

Update of the Nutri-Score algorithm

Update report from the Scientific Committee of the Nutri-Score
2022

The update report from the Scientific Committee of the Nutri-Score was voted on June 29, 2022 and accepted unanimously by the members of the Scientific Committee.

Table of contents

Update report from the Scientific Committee of the Nutri-Score	1
<i>Executive summary</i>	<i>5</i>
<i>Methods – summary</i>	<i>6</i>
<i>Priority areas of the ScC – summary.....</i>	<i>9</i>
1. Main algorithm for general foods	11
1.1. Energy	11
1.1.1. Rationale.....	11
1.1.2. Target groups for modifications in energy	12
1.1.3. Main scenarios tested	15
1.1.4. Main scenario retained.....	16
1.2. Saturated fats.....	16
1.3. Sugars.....	17
1.3.1. Rationale.....	17
1.3.2. Target groups.....	18
1.3.3. Main scenarios tested	20
1.3.1. Results	21
1.3.2. Main scenario retained.....	24
1.4. Salt – sodium.....	24
1.4.1. Rationale.....	24
1.4.2. Target groups.....	25
1.4.3. Main scenarios tested	28
1.4.4. Results	28
1.4.5. Main scenario retained.....	32
1.5. Dietary fibres.....	33
1.5.1. Rationale.....	33
1.5.2. Target groups.....	34
1.5.3. Main scenarios tested	37
1.5.4. Results	37
1.5.5. Main scenario retained.....	40
1.6. Proteins.....	41
1.6.1. Rationale.....	41
1.6.2. Target groups.....	41
1.6.3. Main scenarios tested	45
1.6.1. Results	45
1.6.2. Main scenario retained.....	48
1.7. Fruit, vegetables, legumes, nuts and plant-based oils	48
1.8. Final combination and adjustment of thresholds.....	49
1.8.1. Final combination.....	49

1.8.2.	Thresholds adjustment.....	50
1.8.3.	Impact on food product classification	52
1.8.4.	Conclusion	67
2.	Fats, oils, nuts and seeds	68
2.1.	Rationale	68
2.1.1.	Fats and oils classification	68
2.1.2.	Nuts classification.....	68
2.2.	Target group for modification	69
2.3.	Main scenarios tested.....	69
2.3.1.	Energy component	69
2.3.2.	Fruit, vegetables, legumes and oils component.....	72
2.3.3.	Protein cap threshold	72
2.3.4.	Final Nutri-Score thresholds.....	72
2.4.	Selection of the main modifications	72
2.4.1.	Selection of the Energy component point allocation scale	72
2.4.2.	Protein cap threshold	73
2.4.3.	Final thresholds	74
2.5.	Results.....	74
3.	Meat and meat products	86
3.1.	Rationale	86
3.2.	Target groups for modifications	87
3.3.	Main scenarios tested.....	87
3.4.	Results.....	89
3.5.	Conclusion.....	90
4.	Conclusion	91
5.	Next steps – agenda of the ScC	91
5.1.	Beverages.....	91
5.2.	Fruit and vegetable component definition	91
Acknowledgements.....		92
References.....		93
Appendix		97
 Members of the Scientific Committee of the Nutri-Score.....		98
 List of abbreviations.....		99
 Available databases from COEN for Nutri-Score algorithm testing.....		100
 Nutrient content distribution in the main available databases		106
Energy.....		106
Saturates		109

Sugar.....	113
Salt.....	117
Proteins	121
Fibres.....	125
Algorithm modifications – recap	129
1. <i>Recap of the update in the main algorithm</i>	129
1.1. Unfavourable components – A point allocation.....	129
1.2. Favourable components – C points allocation	129
1.2.1. Point allocation.....	129
1.2.2. Ingredients contributing to the ‘Fruit, vegetables and legumes’ component	130
1.3. Algorithm computation	131
1.4. Final Nutri-Score thresholds	131
2. <i>Recap of the update for the fats, oils, nuts and seeds category</i>.....	132
2.1. Products in the category.....	132
2.2. Unfavourable components – A points allocation	132
2.3. Favourable components – C points allocation	133
2.3.1. Point allocation.....	133
2.3.2. Ingredients contributing to the ‘Fruit, vegetables and legumes’ component	133
2.4. Algorithm computation	134
2.1. Final Nutri-Score thresholds	134

Executive summary

The Scientific Committee of the Nutri-Score (ScC) has been appointed in February 2021 by the Steering Committee as an independent committee of the trans-national governance of the Nutri-Score, operating within the mandate to update of the algorithm underpinning it.

This document provides the update for the algorithm, in the categories of general foods (main algorithm), fats, oils and nuts and seeds and specific rules for meat products.

The ScC provided an annual report in December 2021, highlighting the areas of improvement that were considered a priority for the group. Of note, the ScC considers that overall, the algorithm performs well. The areas of improvement that have been identified are domains in which further alignment between the Nutri-Score classification and food-based dietary guidelines (FBDG) could be sought after.

Principles guiding the ScC work and methods for the group have already been highlighted in the 2021 annual report. As such, the present document provides only a brief summary of these elements and rather focuses on the development of the alternate scenarios for the updated algorithm, their selection and the results of the final combination retained for the update of the Nutri-Score algorithm. Importantly, all the modifications in the components were approved by either a majority or unanimously by the ScC, following the voting procedures set by the group. No minority opinions were expressed concerning each of the component modifications or the final algorithm. The update presented herein is therefore based on a scientific consensus between members of the ScC.

The process for the update of the algorithm consisted in the revision of each of the components of the current algorithm, in relation with the areas of improvement previously identified by the group. Multiple scenarios for improvement for each component were investigated, and the best scenario retained whenever their impact, when tested in multiple databases, were aligned with the objectives of the group. The final combination scenario for the algorithm update was tested in the four available databases of food composition of branded products, including in Belgium, France, Germany and the Netherlands, and the final thresholds were set based on optimized distributions of food products in all databases.

