Co-funded by the European Union

JA PreventNCD

Work Package 5
Deliverable 5.3.2_1

State of play of European nutritional composition and evaluation of digital sources of data

June 2026

Document information and history

PROJECT ACRONYM	JA PREVENTNCD
PROJECT NUMBER	101128023
TITLE	Cancer and other Non-Communicable Diseases Prevention – Action on Health Determinants
DISSEMINATION LEVEL (PU - Public, SEN – Sensitive)	PU
TYPE OF DOCUMENT (R – Document, report/ DEM – Demonstrator, pilot, prototype/other)	R
TITLE OF DOCUMENT	State of play of European nutritional composition and evaluation of digital sources of data
DELIVERABLE NUMBER (eg. D1.1)	D5.3.2_1
LEAD BENEFICARY	Anses
WORKPACKAGE CONTRIBUTION TO THE DOCUMENT	
VERSION	
EXPECTED DELIVERY DATE (dd.mm.year)	30.06.2026
DATE OF DELIVERY	

Contributors	Name	Organisation	**Role in JA PREVENT NCD**
Deliverable leader			
Contributing author(s)	BARBIER Laure, GAUVREAU-BÉZIAT Julie, MAURICE Bastien, VIN Karine	Anses	Subtask leader (5.3.2)
Reviewer(s)	GAUCHARD Françoise, LEURAUD Klervi	Anses	Subtask leader (5.3.2)
	LUIPERSBECK Christian, SEPER-NAGL Katrin;	AGES	Partner
	VANDEVIJVERE Stefanie;	SCIENSANO	
	CHIKOVA-ISCENER Ekaterina, DULEVA Vesselka;	NCPHA	
	ADANIĆ PAJIĆ Andrea, POLLAK Lea;	CIPH	
	FRØKJÆR SCHOU Signe, KIY Nanna;	FVST	
	JOANDI Kerstin, TAIMUR Tuuli;	TAI	

	HAARIO Peppi, KOIVURINTA Emma, KUUSIPALO Heli;	THL	
	FEIß Anja, STORCKSDIECK Stefan;	MRI	
	SARKADI NAGY Eszter; O'MAHONY Sinéad, O'SHAUGHNESSY Gavin;	OGYEI; FSAI	
	CARRANO Elena, DE COSMI Valentina, DI BENEDETTO Rita, SILANO Marco;	ISS	
	GAUCI Charmaine, VASSALO Charlene;	MHA	
	BRUKAŁO Katarzyna, LEMPART-RAPACEWICZ Anna;	SUM	
	GASPAR Marta, GREGÓRIO Maria João, VIEIRA SILVA FIGUEIRA Maria;	DGS	
	CASTELA Inês, FIGUEIRA Inês;	ISPUP	
	BLAZNIK Urska, GREGORCIC Lea;	NJIZ	
	JARRÍN PÉREZ Elena, ROLLÁN GORDO Almudena, YUSTA BOYO María José	AESAN	
	DAMLE Ajinkya, ONG Xinya, TRUEB Kimberley, VERGEL Ingrid, ZANETTA Cristina	Euromonitor	Data provider (only for section 3.)
Final review and approval	HELLEVE Arnfinn, KLEPP Knut-Inge	NIPH (Norwegian Institute of Public Health)	WP5 leader, Scientific Coordinator

Version	Release Date	Reason for change	Status (Draft/In-review /Submitted)

Disclaimer

This project (GA – 101128023) is co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HaDEA). Neither the European Union nor HaDEA can be held responsible for them.

We would like to thank all colleagues from the participating countries involved in Best-ReMaP and PreventNCD for their contributions – in particular: Christian Luipersbeck, Bettina Meidlinger, Katrin Seper-Nagl and Alexandra Wolf-Spitzer from AGES (Austrian Agency for Health and Food Safety) for Austria; Morgan Obura and Stefanie Vandevijvere from the SCIENSANO federal research centre for Belgium; Vedrana Janjetovic and Ivana Trifkovic from the MCA (Ministry of Civil Affairs of Bosnia and Herzegovina) and Aida Filipović Hadziomeragic and Sanela Tukulija from the PHI-FBH (Institute of Public Health of the Federation of Bosnia and Herzegovina) for Bosnia and Herzegovina; Ekaterina Chikova-Iscener, Vesselka Duleva and Hristo Hinkov from the NCPHA (National Center for Public Health and Analyses) for Bulgaria; Camilla Berggreen, Trine Enevold Grønlund, Signe Frøkiær Schou, Nanna Kiy and Elena Vester from the DVFA (Danish Veterinary and Food Administration) for Denmark; Andrea Adanic Pajić and Lea Pollak from the CIPH (Croatian Institute of Public Health) for Croatia; Sille Pihlak from MoSA (Ministry of Social Affairs) and Hanna Alajõe, Kerstin Joandi and Tuuli Taimur from the NIHD (National Institute for Health Development) for Estonia; Peppi Haario, Emma Koivurinta, Heli Kuusipalo and Tiina Sirkjärvi from the THL (National Institute of Health and Welfare) for Finland; Caroline Alié and Thomas Laguitton from ANSES (Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail), and Olivier Allais, Johanna Calvarin, Odeline Molle and Ghislaine Narayanane from INRAE (French National Research Institute for Agriculture, Food and the Environment) for France; Irmela Demuth, Anja Feiß, Senta Kretzschmar, Silvia Roser and Stefan Storcksdieck genannt Bonsmann from the MRI (Max Rubner-Institut, Federal Research Institute of Nutrition and Food) for Germany; Meropi Kontogianni and Mary Yannakoulia from HUA (Harokopio University), and Ioanna Antoniadou-Koumatou, Eleftheria Papachristou, Venetia Vraila and Adamantia Xekalaki from the ICH (Institute of Child Health) for Greece; Márta Bakacs, Georgina Guba, Éva Illés, Eszter Sarkadi-Nagy and Leonóra Zámbó from the NIPN (National Institute of Pharmacy and Nutrition) for Hungary; Ursula O'Dwyer from the DoH (Department of Health) and Sarah Carroll, Nuala Collins, Oonagh Lyons, Aideen McCann, Michael Njoku, Sinead O'Mahony and Gavin O'Shaughnessy from the FSAI (Food Safety Authority of Ireland) for Ireland; Elena Carrano, Valentina De Cosmi, Rita di Benedetto and Marco Silano from the ISS (Istituto Superiore di Sanità) for Italy; Mariella Borg Buontempo, Charmaine Gauci, Charlene Vassalo and Pauline Vassalo from the MFH (Ministry for Health – Government of Malta) for Malta; Marta Figueira, Marta Gaspar and Maria João Gregório from the DGS (Directorate-General of Health), and Inês Castela and Inês Figueira from ISPUP (Institute of Public Health, University of Porto) for Portugal; Katarzyna Brukało, Elżbieta Grochowska-Niedworok, Oskar Kowalski and Anna Lempart-Rapacewicz from SUM (Śląski Uniwersytet Medyczny) for Poland; Svetlana Jankovic, Kristina Simic, and Dragana Stojisavljević from the PH-RS (Public Health Institute of the Republic of Srpska) for Republic of Srpska; Alexandru Partin, Corina Zugravu from the NIPH (National Institute of Public Health) for Romania; Urska Blaznik and Lea Raztresen from the NIJZ (National Institute of Public Health, Republic of Slovenia) for Slovenia; Elena Jarrín Pérez, María José Yusta Boyo and Almudena Rollán Gordo from AESAN (Spanish Agency for Food Safety and Nutrition) for Spain.

Table of Contents

Document information and history 2
Disclaimer 4
Table of Contents 5
List of Tables 6
List of Figures 9
List of Acronyms/Abbreviations 14
1. Introduction 14
Project Summary 14
Deliverable objectives 15
Deliverable description 15
2. State of play of European food offer: Nutritional composition 16
2.1. Methodology 16
2.1.1. Selection of parameters for analysis 19
2.1.2. Data analyses conducted 19
2.2. Results 22
2.2.1. Comparison of products collected by country 22
2.2.2. Comparison of labelling parameters 39
2.2.3. Comparison of nutritional values per category and country 56
3. Evaluation of structured digital data sources using Euromonitor 134
3.1. Euromonitor data overview 134
3.1.1. Euromonitor's methodology 134
3.1.2. Euromonitor data description 134
3.1.3. Duplicates among Euromonitor data 137
3.2. Comparison of Best-ReMaP and Euromonitor datasets 139
3.2.1. Comparative overview of the datasets 139
3.2.2. Comparison of the products available in both datasets 143
3.2.3. List of ingredients 149
3.3. Focus on the comparison with French Oqali data 150
3.4. Conclusion on the use of structured digital data sources 152
4. General conclusion 153
5. References 155

List of Tables

Table 1: Products included and excluded from the food offer analyses, for the five studied categories 18
Table 2: Nutrients of interest selected for the analyses, by category 19
Table 3: Example of the 3-tier ranking assignment for sugar content (g per 100 mL) in sugar-sweetened colas (n_tot = 690) 21
Table 4: Number of collected products included in the analyses, by country and category 23
Table 5: Presence (in %) of nutrient data on labels (n = 61,012 products).....56
Table 6: Number of collected products included in the nutritional analysis, by country and category 57
Table 7: Summary of nutrient differences across subcategories of Bread products 59
Table 8: Mean sugar content per country among Bread products relevant subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background).....61
Table 9: Mean saturated fat content per country among Bread products relevant subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background).....65
Table 10: Mean salt content per country among Bread products relevant subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background).....69
Table 11: Mean fibre content per country among Bread products relevant subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background).....73
Table 12: Summary of country-level positioning (tier position when comparing the median content) and national nutritional policies on Bread products, by nutrient 81
Table 13: Summary of nutrient differences across subcategories of Breakfast cereals.....83
Table 14: Mean sugar content per country among relevant Breakfast cereals subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background).....86
Table 15: Mean saturated fat content per country among relevant Breakfast cereals subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background).....89
Table 16: Mean salt content per country among relevant Breakfast cereals subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries;

Subcategories considered as relevant but with no significative differences are identified on lines with a grey background) 92
Table 17: Mean fibre content per country among relevant Breakfast cereals subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background) 95
Table 18: Summary of country-level positioning (tier position when comparing the median content) and national nutritional policies on Breakfast cereals, by nutrient 97
Table 19: Summary of nutrient differences across subcategories of Delicatessen meats and similar 103
Table 20: Mean Saturated fat content per country among relevant Delicatessen meats and similar subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background) 106
Table 21: Mean salt content per country among relevant Delicatessen meats and similar subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background) 109
Table 22 :Summary of country-level positioning (tier position when comparing the median content) and national nutritional policies on Delicatessen meats and similar, by nutrient 110
Table 23: Summary of nutrient differences across subcategories of Fresh dairy products and desserts 114
Table 24: Mean sugar content per country among relevant Fresh dairy products and desserts products subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background) 116
Table 25: Mean saturated fat content per country among relevant Fresh dairy products and desserts subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background) 119
Table 26:Summary of country-level positioning (tier position when comparing the median content) and national nutritional policies on Fresh dairy products and desserts, by nutrient 124
Table 27: Summary of nutrient differences across subcategories of Soft drinks 126
Table 28: Mean sugar content per country among relevant Soft drinks subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background) 129
Table 29: Summary of country-level positioning (tier position when comparing the median content) and national nutritional policies on Soft drinks, by nutrient 131
Table 30: Number of Euromonitor SKUs by country and food category 135

Table 31: Distribution of Euromonitor's SKUs per category, country and retailer type (n = 25,576) 136
Table 32: Number of duplicates (n = 4,294 SKUs for 1,798 barcode references) among the Euromonitor SKUs with a barcode (n = 13,093), by country for the breakfast cereals & soft drinks 138
Table 33: Comparison of the available information in Euromonitor and Best-ReMaP 141
Table 34: Number of barcode matches by country and category (n = 1,625) 143
Table 35: Number of barcode matches by category and subcategory (n = 1,625) 143
Table 36: Number of French products available in Euromonitor and Oqali by category: A) with or without barcode, B) with barcodes and matches by category 150

List of Figures

Figure 1: Description of the constitutive elements of a boxplot 20
Figure 2: Comparison of the number of references collected among Bread products, by country 24
Figure 3: Comparison of references collected among Bread products, by country: distribution of the five most supplied subcategories in each country.....25
Figure 4: Comparison of references collected among Bread products, by country: distribution of the five most supplied subcategories when considering all countries 26
Figure 5: Comparison of the number of references collected among Breakfast cereals, by country 27
Figure 6: Comparison of references collected among Breakfast cereals, by country: distribution of the five most supplied subcategories in each country.....28
Figure 7: Comparison of references collected among Breakfast cereals, by country: distribution of the five most supplied subcategories when considering all countries 29
Figure 8: Comparison of the references collected among Delicatessen meats and similar, by country.....30
Figure 9: Comparison of references collected among Delicatessen meats and similar, by country: distribution of the five most supplied subcategories in each country.....31
Figure 10: Comparison of references collected among Delicatessen meats and similar, by country: distribution of the five most supplied subcategories when considering all countries 32
Figure 11: Comparison of the references collected among Fresh dairy products and desserts, by country.....33
Figure 12: Comparison of references collected among Fresh dairy products and desserts, by country: distribution of the five most supplied subcategories in each country 34
Figure 13: Comparison of references collected among Fresh dairy products and desserts, by country: distribution of the five most supplied subcategories when considering all countries.....35
Figure 14: Comparison of the references collected among Soft drinks, by country.....36
Figure 15: Comparison of references collected among Soft drinks, by country: distribution of the five most supplied subcategories in each country 37
Figure 16: Comparison of references collected among Soft drinks, by country: distribution of the five most supplied subcategories when considering all countries 38
Figure 17: Comparison of the distribution of Breakfast cereals collected with and without portion size, by country.....40
Figure 18: Distribution of the three most reported portion sizes among Breakfast cereals, considering all countries.....40
Figure 19: Comparison of the distribution by country of the three most reported portion size among Breakfast cereals 41
Figure 20 : Comparison by country of the distribution of reported portion size by interval classes, among Breakfast cereals 42
Figure 21 : Comparison of the distribution of Fresh dairy products and desserts collected with and without portion size, by country 43
Figure 22: Distribution of the three portion sizes most reported among Fresh dairy products and desserts, considering all countries 43
Figure 23: Comparison of the distribution by country of the three most reported portion size among Fresh dairy products and desserts 44
Figure 24 : Comparison by country of the distribution of reported portion size by interval classes, among Fresh dairy products and desserts 45

Figure 25: Comparison of the distribution of Soft drinks collected with and without portion size, by country 46
Figure 26: Distribution of the three portion sizes most reported among Soft drinks, considering all countries 46
Figure 27: Comparison of the distribution by country of the three most reported portion size among Soft drinks 47
Figure 28 : Comparison by country of the distribution of reported portion size by interval classes, among Soft drinks 48
Figure 29: Comparison of the type of front-of-pack labelling found on collected Bread products, by country 50
Figure 30: Comparison of the type of front-of-pack labelling found on collected Breakfast cereals, by country 51
Figure 31: Comparison of the type of front-of-pack labelling found on collected Delicatessen meats and similar, by country 52
Figure 32: Comparison of the type of front-of-pack labelling found on collected Fresh dairy products and desserts, by country 53
Figure 33: Comparison of the type of front-of-pack labelling found on collected Soft drinks, by country 54
Figure 34: Distribution of sugar content for Pre-packaged breads among countries (total number of references considered: 1,431) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 60
Figure 35: Distribution of sugar content for Plain white sandwich breads / hamburger / hot dog buns (total number of references considered: 646) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 62
Figure 36: Distribution of sugar content for Wholemeal cereal grains sandwich breads / hamburger / hot dog buns (total number of references considered: 600) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 63
Figure 37: Distribution of saturated fat content for Pre-packaged breads (total number of references considered: 1,435) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 64
Figure 38: Distribution of saturated fat content for Plain white sandwich breads / hamburger / hot dog buns (total number of references considered: 646) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 66
Figure 39: Distribution of saturated fat content for Wholemeal cereal grains sandwich breads / hamburger / hot dog buns (total number of references considered: 599) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 67
Figure 40: Distribution of salt content for Pre-packaged breads (total number of references considered: 1,441) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 68
Figure 41: Distribution of salt content for Plain white sandwich breads / hamburger / hot dog buns (total number of references considered: 645) (green circle: countries whose average levels are

statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 70
Figure 42: Distribution of salt content for Wholemeal cereal grains sandwich breads / hamburger / hot dog buns (total number of references considered: 600) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 71
Figure 43: Distribution of fibre content for Pre-packaged breads (total number of references considered: 1,302) (green circle: countries whose average levels are statistically among the highest; red circle: countries whose average levels are statistically among the lowest) 72
Figure 44: Distribution of fibre content for Plain white sandwich breads / hamburger / hot dog buns (n = 550) (green circle: countries whose average levels are statistically among the highest; red circle: countries whose average levels are statistically among the lowest) 74
Figure 45: Distribution of fibre content for Wholemeal cereal grains sandwich breads / hamburger / hot dog buns (total number of references considered: 570) (green circle: countries whose average levels are statistically among the highest; red circle: countries whose average levels are statistically among the lowest) 75
Figure 46: Distribution among countries of sugar content for Chocolate-flavoured cereals (total considered number of references: 656) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 84
Figure 47: Distribution among countries of sugar content for Traditional muesli flakes (total considered number of references:1921) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 85
Figure 48: Distribution among countries of saturated fat content for Chocolate flavoured cereals (total considered number of references:657) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 87
Figure 49: Distribution among countries of saturated fat content for Traditional muesli flakes (total considered number of references:1921) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 88
Figure 50: Distribution among countries of salt content for Chocolate flavoured cereals (total considered number of references: 657) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 90
Figure 51: Distribution among countries of salt content for Traditional muesli flakes (total considered number of references:1918) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 91
Figure 52: Distribution among countries of fibre content for Chocolate flavoured cereals (total considered number of references: 630) (green circle: countries whose average levels are statistically among the highest; red circle: countries whose average levels are statistically among the lowest) 93
Figure 53: Distribution among countries of fibre content for Traditional muesli flakes (total considered number of references:1754) (green circle: countries whose average levels are

statistically among the highest; red circle: countries whose average levels are statistically among the lowest) 94
Figure 54: Distribution among countries of saturated fat content for Pork belly and bacon (packaged) (total considered number of references:1219) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 104
Figure 55: Distribution among countries of saturated fat content for Dry sausage (total considered number of references:3354) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest).....105
Figure 56: Distribution among countries of salt content for Pork belly and bacon (packaged) (total considered number of references:1226) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 107
Figure 57: Distribution among countries of salt content for Dry sausage (total considered number of references:3350) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest).....108
Figure 58: Distribution of sugar content for Classic sweet yoghurts and fermented milks (total number of references considered: 4,085) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 115
Figure 59:Distribution of sugar content for Gourmet sweet yoghurts and fermented milks (total number of references considered: 1,535) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 117
Figure 60:Distribution of saturated fat content for Classic sweet yoghurts and fermented milks (total number of references considered: 4,083) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 118
Figure 61: Distribution of saturated fat content for Gourmet sweet yoghurts and fermented milks (total number of references considered: 1,535) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 121
Figure 62:Distribution of sugar content for Sugar-sweetened colas (total number of references considered: 690) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest).....127
Figure 63: Distribution of sugar content for Sugar-sweetened fruit beverages (total number of references considered: 3,455) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest) 128
Figure 64: Concordance between the available different nutritional values among the Euromonitor duplicates (n = 14,384 groups of nutritional values*). 138
Figure 65: Total product entries by country for the Best-ReMaP (n = 15,371) and Euromonitor (n = 25,576) datasets, for A) soft drinks and B) breakfast cereals.....140
Figure 66: Proportion of products with nutritional values (per 100 g or 100 mL of product) by category, for the Best-ReMaP and Euromonitor datasets NB: Euromonitor products with nutritional values given per portion are excluded from this graph (~ 1% of the SKUs), as well as the Best-ReMaP reconstituted products (e.g., porridge) (< 1%).....142

Figure 67: Concordance between the nutritional values reported for breakfast cereals and soft drinks in the Euromonitor & Best-ReMaP unique matches (n = 11,893 pairs of nutrients per 100 g: Energy (kcal) / Fat / Saturated Fatty Acids / Carbohydrates / Sugar / Protein / Salt / Fibre).145
Figure 68: Concordance between the nutritional values reported for breakfast cereals and soft drinks in the Euromonitor & Best-ReMaP unique matches, detailed by nutrient (n = 11,893 pairs of nutrients per 100 g: Energy (kcal) / Fat / Saturated Fatty Acids / Carbohydrates / Sugar / Protein / Salt / Fibre) 146
Figure 69: Quantification of the labelled nutritional differences (in g per 100 g or 100 mL of product) between Euromonitor and Best-ReMaP for A) the soft drinks and B) the breakfast cereals.....147
Figure 70: Scatter plots for Best-ReMaP (orange) and Euromonitor (purple) of the sugar content in soft drinks (A), saturated fat in breakfast cereals (B), sugar in breakfast cereals (C), salt in breakfast cereals (D) and fibre in breakfast cereals (E).....148
Figure 71: Examples of the restitution of ingredient lists for two popular products, in Euromonitor and Best-ReMaP.....149
Figure 72: Estimated market shares in France for Euromonitor and Oqali, by category 151
Figure 73: Availability (in %) of the information on some vitamins and minerals for French breakfast cereals in Oqali (n = 675) 151

List of Acronyms/Abbreviations

[Abbreviation]	[Explanation]
EU	European Union
FOP	Front-of-pack
JA	Joint Action
JRC	Joint Research Centre
NA	Not available
NCD	Non-communicable diseases
MS	Member state
PM	Person month
PNCD	Prevent Non-Communicable Diseases
SFA	Saturated Fatty Acids
SKU	Stock Keeping Unit
WP	Work package

1. Introduction

Project Summary

Cancer and other non-communicable diseases (Cancer & NCDs) make up more than two thirds of the burden of disease in Europe. At the population level, substantial variations exist according to socio-economic status, geographical area, age, disability, gender, and ethnic groups. A large part of this disease burden is preventable. The aim of the joint action (JA) on Cancer and other NCDs prevention – Action on Health Determinants is to support strategies and policies designed to reduce the burden of Cancer & NCDs, their common risk factors both at a personal and societal level, and to define methods to assess their effectiveness across Europe. Specific objectives are:

- improve joint capacities of member states (MS) to plan and implement Cancer & NCDS prevention policies and activities at national, regional, and local levels;
- improve the monitoring system for Cancer & NCDs and their common risk factors;
- contribute to reduce inequalities in Cancer & NCDs;
- engage with key actors in the field of Cancer & NCD prevention, including decision makers, civil society organizations, professionals, the general population, and patients' groups to facilitate cooperation and joint efforts.

This JA represents an ambitious effort to provide strategic guidance and consolidated efforts to the field of Cancer & NCD prevention. Key outputs include an EU Consortium on Cancer Prevention, high-level annual events, and intervention tools and policy recommendations that will contribute to reduced Cancer & NCD burden and inequality across Europe.

As part of the JA PreventNCD work package 5 (WP5) on regulation and taxation, and more specifically in task 5.3, which aims to improve consumer's food environment, this internal deliverable presents the first work carried out under subtask 5.3.2 in order to support public policies to promote food reformulation.

Deliverable objectives

The objective of this internal deliverable is to produce an initial report assessing the state of play of the nutritional quality of the food offer across European countries, using branded composition datasets collected during the JA Best-ReMaP (1). The food offer, the labelling parameters, and the nutritional composition are analysed and compared between countries. All analyses were conducted by Anses; participating MSs contributed by providing information about the nutrition policies implemented in their country.

A second objective is to describe the work undertaken during the JA Best-ReMaP (2) and continued in the JA PreventNCD to explore potential alternative sources of data to in-store labelling data collection. More specifically, this work has involved assessing the representativeness and the reliability of Euromonitor's nutritional data, a structured digital source of data.

Deliverable description

This internal deliverable provides a state of play of the nutritional composition of the European food supply. The food offer of 19 countries that contributed to Best-ReMaP is compared by analysing the products available on the market at a given time for each subcategory of the five food categories studied (Bread products, Breakfast cereals, Delicatessen meats and similar, Fresh dairy desserts and products, Soft drinks). The report presents a benchmark of labelling parameters and an analysis of the nutritional values of the products at the subcategory level. For each food category, nutrient and country, a summary of nutrition policies linked with the results is provided.

Then, an overview of the Euromonitor data is given and a comparison between the Best-ReMaP and Euromonitor datasets is performed, in order to assess the representativeness and reliability of a structured digital source of data compared to an in-store data collection.

2. State of play of European food offer: Nutritional composition

The nutritional quality of the food offer in 19 MSs is described and compared across countries: Austria, Belgium, Bosnia, Bulgaria, Croatia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Ireland, Malta, Poland, Portugal, Romania, and Slovenia.

These countries participated in the JA Best-ReMaP (2020-2023), during which they collected branded data (with the exception of France, which already had data prior to the JA) for five food categories prioritized for their contribution to sugar, saturated fat, and salt intakes among children and adolescents (3): Soft drinks, Breakfast cereals, Fresh dairy products and desserts, Delicatessen meats and similar, and Bread products.

2.1. Methodology

During the JA Best ReMaP, the same data collection methodology was used for all participating countries, by taking photos in supermarkets and entering the data manually into a standard template. All the collected datasets were then codified into Best-ReMaP categories and subcategories (**Annex 1**) by the MSs, making it possible to build a common database of branded data, which is used here to compare the food offer, labelling parameters, and nutritional information across countries at a European level.

Branded datasets selected for the analyses were collected at different times depending on the country:

- from July 2021 to July 2022 (Best-ReMaP 1st snapshot) for four countries for which this was the first data collection at brand level: Bosnia, Croatia, Ireland, and Poland. All datasets collected during this period have been codified and verified during the Best-ReMaP project;

- from March 2022 to February 2023 (Best-ReMaP 2nd snapshot Batch 1) for six countries, which had already collected branded data prior to the project (with various methodologies of data collection): Austria, Belgium, Estonia, Germany, Hungary, and Romania. All datasets collected during this period have been codified and verified during the Best-ReMaP project;

- from July 2022 to July 2023 (Best-ReMaP 2nd snapshot Batch 2) for eight countries that have been engaged in the EUREMO project (4): Bulgaria, Denmark, Finland, Greece, Italy, Malta, Portugal, and Slovenia. Given the timeline of the project, which ended in October 2023, these datasets have been codified but not verified during Best-ReMaP. Consequently, a first stage of data cleaning (using the tool produced during Best-ReMaP (3)) and classification checking was performed in PreventNCD before producing the indicators;

- French data was collected at different times prior to Best-ReMaP. France did not participate in the Best-ReMaP data collection because the French Food Observatory (Oqali) used to monitor changes in processed food supply available on the French market had already been operational since 2008. Oqali served as the basis for the work carried out as part of Best-ReMaP.

The final pooled dataset includes only packaged foods belonging to the five food groups prioritized during Best-ReMaP (3). In agreement with Best-ReMaP partners, some products that are not considered to be consumed by children were not collected (

Table 1).

Table 1: Products included and excluded from the food offer analyses, for the five studied categories

Categories selected	Definition	Subcategories excluded
Bread products	Rusks, brioches, crackers, croutons, unleavened bread, puffed cakes, savoury muffins, sandwich breads, toasted bread, hamburger buns, hot-dog buns, sandwich buns, pita bread, pre-baked bread, pre-packaged bread, tortilla wraps, cereal specialities (wheat crackers, etc.), filled cereal specialities (filled crackers, filled cereal sticks, etc.), fine bakery wares (croissants, chocolate croissants, apple turnovers, etc.), kouglof, brioche pretzel, fougasse, panettone, pancakes, crispbreads (sweet or savoury)	Breadcrumbs; Croutons; Other rusk; Pancakes; Plain rusk; Puffed cakes; Wholemeal cereal grains rusks
Breakfast cereals	All types of breakfast cereals (plain, chocolate, caramel, filled, healthy, whole wheat, etc.), cereal cakes, cereals requiring preparation such as oatflakes, muesli, puffed rice	-
Delicatessen meats and similar	Delicatessen meats and alternative meat-free products (containing tofu, soy, etc.), found in the room-temperature, chilled and frozen, pre-packed sections (excluding foods cut to order) Cooked ham and shoulder, ham knuckle, roast poultry, ham, raw-cured ham, dry-cured ham, sausages, cooked sausages, duck mousse, country-style pâté, pâté, pork liver mousse or terrine, pâtés or terrines of game, pork, poultry or rabbit, preserved liver, rillettes, lardons, pork belly, dry sausages, sausage specialities, chorizo, pavé, rosette, salami, preparation of cooked ham and shoulder, preparation of poultry, preparation of raw- or dry-cured ham, boudin (white or blood sausage), uncooked andouille and andouillette (chitterling sausage), head cheese, brawn, ham in parsley aspic, roast pork, alternative meat-free products (containing tofu, soy, etc.), sausage specialities such as chipolatas, cachir sausage, merguez or sausages with Provençal herbs, coarse minced sausages (Morteau, Montbéliard, Figatelli, etc.), dried, smoked or cured pork (bacon, coppa, Alsatian Kassler, Corsican Lonzu and other regional specialities of this type), dried, smoked or cured beef (Bündnerfleisch, bresaola), preserved uncooked meat (such as canned sausages), corned beef, corned lamb or other (canned or not)	Boudin, andouille and andouillette; Cooked lamb (packaged); Other delicatessen meats based on offal
Fresh dairy products and desserts	All yoghurts and fermented milks (sugar-sweetened, artificially-sweetened or unsweetened, classic or gourmet), fresh cheeses (sugar-sweetened, artificially-sweetened or unsweetened, classic or gourmet), skyr, fresh desserts (dessert creams, curdled milks, jellied milks, Liégeois desserts, fresh desserts with cereals such as rice pudding, fresh mousse desserts, fresh desserts with eggs such as crème caramel, crème brûlée, custards and flans, floating islands, panna cotta and other dairy-based desserts, desserts such as chocolate fondant, profiteroles, tiramisu, clafoutis, rum babas and cakes, whether sugar-sweetened, light or artificially-sweetened) and fresh plant-based desserts (soy desserts and other plant-based desserts)	Fresh cakes; Fresh desserts with fruit; Fresh desserts without fruit; Other fresh desserts
Soft drinks	All beverages with tea, fruit beverages, energy drinks, colas, flavoured waters, lemonades, tonics and bitters, sports drinks, plant-based beverages, flavoured milk beverages (chocolate, vanilla, strawberry, etc.), alcohol-free beers, alcohol-free aperitif beverages, in liquid or powder/granule form to be reconstituted, as well as fruit and/or vegetable beverages that resemble juices or nectars but contain unauthorised ingredients for this type of product (e.g. fibre, colourings, etc., see la Directive 2012/12/EU), juices containing coconut milk (coconut milk is not a juice according to the Codex Alimentarius).	Aperitif beverages without added sugar; Other sports drinks; Sugar-sweetened aperitif beverages; Sugar-sweetened sports drinks

2.1.1. Selection of parameters for analysis

It was decided to produce indicators to assess and compare, across countries, the nutritional information of packaged foods for the categories considered. The parameters studied are as follows:

- number of products collected by country, categories and subcategories;
- labelled parameters: portion size and front of pack labelling;
- labelled nutritional values, with focus on nutrients of interest depending on the category (**Table 2**).

Table 2: Nutrients of interest selected for the analyses, by category

Categories	Sugar	Saturated fat	Salt	Fibre
Bread products	X	X	X	X
Breakfast cereals	X	X	X	X
Delicatessen meats and similar	-	X	X	-
Fresh dairy products and desserts	X	X	-	-
Soft drinks	X	-	-	-

2.1.2. Data analyses conducted

All data treatments were performed using R software.

Food offer and labelling parameters

Descriptive statistics were used to describe and compare, across countries, the number of products collected per category, the distribution of products into subcategories, and the occurrence of portion sizes and front-of-pack labelling available on food packaging. For readability, the graphs showing the distribution (in percentages rounded to the nearest whole number) by subcategory display only the five most represented subcategories. All other subcategories are grouped under “Miscellaneous” (two graphs by food category: one showing the five most represented subcategories in each country and a second one showing the five most represented subcategories all countries combined). Detailed tables showing the number of products collected per subcategory and country, as well as the associated percentages (rounded to one decimal place), are provided in **Annex 2**.

Nutritional composition

Analyses were carried out comparing the mean nutritional content (g per 100 g or mL per 100 mL for Soft drinks) by subcategory across countries. At this stage, all statistical treatments had to be performed at the subcategory level, due to differences in the food supply between countries and categories (classification into subcategories allows to compare similar products).

It should be noted that, as the nutritional information is retrieved as labelled on the packaging, some products may have unquantified nutritional values, such as “less than” a given value or “traces”. In such cases, the information has been replaced as follows:

- by the value of x divided by 2, for values “< x”;
- by 0.0001/100 g, for “traces” values.

Then, as the data did not follow Gaussian distributions, non-parametric statistical tests were applied. First, for each category and nutrient of interest, a Kruskal-Wallis test was performed to determine which subcategories show statistically significant differences across countries. Then, for the subcategories showing significant differences, a Dunn's test with a Bonferroni correction for multiple comparisons was used as a post-hoc test to determine which countries showed significant differences compared with the others. To describe the strength of the statistical differences, the following convention was used for the p-values:

- * for $0.01 < p \leq 0.05$;
- ** for $0.001 < p \leq 0.01$;
- *** for $p \leq 0.001$.

For a better visualization of Dunn's post-hoc multiple pairwise comparisons, compact letter display was chosen, meaning that countries with common letters belong to the same statistical group (e.g., "a" and "ab"), while those with different letters are statistically different (e.g., "abc" and "ef"). Moreover, the letters follow an ordered sequence (a, b, …, f, g), which reflects the ranking of groups based on their median values. Groups with lower medians receive earlier letters (e.g., "a"), while groups with progressively higher medians receive subsequent letters. This ordering provides an intuitive visual gradient from lower to higher values, making it easier to interpret both statistical significance and the relative positioning of countries within each subcategory. Results for all subcategories and countries are presented in tables by category and nutrient.

Boxplots for some selected subcategories (based on their representativeness in most countries and the ease of understanding the included products) are used to visualize and compare the distribution of the nutritional composition across countries. The construction of a boxplot is detailed in **Figure 1**.

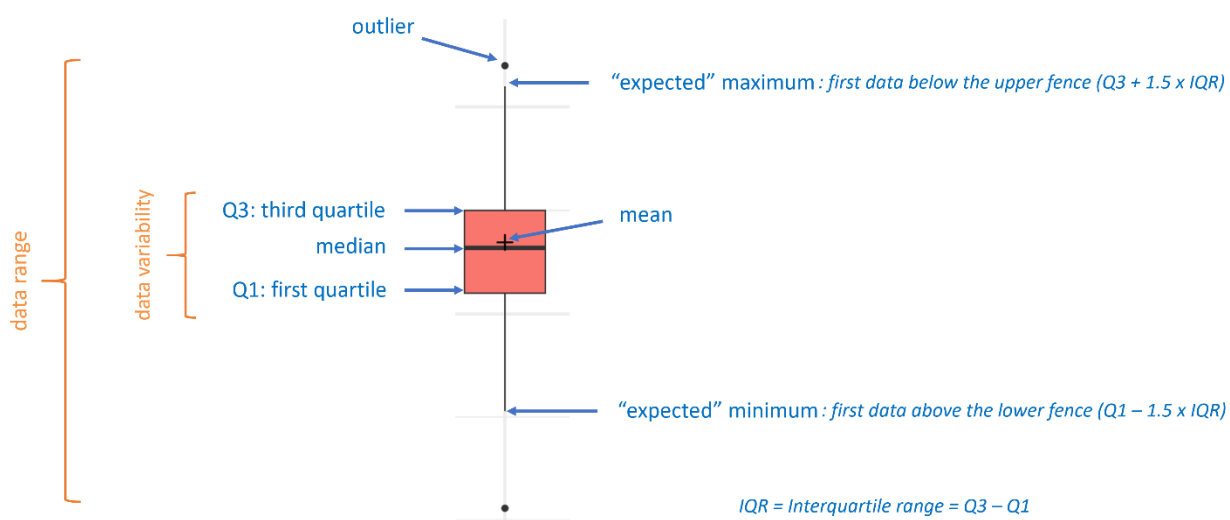

Figure 1: Description of the constitutive elements of a boxplot

In addition to statistical analysis, to get an overview of how countries rank for a nutrient in a given category, a three-tier system has been applied to each subcategory. For each nutrient and each subcategory, countries were divided into three groups based on their median nutrient values (1: low, 2: intermediate, 3: high), with a rule to keep ties within the same tier. An example is given in **Table 3**.

Table 3: Example of the 3-tier ranking assignment for sugar content (g per 100 mL) in sugar-sweetened colas (n_tot = 690)

	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Malta	Poland	Portugal	Romania	Slovenia
Median sugar	9.8	10.6	10.6	11	8.4	10	10.6	10.6	10	9.8	10.6	11.2	10.6	10.9	10.6	10.6	10.6	10.6	10.3
Rank	1	2	2	3	1	1	2	2	1	1	2	3	2	3	2	2	2	2	1

These results were then compiled for each category, examining the position of each subcategory to determine whether, overall, most of its subcategories fell into group 1, 2, or 3. For example, if a country had half or more of its subcategories in group 1 for sugar, then it ranked among the lowest in sugar for that category.

To draw a parallel between these rankings and the nutritional policies in place in each country, a questionnaire on specific national nutritional policies was sent to the partner countries. The questions are detailed in **Annex 3**. Summary tables by category present the compilation of targeted national nutritional measures according to the following taxonomy:

- “Collective agreement”: a formal, jointly negotiated commitment between a government authority (e.g., Ministry of Health) and representatives of an industry (e.g., a manufacturers’ association) in order to improve the nutritional composition of products;
- “Tax”: a legal nutritional tax, government-imposed financial charge applied to foods or beverages that contain specific nutrients considered harmful when consumed in excess;
- “Legal limit”: maximum level beyond which the product cannot be marketed;
- "Legal threshold + mandatory label": a threshold beyond which a mandatory label must be applied on the product. However, this label is not a front-of-pack labelling but a mandatory text-based additional marking (e.g., "high in salt");
- "FOP": front-of-pack labelling, affixed voluntarily.

2.2. Results

More than 61,000 products were included in the analyses: details by country and category can be found in **Table 4** and **Annex 2**.

2.2.1. Comparison of products collected by country

This part focuses on the comparison of collected products across countries. A first level of analysis is conducted by category, to compare the numbers of collected products by country (**Table 4**). A second level of analysis, by subcategory, provides an overview of the diversity of the food offer for a given category depending on the country.

Table 4: Number of collected products included in the analyses, by country and category

Country	Data source	Bread products	Breakfast cereals	Delicatessen meats and similar	Fresh dairy products and desserts	Soft drinks	Total
Austria	Best-ReMaP 2nd snapshot	340	312	1087	610	1219	**3568**
Belgium	Best-ReMaP 2nd snapshot	383	371	1149	856	1818	**4577**
Bosnia	Best-ReMaP 1st snapshot	180	291	744	247	473	**1935**
Bulgaria	Best-ReMaP 2nd snapshot	286	179	811	368	616	**2260**
Croatia	Best-ReMaP 1st snapshot	105	285	81	63	272	**806**
Denmark	Best-ReMaP 2nd snapshot	392	321	1036	351	909	**3009**
Estonia	Best-ReMaP 2nd snapshot	483	523	1042	782	1175	**4005**
Finland	Best-ReMaP 2nd snapshot	483	342	238	383	256	**1702**
France	Oqali	1143	659	4320	2880	2245	**11247**
Germany	Best-ReMaP 2nd snapshot	–	1490	–	1283	2873	**5646**
Greece	Best-ReMaP 2nd snapshot	272	272	392	402	627	**1965**
Hungary	Best-ReMaP 2nd snapshot	226	237	879	454	759	**2555**
Ireland	Best-ReMaP 1st snapshot	524	367	706	713	790	**3100**
Italy	Best-ReMaP 2nd snapshot	206	321	794	641	793	**2755**
Malta	Best-ReMaP 2nd snapshot	–	325	678	–	712	**1715**
Poland	Best-ReMaP 1st snapshot	151	177	461	370	307	**1466**
Portugal	Best-ReMaP 2nd snapshot	235	321	619	757	738	**2670**
Romania	Best-ReMaP 2nd snapshot	328	291	382	720	698	**2419**
Slovenia	Best-ReMaP 2nd snapshot	272	543	1075	856	1042	**3788**
Total		**6009**	**7627**	**16494**	**12736**	**18322**	**61188**

Best-ReMaP 1st snapshot: 2021-2022
Best-ReMaP 2nd snapshot: 2022-2023
Oqali data collection: 2017 for Fresh dairy products and dessert; 2018 for Breakfast cereals; 2019 for Bread products; 2019 for Soft drinks; 2020 for Delicatessen meats and similar

Differences observed in the number of references collected across countries can be explained by:

- different levels of experience in data collection and monitoring processed food. Some countries such as Germany, Slovenia, Belgium, or France were already used to collecting and monitoring food supply on their own prior to the Best-ReMaP project while others experienced it for the first time (e.g., Croatia, Poland, Bosnia). In addition, some countries as Finland, Belgium (3), or Germany (5) did not use the recommended collection methodology (see (6));
- resources allocated for data collection and codification varied across countries;
- finally, the number of visited retailers varied across countries. It was recommended that market coverage reach approximately 70%, but no precise assessment of the market share could be made. Depending on the country, the number of retailers that had to be visited to reach the recommendation was variable.

It should also be noted that due to scheduling and internal constraints, Germany and Malta did not collect some categories (see details in **Table 4** and **Annex 2**).

2.2.1.1. Bread products

Figure 2 shows the number of collected data by country for the bread products. Seventeen countries have provided data for this category, as Germany and Malta did not collect this food category.

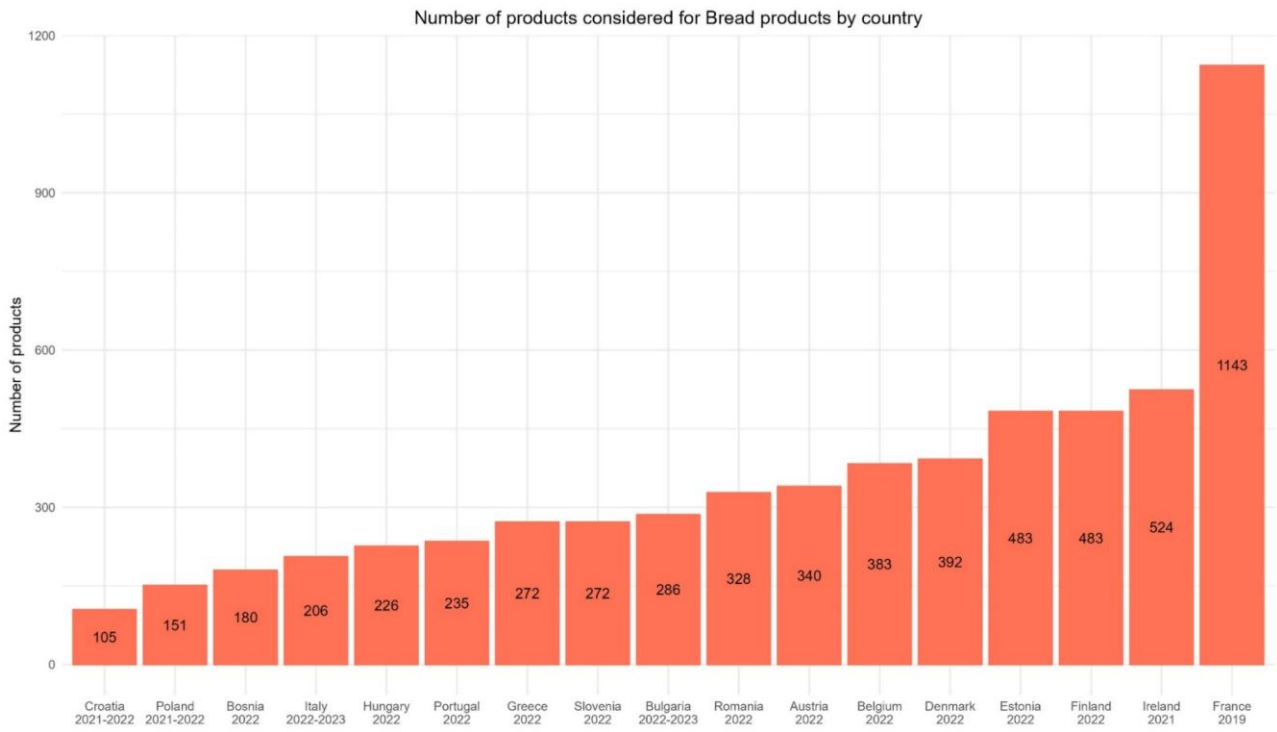

Figure 2: Comparison of the number of references collected among Bread products, by country

The total number of products included varies considerably from country to country: there is five times more data in Ireland (n= 524), Finland (n= 483), and Estonia (n= 483) than in Croatia (n= 105) and up to ten times more in France (n = 1143). Moreover, France is covering up to 86% of

the market share on bread products (7) but no precise data can be provided for other countries. This means that it is not possible to conclude on the representativeness of the collected data for the other countries.

The analysis of the most represented subcategories in each country (**Figure 3**) highlights major differences of food offer between countries. Some subcategories are among the most supplied in most countries as Pre-packaged breads (with products in 15 out of 17 countries) or Plain white sandwich breads / hamburger / hot dogs buns (with products in 12 out of 17 countries). The distribution of the five most supplied subcategories all countries combined (**Figure 4**), reveals that these subcategories are represented in all countries (with the exception of Wholemeal cereal grains sandwich breads / hamburger / hot dog buns, that was not collected in Bulgaria). However, no country has a similar offer regarding the proportion of products collected: Pre-packaged breads represent 63% of the data in Finland (n = 483), but less than 5% in Bulgaria (n = 286) or Italy (n = 206). It should also be noted that in France, Portugal, Austria, Belgium and Italy, the food offer (as collected) is more diversified as shown by the higher proportion of products found in the Miscellaneous group on **Figure 3**.

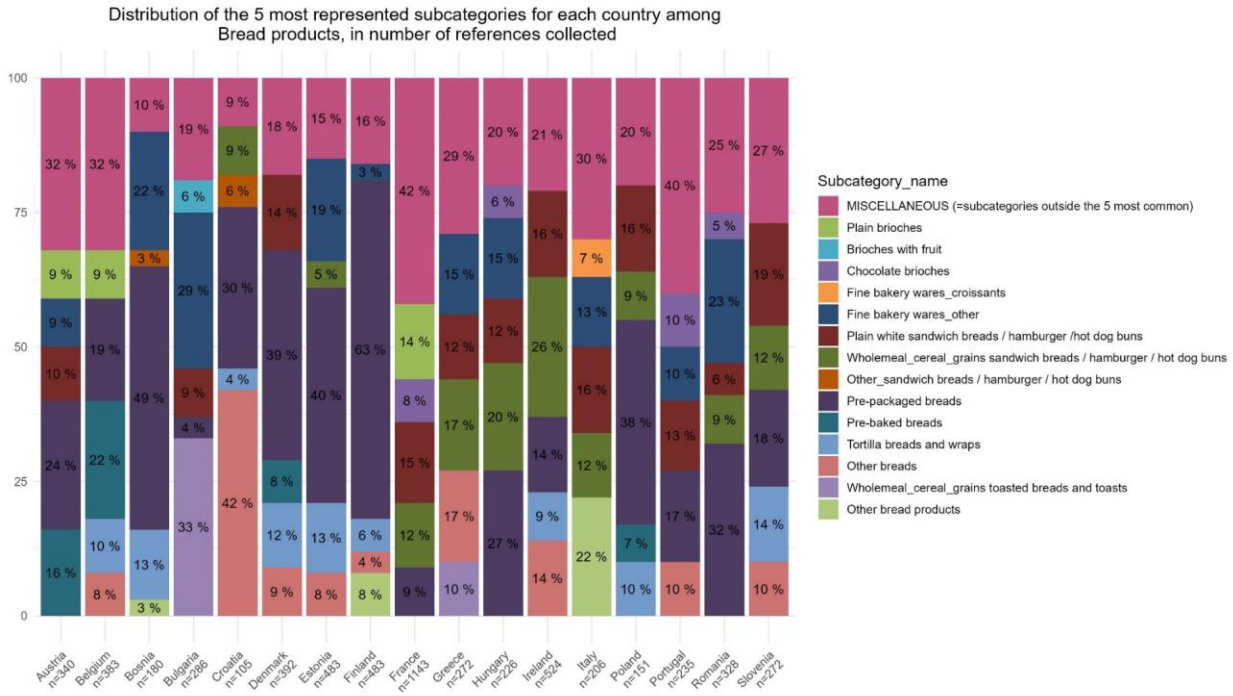

Figure 3: Comparison of references collected among Bread products, by country: distribution of the five most supplied subcategories in each country

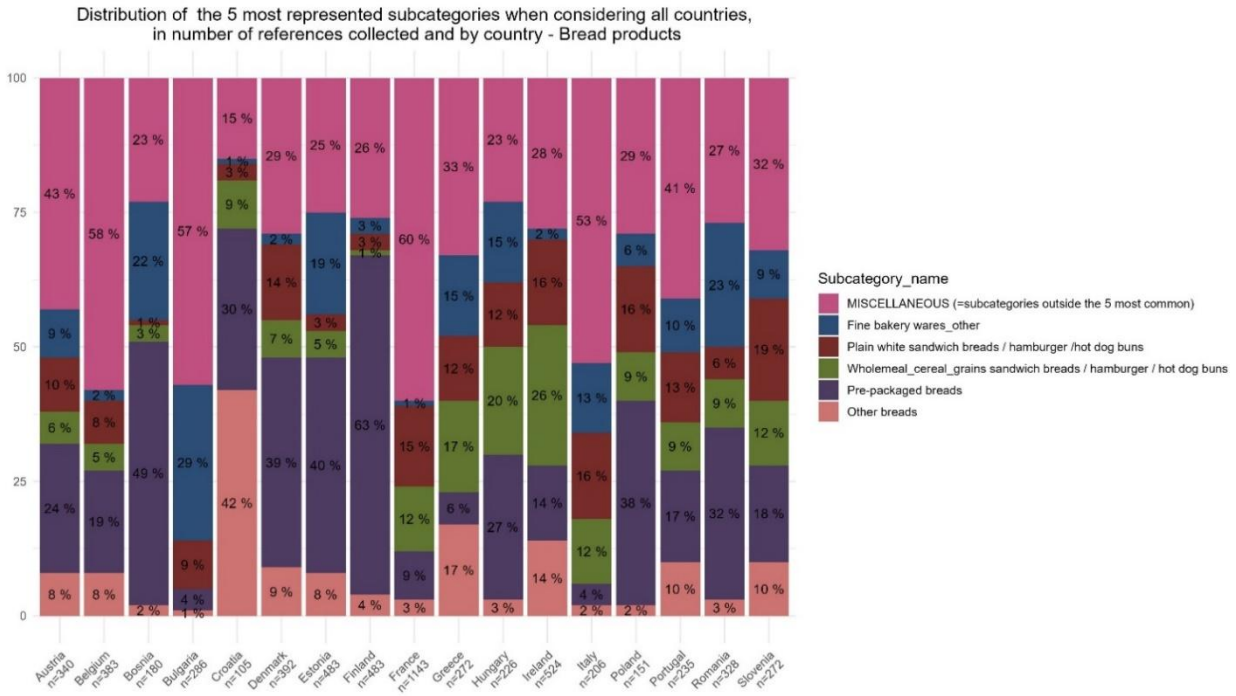

Figure 4: Comparison of references collected among Bread products, by country: distribution of the five most supplied subcategories when considering all countries

2.2.1.2. Breakfast cereals

Number of products considered among Breakfast cereals (**Figure 5**) varies greatly, between Germany (n = 1490), Estonia (n = 523), Slovenia (n = 543), and France (n = 659) compared to Poland (n = 177) or Bulgaria (n = 179). However, for the other countries, the number of references collected is quite close (between 237 and 371). France is covering up to 87% of the market share on breakfast cereals (8) but no precise data can be provided for other countries. This means that it is not possible to conclude on the representativeness of the collected data for the other countries.

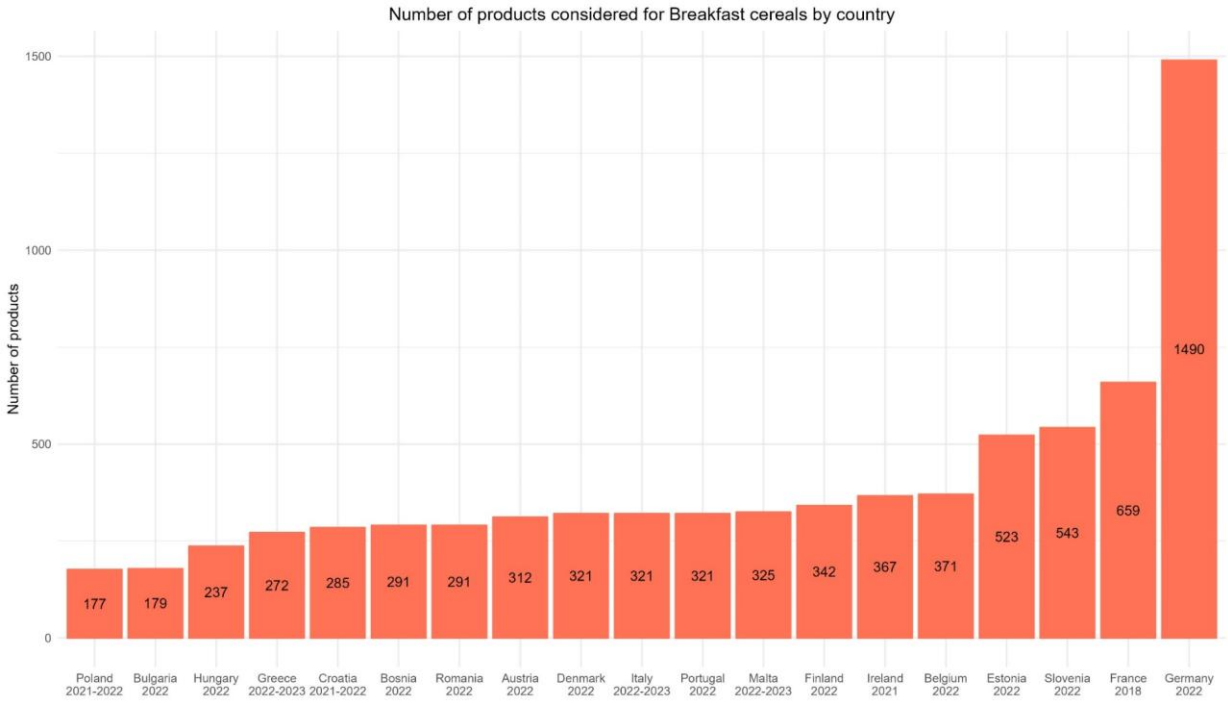

Figure 5: Comparison of the number of references collected among Breakfast cereals, by country

The analysis of the most represented subcategories in each country (**Figure 6**) reveals that, even if there are differences depending on the country, some subcategories are almost systematically found among the five most frequent ones (but in various proportions):

- Traditional muesli flakes (in 17/19 countries);
- Chocolate-flavoured cereals (in 16/19 countries);
- Crunchy fruit muesli (in 16/19 countries);
- Crunchy chocolate muesli (in 14/19 countries);
- Cereals without added sugar (in 14/19 countries).

The proportion of products not belonging to the five most common subcategories varies from 12% in Croatia (n = 285) to 47% in Portugal (n = 321), reflecting a more diversified food offer in the latter.

