2%
Flavoured beverages without added sugar (still)	0.2%
Sugar-sweetened and artificially-sweetened tea beverages	0.03%

Sugar-sweetened dairy	Share of the sample collected
Classic sweet yoghurts (fruited, set)	43.1%
Classic sweet yoghurts (flavoured, set)	14.0%
Gourmet sweet yoghurts (fruited, set)	13.8%
Gourmet sweet yoghurts (flavoured, set)	8.3%
Artificially-sweetened yoghurts (fruited, set)	6.5%
Classic sweet yoghurts (drinkable)	5.1%
Artificially-sweetened yoghurts (flavoured, set)	1.8%
Flavoured milk drinks (chocolate)	1.7%
Soy-based yoghurts (set)	1.5%
Other plant-based yoghurts (set)	1.4%
Artificially-sweetened yoghurts (drinkable)	1.3%
Classic sweet fresh cheeses	0.6%
Artificially-sweetened fresh cheeses	0.5%
Gourmet sweet yoghurts (drinkable)	0.1%
Soy-based yoghurts (drinkable)	0.1%
Gourmet sweet fresh cheeses	0.03%

Other plant-based yoghurts (drinkable)	0.03%

Ice-cream desserts	**Share of the sample collected**
Luxury bulk ice cream	16.5%
Bulk ice-cream	14.9%
Ice cream cones > or = 80ml	9.7%
Ice cream sticks > or = 80ml	9.5%
Dessert creams and jellied milks	5.9%
Frozen ice cream desserts for sharing	5.1%
Sundae and frozen desserts	4.7%
Ice cream sticks < 80ml	4.4%
Egg-based fresh desserts	3.8%
Other fresh desserts	3.4%
Bulk sorbet	2.8%
Mini ice cream sticks	2.6%
Ice cream bars and mini bars	2.5%
Fresh desserts with cereals	2.4%
Ice cream tubs > or = 80ml	2.4%
Water or fruit ices	1.9%
Ice cream cones < 80ml	1.4%
Mini ice cream cones	1.3%
Fresh soy desserts	1.1%
Sorbet tubs	0.9%
Sorbet cones	0.8%
Sorbet sticks	0.8%
Ice cream tubs < 80ml	0.6%
Fresh light and/or artificially-sweetened desserts	0.5%
Other fresh plant-based desserts	0.3%

Ready meals - pizzas	**Share of the sample collected**
Frozen delicatessen-meat pizzas	18.4%

Frozen ham and cheese pizzas	14.0%
Frozen cheese pizzas	12.4%
Frozen margarita pizzas	11.6%
Chilled ham and cheese pizzas	7.4%
Chilled delicatessen-meat pizzas	7.0%
Frozen vegetable pizzas	5.7%
Other frozen meat-based pizzas	4.5%
Frozen seafood pizzas	4.3%
Chilled cheese pizzas	4.0%
Frozen bolognese meat pizzas	3.6%
Chilled vegetable pizzas	3.0%
Chilled meat-based pizzas	2.4%
Other frozen pizzas	1.0%
Other chilled pizzas	0.8%

Ready meals - soups	**Share of the sample collected**
Meat-based soups (ambient)	13.4%
Meat-based soups (dehydrated/instant)	6.1%
Tomato soups (ambient)	6.1%
Soups with pasta and meat or fish (dehydrated/instant)	5.9%
Starchy soups (ambient)	5.9%
Mushroom soups (dehydrated/instant)	5.6%
Other soups (dehydrated/instant)	5.6%
Green vegetable or cabbage soups (ambient)	5.1%
Soups with pasta (dehydrated/instant)	4.1%
Mixed vegetable soups (ambient)	3.9%
Tomato soups (dehydrated/instant)	3.7%
Meat-based soups (chilled)	2.9%
Other soups (ambient)	2.9%

Broths (ambient)	2.7%
Fish or seafood soups (chilled)	2.7%
Green vegetable or cabbage soups (chilled)	2.2%
Onion soups (dehydrated/instant)	2.0%
Green vegetable or cabbage soups (dehydrated/instant)	1.7%
Mixed vegetable soups (dehydrated/instant)	1.7%
Mushroom soups (ambient)	1.5%
Tomato soups (chilled)	1.5%
Carrot soups (ambient)	1.2%
Mixed vegetable soups (ambient)	1.2%
Starchy soups (chilled)	1.2%
Asparagus soups (dehydrated/instant)	1.0%
Fish or seafood soups (ambient)	1.0%
Pumpkin soups (dehydrated/instant)	1.0%
Starchy soups (dehydrated/instant)	1.0%
Fish or seafood soups (dehydrated/instant)	0.7%
Mushroom soups (chilled)	0.7%
Other soups (chilled)	0.7%
Soups with pasta (ambient)	0.7%
Asparagus soups (ambient)	0.5%
Carrot soups (chilled)	0.5%
Pumpkin soups (ambient)	0.5%
Cold soups (ambient)	0.2%
Leek soups (dehydrated/instant)	0.2%
Onion soups (ambient)	0.2%
Pumpkin soups (chilled)	0.2%

Bread and bread products	Share of the sample collected
Pre-packaged breads (wholemeal/grain loaves)	20.6%
Wholemeal/grain sandwich breads	14.6%
Plain white sandwich breads	13.9%
Pre-packaged breads (other loaves)	11.1%
Pre-packaged breads (rolls)	10.0%
Crispbreads/crisp rolls	6.9%
Pre-packaged breads (plain white loaves)	4.5%
Hamburger/hot dog buns (white)	3.8%
Other breads	2.8%
Pre-baked breads (rolls)	2.7%
Salted crackers (plain)	1.9%
Pre-baked breads (baguettes)	1.5%
Salted crackers (other flavours)	1.2%
Hamburger/hot dog buns (other)	0.9%
Hamburger/hot dog buns (wholemeal)	0.8%
Breadsticks	0.6%
Croissants	0.5%
Pre-packaged breads (baguettes)	0.5%
Salted crackers (cheese flavoured)	0.4%
Ciabatta	0.3%
Tortilla breads and wraps	0.3%
Other sandwich breads	0.2%
Sandwich breads	0.2%

Meat and fish	Share of the sample collected
Sausages	31.2%
Cooked pork ham and roast (packaged)	13.1%
Cured ham	9.8%
Pork belly and bacon (packaged)	8.9%

Chilled salmon and trout	6.0%
Pate	4.6%
Chilled seafood tapas	3.3%
Salami	2.6%
Dried, smoked or cured pork	2.5%
Canned cooked meats	2.0%
Chilled plain surimi	1.9%
Chilled Cordon Bleus	1.7%
Chilled burgers	1.3%
Dried, smoked or cured beef	1.3%
Chilled battered or breaded fish	1.2%
Chilled shrimp	1.2%
Saucisson sec	1.0%
Poultry ham and roast (packaged)	1.0%
Other smoked fish	0.8%
Chilled meatballs	0.8%
Chilled fish roe	0.7%
Other cured meats	0.7%
Chilled breaded meats	0.6%
Chilled seafood terrines	0.4%
Chilled filled surimi	0.3%
Chilled mussels	0.3%
Chilled cooked meats (pork)	0.3%
Other fermented meats	0.2%
Chilled taramasalata	0.1%
Filled surimi	0.1%
Chilled grills	0.04%
Chorizo	0.04%

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