The ScC recommends the following for the updated algorithm of the Nutri-Score:

- In the main algorithm
 - A modified Sugars component, using a point allocation scale aligned with the FIC regulation of 3.75% of the 90 g reference value, with up to 15 points [1]
 - A modified Salt component, using a point allocation scale aligned with the FIC regulation of 3.75% of the 6 g reference value, with up to 20 points
 - A modified Fibres component, using a point allocation scale of 3.75% of the 30 g reference value (as recommended in various EU countries), and with a starting point set at the value aligned with the claims regulation for the claim of “source of fibre”, with up to 5 points
 - A modified Proteins component, using a point allocation scale aligned with the claims regulation of “source of proteins” of 3.75% of the 64 g reference value, with up to 7 points
 - A modified ‘Fruit, vegetables, legumes’ component, with the removal of nuts and oils from the ingredients qualifying for the component
 - A simplification of the final computation, with a removal of the protein cap exemption for products with A points ≥ 11 and fruit and vegetable points ≥ 5
 - A modified final threshold between A and B, set at -1/0 points

- In the ‘fats, oils, nuts and seeds’ component
 - The inclusion of nuts and seeds within this category, based on their nutritional composition in fats
 - A modified Energy component, set as an ‘Energy from saturates’ component, with a point allocation scale of 120KJ/point
 - A modified protein cap threshold, set at 7 points for proteins to be taken into account
 - A modified ‘fruit, vegetables and legumes’ component, with oils from ingredients qualifying in the component included as qualifying (e.g. avocado and olive)
 - A modified final threshold between A and B, set at -6/-5

- Specific rules for red meat products within the main algorithm for general foods
 - Based on their position in FBDG
 - A modified protein component, with a reduction in the maximal number of points attributed for red meat and products thereof, proportionate to the ratio of heme iron to total iron content in meat and products, set therefore at 2 maximal points for proteins

Detailed information on the modified components, their development and testing is available in each chapter of the present document, and an appendix details the updated algorithm.

The ScC proposes that the next steps include the update of the algorithm of the Nutri-Score for beverages, which would include milk-based beverages, expected before the end of this year. Adaptations to the algorithm would be necessary to ensure that the addition of milk-based beverages is aligned with FBDG.

In 2023, the ScC will update the list of ingredients qualifying under the ‘Fruit, vegetables and legumes’ component, to ensure that the list of ingredients and the processes that are allowed within the component are aligned with FBDG in the COEN.

Methods – summary

The methods and principles set by the ScC for the update of the Nutri-Score algorithm have been provided in detail in the 2021 annual report of the ScC.

Of note, the Nutri-Score improvements presented in this report are based on scientific rationales. In addition, several stakeholders filed requests for changes to better consider additional qualitative aspects within specific food groups. Following the set of principles adopted by the ScC and in accordance with the mandate of the ScC set by the StC as outlined in its 2021 annual report, to enable a uniform implementation of the Nutri-Score across all participating countries, all scenarios had to account for current EU food labelling rules [1]. Specifically, this includes:

- (1) the fact that mandatory information for prepacked foods includes the declaration of energy value, amounts of fat, saturates, carbohydrates, total sugars, protein and salt, yet further nutrients (monounsaturates, polyunsaturates, polyols, starch, fibre, and vitamins/minerals) are voluntary only and
- (2) current rules do not request the use of unifying declarations of specific ingredients such as added sugars or whole grains.

Hence, whilst more stringent considerations of favourable/unfavourable nutrients or ingredients would be possible, their consideration across European countries would require respective changes in EU labelling legislation on mandatory nutrients and/or ingredients identification.

Briefly, the ScC followed a series of steps to define modifications to the algorithm:

1. Definition of priority areas for the update of the algorithm

The areas of improvement of the Nutri-Score algorithm have been presented in detail in the 2021 annual report from the ScC. Considering the across-the-board nature of the algorithm, whereby any modification in one food group would potentially lead to modifications in other food groups, a further prioritization of the said areas of improvement was performed by the group.

2. Defining scenarios of modification for each component

The ScC reviewed each component of the Nutri-Score algorithm and considered whether modifications would allow to respond to the issues identified in the priority areas for improvement. Primary and secondary target food groups were identified for modification in each component based on their content in each of the component.

Scenarios of modifications were defined and tested in three databases of nutritional composition of branded products from France, Germany and the Netherlands for each component. The final scenario was selected based on the rationale used for their definition and their ability to reach the initial objectives of the modification compared to the current scenario, with careful consideration to potential side-effects in secondary target groups.

3. Testing of combination scenarios

Similarly, combination scenarios including modification scenarios in all of the components were then investigated in the three databases, and the final combination of component modifications for the Nutri-Score algorithm update selected was based on consensus between members of the ScC, considering the priority areas of improvement set beforehand.

The databases available for testing the scenarios were presented in the 2021 annual report, as well as the strengths and limitations of each database. Scenarios were usually tested in one or two databases, but confirmation was required in all three databases for decision-making.

The level of detail of the available databases in terms of food groups varies considerably, depending on the country. Whenever more detailed data was available in one country, the data were used to test the potential scenarios for modification in more depth. In some cases, the ScC also reverted to generic databases (e.g. CIQUAL database from France for red meat products) when the databases did not cover the primary and secondary target groups for improvement and/or additional data, in particular on mono-ingredient or raw food products were required.

4. Definition of the final thresholds for the Nutri-Score

Initially, the Nutri-Score thresholds for the five categories, from A to E, were proposed in 2015 by the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) as quintiles of the distribution of the overall score or points within the OQALI database (which did not contain any unprocessed or minimally processed foods) [2]. The final thresholds were then set by the French High Council for Public Health based on this first analysis, with the objective of maximizing discrimination within food groups [3]. From the initial quintiles, thresholds for the C/D and D/E classes of the Nutri-Score were updated based on the observed distribution of food products.

The finally retained thresholds were as follows:

Points for general foods	Final grading
-15 to -1	A
0 to 2	B
3 to 10	C
11 to 18	D
19 to 40	E

The following objective was set for the update of the Nutri-Score algorithm:

Once a combination of tested scenarios (Nutri-Score algorithm modifications) was evaluated as appropriate and selected by the members of the ScC by consensus, the thresholds were evaluated to fulfil several objectives in order to be considered as adequate:

- To maximise the distribution of food items within a food group across various Nutri-Score categories (colours), with an equitable distribution across achievable colours. Thus, each food group should cover at least three Nutri-Score categories/colours, especially when considering large diverse food groups with many different items (e.g. cereals), with the overall aim of a maximization of distribution to as many classes/categories of the Nutri-Score as possible, as long as this appears to be nutritionally appropriate and broadens consumer choice [4]. On the other hand, some food groups with limited compositional variation or high contents in one or various nutrients, may concentrate in few categories (e.g. hard cheeses) or do not necessarily need to reach certain categories (e.g. sweets).
- To allow a clear differentiation between nutritionally favourable and less favourable food items within a given food group, in line with FBDG of the member states. This included positioning the majority of items rating of specific food groups in certain Nutri-Score categories, based on the recommendations of FBDG of the member states: for specific food groups it was checked whether they were correctly classified according to FBDG in the various countries whose databases were tested, (e.g. median and quartiles of distribution), or for certain foods with limited compositional variation for which a distinct classification was considered (e.g. refined grain pasta, vegetable oils).
- To ensure a minimum number of possible ‘outliers’ (i.e. with < 5% of a given food group in one colour).