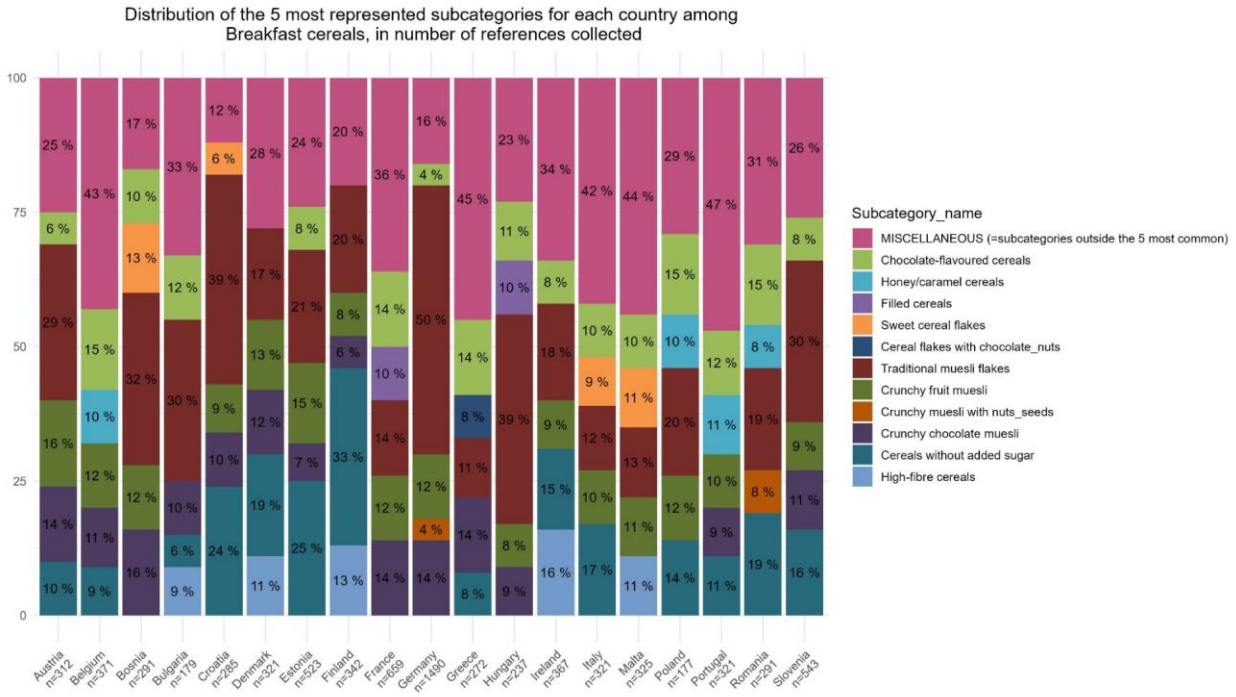

Figure 6: Comparison of references collected among Breakfast cereals, by country: distribution of the five most supplied subcategories in each country

When considering only the five most supplied subcategories all countries combined (**Figure 7**), these are found in every country and cover the majority of collected references in most of them (18/19 countries). The proportion of collected products in these five combined subcategories varies from 49% (Portugal, n = 321) to 85% (Croatia, n = 285), and for each of these five subcategories, the proportion of collected products varies across countries as follows:

- from 7% of the references collected in Portugal (n = 321) to 50% in Germany (n = 1490) for Traditional muesli flakes;
- from 3% in Croatia (n = 285) to 15% in Belgium (n = 371), Poland (n = 177), and Romania (n = 291) for Chocolate-flavoured cereals;
- from 6% in Bulgaria (n = 179) to 16% in Austria (n = 312) for Crunchy fruit muesli;
- from 3% in Ireland (n = 367) to 16% in Bosnia (n = 291) for Crunchy chocolate muesli;
- from 2% in France (n = 659) to 33% in Finland (n =342) for Cereals without added sugar.

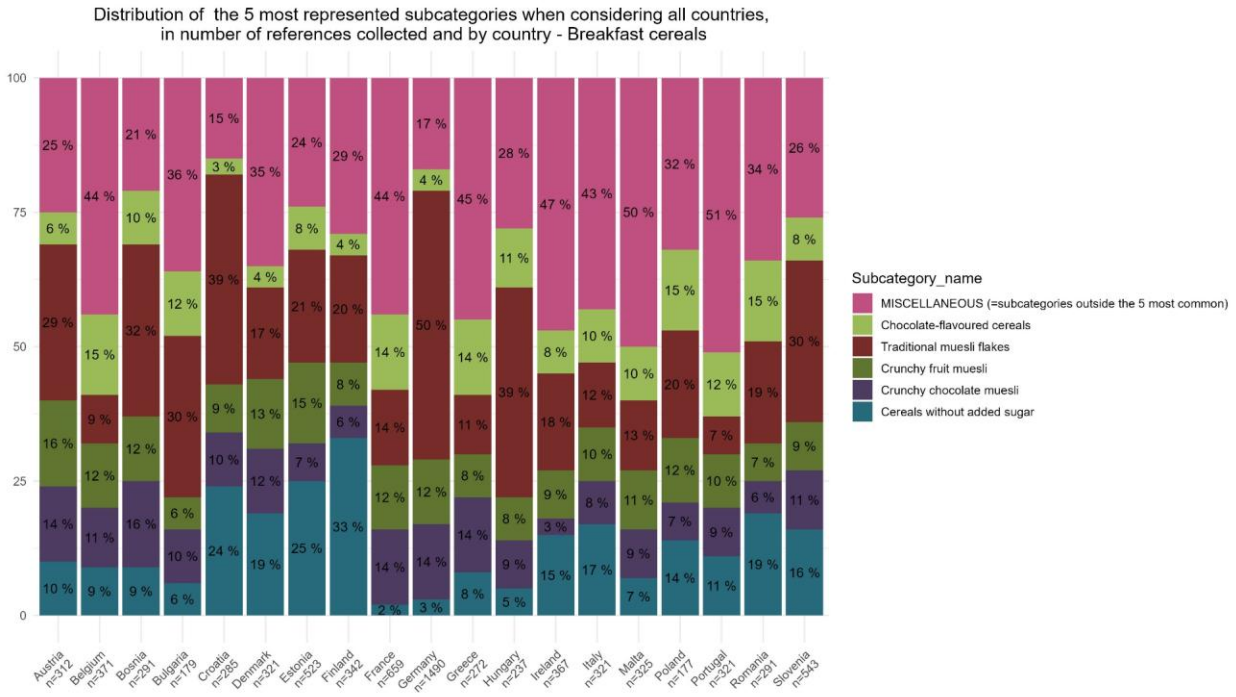

Figure 7: Comparison of references collected among Breakfast cereals, by country: distribution of the five most supplied subcategories when considering all countries

2.2.1.3. Delicatessen meats and similar

Figure 8 shows the number of collected references by country within delicatessen meats and similar.

The total number of products included varies greatly across countries, from 81 products collected in Croatia to 4320 products in France. France is covering up to 81% of the market share of delicatessen meats and similar products (9) but no precise data can be provided for other countries. This means that it is not possible to conclude on the representativeness of the collected data for the other countries.

It should also be noted that for this category, Finland has collected only four subcategories out of the 21 existing, which may explain the lowest number of products compared to other countries, therefore creating a comparison bias.

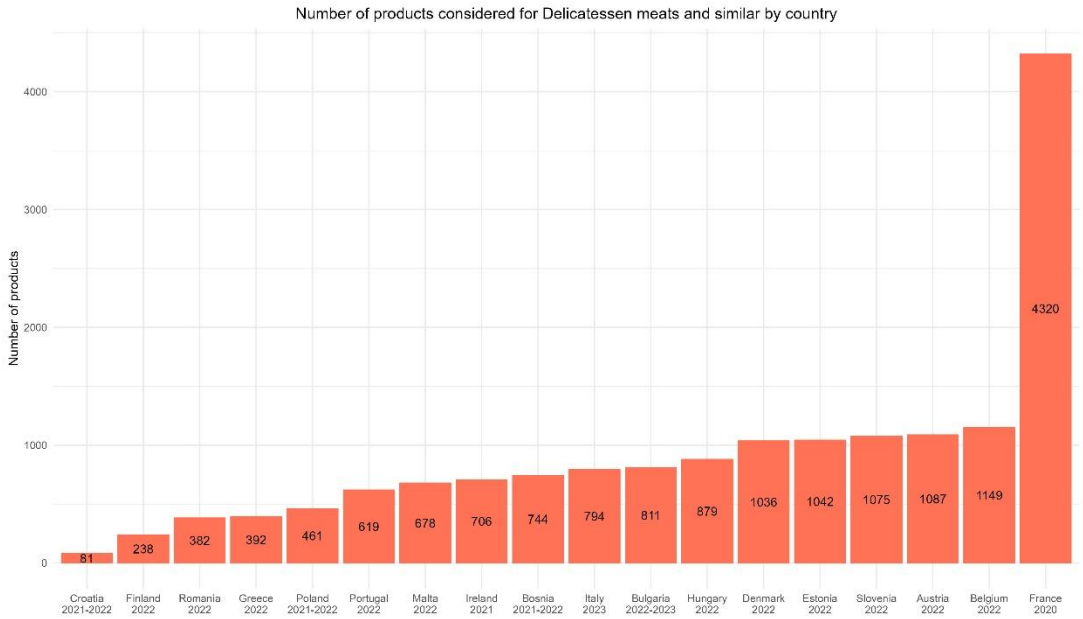

Figure 8: Comparison of the references collected among Delicatessen meats and similar, by country

The analysis of the most represented subcategories in each country (**Figure 9**) shows differences in the food offer from one country to another and that some subcategories are well represented across all countries such as:

- Sausages (17/18 countries);
- Dry sausages (16/18 countries);
- Cooked pork ham and roast (packaged) (14/18 countries).

It should be noted that the subcategories Sausages and Dry sausage include a great diversity of products, meaning that the food offer for these products can vary considerably both within a single country and from one country to another.

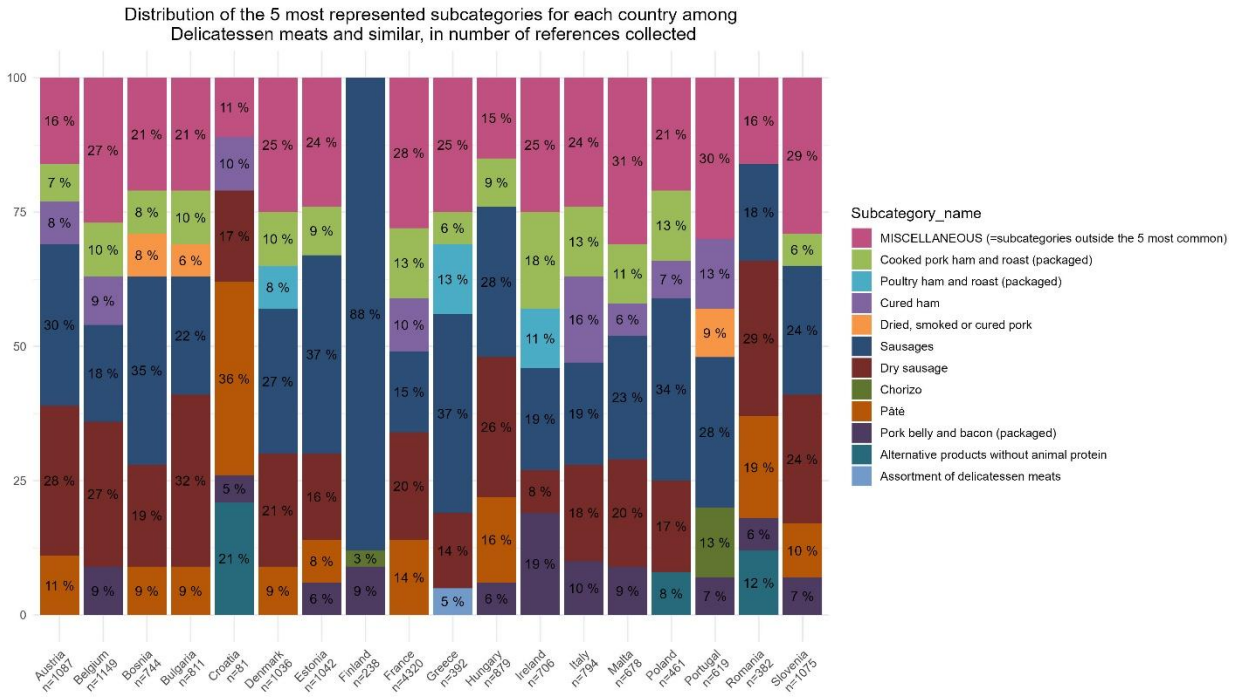

Figure 9: Comparison of references collected among Delicatessen meats and similar, by country: distribution of the five most supplied subcategories in each country

When considering only the five most supplied subcategories all countries combined as displayed on **Figure 10**, it appears that these five subcategories represent the majority of the Delicatessen meats and similar offer collected in all countries: from 51% (Portugal, n = 619) to 97% (Finland, n = 238).

The proportion of products collected in each of these subcategories varies considerably depending on the country:

- from 4% (Croatia, n = 81) to 88% (Finland, n = 238) for Sausages;
- from 0% (Finland, n = 238) to 32% (Bulgaria, n = 811) for Dry sausage;
- from 0% (Finland, n = 238) to 36% (Croatia, n = 81) for Pâté;
- from 1% (Croatia, n = 81) to 18% (Ireland, n = 706) for Cooked pork ham and roast (packaged);
- from 4% (Greece, n = 392 and Bosnia, n = 744) to 19% (Ireland, n = 706) for Pork belly and bacon (packaged).

There is also huge variability in the proportion of products included under “MISCELLANEOUS” on **Figure 10**, ranging from 3% in Finland (n = 238) to 49% in Portugal (n = 619).

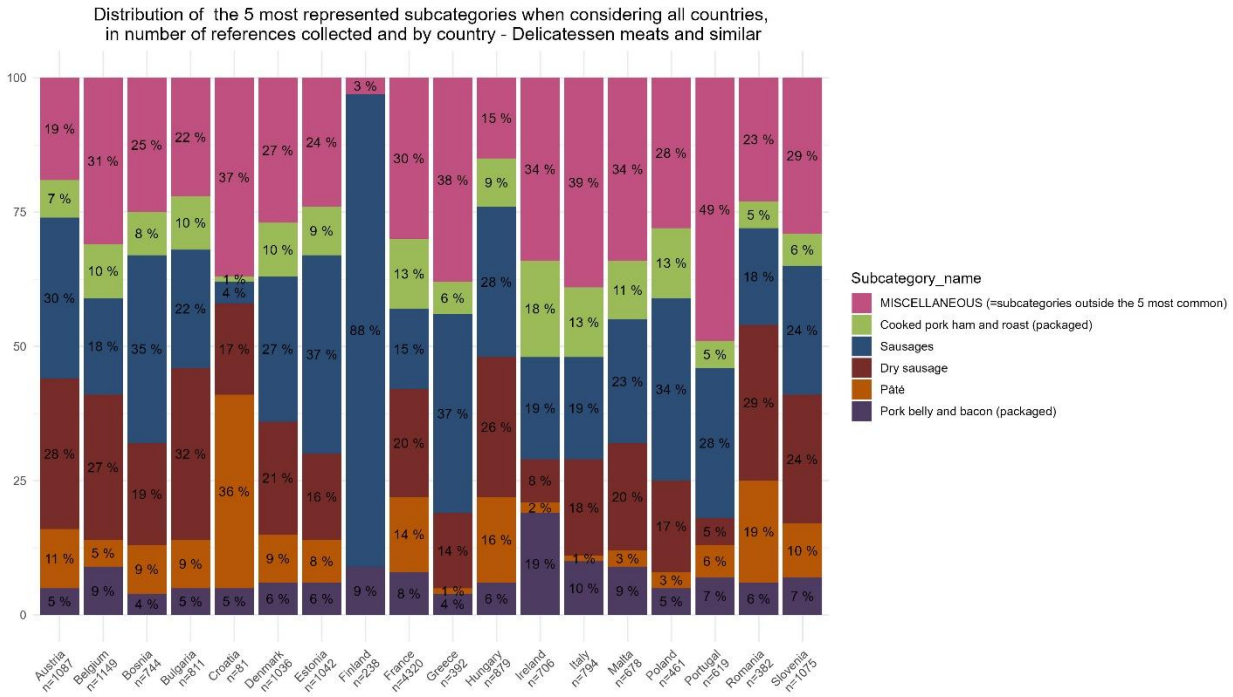

Figure 10: Comparison of references collected among Delicatessen meats and similar, by country: distribution of the five most supplied subcategories when considering all countries

2.2.1.4. Fresh dairy products and desserts

Figure 11 shows the number of collected references within fresh dairy products and desserts by country.

Overall, the number of products varies greatly across countries, from 63 products collected in Croatia to 1283 in Germany or 2880 in France. France is covering up to 87% of the market share on fresh dairy products and desserts (10) but no precise data can be provided for other countries. This means that it is not possible to conclude on the representativeness of the collected data for the other countries.

It should also be noted that for this category, Germany has collected only yoghurt-type products, which has an impact on the number of products and the diversity of subcategories observed, therefore creating a comparison bias.

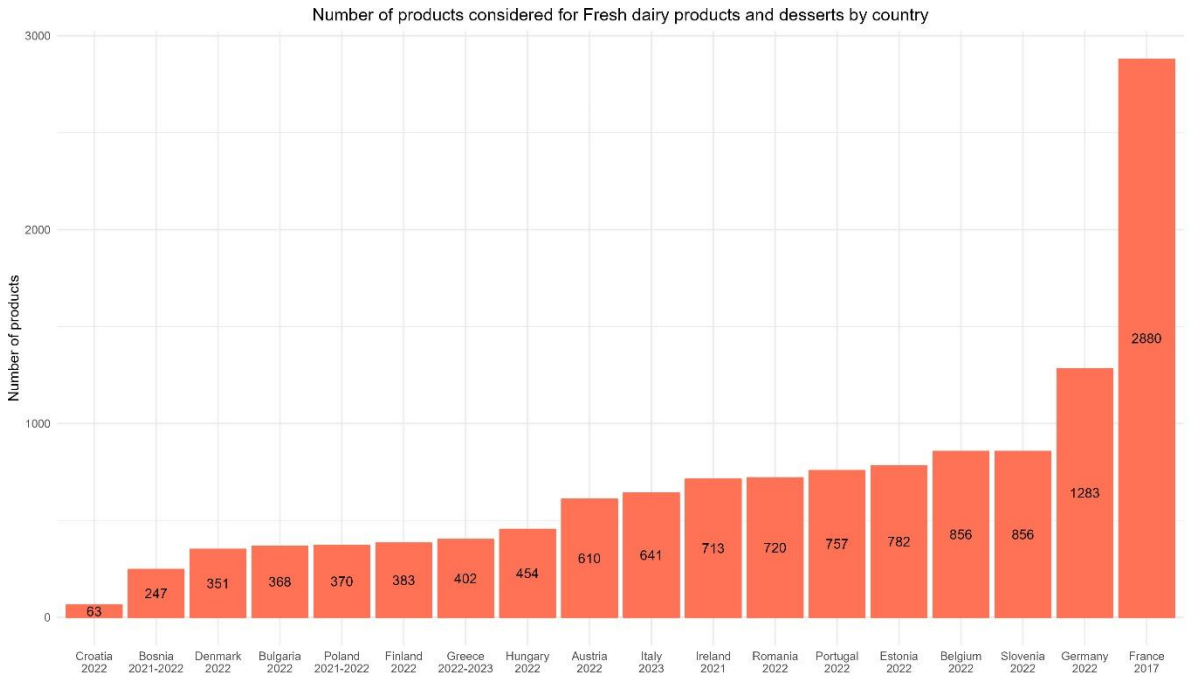

Figure 11: Comparison of the references collected among Fresh dairy products and desserts, by country

The analysis of the most represented subcategories (**Figure 12**) shows major differences in the food offer across countries, as shown by the varying proportions of products in each subcategory, but also by the fluctuation of products gathered in the “MISCELLANEOUS” subcategory on **Figure 12**, varying from 3% (Germany) to 41% (Belgium).

However, some subcategories are well represented in the majority of countries, such as:

- Classic sweet yoghurts and fermented milks (18/18 countries);
- Gourmet sweet yoghurts and fermented milks (18/18 countries);
- Classic plain yoghurts and fermented milks with no added sugar (16/18 countries);
- Dessert creams and jellied milks (12/18 countries).

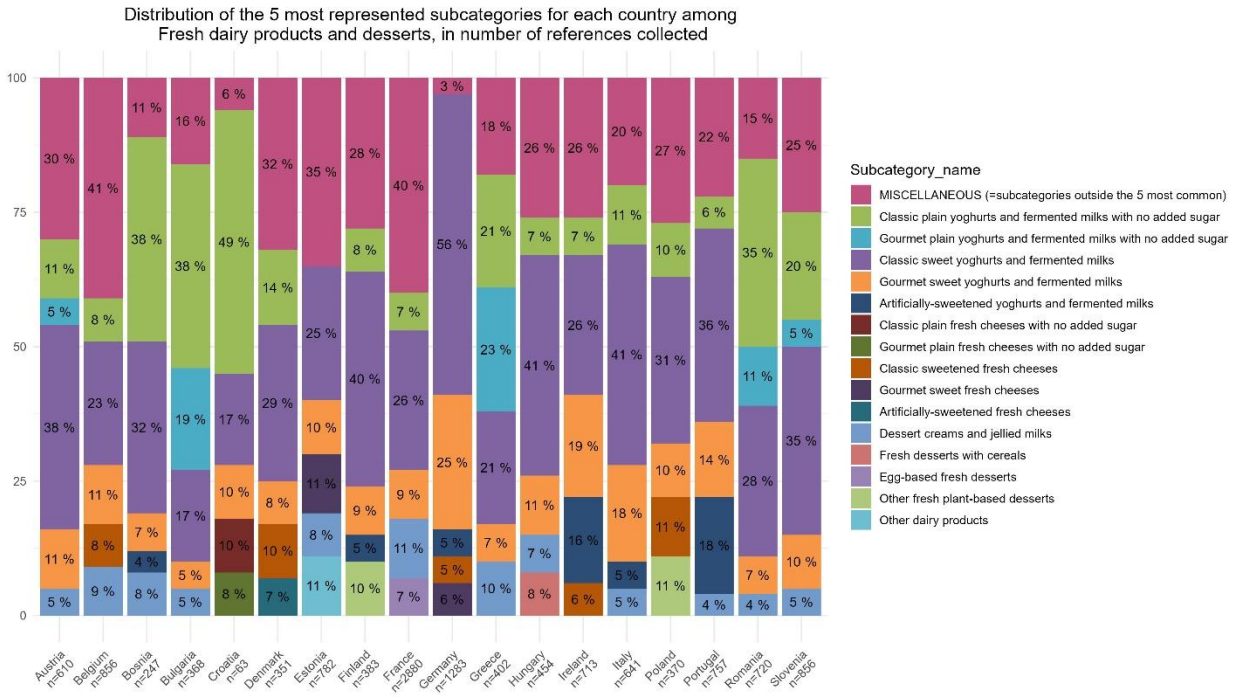

Figure 12: Comparison of references collected among Fresh dairy products and desserts, by country: distribution of the five most supplied subcategories in each country

When considering only the five most supplied subcategories all countries combined as displayed on **Figure 13**, it appears that the five subcategories highlighted represent the majority of the fresh dairy food offer collected in all countries: from 52% (Estonia, n = 782) to 87% (Bosnia, n = 247). However, the proportion of each subcategory varies depending on the country:

- From 5% (Estonia, n= 782) to 49% (Croatia, n = 238) for Classic plain yoghurts and fermented milks with no added sugar;
- From 2% (Bosnia, n = 247) to 23% (Greece, n = 402) for Gourmet plain yoghurts and fermented milks with no added sugar;
- From 17% (Bulgaria, n = 368; Croatia, n = 63) to 56% (Germany, n = 1283) for Classic sweet yogurts and fermented milks;
- From 5% (Bulgaria, n = 368) to 25% (Germany, n = 1283) for Gourmet sweet yoghurts and fermented milks;
- From 0% (Croatia, n = 63) to 11% (France, n = 2880) for Dessert creams and jellied milks.

It should be noted that yoghurt-type products are easily identifiable, so it may have been easier for all countries to collect them. For Germany, the proportion of yoghurts with no added sugar and desserts is zero because they were not collected.

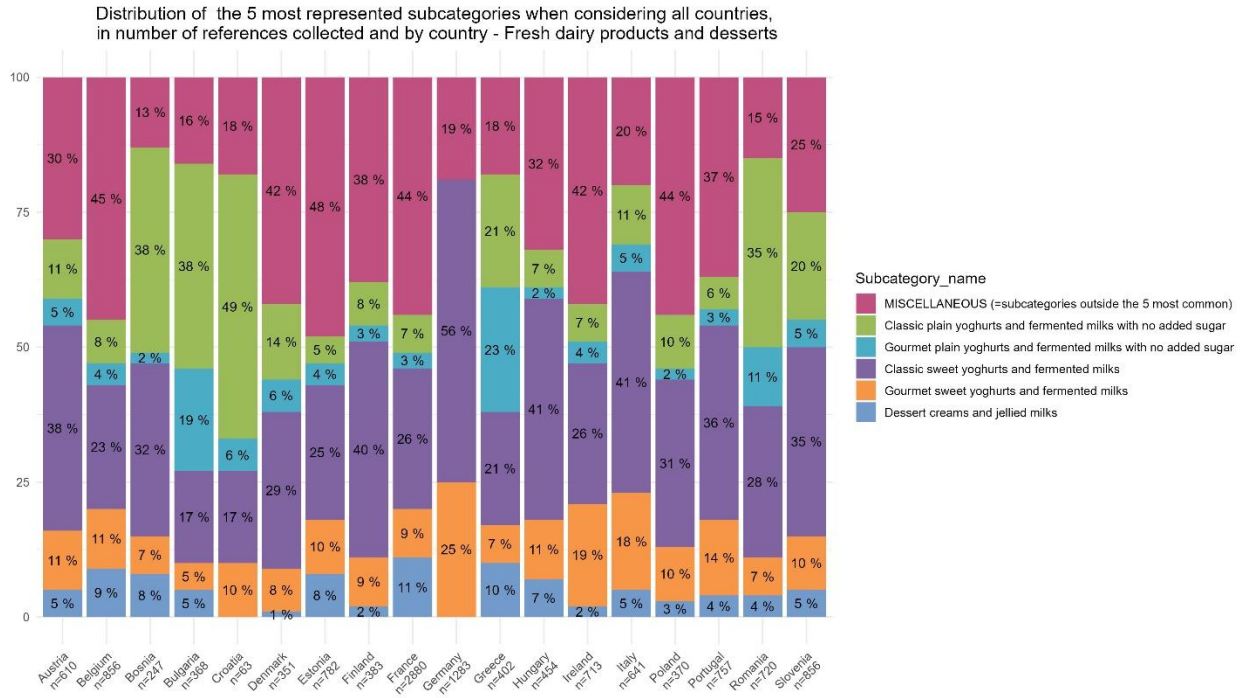

Figure 13: Comparison of references collected among Fresh dairy products and desserts, by country: distribution of the five most supplied subcategories when considering all countries

2.2.1.5. Soft drinks

Figure 14 shows the number of collected data within soft drinks by country. Overall, the number of products collected greatly varies, between 256 references considered in Finland to 2245 in France and 2873 in Germany. France is covering up to 82% of the market share for Soft drinks (11) but no precise data can be provided for other countries. This means that it is not possible to conclude on the representativeness of the collected data for the other countries.

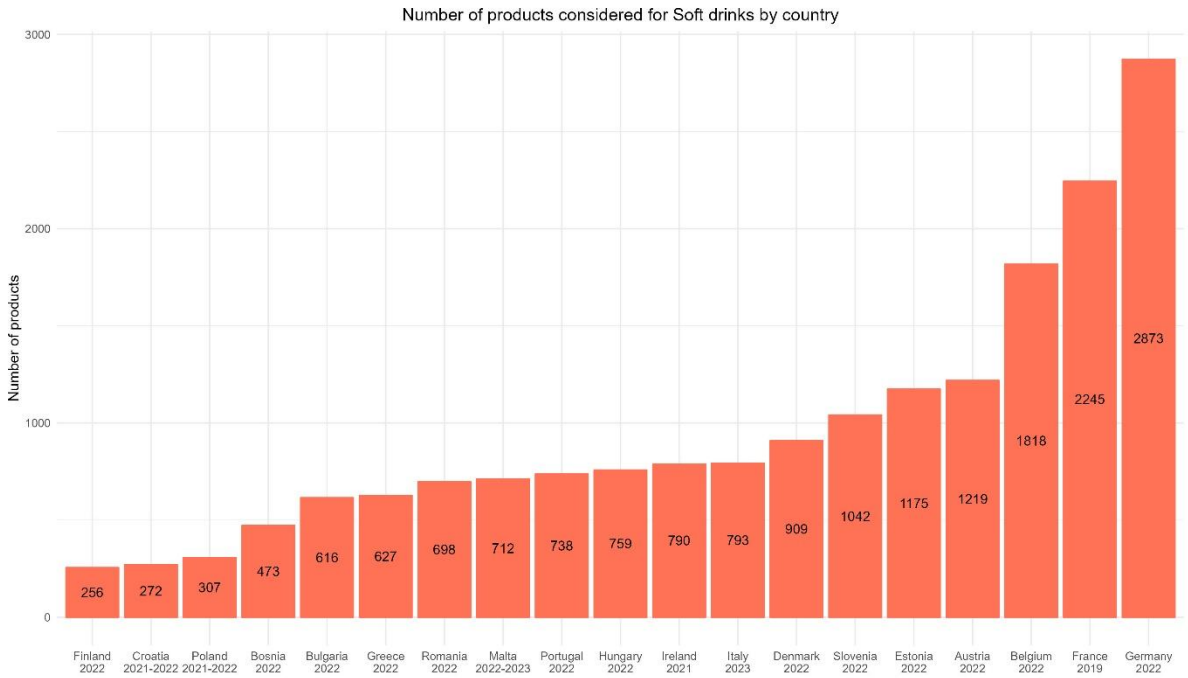

Figure 14: Comparison of the references collected among Soft drinks, by country

The analysis of the most represented subcategories for each country (**Figure 15**) shows that there are major differences in the food offer for soft drinks, as the most represented subcategories are quite different depending on the country. The subcategory of Sugar-sweetened fruit beverages seems to be the most common one as it is found across a majority of countries (17/19), with proportion varying from 8% (Poland, n = 307) to 29% (Bosnia, n = 473).

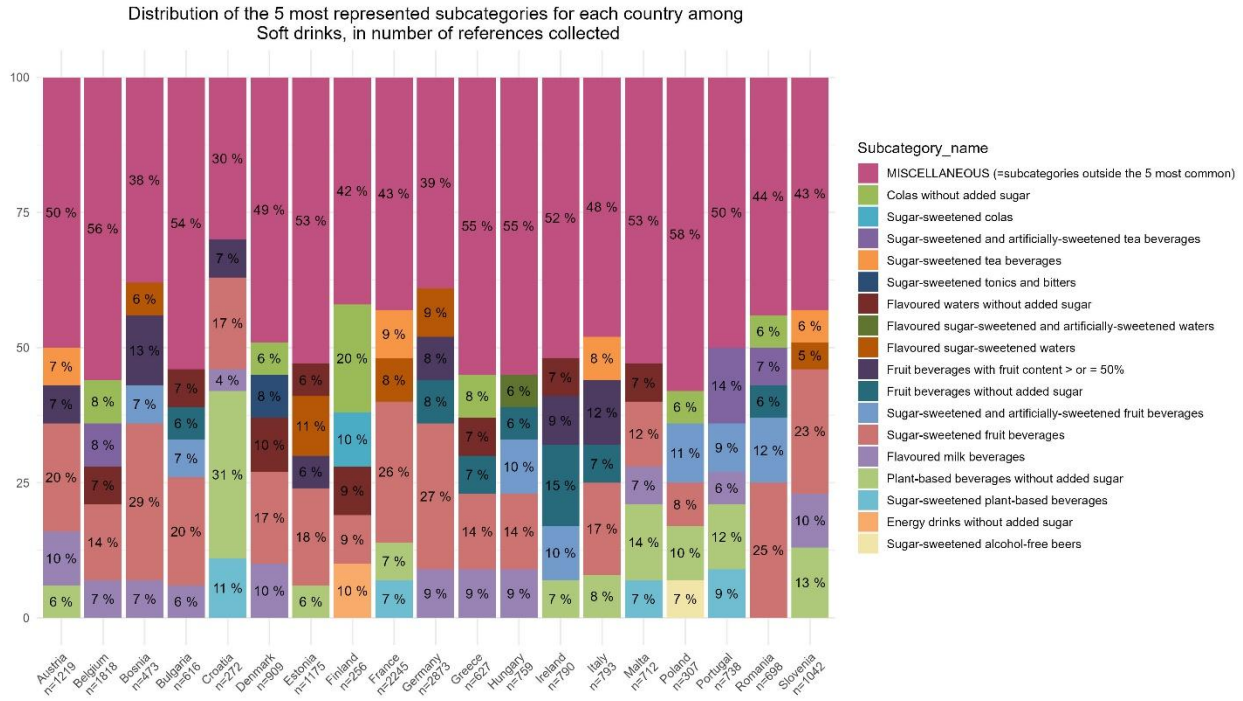

Figure 15: Comparison of references collected among Soft drinks, by country: distribution of the five most supplied subcategories in each country

When considering only the five most supplied subcategories all countries combined as displayed on **Figure 16**, it appears that they do not represent the majority of the food offer for collected soft drinks in most countries. They account for 23% (Finland, n = 256) to 55% (Croatia, n = 272) of references collected. Moreover, the proportions within these subcategories vary considerably from country to country:

- From 2% (Denmark, n = 909; Poland, n = 307 and Slovenia, n = 1042) to 15% (Ireland, n = 790) for Fruit beverages without added sugar;
- From 0% (Croatia, n = 272) to 12% (Romania, n = 698) for Sugar-sweetened and artificially-sweetened fruit beverages;
- From 2% (Ireland, n = 790) to 29% (Bosnia, n = 473) for Sugar-sweetened fruit beverages;
- From 0% (Finland, n = 256) to 10% (Austria, n = 1219; Denmark, n = 909; Slovenia, n = 1042) for flavoured-milk beverages;
- From 3% (Bosnia, n = 473) to 31% (Croatia, n = 272) for Plant-based beverages without added sugar.

Finally, there is a huge proportion of miscellaneous products for all countries, from 45% of collected references in Croatia (n = 272) to 77% in Finland (n = 256) demonstrating the great diversity of products within this category.

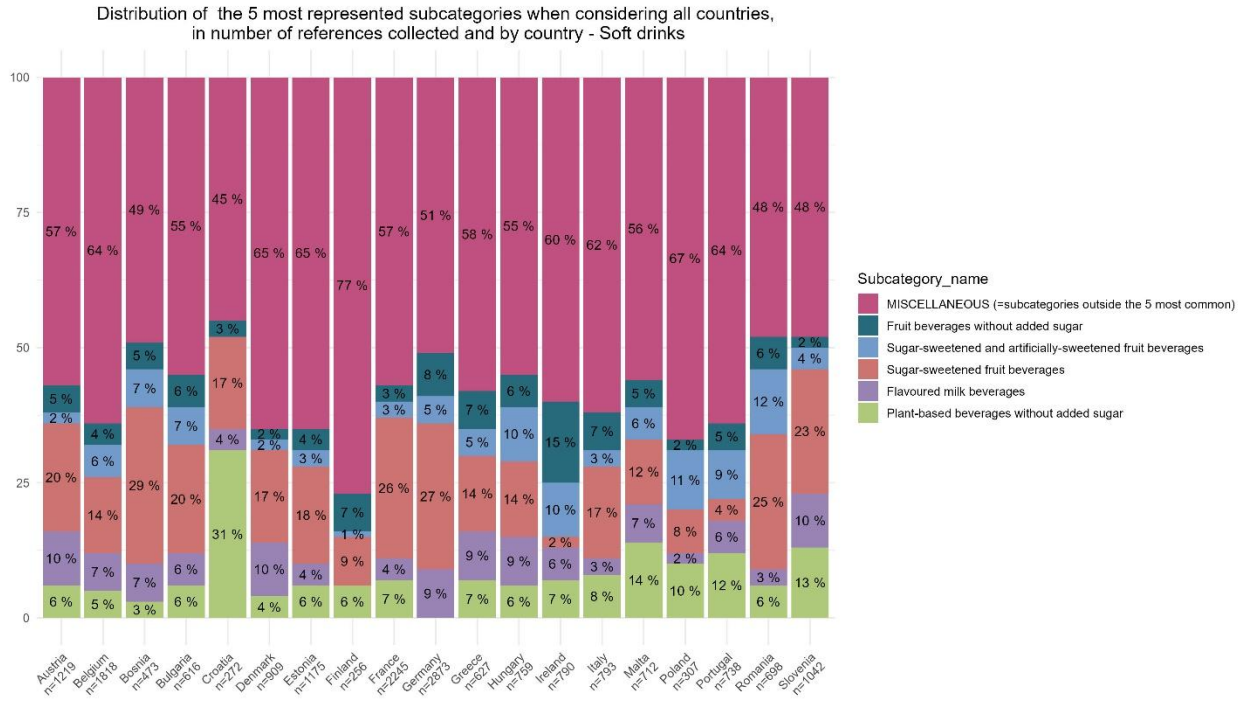

Figure 16: Comparison of references collected among Soft drinks, by country: distribution of the five most supplied subcategories when considering all countries

Conclusion on the comparisons of the food offer

The comparison of the food offer across the countries included in the analysis reveals major differences between European countries. The results show variations both in terms of number of references collected by subcategory in each country and in terms of proportion of each subcategory among all products collected. This highlights that to ensure accuracy, nutritional comparisons between countries (but also analyses within a country) must be conducted at the subcategory level, as more macro comparisons (at category level) may lead to compare very different products. Moreover, as some countries do not have collected all subcategories, any comparison at the category and country level is not relevant.

However, it is important to underline the limitations of these comparisons due to:

- Sampling bias: there may be sampling biases in data collection for certain countries, affecting representativeness;
- Limited coverage of the market: some countries have fewer products collected, and precise market coverage remains unknown (except for France);
- Data collection year disparities: data collection years vary by country, leading to potential differences when comparing the food offer;
- Methodological variability: the methodology used for data collection may differ, as some countries could have used web scraping (even if it was not the recommended method).

2.2.2. Comparison of labelling parameters

Information gathered can also be used to compare product labelling parameters. A focus on two fields collected during Best-ReMaP was realised: portion sizes and front-of-pack labelling.

2.2.2.1. Comparison of portion size reported by category and country

The definition of portion size given to partners was *"Value of the portion size (only numbers, not information such as "2 biscuits", "a spoon", "a cup of tea"...). It can either be clearly stated in a claim, guideline daily amounts, or consumption recommendations or mentioned via a nutrition labelling per serving".* This parameter can potentially influence the quantities consumed and therefore the intake of nutrients as it is corresponding to the quantity of product to consume indicated by the manufacturers.
For each category, the distribution of products with and without a labelled portion size was compared by country. Then, considering products with a portion size only, the three most represented portion sizes all countries combined are highlighted, the rest (if any) being gathered in « Other » group (also including portion sizes that sit between the three most frequently observed ones). A more detailed graph compares the distribution of these three portion sizes within each country. In addition, the distribution of portion sizes class (based on the most commonly observed sizes by category), was examined in order to obtain a more comprehensive overview of the range of portion sizes found in each country.
It should be noted that for the study of this parameter, it was decided to exclude Bread products and Delicatessen meats and similar. Indeed, these categories included a wide diversity of products, consumed in variable quantities, and required analysis by subcategories to be meaningful (in order not to compare a brioche with a tortilla or a ham with a sausage).

2.2.2.1.1. Portion sizes reported on Breakfast cereals collected

Figure 17 displayed the distribution of products with and without portion size labelled among Breakfast cereals collected for the 19 countries included in the analyses. The proportion of reported portion size greatly differs depending on the country, from 4% of collected breakfast cereals with a reported portion in Finland (n_tot = 342), up to 88% in France (n_tot = 659).

A portion size is reported for more than half of the products collected in Austria (n_tot = 312), Belgium (n_tot = 371), France (n_tot = 659), Greece (n_tot = 272), Hungary (n_tot = 237), Ireland (n_tot = 367), Italy (n_tot = 321), Malta (n_tot = 325), Poland (n_tot = 177), and Portugal (n_tot = 321).

The large proportion of products without a quantified portion size can in fact be explained by a probable bias due to information not reported or partially reported. Hence, this proportion includes products, which did not have a quantified portion size on their packaging but also products where the portion size was present but was not reported.

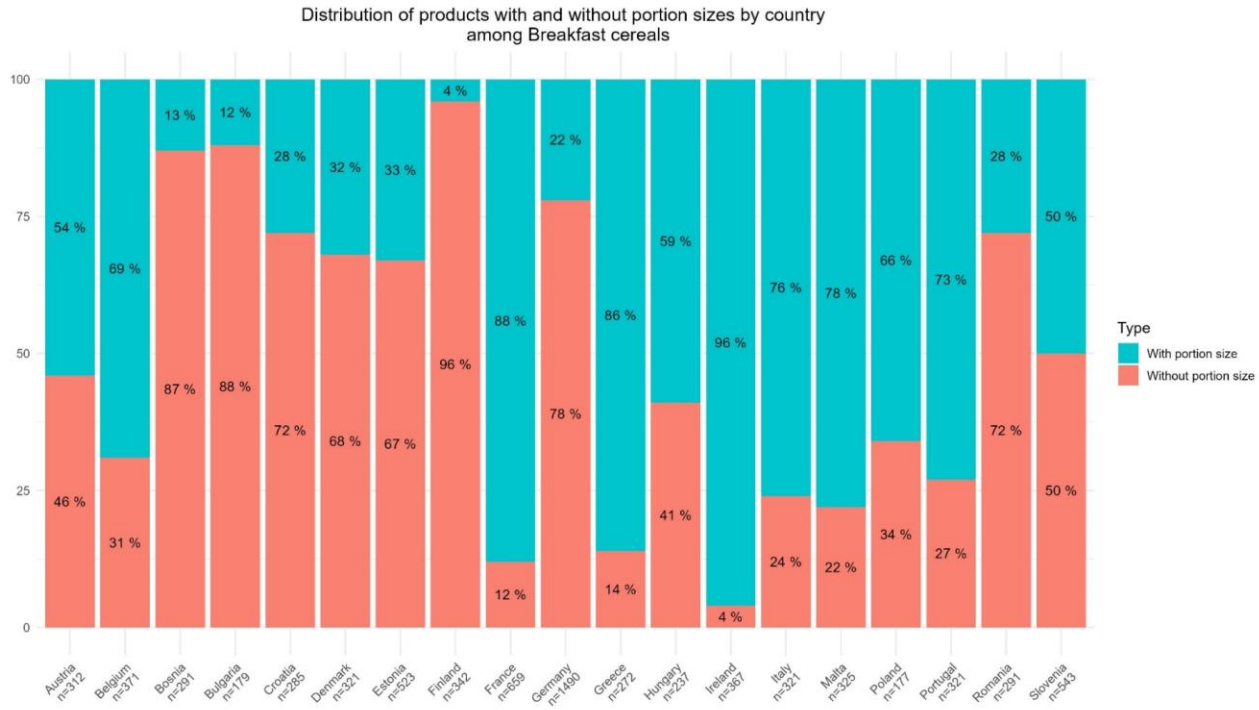

Figure 17: Comparison of the distribution of Breakfast cereals collected with and without portion size, by country

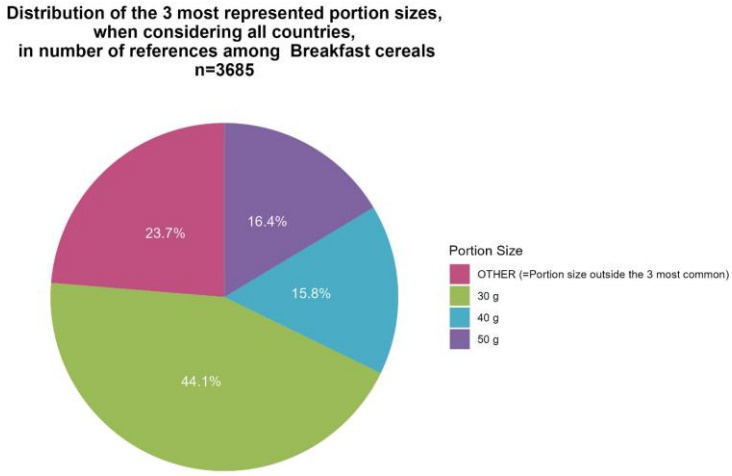

Figure 18: Distribution of the three most reported portion sizes among Breakfast cereals, considering all countries

When considering products with a portion size only, it was possible to identify, as seen on **Figure 18**, the three most reported portion sizes all countries combined. It appears that more than half of the breakfast cereals collected (76.3%) has a labelled portion size of either 30 g, 40 g, or 50 g, with a large proportion (44.1%) of 30 g.

Details of these distributions by country, as shown on **Figure 19**, enable to see how they vary from country to country. It should be noted that the number of products (n) reported here corresponds only to products for which portion sizes have been reported.

Overall, the portion size reported varies greatly depending on the country. There is a predominance of the 30 g portion size in 15 countries out of 19. Exception is observed in Finland, with a predominance of the 40 g portion size and in Austria, Croatia, and Germany where the most frequent size is 50 g.

At least one of the three most common portion sizes is not found in Bosnia, Bulgaria, Croatia, and Finland.

For Germany (n_tot = 328) and Hungary (n_tot = 140), there are respectively 54% and 48.6% of products that have a portion size different from 30 g, 40 g or 50 g. In contrast, Romania (n_tot = 82) reported few other portion sizes.

Nevertheless, all these results are to be aligned with the number of products collected in each country, which varies greatly and may not be representative of the market (except for France).

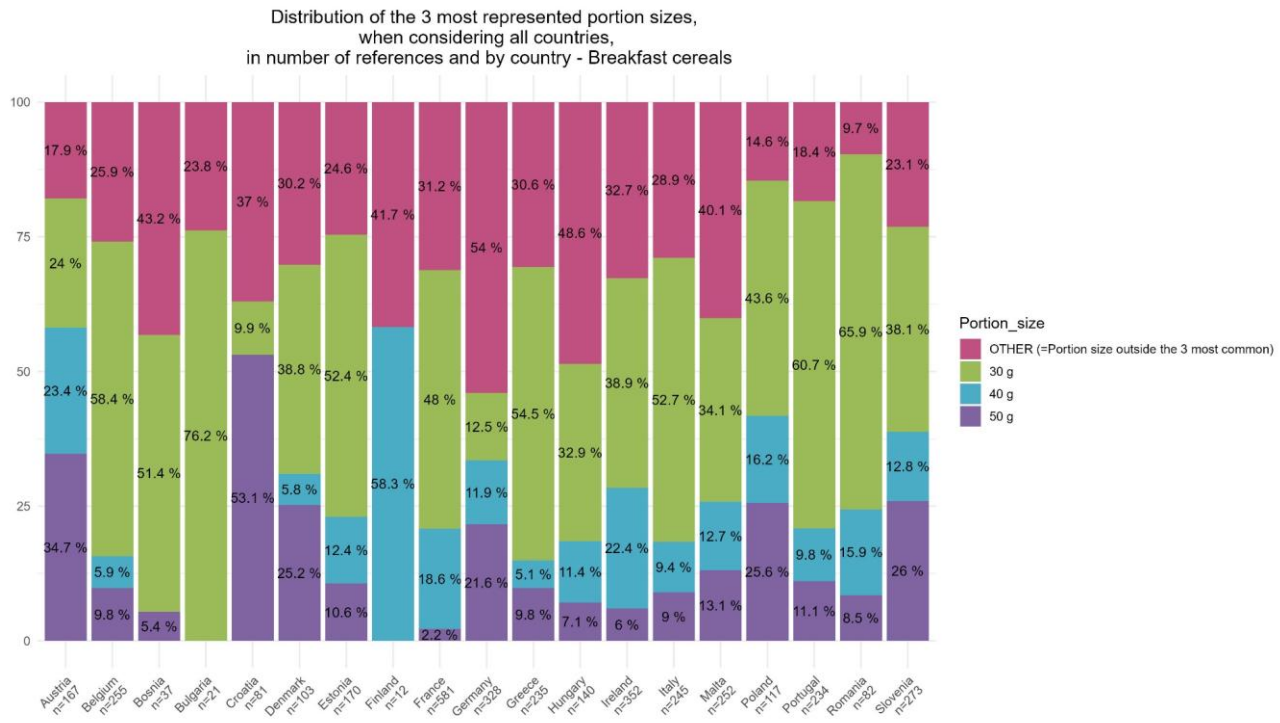

Figure 19: Comparison of the distribution by country of the three most reported portion size among Breakfast cereals

In addition to the above points, **Figure 20** shows the distribution of reported portion size by interval classes.

Some countries, such as Belgium, Denmark, Estonia, France, Greece, Ireland, Italy, Malta, Portugal, and Romania have very few portion sizes outside the three mid ranges, with less than 10% of portion sizes reported lower than 25 g or higher than 55 g. Some others tend to have more proportions of bigger portion sizes reported as Bosnia, Bulgaria, Croatia, Germany, Hungary, Poland, and Slovenia with portion sizes reported strictly superior to 55g, between 11.1% (Poland) and 43.6% (Hungary).

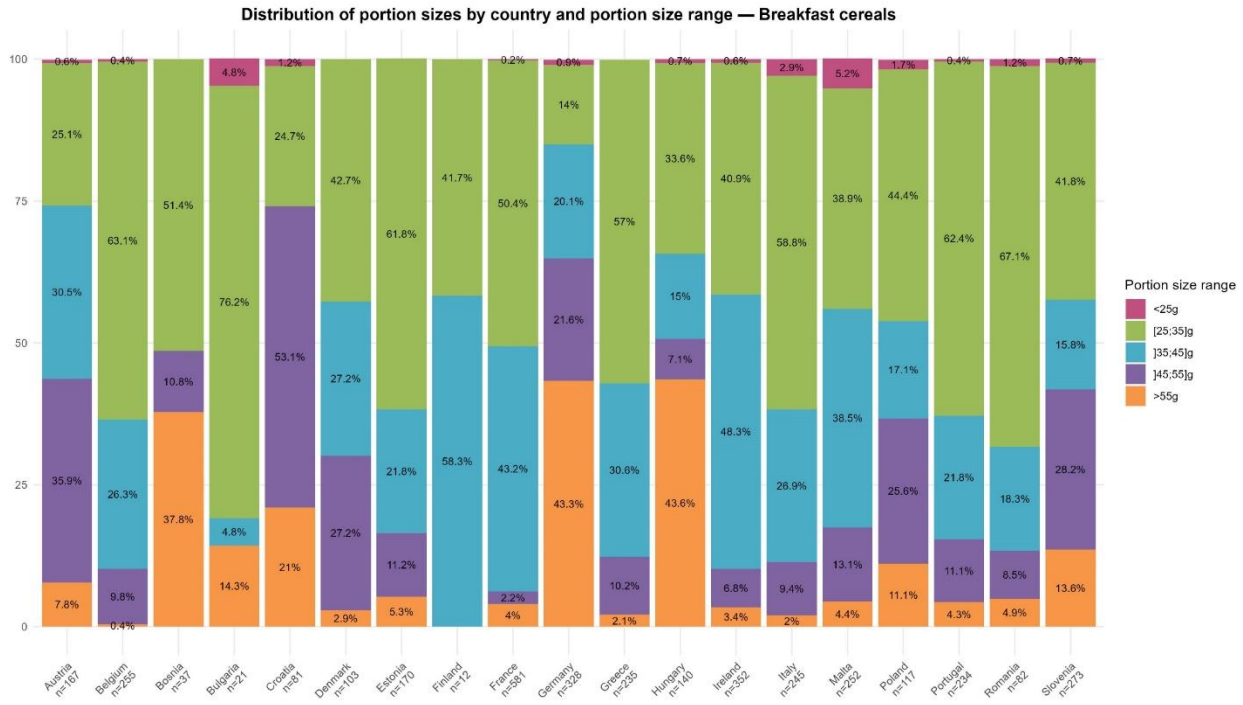

Figure 20 : Comparison by country of the distribution of reported portion size by interval classes, among Breakfast cereals

2.2.2.1.2. Portion sizes reported on Fresh dairy products and desserts collected

Figure 21 displayed the distribution of products with and without portion size labelled among Fresh dairy products and desserts collected by the 18 countries included in the analyses (Malta excluded). The proportion of reported portion size greatly differs depending on the country, from 8% of collected Fresh dairy products and desserts with a reported portion in Estonia (n_tot = 782), up to 99% in Italy (n_tot = 641).

A portion size is reported for more than half of products collected in eight countries: Belgium (n_tot = 856), Finland (n_tot = 383), France (n_tot = 2880), Greece (n_tot = 402), Ireland (n_tot = 713), Italy (n_tot = 641), Portugal (n_tot = 757), and Romania (n_tot = 720).

The large proportion of products without a quantified portion size can in fact be explained by a probable bias due to information not reported or partially reported.

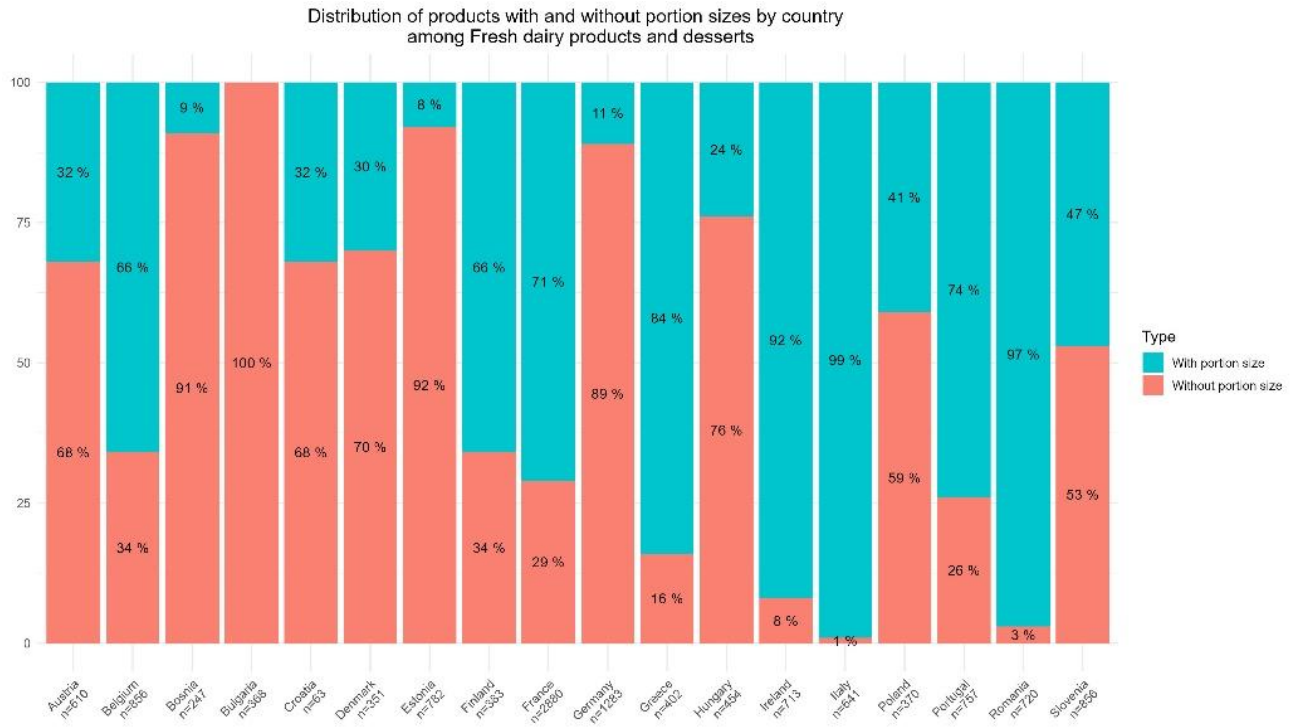

Figure 21 : Comparison of the distribution of Fresh dairy products and desserts collected with and without portion size, by country

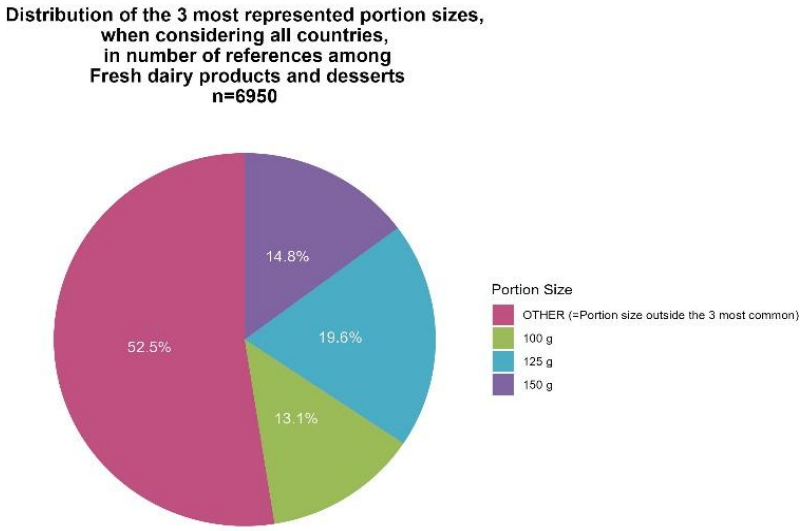

Figure 22: Distribution of the three portion sizes most reported among Fresh dairy products and desserts, considering all countries

When only considering products with a portion size, it was possible to identify, as displayed on **Figure 22**, the three most reported portion sizes, all countries combined. It appears that the majority of reported portion sizes among Fresh dairy products and desserts are gathered in Other (52.5%), reflecting a great diversity of portion sizes among this category.