For the further revision of the thus far approved Nutri-Score modifications, **the existing thresholds were checked on the selected scenario**, by using the French databases, while the German and Dutch databases were used for confirmation. The distribution of various food items was verified using specific indicator food groups, which were chosen by the majority of the ScC members, based on their

nutritional content that would potentially be more sensitive to modifications of one of the thresholds regarding the priority areas of the ScC and identifying where adjustments were needed.

Several tests were performed shifting the threshold of interest by \pm 1-2 points on the final combination scenario of the modified Nutri-Score algorithm (final nutritional score FNS) to a set of indicator foods that contained exemplary generic foods / specific relevant branded foods to provide a proof-of-concept. This also took into account the median content of key nutrients in the categories of the Nutri-Score.

For this purpose, the ScC used boxplots to show the distribution of food items in each Nutri-Score category (A, B, C, D, E) against their number of points, which showed the median, the 25th and 75th percentiles as well as outliers of the distribution of selected indicator food groups.

Priority areas of the ScC – summary

The annual 2021 report of the ScC highlighted the various areas of improvement investigated by the ScC for the update of the Nutri-Score algorithm. These included priority areas in terms of classification of food groups (e.g. fish) and/or discrimination of products based on their content in some nutrients of concern (e.g. sugars and salt). The considerations regarding the choice of food groups were generally based on the available evidence regarding the health-promoting aspects and nutrient density of the food groups, and also taking into account the current dietary/nutritional guidelines in the COEN countries.

Requests from stakeholders were examined at an earlier stage, in the definition of the overall strategy and priority areas presented in the 2021 annual report, approved by the ScC in January 2022. They were summarized within that report and considered in the investigation of the potential modifications in the algorithm in the workflow of the ScC.

In order to determine which food groups should deserve special attention and prioritize the work of the ScC, information was collected within the ScC (with quorum majority), by means of a structured questionnaire. This aimed for providing a prioritization in the areas of improvement of the Nutri-Score in terms of food group classification, considering the across-the-board nature of the algorithm, and therefore the potential impact of any modification of the algorithm in one target group to other potentially non-target groups.

More specifically, it was requested from the panel members to indicate

- a) Which food groups would require a modification and in which direction – improvement, deterioration, or maintaining the status quo
- b) How much priority would a certain food group deserve – based on a tiered Likert scale

Following a quantitative evaluation, the following combined results were obtained: regarding the food groups that should receive priority attention, the ScC classified food groups in order of importance, as follows:

- Fish – including fatty fish: should be preferably classified in more favourable classes of the Nutri-Score. However, the algorithm should allow for a discrimination between fish with added nutrients of concern (especially salt) and fish with no added nutrients of concern.

- Discrimination between wholegrain and refined breads: whole grain products should be classified as more favourable than refined products, i.e. a clear discrimination should be seen, according to their content in dietary fibres.
- Vegetable oils: more favourable ones (canola, olive, nut oils and oils rich in polyunsaturated fatty acids—due to their lower content of saturated fatty acids) should be discriminated from less favourable ones.
- Sugary items such as candies: should be better discriminated based on their sugar content, with a generally rather lower ranking, due to the low nutrient density, cariogenic potential, and other negative health consequences of a high simple sugar intake.
- Whole grain rice and pasta: it would ideally allow differentiation between wholegrain products and refined products, especially based on their dietary fibre content.
- Discrimination between unsweetened and sweetened dairy products: an improvement in the discrimination of dairy products based on their sugar content would be preferable.
- Breakfast cereals: classification should allow to discriminate between sugar-rich breakfast cereals and those containing less sugar.
- Meat: the ScC considered that the discrimination between meat (in particular red and processed meat), poultry and fish, to reflect their relative place in FBDG should be improved, i.e. it was perceived that red meat should receive a lower rating than fish or poultry.

Therefore, a special focus was placed on the classification of the above food groups, which is reflected by the overall focus on certain food groups in this report, in addition to considering the strategy explained in the annual 2021 report, and also the stakeholders' requests.

1. Main algorithm for general foods

The main algorithm for general foods includes all solid foods, soups and stocks, with the exclusion of fats, oils, nuts and seeds (see specific chapter Fats, oils, nuts and seeds page 68). The ScC is considering the inclusion of milk and milk-based beverages along with the plant-based beverages within the beverages category, therefore these products are no longer included in the main algorithm for general foods. All calculations for dairy products exclude dairy beverages.

1.1. Energy

1.1.1. Rationale

Energy intakes above energy requirements are associated with increased risks of weight gain, overweight, obesity, and consequently risk of diet-related chronic diseases [5]. Overweight and obesity are a major public health concern in COEN, with increasing prevalence, in particular in children [6]. The NDA panel of EFSA concluded that taking into account the high prevalence of overweight and obesity, a reduction of energy intakes was of public health importance for European populations [7].

Energy density is included in the Nutri-Score algorithm, as an ‘unfavourable’ component, up to 10 points, with a point allocation scale of 335 kJ/point, corresponding to 3.75% of the energy reference intakes for children aged 11-16 years (8950 kJ), in accordance with the initial objectives and population target for the development of the nutrient profile model. Points are therefore allocated to foods from 0 points for foods <335 kJ/100 g to a maximum of 10 points for foods >3350 kJ/100 g.

However, energy density at the food level is directly related to the relative content in macro-nutrients and their relative caloric density, as given in the FIC regulation [1]:

Food constituent	Energy conversion factor
Fat	9 kcal/g (37 kJ/g)
Alcohol	7 kcal/g (29 kJ/g)
Protein	4 kcal/g (17 kJ/g)
Glycaemic carbohydrates	4 kcal/g (17 kJ/g)
Polyols	2.4 kcal/g (10 kJ/g)
Dietary fibres	2 kcal/g (8 kJ/g)
Salt	0 kcal/g (0 kJ/g)

Considering the differing energy conversion factors for the macro-nutrients, the linear point allocation scale leads to an imbalance in the maximum number of points potentially allocated depending on the relative contribution of in particular carbohydrates (including products high in sugars) and proteins versus fats (including products high in saturated fats).