Nevertheless, there is a large proportion (47.5%) of the three highlighted portion sizes: 100 g, 125 g and 150 g, with a predominance of 125 g (19.6% of all gathered portions).

Details of the distribution by country is shown on **Figure 23**.

Seven countries report greater consistency in portion sizes: Belgium, Estonia, France, Germany, Hungary, Ireland, and Italy, where more than 50% of the labelled portion sizes correspond to at least two of the three most common portion sizes:

- 100 g and 125 g in Belgium, France, and Hungary, representing respectively 57.2%, 72.6%, and 66.3% of portion size reported on collected products;
- 125 g and 150 g in Germany and Italy, representing respectively 55.9% and 52.9% of reported portion sizes;
- 100 g, 125 g, and 150 g in Estonia and Ireland, representing respectively 52.9% and 53.8% of portion size reported on collected products.

In other countries, portion sizes reported are more varied, as there is a large range of several portion sizes gathered under “Other”: from 54.8% (Denmark) to 95% (Croatia).

To be noted, in Croatia (n_tot = 20) and Bosnia (n_tot = 22), the number of products including a portion size are very low compared to the other countries. However, the number of products collected is also low for these countries (and the representativity of the data not guaranteed), which may explain why the distribution of portion sizes in Croatia and Bosnia is very different from those observed in other countries.

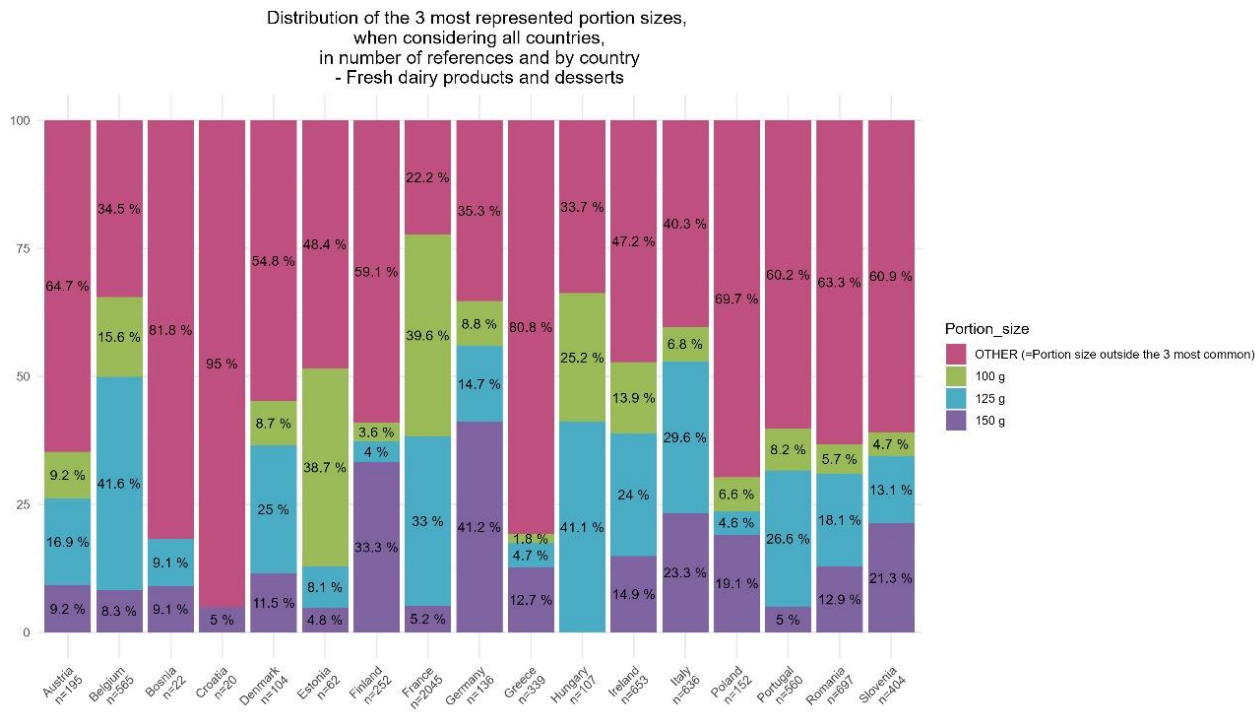

Figure 23: Comparison of the distribution by country of the three most reported portion size among Fresh dairy products and desserts

In addition to the points mentioned above, **Figure 24** shows how the portion sizes are distributed around the three most frequently reported ones (100 g, 125 g, and 150 g). It can be seen that the majority of portions are in the three intermediate classes for 10 countries out of 18, especially in

Belgium, Estonia, France, Germany, Hungary, Ireland and Portugal and in lower proportion in Denmark, Italy and Poland.

Some countries, such as Bosnia, Croatia, Finland and Greece have a majority of reported portion sizes higher than 165g. Conversely, there is a minority of reported portion sizes lower than 90g for all countries.

These results reflect that reported portion sizes among Fresh dairy products and dessert depend on the country with huge differences between them.

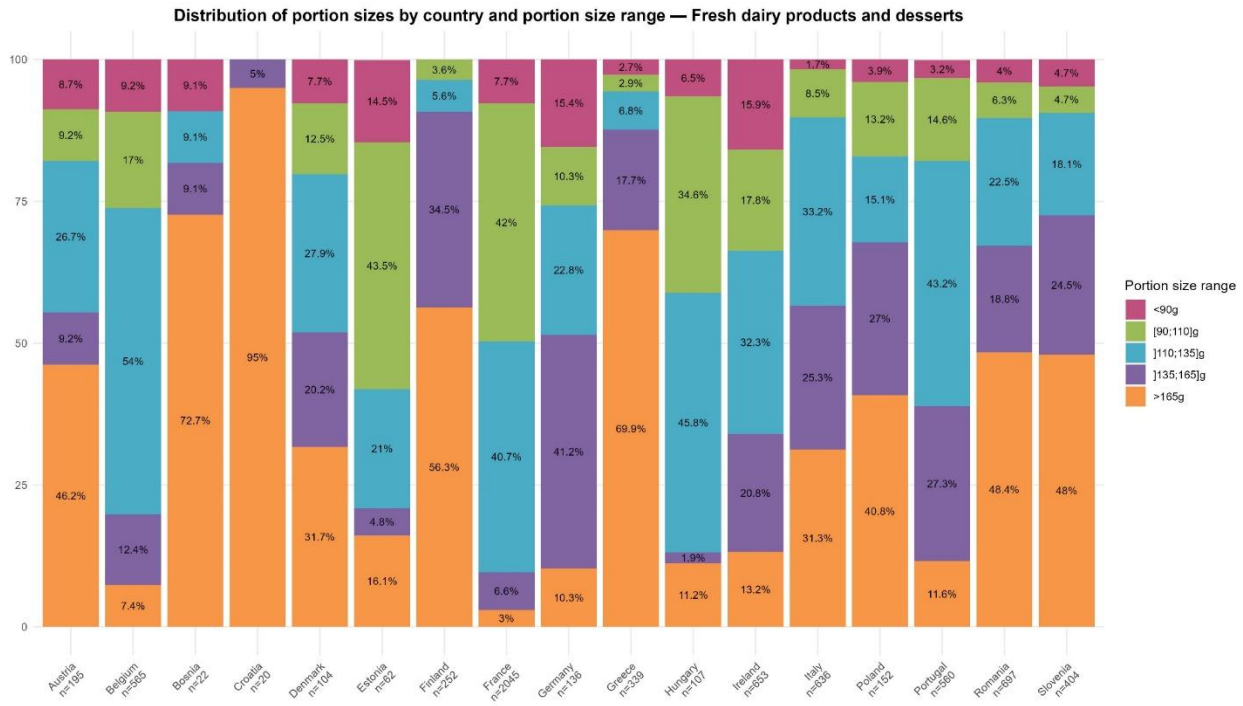

Figure 24 : Comparison by country of the distribution of reported portion size by interval classes, among Fresh dairy products and desserts

2.2.2.1.3. Portion sizes reported on Soft drinks collected

Figure 25 displays the distribution of products with and without portion size labelled among Soft drinks collected by the 19 countries included in the analyses. The proportion of reported portion sizes differs depending on the country, ranging from 1% in Germany up to 100% in Finland.

A portion size is reported for more than half of the products collected in seven countries: Belgium, Finland, France, Greece, Ireland, Portugal, and Slovenia.

The large proportion of products without a quantified portion size can in fact be explained by a probable bias due to information not or partially reported.

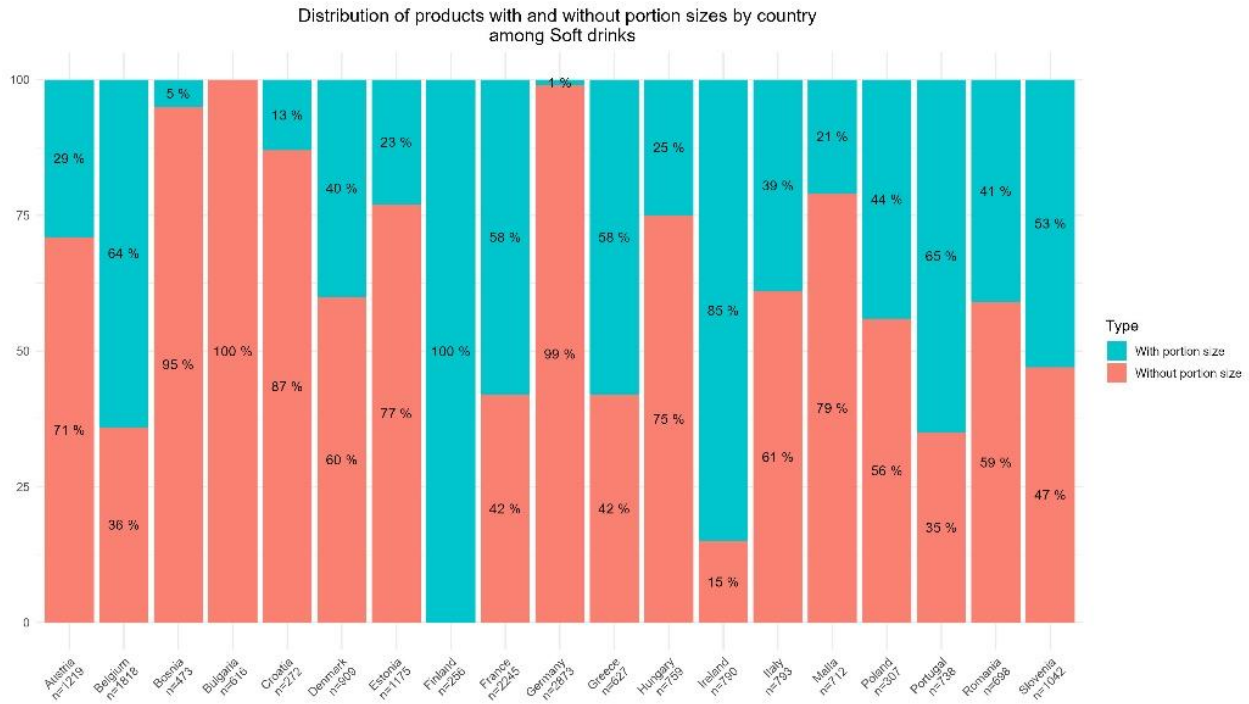

Figure 25: Comparison of the distribution of Soft drinks collected with and without portion size, by country

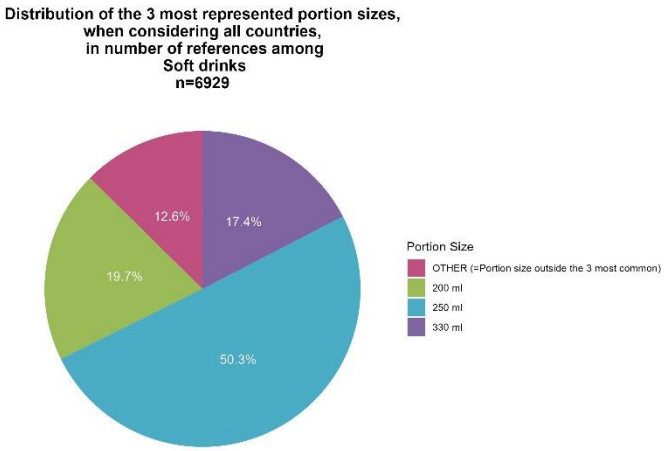

Figure 26: Distribution of the three portion sizes most reported among Soft drinks, considering all countries

When considering products with a portion size only, it was possible to identify, as seen on **Figure 26**, the three most reported ones all countries combined. It appears that the great majority of portion sizes reported among Soft drinks are quite homogenous: 200 mL, 250 mL, or 330 mL for more than 87% of the references. It corresponds to the size of a glass or a can.

Details of the distribution by country, as shown on **Figure 27**, enable to see how these distributions vary from country to country.

Overall, as seen on **Figure 27**, there is similarity of the most reported portion sizes among countries, as very few other portion sizes are reported: from 5.7% in Germany (n_tot = 35) to 38.9% in Croatia (n_tot = 36). In addition, the 250 mL portion size is by far the most common in all countries, with the exception of France (n_tot = 1303), where the most frequently reported portion size is 200 mL (59.3%), in Croatia (n_tot = 36), where it is 330 mL (38.9%), and in Italy (n_tot = 311), where the proportions of 200 mL (45.3%) and 250 mL (43.4%) portion sizes are fairly similar.

To be noted, in Croatia (n_tot = 36) and Bosnia (n_tot = 25), the number of products including a portion size are very low compared to the other countries. However, the number of products collected is also low for these countries (and the representativity of the data not guaranteed), which may explain why the distribution of portion sizes in Croatia and Bosnia is very different from those observed in other countries.

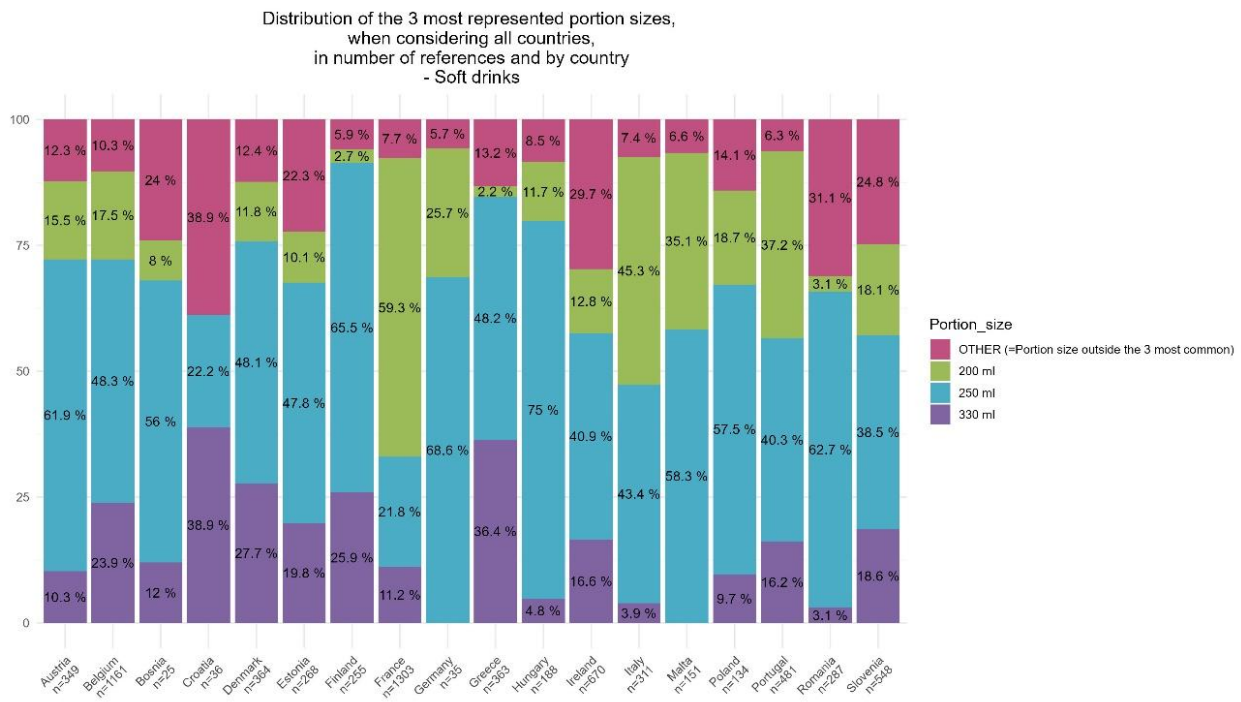

Figure 27: Comparison of the distribution by country of the three most reported portion size among Soft drinks

Figure 28 shows how the portion sizes are distributed around the three most frequently reported ones all countries combined (200 mL, 250 mL, or 330 mL). It can be seen that the vast majority of products displays a portion size close to the three main values reported for all countries. However, some countries appear to stand out due to a higher proportion of portion sizes smaller than 175 mL, namely Croatia (n_tot = 36), Ireland (n_tot = 670), and Romania (n_tot = 287). All other countries display portion sizes mostly between 175 mL and 300 mL, which highlights that reported portion sizes for Soft drinks are fairly similar across countries.

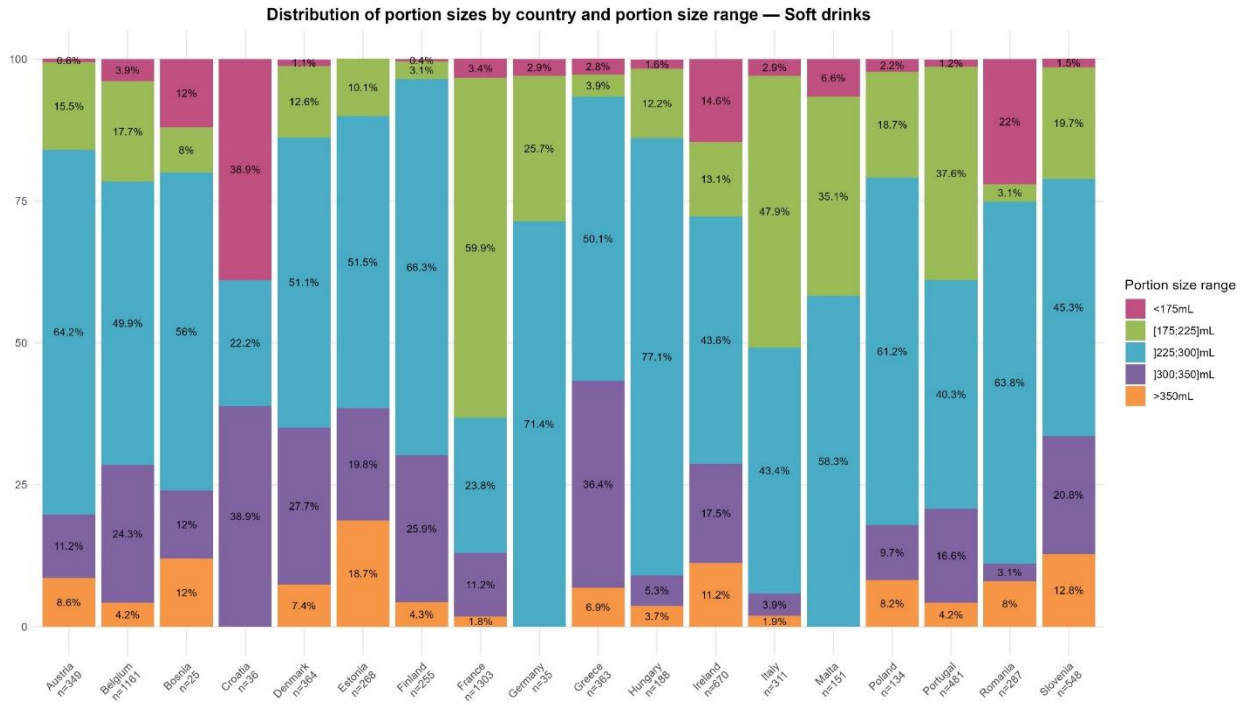

Figure 28 : Comparison by country of the distribution of reported portion size by interval classes, among Soft drinks

2.2.2.1.4. Conclusion on the portion sizes

The analysis of reported portion sizes reveals differences between countries:

- there is a high degree of consistency in portion sizes across participating countries for soft drinks, and the 250-mL portion is the most common in most European countries;
- in contrast, portion sizes reported for fresh dairy products and desserts show a high variability both within and between countries;
- some countries, namely France, Belgium, Ireland, and Portugal, have reported portion sizes for a wide majority of collected products for the three selected categories;
- conversely, Bosnia, Bulgaria, Croatia, Denmark, Estonia, and Germany provided information on portion sizes less frequently, regardless of the category.

However, these disparities between countries may be partly explained by certain limitations due to:

- heterogeneity in the declaration of portion sizes. In some cases, this information may be incomplete or contain inconsistencies, introducing potential bias for certain countries where portion size information is missing;
- number and scope of products collected varying greatly across countries. For instance, Germany focused only on yoghurts within the fresh dairy products and desserts category, reducing the dataset's representativeness for that country;
- differences in the data collection methodology due to the use of web scraping that can result in the loss of detailed information, such as portion size.

2.2.2.2. Comparison of front-of-pack labelling by category and country

Front-of-pack labelling was a mandatory field that had to be collected by the country partners. Definition given for this field was *"Type of Front-of-pack Nutrition labelling present (not mandatory) among these only: Reference intake, Traffic light, Choices, Nutri-Score, Keyhole, Finnish heart, Nutrinform battery"*.
Main simplified nutrition labelling systems were identified and validated with the countries involved in Best-ReMaP and the JRC (if a system was not a national official system – not standardised – even if used by the industry, it was not to consider). Products are considered "without FOP labelling" if there is no front-of-pack label on the product's packaging or in case of presence of a label different from the targeted ones.

For this part, France has been deliberately excluded from the comparison as the data collection took place between 2017 and 2020, prior to the other countries (2020–2023) and also prior to the implementation of the Nutri-Score logo in France (or just at the beginning). Meaning that the actual use of Nutri-Score in the French market cannot be reflected in the data used for the analysis[1] (manufacturers committed to the approach have 2 years to update their packaging (12)). However, comparative graphs including results for France are available in **Annex 4**.

2.2.2.2.1. Front-of pack-labelling on Bread products

Figure 29 presents the type of front-of-pack labelling (if any) present on the references collected among Bread products. The majority of products collected did not display any of the selected front-of-pack labels (mentioned above), except in Belgium and Ireland.

Depending on the country, the most commonly found front-of-pack labels among data collected differ:

- ➔ Reference intake is the most common in Bosnia, Estonia, Greece, Hungary, Italy, Poland, Portugal, Romania and Slovenia. Proportions are varying widely between 1.1% in Bosnia to 37.9% in Greece;
- ➔ Traffic light system prevails in Ireland, with 42.9% of collected products displaying it, but 10.9% of the references hold a reference intake;
- ➔ Finnish heart logo is most commonly used in Finland, but with only 2.3% of collected products displaying it;
- ➔ Keyhole system is the most common in Denmark, with 31.9% of collected references displaying it;
- ➔ Nutri-Score logo appears to be the most employed labelling system in Austria, Belgium, Bulgaria and Romania, but proportions of products with this type of front-of-pack label greatly differ from 2.1% in Bulgaria to 46% in Belgium. It is also to be noted that 29% of products from Belgium present a reference intake.

[1] The latest report on Nutri-Score follow-up (2023) in France is available on the Oqali website: https://www.oqali.fr/publications-oqali/suivi-du-nutri-score/

Croatia did not report any front-of-pack label for this category.

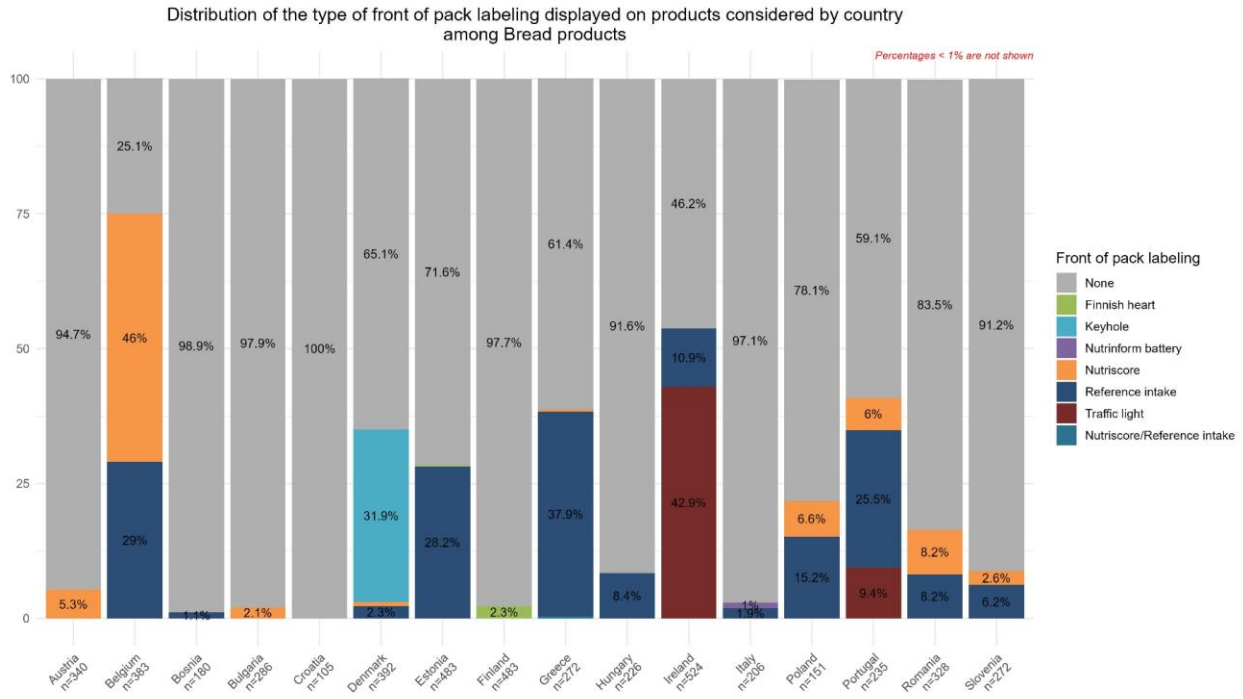

Figure 29: Comparison of the type of front-of-pack labelling found on collected Bread products, by country

2.2.2.2.2. Front-of-pack labelling on Breakfast cereals

Figure 30 presents the type of front-of-pack labelling (if any) present on the references collected among Breakfast cereals. The majority of products collected did not display any of the selected front-of-pack labels except in Belgium, Greece, and Ireland.

Depending on the country, the type of front-of-pack label most commonly found and its proportion differ:

- ➔ Reference intake is the most common in Bosnia, Estonia, Malta, Italy, Greece, Hungary, Romania and Slovenia with proportion of collected products displaying it, varying from 3.8% in Bosnia and Hungary to 66.5% in Greece;
- ➔ Traffic light system prevails in Ireland, with 72.5% of collected products displaying it, but 15.5% of the references hold a reference intake;
- ➔ Finnish heart logo is the most found in Finland, displayed on 38% of collected products;
- ➔ Keyhole is predominant in Denmark, with 27.1% of collected products displaying it;
- ➔ Nutri-Score logo is the most common front-of-pack labelling in Austria, Belgium, Bulgaria, Germany, Poland, and Portugal, with proportions of products displaying it from 13.8% (Germany) to 59.3% (Belgium) but the reference intake is also present on 23.5% of the products in Belgium and on 13.6% in Poland. In Portugal, Traffic light and Reference intake also appear on a significant number of products (respectively 10.5 and 9%).

Croatia did not report any front-of-pack label for this category.

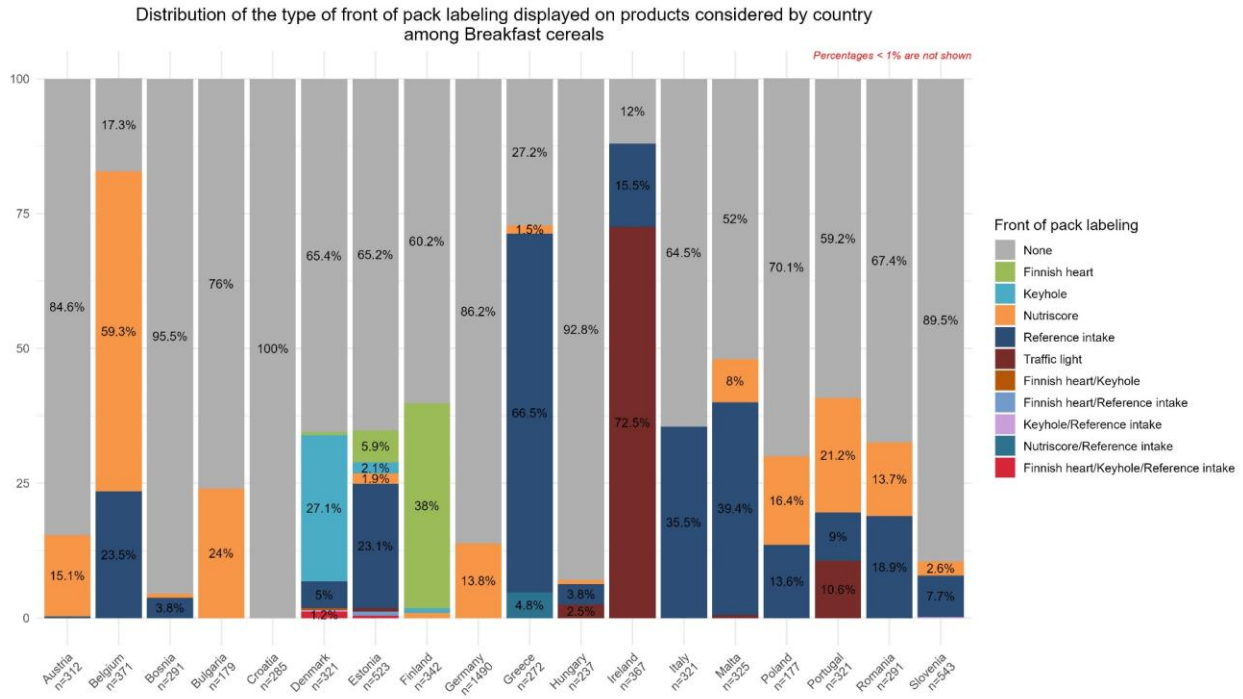

Figure 30: Comparison of the type of front-of-pack labelling found on collected Breakfast cereals, by country

2.2.2.2.3. Front-of-pack labelling on Delicatessen meats and similar

Figure 31 presents the type of front-of-pack labelling (if any) present on the references collected among Delicatessen meats and similar. The great majority of collected products did not display any of the selected front-of-pack labels except in Belgium and Ireland.

Depending on the country, the type of front-of-pack label most commonly found and its proportions differ:

- ➔ Reference intake is the most common in Bosnia, Bulgaria, Estonia, Greece, Malta, Italy, Poland and Portugal, with proportion of collected product displaying it, varying between less than 1% in Bosnia and Estonia to 17.8% in Poland;
- ➔ Traffic light system prevails in Ireland, with 48% of collected products displaying it, followed by the Reference intake (4.2%);
- ➔ Keyhole logo is the most commonly used in Denmark, with 17.8% of collected products displaying it;
- ➔ Nutri-Score logo is the most common front-of-pack in Belgium and Romania, with proportions of products displaying it respectively of 39.9% and 1.3%. It can be noted that it is also represented in Poland, Bulgaria, Portugal and Romania. Belgium also displays Reference intake on 15.8% of its products.

Austria, Croatia, Finland, Hungary and Slovenia did not report any front-of-pack label for this category.

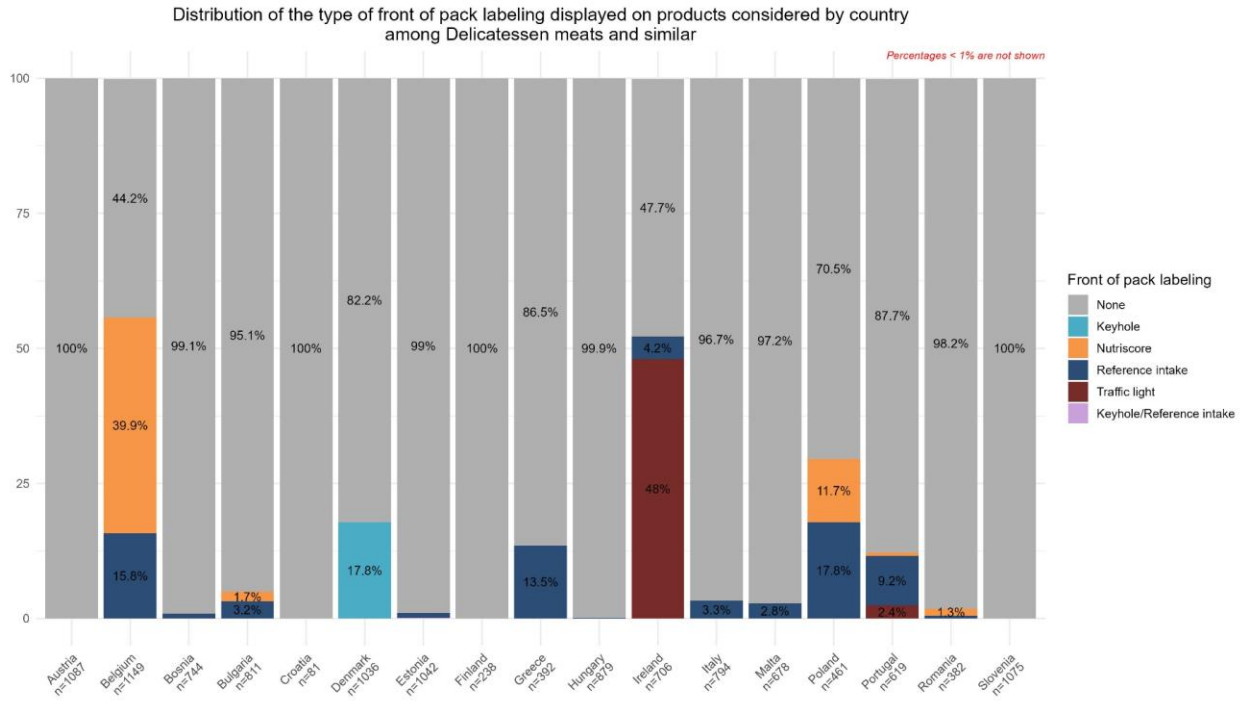

Figure 31: Comparison of the type of front-of-pack labelling found on collected Delicatessen meats and similar, by country

2.2.2.2.4. Front-of-pack labelling on Fresh dairy products and desserts

Figure 32 presents the type of front-of-pack labelling (if any) present on the references collected among Fresh dairy products and desserts. For a majority of countries, more than 80% of collected products did not display any of the selected front-of-pack labels. Exception can be seen in Belgium, Ireland, Poland and Portugal.

Depending on the country, the type of front-of-pack label most commonly found and its proportions differ:

- ➔ Reference intake is the most reported in Poland, with 26.5% of collected products displaying it. This is also the case in Bosnia, Italy and Greece but observed proportions remain low (less than 4%);
- ➔ Traffic light system prevails in Ireland, with 32% of collected products displaying it, followed by the Reference intake (13.6%);
- ➔ Keyhole logo that is the most common in Denmark, with 11.1% of collected products displaying it and no other observed;
- ➔ In Finland, few products displayed the Finnish heart logo (10.2%) and less than 1% of collected products displayed a Nutri-score;
- ➔ In Austria, Belgium, Bulgaria, Estonia, Germany, Hungary, Portugal, Romania and Slovenia the most common front-of-pack is the Nutri-Score logo. However, proportion of products displaying varies greatly, from 3.5% (Estonia) to 55.7% (Belgium). Reference

intake is also found on 15.9% of the reference in Belgium and in Portugal, Traffic light and Reference intake appear on a significant number of products (respectively 11.9 and 5.4%).

Croatia did not report any front-of-pack label.

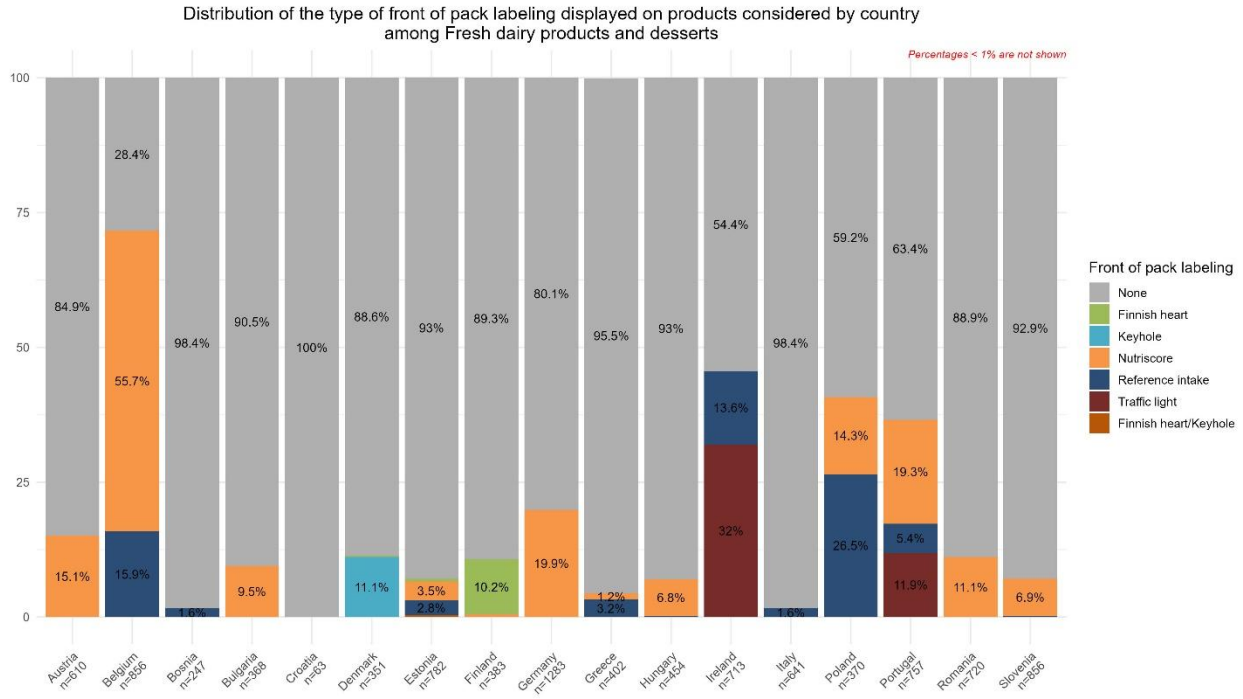

Figure 32: Comparison of the type of front-of-pack labelling found on collected Fresh dairy products and desserts, by country

2.2.2.2.5. Front-of-pack labelling on Soft drinks

Figure 33 presents the type of front-of-pack labelling (if any) present on the references collected among Soft drinks. For a great majority of collected products, there is no selected front-of-pack labelling. Exception can be seen in Belgium and Ireland with more than 50% of the products featuring a FOP labelling.

Depending on the country, the type of front-of-pack label most commonly found and its proportions differ:

- ➔ Reference intake is the most reported in Belgium, Bosnia, Denmark, Estonia, Greece, Hungary, Italy, Malta and Poland, with proportion of collected products displaying it varying from 1.1% in Bosnia to 43.9% in Belgium;
- ➔ Traffic light system prevails in Ireland and Bulgaria, with respectively 33.4% and 4.9% of collected products displaying it. In Ireland, several products also displayed the Reference intake (20.6%) and in Bulgaria a few displayed the Nutri-Score logo (4.7%);
- ➔ In Finland, very few products displayed the Finnish heart logo (2.3%) and it is the only front-of-pack reported among collected products;

➔ Nutri-Score is the most common front-of-pack labelling in Austria, Germany, Portugal, Romania and Slovenia. However, proportion of products displaying it are quite low, varying from 1.4% (Slovenia) to 6.6% (Portugal). It is also present on 17.5% of the soft drinks found in Belgium.

Croatia did not report any front-of-pack label.

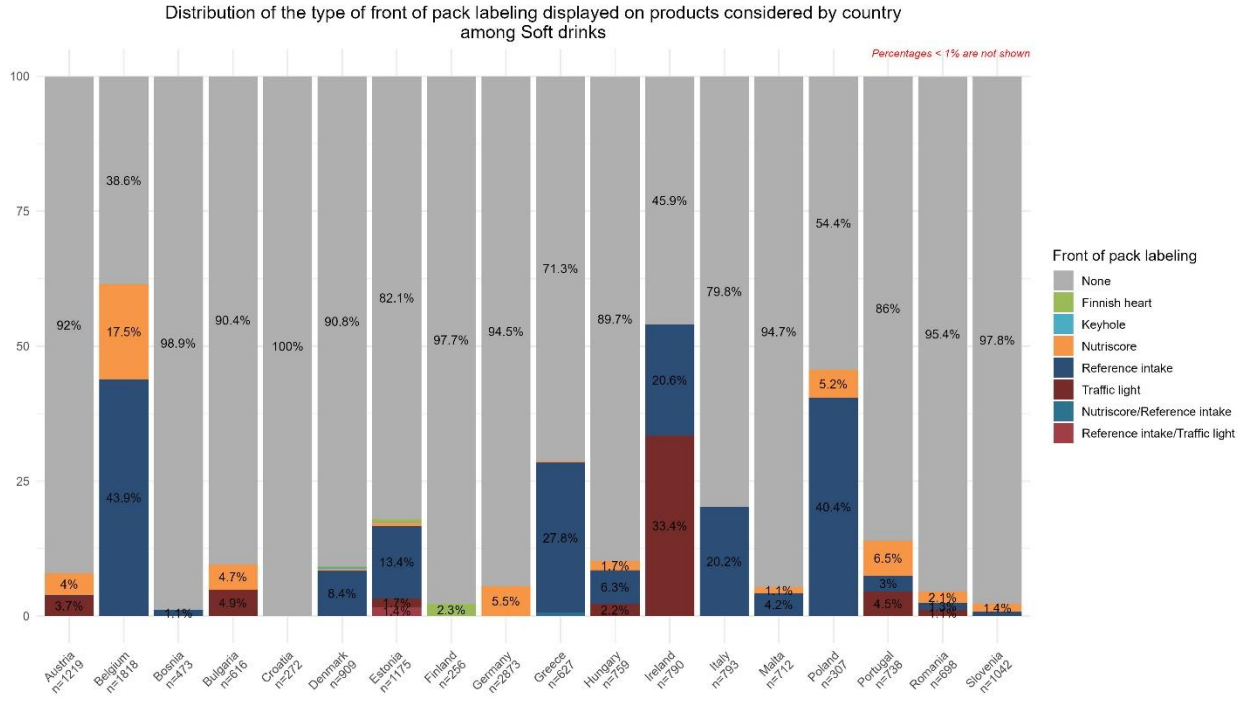

Figure 33: Comparison of the type of front-of-pack labelling found on collected Soft drinks, by country

2.2.2.2.6. Conclusion on front-of-pack labelling

For data collected between 2020 and 2023, the results highlight the low prevalence and high variability in the use of front-of-pack labelling across Europe, shaped by differences between categories and countries. The proportions of products without front-of-pack labelling range from a minimum of 12% (Breakfast cereals in Ireland) to a maximum of 100% (all categories in Croatia, probably linked to a poor reporting of this labelling parameter, and Delicatessen meats in Finland and Slovenia).

The presence of front-of-pack labelling differs widely between categories, Breakfast cereals having a higher proportion, while Delicatessen meats and similar products and Soft drinks display it less often.

There is also notable variation between countries. In Belgium and Ireland, more than 50% of products display a front-of-pack labelling. Conversely, in other countries like Croatia, Finland, and Slovenia, fewer products are reported with a front-of-pack labelling among the targeted ones, meaning that few products present a targeted front-of-pack labelling in these countries, or that information has been only partially reported.

In addition, it seems that the type of front-of-pack labelling is influenced by country-specific practices. Reference Intake and Nutri-Score globally are the most frequent ones, all countries together, but there are some notable exceptions:

- In Ireland, where the Traffic Light system is the predominant label across all categories;
- In Finland, where the Finnish Heart system is used;
- In Denmark, where the Keyhole system is the most frequently reported across all categories.

These exceptions correspond to logos officially implemented in the corresponding countries.

Finally, it has to be noted that periods of data collection differ between countries, which could lead to discrepancies in the presence of front-of-pack labelling due to changes in regulations or industry practices over time. Also, the use of online data or web scraping for data collection can result in the loss of detailed information, such as front-of-pack labelling. These points introduce potential gaps and biases for the comparisons**.**

2.2.3. Comparison of nutritional values per category and country

Another part of the analysis focused on nutritional values. The results are presented category by category, and nutrient by nutrient (**Table 2)**. The data source used for this part of the analysis is the same one used for section 2.2.1 (**Table 4**). The data considered may differ slightly because reconstituted products without portion size had to be excluded from this nutritional analysis: all counts are detailed in **Table 6**.

It also has to be noted that the amount of data available for each nutrient may vary, even within the same subcategory, as it depends on which nutrients are labelled on the products considered, as detailed in **Table 5**.

Table 5: Presence (in %) of nutrient data on labels (n = 61,012 products)

	Sugar	Saturated fat	Salt	Fibre*
Bread products	**99**	**99**	**99**	**79**
Breakfast cereals	**99**	**99**	**99**	**93**
Delicatessen meats & similar	99	**99**	**99**	32
Fresh dairy products & desserts	**99**	**99**	99	36
Soft drinks	**99**	97	98	34

The percentages in grey correspond to nutrients that are not considered as relevant: they are not discussed in the report.
**Nutritional labelling of fibre is not mandatory, which explains why the percentages are lower.*

Table 6: Number of collected products included in the nutritional analysis, by country and category

Country	Data source	Bread products	Breakfast cereals	Delicatessen meats & similar	Fresh dairy products & desserts	Soft drinks	TOTAL
Austria	Best-ReMaP 2nd snapshot	340	312	1,087	610	1,219	**3,568**
Belgium	Best-ReMaP 2nd snapshot	383	371	1,148	856	1,818	**4,576**
Bosnia	Best-ReMaP 1st snapshot	180	291	744	247	473	**1,935**
Bulgaria	Best-ReMaP 2nd snapshot	286	179	811	368	616	**2,260**
Croatia	Best-ReMaP 1st snapshot	105	285	81	63	263	**797**
Denmark	Best-ReMaP 2nd snapshot	392	321	1,036	351	903	**3,003**
Estonia	Best-ReMaP 2nd snapshot	483	522	1,042	781	1175	**4,003**
Finland	Best-ReMaP 2nd snapshot	483	342	238	383	256	**1,702**
France	Oqali	1,143	659	4,320	2,880	2,245	**11,247**
Germany	Best-ReMaP 2nd snapshot	–	1,490	–	1,283	2,873	**5,646**
Greece	Best-ReMaP 2nd snapshot	272	272	392	402	627	**1,965**
Hungary	Best-ReMaP 2nd snapshot	226	192	879	454	759	**2,510**
Ireland	Best-ReMaP 1st snapshot	524	367	706	708	787	**3,092**
Italy	Best-ReMaP 2nd snapshot	206	321	794	641	779	**2,741**
Malta	Best-ReMaP 2nd snapshot	–	308	678	–	707	**1,693**
Poland	Best-ReMaP 1st snapshot	151	177	461	370	307	**1,466**
Portugal	Best-ReMaP 2nd snapshot	235	321	619	757	738	**2,670**
Romania	Best-ReMaP 2nd snapshot	328	290	382	720	698	**2,418**
Slovenia	Best-ReMaP 2nd snapshot	272	478	1,075	856	1,036	**3,717**
TOTAL		**6,009**	**7,498**	**16,493**	**12,730**	**18,279**	**61,009**

Best-ReMaP 1st snapshot: 2021-2022
Best-ReMaP 2nd snapshot: 2022-2023
Oqali data collection: 2017 for Fresh dairy products and dessert; 2018 for Breakfast cereals; 2019 for Bread products; 2019 for Soft drinks; 2020 for Delicatessen meats and similar

2.2.3.1. Bread products

Table 7 summarises the statistical differences in mean nutrient content observed across the four nutrients of interest for the 19 subcategories of the Bread products. The subcategories considered not relevant to be presented (e.g., “other” subcategories that grouped very different products) are shown in grey.

Therefore, the upcoming analysis focuses on 15/19 subcategories for sugar, saturated fat, salt, and fibre.

Most subcategories show statistically significant differences in mean nutrient content across countries:

- 93% of the considered subcategories for sugar (14/15 subcategories);
- 87% of the considered subcategories for saturated fat (13/15);
- 93% of the considered subcategories for salt (14/15);
- 40% of the considered subcategories for fibre (6/15).

Detailed results for average nutrient contents are presented below for each nutrient, by country, and for the relevant subcategories.

For reasons of readability, a selection of boxplots for three subcategories (chosen based on their representativeness (e.g., products collected in most countries), and the ease of understanding of the definition of included products) is presented in this report: Pre-packaged breads, Plain white sandwich breads / hamburger / hot dog buns and Wholemeal cereal grains sandwich breads / hamburger / hot dog buns.

Descriptive tables for all Bread products subcategories are available in **Annex 5**.

Table 7: Summary of nutrient differences across subcategories of Bread products

Subcategory	SUGAR (n = 5,961)				SATURATED FAT (n = 5,961)				SALT (n = 5,966)				FIBRE (n = 4,731)			
	n	countr	p	signif	n	countr	p	signif	n	countr	p	signif	n	countr	p	signif
Brioches with fruit	93	13	5E-03	**	93	13	2E-02	*	93	13	3E-02	*	57	11	3E-01	NS
Chocolate brioches	199	15	2E-04	***	199	15	6E-03	**	199	15	9E-08	***	132	12	5E-02	NS
Cream-filled brioches	52	9	2E-04	***	52	9	7E-05	***	52	9	2E-02	*	23	8	1E-01	NS
Fine bakery wares_chocolate croissants	77	9	2E-06	***	77	9	1E-01	NS	77	9	9E-07	***	39	7	3E-02	*
Fine bakery wares_croissants	87	12	1E-02	*	87	12	3E-02	*	87	12	6E-07	***	63	11	8E-01	NS
Fine bakery wares_other	524	17	6E-05	***	521	17	5E-24	***	520	17	1E-10	***	220	14	5E-09	***
Other bread products	136	12	5E-09	***	136	12	4E-10	***	136	12	3E-12	***	116	10	5E-12	***
Other breads	424	17	2E-12	***	424	17	9E-05	***	423	17	4E-09	***	361	17	4E-22	***
Other_sandwich breads / hamburger / hot dog buns	97	15	7E-04	***	97	15	5E-03	**	98	15	2E-01	NS	85	14	4E-02	*
Plain brioches	301	15	6E-08	***	301	15	2E-07	***	301	15	5E-12	***	168	14	7E-02	NS
Plain toasted breads and toasts	142	11	6E-04	***	142	11	5E-06	***	142	11	1E-01	NS	127	11	2E-02	*
Plain white sandwich breads / hamburger / hot dog buns	646	17	7E-21	***	646	17	2E-07	***	645	17	5E-21	***	550	16	3E-08	***
Pre-baked breads	334	14	2E-02	*	334	14	2E-02	*	334	14	1E-05	***	271	14	1E-01	NS
Pre-packaged breads	1,431	17	9E-16	***	1,435	17	2E-16	***	1,441	17	1E-24	***	1,302	17	6E-17	***
Tortilla breads and wraps	445	17	3E-03	**	445	17	1E-11	***	445	17	4E-06	***	333	17	2E-01	NS
Unleavened breads	55	9	3E-02	*	55	9	8E-05	***	55	9	1E-04	***	46	7	6E-02	NS
Wholemeal_cereal_grains brioches	47	11	5E-02	NS	47	11	6E-01	NS	47	11	4E-02	*	34	10	2E-01	NS
Wholemeal_cereal_grains sandwich breads / hamburger / hot dog buns	600	17	1E-28	***	599	17	2E-09	***	600	17	4E-18	***	570	17	5E-05	***
Wholemeal_cereal_grains toasted breads and toasts	271	13	2E-09	***	271	13	5E-14	***	271	13	2E-05	***	234	13	1E-02	*

*"n": number of references; "countr": number of countries compared; "p": p value for the Kruskal-Wallis test; "signif": NS = not significant; * for 0.01 < p ≤ 0.05, ** for 0.001 < p ≤ 0.01, *** for p ≤ 0.001.*
Categories in grey are the less relevant ones for comparisons: they are not discussed in the report.

Sugar

Table 8 presents the statistical differences between countries and the mean sugar content among all relevant subcategories of Bread products identified previously (15 subcategories). Subcategories considered as relevant but with no significative differences are identified on lines with a grey background.

It shows that the results are highly dependent on the subcategory and the country. It has to be noted that all the results should therefore be analysed regarding the amount of data collected, which can vary considerably from one country to another.

It appears that on the 14 subcategories for which the Kruskal-Wallis test indicated a difference between countries (**Table 7**), the Dunn's post-hoc test (**Table 8**) did not have sufficient statistical power to identify which specific countries differed from one another for two subcategories: Plain toasted breads and toasts and Pre-baked breads (see **Annex 1**, p. 3 & 5, for the definition of the subcategories).

Figure 34 shows the distributions of sugar content for **Pre-packaged breads** by country. The mean sugar content ranges from 2 g per 100 g (Croatia) to 4.4 g per 100 g (Estonia). Regarding the countries that statistically differ from the others, Estonia tends to have sweetest products. Conversely, Croatia and Romania tend to have the least sweet products. The wide range of values suggests possible reformulation for all countries.