Full-fat products can receive 10 points due to their energy density, while full-carbohydrates (including sugars) and full-protein products do not reach energy density levels above the equivalent of 5 points. This natural imbalance in energy density tends to overly penalize food products that are otherwise promoted within dietary guidelines such as plant-based oils or fatty fish, and by contrast do not equally penalize products that should be limited within the same FBDG (including confectionery).

The food groups that are highly affected by the energy imbalance therefore include:

- Food groups with rather high FNS and therefore unfavourable Nutri-Score classification compared to the target classification/dietary guidelines
 - Plant-based oils
 - Fish and fatty fish

- Food groups with rather low FNS compared to the target classification/dietary guidelines
 - Sugary products
 - High salt products

Thus, the ScC investigated whether modifications of the energy density component would be adequate to improve the relative classification of priority groups in the Nutri-Score.

1.1.2. Target groups for modifications in energy

Products with a relative high amount of fats, that are promoted by dietary guidelines:

- Fish and fatty fish
- Plant-based oils

Products with a high level of carbohydrates – and specifically sugars – that should be limited according to dietary guidelines:

- High sugar products

Detailed distribution of the energy content in the various target food groups is presented in Table 1.

Table 1 Average energy composition (values in kJ) of the target food groups and distributions, given in percentiles (P) – data from Belgium, France, Germany and The Netherlands

Food groups	BELGIUM								FRANCE							
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95		
Confectionery	2179	1768	728	1448	1732	2264	2413	2335	1409	393	890	1289	2140	2390		
Candy, sweet sauces	1194	1387	666	1203	1470	1653	1907	273	1487	970	1390	1465	1648	1865		
Chocolate	985	2230	1871	2155	2272	2343	2479	759	2110	353	2138	2273	2349	2442		
Ice cream	171	948	421	763	965	1167	1456	1303	965	405	744	967	1221	1457		
Fats and oils	810	2180	551	1314	2262	3130	3700	8088	3099	1013	3038	3448	3528	3766		
Vegetable fats and oils	185	3504	3276	3435	3464	3700	3766	5252	3609	3390	3448	3700	3766	3766		
Animal fats	127	2464	844	1585	3060	3109	3130	1356	3003	2250	3025	3058	3109	3700		
Margarines	155	2157	946	1434	2206	2889	3050	526	2104	1300	1883	2170	2272	3012		
Cream	260	1048	330	688	1200	1393	1603	954	1070	418	724	1206	1247	1577		
Baking fats (excl. oils)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fine bakery products -sweet	1786	1791	1002	1632	1855	2033	2226	2553	1802	1120	1585	1870	2065	2216		
Fish (and seafood)	1723	561	6	276	440	824	1336	13192	770	326	531	766	916	1318		
Lean fish	-	-	-	-	-	-	-	2335	702	295	423	661	833	1678		
Fatty fish	-	-	-	-	-	-	-	9392	829	444	682	816	948	1314		
Seafood	-	-	-	-	-	-	-	1465	499	238	347	401	602	1017		
Processed meat (composed and single)	-	-	-	-	-	-	-	1061	1080	440	555	1079	1397	1954		
Savoury snacks	607	1674	711	1204	1893	2151	2264	1165	1811	948	1274	2034	2185	2335		
Spreads	414	222	84	126	158	209	381	529	1011	600	749	1016	1048	2237		
Savoury spreads	-	-	-	-	-	-	-	89	1048	333	700	869	1167	2375		
Sweet spreads	-	-	-	-	-	-	-	440	1004	674	764	1018	1045	2203		

	GERMANY								THE NETHERLANDS							
Food groups	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95		
Confectionery	-	-	-	-	-	-	-	2684	1793	661	1411	2014	2271	2397		
Candy, sweet sauces	-	-	-	-	-	-	-	723	1446	746	1368	1460	1675	1874		
Chocolate	-	-	-	-	-	-	-	1485	2243	1855	2188	2258	2335	2425		
Ice cream	-	-	-	-	-	-	-	476	916	314	653	925	1184	1469		
Fats and oils	1721	2871	729	2720	3378	3404	3700	452	2996	1434	2704	3369	3404	3700		
Vegetable fats and oils	942	3446	3367	3386	3400	3405	3700	203	3466	3378	3378	3404	3405	3760		
Animal fats	357	3002	2377	2972	3056	3075	3680	46	3036	2989	3028	3061	3071	3098		
Margarines	142	2488	1412	2422	2600	2801	2970	129	2144	1115	1445	2391	2702	2965		
Cream	280	966	391	679	1148	1210	1315	-	-	-	-	-	-	-		
Baking fats (excl. oils)	-	-	-	-	-	-	-	74	3169	2701	2745	3340	3404	3700		
Fine bakery products -sweet	2074	1913	1387	1760	1963	2089	2250	6921	1643	983	1302	1720	1958	2185		
Fish (and seafood)	408	622	277	396	597	821	1024	840	707	302	458	728	891	1177		
Lean fish	168	607	305	393	556	791	1021	304	705	314	526	770	887	1033		
Fatty fish	162	724	413	517	741	878	1045	284	874	646	725	788	1027	1214		
Seafood	78	441	229	289	330	494	948	252	521	243	358	388	634	1166		
Processed meat (composed and single)	546	1044	450	838	1030	1253	1748	1612	1123	463	776	1139	1364	1937		
Savoury snacks	1311	1981	1579	1792	2020	2149	2291	952	2023	1625	1894	2075	2180	2310		
Spreads	944	1264	454	756	1000	1840	2544	1256	1234	511	842	1090	1465	2374		
Savoury spreads	453	988	490	756	918	1191	1592	562	1091	545	830	1107	1289	1649		
Sweet spreads	491	1519	451	756	1113	2340	2670	694	1351	502	889	1071	1968	2389		

Not all food groups were represented in the databases, thus explaining missing data in the table.

1.1.3. Main scenarios tested

In order to address the limitations explained previously, different options to modify the energy component were tested.