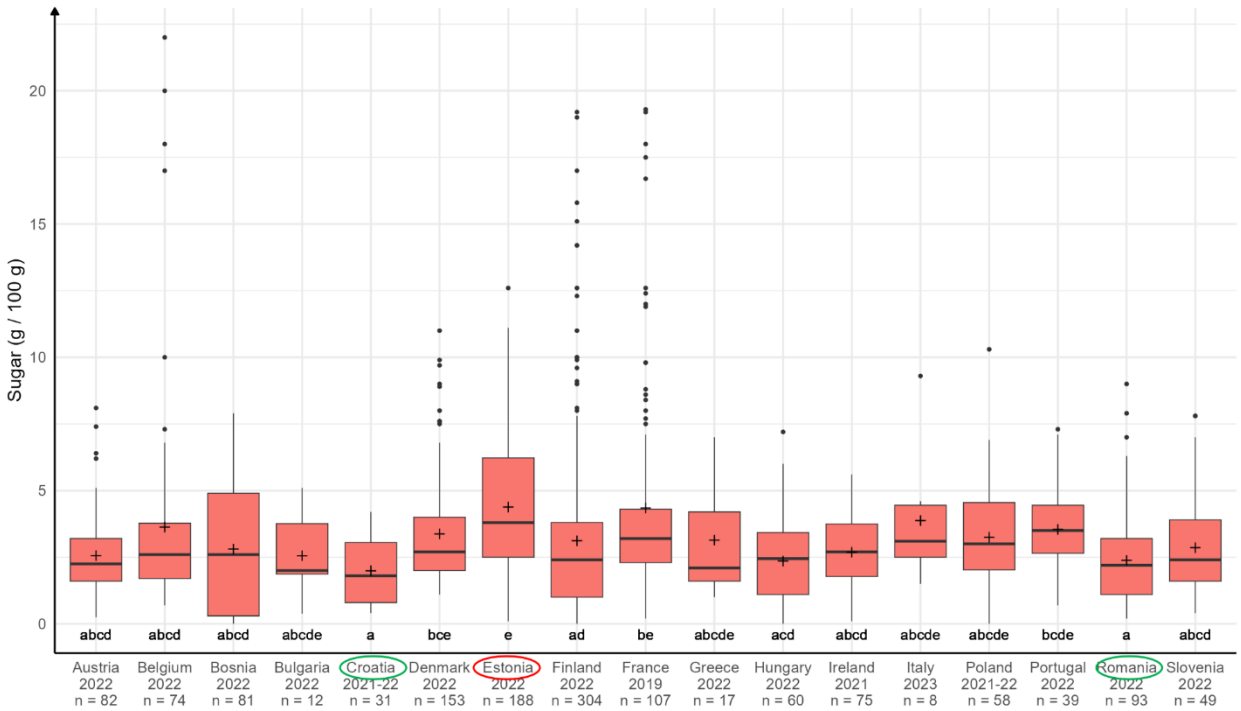

Figure 34: Distribution of sugar content for Pre-packaged breads by country (total number of references considered: 1,431) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Table 8: Mean sugar content per country among Bread products relevant subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Greece	Hungary	Ireland	Italy	Poland	Portugal	Romania	Slovenia
Brioches with fruit	93	21.7	24	28	23.3	25.5		12.6		24.6		20		20	23.1	**28.4**	26.5	20.3
		ab	ab	ab	ab	ab		a		b		ab		ab	ab	b	b	ab
Chocolate brioches	199	21.6	18.2	**24**	18.2		17	19		17.9	20.3	12.5	16	18.1	19	20.3	22.5	22
		bc	abc	abc	abc		abc	abc		ab	abc	a	abc	abc	abc	bc	c	abc
Cream-filled brioches	52	16.6	16		21.7					19.2			19.1	18		23	**24.6**	14.7
		a	ab		ab					a			ab	ab		ab	b	a
Fine bakery wares_chocolate croissants	77		13.3					17.1		13	17.4		15.8	18		18.2	11	**23.5**
			ab					a		b	a		ab	a		a	ab	ab
Fine bakery wares_croissants	87	10	8.9			**14.5**		6.1	5.3	8.6	9.1		7.8	12.8		11.3	9.2	10.8
		ab	ab			ab		ab	a	ab	ab		ab	b		b	ab	ab
Plain brioches	301	13.9	11	**25.5**	16.3		14	13.4		13.4	18.7	10.8	12.6	11.8	13.5	11.4	11.7	10.1
		abc	a	abc	abc		abc	abc		b	c	ab	abc	abc	abc	ab	abc	ab
Plain toasted breads and toasts	142		5.7		4.5		**13**	4.6	2.2	8.1	4.2	5.9	9.7	2.4			7.6	
			a		a		a	a	a	a	a	a	a	a			a	
Plain white sandwich breads / hamburger / hot dog buns	646	4.7	6	4.2	3.7	4.1	5.3	4.9	4.9	**6.7**	5	4.6	4.6	5.3	4.4	4.4	4.3	4.1
		abc	bd	abcd	a	abcd	bc	abcd	abcd	d	abc	abc	abc	abc	abc	abc	abc	ac
Pre-baked breads	334	2.4	2.6				2.9	**3.8**	3.2	2.8	1.7	3.3	3	2.1	2.6	3.7	3.7	2.6
		a	a				a	a	a	a	a	a	a	a	a	a	a	a
Pre-packaged breads	1431	2.6	3.6	2.8	2.6	2	3.4	**4.4**	3.1	4.3	3.1	2.4	2.7	3.9	3.2	3.5	2.4	2.9
		abcd	abcd	abcd	abcde	a	bce	e	ad	be	abcde	acd	abcd	abcde	abcde	bcde	a	abcd
Tortilla breads and wraps	445	2	2.4	2.6	2.5	**7.8**	2.5	2.7	2.2	2.1	2.7	1.9	2.6	1.3	3.3	2.8	2.4	2.5
		ab	b	b	ab	ab	b	b	ab	ab	ab	ab	b	a	b	b	ab	b
Unleavened breads	55			1.5	2.3	5.4			2.8	3.1			**8.2**	2.1	0.6			1.8
				ab	ab	ab			ab	b			b	ab	a			ab
Wholemeal_cereal_grains brioches	47	14.3	7	16				7.7	3.4	12.3	16	**20.3**	12.7				14.2	12.7
Wholemeal_cereal_grains sandwich breads / hamburger / hot dog buns	600	3.3	5	**5.7**	1.7	3.4	3.6	2.7	4.1	5.4	4.5	2.9	3	4.8	3.5	3.3	3.1	3.3
		abc	ad	abcd	abcd	abcd	abc	b	abcd	d	acd	b	b	ad	abcd	abc	bc	bc
Wholemeal_cereal_grains toasted breads and toasts	271		4.4		2.9	3.1	**8.1**	5.2	2.8	5	4.9		7.9	2.3		3.6	5.1	2.5
			abc		a	abc	b	abc	ac	bc	abc		abc	a		abc	abc	abc

Figure 35 shows the distributions of sugar content for **Plain white sandwich breads / hamburger / hot dog buns** by country. The mean sugar content ranges from 3.7 g per 100 g (Bulgaria) to 6.7 g per 100 g (France). France tends to have the sweetest products; conversely, Bulgaria tends to have least sweet products. Overall, differences across countries are notable and there is substantial variability in most of them (particularly Austria, Estonia, Poland, and Romania), which indicates room for reformulation.

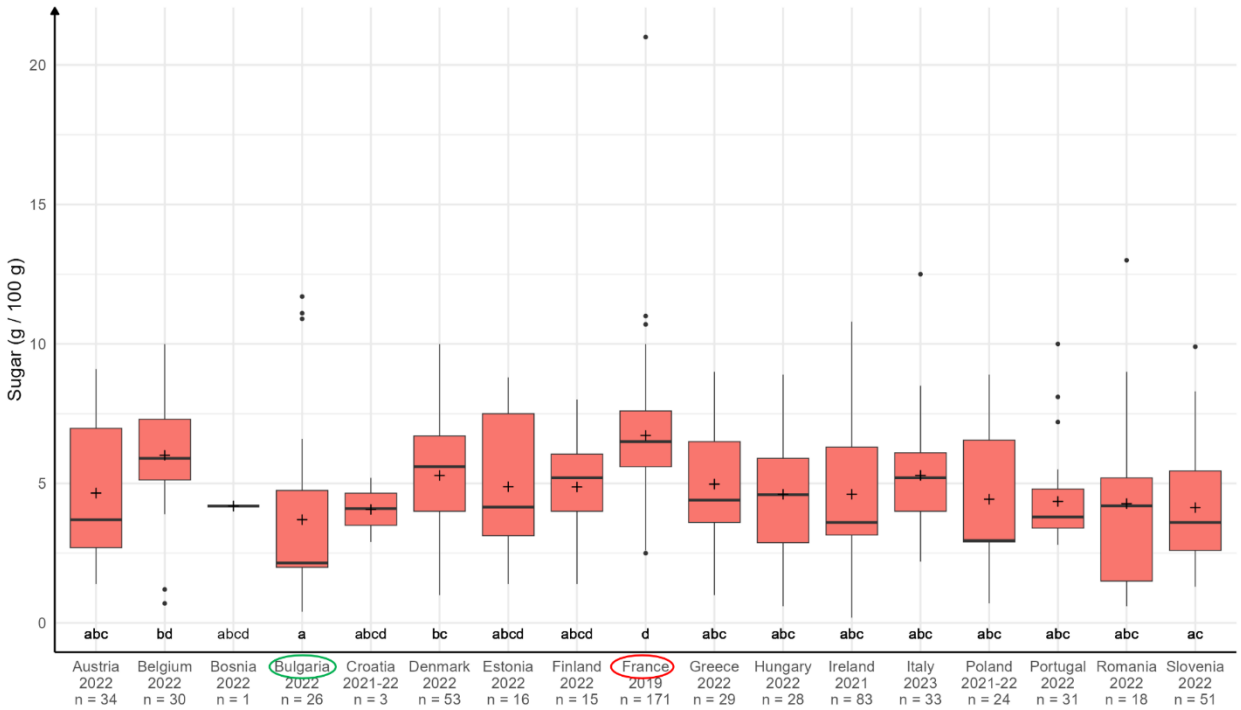

Figure 35: Distribution of sugar content for Plain white sandwich breads / hamburger / hot dog buns (total number of references considered: 646) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Figure 36 shows the distributions of sugar content for **Wholemeal cereal grains sandwich breads / hamburger / hot dog buns** by country. The mean sugar content ranges from 1.7 g per 100 g (Bulgaria, but only one product) to 5.7 g per 100 g (Bosnia, also with a low number of products: n = 6). France tends to have the sweetest products (mean of 5.4 g/100 g), while Estonia, Hungary and Ireland tend to have the least sweet, with mean sugar contents respectively of 2.7 g/100 g, 2.9 g/100 g and 3 g/100 g. Overall, differences across countries are notable and there is substantial variability in most of them (particularly Denmark, Greece, Hungary and Romania), which indicates room for reformulation.

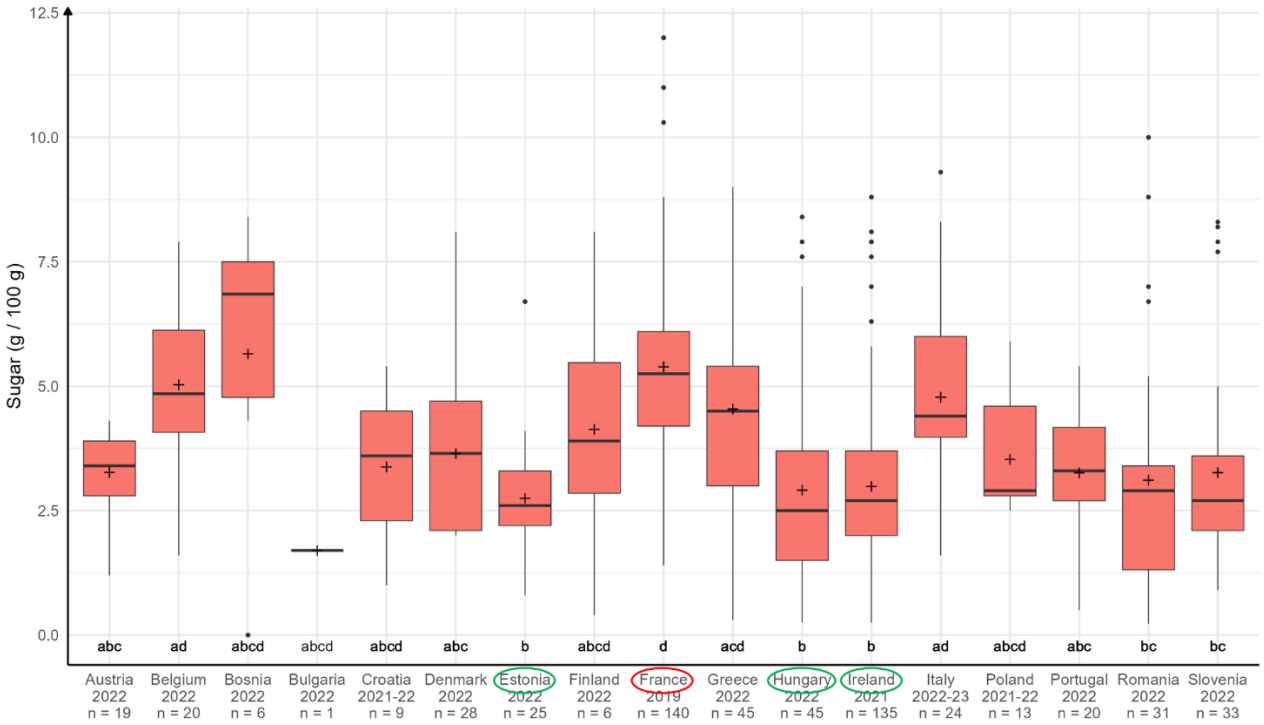

Figure 36: Distribution of sugar content for Wholemeal cereal grains sandwich breads / hamburger / hot dog buns (total number of references considered: 600) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Saturated Fat

Table 9 presents the statistical differences between countries and the mean saturated fat content among all relevant subcategories of Bread products identified previously (15 subcategories). Subcategories considered as relevant but with no significative differences are identified on lines with a grey background.

It shows that the results are highly dependent on the subcategory and the country. It has to be noted that all the results should be analysed regarding the amount of data collected, which can vary considerably from one country to another.

It appears that on the 13 subcategories for which the Kruskal-Wallis test indicated a difference between countries (**Table 7**), the Dunn's post-hoc test (**Table 9**) did not have sufficient statistical power to identify which specific countries differed from one another for three subcategories: Chocolate brioches, Fine bakery wares/croissants and Pre-baked breads (see **Annex 1**, p. 3–5, for the definition of the subcategories).

Figure 37 shows the distributions of saturated fat content for **Pre-packaged breads** by country. The mean saturated fat content ranges from 0.3 g per 100 g (Bulgaria) to 1.0 g per 100 g (Portugal). Regarding the countries that statistically differ from the others, Portugal and Ireland are among the highest in saturated fat. Conversely, Bulgaria and Estonia are among the lowest in saturated fat. Although the variability appears low, the presence of several outliers suggests that these products may call for reformulation.

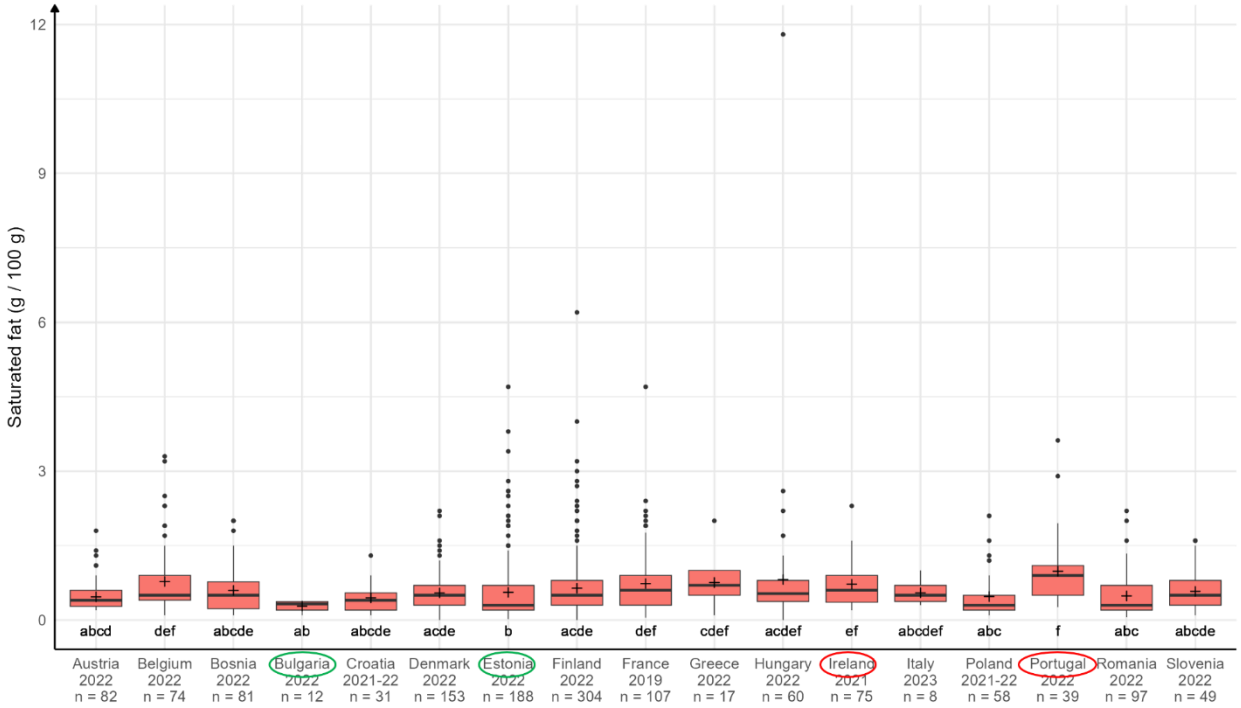

Figure 37: Distribution of saturated fat content for Pre-packaged breads (total number of references considered: 1,435) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Table 9: Mean saturated fat content per country among Bread products relevant subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Greece	Hungary	Ireland	Italy	Poland	Portugal	Romania	Slovenia
Brioches with fruit	93	2.9	2.7	6.2	4.6	3.9		2.9		4.3		2.1		8	1	**8.3**	5.8	4
		ab	ab	ab	ab	ab		ab		ab		ab		ab	a	b	ab	ab
Chocolate brioches	199	3.3	4.2	2.3	4.2		3.5	3.2		5.1	**6.8**	3.3	4.6	5.7	3.1	5.1	6.3	3.1
		a	a	a	a		a	a		a	a	a	a	a	a	a	a	a
Cream-filled brioches	52	2.4	3.1		0.8					2.6			3.1	3.6		**10**	8.4	5
		a	ab		a					a			ab	ab		ab	b	ab
Fine bakery wares_chocolate croissants	77		12					**14.3**		12.5	12.2		11.4	9		11.6	10	11.8
Fine bakery wares_croissants	87	6.2	**12.1**			0.8		9.3	11.3	12.1	11.6		10.4	10.1		7.9	6.8	4
		a	a			a		a	a	a	a		a	a		a	a	a
Plain brioches	301	4	3.4	2	**6**		5.1	3.8		**6**	4.9	2.7	4.4	4.1	2.6	3.4	1.3	2.4
		ab	a	ab	ab		ab	ab		b	ab	ab	ab	ab	ab	a	ab	ab
Plain toasted breads and toasts	142		1.1		0.2		1.3	2.4	0.7	**2.7**	2.3	0.4	2.5	0.1			1	
			ab		a		ab	b	ab	b	ab	ab	ab	ab			ab	
Plain white sandwich breads / hamburger / hot dog buns	646	0.8	0.8	0.3	0.8	0.5	1	0.6	1.1	0.7	**1.2**	0.9	0.7	0.7	0.8	0.8	1	0.8
		abcd	abcd	abcd	ab	abcd	acd	abcd	abcd	abc	d	abcd	b	abcd	abcd	cd	cd	abcd
Pre-baked breads	334	0.5	0.7				0.4	0.5	0.6	0.5	0.7	0.5	0.4	**1.1**	0.3	0.3	0.7	0.5
		a	a				a	a	a	a	a	a	a	a	a	a	a	a
Pre-packaged breads	1435	0.5	0.8	0.6	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.7	0.6	0.5	**1**	0.5	0.6
		abcd	def	abcde	ab	abcde	acde	b	acde	def	cdef	acdef	ef	abcdef	abc	f	abc	abcde
Tortilla breads and wraps	445	1.3	1.5	**2.6**	2	1.7	1	1.3	1.3	1.4	2.4	1.7	2	2.4	1.4	1.3	1.2	1.8
		abc	abc	d	abcd	abcd	a	ab	abc	abc	bcd	bcd	cd	bcd	abcd	abc	abcd	bcd
Unleavened breads	55			0.6	0.3	0.9			0.6	0.3			**1.1**	0.3	0.2			2.4
				ab	ab	ab			a	ab			a	ab	b			a
Wholemeal_cereal_grains brioches	47	2.5	2.8	3.8				1.1	1.1	**3.9**	3.8	2.2	2.2				1	3.4
Wholemeal_cereal_grains sandwich breads / hamburger / hot dog buns	599	0.8	0.7	1	0.5	0.8	0.6	0.6	0.7	0.8	**1.1**	0.9	0.6	0.7	0.5	1	0.7	0.8
		abcd	abc	abcd	abcd	abcd	ab	ab	abcd	acd	d	acd	b	abcd	ab	cd	abcd	acd
Wholemeal_cereal_grains toasted breads and toasts	271		1.8		0.6	0.8	1.3	1.8	0.6	1.4	1.6		1.6	1.7		**3.8**	1.8	1
			bc		a	abc	abc	abc	ab	bc	bc		abc	bc		c	abc	abc

Figure 38 shows the distributions of saturated fat content for **Plain white sandwich breads / hamburger / hot dog buns** by country. The mean saturated fat content ranges from 0.3 g per 100 g (Bosnia, only one product) to 1.2 g per 100 g (Greece). Greece, Portugal and Romania tend to have the highest levels of saturated fat in bread products, conversely, Bulgaria and Ireland tend to have the lowest levels of saturated fat. Variability differs across countries, with higher levels in Greece and Denmark, which suggests that reformulation would be possible.

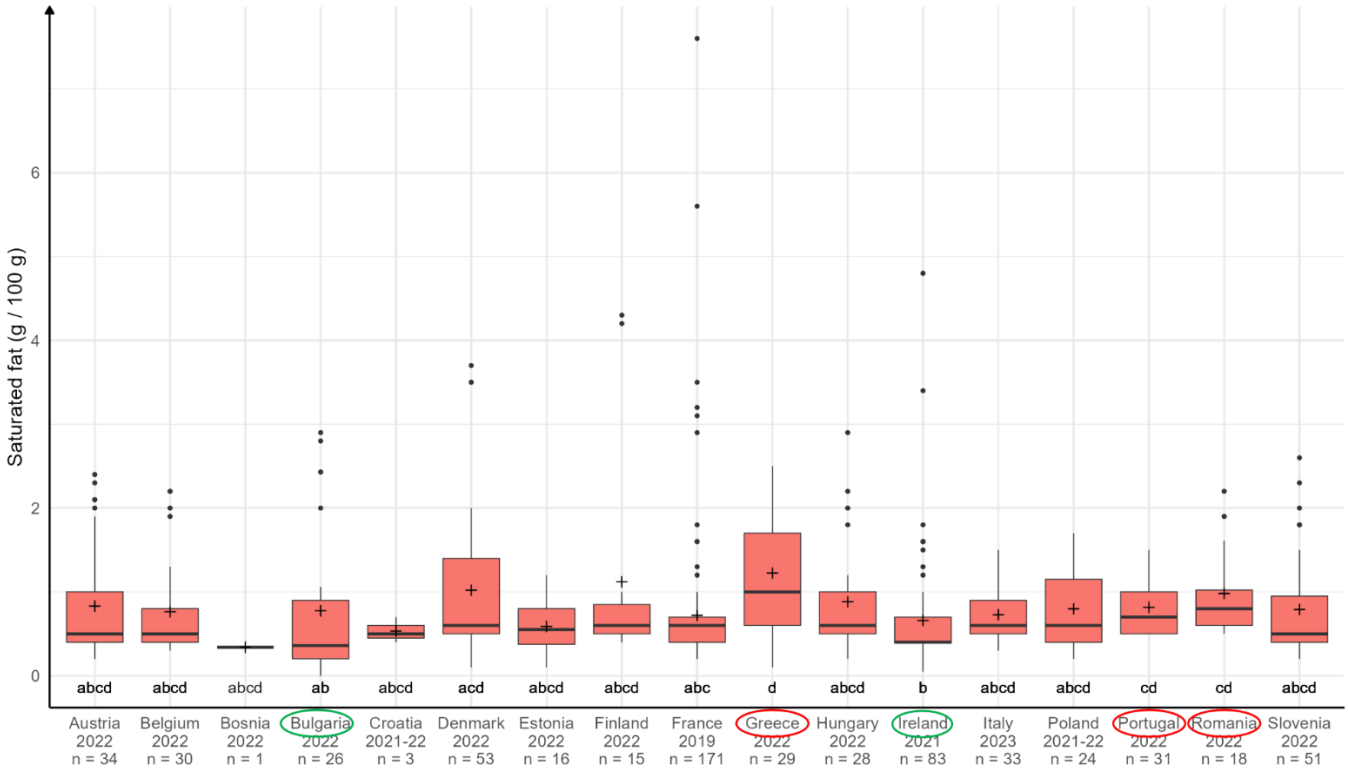

Figure 38: Distribution of saturated fat content for Plain white sandwich breads / hamburger / hot dog buns (total number of references considered: 646) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Figure 39 shows the distributions of saturated fat content for **Wholemeal cereal grains sandwich breads / hamburger / hot dog buns** by country. The mean saturated fat content ranges from 0.5 g per 100 g (Poland, n=13 and Bulgaria, n=1) to 1.1 g per 100 g (Greece, n=45). For this subcategory, Greece and Portugal tend to have products with the highest content in saturated fat. Conversely, Denmark, Estonia, Poland and Ireland tend to have products with the lowest saturated fat content. Variability differs across countries, with higher levels in Greece, Portugal and Slovenia and lower levels in Poland and Austria, suggests that some reformulation may be possible.

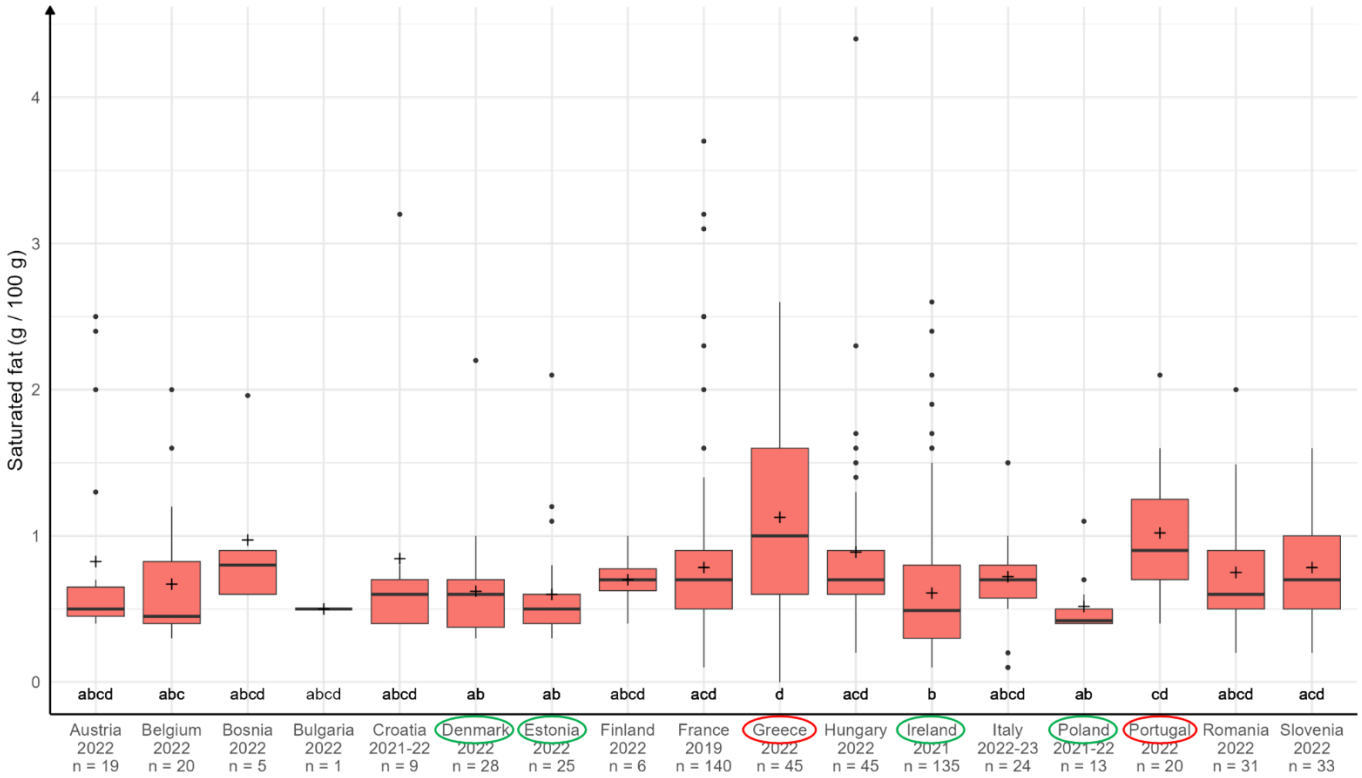

Figure 39: Distribution of saturated fat content for Wholemeal cereal grains sandwich breads / hamburger / hot dog buns (total number of references considered: 599) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Salt

Table 10 presents the statistical differences between countries and the mean salt content among all relevant subcategories of Bread products identified previously (15 subcategories). Subcategories considered as relevant but with no significative differences are identified on lines with a grey background.

It shows that the results are highly dependent on the subcategory and the country. All the results should be analysed regarding the amount of data collected, which can vary considerably from one country to another. Subcategories considered as relevant but with no significative differences are identified in greyed out-lines.

It appears that on the 14 subcategories for which the Kruskal-Wallis test indicated a difference between countries (**Table 7**), the Dunn's post-hoc test (**Table 10**) did not have sufficient statistical power to identify which specific countries differed from one another for one subcategory: Wholemeal_cereal_grains brioches (see **Annex 1**, p. 3, for the definition of the subcategory).

Figure 40 shows the distributions of salt content for **Pre-packaged breads** by country. The mean salt content ranges from 1.02 g per 100 g (Portugal) to 1.29 g per 100 g (Italy). Regarding the countries that statistically differ from the others, Portugal tends to have the least salty products, while Poland tends to have saltiest bread products. Although the variability appears low, the presence of several outliers suggests room for reformulation.

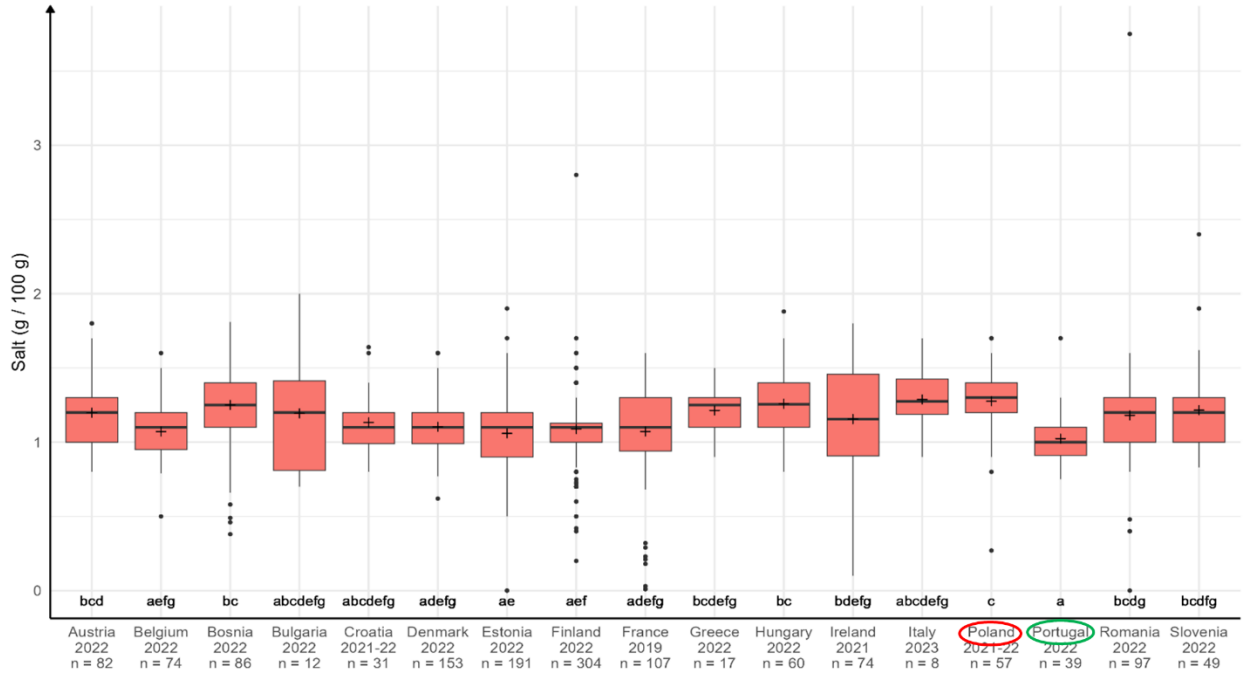

Figure 40: Distribution of salt content for Pre-packaged breads (total number of references considered: 1,441) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Table 10: Mean salt content per country among Bread products relevant subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Greece	Hungary	Ireland	Italy	Poland	Portugal	Romania	Slovenia
Brioches with fruit	93	0.66	**1.01**	0.37	0.50	0.70		0.80		0.69		0.76		0.50	0.37	0.47	0.60	0.59
		ab	b	ab	ab	ab		ab		ab		ab		ab	a	ab	ab	ab
Chocolate brioches	199	0.8	0.91	0.65	0.73		**1**	0.83		0.88	0.39	0.84	0.93	0.76	0.83	0.69	0.62	0.61
		abc	b	abc	abc		abc	abc		b	a	abc	bc	abc	abc	ac	a	abc
Cream-filled brioches	52	0.71	0.76		0.8					0.7			0.61	0.45		0.47	0.54	**0.82**
		ab	ab		ab					ab			ab	ab		ab	a	b
Fine bakery wares_chocolate croissants	77		0.95					0.48		**0.98**	0.54		0.7	0.63		0.77	0.8	0.92
			b					a		b	a		ab	ab		ab	ab	ab
Fine bakery wares_croissants	87	0.91	0.95			0.39		**1.34**	1.18	1.11	0.67		0.88	0.57		0.90	0.74	0.78
		ab	ab			ab		ab	a	a	ab		ab	b		ab	ab	ab
Plain brioches	301	0.92	1.1	0.59	0.87		1.1	0.68		1	0.38	0.88	0.90	0.97	0.77	0.94	1.07	**1.19**
		b	c	abc	abc		abc	abc		bc	a	abc	abc	bc	abc	bc	bc	bc
Plain toasted breads and toasts	142		1.37		1.15		0.5	**2**	1.25	1.19	0.73	1.6	1.09	1.02			1.45	
Plain white sandwich breads / hamburger / hot dog buns	645	1.2	1.11	**1.54**	1.21	1.27	1.05	1.09	1.03	1.17	1.16	1.23	1.05	1.26	1.26	1.07	1.26	1.27
		de	abcd	abcde	ade	abcde	bc	abcde	abc	ade	abde	de	c	e	de	abc	de	e
Pre-baked breads	334	1.2	1.1				1.09	1.05	0.95	1.24	1.08	1.19	1.1	**1.48**	1.18	1	1.1	1.1
		bc	ab				ab	ab	a	c	abc	abc	abc	abc	abc	abc	abc	abc
Pre-packaged breads	1441	1.2	1.07	1.25	1.19	1.13	1.1	1.06	1.09	1.07	1.21	1.26	1.16	**1.29**	1.28	1.02	1.18	1.22
		bcd	aefg	bc	abcdefg	abcdefg	adefg	ae	aef	adefg	bcdefg	bc	bdefg	abcdefg	c	a	bcdg	bcdfg
Tortilla breads and wraps	445	1.12	1.26	1.34	1.46	1.12	1.1	1.08	1.09	1.4	1.41	1.26	1.19	**1.69**	1.35	1.25	1.27	1.12
		abc	a	abc	abc	abc	a	a	ab	bc	abc	abc	ab	c	abc	abc	abc	ab
Unleavened breads	55			0.73	**1.56**	1.12			1.01	0.08			1.11	0.61	0.36			1.4
				abc	c	abc			ac	b			abc	abc	ab			abc
Wholemeal_cereal_grains brioches	47	0.79	1	0.59				1.05	**1.3**	1.1	0.59	0.89	0.85				1.1	0.58
		a	a	a				a	a	a	a	a	a				a	a
Wholemeal_cereal_grains sandwich breads / hamburger / hot dog buns	600	1.21	1.07	1.06	**1.48**	1.21	0.99	1.07	1.12	1.11	1.31	1.2	1.05	1.22	1.2	0.98	1.14	1.21
		cde	abcd	abcde	abcde	cde	a	abcd	abcde	bcd	e	ce	abd	ce	cde	ab	cde	ce
Wholemeal_cereal_grains toasted breads and toasts	271		1.35		1.21	1.34	1.46	**5.2**	1.07	1.31	1.37		1.05	2.12		1.66	1.54	1.74
			abc		ab	abc	abc	abc	a	bc	bc		abc	c		bc	abc	abc

Figure 41 shows the distributions of salt content for **Plain white sandwich breads / hamburger / hot dog buns** by country. The mean salt content ranging from 1.03 g per 100 g (Finland) to 1.54 g per 100 g (Bosnia, with only one product). Italy and Slovenia tend to have saltiest bread products, while Finland, Portugal, Denmark and Ireland tend to have least salty products. Although the variability appears low, the presence of several outliers suggests room for reformulation.

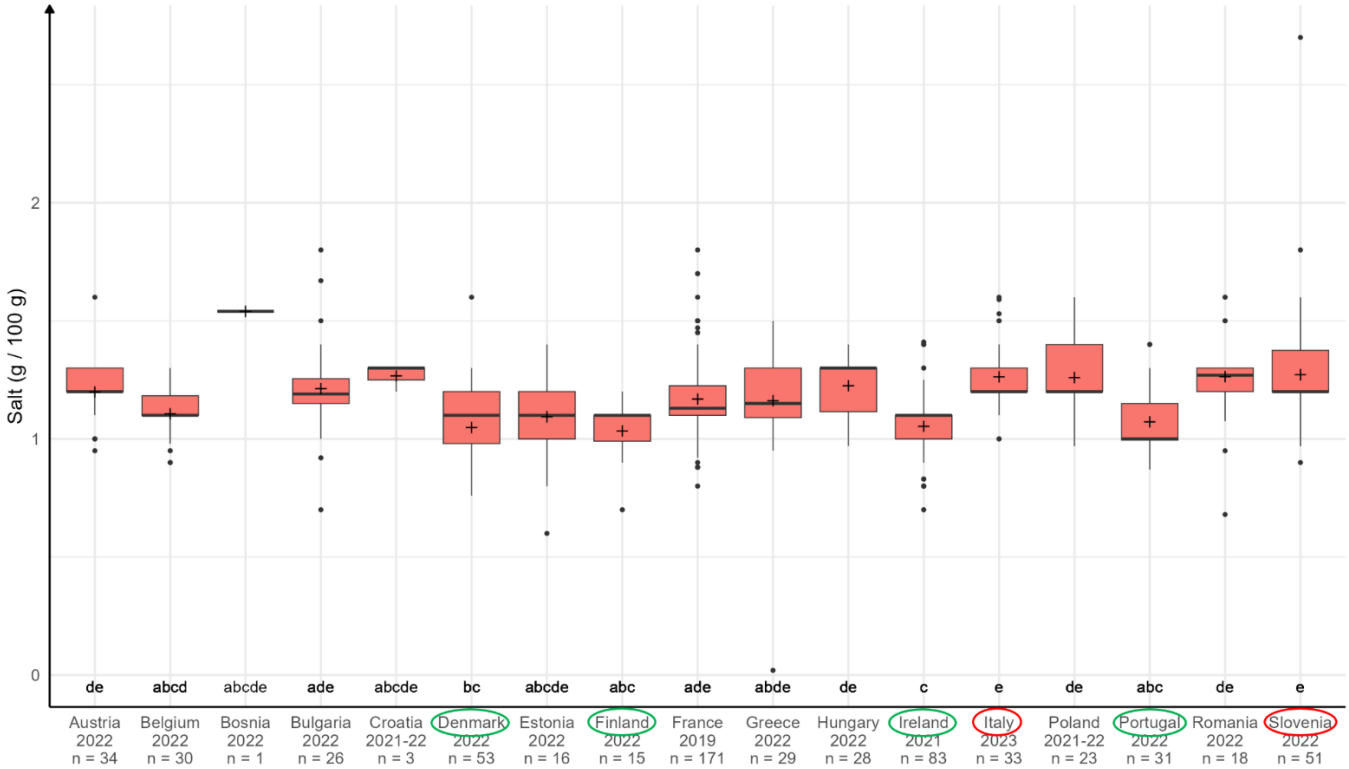

Figure 41: Distribution of salt content for Plain white sandwich breads / hamburger / hot dog buns (total number of references considered: 645) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Figure 42 shows the distributions of salt content for **Wholemeal cereal grains sandwich breads / hamburger / hot dog buns** by country. The mean salt content ranges from 0.98 g per 100 g (Portugal) to 1.48 g per 100 g (Bulgaria, with only one product). Greece tends to have the saltiest products. Conversely, Denmark and Portugal tend to have the least salty. Overall, there are differences in terms of variability, with lower levels in Denmark and higher levels in Greece and Romania, which suggest some room for reformulation.

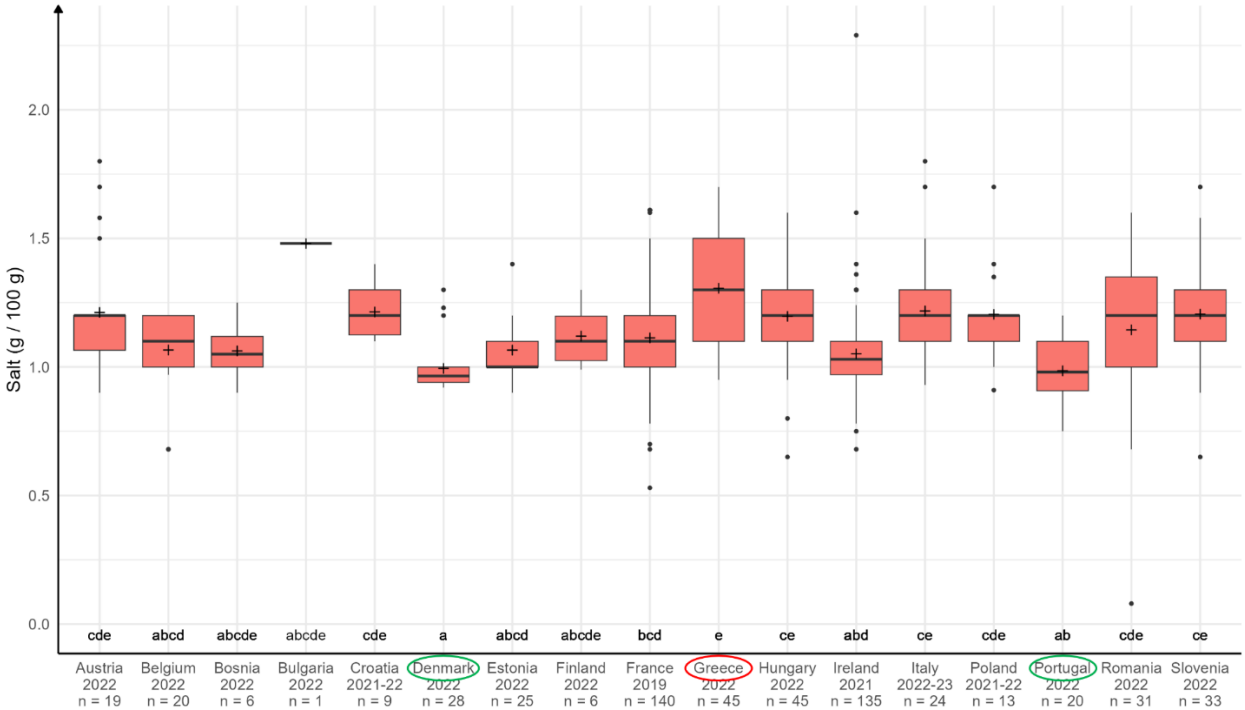

Figure 42: Distribution of salt content for Wholemeal cereal grains sandwich breads / hamburger / hot dog buns (total number of references considered: 600) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Fibre

Table 11 presents the statistical differences between countries in mean fibre content among all relevant subcategories of Bread products identified previously (15 subcategories). Subcategories considered as relevant but with no significative differences are identified on lines with a grey background.

It shows that the results are highly dependent on the subcategory and the country. It has to be noted that all the results should be analysed regarding the amount of data collected, which can vary considerably depending on the country and/or the subcategory.

It also appears that on the 6 subcategories for which the Kruskal-Wallis test indicated a difference between countries (**Table 7**), the Dunn's post-hoc test (**Table 11**) had sufficient statistical power to identify which specific countries differed from one another.

Figure 43 shows the distributions of fibre content for **Pre-packaged breads** by country. The mean fibre content ranges from 4.0 g per 100 g (Bulgaria) to 9.2 g per 100 g (Croatia). Regarding the countries that statistically differ from the others, Austria and Croatia tend to have the products richest in fibre. Conversely, Bosnia and Romania tend to have the products with the lowest fibre content. There are notable differences in average fibre content across countries, as well as differences in terms of variability with lower levels in Croatia, Bulgaria, and Italy and higher levels in Hungary, Finland, Poland, Belgium and Austria, which suggests room for reformulation.

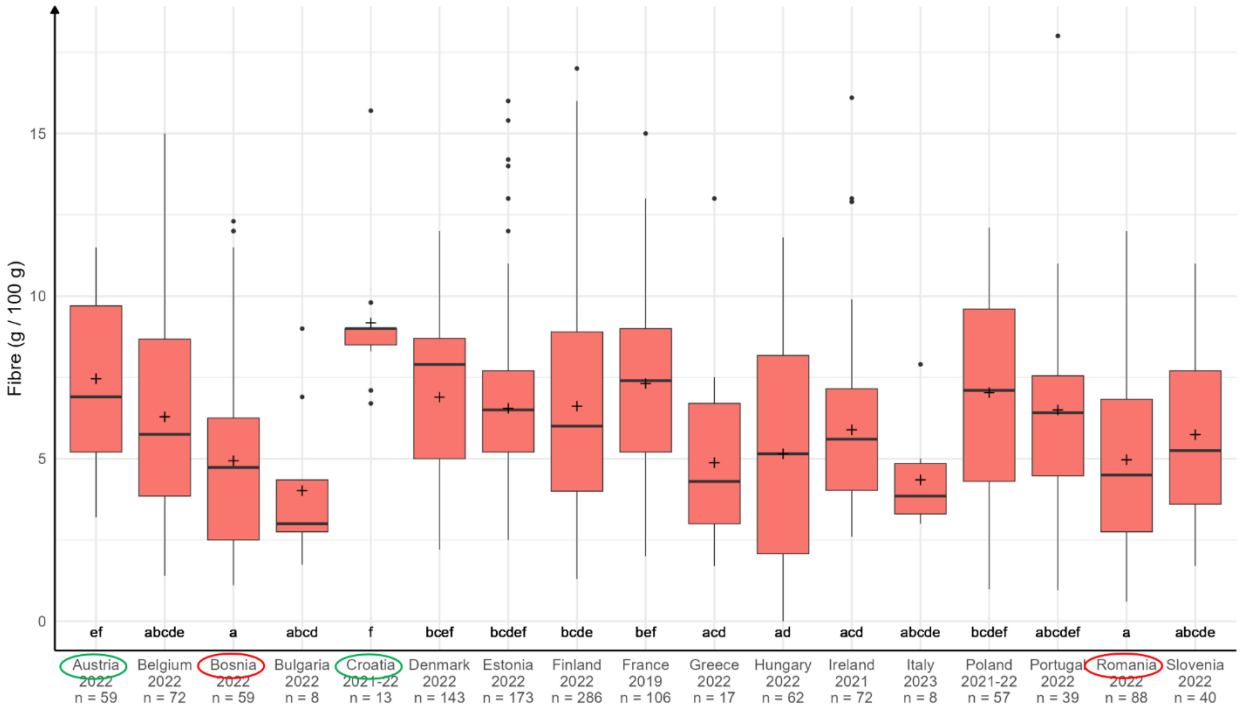

Figure 43: Distribution of fibre content for Pre-packaged breads (total number of references considered: 1,302) (green circle: countries whose average levels are statistically among the highest; red circle: countries whose average levels are statistically among the lowest)

Table 11: Mean fibre content per country among Bread products relevant subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Greece	Hungary	Ireland	Italy	Poland	Portugal	Romania	Slovenia
Brioches with fruit	57	3.1	2.3		2.6			**3.2**		2.4		0		1.5	3	2	3.1	2.9
Chocolate brioches	132	1.7	**4.1**		3					2.9	2.1	2.8	3	2.8	1.6	2.7	2.8	2.3
Cream-filled brioches	23	2	1.6		2.8					1.6			1.9	**3.4**		2.2	1.5	
Fine bakery wares_chocolate croissants	39		2.9							2.7	2.1		2.7	2.5		**3.4**	2.6	
			ab							ab	a		ab	ab		b	ab	
Fine bakery wares_croissants	63	2.2	2.4					**4.8**	2.5	2.3	2.9		2.8	2.4		3.2	4.3	4.7
Plain brioches	168	2	2.5	**2.9**	1.8			2.7		2.1	2.2	1.4	2.6	2.5	2.4	2.3	2	2.7
Plain toasted breads and toasts	127		4		2.4		3.2	3.1	3.4	3.8	5.1	2.8	3.6	**5.7**			3.4	
			b		a		ab	ab	ab	b	ab	ab	ab	ab			ab	
Plain white sandwich breads / hamburger / hot dog buns	550	2.9	**3.7**		2.6	3	2.7	3	2.8	2.9	2.5	2.2	2.8	3.2	2.3	3.4	3.4	2.8
		abc	b		abc	abc	ac	abc	abc	abc	a	a	ac	abc	a	b	bc	abc
Pre-baked breads	271	5.3	4.3				5	4.9	3.9	4.4	**8.2**	4.2	4.3	3.6	6.3	5	6.3	5.3
Pre-packaged breads	1302	7.5	6.3	4.9	4	**9.2**	6.9	6.5	6.6	7.3	4.9	5.2	5.9	4.3	7	6.5	5	5.7
		ef	abcde	a	abcd	f	bcef	bcdef	bcde	bef	acd	ad	acd	abcde	bcdef	abcdef	a	abcde
Tortilla breads and wraps	333	3.8	4.9	3.1	4.9	3	4.7	3.7	3.4	3.1	3.9	3.3	5	3.2	**5.5**	3.6	3.4	3.3
Unleavened breads	46					**8.3**			4.8	5.4			6.3	5	3.3			2.6
Wholemeal_cereal_grains brioches	34	3.1	4.2	4.2					4.7	2.9	4.2	2.7	**6.8**				2.6	4.2
Wholemeal_cereal_grains sandwich breads / hamburger / hot dog buns	570	5.6	5.6	6.7	6	**6.9**	6.5	6	6.8	5.6	5	6.1	6.8	6.6	4.4	6.8	6.4	5.1
		ab	ab	ab	ab	ab	ab	ab	ab	ab	a	ab	b	b	a	ab	ab	ab
Wholemeal_cereal_grains toasted breads and toasts	234		8.4		7.2	**10**	6.8	5	6.2	6.7	9.3		5.4	6.3		9	7.6	**10**
			ab		ab	ab	ab	ab	ab	a	b		ab	ab		ab	ab	ab

Figure 44 shows the distributions of fibre content for **Plain white sandwich breads / hamburger / hot dog buns** by country. The mean fibre content ranges from 2.2 g per 100 g (Hungary) to 3.7 g per 100 g (Belgium). Romania tends to have the products with the highest fibre content. Conversely, Greece, Hungary and Poland tend to have the products with the lowest fibre content. There are notable differences in average fibre content across countries, with many values around 3.0 g per 100 g.

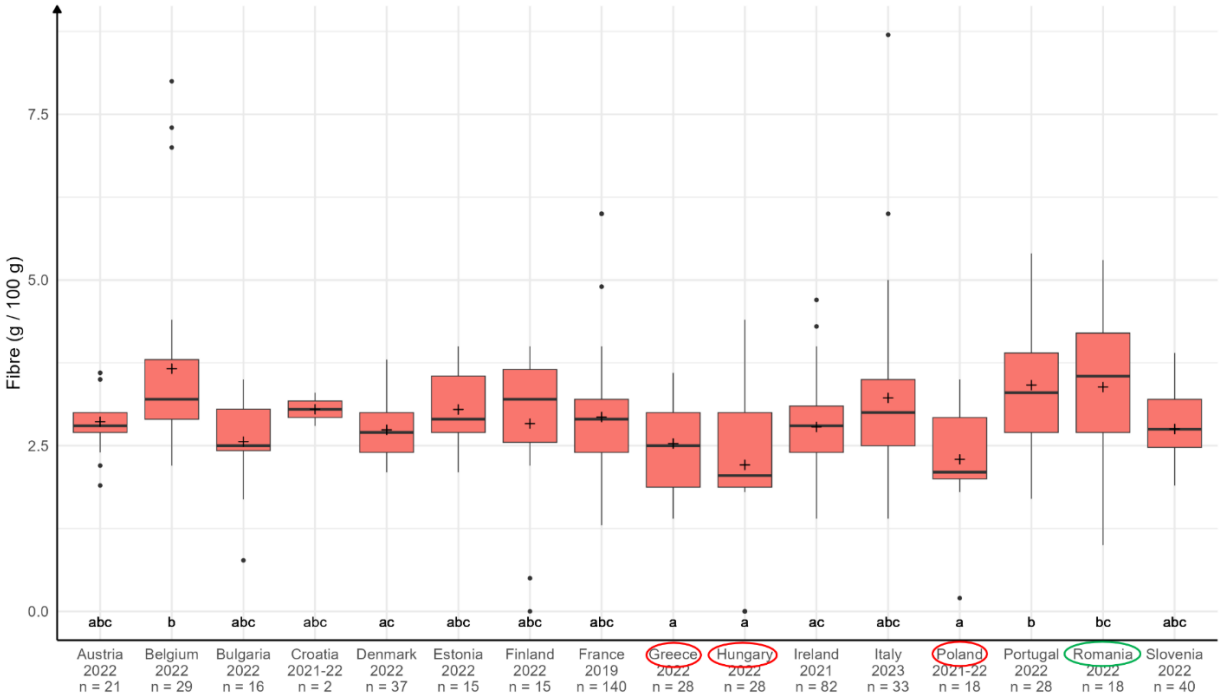

Figure 44: Distribution of fibre content for Plain white sandwich breads / hamburger / hot dog buns (n = 550) (green circle: countries whose average levels are statistically among the highest; red circle: countries whose average levels are statistically among the lowest)

Figure 45 shows the distributions of fibre content for **Wholemeal cereal grains sandwich breads / hamburger / hot dog buns** by country. The mean fibre content ranges from 4.4 g per 100 g (Poland, n=10) to 6.9 g per 100 g (Croatia, n = 7). Ireland and Italy tend to have the products with the highest fibre content. Conversely, Greece and Poland tend to have the products with the lowest fibre content. This subcategory seems fairly homogeneous in terms of mean fibre content, but with an important variability suggesting possible reformulation.

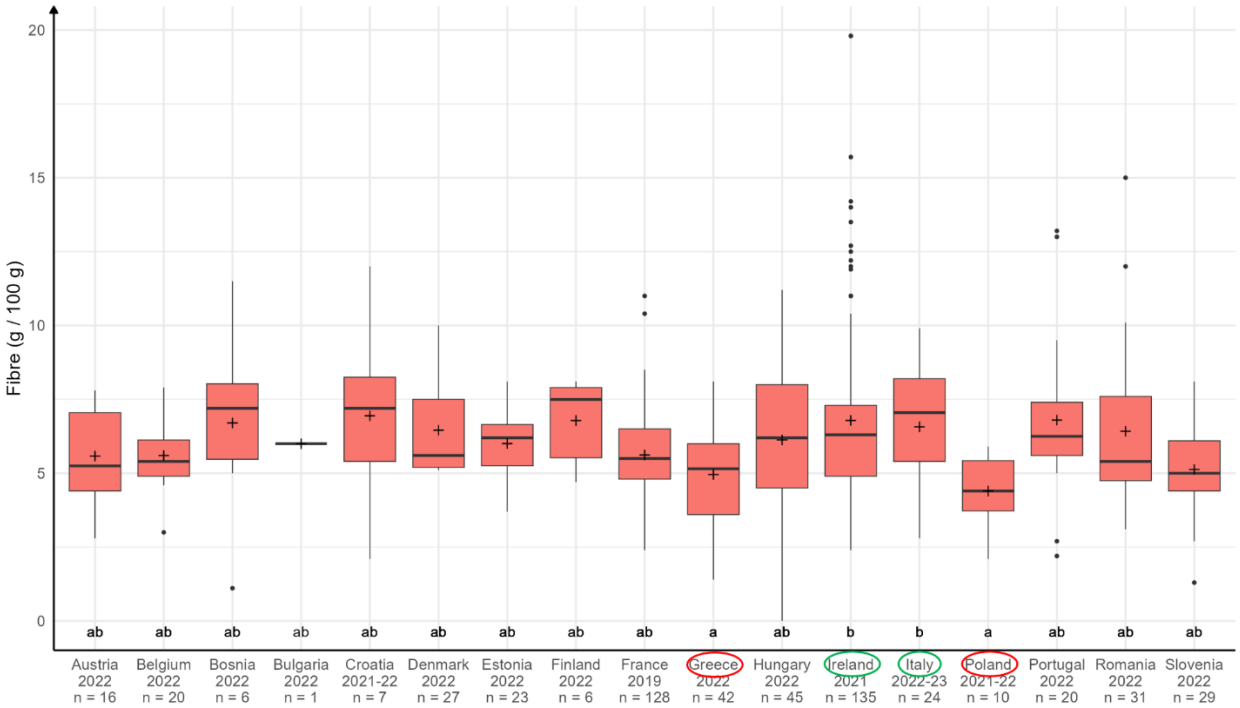

Figure 45: Distribution of fibre content for Wholemeal cereal grains sandwich breads / hamburger / hot dog buns (total number of references considered: 570) (green circle: countries whose average levels are statistically among the highest; red circle: countries whose average levels are statistically among the lowest)

Synthesis and links to the national nutritional policies linked to bread products

Table 12 summarises the global ranking of the median at the category level (see methodology in section 2.1.2) and the implementation of specific national nutritional measures (as defined in section 2.1.2) related to Bread products and the targeted nutrients content (sugar, saturated fat, salt and fibre) for each studied country. It should be noted that the rankings and conclusions presented in this section are based on categories (and not subcategories); they therefore do not accurately reflect the quality of the food offer by country. Furthermore, no direct causal link between the global ranking and policies can be established in this section.

Overall, for bread products, the public policies preferentially focus on salt. Besides, for countries considered as low in the tier position, there is not always but frequently a public policy in place, often a mandatory type (tax/legal limit). In countries ranked in the top category, public policies are implemented less frequently, and when they are, they tend to rely on incentives rather than regulations. Five countries out of 17 have implemented regulatory measures for bread products: Bosnia for salt (classified as low); Finland for salt (classified as mid); Hungary for sugar (classified as low); Portugal for salt (classified as low) and Romania for sugar (classified as high). For Romania, the measure has been taken after the data collection. In Finland, there is an additional mandatory statement that must be clearly displayed on bread products exceeding a salt limit.

Efforts to improve the nutritional quality of the food supply are still possible in all countries, regardless of the country's position and the policies already implemented or not.

Sugar

Overall, based on the median-based ranking for the whole category (for the 15 considered subcategories), Hungary and Austria tend to have the least sweet bread products, while Bosnia, Denmark, Portugal, Romania, and France tend to have the sweetest bread products.

If these results are examined in light of the health policies implemented in each country regarding the sugar content of bread products, it can be seen that, of the 17 countries included in the analyses (Malta and Germany do not have data for this food category), six of them stated that they had at least one of the targeted measures relating to the sugar content in bread products:

- One is among the countries with the least sweet bread product (Low):
    - Hungary has had a sugar tax (2011, updated in 2022) that applies to bread products.
- Three are among the ones with the sweetest bread products (High):
    - Romania introduced a tax on high-sugar foods (2024), after the data collection studied;
    - Denmark had a collective agreement in 2007 and has had the Keyhole labelling since 2009;
    - France has had the Nutri-Score labelling since 2017.
- Two are ranked with intermediate results (Mid):
    - Finland has had the Heart Symbol labelling since 2000;
    - Belgium has had the Nutri-Score labelling since 2019.

No specific measures were reported for 11 countries: Austria (Low), Bosnia (High), Bulgaria (Mid), Croatia (Mid), Estonia (Mid), Greece (Mid), Ireland (Mid), Italy (Mid), Poland (Mid), Portugal (High), and Slovenia (Mid).

Saturated fat

Overall, based on the median ranking for the category (for 15 considered subcategories), Austria, Bulgaria, Croatia, and Poland tend to have the lowest levels of saturated fat in Bread products, while Greece, Portugal, and Ireland tend to have the highest levels of saturated fat in Bread products.

If these results are examined in light of the health policies implemented in each country regarding the saturated fat content of bread products, it can be seen that, of the 17 countries included in the analyses (Malta and Germany do not have data for this food category), four of them, all with intermediate saturated fat content (Mid) stated that they had at least one of the targeted measures relating to the saturated fat content in bread products:

- Finland has had the Heart Symbol labelling since 2000;
- Denmark has had the Keyhole labelling since 2009 and had collective agreement in 2007;
- France has had the Nutri-Score labelling since 2017;
- Belgium has had the Nutri-Score labelling since 2019.

It can be observed that neither the “best in class” countries (Low) nor those with the highest saturated fat content at the category level (High) have reported any specific policies aimed at reducing saturated fat content in bread products.

No specific measures were reported for 13 countries: Austria (Low), Bosnia (Mid), Bulgaria (Low), Croatia (Low), Estonia (Mid), Greece (High), Hungary (Mid), Ireland (High), Italy (Mid), Poland (Low), Portugal (High), Romania (Mid) and Slovenia (Mid).

Salt

Overall, based on the median ranking for the category (for the 15 considered subcategories), Portugal, Denmark, Bosnia, and Estonia tend to have the least salty Bread products while Hungary, Slovenia, Poland, Italy, France, and Croatia tend to have the saltiest bread products.

If these results are examined in light of the health policies implemented in each country regarding the salt content of bread products, on the 17 countries included in the analyses (Malta and Germany do not have data for this food category), nine of them stated that they had at least one of the targeted measures relating to the salt content in bread products:

- Three are ranked among the country with the lowest salt content (Low):
    - Bosnia has had a legislation from 2019 to reduce salt in bread and bread products, as well as a legal limit on salt content for bread (< 1.4 g of salt per 100 g);
    - Denmark had a collective agreement that concerned salt content in bread products in 2007 and has had the Keyhole labelling since 2009;
    - Portugal had a collective agreement that concerned salt in bread products in 2018 (updated and maintained for 2019–2021) and has had a legal limit on salt content since 2009.

- Three are ranked among the countries with the highest salt content (High):
    - France had a collective agreement covering the period 2022–2025 for a salt reduction in artisanal breads and soft breads (covering a period after the studied data collection). France also has had the Nutri-Score labelling since 2017;
    - Slovenia had a collective agreement in 2019 aimed at reducing by 5% salt content by the end of 2022;
    - Italy had a collective agreement in 2009.

- Three are ranked with intermediate results (Mid):
    - Finland has had the Heart symbol system since 2000 and a legal threshold for salt, beyond which a mandatory “high in salt” label must be applied (2014);
    - Belgium has had the Nutri-Score labelling since 2019;
    - Austria had a collective agreement targeting a 15% reduction in salt content between 2011 and 2015.

No specific measures were reported for eight countries: Bulgaria (Mid), Croatia (High), Estonia (Low), Greece (Mid), Hungary (High), Ireland (Mid), Poland (High) and Romania (Mid).

Fibre

Overall, based on the median ranking for the category (for the 15 considered subcategories), Croatia, Belgium, and Portugal tend to have the highest levels of fibre in Bread products while Bulgaria, Greece, Poland, and Hungary tend to have the lowest levels of fibre in Bread products.

If these results are examined in the light of the health policies implemented in each country, on the 17 countries included in the analyses (Malta and Germany do not have data for this food category), five of them stated that they had at least one of the targeted measures relating to the fibre content in bread products:

- One is ranked among the countries with the highest fibre content (High):
    - Belgium has had the Nutri-Score labelling since 2019.

- None of those with the lowest fibre content in bread products category (Low) have reported any specific policy addressing fibre in bread products.

- Four are ranked with intermediate results (Mid):
    - Denmark has had the Keyhole labelling since 2009 and had a collective agreement (2007);
    - Slovenia had a collective agreement that concerned fibre content in 2019;
    - Finland has had the Heart Symbol labelling since 2000;
    - France has had the Nutri-Score labelling since 2017.

No specific measures were reported for 12 countries: Austria (Mid), Bosnia (Mid), Bulgaria (Low), Croatia (High), Estonia (Mid), Greece (Low), Hungary (Low), Ireland (Mid), Italy (Mid), Poland (Low), Portugal (High) and Romania (Mid).

Table 12: Summary of country-level positioning (tier position when comparing the median content) and national nutritional policies on Bread products, by nutrient

COUNTRY	Collection Year	SUGAR		SATURATED FAT		SALT		FIBRE	
		Tier Position	Type of measure(s)	Tier Position	Type of measure(s)	Tier Position	Type of measure(s)	Tier Position	Type of measure(s)
Austria	2022	Low		Low		Mid	Collective agreement (2011-2015)	Mid	
Belgium	2022	Mid	FOP (Nutri-Score: 2019)	Mid	FOP (Nutri-Score: 2019)	Mid	FOP (Nutri-Score: 2019)	High	FOP (Nutri-Score: 2019)
Bosnia	2022	High		Mid		Low	Legal limit (2019)	Mid	
Bulgaria	2022-2023	Mid		Low		Mid		Low	
Croatia	2021-2022	Mid		Low		High		High	
Denmark	2022	High	Collective agreement (2007); FOP (Keyhole: 2009)	Mid	Collective agreement (2007); FOP (Keyhole: 2009)	Low	Collective agreement (2007); FOP (Keyhole: 2009)	Mid	Collective agreement (2007); FOP (Keyhole: 2009)
Estonia	2022	Mid		Mid		Low		Mid	
Finland	2022	Mid	FOP (Heart Symbol: 2000)	Mid	FOP (Heart Symbol: 2000)	Mid	FOP (Heart Symbol: 2000); legal threshold + mandatory label (2014)	Mid	FOP (Heart Symbol: 2000)
France	2019	High	FOP (Nutri-Score: 2017)	Mid	FOP (Nutri-Score: 2017)	High	FOP (Nutri-Score: 2017); Collective agreement (2022-2025)	Mid	FOP (Nutri-Score: 2017)
Greece	2022	Mid		High		Mid		Low	
Hungary	2022	Low	Tax (2011 updated 2022)	Mid		High		Low	
Ireland	2021	Mid		High		Mid		Mid	
Italy	2022-2023	Mid		Mid		High	Collective agreement (2009)	Mid	
Poland	2021-2022	Mid		Low		High		Low	
Portugal	2022	High		High		Low	Legal limit (2009); Collective agreement (2018 + 2019-2021)	High	
Romania	2022	High	Tax (2024)	Mid		Mid		Mid	
Slovenia	2022	Mid		Mid		High	Collective agreement (2019)	Mid	Collective agreement (2019)

green: countries ranked in the top tier; yellow: countries ranked in the middle tier; red: countries in the bottom tier. Collective agreement: jointly negotiated commitment between a government authority and representatives of an industry / FOP: front-of-pack labelling / Tax: legal nutritional tax imposed by government / Legal limit: maximum level beyond which the product cannot be marketed. / Legal threshold + mandatory label: threshold beyond which a mandatory label must be applied.

2.2.3.2. Breakfast cereals

Table 13 summarises the statistical differences in mean nutrient content observed across the four nutrients of interest for the 16 subcategories of Breakfast cereals. Some subcategories considered not relevant to be presented (e.g., “other” subcategories that grouped very different products and/or those with a very limited reformulation potential and/or those with very few products in all data collections) are shown in grey.

Therefore, the upcoming analysis focuses on 13/16 subcategories for sugar (Cereals without added sugar are excluded as there is no room for reformulation on sugar for this subcategory) and 14/16 subcategories for saturated fat, salt and fibre.

Most subcategories show statistically significant differences in mean nutrients content across countries:

- 85% of the considered subcategories for sugar (11/13 subcategories);
- 86% of the considered subcategories for saturated fat (12/14);
- 79% of the considered subcategories for salt (11/14);
- 40% of the considered subcategories for fibre (9/14).

Detailed results for average nutrient contents are presented below for each nutrient, by country, and for the relevant subcategories. For reasons of readability, a selection of boxplots for 2 subcategories (chosen based on their representativeness (e.g., products collected in most countries), and the ease of understanding of the definition of included products) is presented in this report: Chocolate flavoured cereals and Traditional muesli flakes.

Descriptive tables for all Breakfast cereals subcategories are available in **Annex 5**.

Table 13: Summary of nutrient differences across subcategories of Breakfast cereals

Subcategory	SUGAR (n = 7,437)				SATURATED FAT (n = 7,444)				SALT (n = 7,427)				FIBRE (n = 6,960)			
	n	countr	p	signif	n	countr	p	signif	n	countr	p	signif	n	countr	p	signif
Cereal flakes with chocolate_nuts	175	19	2E-01	NS	175	19	1E-03	**	175	19	6E-03	**	166	19	3E-01	NS
Cereal flakes with fruit	48	12	4E-02	*	48	12	2E-03	**	48	12	2E-01	NS	45	12	7E-01	NS
Cereal preparation to drink	2	1	NA		2	1	NA		2	1	NA		2	1	NA	
Cereals without added sugar	851	19	1E-06	***	852	19	2E-13	***	843	19	4E-16	***	789	19	2E-11	***
Chocolate and caramel cereals	60	17	2E-02	*	60	17	3E-02	*	60	17	5E-01	NS	58	17	2E-01	NS
Chocolate-flavoured cereals	656	19	2E-12	***	657	19	2E-01	NS	657	19	1E-01	NS	630	19	2E-02	*
Crunchy chocolate muesli	795	19	5E-15	***	795	19	5E-09	***	795	19	2E-10	***	732	19	4E-08	***
Crunchy fruit muesli	833	19	3E-09	***	834	19	4E-03	**	833	19	2E-07	***	783	19	9E-08	***
Crunchy muesli with nuts_seeds	358	18	3E-04	***	358	18	4E-06	***	358	18	1E-06	***	334	18	5E-02	*
Filled cereals	328	19	1E-05	***	328	19	8E-04	***	328	19	2E-04	***	305	18	5E-05	***
High-fibre cereals	383	19	3E-01	NS	385	19	3E-01	NS	385	19	8E-04	***	381	19	6E-02	NS
High-fibre fruit cereals	119	17	6E-03	**	119	17	3E-02	*	119	17	1E-04	***	119	17	6E-01	NS
Honey/caramel cereals	423	19	2E-06	***	423	19	8E-07	***	421	19	1E-06	***	402	19	1E-02	*
Other ready-to-eat cereals	75	15	6E-02	NS	75	15	1E-04	***	75	15	4E-04	***	73	14	6E-05	***
Sweet cereal flakes	410	19	9E-07	***	412	19	7E-09	***	410	19	9E-06	***	387	19	3E-05	***
Traditional muesli flakes	1,921	19	1E-12	***	1,921	19	3E-12	***	1,918	19	2E-53	***	1,754	19	4E-51	***

*"n": number of references; "countr": number of countries compared; "p": p value for the Kruskal-Wallis test; NA = not applicable; "signif": NS = not significant; * for 0.01 < p ≤ 0.05, ** for 0.001 < p ≤ 0.01, *** for p ≤ 0.001.*
Categories in grey are the less relevant ones for comparisons: they are not discussed in the report.

Sugar

Table 14 presents the statistical differences and the mean sugar content between countries among all relevant subcategories of breakfast cereals identified previously (13 subcategories). Subcategories considered as relevant but with no significative differences are identified on lines with a grey background.

It shows that the results are highly dependent on the subcategory and the country. It has to be noted that all the results should therefore be analysed regarding the amount of data collected, which can vary considerably depending on the country and/or the subcategory.

It also appears that on the 11 subcategories for which the Kruskal-Wallis test indicated a difference between countries (**Table 13**), the Dunn's post hoc test (**Table 14**) had sufficient statistical power to identify which specific countries differed from one another.

Figure 46 shows the distributions of sugar content for **Chocolate flavoured cereals** by country. The mean sugar content ranges from 19.8 g per 100 g (Finland, n=14) to 26.9 g per 100 g (France, n=90). Regarding the countries that stand out statistically from the rest, France and Romania tend to offer the sweetest products, while Germany, Austria, Belgium, and Ireland tend to offer the least sweet products. For all countries, sugar contents are quite high and the observed range of values (particularly in Belgium, Ireland, Greece, and Malta) suggests possible reformulation.

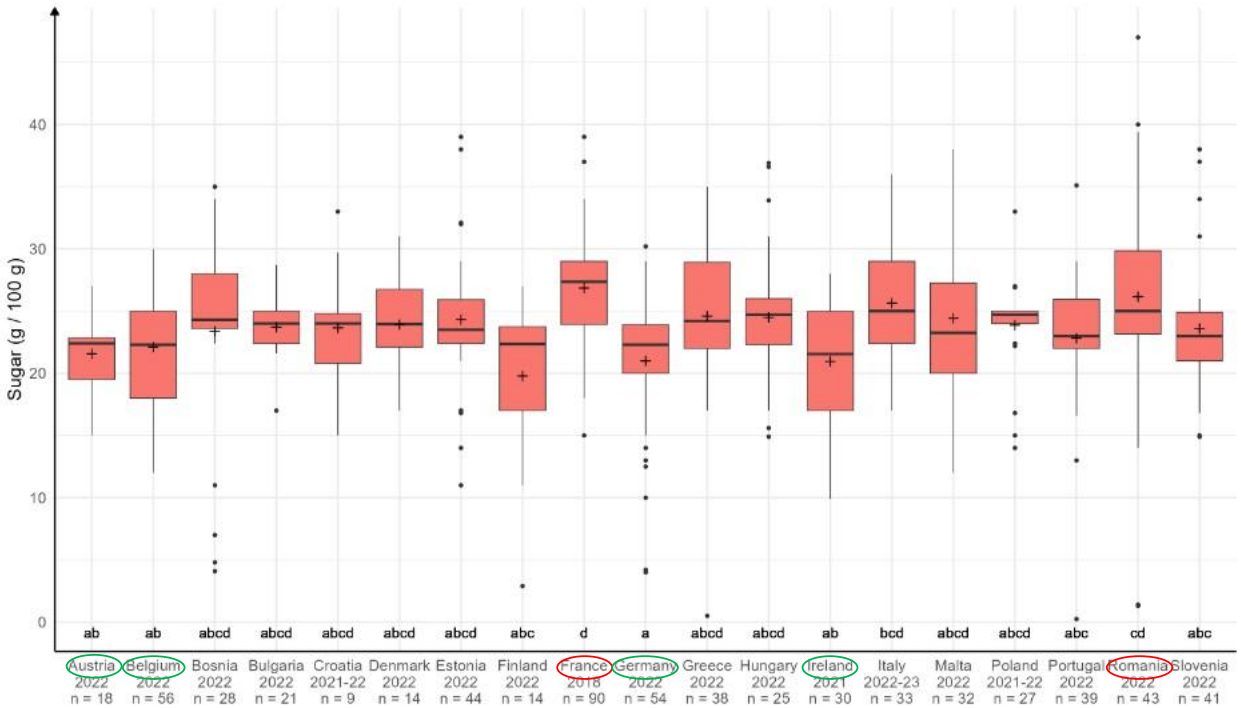

Figure 46: Distribution of sugar content for Chocolate-flavoured cereals by country (total considered number of references: 656) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Figure 47 shows the distribution of sugar content for **Traditional muesli flakes** by country. The mean sugar content ranges from 12.4 g per 100 g (Finland) to 18.8 g per 100 g (Bosnia). Bosnia and Poland tend to offer the sweetest breakfast cereals and Bulgaria, Croatia, Finland, Slovenia, and Germany the least sweet. Overall, the observed differences across countries and the important variability within most of them indicate possible room for reformulation.

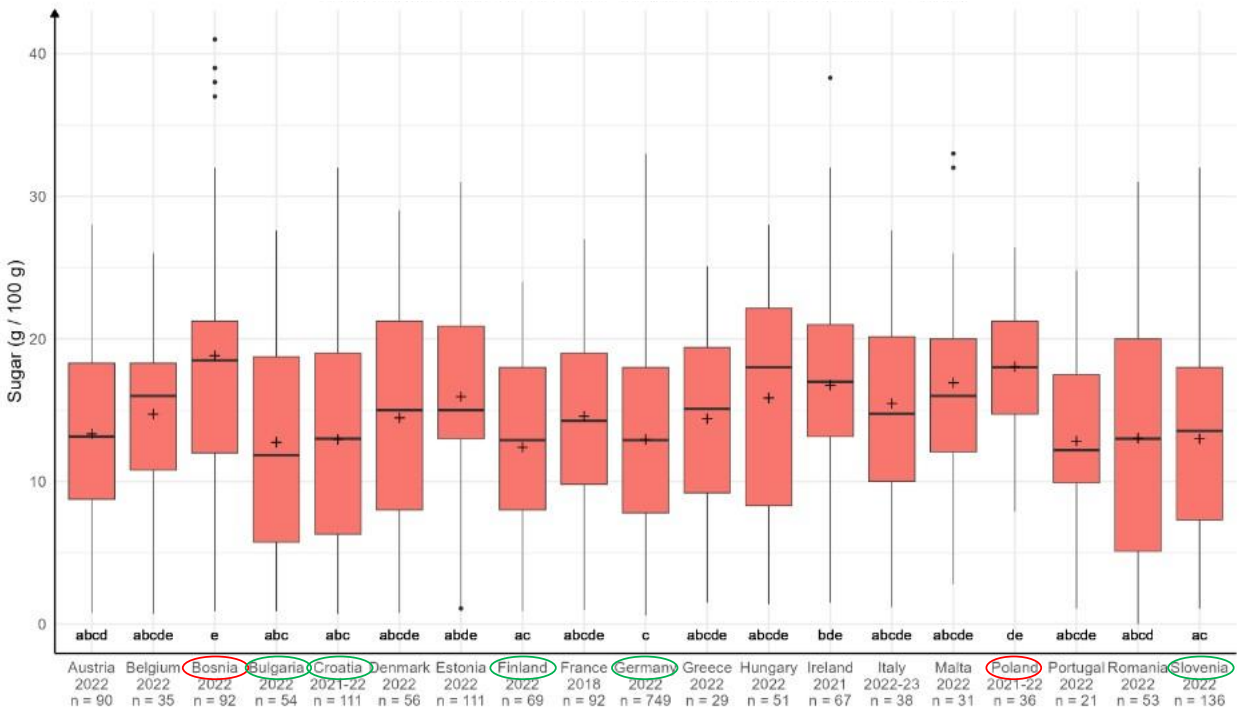

Figure 47: Distribution of sugar content for Traditional muesli flakes by country (total considered number of references:1921) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Table 14: Mean sugar content per country among relevant Breakfast cereals subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Malta	Poland	Portugal	Romania	Slovenia
Cereal flakes with chocolate_nuts	175	**27.4**	18.5	21.1	17.6	25.7	**27.4**	26.2	23.2	19.7	21.3	20.2	25	23.6	18.5	20	20.5	20	21.5	22.4
Cereal flakes with fruit	48		17			14.6		24.4		13.6	20.4	27		16.8	18.4	20.5	24	21.3	**39.4**	
			ab			ab		ab		a	ab	ab		ab	ab	ab	ab	ab	b	
Chocolate and caramel cereals	60	25	25.6	23.7	24.9		25	26.6	25	28.7	24.6	25.9	25		27	25.4	26	25.3	25	**31**
		ab	ab	ab	ab		ab	ab	ab	a	b	ab	ab		ab	ab	ab	ab	ab	ab
Chocolate-flavoured cereals	656	21.6	22.1	23.4	23.7	23.7	23.9	24.3	19.8	**26.9**	21	24.6	24.5	20.9	25.6	24.4	23.9	22.8	26.2	23.6
		ab	ab	abcd	abcd	abcd	abcd	abcd	abc	d	a	abcd	abcd	ab	bcd	abcd	abcd	abc	cd	abc
Crunchy chocolate muesli	795	20.4	15.8	21.3	21.8	14.2	18.2	21.1	19.7	20.2	17.1	20.3	20.1	21.8	20.6	19.4	**23**	16.9	19.5	18.4
		d	abc	d	d	a	abcd	d	abcd	d	ab	cd	bcd	bcd	cd	abcd	d	abcd	abcd	abcd
Crunchy fruit muesli	833	16.4	15.8	18.3	18.2	14.3	15.7	18	14.2	20.4	16.1	19.3	16.1	17.4	19.3	19.4	**23**	18	19.6	16.5
		a	a	abc	abc	a	a	abc	a	bc	a	abc	ab	abc	abc	abc	c	abc	abc	ab
Crunchy muesli with nuts_seeds	358	13.4	13.3	**22**	18.9	12.9	14.2	11.7	12.8	18	14.9	12.5		13.9	17	14.3	21	15.2	16.5	16.4
		ab	ab	ab	ab	ab	ab	ab	ab	a	ab	b		ab	ab	ab	ab	ab	ab	ab
Filled cereals	328	27.3	27.1	30.8	28	19	25.5	29.6	24.7	29.5	25.3	29.7	**34.5**	25.7	26.5	28.5	27.5	27.6	32.2	30.8
		abc	ab	abc	abc	abc	abc	abc	a	abc	ab	abc	c	ab	ab	abc	abc	abc	abc	bc
High-fibre cereals	383	14.6	11.5	10.6	9.5	11.9	11.7	11.1	12.6	14.1	14	14.1	10.5	11.9	12.3	10.2	13.4	12.2	**15.2**	10.7
High-fibre fruit cereals	119	11	20.6		21.1		**22**	20.3	10.6	21.9	11.4	16.9	21.6	20.1	15.3	18.9	21.7	21.5	20.6	16.3
		ab	ab		ab		ab	ab	a	b	a	ab	ab	ab	ab	ab	ab	ab	ab	ab
Honey/caramel cereals	423	26.3	24.4	25.6	23	24.7	21.7	26.8	15	26.7	24.1	26.1	24.5	18	**30.5**	21.3	24.4	23	30.2	22.7
		abcd	abcd	abcd	abcd	abcd	abcd	acd	ab	cd	abcd	abcd	abcd	bc	d	abc	abcd	abcd	cd	abcd
Sweet cereal flakes	410	8.2	19	11.9	13	9.9	10.3	12.5	**19.1**	15.6	7.2	11	10.3	13.9	9.3	12.8	6.7	12.6	8.4	7.1
		abc	bd	abcd	abcd	abcd	abcd	abcd	abcd	d	a	abcd	abcd	bcd	abcd	abcd	abcd	bcd	ac	abc
Traditional muesli flakes	1921	13.3	14.7	**18.8**	12.7	13	14.5	15.9	12.4	14.6	13	14.4	15.9	16.7	15.5	16.9	18.1	12.8	13	13
		abcd	abcde	e	abc	abc	abcde	abde	ac	abcde	c	abcde	abcde	bde	abcde	abcde	de	abcde	abcd	ac

Saturated Fat

Table 15 presents the statistical differences and mean saturated fat content between countries among all relevant subcategories of breakfast cereals identified previously (14 subcategories). Subcategories considered as relevant but with no significative differences are identified on lines with a grey background.

It shows that the results are highly dependent on the subcategory and the country. It has to be noted that all the results should be analysed regarding the amount of data collected, which can vary considerably depending on the country and/or the subcategory.

It appears that on the 12 subcategories for which the Kruskal-Wallis test indicated a difference between countries (**Table 13**), the Dunn's post-hoc test (**Table 15**) did not have sufficient statistical power to identify which specific countries differed from one another for two subcategories: Chocolate and caramel cereals, and High-fibre fruit cereals (see **Annex 1**, p. 7, for the definition of the subcategories).

Figure 48 shows the distributions of saturated fat content for **Chocolate flavoured cereals** by country. The mean saturated fat content ranges from 1 g per 100 g (Denmark) to 1.6 g per 100 g (Belgium). Statistically there is no difference between countries in saturated fat content and the variability seems limited. However, there is still scope for reducing the saturated fat content of products in all countries.

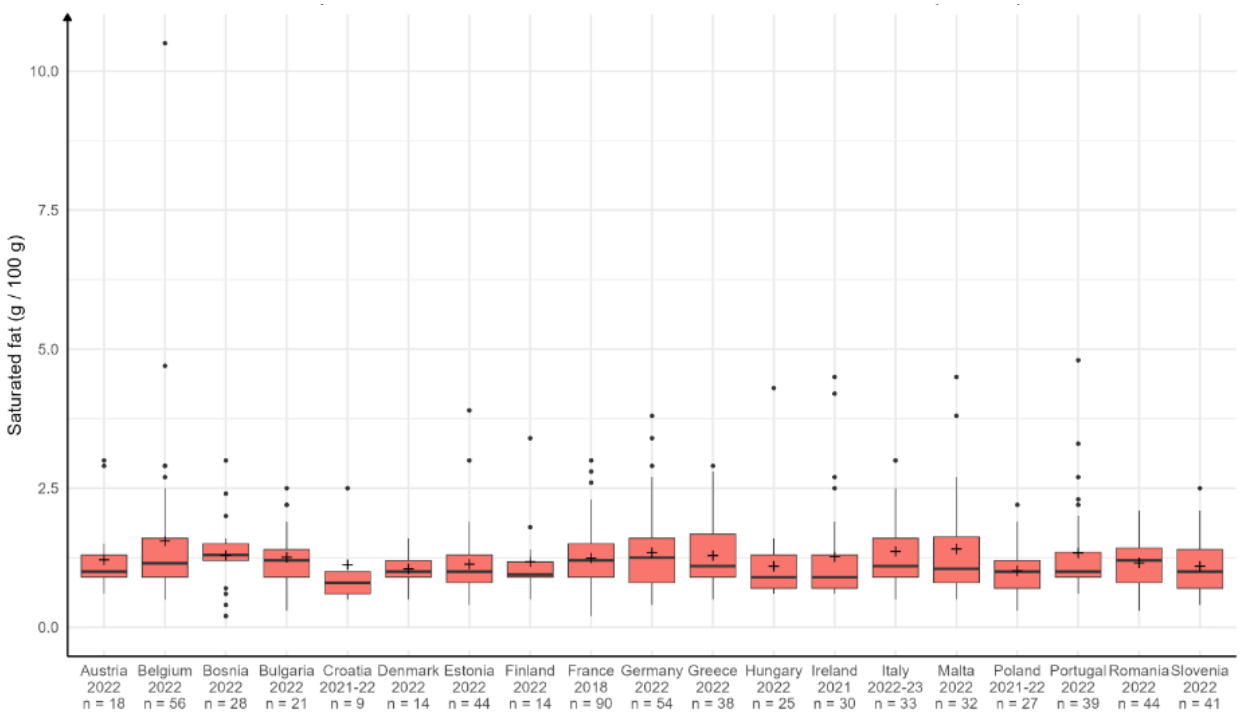

Figure 48: Distribution of saturated fat content for Chocolate flavoured cereals by country (total considered number of references:657) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Figure 49 shows the distribution of saturated fat content for **Traditional muesli flakes** by country. The mean saturated fat content ranges from 1.6 g per 100 g (Finland and Ireland) to 3.0 g per 100 g (Poland). Germany tends to have the products with highest saturated fat content while Ireland, Estonia and Romania tend to have those with the lowest saturated fat content. The wide dispersion of the collected values, with regard to the multiple outliers, indicates possible room for reformulation in all countries.

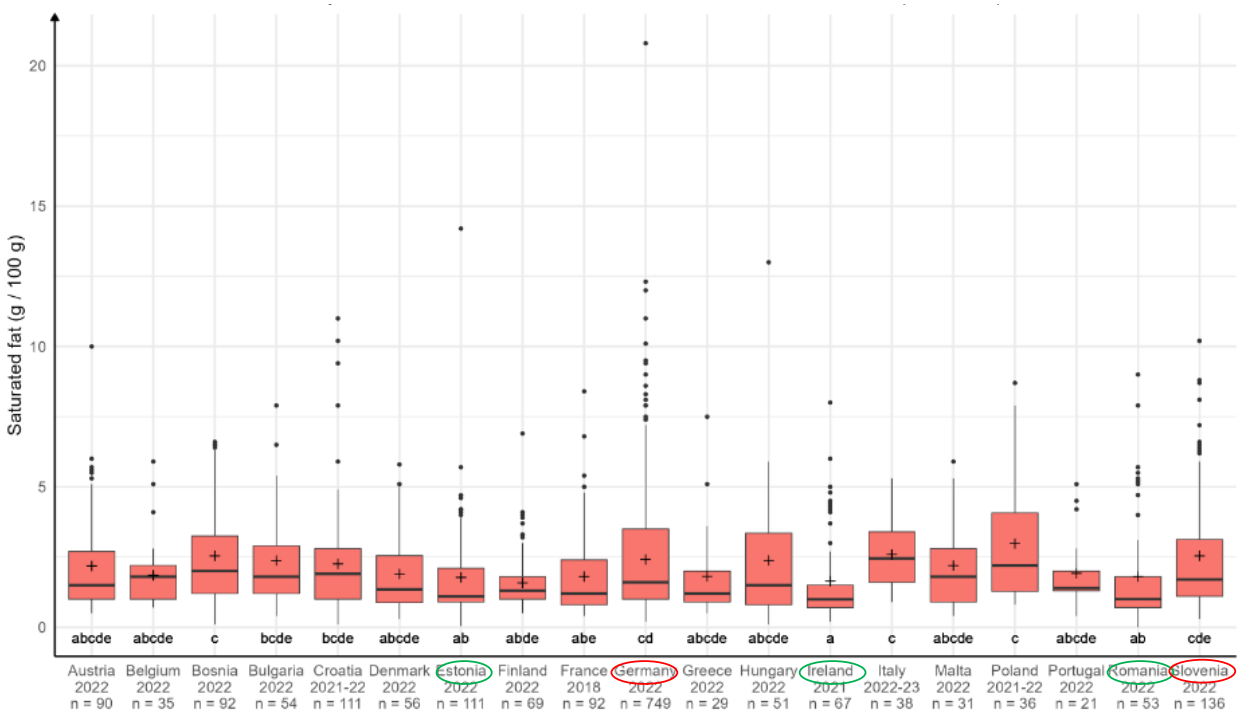

Figure 49: Distribution of saturated fat content for Traditional muesli flakes by country (total considered number of references:1921) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Table 15: Mean saturated fat content per country among relevant Breakfast cereals subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Malta	Poland	Portugal	Romania	Slovenia
Cereal flakes with chocolate_nuts	175	1	3.6	0.8	3.4	2.2	1	1.6	2.5	3.4	4.9	3.2	2.1	0.7	3.1	2.5	2	3.3	2.3	**6.8**
		ab	ab	ab	ab	ab	ab	a	ab	ab	ab	ab	ab	a	ab	ab	ab	ab	ab	b
Cereal flakes with fruit	48		0.3			0.7		1.4		0.3	0.5	1.1		0.4	0.6	0.6	4	2.2	**6.1**	
			ab			ab		ab		a	ab	ab		a	ab	ab	ab	ab	b	
Cereals without added sugar	852	1	0.9	0.6	1	0.9	1	0.8	**1.1**	0.5	0.5	**1.1**	0.9	0.9	0.9	**1.1**	1	1	0.8	0.9
		bcd	abcd	abc	abcd	abc	bd	bc	d	ac	a	bd	abcd	abcd	abcd	bd	bd	bd	abc	abcd
Chocolate and caramel cereals	60	1.3	1.3	1	1.8		1.1	0.9	2.6	1	2.1	2	1.1		1.2	**3.2**	1	2.6	1.1	1
		a	a	a	a		a	a	a	a	a	a	a		a	a	a	a	a	a
Chocolate-flavoured cereals	657	1.2	**1.6**	1.3	1.3	1.1	1	1.1	1.2	1.2	1.3	1.3	1.1	1.3	1.4	1.4	1	1.3	1.2	1.1
Crunchy chocolate muesli	795	795	5	5.1	3.2	6.7	5.3	4.7	**6.9**	6.5	5.2	5.1	5.2	5.8	6.5	6.4	5.3	5.9	4.5	5.8
			abcd	abcd	a	d	bcd	ab	cd	bcd	bcd	bcd	bcd	bcd	abcd	bcd	abcd	bcd	abc	bcd
Crunchy fruit muesli	834	834	3.9	4.6	2.4	4	4.4	3.8	4.7	3.1	4.5	4.6	4.5	4.3	3.5	**5.1**	4.7	4.4	4.1	3.8
			ab	b	a	ab	ab	ab	b	ab	b	b	ab	ab	ab	b	b	ab	ab	ab
Crunchy muesli with nuts_seeds	358	358	2.7	3	2	5.4	4	3.7	2.9	2.9	2.8	2.9	2.9		3.2	4.8	4.2	5.3	2.4	**5.6**
			ab	a	a	ab	ab	ab	ab	a	a	a	ab		ab	ab	ab	ab	a	b
Filled cereals	328	328	3.9	3.9	3	3.6	6.1	3.7	3.2	3.8	4.4	5.3	3.8	**6.8**	3.7	4	4.9	4.1	3.6	5.7
			ab	ab	ab	ab	ab	ab	a	ab	ab	b	ab	b	ab	ab	ab	ab	ab	ab
High-fibre cereals	385	0.8	0.7	0.6	0.7	0.6	0.6	0.9	0.9	0.8	1	0.6	1.1	0.7	0.8	0.7	**2.2**	0.8	0.9	0.8
High-fibre fruit cereals	119	0.3	2.8		2.9		0.5	2.2	0.8	2.5	0.4	2.5	1.7	1.8	0.6	2.3	**3.1**	2.7	1.9	2.8
		a	a		a		a	a	a	a	a	a	a	a	a	a	a	a	a	a
Honey/caramel cereals	423	0.7	0.5	0.9	0.9	**1.4**	0.6	0.8	0.8	0.5	1.1	1.1	1	0.7	0.5	0.6	**1.4**	0.8	0.7	0.6
		abc	ab	abc	abc	abc	abc	c	abc	a	bc	c	c	abc	abc	bc	bc	bc	abc	abc
Sweet cereal flakes	412	0.2	0.2	1.2	0.4	0.4	0.3	0.7	**1.3**	0.3	0.2	0.3	0.3	0.2	0.4	0.3	0.5	0.7	0.5	0.3
		abc	ab	de	abcde	abcde	abcde	acde	abcde	abc	b	abcde	abcde	abc	acde	abcd	cde	e	abcde	abcde
Traditional muesli flakes	1921	2.2	1.8	2.5	2.4	2.3	1.9	1.8	1.6	1.8	2.4	1.8	2.4	1.6	2.6	2.2	**3**	1.9	1.8	2.5
		abcde	abcde	c	bcde	bcde	abcde	ab	abde	abe	cd	abcde	abcde	a	c	abcde	c	abcde	ab	cde

Salt

Table 16 presents the statistical differences and the mean salt content between countries among all relevant subcategories of Breakfast cereals identified previously (14 subcategories). Subcategories considered as relevant but with no significative differences identified on lines with a grey background.

It shows that the results are highly dependent on the subcategory and the country. It has to be noted that all the results should be analysed regarding the amount of data collected, which can vary considerably depending on the country and/or the subcategory.

It appears that on the 11 subcategories for which the Kruskal-Wallis test revealed significant differences between countries (**Table 13**), the Dunn's post-hoc test (**Table 16**) did not have sufficient statistical power to identify the specific countries that differed from one another for one subcategory: Cereal flakes with chocolate_nuts (see **Annex 1**, p. 9, for the definition of the subcategory).

Figure 50 shows the distributions of salt content for **Chocolate flavoured cereals** by country. The mean salt content ranges from 0.38 g per 100 g (Romania) to 0.69 g per 100 g (Bosnia). Statistically there is no difference between countries in salt content but there is still a variation in salt content within countries. Thus, there is still room for reducing the salt content in all countries.

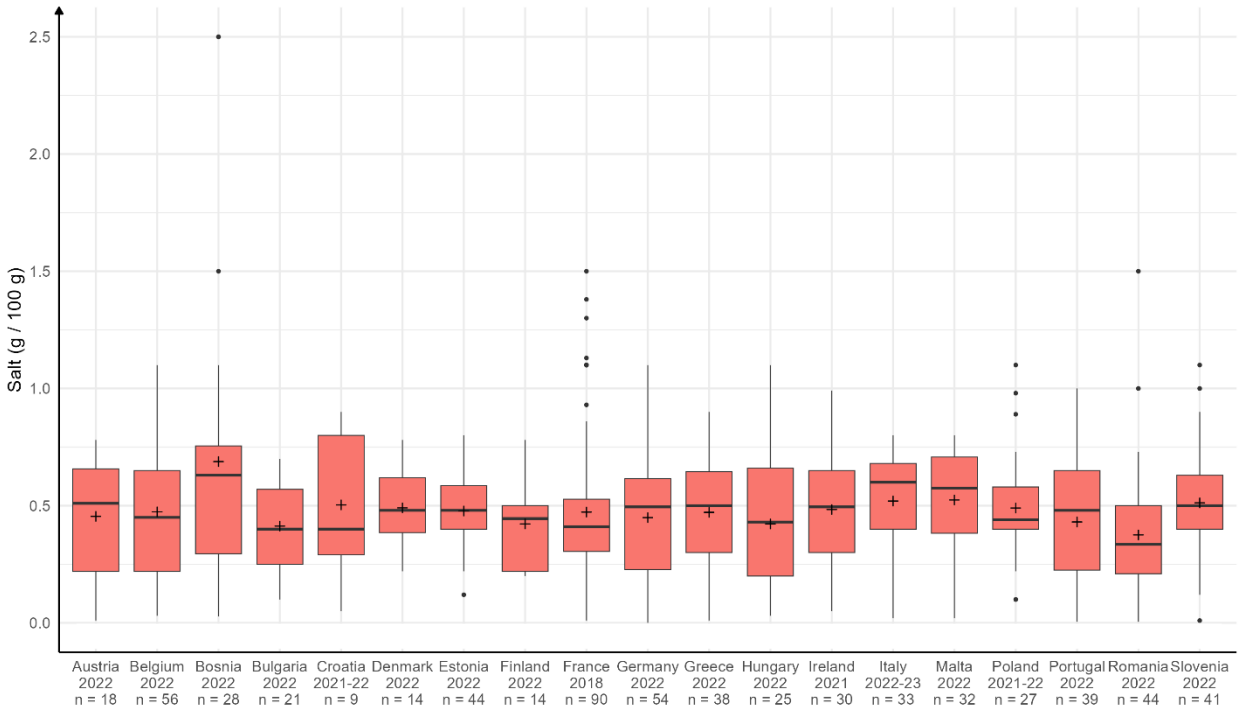

Figure 50: Distribution of salt content for Chocolate flavoured cereals by country (total considered number of references: 657) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Figure 51 shows the distribution of salt content for **Traditional muesli flakes** by country. The mean salt content ranges from 0.09 g per 100 g (Austria and Belgium) to 0.53 g per 100 g (Finland). Estonia, Bosnia, and Finland tend to have the products with highest salt content while Germany, Austria, France and Ireland tend to have those with the lowest salt content. It can be seen that there are notable differences in the averages salt content depending on the country and a wide variability, especially in Finland, Estonia, Bosnia and Hungary meaning that there is room for reformulation.

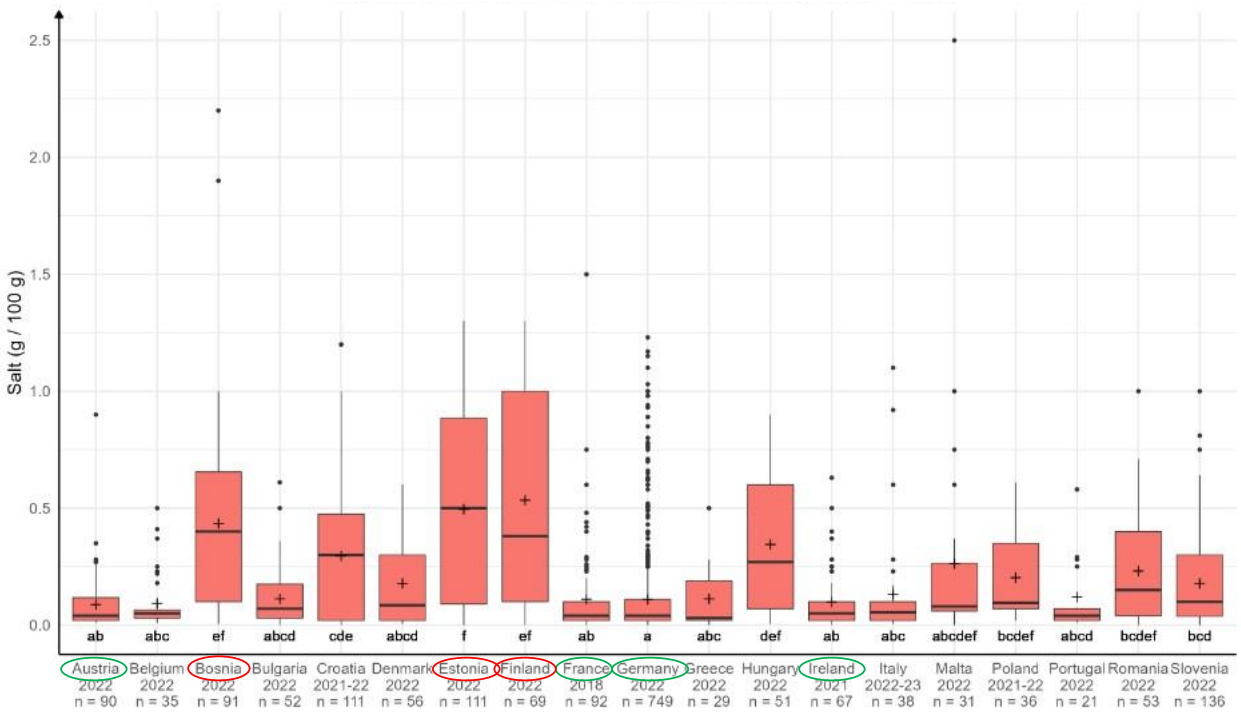

Figure 51: Distribution of salt content for Traditional muesli flakes by country (total considered number of references:1918) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Table 16: Mean salt content per country among relevant Breakfast cereals subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Malta	Poland	Portugal	Romania	Slovenia
Cereal flakes with chocolate_nuts	175	0.83	0.71	0.95	0.88	0.83	**1.2**	1.01	0.98	0.78	0.86	0.86	0.94	0.6	0.64	0.55	1.05	0.66	1.02	0.62
		a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Cereal flakes with fruit	48		0.84			0.3		1		0.8	0.93	**1.09**		0.74	0.79	0.7	1	0.65	0.45	
Cereals without added sugar	843	0.09	0.12	0.34	0.02	0.06	0.06	0.08	0.16	**0.72**	0.46	0.1	0.09	0.05	0.08	0.23	0.01	0.28	0.29	0.19
		abcde	bde	abcde	abcde	bcde	ac	abc	a	de	e	abcde	abcde	bde	abc	abcde	abcd	de	de	abcd
Chocolate and caramel cereals	60	0.49	0.46	0.5	0.44		0.45	0.46	0.45	0.49	0.48	0.52	0.45		0.44	**0.56**	0.42	0.48	0.45	0.34
Chocolate-flavoured cereals	657	0.45	0.47	**0.69**	0.41	0.5	0.49	0.48	0.42	0.47	0.45	0.47	0.42	0.48	0.52	0.52	0.49	0.43	0.38	0.51
Crunchy chocolate muesli	795	0.38	0.23	0.46	0.2	0.36	0.29	0.31	0.41	0.26	0.21	0.39	0.3	**0.54**	0.38	0.22	0.37	0.23	0.27	0.33
		ad	bc	d	abcd	abcd	abcd	abcd	abcd	bc	b	acd	abcd	acd	abcd	abc	abcd	abcd	abcd	acd
Crunchy fruit muesli	833	0.3	0.23	0.28	0.22	0.16	0.26	0.26	**0.39**	0.24	0.18	0.28	0.36	0.18	0.25	0.21	0.31	0.22	0.32	0.27
		abc	abc	abc	abc	ab	abc	abc	c	ab	a	abc	abc	ab	abc	ab	bc	abc	abc	abc
Crunchy muesli with nuts_seeds	358	0.32	0.11	0.46	0.26	0.22	0.31	0.39	0.47	0.18	0.32	**0.74**		0.26	0.45	0.31	0.22	0.19	0.23	0.39
		abc	a	abc	abc	abc	bc	abc	b	ac	bc	bc		abc	b	abc	abc	abc	abc	bc
Filled cereals	328	0.59	0.7	0.42	0.36	0.16	**0.81**	0.66	0.69	0.62	0.45	0.55	0.57	0.6	**0.81**	0.55	0.32	0.59	0.52	0.48
		abc	ab	abc	ac	abc	abc	abc	abc	abc	ac	abc	abc	abc	b	abc	c	abc	abc	abc
High-fibre cereals	385	0.57	0.75	0.43	0.43	0.82	0.79	0.69	0.61	0.73	0.65	0.87	**0.93**	0.5	0.79	0.46	0.78	0.66	0.58	0.58
		abc	abc	abc	abc	abc	a	abc	abc	abc	abc	abc	ab	bc	abc	c	abc	abc	abc	abc
High-fibre fruit cereals	119	0.59	0.62		0.69		0.3	0.55	0.6	**1.06**	0.11	0.62	0.62	0.52	0.56	0.68	0.55	0.67	0.64	0.67
		abc	abc		abc		ab	abc	abc	c	a	abc	abc	ab	abc	abc	abc	bc	abc	abc
Honey/caramel cereals	421	0.44	0.59	**1.1**	0.67	0.54	0.61	0.62	0.88	0.47	0.27	0.79	0.6	0.63	0.4	0.73	0.63	0.5	0.46	0.55
		ab	b	ab	ab	ab	ab	b	b	ab	a	b	ab	b	ab	b	ab	ab	ab	ab
Sweet cereal flakes	410	1.05	0.88	1.22	1.13	1.15	1.13	1.36	1.05	1.2	1.08	1.36	1.37	0.78	1.15	1.15	**1.7**	1.13	1.09	1.52
		abc	bc	abc	abc	abc	abc	c	abc	bc	abc	bc	abc	a	abc	abc	c	abc	abc	c
Traditional muesli flakes	1918	0.09	0.09	0.43	0.11	0.3	0.18	0.5	**0.53**	0.11	0.11	0.11	0.34	0.1	0.13	0.26	0.2	0.12	0.23	0.18
		ab	abc	ef	abcd	cde	abcd	f	ef	ab	a	abc	def	ab	abc	abcdef	bcdef	abcd	bcdef	bcd

Fibre

Table 17 presents the statistical differences and the mean fibre content between countries among all relevant subcategories of Breakfast cereals identified previously (14 subcategories). Subcategories considered as relevant but with no significative differences identified on lines with a grey background.

It shows that the results are highly dependent on the subcategory and the country. It has to be noted that all the results should be analysed regarding the amount of data collected, which can vary considerably depending on the country and/or the subcategory.

It appears that on the 9 subcategories for which the Kruskal-Wallis test revealed significant differences between countries (**Table 13**), the Dunn's post-hoc test (**Table 17**) did not have sufficient statistical power to identify the specific countries that differed from one another for two subcategories: Crunchy muesli with nuts_seeds and Honey/caramel cereals (see **Annex 1**, p. 8 & 6, for the definition of the subcategories).

Figure 52 shows the distributions of fibre content for **Chocolate flavoured cereals** by country. The mean fibre content ranges from 3.2 g per 100 g (Croatia, but n=7) to 6.9 g per 100 g (Poland). Statistically Austria, Belgium, Germany, and Poland tend to have the products with the highest fibre content. Conversely, Croatia (but n=7) tends to have the products with the lowest fibre content. Overall, the observed differences across countries and the important variability within most of them indicate possible room for reformulation to increase fibre content by following the example of those with the most virtuous fibre content.

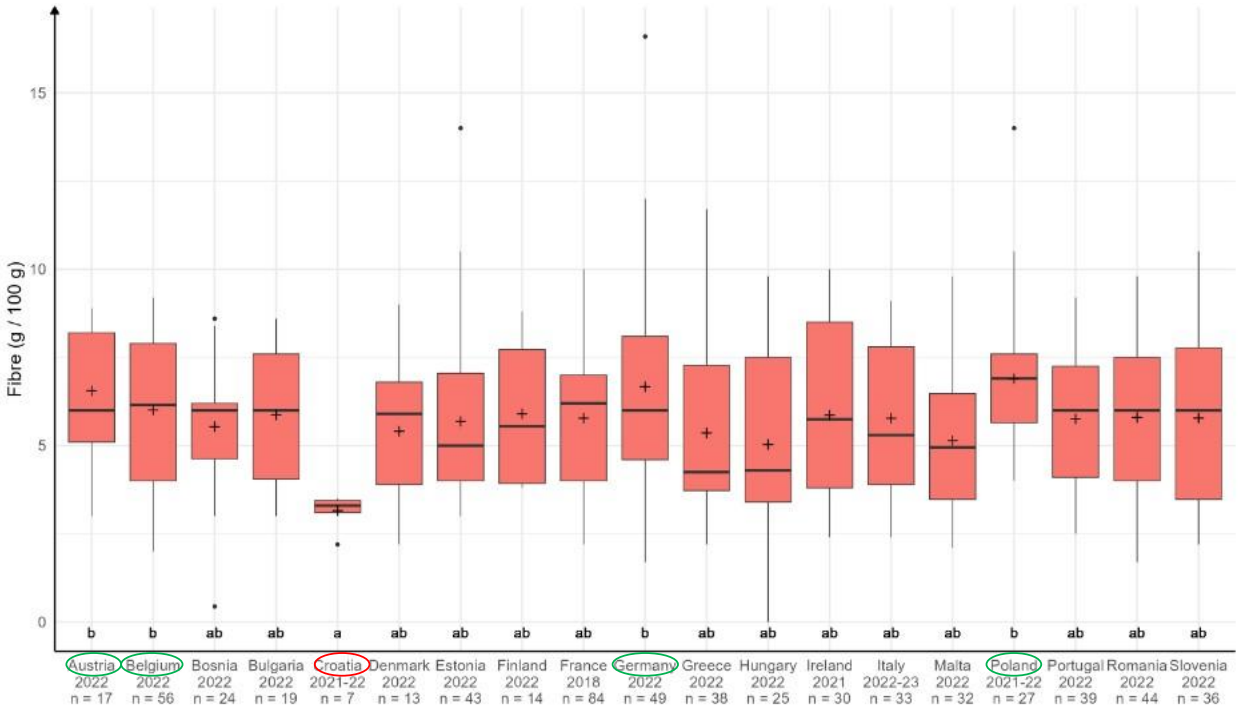

Figure 52: Distribution of fibre content for Chocolate flavoured cereals by country (total considered number of references: 630) (green circle: countries whose average levels are statistically among the highest; red circle: countries whose average levels are statistically among the lowest)

Figure 53 shows the distributions of fibre content for **Traditional muesli flakes** by country. The mean fibre content ranges from 6.3 g per 100 g (Hungary) to 10.3 g per 100 g (Finland and Portugal). Finland and Germany tend to have the products with highest fibre content while Bosnia and Hungary tend to have those with the lowest fibre content. It can be seen that there is a wide dispersion of the fibre value both within and between countries, meaning that there is room for reformulation to increase fibre content by following the example of those with the most favourable fibre content.