Energy from saturates and sugars

Description

The current energy component of the Nutri-Score algorithm penalizes fats in whichever form, whether saturated or unsaturated. However, national dietary guidelines emphasize the importance of consuming foods rich in unsaturated fatty acids, either in the category of fats and oils (through a preference towards certain plant-based oils) and fish (through the promotion of both lean and fatty fish considering their contribution to long-chain n-3 fatty acids intakes (especially eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)) in the population).

Therefore, an option explored to modify the energy component was to use the energy from saturates and sugars.

To do so, the energy component would be calculated as

$$Energy_{saturates\ and\ sugars}(kJ/100g) = Sugars\ (g/100\ g) \times 17 + Saturates\ (g/100\ g) \times 37$$

Investigation and conclusions

This modification improved the classification of foods with higher content in unsaturated fatty acids, such as plant-based oils, nuts and fish, in alignment with dietary recommendations in COEN.

However, the ScC considered it as a form of double counting of some nutrients (i.e. saturates and sugars) that would not act as an adequate substitute of the energy component.

In addition, the literature on the subject mainly focused on the overall energy density with no specific distinction on the source of energy such as sugars and/or saturates specifically, even if the excess of calorie is often related to the consumption of foods rich in these nutrients.

Energy removal

Description

Given that saturated fatty acids and sugars as nutrients of public health concerns are already penalized through their respective components, the ScC explored the option to totally remove the energy component from the algorithm, to thereby remove the energy imbalance between sources of calories at the food level.

Investigation and conclusion

Although this option improves the classification of the key target groups and has the advantage of not leading to any form of double counting with other elements within the algorithm, a number of limitations were observed:

- Reduction of 10 points in the overall algorithm would shift the entire scale, with severe effects on the thresholds. In particular, this removal tends to lead to a much higher improvement of products high in fats and sugars (rather less favourable foods) than more favourable foods, as

the reduction in points is by definition more important for high-energy dense foods (high in fats and sugars, high in fats and salt).

- A removal of the energy component would neglect the problem of overconsumption, excess energy intakes and their association with obesity
- Considering the vast alteration that this modification would entail, in particular in terms of algorithm equilibrium between components, additional modification of the components on saturated fats and sugars would be needed to compensate for this.

Limitation in the number of points for energy

Description

The energy component does not allow discriminating plant-based oils since they all get the maximal points (i.e. 10 points). Additionally, products high in carbohydrates or proteins can mathematically not reach a number of points higher than 5. Therefore, the ScC explored the option to reduce the number of maximal points of the scale to 5 points.

Investigation and conclusion

Although the modification improves the score of plant-based oils rich in unsaturated fatty acids, it also improves the classification of all other fats, as well as the classification of nuts (including the salted alternatives), sauces and some fatty and sugary products such as chocolate bars, cocoa butter, sweet spreads.

1.1.4. Main scenario retained

Finally, after exploring the various options for the modification of the energy component and reviewing the literature, the conclusions of the ScC were the following:

- The rationale for including energy density *per se* is strong, given the risks of weight gain and obesity, and the subsequent adverse health effects. This is highlighted in the conclusion of the document from the EFSA NDA panel regarding energy, which concludes that energy could be included in nutrient-profiling models because a decrease in energy intake is of public health importance for European populations [7].
- The results of the different options tested to modify the energy component of the algorithm did not provide sufficient justification for a modification considering the objectives of the group

The ScC recommends **no modification of the energy component for the overall algorithm**. The issues identified previously were further addressed by exploring modifications on specific nutrients (i.e. sugars) or subgroups (i.e. fats and oils) and are described later in the report.

1.2. Saturated fats

The ScC reviewed the saturated fats component. Overall, the component is aligned with the current recommendations and reference intakes regarding the intakes of saturated fatty acids (SFA).

Considering the relative strictness of the component, the ScC reviewed potential modifications of the point allocation scale or the starting point for the scale (with potential alignment with claims for ‘low in saturated fats’).

However, the results of these investigations showed that any modification to the scale would yield a modification towards an unwanted more favourable classification for food products for which consumption is to be limited within dietary guidelines.

The ScC recommends no modifications of the saturated fats component in the main algorithm.

1.3. Sugars

1.3.1. Rationale

Sugars are included in the Nutri-Score algorithm as an unfavourable component, as dietary sugars are considered as a nutrient to be limited in main recent recommendations, including all COEN ones.

The EFSA NDA panel stated in their report on nutrient profiling that a reduction in the intake of added and free sugars is of public health importance for European populations, and noted that decreasing the intake of added and free sugars would decrease the intake of total sugars [7]. This conclusion is based on the well-established positive relationships between (a) the intake of dietary sugars (total/added/free) and dental caries risk and (b) the intake of added and free sugars and the risk of developing chronic metabolic diseases, and that intakes of added and free sugars exceed the recommended intakes in most European countries [7].

In their recent review, the EFSA NDA panel did not provide a tolerable upper intake level or a safe level of intake for either total, added or free sugars, considering that the risk associated with intakes is linear from low doses onward [8]. The EFSA NDA panel concludes that the intake of added and free sugars should be as low as possible in the context of a nutritionally adequate diet, and that decreasing their intake would decrease the intake of total sugars to a similar extent. In general, FBDG from several European countries recommend less than 10% of the total energy intake (En%) should come from added or free sugars. This is in line with WHO guidelines, which strongly recommend a reduction of free sugars intake to less than 10 En%. A further reduction to less than 5 En% is suggested for additional health benefits [9]. The FIC regulation refers to sugars as 'all monosaccharides and disaccharides present in food, but excludes polyols' [1]. Thus, the available information from the mandatory nutrition declaration only refers to the amount of total sugars in a product, and does not allow to conclude easily on the content of added or free sugars in foods composed of several ingredients. The information for those sugars is neither part of a mandatory nor of an additional voluntary nutritional declaration.

The Nutri-Score is based on the mandatory nutritional information on the back-of-pack, which -among other nutrients - only provides information on the content of total sugars. The Nutri-Score in its current version does not differentiate between free, added or naturally occurring sugars in its algorithm. Any inclusion of specific forms of sugars would necessitate either elements outside of the mandatory or voluntary nutritional declaration (e.g. added/free sugars or any specific types of mono- or disaccharides) which forms the basis of the Nutri-Score or computational elements. Given the practical difficulties associated with estimating and including free and added sugars, and the other envisaged modifications, the ScC decided to maintain the basic principle of using only available information from the back-of-pack nutritional declaration, and therefore not to consider free, added or specific sugars in the proposed scenarios.