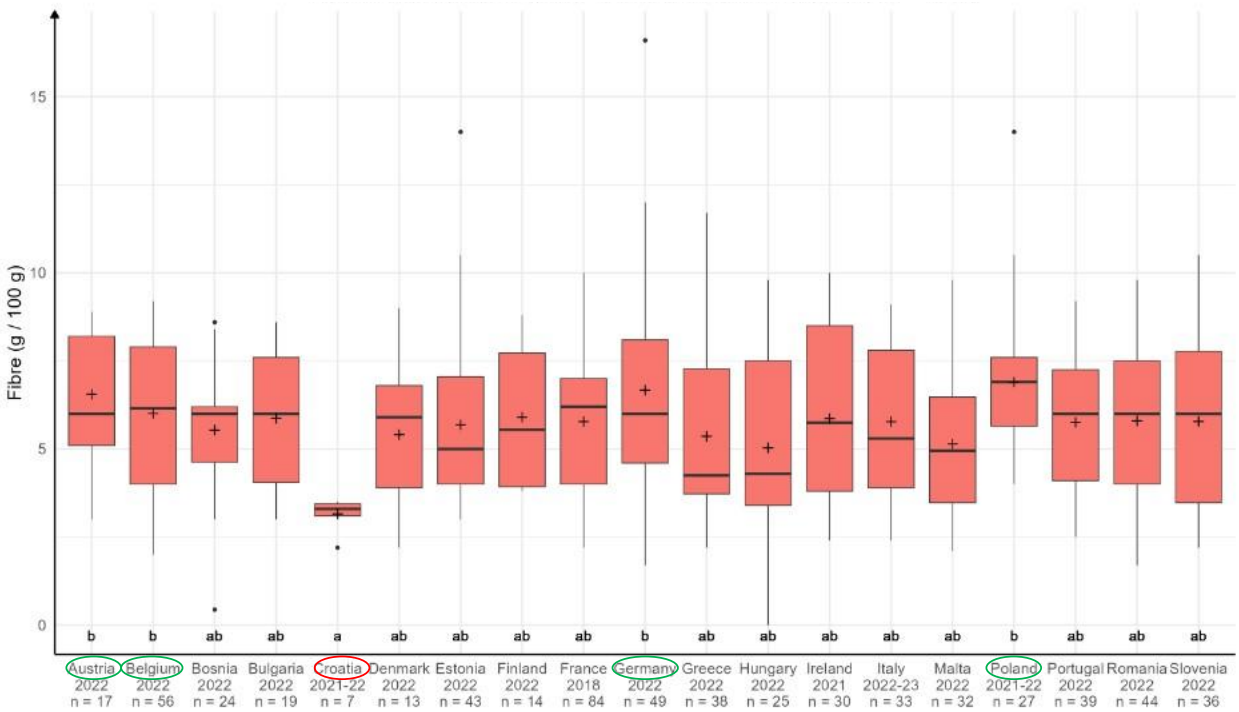

Figure 53: Distribution of fibre content for Traditional muesli flakes by country (total considered number of references:1754) (green circle: countries whose average levels are statistically among the highest; red circle: countries whose average levels are statistically among the lowest)

Table 17: Mean fibre content per country among relevant Breakfast cereals subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Malta	Poland	Portugal	Romania	Slovenia
Cereal flakes with chocolate_nuts	166	6	6.8	4.8	**8.4**	4.9	4	4.8	5.4	5.9	6	6.3	5.7	3	7.1	5.9	4.7	6.3	6.3	6.3
Cereal flakes with fruit	45		5.6			6.2		5.5		4.9	5.7	4.8		4.3	5.1	4.7	4	4.8	4.3	
Cereals without added sugar	789	8.2	8.8	10.4	7.7	7.6	9.9	9.5	10.7	9.3	6.9	10	9.8	8.9	10.7	8.4	9	8.2	**10.8**	9.4
		abc	abc	abcd	abcd	ab	acd	cd	d	abcd	b	abcd	abcd	ab	abc	abcd	abcd	abc	acd	acd
Chocolate and caramel cereals	58	5.8	6	5.5	6.6		**8.6**	6.5	6.6	6.1	7.7	5.9	6.6		4.7	5.8	7	5.8	6.6	5.6
Chocolate-flavoured cereals	630	6.6	6	5.5	5.9	3.2	5.4	5.7	5.9	5.8	6.7	5.4	5	5.9	5.8	5.1	**6.9**	5.8	5.8	5.8
		b	b	ab	ab	a	ab	ab	ab	ab	b	ab	ab	ab	ab	ab	b	ab	ab	ab
Crunchy chocolate muesli	732	7.9	8.6	7.6	6.7	7.8	**10.5**	7.9	7.1	7.4	8.3	7.9	7.8	5.8	7.5	7.4	7.6	8.6	7.8	7.8
		abc	abc	abc	ab	abc	bc	ab	abc	ab	c	abc	ab	a	abc	abc	abc	abc	abc	abc
Crunchy fruit muesli	783	8.4	8.3	8.9	7.4	9.5	11.2	8.9	**11.5**	7.5	8.6	7.4	8.9	8	7.1	7.3	7.2	9	7.5	7.8
		abcd	abcd	abcd	abcd	abcd	ad	abc	d	b	acd	abc	abcd	abc	bc	b	abc	abcd	abc	abc
Crunchy muesli with nuts_seeds	334	9.3	8	7	6.6	8.3	9.9	10.4	**11.1**	7.1	8.9	8.3		8.9	8.5	7.3	7	8.9	7.4	7.2
		a	a	a	a	a	a	a	a	a	a	a		a	a	a	a	a	a	a
Filled cereals	305	4.5	4.5	4	4.6		4.1	4.2	4.2	5.1	4.6	**5.8**	3.6	3.4	3.8	4.3	5.1	5.7	4.5	4.3
		abc	abc	abc	abc		abc	abc	abc	c	abc	c	a	ab	abc	ab	abc	bc	abc	abc
High-fibre cereals	381	8.2	11.2	7.8	10.3	12	11.5	10.2	10	**14.4**	8.7	14.4	10.3	11.4	14.1	11.1	7.6	12.9	8	12.6
High-fibre fruit cereals	119	6.3	8.7		7		**20.5**	11.3	9	8.4	11.2	9.9	7.5	8.8	10.9	8.5	7.5	10.5	8.9	8
Honey/caramel cereals	402	5.7	4.9	2	**6.7**	4.4	4.7	4.8	3.4	4.4	5.6	5.4	4.7	4.4	5.1	5.1	6	5	4.9	6.3
		a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Sweet cereal flakes	387	4.3	3.3	**4.9**	3.5	5.6	3.3	3.2	3.9	3.5	3.7	3.4	3.2	2.9	3.6	4.3	2.8	4.7	4.1	4
		abcd	abcd	abcd	abcd	d	abcd	ab	abcd	abcd	abcd	abcd	abcd	a	abcd	abcd	abc	cd	bcd	bcd
Traditional muesli flakes	1754	9.6	8.9	6.5	8	8.3	9.5	9	**10.3**	9.3	10	9.3	6.3	7.2	9.3	9.2	9.4	**10.3**	8.1	9.5
		de	cde	a	abcd	bcd	de	d	e	de	e	de	ab	abc	bcd	cde	de	de	bcd	de

Synthesis and links to the national nutritional policies linked to breakfast cereals

Table 18 summarises the global ranking of the median at the category level (see methodology in section 2.1.2) and the implementation of specific national nutritional measures (as defined in section 2.1.2) related to breakfast cereals and the targeted nutrients content (sugar, saturated fat, salt and fibre) for each studied country. It should be noted that the rankings and conclusions presented in this section are based on categories (and not subcategories); they therefore do not accurately reflect the quality of the food offer by country. Furthermore, no direct causal link between the global ranking and policies can be established in this section.

Overall, for breakfast cereals, for countries considered as low in the tier position, there is not always but frequently a public policy in place, which is always an incentive one (front of pack labelling or collective agreement). For countries considered as high in the tier position, there is less often a public policy in place. Three countries out of 19 have implemented regulatory measures for breakfast cereals: Finland for salt (classified as high); Romania and Hungary, with both a sugar tax and both classified as high for this nutrient. For Romania, the measure has been taken after the data collection). In Finland, there is additional mandatory statement that must be clearly displayed on breakfast cereals exceeding a salt limit.

Efforts to improve the food supply are still possible in all countries, regardless of the country's position and the policies already implemented or not.

Table 18: Summary of country-level positioning (tier position when comparing the median content) and national nutritional policies on Breakfast cereals, by nutrient

COUNTRY	Collection Year	SUGAR		SATURATED FAT		SALT		FIBRE	
		Tier Position	Type of measure(s)	Tier Position	Type of measure(s)	Tier Position	Type of measure(s)	Tier Position	Type of measure(s)
Austria	2022	Mid		Mid		Mid		High	
Belgium	2022	Mid	Collective agreement (2012-2017); FOP (Nutri-Score: 2019)	Mid	FOP (Nutri-Score: 2019)	Mid	FOP (Nutri-Score: 2019)	High	Collective agreement (2012-2017); FOP (Nutri-Score: 2019)
Bosnia	2022	High		Low		High		Mid	
Bulgaria	2022	Mid		High		Mid		Mid	
Croatia	2021-22	Low		Mid		Mid		Mid	
Denmark	2022	Mid	Collective agreement (2007); FOP (Keyhole: 2009)	Mid	Collective agreement (2007); FOP (Keyhole: 2009)	Mid	Collective agreement (2007); FOP (Keyhole: 2009)	Mid	Collective agreement (2007); FOP (Keyhole: 2009)
Estonia	2022	High		Mid		High		Mid	
Finland	2022	Low	FOP (Heart symbol: 2000)	Low	FOP (Heart symbol: 2000)	High	FOP (Heart symbol: 2000); legal threshold + mandatory label (2014)	Mid	FOP (Heart symbol: 2000)
France	2018	High	FOP (Nutri-Score: 2017)	Low	FOP (Nutri-Score: 2017)	Mid	FOP (Nutri-Score: 2017)	Mid	FOP (Nutri-Score: 2017)
Germany	2022	Low	Collective agreement (2019-2025); FOP (Nutri-Score: 2020)	Mid	Collective agreement (2019-2025); FOP (Nutri-Score: 2020)	Low	Collective agreement (2019-2025); FOP (Nutri-Score: 2020)	High	FOP (Nutri-Score: 2020)
Greece	2022-23	High		Mid		Mid		Mid	
Hungary	2022	High	Tax (2011 updated 2022)	High		High		Low	
Ireland	2021	Mid		Low		Low		Low	
Italy	2022-23	Mid	Collective agreement (2017)	High	Collective agreement (2017)	Mid	Collective agreement (2017)	Low	
Malta	2022-23	Mid		High		Mid		Low	
Poland	2021-22	High		High		High		Mid	
Portugal	2022	Mid	Collective agreement (2019-2022)	Mid		Mid	Collective agreement (2019-2022)	Mid	
Romania	2022	High	Tax (2024)	Mid		Mid		Mid	
Slovenia	2022	Mid		Mid		Mid		Mid	

green: countries ranked in the top tier; yellow: countries ranked in the middle tier; red: countries in the bottom tier. Collective agreement: jointly negotiated commitment between a government authority and representatives of an industry / FOP: front-of-pack labelling / Tax: legal nutritional tax imposed by government / Legal limit: maximum level beyond which the product cannot be marketed. / Legal threshold + mandatory label: threshold beyond which a mandatory label must be applied.

Sugar

Overall, based on the median ranking for the category (for the 13 considered subcategories), Germany, Finland and Croatia tend to have the least sweet breakfast cereals, while Bosnia, France, Poland, Romania, Estonia, Greece and Hungary tend to have the sweetest breakfast cereals.

If these results are examined in light of the health policies implemented in each country regarding the sugar content of breakfast cereals, it can be seen that, of the 19 countries included in the analyses, nine of them stated that they had at least one of the targeted measures relating to the sugar content in breakfast cereals:

- Two are among the countries with the least sweet breakfast cereals (Low):
    - Germany had a national reduction strategy covering the period 2019–2025 and has had the Nutri-Score labelling since 2020;
    - Finland has had the Heart Symbol labelling since 2000.

- Three are among the ones with the sweetest breakfast cereals (High):
    - Hungary has had a sugar tax in 2011, that applies to products with more than 15 g of added sugar per 100 g;
    - France has had the Nutri-Score since 2017;
    - Romania has had a sugar tax in 2024 (after the studied data collection).

- Four are ranked with intermediate results (Mid):
    - Belgium had an agreement with the food sector (2012–2017) aimed at reducing the sugar content of food by 4% and has had the Nutri-Score labelling since 2019;
    - Denmark has had the Keyhole labelling since 2009 and had a collective agreement on sugar content (2007);
    - Italy had a collaboration with industries to limit sugar content of foods (2017);
    - Portugal had a food reformulation plan (2019–2022) aimed at reducing sugar content by 10%.

No specific measures were reported for 10 countries: Austria (Mid), Bosnia (High), Bulgaria (Mid), Croatia (Low), Estonia (High), Greece (High), Ireland (Mid), Malta (Mid), Poland (High), and Slovenia (Mid).

Saturated fat

Overall, based on the median ranking for the category (for the 14 considered subcategories), Ireland, Bosnia, France and Finland tend to have the breakfast cereals with lowest saturated fat content, while Bulgaria, Poland, Hungary, Malta and Italy tend to have the breakfast cereals with the highest saturated fat content.

If these results are examined in light of the health policies implemented in each country regarding the saturated fat content of breakfast cereals, on the 19 countries included in the analyses, six of them stated that they had at least one of the targeted measures relating to the saturated fat content in breakfast cereals:

- Two are ranked among the country with the lowest saturated fat content (Low):
    - Finland has had the Heart Symbol labelling since 2000;
    - France has had the Nutri-Score labelling since 2017.

- One is ranked among the countries with highest saturated fat content (High):
    - Italy had a collaboration with industries to limit saturated fat content of foods (2017).

- Three are ranked with intermediate results (Mid):
    - Germany had a national reduction strategy covering the period 2019–2025 and has had the Nutri-Score labelling since 2020;
    - Denmark has had the Keyhole labelling since 2009 and had a collective agreement (2007);
    - Belgium has had the Nutri-Score since 2019.

No specific measures were reported for 13 countries: Austria (Mid), Bosnia (Low), Bulgaria (High), Croatia (Mid), Estonia (Mid), Greece (Mid), Hungary (High), Ireland (Low), Malta (High), Poland (High), Portugal (Mid), Romania (Mid), and Slovenia (Mid).

Salt

Overall, based on the median ranking for the category (for the 14 considered subcategories), Ireland and Germany tend to have the breakfast cereals with lowest salt content, while Estonia, Hungary, Bosnia, Finland and Poland tend to have the breakfast cereals with the highest salt content.

If these results are examined in the light of the health policies implemented in each country regarding the salt content of breakfast cereals, on the 19 countries included in the analyses, seven of them stated that they had at least one of the targeted measures relating to the salt content in breakfast cereals:

- One is ranked among the country with the lowest salt content (Low):
    - Germany had a national reduction strategy covering the period 2019–2025 and has had the Nutri-Score labelling since 2020.

- One is ranked among the countries with the highest salt content (High):
    - Finland introduced a legal threshold beyond which a mandatory 'high in salt' label must be applied and has had the Heart symbol labelling since 2000.

Five are ranked with intermediate results (Mid):

- Belgium has had the Nutri-Score labelling since 2019;
- Denmark has had the Keyhole labelling since 2009 and had a collective agreement (2007);
- France has had the Nutri-Score labelling since 2017;
- Italy had a collaboration with industries to limit salt content of foods (2017);
- Portugal had a food reformulation plan (2019–2022) aimed at reducing salt content by 10%.

No specific measures were reported for 12 countries: Austria (Mid), Bosnia (High), Bulgaria (Mid), Croatia (Mid), Estonia (High), Greece (Mid), Hungary (High), Ireland (Low), Malta (Mid), Poland (High), Romania (Mid), and Slovenia (Mid).

Fibre

Overall, based on the median ranking for the category (for the 14 considered subcategories), Germany, Austria and Belgium tend to have the breakfast cereals with highest fibre content, while Ireland, Hungary, Malta, and Italy tend to have the breakfast cereals with the lowest fibre content.

If these results are examined in the light of the health policies implemented in each country regarding the fibre content of breakfast cereals, on the 19 countries included in the analyses, five of them stated that they had at least one of the targeted measures relating to the fibre content in breakfast cereals:

- Two are ranked among the countries with the highest fibre content (High):
    - Belgium had an agreement with the food sector (2012–2017) aimed at increasing the fibre content of food by 5% and the proportion of whole grain by 8.5% and has had the Nutri-Score labelling since 2019;
    - Germany has had the Nutri-Score labelling since 2020.

- Three are ranked with intermediate results (Mid):
    - Denmark has had the Keyhole labelling since 2009 and had a collective agreement (2007);
    - Finland has had the Heart Symbol labelling since 2000;
    - France has had the Nutri-Score labelling since 2017.

No specific measures were reported for 14 countries: Austria (High), Bosnia (Mid), Bulgaria (Mid), Croatia (Mid), Estonia (Mid), Greece (Mid), Hungary (Low), Ireland (Low), Italy (Low), Malta (Low), Poland (Mid), Portugal (Mid), Romania (Mid), and Slovenia (Mid).

2.2.3.3. Delicatessen meats and similar

Table 19 summarises the statistical differences in mean nutrient content observed across the 18 subcategories of the Delicatessen meats and similar for the two nutrients of interest. Some subcategories considered not relevant to be presented (e.g., “other” subcategories that grouped very different products and/or those with very few products in all data collections) are shown in grey.

Therefore, the upcoming analysis focuses on 14/18 subcategories for saturated fat and salt.

Most subcategories show statistically significant differences in mean nutrient content across countries:

- 100% of the considered subcategories for saturated fat (14/14);
- 93% of the considered subcategories for salt (13/14).

The detailed results of the mean by country for the relevant subcategories are presented in the following part nutrient by nutrient.

For reasons of readability, a selection of boxplots for 2 subcategories (chosen based on their representativeness (e.g., products collected in most countries), and the ease of understanding of the definition of included products) is presented in this report: Pork belly and bacon (packaged) and Dry sausage.

Descriptive tables for all Delicatessen meats and similar subcategories are available in **Annex 5**.

Table 19: Summary of nutrient differences across subcategories of Delicatessen meats and similar

Subcategory	SATURATED FAT (n = 16,386)				SALT (n = 16,405)			
	n	countr	p	signif	n	countr	p	signif
Alternative products without animal protein	374	18	4E-07	***	374	18	2E-09	***
Assortment of delicatessen meats	188	15	4E-03	**	188	15	2E-02	*
Chorizo	449	15	1E-03	**	450	15	3E-13	***
Cooked beef (packaged)	153	13	5E-14	***	153	13	2E-05	***
Cooked pork ham and roast (packaged)	1,684	17	5E-34	***	1,685	17	8E-70	***
Cured ham	1,217	17	3E-14	***	1,217	17	4E-16	***
Dried, smoked or cured beef	280	16	3E-08	***	282	16	5E-08	***
Dried, smoked or cured pork	550	17	5E-15	***	560	17	2E-15	***
Dry sausage	3,354	17	1E-98	***	3,350	17	5E-158	***
Other cooked meats (packaged)	190	11	4E-04	***	190	11	4E-07	***
Other cured meats	42	9	4E-02	*	42	9	7E-03	**
Pepperoni	52	10	2E-03	**	52	10	3E-01	NS
Pork belly and bacon (packaged)	1,219	18	4E-102	***	1,226	18	4E-27	***
Poultry ham and roast (packaged)	1,070	17	3E-08	***	1,070	17	3E-50	***
Poultry lardons	53	5	1E-02	**	53	5	4E-04	***
Preserved pork or poultry liver (canned)	18	1	NA		19	2	1E-01	NS
Pâté	1,534	17	1E-74	***	1,534	17	4E-39	***
Sausages	3,959	18	4E-25	***	3,960	18	9E-70	***

*"n": number of references; "countr": number of countries compared; "p": p value for the Kruskal-Wallis test; NA = not applicable; "signif": NS = not significant; * for 0.01 < p ≤ 0.05, ** for 0.001 < p ≤ 0.01, *** for p ≤ 0.001.*
Categories in grey are the less relevant ones for comparisons: they are not discussed in the report.

Saturated fat

Table 20 presents the statistical differences and the mean saturated fat content between countries among all relevant subcategories of Delicatessen meats and similar identified previously (14 subcategories).

It shows that the results are highly dependent on the subcategory and the country. It has to be noted that all the results should therefore be analysed regarding the amount of data collected, which can vary considerably depending on the country and/or the subcategory.

It also appears that on the 14 subcategories for which the Kruskal-Wallis test indicated a difference between countries (**Table 19**), the Dunn's post hoc test (**Table 20**) had sufficient statistical power to identify which specific countries differed from one another.

Figure 54 shows the distributions of saturated fat content for **Pork belly and bacon (packaged)** by country. The mean saturated fat content ranges from 5 g per 100 g (Ireland) to 19 g per 100 g (Croatia, but n=4). Regarding the countries that statistically differ from the others, Austria, Hungary and Italy tend to have the products with the highest saturated fat content, while Ireland tends to have the products with the lowest saturated fat content. For all countries, saturated fat

contents are quite high and the observed range of values (particularly in Estonia, Bulgaria and Romania) suggests possible reformulation.

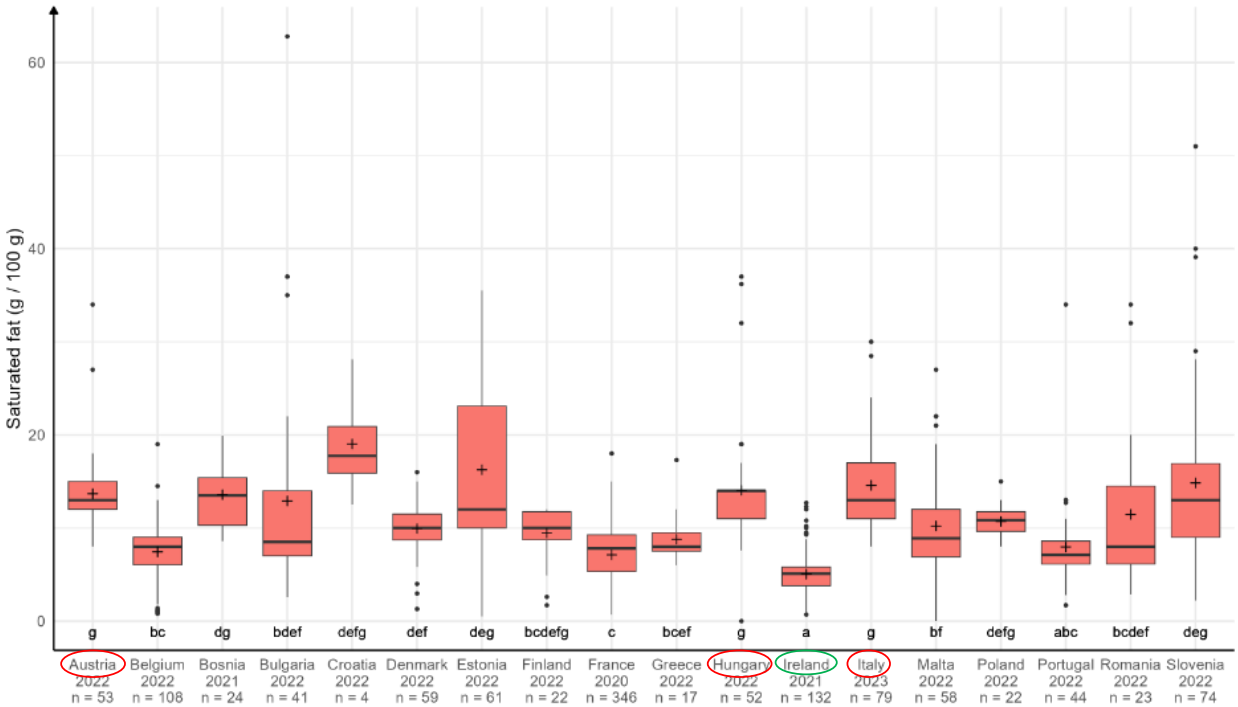

Figure 54: Distribution of saturated fat content for Pork belly and bacon (packaged) by country (total considered number of references:1219) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Figure 55 shows the distributions of saturated fat content for **Dry sausage** by country**.** The mean saturated fat content ranges from 11.7 g per 100 g (Malta) to 17.1 g per 100 g (Hungary). Regarding the countries that statistically differ from the others, Austria and Hungary tend to have the products with the highest saturated fat content, while Malta and Italy tend to have the products with the lowest saturated fat content. For all countries, saturated fat contents are quite high and the observed range of values suggests possible reformulation.

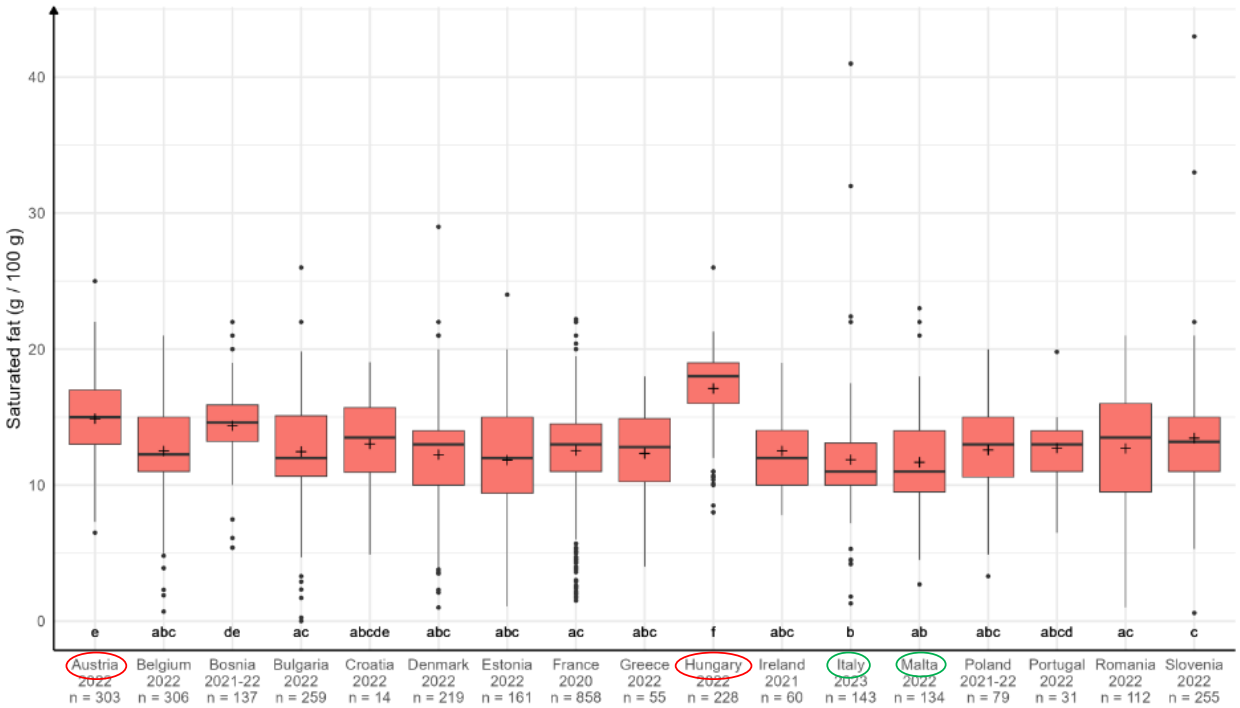

Figure 55: Distribution of saturated fat content for Dry sausage by country (total considered number of references:3354) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Table 20: Mean Saturated fat content per country among relevant Delicatessen meats and similar subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Greece	Hungary	Ireland	Italy	Malta	Poland	Portugal	Romania	Slovenia
Alternative products without animal protein	374	3	1.7	2.7	2.2	2.3	1.5	2.8	0.9	2.6	1.9	2.8	1.9	3.2	**7.8**	1.3	2.4	2.7	1.6
		ab	a	ab	ab	ab	a	a	ab	ab	ab	ab	a	ab	ab	a	ab	b	a
Chorizo	449	11.1	**13.5**		12		12	13.1	9.4	13.2	12.7	11.8	12.7		13	8.1	11.7	**13.5**	**13.5**
		abc	bc		abc		abc	abc	abc	b	abc	abc	abc		abc	a	ac	abc	abc
Cooked beef (packaged)	153	2.5	7.3	6.3	**11.2**		1.3	4.4		3.5	6.8	4.5	1.9		6.5	6			4.7
		abcd	cd	abcd	d		a	bcd		abc	bcd	abcd	ab		d	abcd			abcd
Cooked pork ham and roast (packaged)	1684	2.1	1.5	2.2	1.8	**5.9**	1.7	3.7		1.7	1.5	2.1	1.1	2.7	2.6	1.6	1.4	2.4	2.1
		bcd	b	bc	b	abcd	b	d		b	abc	bcd	a	cd	b	b	ab	bcd	bc
Cured ham	1217	6.1	5.1	**8.7**	5.2	5.7	5.3	5.3		5.5	5.4	5.5	5	5.7	5.2	4.8	5.7	5.1	6.5
		abe	cd	e	abcd	abcde	acd	c		acd	abcd	abcd	c	abd	acd	cd	acd	abcd	be
Dried, smoked or cured beef	280	1.7	1.6	**4.3**	1.1		1.5	2.9		1.8	1.5	0.7	0.7	1.3	2.3	1.6	1.7	1.8	1.7
		ab	a	c	a		ab	bc		ab	abc	abc	abc	a	abc	abc	abc	abc	ab
Dried, smoked or cured pork	550	5.6	5.4	6	3.3	2.6	3.2	6.5		6.2	2.9	4.7	5.3	**12.5**	6.7	7.2	7	2.7	6.2
		ab	ab	b	a	abc	a	abc		b	ab	ab	ab	c	abc	abc	b	ab	b
Dry sausage	3354	14.9	12.5	14.4	12.5	13	12.2	11.8		12.5	12.3	**17.1**	12.5	11.9	11.7	12.6	12.7	12.7	13.5
		e	abc	de	ac	abcde	abc	abc		ac	abc	f	abc	b	ab	abc	abcd	ac	c
Pepperoni	52	12.9	8.5	14.2			16.5	8.7				**19.2**	15.7		16	19	7.7		
		ab	ab	ab			a	b				a	ab		ab	ab	ab		
Pork belly and bacon (packaged)	1219	13.7	7.4	13.6	12.9	**19**	9.9	16.3	9.5	7.1	8.8	14	5	14.6	10.2	10.7	8	11.5	14.8
		g	bc	dg	bdef	defg	def	deg	bcdefg	c	bcef	g	a	g	bf	defg	abc	bcdef	deg
Poultry ham and roast (packaged)	1070	0.6	0.9	0.7	0.9	0.3	0.7	**1.6**		1	0.6	1.3	0.6	0.6	0.5	0.9	0.6	1.3	0.7
		abc	ab	abc	abc	abc	abc	abc		ac	ac	b	c	c	c	abc	c	abc	abc
Poultry lardons	53		1.6				1.3			**6.1**			0.3		1.7				
			a				ab			b			ab		ab				
Pâté	1534	9.9	10.2	6.5	6.5	7.4	7.7	7		10.9	**14.4**	7	11	8	9.7	7.4	9.8	6.4	7.6
		cd	cf	ab	a	abcde	abe	ab		f	abcdef	ab	cdef	abcdef	bcdef	abcde	cf	a	abde
Sausages	3959	8.1	6.7	6.8	**8.8**	5.9	8	8.2	7.6	8.4	7.5	7.8	7.9	7.7	7.2	7.1	7.8	7.2	7.3
		ab	c	c	a	abcde	abde	abd	abde	a	bcde	abde	abde	abde	bcde	ce	bcde	bcde	cde

Salt

Table 21 presents the statistical differences and the mean salt content between countries among all relevant subcategories of Delicatessen meats and similar identified previously (14 subcategories).

It shows that the results are highly dependent on the subcategory and the country. It has to be noted that all the results should therefore be analysed regarding the amount of data collected, which can vary considerably depending on the country and/or the subcategory.

It also appears that on the 13 subcategories for which the Kruskal-Wallis test indicated a difference between countries (**Table 19**), the Dunn's post hoc test (**Table 21**) had sufficient statistical power to identify which specific countries differed from one another.

Figure 56 shows the distributions of salt content for **Pork belly and bacon (packaged)** by country. The mean salt content ranges from 2.24 g per 100 g (Poland) to 4.07 g per 100 g (Bosnia). Regarding the countries that statistically differ from the others, Bosnia and Italy tend to have the products with the highest salt content, while Poland, Finland, and France tend to have the products with the lowest salt content. There are differences in terms of the observed variability, with wider range of values in Bosnia, Austria and Slovenia, that suggests possible reformulation.

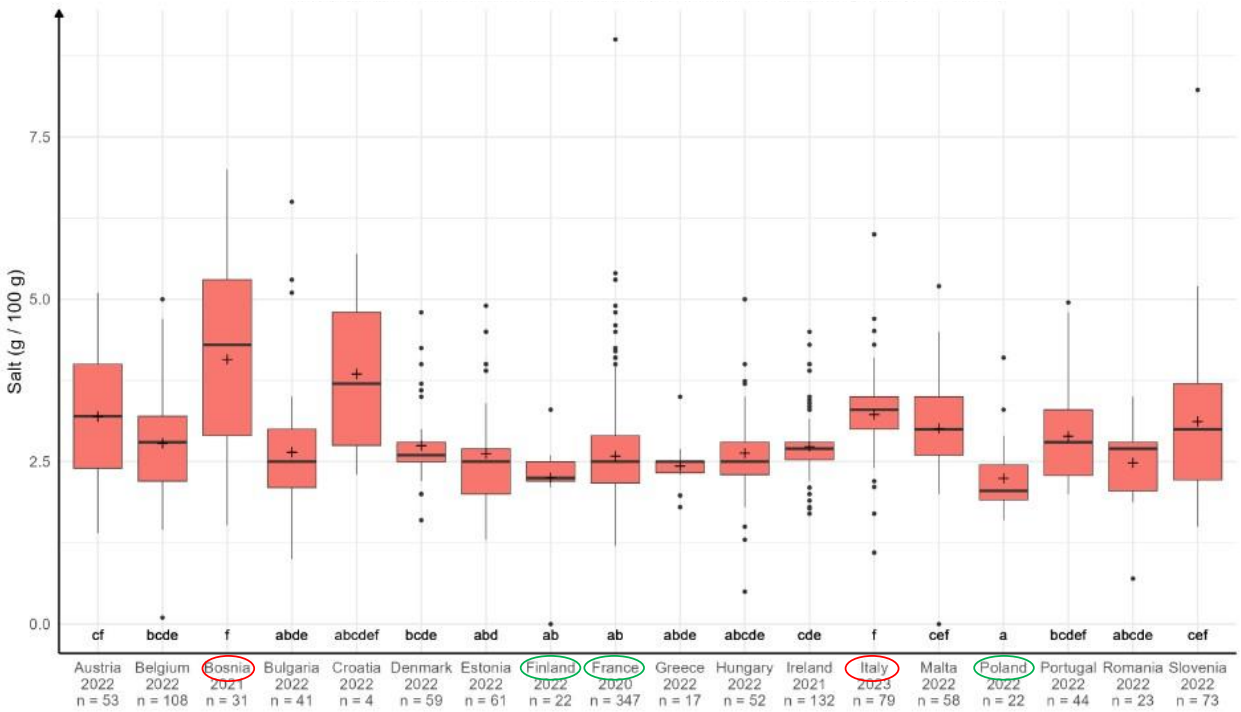

Figure 56: Distribution of salt content for Pork belly and bacon (packaged) by country (total considered number of references: 1226) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Figure 57 shows the distributions of salt content for **Dry sausage** by country. The mean salt content ranges from 3.43 g per 100 g (Romania) to 4.51 g per 100 g (France). Regarding the countries that statistically differ from the others, France, Austria and Denmark tend to have the products with the highest salt content, while Estonia, Poland and Romania tend to have the products with the lowest salt content. For all countries, salt contents are quite high and the observed range of values suggests possible reformulation.

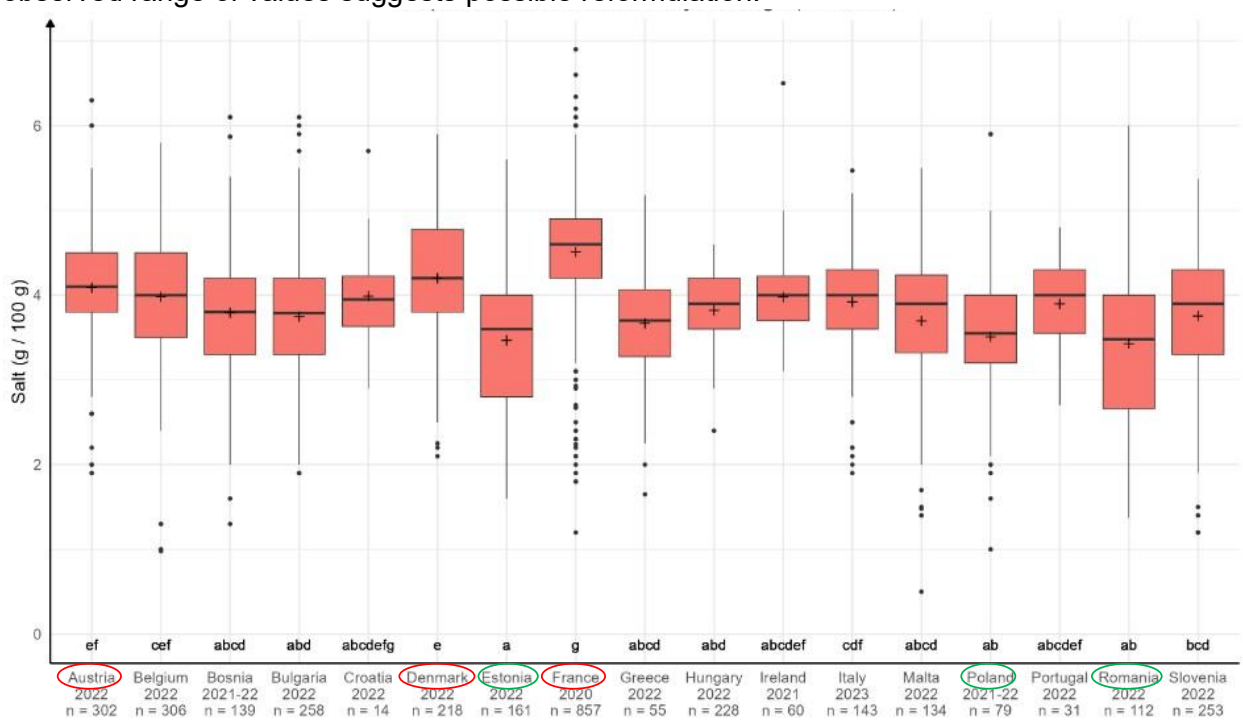

Figure 57: Distribution of salt content for Dry sausage by country (total considered number of references: 3350) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Table 21: Mean salt content per country among relevant Delicatessen meats and similar subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Greece	Hungary	Ireland	Italy	Malta	Poland	Portugal	Romania	Slovenia
Alternative products without animal protein	374	**2.18**	1.68	0.98	1.62	1.97	1.8	1.69	1.9	1.58	2.12	1.28	1.39	2.02	2.17	1.9	1.82	1.5	1.95
		b	abcde	a	abcde	abcde	abcde	acde	abcde	acde	bcde	a	ac	abcde	bde	abcde	abcde	abc	be
Chorizo	450	3.72	3.66		3.78		3.69	3.88	1.97	3.93	**4.25**	4.05	3.77		3.8	4.04	3.15	3.72	3.79
		abc	c		abc		c	c	a	c	bc	abc	c		c	c	ab	abc	abc
Cooked beef (packaged)	153	1.25	1.62	1.83	2.14		**2.53**	1.6		1.98	1.68	1.6	2.01		1.89	2.1			2.5
		a	ab	ab	ab		b	a		a	ab	ab	a		a	ab			ab
Cooked pork ham and roast (packaged)	1685	2.16	1.86	2.04	2.24	**2.7**	2.28	2.22		1.88	2.3	2.27	1.83	1.97	2.33	2.26	2.52	2.57	2.23
		cd	ab	bc	cd	abcd	cd	cd		ab	cd	cd	a	ab	cd	cd	d	d	cd
Cured ham	1217	4.42	4.91	4.36	5.06	4.74	4.77	3.91		5.11	4.98	4.69	4.32	4.87	4.91	5	4.89	5.11	**5.36**
		ab	cd	abcd	bcd	abcd	abcd	a		d	abcd	abcd	abc	bc	bcd	bcd	cd	abcd	d
Dried, smoked or cured beef	282	3.42	3.74	5.06	3.81		3.36	3.48		4.33	**5.26**	4	3.8	3.71	3.21	3.58	3.97	3.58	3.97
		a	abc	bc	abc		abc	a		b	abc	abc	abc	ac	a	abc	abc	abc	abc
Dried, smoked or cured pork	560	2.75	4.05	4.1	4.07	**4.88**	3.29	3.43		4.11	2.44	3.29	2.75	3.95	3.22	4.07	3.52	3.64	4.45
		a	bcd	bcd	bcd	abcd	ab	abcd		cd	a	abcd	a	bcd	abcd	abcd	abc	abcd	d
Dry sausage	3350	4.09	3.98	3.79	3.75	3.99	4.2	3.47		**4.51**	3.67	3.82	3.98	3.92	3.7	3.51	3.9	3.43	3.75
		ef	cef	abcd	abd	abcdefg	f	a		g	abcd	abd	abcdef	cdf	abcd	ab	abcdef	ab	bcd
Pepperoni	52	4.1	3.15	3.62			3.73	3.05				3.9	3.52		**4.22**	3.5	4.15		
Pork belly and bacon (packaged)	1226	3.19	2.78	**4.07**	2.65	3.85	2.75	2.62	2.25	2.59	2.43	2.63	2.73	3.22	3.01	2.24	2.89	2.48	3.12
		cf	bcde	f	abde	abcdef	bcde	abd	ab	ab	abde	abcde	cde	f	cef	a	bcdef	abcde	cef
Poultry ham and roast (packaged)	1070	2.29	2.03	2.07	2.4	1.9	1.91	1.82		1.83	2.23	2.15	1.07	1.86	**2.74**	2.14	2.04	2.49	1.98
		bcf	bde	bcdf	cf	abcdef	bcdf	de		e	f	bcdf	a	bcde	bcdef	bcdf	bcdef	f	bcde
Poultry lardons	53		2.03				**3.3**			3.08			1.8		1.48				
			a				ab			b			ab		ab				
Pâté	1534	1.68	1.81	1.23	1.58	1.21	1.76	1.62		1.49	1.9	1.62	1.61	**2.33**	1.36	1.53	1.63	1.5	1.47
		bcd	e	a	bcd	a	ce	bcd		b	abcde	cd	bcde	abcde	abcd	bcde	bcde	bd	b
Sausages	3960	2.28	1.92	2.03	**2.33**	1.99	2.18	2.06	1.98	2	2.31	2.12	1.81	2.23	2.19	2.13	2.04	2.13	2.05
		e	ab	cdf	egh	abcdefghi	egh	cd	acd	ac	eg	fhi	b	egh	eghi	dfghi	acd	cdefghi	cdfi

Synthesis and links to the national nutritional policies linked to delicatessen meats and similar

Table 22 summarises the global ranking of the median at the category level (see methodology in section 2.1.2) and the implementation of specific national nutritional measures (as defined in section 2.1.2) related to the targeted nutrients content for each studied country. It should be noted that the rankings and conclusions presented in this section are based on categories (and not subcategories); they therefore do not accurately reflect the quality of the food offer by country. Furthermore, no direct causal link between the global ranking and policies can be established in this section.

Overall, for delicatessen meats and similar, for countries considered as low in the tier position, they generally do not have public policies in place. For countries considered as high in the tier position, there is no public policy in place. One country out of 18 has implemented regulatory measures: in Finland (classified as low for salt content), there is an additional mandatory statement that must be clearly displayed on delicatessen meats exceeding a salt limit.
Efforts to improve the food supply are still possible in all countries, regardless of the country's position

Table 22 :Summary of country-level positioning (tier position when comparing the median content) and national nutritional policies on Delicatessen meats and similar, by nutrient

COUNTRY	Collection Year	SATURATED FAT		SALT	
		Tier Position	Type of measure(s)	Tier Position	Type of measure(s)
Austria	2022	High		Mid	
Belgium	2022	Mid	FOP (Nutri-Score: 2019)	Mid	FOP (Nutri-Score: 2019)
Bosnia	2021-2022	High		Mid	
Bulgaria	2022-2023	Mid	Collective agreement on fat (2018)	Mid	Collective agreement (2018)
Croatia	2021-2022	High		Mid	
Denmark	2022	Mid	FOP (Keyhole: 2009)	Mid	FOP (Keyhole: 2009)
Estonia	2022	Mid		Low	
Finland	2022	Low	FOP (Heart symbol: 2000)	Low	FOP (Heart symbol: 2000); legal threshold + mandatory label (2014)
France	2020	Mid	Collective agreement (2010-2015); FOP (Nutri-Score: 2017)	Mid	Collective agreement (2010-2015); FOP (Nutri-Score: 2017)
Greece	2022	Mid		High	
Hungary	2022	Mid		Mid	
Ireland	2021	Low		Mid	
Italy	2023	Mid		Mid	
Malta	2022	Mid		Mid	
Poland	2021-2022	Mid		Mid	
Portugal	2022	Low		Mid	
Romania	2022	Low		Mid	
Slovenia	2022	High		High	

green: countries ranked in the top tier; yellow: countries ranked in the middle tier; red: countries in the bottom tier. Collective agreement: jointly negotiated commitment between a government authority and representatives of an industry / FOP: front-of-pack labelling / Tax: legal nutritional tax imposed by government / Legal limit: maximum level beyond which the product cannot be marketed. / Legal threshold + mandatory label: threshold beyond which a mandatory label must be applied.

Saturated fat

Overall, based on the median ranking for the category (for the 14 considered subcategories), Finland, Ireland, Portugal, and Romania tend to have the delicatessen meats with lowest saturated fat content, while Austria, Bosnia, Croatia, and Slovenia tend to have the delicatessen meats with the highest saturated fat content.

If these results are examined in light of the health policies implemented in each country regarding the saturated fat content of delicatessen meats and similar, on the 18 countries included in the analyses (Germany did not collect data for this category during Best-ReMaP), five of them stated that they had at least one of the targeted measures relating to the saturated fat content in delicatessen meats and similar:

- One is ranked among the country with the lowest saturated fat content (Low):
    - Finland has had the Heart Symbol labelling since 2000.

- Four are ranked with intermediate results (Mid):
    - Belgium has had the Nutri-Score labelling since 2019;
    - France has had the Nutri-Score labelling since 2017 and had a collective agreement (2010–2015);
    - Bulgaria had a collective agreement to reduce fat content in products in 2018;
    - Denmark has had the Keyhole labelling since 2009.

No specific measures were reported for 13 countries: Austria (High), Bosnia (High), Croatia (High), Estonia (Mid), Greece (Mid), Hungary (Mid), Ireland (Low), Italy (Mid), Malta (Mid), Poland (Mid), Portugal (Low), Romania (Low), and Slovenia (High).

Salt

Overall, based on the median ranking for the whole category, Estonia and Finland tend to have the delicatessen meats with lowest salt content, while Slovenia and Greece tend to have the delicatessen meats with the highest salt content.

If these results are examined in light of the health policies implemented in each country regarding the salt content of delicatessen meats and similar, on the 18 countries included in the analyses (Germany did not collect data for this category during Best-ReMaP), five of them stated that they had at least one of the targeted measures relating to the salt content in delicatessen meats:

- One is ranked among the country with the lowest saturated fat content (Low):
    - Finland has had the Heart Symbol labelling since 2000 and introduced in 2014 a legal salt threshold involving the display of a mandatory label on product high in salt.

- Four are ranked with intermediate results (Mid):
    - Belgium has had the Nutri-Score labelling since 2019;
    - Bulgaria had a collective agreement to encourage reduction of salt content in 2018;
    - Denmark has had the Keyhole labelling since 2009;
    - France has had the Nutri-Score labelling since 2017 and had a collective agreement covering the period 2010–2015.

No specific measures were reported for 13 countries: Austria (Mid), Bosnia (Mid), Croatia (Mid), Estonia (Low), Greece (High), Hungary (Mid), Ireland (Mid), Italy (Mid), Malta (Mid), Poland (Mid), Portugal (Mid), Romania (Mid), and Slovenia (High).

2.2.3.4. Fresh dairy products and desserts

Table 23 summarises the statistical differences in mean nutrient content observed across the two nutrients of interest for the 21 subcategories of the Fresh dairy products and desserts. Some subcategories considered not relevant to be presented (e.g., “other” subcategories that grouped very different products and/or those with a very limited reformulation potential and/or those with very few products in all data collections) are shown in grey.

Therefore, the upcoming analyses focuses on 14/21 subcategories for sugar (yoghurts and fresh cheeses with no added sugar excluded as there is normally no room for reformulation on sugar for these subcategories) and 18/21 for saturated fat.

Most subcategories show statistically significant differences in mean nutrient content across countries:

- 93% of the considered subcategories for sugar (13/14 subcategories);
- 89% of the considered subcategories for saturated fat (16/18 subcategories).

The detailed results of the mean by country for the relevant subcategories are presented in the following part nutrient by nutrient.

For reasons of readability, a selection of boxplots for 2 subcategories (chosen based on their representativeness (e.g., products collected in most countries), and the ease of understanding of the definition of included products) is presented in this report: Classic sweet yoghurts and fermented milks and Gourmet sweet yoghurts and fermented milks.

Descriptive tables for all Fresh dairy products and desserts subcategories are available in **Annex 5**.

Table 23: Summary of nutrient differences across subcategories of Fresh dairy products and desserts

Subcategory	SUGAR (n = 12,646)				SATURATED FAT (n = 12,662)			
	n	countr	p	signif	n	countr	p	signif
Artificially-sweetened fresh cheeses	168	14	3E-05	***	168	14	2E-06	***
Artificially-sweetened yoghurts and fermented milks	635	17	2E-14	***	635	17	8E-27	***
Classic plain fresh cheeses with no added sugar	274	14	3E-02	*	274	14	5E-03	**
Classic plain yoghurts and fermented milks with no added sugar	1,429	17	3E-39	***	1,437	17	3E-26	***
Classic sweet yoghurts and fermented milks	4,085	18	2E-107	***	4,083	18	3E-54	***
Classic sweetened fresh cheeses	512	17	4E-27	***	514	17	8E-11	***
Curdled milks	39	4	1E-04	***	43	4	4E-01	NS
Dessert creams and jellied milks	774	16	5E-34	***	773	16	4E-19	***
Egg-based fresh desserts	262	13	1E-08	***	262	13	9E-07	***
Fresh desserts with cereals	372	16	2E-10	***	372	16	3E-08	***
Fresh light and/or artificially-sweetened desserts	169	16	2E-11	***	169	16	2E-05	***
Fresh mousse-type desserts	272	16	3E-06	***	272	16	2E-08	***
Fresh plain unsweetened soy desserts	56	13	3E-01	NS	56	13	2E-01	NS
Fresh sweetened soy desserts	312	15	8E-20	***	312	15	3E-03	**
Gourmet plain fresh cheeses with no added sugar	178	11	1E-02	*	178	11	2E-01	NS
Gourmet plain yoghurts and fermented milks with no added sugar	606	17	5E-08	***	610	17	8E-09	***
Gourmet sweet fresh cheeses	339	11	3E-04	***	339	11	7E-07	***
Gourmet sweet yoghurts and fermented milks	1,535	18	1E-03	***	1,535	18	2E-24	***
Liégeois desserts and similar	251	16	3E-16	***	251	16	2E-19	***
Other dairy products	98	6	2E-05	***	97	6	5E-04	***
Other fresh plant-based desserts	280	15	5E-02	NS	282	15	1E-11	***

*"n": number of references; "countr": number of countries compared; "p": p value for the Kruskal-Wallis test; "signif": NS = not significant; * for 0.01 < p ≤ 0.05, ** for 0.001 < p ≤ 0.01, *** for p ≤ 0.001.*
Categories in grey are the less relevant ones for comparisons: they are not discussed in the report.

Sugar

The statistical differences and the mean sugar content between countries among Fresh dairy products and desserts are detailed for each relevant subcategory (14 subcategories) in **Table 24**.

It shows that the results are highly dependent on the subcategory and the country. All the results should be analysed regarding the amount of data collected, which can vary considerably from one country to another.

It also appears that on the 13 subcategories for which the Kruskal-Wallis test indicated a difference between countries (**Table 23**), the Dunn's post hoc test (**Table 24**) had sufficient statistical power to identify which specific countries differed from one another.

Figure 58 shows the distributions of sugar content for Classic sweet yoghurts and fermented milks by country. For this subcategory, the mean sugar content ranges from 9.6 g per 100 g (Finland) to 12.4 g per 100 g (France). Except for Finland, all countries have a mean sugar value above 10 g per 100 g. Regarding the countries that statistically differ from the others, France and Italy tend to have sweetest products. Conversely, Finland and Ireland tend to have the least sweet products. The wide range of values suggests possible reformulation for all countries.

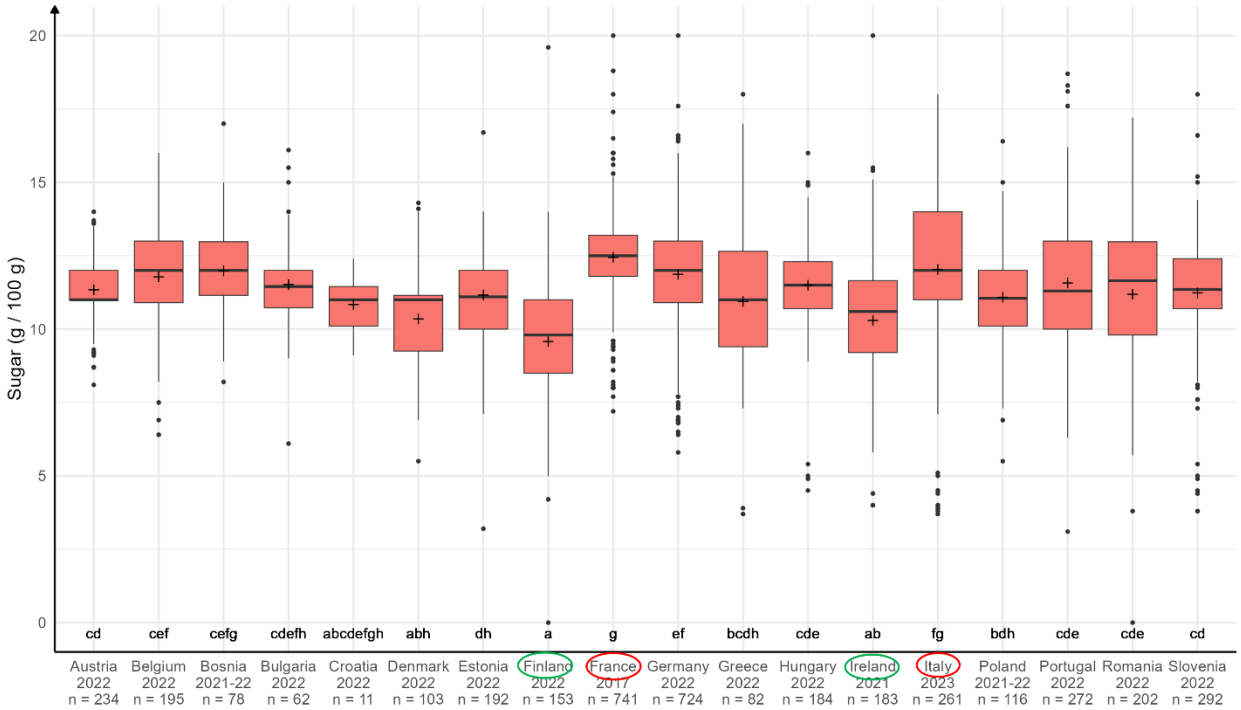

Figure 58: Distribution of sugar content for Classic sweet yoghurts and fermented milks (total number of references considered: 4,085) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Table 24: Mean sugar content per country among relevant Fresh dairy products and desserts products subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Poland	Portugal	Romania	Slovenia
Artificially-sweetened fresh cheeses	168	4	3.8		4.3		3.6	4.6	4.2	**5**	3.8		3.5	3.2	3.9	4.6	3.1		3.8
		ab	ab		ab		ab	ab	ab	b	ab		ab	a	ab	ab	a		ab
Artificially-sweetened yoghurts and fermented milks	635	4.2	4.9	**5.6**	4		3.9	4.8	4.2	**5.6**	4.8	4.8	5	**5.6**	4.8	5.5	4.7	5.4	3.8
		ab	ac	ac	abc		ab	abc	ab	c	ac	abc	abc	c	ab	abc	ab	abc	b
Classic sweet yoghurts and fermented milks	4085	11.3	11.8	12	11.5	10.8	10.3	11.2	9.6	**12.4**	11.9	10.9	11.5	10.3	12	11.1	11.6	11.2	11.2
		cd	cef	cefg	cdefh	abcdefgh	abh	dh	a	g	ef	bcdh	cde	ab	fg	bdh	cde	cde	cd
Classic sweetened fresh cheeses	512	10.5	11.4	8.4	10.3		9.6	13.3	10.2	12	10.9	10	**19**	9.1	10.8	12.2	11.3	10.2	9.4
		abcd	ab	abcde	abcde		cd	e	abcde	ae	bc	abcde	e	d	abcde	abe	abcde	abcd	cd
Dessert creams and jellied milks	774	12.5	14.8	13.7	14		8	15.9	10.9	16.6		15.5	13.4	**23.6**	15.8	13.3	12.8	13.5	13.5
		a	bcd	abcd	abcd		abcd	bce	abcd	e		bce	abd	f	ce	abcd	abcd	abcd	ad
Egg-based fresh desserts	262	19.1	19.3		19.8		10.6	12.5		17.5		8.3		17.1	18.5	16.5	29.2	23.2	**43**
		abc	abc		abc		a	ab		b		ab		abc	abc	abc	c	abc	abc
Fresh desserts with cereals	372	11.5	13	10.2	11.5		10.5	12.7	11.2	13.9		13	11.7	11.5	12.5	12.2	**16.1**	12.2	11.7
		ab	abc	ab	abc		a	abc	ab	c		bc	ab	ab	abc	abc	abc	abc	abc
Fresh light and/or artificially-sweetened desserts	169	4.5	5.7	4.7	4.1		4.2	4.4	4	**11.8**		10.5	4.3	4.4	4.6	4.8	4	2.8	4.6
		a	a	ab	a		ab	a	ab	b		ab	a	ab	a	ab	a	a	a
Fresh mousse-type desserts	272	19.2	19.8	15.3	20.9		19	21.5	9.8	20		19.2	20.5	18.8	14.5	**23**	16.6	22.8	13
		ab	b	ab	ab		ab	ab	a	b		ab	ab	b	ab	ab	b	b	ab
Fresh plain unsweetened soy desserts	56	0.1	0.1		**5.7**		2.8	0.4	2.1	0.2		0	0	0.2	1.9		3.3		1.7
Fresh sweetened soy desserts	312	8.1	7.9		6.9		7.1	8.9	6.6	**12.1**		10.6	7.6	7.5	11.8	6.5	8.1	8.1	7.3
		a	a		ab		a	ab	a	c		abc	a	a	bc	abc	a	a	a
Gourmet sweet fresh cheeses	339	14.2	12.8					13.4	**17**	13.2	13.1		17.7	9.6	11.9	13.3			13.8
		bc	ab					ab	abc	ab	ab		c	a	abc	ab			abc
Gourmet sweet yoghurts and fermented milks	1535	13.3	12.9	13.3	13.4	**14.3**	12	13.3	12.2	12.9	12.8	12.4	12.9	12.9	14.2	13.4	13.8	13.3	12.9
		ab	ab	ab	ab	ab	a	ab	a	ab	ab	ab	ab	ab	b	ab	b	ab	ab
Liégeois desserts and similar	251	12.8	14.2	14.2	13.2		13.4	13.8	14.3	**15.9**		11.8	13.5	11.8	13.1	13.5	13.3	13.6	13.6
		a	a	ab	ab		ab	ab	ab	b		ab	a	a	ab	ab	a	a	a

Figure 59 shows the distributions of sugar content for Gourmet sweet yoghurts and fermented milks by country. The mean sugar content ranges from 12 g per 100 g (Denmark) to 14.3 g per 100 g (Croatia, with a low number of products n = 6). Italy and Portugal tend to have sweetest products. Conversely, Denmark and Finland tend to have the least sweet products. Although the category appears homogeneous in terms of sugar content, the observed variability indicates that there is still room for reformulation.

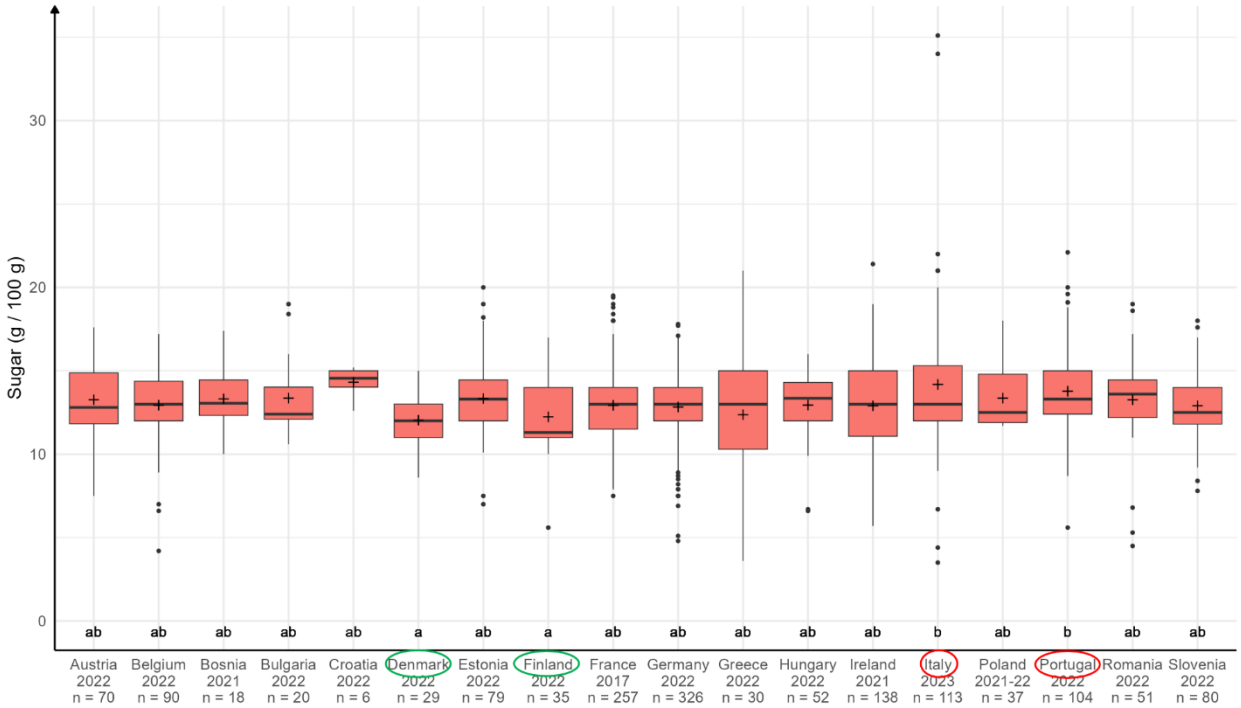

Figure 59: Distribution of sugar content for Gourmet sweet yoghurts and fermented milks (total number of references considered: 1,535) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Saturated fat

Table 25 presents the statistical differences between countries and the mean saturated fat content among all relevant subcategories of Fresh dairy products and desserts (18 subcategories)**.**

It shows that the results are highly dependent on the subcategory and the country. It has to be noted that all the results should be analysed regarding the amount of data collected, which can vary considerably from one country to another.

It also appears that on the 16 subcategories for which the Kruskal-Wallis test indicated a difference between countries (**Table 23**), the Dunn's post-hoc test (**Table 25**) did not have sufficient statistical power to identify which specific countries differed from one another for two subcategories: Classic plain fresh cheeses with no added sugar and Fresh sweetened soy desserts (see **Annex 1**, p. 25 & 27, for the definition of the subcategories).

Figure 60 shows the distributions of saturated fat content for Classic sweet yoghurts and fermented milks by country. For this subcategory, the mean saturated fat content ranges from 1 g per 100 g (Greece) to 1.8 g per 100 g (Croatia, n = 11). Regarding the countries that statistically differ from the others, France and Germany tend to have products with the highest content in saturated fat. Conversely, Bosnia and Greece tend to have products with lowest saturated fat content. The differences in terms of variability (higher in Italy and Ireland; lower in Greece and Croatia) suggest some room for reformulation.

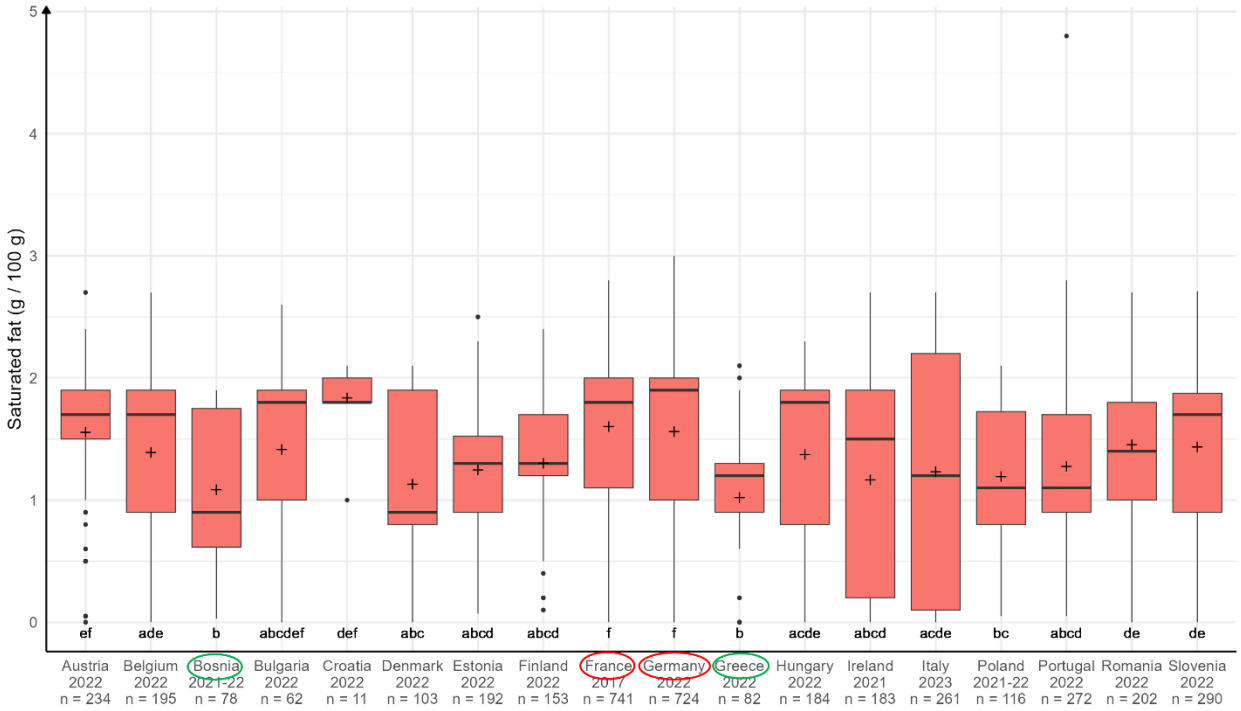

Figure 60: Distribution of saturated fat content for Classic sweet yoghurts and fermented milks (total number of references considered: 4,083) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Table 25: Mean saturated fat content per country among relevant Fresh dairy products and desserts subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Poland	Portugal	Romania	Slovenia
Artificially-sweetened fresh cheeses	168	0.3	0.1		0.1		0.2	0.1	0.3	0.1	0.3		**1.9**	0.2	0.1	0.1	0.3		0.3
		b	ab		ab		b	ab	ab	a	b		ab	b	ab	ab	b		b
Artificially-sweetened yoghurts and fermented milks	635	0.1	0.1	0	0.2		0.2	0.4	0.5	0.1	0.8	0.4	0.3	0.4	0.4	**1**	0.2	0.5	0.6
		acdef	ac	ab	abcdef		cdef	cdef	cdef	b	e	abcdf	abcd	cdf	cdef	ef	cdf	cdef	def
Classic plain fresh cheeses with no added sugar	274	0.1	0.8	0.1	0.1	0.7	0.2	0.4		**1.2**				0.4	0.1	0.1	0.3	0.1	0.2
		a	a	a	a	a	a	a		a				a	a	a	a	a	a
Classic plain yoghurts and fermented milks with no added sugar	1437	1.5	0.9	1.5	1.7	1.4	1.3	1.3	1.2	1.3		1.2	**1.8**	0.9	0.6	1.3	1.2	1.6	1.5
		cdef	ab	cdef	f	bcdef	bcdef	bcd	abcd	cde		bc	ef	ab	a	bcde	bcde	def	cdef
Classic sweet yoghurts and fermented milks	4083	1.6	1.4	1.1	1.4	**1.8**	1.1	1.2	1.3	1.6	1.6	1	1.4	1.2	1.2	1.2	1.3	1.5	1.4
		ef	ade	b	abcdef	def	abc	abcd	abcd	f	f	b	acde	abcd	abcde	bc	abcd	de	de
Classic sweetened fresh cheeses	514	1.3	1.6	0.1	0.2		0.5	1	1.5	1.5	1.3	**1.9**	1.5	1.4	0.7	1.4	1.8	1.7	0.8
		abc	a	abcd	bd		d	bd	abcd	abc	abc	abcd	abcd	abc	abcd	abc	ac	abcd	bcd
Dessert creams and jellied milks	773	5.4	2.7	5.1	4		3.4	6	1.8	2.5		2.2	4.4	**6.7**	2.9	5.3	1.8	3.2	4.2
		c	ab	bc	bc		abc	c	ab	ab		ab	bc	c	ab	bc	a	abc	bc
Egg-based fresh desserts	262	8	10.4		7.2		2.6	**14.4**		5.5		2.1		3.2	9.2	13.5	3.5	1.4	10
		abc	b		abc		a	bc		ac		abc		a	abc	abc	a	abc	abc
Fresh desserts with cereals	372	2.3	2	2.1	1.5		2.4	**2.6**	2.1	2.3		2.2	2.2	1.7	1.6	2.1	1.8	1.9	1.7
		bc	bc	abc	abc		bc	bc	bc	b		bc	bc	a	abc	abc	abc	ac	abc
Fresh light and/or artificially-sweetened desserts	169	1.2	**2.4**	1	0.5		1	1.2	1.6	**2.4**		1.3	1.5	1	0.8	0.8	0.9	1.5	1.8
		b	ab	ab	a		ab	b	ab	ab		ab	b	ab	ab	ab	ab	b	b
Fresh mousse-type desserts	272	7.1	9.2	3.5	7.8		9.8	7.2	2.3	7.1		4.1	5.2	6.8	7.5	**10**	5.2	7.6	4.2
		bc	b	abc	abc		bc	abc	a	c		abc	abc	bc	abc	abc	ac	abc	abc
Fresh plain unsweetened soy desserts	56	**0.4**	**0.4**		**0.4**		**0.4**	**0.4**	**0.4**	**0.4**		**0.4**	**0.4**	**0.4**	0.3		**0.4**		**0.4**
Fresh sweetened soy desserts	312	0.4	0.4		0.4		0.4	0.5	0.5	0.5		**0.7**	0.5	0.4	0.4	0.3	0.4	0.6	0.4
		a	a		a		a	a	a	a		a	a	a	a	a	a	a	a
Gourmet plain fresh cheeses with no added sugar	178	3.5	4.6			**9.9**	3	5.7		5.3				2.7		4.5	3	4.1	5.3

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Poland	Portugal	Romania	Slovenia
Gourmet plain yoghurts and fermented milks with no added sugar	610	4.8	5	6	3.6	**6.8**	6.2	3.5	4.4	4.8		4.2	5.6	4.4	3.4	4.9	4.5	4.5	4.5
		abcd	abcd	abcd	ab	bcd	d	a	abcd	cd		abc	bcd	abcd	abc	abcd	abcd	abc	abc
Gourmet sweet fresh cheeses	339	3	3					**4.4**	2.6	**4.4**	3.5		3	3	2.5	4.1			3.7
		ab	a					bc	abc	c	ab		abc	abc	abc	bc			abc
Gourmet sweet yoghurts and fermented milks	1535	4	4.2	4.1	4	4.3	4	3.8	3.2	4	4.3	3.3	3.6	4.1	3.4	**4.9**	4.5	3.8	3.9
		abdef	defg	abcdefg	abcdefg	abcdefg	abcdefg	abcd	ac	bde	efg	abc	abcd	def	c	g	fg	abcdef	abde
Liégeois desserts and similar	251	2.7	4	1.9	2.4		2.4	2.1	1.9	**4.6**		1.8	2.6	3.4	3.3	1.7	3.2	1.9	2.1
		ab	ac	ab	abc		abc	b	abc	c		abc	ab	abc	abc	ab	abc	b	b

Figure 61 shows the distributions of saturated fat content for Gourmet sweet yoghurts and fermented milks by country. The mean saturated fat content ranges from 3.2 g per 100 g (Finland) to 4.9 g per 100 g (Poland). For this subcategory, statistically, Poland and Portugal tend to have products with the highest saturated fat content. Conversely, Finland and Italy tent to have products with the lowest saturated fat content. Although the category appears homogeneous in terms of saturated fat content, the observed variability indicates that there is still room for reformulation.

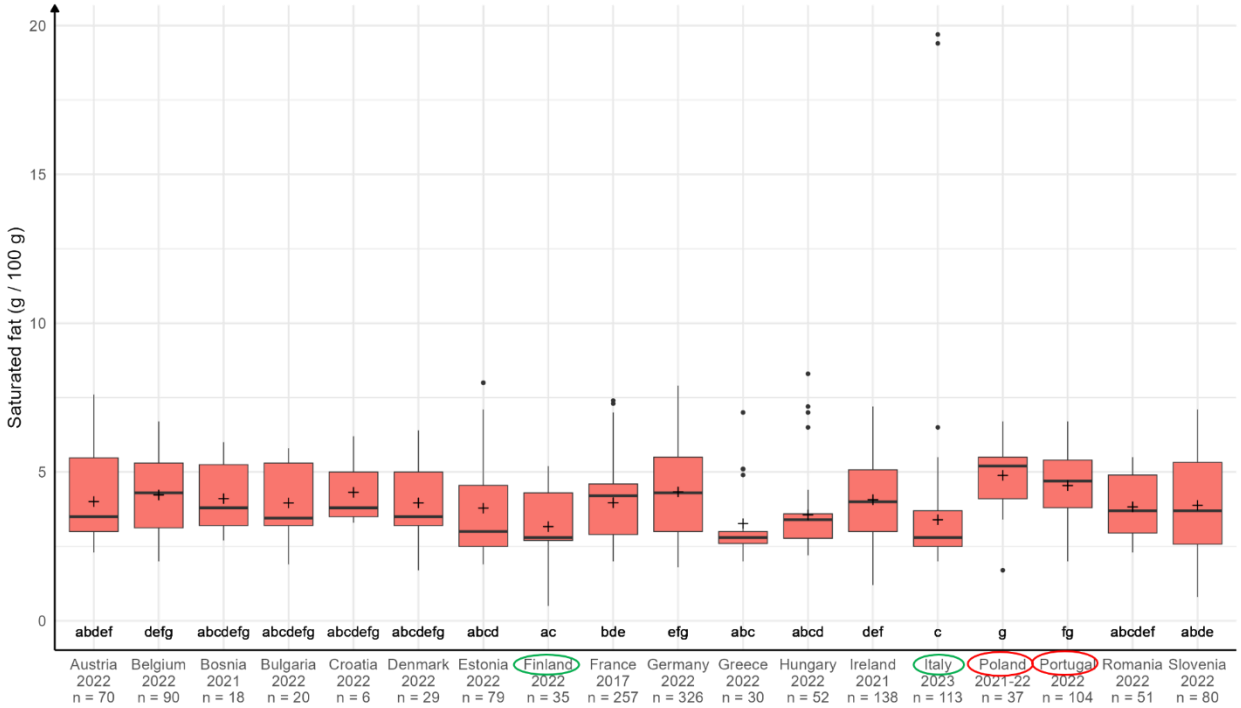

Figure 61: Distribution of saturated fat content for Gourmet sweet yoghurts and fermented milks (total number of references considered: 1,535) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Synthesis and links to the national nutritional policies linked to fresh dairy products and desserts

Table 26 summarises the global ranking of the median at the category level (see methodology in section 2.1.2) and the implementation of specific national nutritional measures (as defined in section 2.1.2) related to Fresh dairy products and desserts and the targeted nutrients content (sugar and saturated fat) for each partner country. It should be noted that the rankings and conclusions presented in this section are based on categories (and not subcategories); they therefore do not accurately reflect the quality of the food offer by country. Furthermore, no direct causal link between the global ranking and policies can be established in this section.

Overall, for Fresh dairy products and desserts, for countries considered as low in the tier position, there is not always but frequently a public policy in place. For countries considered as high in the tier position, there is less often a public policy in place. Two countries out of 18 have implemented regulatory measures (Romania and Hungary, both a sugar tax and both classified as “mid” for this nutrient. For Romania, the measure has been taken after the data collection).

Efforts to improve the nutritional quality of the food supply are still possible in all countries, regardless of the country's position and the policies already implemented or not.

Sugar

Overall, based on the median-based ranking for the whole category (for the 14 considered subcategories), Denmark, Finland, Slovenia, and Austria tend to have the least sweet Fresh dairy products and desserts. Conversely, France, Estonia, Belgium, and Bosnia tend to have the sweetest Fresh dairy products and desserts.

If these results are examined in light of the health policies implemented in each country regarding the sugar content of Fresh dairy products and desserts, it can be seen that, of the 18 countries included in the analyses (Malta does not have data for this food category), ten of them stated that they had at least one of the targeted measures relating to the sugar content in Fresh dairy products and desserts:

- Three are among the countries with the least sweet Fresh dairy products and desserts (Low):
    - Denmark has had the Keyhole labelling since 2009;
    - Finland has had the Heart Symbol labelling since 2000;
    - Slovenia had a collective agreement with the dairy sector in 2017.

- Two are among the ones with the sweetest Fresh dairy products and desserts (High):
    - Belgium had a collective agreement between 2012 and 2017 and also has had the Nutri-Score labelling since 2019;
    - France has had the Nutri-Score labelling since 2017.

- Five are ranked with an intermediate position (Mid):
    - Germany had a national reduction strategy covering the period 2019–2025 and has had the Nutri-Score labelling since 2020;
    - Hungary has had a sugar tax (since 2011, updated in 2022);

    - Italy had a collective agreement in 2017;
    - Portugal had a collective agreement between 2019 and 2022 aimed at achieving a 10% reduction in added sugars in yoghurts and fermented milks;
    - Romania has had a tax since 2024 (after the studied data collection).

None of the targeted measures were reported for the following eight countries: Austria (Low), Bosnia (High), Bulgaria (Mid), Croatia (Mid), Estonia (High), Greece (Mid), Ireland (Mid), and Poland (Mid).

Saturated fat

Overall, based on the median-based ranking for the whole category (for the 18 considered subcategories), Italy tends to have the least rich Fresh dairy products and desserts in saturated fat. Conversely, Germany, Croatia, Estonia, and Belgium tend to have the richest Fresh dairy products and desserts in saturated fat.

If these results are examined in light of the health policies implemented in each country regarding the saturated fat content of Fresh dairy products and desserts, it can be seen that, of the 18 countries included in the analyses (Malta does not have data for this food category), six of them stated that they had at least one of the targeted measures relating to the saturated fats content in Fresh dairy products and desserts:

- One is among the countries with the least rich Fresh dairy products and desserts in saturated fat (Low):
    - Italy had a collective agreement with fresh dairy industries in 2017.

- Two are among the ones with the richest Fresh dairy products and desserts in saturated fat (High):
    - Belgium has had the Nutri-Score labelling since 2019;
    - Germany had a national reduction strategy covering the period 2019–2025 and has had the Nutri-Score labelling since 2020.

- Three are ranked with an intermediate position (Mid):
    - Denmark has had the Keyhole labelling since 2009;
    - Finland has had the Heart Symbol labelling since 2000;
    - France has had the Nutri-Score labelling since 2017.

None of the targeted measures were reported for the following 12 countries: Austria (Mid), Bosnia (Mid), Bulgaria (Mid), Croatia (High), Estonia (High), Greece (Mid), Hungary (Mid), Ireland (Mid), Poland (Mid), Portugal (Mid), Romania (Mid), and Slovenia (Mid).

Table 26:Summary of country-level positioning (tier position when comparing the median content) and national nutritional policies on Fresh dairy products and desserts, by nutrient

COUNTRY	Collection Year	SUGAR		SATURATED FAT	
		Tier Position	Type of measure(s)	Tier Position	Type of measure(s)
Austria	2022	Low		Mid	
Belgium	2022	High	Collective agreement (2012-2017); FOP (Nutri-Score: 2019)	High	FOP (Nutri-Score: 2019)
Bosnia	2021-22	High		Mid	
Bulgaria	2022	Mid		Mid	
Croatia	2022	Mid		High	
Denmark	2022	Low	FOP (Keyhole: 2009)	Mid	FOP (Keyhole: 2009)
Estonia	2022	High		High	
Finland	2022	Low	FOP (Heart Symbol: 2000)	Mid	FOP (Heart Symbol: 2000)
France	2017	High	FOP (Nutri-Score: 2017)	Mid	FOP (Nutri-Score: 2017)
Germany	2022	Mid	Collective agreement (2019-2025); FOP (Nutri-Score: 2020)	High	Collective agreement (2019-2025); FOP (Nutri-Score: 2020)
Greece	2022-23	Mid		Mid	
Hungary	2022	Mid	Tax (2011 updated 2022)	Mid	
Ireland	2021	Mid		Mid	
Italy	2023	Mid	Collective agreement (2017)	Low	Collective agreement (2017)
Poland	2021-22	Mid		Mid	
Portugal	2022	Mid	Collective agreement (2019-2022)	Mid	
Romania	2022	Mid	Tax (2024)	Mid	
Slovenia	2022	Low	Collective agreement (2017)	Mid	

green: countries ranked in the top tier; yellow: countries ranked in the middle tier; red: countries in the bottom tier. Collective agreement: jointly negotiated commitment between a government authority and representatives of an industry / FOP: front-of-pack labelling / Tax: legal nutritional tax imposed by government / Legal limit: maximum level beyond which the product cannot be marketed. / Legal threshold + mandatory label: threshold beyond which a mandatory label must be applied.

2.2.3.5. Soft drinks

Table 27 summarises the statistical differences in mean nutrient content observed in the nutrient of interest for the 27 subcategories of the Soft drinks. Some subcategories considered not relevant to be presented (e.g., “other” subcategories that grouped very different products and/or those with a very limited reformulation potential) are shown in grey.

Therefore, the analysis focuses on 17/27 subcategories for sugar.

Most subcategories show statistically significant differences in mean nutrient content across countries:

- 100% of the considered subcategories for sugar (17/17 subcategories).

The detailed results of the mean by country for the relevant subcategories are presented in the following part for sugar.

For reasons of readability, a selection of boxplots for two subcategories (chosen based on their representativeness (e.g., products collected in most countries), and the ease of understanding of the definition of included products) is presented in this report: Sugar-sweetened colas, Sugar-sweetened fruit beverages.

Descriptive tables for all Soft Drinks subcategories are available in **Annex 5**.

Table 27: Summary of nutrient differences across subcategories of Soft drinks

Subcategory	SUGAR (n = 18,133)			
	n	countr	p	signif
Alcohol-free beers without added sugar	293	17	2E-07	***
Colas without added sugar	761	18	9E-29	***
Energy drinks without added sugar	400	18	6E-08	***
Flavoured milk beverages	1,230	18	3E-17	***
Flavoured sugar-sweetened and artificially-sweetened waters	397	18	1E-14	***
Flavoured sugar-sweetened waters	937	19	3E-36	***
Flavoured waters without added sugar	780	19	2E-23	***
Fruit beverages with fruit content strictly over 50 percent	913	19	3E-61	***
Fruit beverages without added sugar	974	19	1E-21	***
Other beverages without added sugar	78	16	1E-01	NS
Other sugar-sweetened beverages	155	16	3E-01	NS
Plant-based beverages without added sugar	1,198	18	6E-08	***
Sugar-sweetened alcohol-free beers	426	18	6E-21	***
Sugar-sweetened and artificially-sweetened colas	115	15	3E-05	***
Sugar-sweetened and artificially-sweetened energy drinks	228	17	2E-06	***
Sugar-sweetened and artificially-sweetened fruit beverages	971	18	2E-34	***
Sugar-sweetened and artificially-sweetened tea beverages	663	18	2E-08	***
Sugar-sweetened and artificially-sweetened tonics and bitters	101	16	1E-03	**
Sugar-sweetened colas	690	19	5E-23	***
Sugar-sweetened energy drinks	610	19	9E-03	**
Sugar-sweetened fruit beverages	3,455	19	3E-130	***
Sugar-sweetened plant-based beverages	733	18	2E-04	***
Sugar-sweetened tea beverages	859	19	7E-27	***
Sugar-sweetened tonics and bitters	509	19	2E-10	***
Tea beverages without added sugar	304	18	2E-08	***
Tonics and bitters without added sugar	100	16	3E-02	*
Vegetable beverages	253	18	5E-06	***

*"n": number of references; "countr": number of countries compared; "p": p value for the Kruskal-Wallis test; "signif": NS = not significant; * for 0.01 < p ≤ 0.05, ** for 0.001 < p ≤ 0.01, *** for p ≤ 0.001. Categories in grey are the less relevant ones for comparisons: they are not discussed in the report.*

Sugar

The statistical differences in mean sugar content across countries among Soft drinks are detailed for each relevant subcategory (17 subcategories) in **Table 28**. **It shows that the results are highly dependent on the subcategory and the country**. All the results should be analysed regarding the amount of data collected, which can vary considerably from one country to another.

It appears that on the 17 subcategories for which the Kruskal-Wallis test indicated a difference between countries (**Table 27**), the Dunn's post-hoc test (**Table 28**) did not have sufficient statistical power to identify which specific countries differed from one another for two subcategories: Sugar-sweetened energy drinks and Sugar-sweetened plant-based beverages (see **Annex 1**, p. 59 & p.57, for the definition of the subcategories).

Figure 62 shows the distributions of sugar content for Sugar-sweetened colas by country. For this subcategory, the mean sugar content ranges from 8.8 g per 100 mL (Croatia, with a low number of products n = 4) to 11.0 g per 100 mL (Hungary). Regarding the countries that statistically differ from the others, Hungary tends to have the sweetest products. Conversely, Austria and Germany tend to have the least sweet products. The differences in terms of variability (higher in Austria, Finland, France, Germany and Slovenia; lower in Belgium, Hungary, Bulgaria, Italy and Estonia) suggest some room for reformulation.

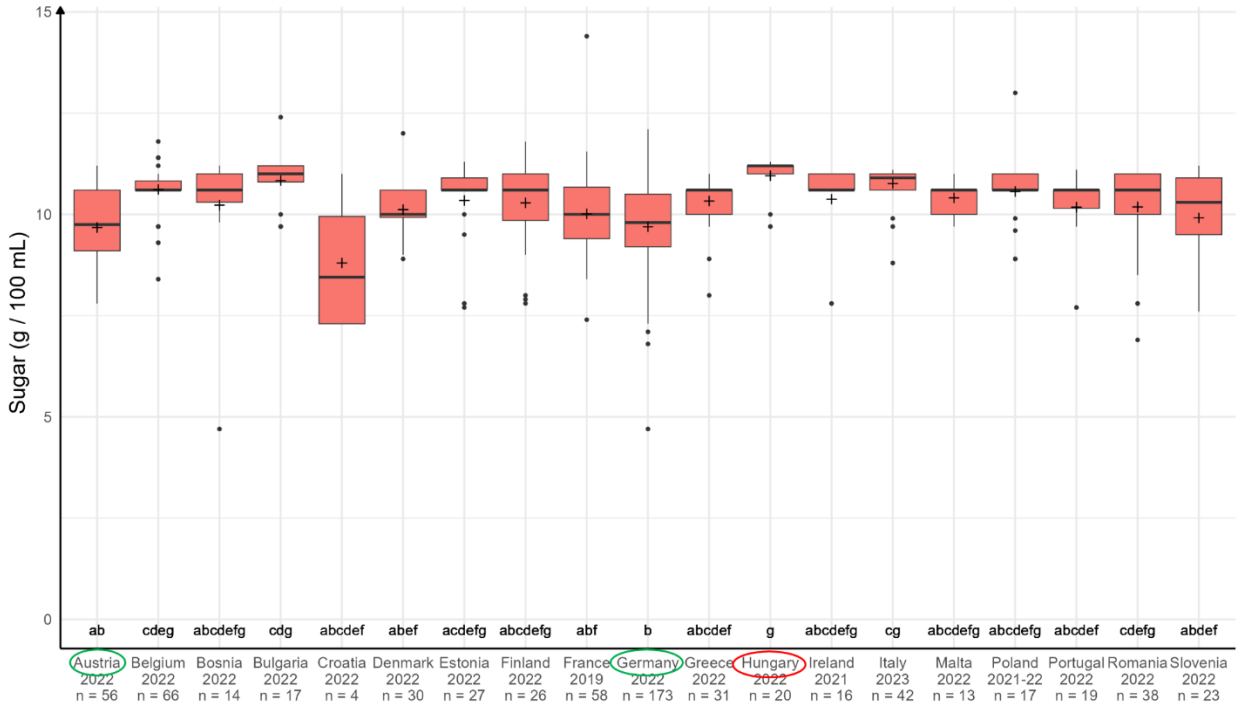

Figure 62: Distribution of sugar content for Sugar-sweetened colas (total number of references considered: 690) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Figure 63 shows the distributions of sugar content for Sugar-sweetened fruit beverages by country. The mean sugar content ranges from 6.4 g per 100 mL (Austria) to 10.7 g per 100 mL (Greece). For this subcategory, Bulgaria, Italy, Romania, and Greece tend to have the sweetest products. Conversely, Austria and Croatia tend to have the least sweet products. The differences in terms of variability (higher in Austria, Ireland and Poland; lower in Finland and Greece) suggest some room for reformulation.

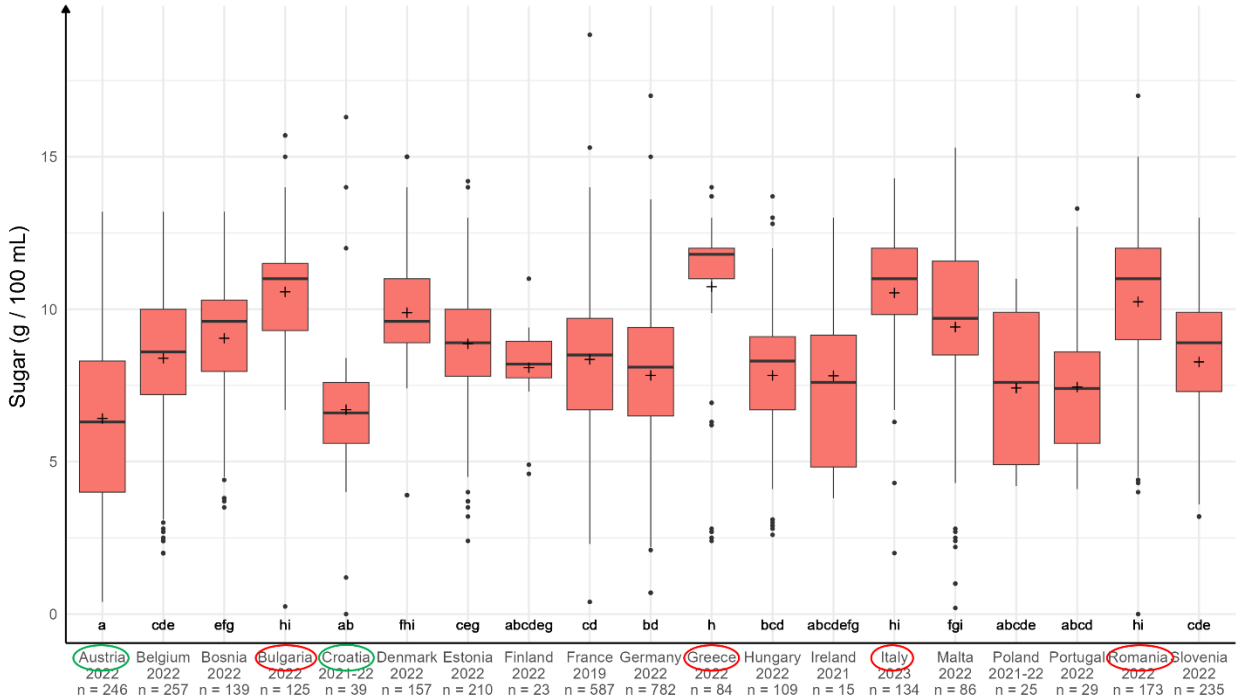

Figure 63: Distribution of sugar content for Sugar-sweetened fruit beverages (total number of references considered: 3,455) (green circle: countries whose average levels are statistically among the lowest; red circle: countries whose average levels are statistically among the highest)

Table 28: Mean sugar content per country among relevant Soft drinks subcategories (letters from Dunn's test). Within each subcategory, the minimum mean content is underlined, and the maximum is bold and underlined (n_tot: total number of references considered for all countries; Subcategories considered as relevant but with no significative differences are identified on lines with a grey background)

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Malta	Poland	Portugal	Romania	Slovenia
Flavoured milk beverages	1230	7.9	8.5	8.8	8	5.8	8.4	8.4		9.8	8.2	9.5	8.1	7.4	8.2	**10**	9.4	8.5	7.8	7.8
		ab	abc	bcde	abc	a	abc	abc		d	ab	cde	abc	ab	abcde	de	abcde	abce	abce	ab
Flavoured sugar-sweetened and artificially-sweetened waters	397	3.2	5.9	4.8	4.6		5.6	5.8	**6.8**	5.4	3.4	3.9	4.4	4.2	3.6	3.3	5.1	5.5	3.8	4.1
		a	c	abc	abc		abc	bc	abc	bc	a	ab	ab	ab	ab	a	abc	bc	ab	abc
Flavoured sugar-sweetened waters	937	8.4	9.1	4.8	8.5	4.9	9.4	7.2	5.8	8	6.6	9.4	3.3	9.8	10.4	8.1	7.5	8.8	**10.5**	6.3
		cdfghi	fghi	ab	bcdefghi	abcef	hi	cdefg	abcdefghi	cdfgh	be	hi	a	cdefghi	i	cdefghi	bcdefghi	abcdefghi	dghi	bcde
Fruit beverages with fruit content strictly over 50 percent	913	8.6	9.8	7.5	8.6	9.9	9.5	9.3	9.8	9.7	5.9	**10**	6	9.7	8.4	9.5	9.9	9.7	7.5	6.6
		abc	a	b	abcd	abc	abc	abc	abc	a	d	abcd	bd	a	bc	abc	abc	ac	abcd	abcd
Sugar-sweetened alcohol-free beers	426	4.8	2.7	4.7	4.8	5.1	2.7	6		6	**6.3**	2.4	5.8	3.6	4.1	5.3	5.4	1.3	4.6	5.5
		abcd	a	abcd	abcd	abcd	ab	d		cd	d	abc	cd	abcd	abcd	abcd	bcd	abcd	abcd	abcd
Sugar-sweetened and artificially-sweetened colas	115	4.2	6.9		**7**		**7**	6.9	6.2	6	3.6		6	4.6	4.5	4.2		6.4	3.5	5.8
		ab	a		ab		a	ab	ab	a	b		ab	ab	ab	ab		a	ab	ab
Sugar-sweetened and artificially-sweetened energy drinks	228	8.6	6.7	8.1	9.6		10.2	9.7		6.2	8.2	9.7	8	5.8	**10.5**	8.7	7.1	8.2	7.2	8.2
		abc	abc	abc	bc		bc	b		ac	abc	abc	abc	a	b	abc	abc	abc	abc	abc
Sugar-sweetened and artificially-sweetened fruit beverages	971	5	4.2	5.6	5.9		6.5	5.3	4	6.1	3.8	**7.3**	5.3	5	6	5.7	5.1	4.2	5.2	5.3
		abcde	ab	cd	cdf		cf	bcde	abcde	cf	a	f	cd	abde	cdf	cd	bcde	abe	cde	bcde
Sugar-sweetened and artificially-sweetened tea beverages	663	4.4	4	**6.4**	4.9	4.3	3.1	4.2		4.2	4.2	3.9	4	3.2	4.4	4.6	4	4.3	4.4	4.1
		abc	a	abc	bc	abc	abc	abc		ab	abc	abc	abc	ab	abc	bc	abc	c	abc	abc
Sugar-sweetened and artificially-sweetened tonics and bitters	101	4.6	5.3	6.5	5.4		3.2	**9.1**		5.5	3	6.4	6.3	4.2	4.3	6.6	5	5.3		6.2
		ab	a	ab	ab		ab	ab		a	b	ab	a	ab	ab	a	ab	ab		a
Sugar-sweetened colas	690	9.7	10.6	10.2	10.8	8.8	10.1	10.3	10.3	10	9.7	10.3	**11**	10.4	10.8	10.4	10.6	10.2	10.2	9.9
		ab	cdeg	abcdefg	cdg	abcdef	abef	acdefg	abcdefg	abf	b	abcdef	g	abcdefg	cg	abcdefg	abcdefg	abcdef	cdefg	abdef
Sugar-sweetened energy drinks	610	9.1	10.5	9.8	10.8	8.2	11.1	9.7	11.2	10.2	10	10.4	11.1	9.4	11.4	**11.5**	11.1	**11.5**	10.9	10.6
		a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Sugar-sweetened fruit beverages	3455	6.4	8.4	9	10.6	6.7	9.9	8.9	8.1	8.4	7.8	**10.7**	7.8	7.8	10.5	9.4	7.4	7.4	10.2	8.3
		a	cde	efg	hi	ab	fhi	cdg	abcdeg	cd	bd	h	bcd	abcdefg	hi	fgi	abcde	abcd	hi	cde

Subcategory_name	n_tot	Austria	Belgium	Bosnia	Bulgaria	Croatia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Malta	Poland	Portugal	Romania	Slovenia
Sugar-sweetened plant-based beverages	733	4.1	4.8	2	5.3	5.4	5.5	4.5	**5.7**	5		5.1	4.4	3.7	4.1	4.1	4.6	4	4.8	3.8
		a	a	a	a	a	a	a	a	a		a	a	a	a	a	a	a	a	a
Sugar-sweetened tea beverages	859	6.2	6	6.4	5.6	6.4	**7.5**	5.5	7.3	5.5	6.5	6.7	6.8	3.3	8.3	7.2	4.3	2.4	7	5.5
		acde	acd	abcdef	abcde	abcde	acdef	abc	abcdef	ab	cde	abcdef	def	b	f	ef	abcde	ab	abcdef	abcd
Sugar-sweetened tonics and bitters	509	8.8	7.7	5.7	**9.9**	6.6	8	7.9	9	8.2	9	8.4	8	5.7	8.6	7.4	8.6	7.9	7.8	7.6
		ab	ac	abc	ab	abc	ab	ab	ab	ab	b	abc	abc	c	ab	abc	abc	abc	abc	a
Vegetable beverages	253	8.5	6.8	4.1	10.6	6	7	8.8		9	5.7	9.9	3.7	10.2	7.4	5.3	7	7.4	**12**	9.2
		abc	ab	a	bc	abc	abc	abc		abc	abc	abc	abc	c	abc	abc	abc	abc	bc	abc

Synthesis and links to the national nutritional policies linked to soft drinks

Table 29 summarises the global ranking of the median at the category level (see methodology in section 2.1.2) and the implementation of specific national nutritional measures (as defined in section 2.1.2) related to soft drinks and the targeted nutrient content (sugar) for each participating country. It should be noted that the rankings and conclusions presented in this section are based on categories (and not subcategories); they therefore do not accurately reflect the quality of the food offer by country. Furthermore, no direct causal link between the global ranking and policies can be established in this section.

Overall, for soft drinks, all countries considered as low in the tier position have implemented public policies. For countries considered as high in the tier position, there is most of the time a public policy in place. Eleven countries out of 19 have implemented or will implement regulatory measures for soft drinks: Belgium (classified as mid), Croatia (classified as low), Finland (classified as high), France (classified as mid), Hungary (classified as mid), Ireland (classified as low), Italy (classified as high), Poland (classified as mid), Portugal (classified as mid), Romania (classified as mid), and Slovenia (classified as mid). For Romania and Italy, the measure has been taken after the data collection.

Efforts to improve the food supply are still possible in all countries, regardless of the country's position and the policies already implemented or not.

Table 29: Summary of country-level positioning (tier position when comparing the median content) and national nutritional policies on Soft drinks, for sugar

COUNTRY	Collection Year	SUGAR	
		Tier Position	Type of measure(s)
Austria	2022	Mid	
Belgium	2022	Mid	Collective agreement (2012-2020); Tax (2016); FOP (Nutri-Score: 2019)
Bosnia	2022	Mid	
Bulgaria	2022	High	Collective agreement (2015-2020; 2019-2025)
Croatia	2021-2022	Low	Tax (2020)
Denmark	2022	High	
Estonia	2022	Mid	
Finland	2022	High	Tax (2010 updated 2026)
France	2019	Mid	Collective agreement (2010-2015); Tax (2012 updated 2018 & 2025); FOP (Nutri-Score: 2017)
Germany	2022	Low	Collective agreement (2019-2025); FOP (Nutri-Score: 2020)
Greece	2022	High	
Hungary	2022	Mid	Tax (2011 updated 2022)
Ireland	2021	Low	Tax (2018)
Italy	2023	High	Collective agreement (2017); Tax (to be implemented 2027)
Malta	2022	High	
Poland	2021-2022	Mid	Tax (2021)
Portugal	2022	Mid	Tax (2016 updated 2018); Collective agreement (2019-2022)
Romania	2022	Mid	Tax (2024)
Slovenia	2022	Mid	Collective agreement (2015); Tax (2025)

green: countries ranked in the top tier; yellow: countries ranked in the middle tier; red: countries in the bottom tier. Collective agreement: jointly negotiated commitment between a government authority and representatives of an industry / FOP: front-of-pack labelling / Tax: legal nutritional tax imposed by government / Legal limit: maximum level beyond which the product cannot be marketed. / Legal threshold + mandatory label: threshold beyond which a mandatory label must be applied.

Sugar

Overall, based on the median-based ranking for the category (3-tier ranking of sugar median content for the 17 considered subcategories), Germany, Croatia, and Ireland tend to have the least sweet Soft drinks. Conversely, Finland, Bulgaria, Denmark, Greece, Italy, and Malta tend to have the sweetest Soft drinks.

If these results are examined in light of the health policies implemented in each country regarding the sugar content of Soft drinks, it can be seen that, of the 19 countries included in the analyses, 13 of them stated that they had at least one of the targeted measures relating to the sugar content in Soft drinks:

- Three are among the countries with the least sweet Soft drinks (Low):
    - Ireland has had a sugar tax since 2018;
    - Germany had a national reduction strategy covering the period 2019–2025, with a significant decrease of 0.3 g of sugar per 100 mL between 2018 and 2022. Germany also has had the Nutri-Score labelling since 2020;
    - Croatia has had a sugar tax since 2020.

- Three are among the ones with the sweetest Soft drinks (High):
    - Finland has had a tax since 2010 (updated in 2026);
    - Bulgaria had two collective agreements (2015–2020 and 2019–2025) with objectives of reducing sugar content by 15% and 10%, respectively;
    - Italy had a collective agreement in 2017 and has planned to implement a tax in 2027.

- Seven are ranked with an intermediate position (Mid):
    - France had a collective agreement (2010–2015) to reduce sugar content by 5%, has had a sugar tax since 2012 (updated in 2018 and 2025) and the Nutri-Score labelling since 2017;
    - Hungary has had a tax since 2011 (updated in 2022);
    - Belgium had a collective agreement (2012–2020) to reduce sugar content by 5% by the end of 2017 and by 10% by 2020. Belgium also has had a tax since 2016 and has had the Nutri-Score labelling since 2019;
    - Slovenia had a collective agreement in 2015 and a tax since 2025;
    - Portugal has had a tax since 2016 (updated in 2018) and had a collective agreement (2019–2022) with a goal of reducing sugar by 10%;
    - Poland has had a tax since 2021;
    - Romania has had a tax since 2024.

None of the targeted measures were reported for five countries: Austria (Mid), Bosnia (Mid), Denmark (High), Estonia (Mid), Greece (High), Malta (High).

2.2.3.6. Conclusion on the comparison of nutritional values

This study highlights differences in food offer by subcategories of five categories of food products collected using a common methodology (Bread products, Breakfast cereals, Delicatessen meats and similar, Fresh dairy products and desserts, and Soft drinks), as well as the variability in the levels of five nutrients of interest (sugar, saturated fat, salt, and fibre) in these products across European countries. **This shows that results vary considerably across countries and subcategories, and that there is overall room for reformulation, both within countries, where a wide range of values is observed, and between countries, where similar products (i.e., those belonging to a same subcategory) display different content ranges across Europe.** This also underscores the need to examine and compare the food offer at the subcategory level rather than aggregating and averaging across an entire food category that may contain very heterogeneous products.

For each nutrient examined, the comparison of the country's position relative to other European countries, along with the public health policies implemented nationally shows that **nutrition policies are not consistently implemented across countries or categories, and when they are, they target different nutrients and can take various forms** (e.g., taxation, collective agreements, front-of-pack labelling). Moreover, **the existence of a policy does not necessarily reflect a better food offer**. However, to draw robust conclusions, an in-depth analysis of policy strength, reach and duration in relation to reformulation would be necessary.

It has to be noted that we collected information only on specific national nutrition policies linked to the five categories collected during Best-ReMaP and to the targeted nutrient of interest relative to each category. As a consequence, some nutrition policies are not taken into account here (because not included in the scope specified in the methodology or that concerned other food categories). Additional nutritional (or other) policies not mentioned here could also play a role, such as measures related to canteens/public catering, or advertising. In addition, there are also some general national nutrition policies (e.g., dietary guidelines or nutrient profile models) or initiatives aimed at monitoring the nutritional composition of processed foods, which encourage voluntary improvements in nutritional quality without targeting any specific nutrient or category, as well as actions taken at the European level, such as the European Salt Action Network (2008) or European projects such as Janpa (2015–2017) or Best-ReMaP (2020–2023), that could be mentioned as significant leverages. Therefore, the information collected for this report is not exhaustive and does not accurately reflect each country's involvement in terms of nutrition policies.

Other limitations include the comparability of data across countries, which is affected by differences in data collection periods, as well as the representativeness of national market shares, which is linked to the varying number of products collected and the years of data collection, which may differ by country. It should also be kept in mind that there is no weighting by market share (as this data is not available for the project for most countries), meaning that a popular product and a niche product each count as a single item with the same weight. Beyond these limitations, this report enables the first accurate comparisons to be made of the current state of the food supply available in 19 European countries, which has been classified in a common/standardised manner, and links the results to the health policies implemented in each country. This helps identify the levers and measures to be promoted in order to improve the nutritional quality of products available on the European market and to create a virtuous cycle between countries.

3. Evaluation of structured digital data sources using Euromonitor

Taking into account what was done during Best-ReMaP (1) and the fact that Janpa/Best-ReMaP's methodology for data collection is burdensome, structured digital sources of data could prove to be an efficient alternative for data collection. The objective of this section is to assess the representativeness and reliability of structured digital sources of data, in order to simplify the data collection.

3.1. Euromonitor data overview

Euromonitor International is an independent market research organisation providing international market research, statistics, and analyses on sectors, countries, consumers, and companies. Euromonitor was chosen for the evaluation, as it appeared to be among the most complete structured digital data sources on the market, covering most European countries.

3.1.1. Euromonitor's methodology

Via is a web scraping tool that leverages machine learning and artificial intelligence to collect Stock Keeping Unit (SKU) information from e-retailers. A SKU is a unique identifier assigned to a product to track inventory and sales. Each SKU represents a distinct product variant, considering factors like size, colour, flavour, packaging (e.g., a 500 mL bottle of cola and a 1 L bottle of the same cola should have different SKUs), or retailer. However, it means that a same barcode can be scraped several times if it is available on different websites. It also means that if the retailer does not own an online sales website, no data will be collected. This reflects an inherent limitation of web-based data collection approaches, which depend on the availability and quality of retailer websites.

The Via database covers more than 1,500 retailer websites across 80 countries, for a total of tens of millions of SKUs in 41 countries tracked daily since 2019. Thirty-nine additional countries are covered monthly. This tool is designed to support market monitoring, trend analysis, and benchmarking at scale.

3.1.2. Euromonitor data description

Following discussions with Euromonitor and in adequacy with the budget allocated to the task, we agreed to the extraction of the dataset presented in **Table 30**, for two categories: soft drinks and breakfast cereals and for seven countries. These countries were selected because they had data collected using the traditional method to compare with Euromonitor data.

Table 30: Number of Euromonitor SKUs by country and food category

COUNTRY	YEAR	TOTAL	Breakfast cereals	Soft drinks
France	**2018 (cereals) 2019 (drinks)**	**6,795**	2,364	4,395
Ireland	**2021**	**1,697**	545	1,152
Austria	**2022**	**2,239**	890	1,349
Belgium		**4,108**	1,022	3,086
Estonia		**842**	294	548
Germany		**6,560**	2,640	3,920
Hungary		**3,371**	988	2,383
TOTAL		**25,576**	**8,743**	**16,833**

The Euromonitor dataset covers a large range of retailers. To compare with Best-ReMaP data, we asked to exclude exclusive e-retailers that do not have a physical store, such as Amazon. The complete definitions of the retailer types included in this dataset are given in **Annex 6**, while their distribution by country is detailed in **Table 31**. Euromonitor's dataset depicts a richer catalogue of soft drink SKUs compared to breakfast cereal SKUs (twice as much). There is also disparity between countries, with France and Germany presenting a larger number of products (more than 6,500 each), while Estonia has fewer (n_tot = 842). This may reflect a more or less developed market and online shopping ecosystem in some countries, and/or a greater or lesser number of screened websites by Euromonitor. Coverage differences may also reflect structural differences in online retail penetration and website availability across countries and sales channels.