Nevertheless, the ScC acknowledges that including free or added sugars instead of total sugars in the algorithm would be quite relevant from a scientific perspective but believes that a change in the FIC regulation is firstly required. So, the ScC aims to prioritize products contributing mainly to the excess of free or added sugars with its proposed scenarios for total sugars.

The current total sugars criteria are based on the Food Standards Agency/Office of Communication nutrient profile model, using a reference value of 21% of food energy (i.e., 113 g/day coming from 21 En% of 8950kJ, Annex A -The 2018 review of the UK nutrient profiling model) [10]. Considering that total sugar consumption was estimated between 15 and 21% of total energy intakes in a study from 11 representative samples in Europe [11], the current reference value does not reflect low to moderate consumption intake levels, nor the adult reference intake for dietary sugars of 90 g from the FIC regulation. Furthermore, the application of the point allocation scale does not appear to provide an adequate discrimination between foods high in sugars and those with a lower content. As an illustration, pure crystallised sugar cannot reach the Nutri-Score E rating in the current algorithm. This needs to be considered in the algorithm revision.

Furthermore, to comply with the EU rule for nutrient declaration, the precision of a point allocation scale (adequate use of decimal) needs to be revised.

Hence, the ScC considered a modification of the (total) sugar component, aligned with the FIC regulation, in order to allow a more adequate classification of sugary products, especially those with high levels of added and free sugars and to align the precision of points allocation system with the EU rules for nutrient declaration.

1.3.2. Target groups

In order to test different scenarios on a potential sugar modification, target food groups were identified as either high-sugary products or meaningful sources of dietary sugar intake, and more specifically added and free sugars. Food groups mostly contributing to the intake of added and free sugars in European countries are confectionery followed by beverages (sugar-sweetened soft and fruit drinks, fruit juices) and fine bakery wares [12]. Since beverages are rated based on a slightly different algorithm of the Nutri-Score, we included confectionery (including candy, sweet sauces, chocolate and ice cream) and fine bakery ware as the target groups. Since bars, sweetened dairy products and sweet spreads are reported to meaningfully contribute to the dietary sugar intake in some COEN [9,11], these food groups were additionally included. Furthermore, since a discrimination between sugar-rich breakfast cereals and those containing less sugars was defined as a priority area, breakfast cereals were added to the list of target food groups.

Table 2 Average sugar composition of the target food groups and distributions (in g/100g) across percentiles (P) – data from Belgium, France, Germany and The Netherlands

Food group	BELGIUM							FRANCE						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bars	172	29.7	12.0	19.0	27.0	42.2	50.6	173	28.9	20.4	26.0	28.6	32.0	37.0
Breakfast cereals	347	17.0	1.0	10.3	17.2	24.0	30.0	652	20.8	5.9	16.0	22.0	26.3	32.4
Candy, sweet sauces	1194	50.4	0.0	42.0	58.0	69.0	91.1	273	57.7	0.4	56.0	63.3	69.9	78.0
Chocolate	985	47.8	24.4	43.5	50.0	54.0	63.0	759	42.1	11.1	36.0	46.5	51.5	58.7
Ice cream	171	21.6	9.9	18.8	22.8	25.4	30.0	1303	25.2	18.7	22.3	25.2	28.2	32.2
Dairy products sweetened	-	-	-	-	-	-	-	493	12.0	5.2	11.0	12.4	13.2	15.8
Fine bakery products -sweet	1786	24.9	1.2	13.0	28.0	35.0	47.1	2553	29.0	20.4	26.0	28.6	32.0	37.0
Sweet spreads	389	47.1	4.7	38.7	52.0	57.6	65.4	440	50.4	35.8	40.0	54.0	59.0	60.0

Food group	GERMANY							THE NETHERLANDS						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bars	788	28.3	1.7	16.7	28.8	41.1	53.0	238	25.6	8.5	19.2	24.8	32.0	43.8
Breakfast cereals	639	15.8	3.0	11.0	15.8	21.1	27.6	534	15.1	4.3	9.4	14.9	20.2	27.4
Candy, sweet sauces	-	-	-	-	-	-	-	723	56.1	0.0	46.1	62.7	76.0	96.0
Chocolate	-	-	-	-	-	-	-	1485	48.2	24.0	44.0	51.8	56.0	62.0
Ice cream	-	-	-	-	-	-	-	476	23.5	12.3	20.2	23.8	26.9	31.8
Dairy products sweetened	1379	11.1	2.8	9.0	12.0	13.7	16.0	219	10.5	6.9	8.5	10.3	12.0	15.7
Fine bakery products -sweet	2074	29.9	14.0	23.2	29.0	36.8	48.1	6921	29.4	8.8	22.1	29.6	36.5	46.9
Sweet spreads	491	37.4	5.7	26.8	39.0	50.0	59.0	694	47.5	14.4	36.2	53.0	57.5	68.0

Not all food groups were represented in the databases, thus explaining missing data in the table.

1.3.3. Main scenarios tested

Considering the principles by which the ScC operates, considering only elements within the boundaries of the mandatory nutritional declaration, only reference values that refer to total sugars were taken into account. As most dietary guidelines refer to added or free sugars, a limited number of options were available.

The ScC elected to consider a reference value for sugars of 90 g, in alignment with FIC regulation [1] as this was the only available internationally acknowledged reference value for total sugars.

In the current algorithm, products consisting predominantly of sugars cannot reach a Nutri-Score E rating, as the maximum number of points that they reach is 15 (while the lower boundary for the E class of Nutri-Score is 19). In order to be able to rate those high-sugary products in the most unfavourable Nutri-Score category, the maximum point attributed for the sugar content of products was raised to 15 points.

In order to align with the EU regulations regarding the use of decimal places, point allocation values in the tested scenarios are rounded to the nearest integer value for products with sugar contents of more than 10 g/100 g.

Scenario I

Scenario I is based on a modified reference value for sugars of 90 g. Starting point and subsequent point allocation are based on the initial methodology set for the FSA nutrient profile model. Based on the modified reference value, the point allocation starts at 3.75% of a 90 g reference (i.e. 3.4 g/100 g, rounded), with linear increases in 3.75%-steps up to a maximum of 15 points for the sugar content of foods. Values for sugar contents of more than 10 g/100 g are rounded to the nearest integer value.