Table 31: Distribution of Euromonitor's SKUs per category, country and retailer type (n = 25,576)

Category	Retailer_Type	Austria (n = 2,239)	Belgium (n = 4,108)	Estonia (n = 842)	France (n = 6,759)	Germany (n = 6,560)	Hungary (n = 3,371)	Ireland (n = 1,697)	TOTAL	
		Proportion within the country for the category (%)							Number of SKUs	Proportion within the category (%)
Breakfast Cereals	Alcohol Specialist	0	0	0	0	6.0	0	0	**158**	**1.8**
	Digitally Native Brand	0	0	0	0	0.8	0	0	**22**	**0.3**
	Discounter/Value	2.8	0.7	0	0.8	1.9	0	0	**101**	**1.2**
	Drugstore/Chemist/Pharmacy	63.0	31.3	0	1.5	25.6	5.5	0.4	**1,647**	**18.8**
	Food and Beverage Specialist	0	0	0	0.1	0	0	0	**3**	**0.0**
	Grocery/Mass Merchandiser	34.2	48.2	100.0	97.3	44.0	94.5	87.2	**5,962**	**68.2**
	Other Non-Grocery Specialist	0	18.4	0	0.2	0.3	0	0	**199**	**2.3**
	Vitamin and Dietary Supplement Specialist	0	1.4	0	0.2	21.4	0	12.5	**651**	**7.4**
Soft Drinks	Alcohol Specialist	0	0	1.8	0	10.4	4.5	0.1	**525**	**3.1**
	Beauty Specialist	0	0	0	0	0.1	0	0	**2**	**0.0**
	Digitally Native Brand	0	0	0	0	0	0	0	**1**	**0.0**
	Direct Seller	0	0	0	0	0.1	0	0.2	**5**	**0.0**
	Discounter/Value	6.7	0.9	0	3.0	4.5	0	0	**430**	**2.6**
	Drugstore/Chemist/Pharmacy	28.0	5.9	0	0.7	8.6	3.5	0	**1,012**	**6.0**
	Grocery/Mass Merchandiser	65.2	57.6	98.2	95.2	70.4	92.0	78.9	**13,239**	**78.6**
	Other Non-Grocery Specialist	0	34.6	0	1.1	0.8	0	0	**1,147**	**6.8**
	Vitamin and Dietary Supplement Specialist	0	1.0	0	0	5.1	0	20.8	**472**	**2.8**

Table 31 also highlights the predominance of the grocery/mass merchandisers, representing 68% of the SKUs for the breakfast cereals and 79% for the soft drinks. The second most important retailer type is the Drugstore/Chemist/Pharmacy, with 19% of the breakfast cereals SKUs and 6% of the soft drink SKUs. It is also interesting to note that discounters only count for 1% of the breakfast cereal SKUs and 3% of the soft drink SKUs. This may be explained in part by the more limited variety of discount products and by the absence of websites for some discounters (e.g., Lidl). Finally, where it is understandable to have alcohol specialists representing 3% of the soft drink SKUs (as they can also sell soft drinks and not only alcohol), it is more surprising to have them account for 6% of the breakfast cereal SKUs in Germany. It appeared that some retailers like mytime.de, categorized as alcohol specialist, were selling several other types of products.

The Euromonitor dataset includes the following information:

- Product name: translated in English (original name is not available);
- Country and year;
- Euromonitor category and subcategory (different taxonomy compared to Best-ReMaP);
- Company name and brand name;
- Retailer name and retailer type;
- Weight & volume;
- Number of units (e.g., pack of 12 cans);
- Serving size;
- Barcodes;
- Ingredients: pre-processed and translated in English (original list is not available);
- Nutritional values (mostly expressed per 100 g) when available for these nutrients only: Energy (kcal) / Fat / Saturated Fatty Acids / Carbohydrates / Sugar / Protein / Salt / Fibre.

For confidentiality reasons, the entire raw data cannot be made available in this report. However, aggregated summary data will be presented to meet the objectives of this deliverable.

3.1.3. Duplicates among Euromonitor data

An initial check on data quality was to look for duplicates inside the data (i.e., products with the same barcode found in different online shops for a country, but considered as different SKUs by Euromonitor because the data source is different). For instance, if a soda had two SKUs, with the same barcode in France and Germany, it would not be considered as duplicates because they are not in the same country. If this soda was sold in several supermarkets in France (e.g., one in Auchan and one in Carrefour), it would have as many SKUs as the number of stores where it is sold, and these SKUs would be considered duplicates. In this report, the term “duplicates” will refer to actual duplicates (i.e., two SKUs for the <u>same country</u> with the <u>same barcode</u>), but also to triplicates (three SKUs), quadruplicates or more. The presence of duplicate SKUs reflects the underlying data collection approach, where the same product may be captured across multiple retailer websites. In raw extracts, these are not automatically consolidated, as retailer-level visibility is preserved.

As the barcode is not available for all SKUs, the dataset considered includes a total of 13,093 SKUs for which a barcode has been found (i.e., 51% of the whole dataset). Among these 13,093 SKUs, 4,294 are considered as duplicates (33% of the data with a barcode), meaning that a same

barcode can be found under two or more SKUs for a same country (**Table 32**). More specifically, in Hungary, Ireland, and France, duplicates represent almost half of collected data with a barcode.

Table 32: Number of duplicates (n = 4,294 SKUs for 1,798 barcode references) among the Euromonitor SKUs with a barcode (n = 13,093), by country for the breakfast cereals & soft drinks

Country	Number of duplicates					TOTAL unique barcodes with duplicates	TOTAL duplicated SKUs	Proportion of SKUs with a barcode	Proportion of duplicates among the SKUs with a barcode
	2	3	4	5	39				
Austria	51	3	1	0	0	**55**	**115**	68.9%	**7.5%**
Belgium	67	5	0	0	1	**73**	**188**	38.8%	**11.8%**
Estonia	3	0	0	0	0	**3**	**6**	36.3%	**2.0%**
France	295	136	51	6	0	**488**	**1,232**	37.0%	**49.2%**
Germany	273	79	8	1	0	**361**	**820**	47.7%	**26.2%**
Hungary	280	202	41	0	0	**523**	**1,330**	82.7%	**47.7%**
Ireland	282	13	0	0	0	**295**	**603**	72.6%	**48.9%**
TOTAL	1,251	438	101	7	1	**1,798**	**4,294**	51.2%	**32.8%**

In order to investigate these duplicates in greater details, a comparison of the nutritional content has been made between duplicates for a given barcode (1,798 identified) (i.e., per 100 g: energy (kcal) / fat / saturated fatty acids / carbohydrates / sugar / protein / salt / fibre). From a global point of view, for these 1,798 barcode references with multiple SKUs (1,798 barcode references comprising 4,294 duplicates), 78% had at least one difference on their nutritional content, i.e., at least one different numerical value and/or one missing values (e.g., 4.8/NA/4.8 for sugar). When looking at nutrients individually (e.g., only comparing the protein content) (**Figure 64**), 44% were different, i.e., with at least one difference, with possibly missing values.

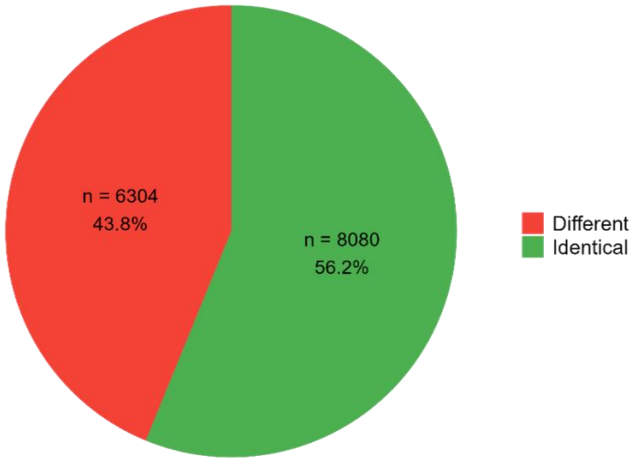

Figure 64: Concordance between the available different nutritional values among the Euromonitor duplicates (n = 14,384 groups of nutritional values).*
**Per 100g: Energy (kcal) / Fat / Saturated Fatty Acids / Carbohydrates / Sugar / Protein / Salt / Fibre*

As a conclusion, of the 51% of the Euromonitor products with a barcode, 33% were duplicates (Table 32). If not processed, these duplicates lead to an overestimation of the number of products on the market. It also constitutes a bias for the monitoring of trends (e.g., for calculating mean/median nutritional contents). Besides, users of such data do not know which product would be the one to consider, which makes it complicated to use. Finally, considering that a majority of the duplicates (78%) have at least one difference in nutritional content, this highlights a major issue to monitor reformulations.

3.2. Comparison of Best-ReMaP and Euromonitor datasets

To have a better idea of the quality of Euromonitor's data, a comparison has been made to the data previously collected during Best-ReMaP.

3.2.1. Comparative overview of the datasets

As a reminder, the Best-ReMaP data was collected by the different partner countries, essentially by in-store product collection, which has been promoted by the European Commission and defined as the "Gold standard" for its reliability by members of the European High Level Group on Nutrition and Physical Activity during the meeting held in Brussels on 23 November 2016. While this methodology provides a high level of precision, it is also more resource-intensive than digital data collection approaches. Due to the collection method (2), this dataset contains no duplicates (no duplicated collection if the same product is seen in multiple places). A corresponding dataset, covering the same countries and years as Best-ReMaP, was extracted from Euromonitor and is described in **Table 30**. The correspondence was made as close as possible in terms of years, countries, and categories, but the (sub)categories definitions may differ (e.g., the cereal bars are included in Euromonitor (~ 40 SKUs) and out of scope in Best-ReMaP). Furthermore, as described in section 3.1.2, the type of retailers is also different (e.g., pharmacies not included in Best-ReMaP). And even though exclusive e-retailers were outside our scope, some may still be included in the Euromonitor dataset (e.g., mytime.de in Germany).

An overview of the total amount of products for each dataset per country and category is given in **Figure 65**. It appears that, except for Estonia, Euromonitor contains more data than Best-ReMaP, which can be related to the wider scope of retailers in Euromonitor than in Best-ReMaP and the presence of duplicates in Euromonitor, as described in section 3.1.3.

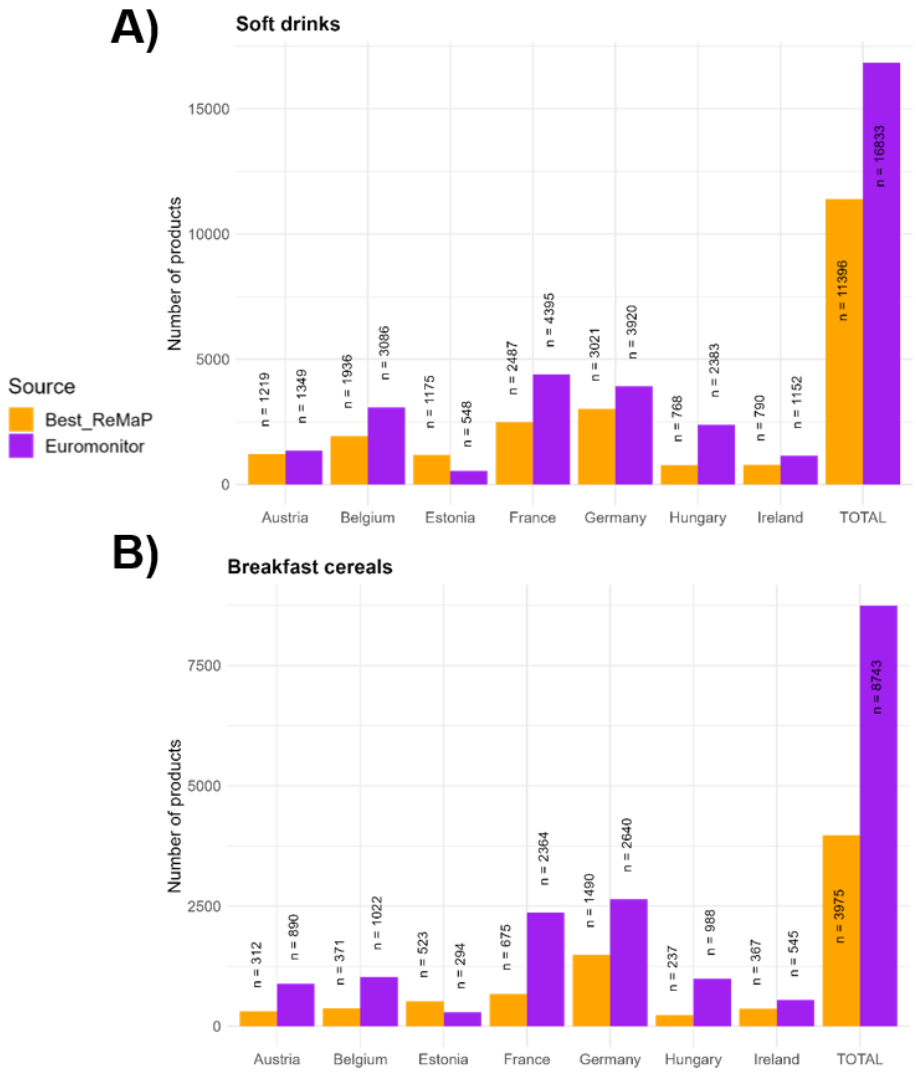

Figure 65: Total product entries by country for the Best-ReMaP (n = 15,371) and Euromonitor (n = 25,576) datasets, for A) soft drinks and B) breakfast cereals

To go deeper into the comparison, the available information in both datasets is compared in **Table 33**. It shows that information allowing the identification of the product (e.g., barcode, products name, weight and/or volume, brand name) was gathered in both datasets. However, the Best-ReMaP data is more precise and exhaustive as it includes the front-of-pack labelling, the preservation method (e.g., frozen, fresh), and if the products are part of an assortment, while this information is not collected in Euromonitor. Also, barcodes were provided for 73% of the products collected in Best-ReMaP, but for only 51% of the SKUs in Euromonitor. But Euromonitor always had the information on the number of units per product (e.g., 6 cans of soft drink), whereas this was available for only about 50% of the products in Best-ReMaP. Euromonitor also provided weight and/or volume for 96% of its data, compared with around 77% in Best-ReMaP.

Table 33: Comparison of the available information in Euromonitor and Best-ReMaP

VARIABLE	EUROMONITOR	BEST-REMAP
	Percentage of products with information for this variable out of the 25,576 SKUs considered	Percentage of products with information for this variable out of the 15,371 products considered
Product names	100 (translated in English / raw data not available)	100
Year & Country	100	100
Category & Subcategory	100	100
Assortment (yes/no)	0	100
Number of units (quantity)	100	50.1
Preservation method (e.g., frozen)	0	100
Front-of-pack labelling	0	100
Brand name	100	100
Retailer name	100	0
Weight and/or Volume	95.6	76.3
Portion size	38.9	40.1
Barcodes	51.2	73.2
Mandatory nutritional values per 100 g	42	95.6
Ingredients	73.7 (formatted / raw data not available)	78.8

For the nutritional values, Best-ReMaP data appeared to be more complete than Euromonitor, with higher proportions of products with nutritional values (**Figure 66**). The mandatory nutritional values (i.e., energy, fat, saturated fatty acids, carbohydrates, sugar, protein and salt) were given in 42% of the SKUs in Euromonitor and 96% in Best-ReMaP (**Table 33**). Overall, the breakfast cereals products appeared to have more nutritional data than the soft drinks, which was even more noticeable for fibres (49% of breakfast cereals and 8% of soft drinks with fibres in Euromonitor; 93% of breakfast cereals and 27% of soft drinks in Best-ReMaP).

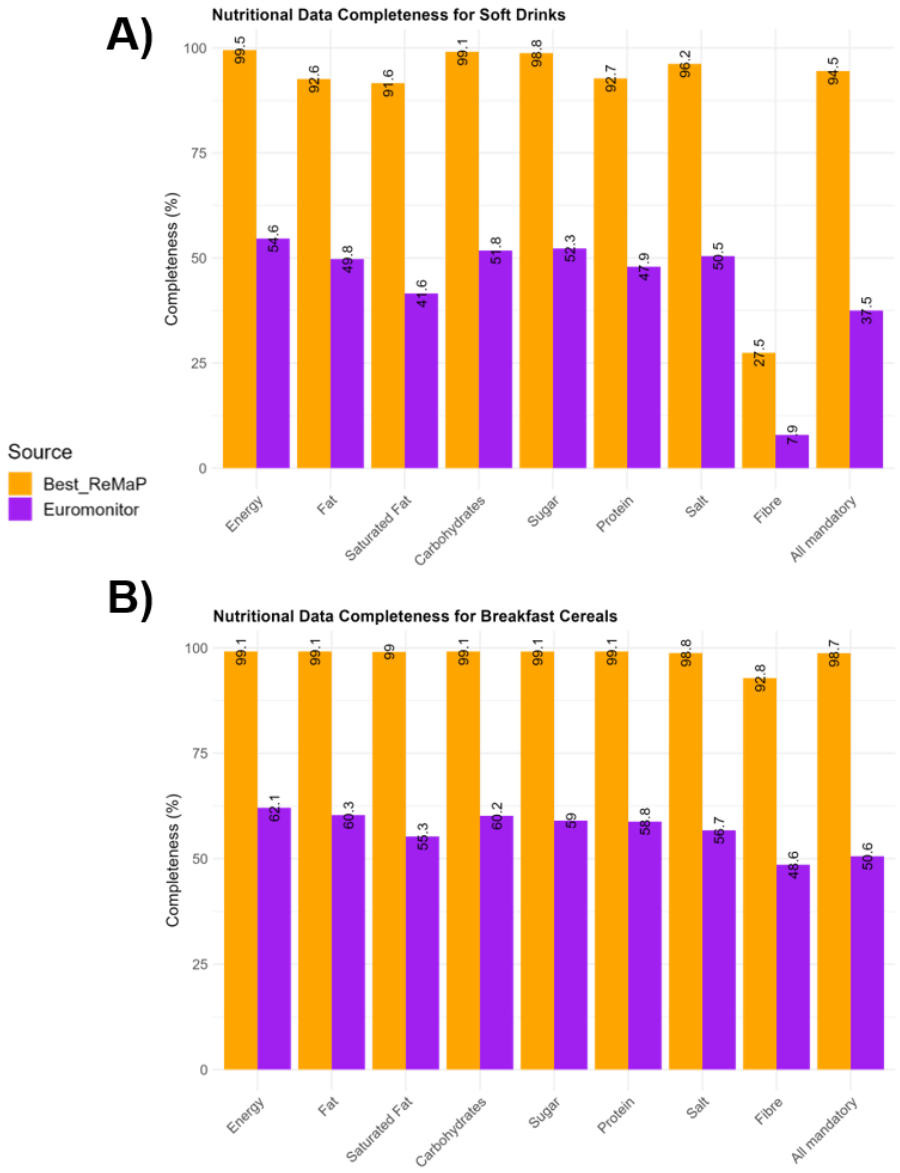

Figure 66: Proportion of products with nutritional values (per 100 g or 100 mL of product) by category, for the Best-ReMaP and Euromonitor datasets
NB: Euromonitor products with nutritional values given per portion are excluded from this graph (~ 1% of the SKUs), as well as the Best-ReMaP reconstituted products (e.g., porridge) (< 1%).

To conclude, Euromonitor presented a lower proportion of products with barcodes (51% in Euromonitor, compared to 73% in Best-ReMaP), which can be an issue to monitor a product over time and link each reference with the previous version of the same product. Another issue to monitor reformulation is the missing nutritional values per 100 g (Euromonitor has data on sugar content for 52% of all soft drinks SKUs *versus* 99% in Best-ReMaP). In Euromonitor, at least one mandatory nutritional value is missing for 73% of the soft drinks and 49% of the breakfast cereals (*versus* respectively 6% and 1% for Best-ReMaP), which strongly limits the ability to track the nutritional quality of the food offer.

3.2.2. Comparison of the products available in both datasets

To assess the reliability of the data, the two datasets were matched using barcodes and countries. It appeared to be the simplest and most robust way to compare equivalent data. However, it implies that the references without barcodes were lost in that procedure. To perform the comparison (in particular the nutritional values), we only considered the matching barcodes that were associated, per country, to a unique product in each dataset (assortments and duplicates were then excluded). A total of 1,625 products were therefore considered based on barcode matching. The number of matched barcodes by country and category are given in **Table 34**, and by subcategory in **Table 35**.

Table 34: Number of barcode matches by country and category (n = 1,625)

COUNTRY	BREAKFAST CEREALS	SOFT DRINKS
Austria	50	91
Belgium	55	174
Estonia	82	131
France	131	355
Germany	29	27
Hungary	40	115
Ireland	144	201
TOTAL	**531**	**1,094**

Table 35: Number of barcode matches by category and subcategory (n = 1,625)

CATEGORY	SUBCATEGORY	BARCODE MATCHES
SOFT DRINKS	Colas without added sugar	50
	Energy drinks without added sugar	47
	Flavoured milk beverages	51
	Flavoured sugar-sweetened and artificially-sweetened waters	21
	Flavoured sugar-sweetened waters	68
	Flavoured waters without added sugar	67
	Fruit beverages with fruit content > or = 50%	23
	Fruit beverages without added sugar	72
	Other sports drinks	5
	Other sugar-sweetened beverages	12
	Plant-based beverages without added sugar	2

CATEGORY	SUBCATEGORY	BARCODE MATCHES
	Sugar-sweetened alcohol-free beers	5
	Sugar-sweetened and artificially-sweetened colas	10
	Sugar-sweetened and artificially-sweetened energy drinks	33
	Sugar-sweetened and artificially-sweetened fruit beverages	81
	Sugar-sweetened and artificially-sweetened tea beverages	45
	Sugar-sweetened and artificially-sweetened tonics and bitters	7
	Sugar-sweetened colas	46
	Sugar-sweetened energy drinks	36
	Sugar-sweetened fruit beverages	223
	Sugar-sweetened plant-based beverages	2
	Sugar-sweetened sports drinks	5
	Sugar-sweetened tea beverages	102
	Sugar-sweetened tonics and bitters	35
	Tea beverages without added sugar	26
	Tonics and bitters without added sugar	11
	Vegetable beverages	9
	TOTAL	**1,094**
BREAKFAST CEREALS	Cereal flakes with chocolate/nuts	11
	Cereal flakes with fruit	4
	Cereals without added sugar	62
	Chocolate and caramel cereals	3
	Chocolate-flavoured cereals	43
	Crunchy chocolate muesli	55
	Crunchy fruit muesli	82
	Crunchy muesli with nuts/seeds	25
	Filled cereals	28
	High-fibre cereals	31
	High-fibre fruit cereals	11
	Honey/caramel cereals	34
	Other ready-to-eat cereals	4
	Sweet cereal flakes	29
	Traditional muesli flakes	109
	TOTAL	**531**

Among the 1,625 matching barcodes in both datasets, the whole nutritional labelling per 100 g was compared (i.e., Energy (kcal) / Fat / Saturated Fatty Acids / Carbohydrates / Sugar / Protein / Salt / Fibre). It appeared that only 15% had a completely identical nutritional labelling meaning the same numerical values or non-labelled for both (e.g., 4.8/4.8 sugar & NA/NA fibre). On the contrary, 85% had a different nutritional labelling, meaning at least one different numerical value, and/or missing values (e.g., 4.8/NA fat). By looking at nutrients individually (**Figure 67**) and removing the cases where no information was available (e.g., NA/NA), it appeared that 48% of the values were identical, while 17% were different (the rest could not be evaluated as it was either missing in Euromonitor (34%) or in Best-ReMaP (2%)). Differences may also reflect timing mismatches between datasets, as product formulations and labelling can change over time, while online retailer data may not always reflect the most up-to-date packaging.

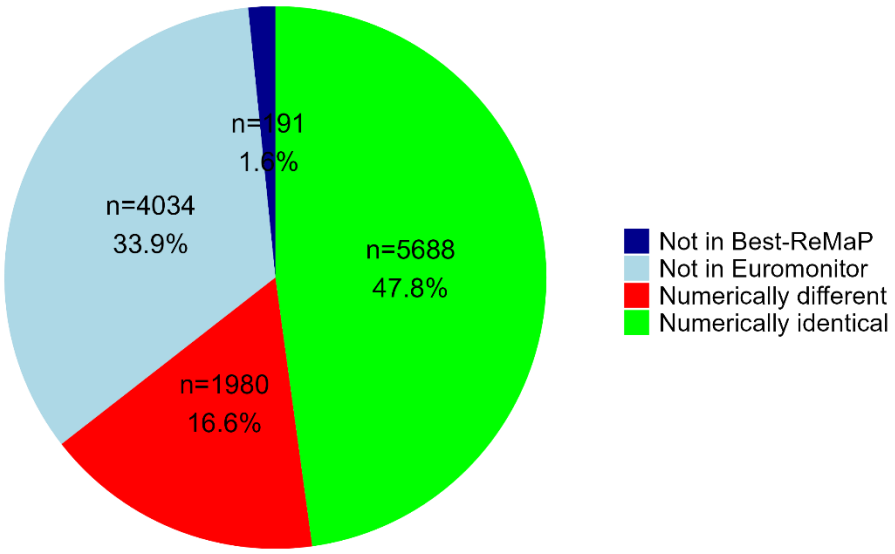

Figure 67: Concordance between the nutritional values reported for breakfast cereals and soft drinks in the Euromonitor & Best-ReMaP unique matches (n = 11,893 pairs of nutrients per 100 g: Energy (kcal) / Fat / Saturated Fatty Acids / Carbohydrates / Sugar / Protein / Salt / Fibre)

Looking at each nutrient independently (**Figure 68**), most showed around 50% of numerically identical values, whereas fibres were identical in only 41% of cases and energy (kcal) in 33%. Energy (kcal) had the highest ratio of numerical difference (36%), followed by salt (16%), sugar (15.9%) and carbohydrates (15.6%).

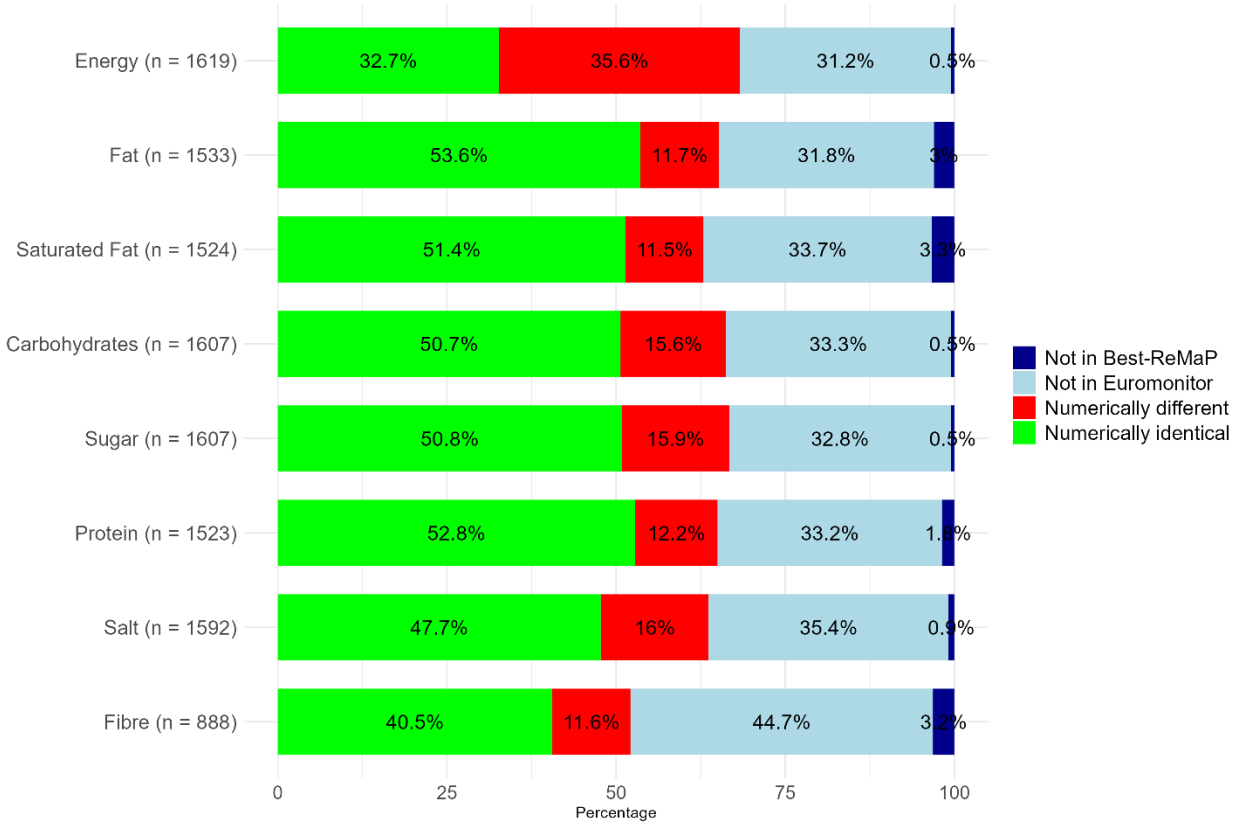

Figure 68: Concordance between the nutritional values reported for breakfast cereals and soft drinks in the Euromonitor & Best-ReMaP unique matches, detailed by nutrient (n = 11,893 pairs of nutrients per 100 g: Energy (kcal) / Fat / Saturated Fatty Acids / Carbohydrates / Sugar / Protein / Salt / Fibre)

For a more in-depth analysis, these differences (represented in red in **Figure 68**) have been quantified in g per 100 g (breakfast cereals) or 100 mL (soft drinks) in **Figure 69**. At first, it appeared that differences were overall larger for the breakfast cereals (**Figure 69B**) than for the soft drinks (**Figure 69A**), which is probably related to the different natures of the products –soft drinks as liquids contain mostly carbohydrates and sugar. Thus, for the soft drinks category, carbohydrate and sugar values show the largest gaps, with almost a quarter of products (24% and 23%, respectively) displaying a difference of more than 2 g per 100 g (**Figure 69A**). For the other nutrients (fat, saturated fat, protein, and fibre), most differences were below 0.5 g and below 0.05 g for salt. For the breakfast cereals, differences in nutritional values between a product in Best-ReMaP and its counterpart in Euromonitor were more frequently substantial. Half of the differences in fibre content exceeded 2 g per 100 g, as did 49% for carbohydrates, 46% for sugar, 34% for fat, 30% for protein, and 25% for saturated fat (**Figure 69B**).

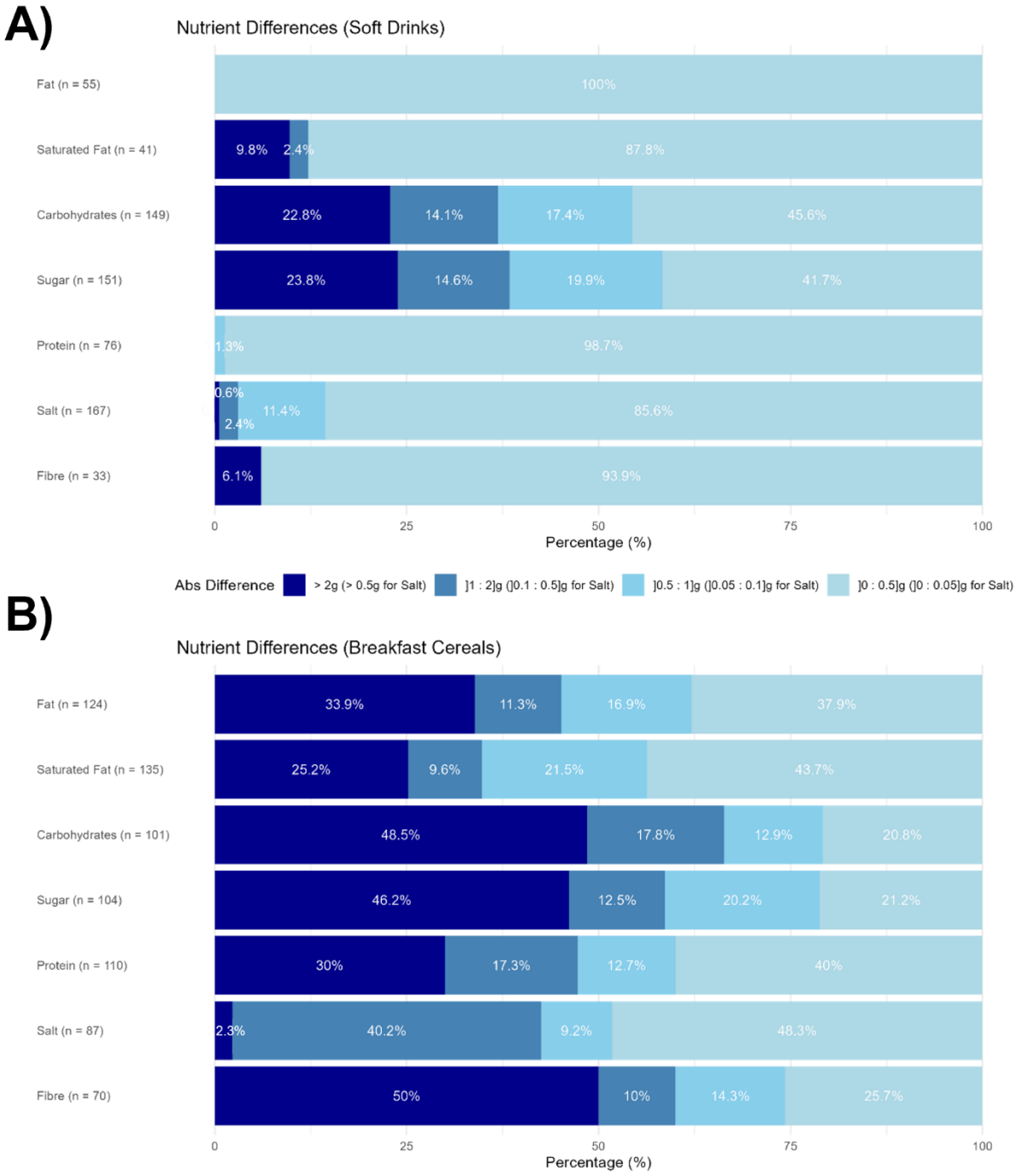

Figure 69: Quantification of the labelled nutritional differences (in g per 100 g or 100 mL of product) between Euromonitor and Best-ReMaP for A) the soft drinks and B) the breakfast cereals

Alternative representations of these nutritional differences are given in **Figure 70**. These scatter plots superimpose the same reference from Euromonitor (purple) and Best-ReMaP (orange) on the same x-axis, allowing for better visualization of the product-by-product differences. In particular, it shows that 22% of the matched soft drinks and 28% of the matched breakfast cereals have different sugar contents when both datasets have a value (**Figure 70A&C**). For breakfast

cereals, the matched references also differ by 36% for saturated fat, 25% for salt and 24% for fibres when both datasets have a value (**Figure 70B,D&E**). Some outliers, such as products in Euromonitor reported with 100 g of sugar per 100 g of product (**Figure 70A&C**), appear unrealistic and are most likely errors (probably due to inconsistencies in how information is displayed or captured from retailer websites).

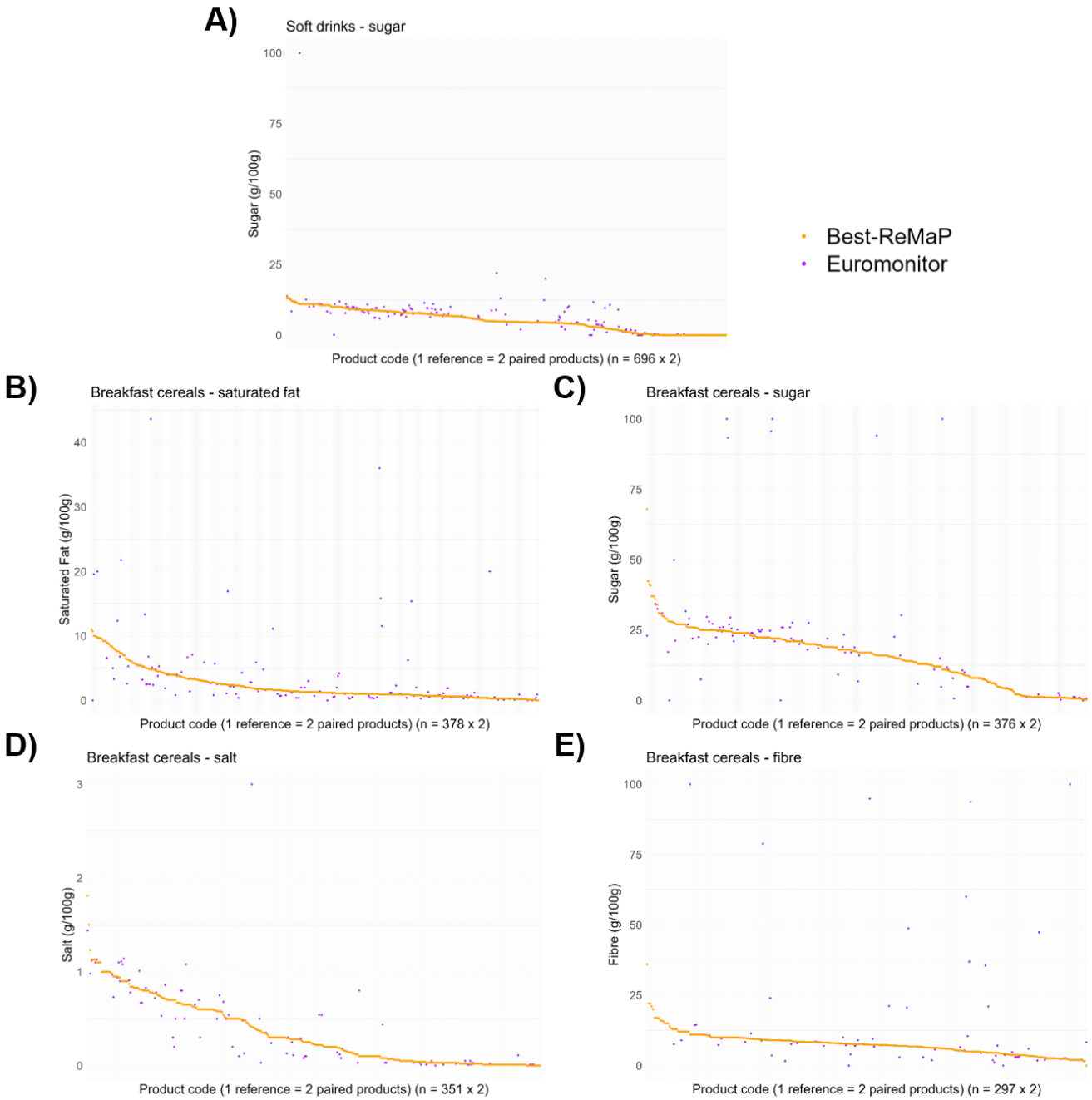

Figure 70: Scatter plots for Best-ReMaP (orange) and Euromonitor (purple) of the sugar content in soft drinks (A), saturated fat in breakfast cereals (B), sugar in breakfast cereals (C), salt in breakfast cereals (D) and fibre in breakfast cereals (E)

3.2.3. List of ingredients

The last point of comparison was the list of ingredients. Euromonitor's complete methodology for the processing of the ingredient list is not publicly available, but the models are designed to capture and standardize ingredients by looking for keywords from the text scraped from retailer webpages.

As depicted with examples on **Figure 71,** Euromonitor's ingredient list, as extracted and standardised from retailer websites, did not keep information on the proportions of the ingredients and did not always respect the descending order of the ingredients contained in the products, which is crucial in food labelling.

It also appeared that, in Euromonitor, some ingredients were completely missing, or that some precisions were missed in the transcription, as the "wholegrain wheat" becoming "wheat" and the "carbonated water" becoming "water". Besides, it was impossible to access the raw list ingredients in Euromonitor, in order to look at the list in its original language and have potential complementary information. In comparison, the list of ingredients in Best-ReMaP was given in its original language, and appeared to be more similar to the labelling.

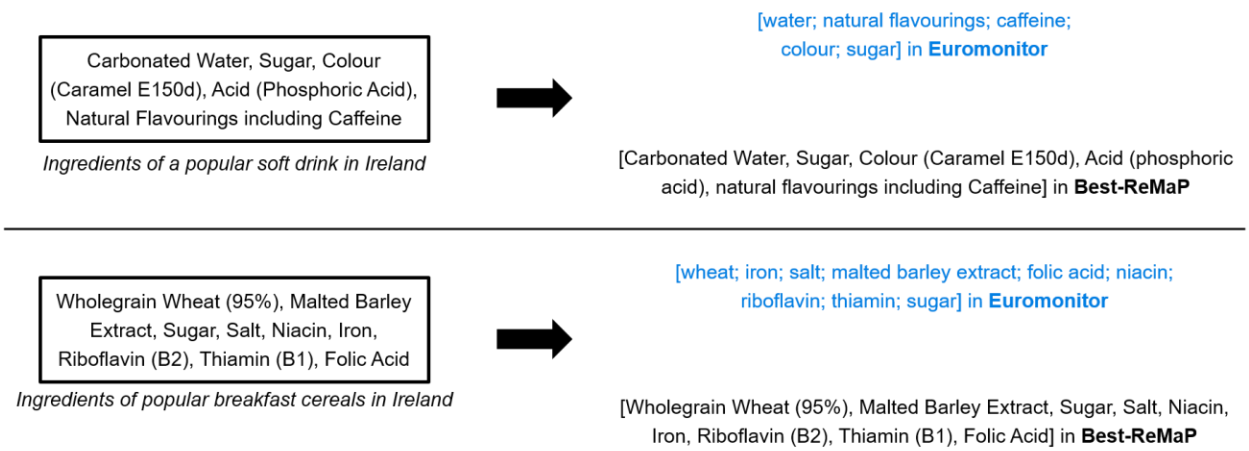

Figure 71: Examples of the restitution of ingredient lists for two popular products, in Euromonitor and Best-ReMaP

With such flaws, the ingredient list given by Euromonitor doesn't seem reliable enough to use, as the order of the ingredients is not respected and the quantities are missing.

3.3. Focus on the comparison with French Oqali data

This section uses the French data from Oqali (The French Food Observatory), which served both as the source of the French dataset and as the methodological model for Best-ReMaP. It is important to note that the two datasets are based on fundamentally different methodologies: Oqali relies on in-store data collection designed to monitor processed-food reformulation at the branded level, whereas Euromonitor's Via dataset is designed for scalable, high-frequency market observation based on digital sources.

In line with what was described in section 3.2.1, there were two times more products in French Euromonitor data than in Oqali (

Table 36**A**). Then, only considering the products with a barcode, it appeared that Euromonitor had more breakfast cereals than Oqali (913 *vs* 671), but less soft drinks (1,591 *vs* 2,466) (

Table 36**B**). Following the matching methodology described in section 3.2.2 and considering only data with a barcode in both datasets, a total of 723 references has matching barcodes, 223 breakfast cereals and 500 soft drinks (

Table 36**B**)**.** Note that the number of matched references in Euromonitor (1,102 SKUs) is higher, as it contains duplicates (34% of the data considered).

Table 36: Number of French products available in Euromonitor and Oqali by category: A) with or without barcode, B) with barcodes and matches by category

A)

	BREAKFAST CEREALS	SOFT DRINKS	TOTAL
Euromonitor	2 364	4 395	6 759
Oqali	675	2 487	3 162

B)

		BREAKFAST CEREALS	SOFT DRINKS	TOTAL
Euromonitor		913	1 591	2 504
Oqali		671	2 466	3 137
MATCH	**Unique barcodes**	223	500	723
	SKUs in Euromonitor	376	726	1 102
	Products in Oqali	223	500	723

Benefiting from the Kantar–Panel Worldpanel data, which are available for the Oqali datasets, some estimations about the market shares covered by both datasets have been made (**Figure 72**). It appeared that Oqali covered 82% of the soft drinks market and 88% of the breakfast cereals market (in terms of sales). It can also be mentioned that Euromonitor covers at least 48% of the soft drinks market and 63% of the breakfast cereals market. However, as the data was matched

by barcode, the majority of Euromonitor's SKUs are missing (63%), which makes it impossible to estimate Euromonitor's actual coverage through this data.

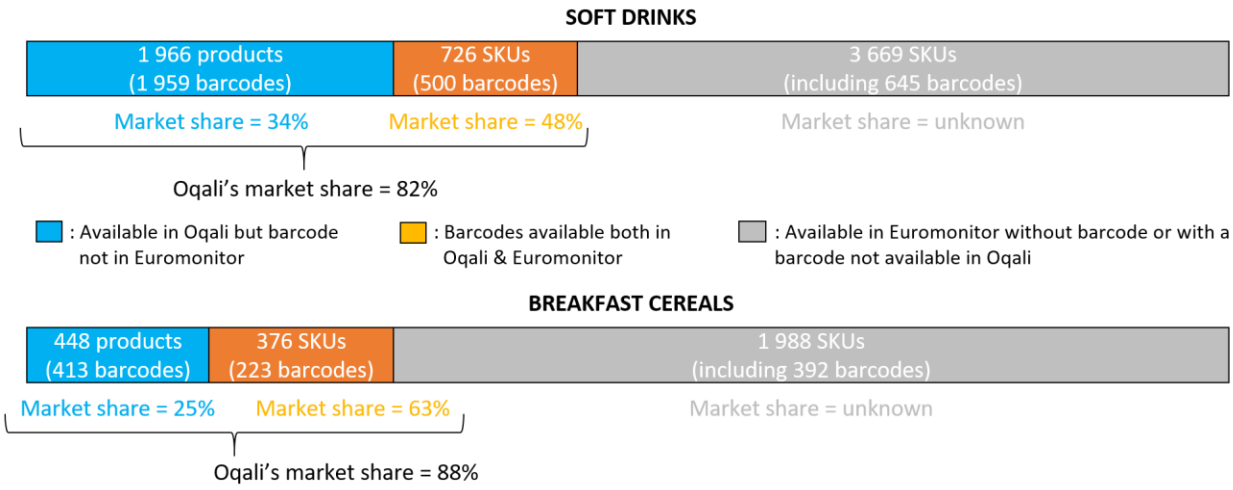

Figure 72: Estimated market shares in France for Euromonitor and Oqali, by category

In terms of nutritional data, Euromonitor does not collect micronutrient data. The Oqali's dataset shows that such data concerns 6 to 32% of the French breakfast cereals collected for B vitamins and iron (**Figure 73**).

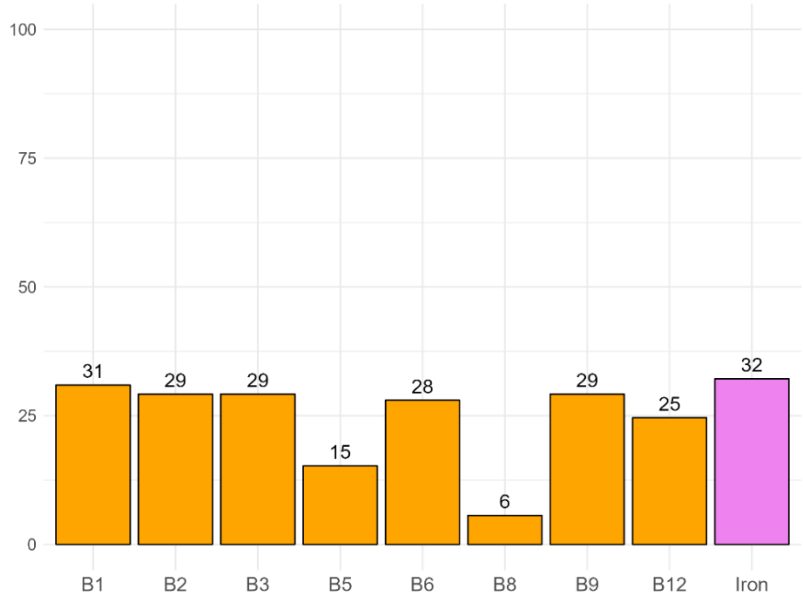

Figure 73: Availability (in %) of the information on some vitamins and minerals for French breakfast cereals in Oqali (n = 675)

As a conclusion, for France, Euromonitor had twice as many products as Oqali, but fewer products with a barcode. In terms of market share, 82% of the soft drinks and 88% of the breakfast cereals markets were covered by Oqali, including respectively at least 48% and 63% in common with Euromonitor. However, no precise market share could be calculated

for Euromonitor data, as it is linked to barcodes and only 37% of unique references in Euromonitor data have a barcode. Finally, micronutrient information was not collected in Euromonitor, whereas it can cover up to one-third of products in Oqali.

3.4. Conclusion on the use of structured digital data sources

Using Euromonitor's Via database had significant advantages. It is an automated procedure, which outputs formatted data, allowing automated and quick data treatment. The service can be tailored to specific needs in terms of selection of the data, country, type of retailers etc. The high-frequency data capture (every day or every month depending on the country) and the broad coverage of retailers and countries covered is an asset.

However, multiple limits have been highlighted:

- The presence of many duplicates was a major issue, as a same product (same barcode and same country) can correspond to many SKUs but with characteristics that might differ (e.g., nutritional values, ingredients), making impossible to know which information corresponds to the one displayed on the packaging in-store.
- The fact that only 50% of the SKUs had a barcode makes it harder to follow products over time (e.g., for reformulation).
- The overall quality of the data was also questioned. Even when available, the data does not always seem to match the mirror in-store collected data. This might also be explained by the underlying methodology, which relies on the quality of the scraped websites (e.g., updated information, completion of the information). This reflects a broader limitation of web-based data collection approaches, which depend on the availability and quality of retailer websites.
- The ingredient list was not exploitable as provided, as it loses some information (e.g., percentages, order of the ingredients). Some parts of the data look incorrect (e.g., soft drinks with 100 g sugar per 100 g, portion sizes of "0.0 g").
- The automated translation of the product names and ingredients could be inaccurate, and cannot be verified through the raw entry in the original language. Some product names were also cut (e.g., "muesli cereal nuts pecan & nuts Bre…").
- Finally, only 50% of the SKUs had nutritional data, and micronutrients were not available. Some additional information were missing (e.g., "traces", values with "<"), which can be a problem to monitor reformulation. Euromonitor is already aware of some of these issues and is conducting pilot studies focused on capturing nutritional data in order to improve their technique.

Euromonitor could be an interesting data source and using such digital data appears to be less burdensome than in-store data collection, as it simplifies and speeds up the data collection process. However, given the many limitations highlighted, it does not yet appear suitable for monitoring processed food reformulation.

4. General conclusion

The implementation of a harmonised classification at the European level allows for comparisons between countries and opens up discussions on an inter-country benchmark.

This previously unpublished data enables:

- public authorities to have access to factual information to guide public policy (for example, to negotiate with industry professionals regarding improvements of nutritional composition, based on products available on the European market or to assess the impact of a given public policy);
- consumers to have access to factual information on the nutritional composition of products;
- industry to compare the nutritional composition of their products with others currently on the market.

Regarding the comparisons of the state of play of the food offer, it allows displaying similarities and differences between some European countries. Major differences are revealed, with a high variation in the number of products collected in the categories and subcategories.

Analyses of packaging information such as the presence of a portion size or a front-of-pack labelling, also provide factual information on what is or is not implemented in different countries, in order to inform consumers and provide transparency. The report for example highlights:

- a low prevalence and high variability regarding the presence of a front-of-pack labelling across Europe;
- a low prevalence regarding the presence of portion size displayed on the packaging, but depending on the category, portions may be of a similar size (without necessarily being identical in all countries).

Regarding the variability of nutritional values in sugar, salt, saturated fat, and fibre, the comparisons between countries highlight that there are differences depending on the country, subcategory and nutrient analysed, **but there is always room for reformulation in order to improve the nutritional quality of the food offer.** Cross-referencing the analysis of the state of play of food offer with specific, targeted health policies (collecting data relating to nutrients and categories of interest) such as taxation, nutrition labelling or collective agreements allows to conclude that:

- the implementation of targeted policies in a country is not necessarily linked to a better nutritional quality of its products;
- the absence of policy does not necessarily mean that the countries have the highest nutrient content in sugar, salt or saturated fat;
- a more in-depth analysis of policy strength, reach and duration in relation to reformulation would be necessary to draw robust conclusions;
- **regardless of the results observed and whether policies have already been implemented or not, efforts to improve the food supply are still possible in all countries**.

This work also demonstrates the importance of making nutritional comparisons (across countries and within a country) at the subcategory level, in order to analyse comparable products and identify relevant margins of improvement depending on the type of product.

Finally, such a nutritional overview is highly dependent on the amount and quality of the data collected. The classical in-store approach, carried out during Best-ReMaP is burdensome. Digital data sources therefore appear to be an attractive solution. However, as the evaluation of Euromonitor data shows, the quality of these digital sources does not appear enough sufficient in a context of tracking food reformulation. Future significant quality improvements would be required to lead to a reassessment of these digital data sources.

5. References

1. Best-ReMaP – Healthy Food for a Healthy Future [Internet]. [cité 11 déc 2025]. Disponible sur: https://bestremap.eu/

2. D5.1-Development-of-the-Guidelines-for-an-European-harmonised-and-sustainable-monitoring-system-of-the-pocessed-food-supply.

3. Anses. Best-ReMaP-Guidelines-D5.2_final [Internet]. 2023 [cité 11 août 2025]. Disponible sur: https://bestremap.eu/wp-content/uploads/2023/04/Best-ReMaP-Guidelines-D5.2_final.pdf

4. European Health and Digital Executive Agency (European Commission), ICF S.A. EU REformulation MOnitoring (EUREMO): feasibility study for a monitoring system on reformulation initiatives for salt, sugars and fat : final report [Internet]. Publications Office of the European Union; 2022 [cité 12 déc 2024]. Disponible sur: https://data.europa.eu/doi/10.2925/308861

5. Gréa C, Turban C, Roser S, Storcksdieck genannt Bonsmann S, Hoffmann I. Design and methods of the German monitoring of packaged food in the European context. Journal of Food Composition and Analysis. 1 août 2023;121:105405. doi:10.1016/j.jfca.2023.105405

6. Anses. D5.3: REPORT ON REFORMULATION MONITORING: ANNEXES [Internet]. sept 2023. p. 1055. Disponible sur: https://bestremap.eu/wp-content/uploads/2023/09/Annexes-D5.3-Report-on-reformulation-monitoring.pdf

7. Giraudeau B, Narayanane G, Molle O, Allais O, Soler LG, Dulieu J, et al. Étude d'évolution du secteur de la Panification croustillante et moelleuse - Oqali - Données 2009, 2012 et 2019 [report] [Internet]. INRAE PSAE - Oqali; 2022 [cité 11 déc 2025]. p. 310 p. Disponible sur: https://hal.inrae.fr/hal-03788520

8. Champion M, Molle O, Allais O, Narayanane G, Soler LG, Dulieu J, et al. Etude d'évolution du secteur des Céréales pour le petit-déjeuner - Oqali - Données 2008, 2011 et 2018 [Other] [Internet]. INRAE ALISS - Oqali; déc 2020 [cité 11 déc 2025]. p. 284 p. + bilan 39 p. Disponible sur: https://hal.inrae.fr/hal-03106350

9. Molle O, Trichard M, Allais O, Calvarin J, Narayanane G, Nicklaus S, et al. Etude d'évolution du secteur de la Charcuterie et assimilés - Oqali - Données 2010, 2013 et 2020 [Internet]. Oqali; juin 2025 [cité 11 déc 2025]. p. 174 p. Disponible sur: https://hal.science/hal-05116269

10. Mathiot H, Sauvage E, Battisti C, Gauvreau-Béziat J, Ménard C, Volatier JL, et al. Produits laitiers et desserts frais [report] [Internet]. Anses - Oqali; 2020 [cité 11 déc 2025]. p. 342 p. Disponible sur: https://anses.hal.science/anses-04189067

11. Coudray A, Vin K, Gauvreau-Beziat J, Volatier JL, Digaud O, Duplessis B, et al. Boissons rafraichissantes sans alcool - Evolution de l'offre et de la qualité nutritionnelle entre 2010, 2013 et 2019 - Rapport détaillé [report] [Internet]. Anses - Oqali; 2024 [cité 11 déc 2025]. p. 197 p. Disponible sur: https://anses.hal.science/anses-04515558

12. Santé Publique France – Conditions of Use of the trademark « Nutri-Score ».

The complete annexes are available in the file attached to this report.

Annex 1: Best-ReMaP nomenclature (2022 September, 7)

Annex 2: Tables showing the number and percentage of products collected and analysed by subcategory and country

Annex 3: Questionnaire for gathering information on specific nutrition policies, as shared with partners

Annex 4: Comparison between countries (including France) of the type of front-of-pack labelling found on collected products, by category

Annex 5: Descriptive statistics for each nutrient, by subcategory and country. "n": number of references; "min": minimum; "Q1": first quartile; "Q3": third quartile; "max": maximum

Annex 6: List of the retailer types included in the dataset and their Euromonitor definitions