Scenario II

Scenario II is based on a modified reference value of 90 g and a modified starting value. Here, the point allocation for sugar starts at the cut-off for products that are defined as “low sugars” (< 5 g sugar per 100 g), based on the EU regulation 1924/2006 on nutrition and health claims (claims regulation). Point allocation continuously increases in linear 3.75%- steps of the 90 g reference (i.e. +3.4 g per point) up to a maximum of 15 points. Values for sugar contents of more than 10 g/100 g are rounded to the nearest integer value.

Table 3 Point allocation of the current Nutri-Score algorithm and alternative scenarios tested for sugars

Points	Current algorithm (g sugar/100g)	Scenario I (g sugar/100 g)	Scenario II (g sugar/100 g)
0	≤ 4.5	≤ 3.4	≤ 5.0
1	> 4.5	> 3.4	> 5.0
2	> 9	> 6.8	> 8.4
3	> 13.5	> 10	> 12
4	> 18	> 14	> 15
5	> 22.5	> 17	> 19
6	> 27	> 20	> 22
7	> 31	> 24	> 25
8	> 36	> 27	> 29
9	> 40	> 31	> 32
10	> 45	> 34	> 36
11		> 37	> 39
12		> 41	> 42
13		> 44	> 46
14		> 48	> 49
15		> 51	> 53

1.3.1. Results

Results for the distribution of the target groups in the current algorithm and in the alternative scenarios are presented in Table 4.

Both scenario I and II increased the points for the sugar content of foods in almost all target food groups, resulting in a more unfavourable mean of the nutritional score (FNSm) compared to the current algorithm.

In the current algorithm, two target food groups had meaningful proportions of products that were either rated A or B. Among sweetened dairy products, 13-18% were rated A and 36-47% rated B, the range indicating the variability across databases and countries. For breakfast cereals, 16-50% of products were rated A and 10-14% rated B.

For both scenarios, the modified distribution showed a decreased number of products rated A or B. For scenario I, 10-14% of products were rated A and 26-37% rated B for sweetened dairy products, and 13-42% of products rated A and 5-13% rated B for breakfast cereals. For scenario II, 13-16% of sweetened dairy products were rated A and 29-40% rated B; whereas for breakfast cereals, 1-46% were rated A and 6-8% were rated B.

For target food groups containing high sugar products, a higher proportion of products were rated E compared to the current algorithm. In Confectionery food groups such as “Candy & sweet sauces” a majority of products were rated D by the current algorithm (62% in France, 71% in the Netherlands) whereas both scenario I (73% in France and 67% in the Netherlands) and scenario II (73% in France and 66% in the Netherlands) rated the majority of products as E.

For bars, both scenarios show meaningful differences compared to the current algorithm, with an overall shift of sugary products towards less favourable ratings (higher FNS).

The modified distributions in both scenarios achieve the objectives in all the target food groups with a more adequate Nutri-Score distribution of products in relation to the sugars content. Overall, scenario I appeared stricter compared to scenario II. The observed changes were without unintended effects for the food groups tested, resulting in adequate distributions based on their nutritional compositions and discrimination according to sugars content.

Table 4 Distribution (%) of the target food groups in the current and alternate scenarios for sugars and mean current FNS and modified (FNSm) – data from France, Germany and The Netherlands

Food group	Nutri-Score (%)							Nutri-Score (%)							Nutri-Score (%)						
	Current algorithm							Scenario I							Scenario II						
	N	FNS	A	B	C	D	E	FNSm	A	B	C	D	E	FNSm	A	B	C	D	E		
France																					
Breakfast cereals	652	6	16	12	46	25	1	8	13	5	44	35	3	8	14	8	45	31	2		
Cereal bars	173	12	0	1	40	50	9	14	0	0	22	59	19	14	0	0	28	54	18		
Fine bakery products- sweet	2553	18	0	0	5	45	50	20	0	0	3	31	66	20	0	0	3	34	63		
Candy, sweet sauces	273	14	0	7	12	62	19	19	0	6	4	17	73	19	0	6	5	16	73		
Chocolate	759	21	0	7	1	14	78	24	0	4	4	6	86	24	0	5	3	7	85		
Ice cream	1303	13	0	1	28	54	17	15	0	0	20	47	33	15	0	0	22	49	29		
Sweet spreads	440	12	0	0	36	55	9	16	0	0	11	76	13	16	0	0	13	74	13		
Sweetened dairy products	493	2	18	36	44	2	0	3	14	26	58	2	0	3	16	29	53	2	0		
Germany																					
Breakfast cereals	639	2	50	10	30	10	0	4	42	7	33	17	1	3	46	7	33	13	0		
Bars	788	7	6	4	57	30	3	11	6	3	37	47	7	10	6	3	42	43	6		
Fine bakery products- sweet	2074	18	0	1	6	46	46	20	0	1	5	31	63	19	0	1	5	34	59		
Candy, sweet sauces	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chocolate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ice cream	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sweet spreads	491	11	6	9	35	30	21	14	3	4	26	35	32	14	4	5	26	35	30		
Sweetened dairy products	1379	2	13	47	39	1	0	3	10	33	55	1	0	2	13	38	48	1	0		
The Netherlands																					
Breakfast cereals	534	3	37	14	39	10	0	5	29	13	41	17	0	4	33	12	41	14	0		
Bars	238	11	2	14	32	47	6	13	1	5	29	47	18	12	1	6	29	49	15		
Fine bakery products- sweet	6921	17	1	2	16	31	50	19	1	1	9	30	59	19	1	1	10	30	57		
Candy, sweet sauces	723	13	5	10	5	71	10	17	5	9	5	14	67	17	5	9	5	16	66		

Food group	Nutri-Score (%)							Nutri-Score (%)							Nutri-Score (%)						
	Current algorithm							Scenario I							Scenario II						
	N	FNS	A	B	C	D	E	FNSm	A	B	C	D	E	FNSm	A	B	C	D	E		
Chocolate	1485	23	0	0	1	12	87	27	0	0	0	6	94	27	0	0	0	6	93		
Ice cream	476	12	3	5	22	57	13	14	2	4	21	46	27	14	2	4	21	47	25		
Sweet spreads	694	13	1	3	32	32	31	17	1	2	19	43	35	17	1	2	21	41	34		
Sweetened dairy products	219	2	16	43	41	0	0	3	11	37	49	3	0	2	13	40	46	1	0		

Not all food groups were represented in the databases, thus explaining missing data in the table.

1.3.2. Main scenario retained

Considering the overall objective of the group to discriminate products based on their sugar content, and in particular for high-sugar group to reach an adequate rating within the Nutri-Score algorithm, **the ScC recommends scenario I for the sugar component to be included in the update of the Nutri-Score algorithm.**

1.4. Salt – sodium

1.4.1. Rationale

The positive and causal relationship between the intake of dietary sodium and blood pressure is well established. High sodium intakes increase blood pressure and the risk of hypertension, which is a risk factor for CVD and chronic kidney disease [12]. Sodium is the active component and is derived from sodium chloride, also known as salt. Main sources contributing to the sodium intake are bread, meat (products), cheese, soups and sauces, as well as salt added to food at the table or during food preparation.

Daily salt intake is recommended to be below 5 g/day (WHO, EFSA, Switzerland, Belgium, Spain) or 6 g/day (France, the Netherlands, Germany). Several European countries have national salt reformulation policies, as the intake of their population exceed the recommendations. The EFSA NDA panel stated in its report on nutrient profiling that a reduction in the intake of dietary sodium is of public health importance for European populations [12]. The Nutri-Score could provide an incentive for manufacturers to reformulate foods towards lower salt contents.

Within the Nutri-Score algorithm, the current component is formulated as sodium, with points attributed for each 90 mg of sodium per 100 g of foods. This formulation is not aligned with current EU regulation [1], on the following points:

- EU regulations promote the use of salt for the mandatory nutritional declaration, rather than sodium. ‘salt’ means the salt equivalent content calculated using the formula:

$$Salt = Sodium \times 2.5$$

- The rules for nutrient declaration specify adequate use of decimals. The conversion from sodium to salt leads to some thresholds with 2 decimal points above 1 g, which is not aligned with the recommendation of using only one decimal point for this range.

It appears therefore necessary to change the sodium component into a salt component, following the rules for decimal points of the EU regulation. The risk of maintaining diverging systems is to observe divergences between the back-of-pack declaration and the Nutri-Score obtained, hindering the possibility for consumers and control authorities of verifying the adequacy of the allocation and limiting transparency.

Salt content (g/100 g) of major contributors to the salt intake are either at the lower end, e.g. bread and sauces (around 1 g/100 g), or at the higher end of the salt content distribution (2 g/100 g and more), e.g. cheese and cured meat (Table 5). The current point allocation scale for salt (currently sodium) of the Nutri-Score does not cover salt contents above 2 g/100 g and thus does not allow to discriminate products with salt content above 2 g/100 g. Additionally, in the current algorithm, highly salted but energy-poor foods cannot reach the same unfavourable classification as high-fat or high-sugar foods.

Hence, the ScC concluded that a modification of the sodium component is required, to allocate more unfavourable (i.e. positive in the algorithm) points to foods with salt contents higher than 2 g/100 g, and to align with current EU rules for nutrient declaration. In this way, the Nutri-Score would allow to discriminate better among highly salted foods in order to favour the less salted versions and/or stimulate food reformulation.

1.4.2. Target groups

Target food groups for this modification were identified considering the salt content and/or the high contribution to salt intake and/or the potential for reformulation of salt content. Secondary target foods were identified that may also vary in salt content and/or contribute importantly to the salt intake but not necessarily have the highest salt contents.

The primary target groups for the modification of the salt component, are the following:

- Processed meat
- Cheese
- Bread
- Spreads, and in particular savoury spreads
- Cold sauces and meal sauces based on tomatoes and vegetables
- Convenience foods including pizza
- Soups and stock

The secondary target groups, are the following:

- Savoury snacks (crisps, savoury biscuits)
- Breakfast cereals
- Ready-to-eat meals

Table 5 Average salt composition of the target food groups (in g/100 g) and distributions across percentiles (P) – data from Belgium, France, Germany and The Netherlands

Food group	BELGIUM							FRANCE						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bread	539	1.4	0.8	1.0	1.2	1.4	2.3	814	1.2	0.9	1.1	1.1	1.3	1.5
Whole grain bread	100	1.3	0.8	1.0	1.1	1.2	1.7	239	1.2	0.9	1.1	1.1	1.3	1.5
Refined and mixed grain	191	1.4	0.8	1.0	1.2	1.4	2.1	575	1.2	0.9	1.0	1.1	1.3	1.5
Other bread	195	1.3	0.8	1.0	1.1	1.3	1.8	-	-	-	-	-	-	-
Breakfast cereals	347	0.4	0.0	0.0	0.3	0.8	1.0	652	0.5	0.0	0.1	0.4	0.7	1.4
Cheese	2610	1.4	0.1	1.0	1.5	1.8	2.5	385	1.5	0.6	1.1	1.4	1.7	2.8
Solid and semi-solid cheese	999	1.7	0.7	1.5	1.7	1.9	2.4	162	1.4	0.6	0.9	1.4	1.8	2.2
Soft cheese	1084	1.0	0.1	0.5	1.1	1.4	2.1	123	1.5	1.0	1.3	1.5	1.6	1.9
Fresh cheese	244	1.3	0.3	1.0	1.3	1.7	2.7	39	1.3	0.4	0.7	1.0	1.7	3.0
Blue cheese	69	2.3	1.2	1.6	2.1	3.6	3.7	20	2.8	1.5	2.2	2.9	3.6	3.7
Processed cheese	203	2.2	1.4	1.8	2.2	2.6	3.4	41	1.6	1.0	1.3	1.5	1.8	2.3
Convenience food	1375	0.9	0.4	0.7	0.9	1.1	1.5	4489	0.9	0.5	0.7	0.9	1.1	1.6
Partly ready meals	202	1.0	0.3	0.6	0.9	1.2	1.5	3330	0.8	0.4	0.7	0.8	1.0	1.5
Ready to eat meals	892	0.8	0.3	0.6	0.8	1.0	1.5	523	1.1	0.4	0.8	1.1	1.4	1.8
Pizza	281	1.2	0.8	1.0	1.2	1.3	1.6	636	1.2	0.7	1.0	1.1	1.3	1.6
Processed meat (composed and single)	-	-	-	-	-	-	-	1061	2.9	1.4	1.7	2.1	4.3	5.6
Sauces	1267	2.8	0.2	0.9	1.2	2.0	10.0	542	1.4	0.4	1.0	1.2	1.9	2.7
Meal sauces	247	1.3	0.0	0.9	1.2	1.9	2.9	370	1.1	0.3	0.9	1.0	1.3	2.1
Cold sauces	1020	3.2	0.4	0.9	1.3	2.1	14.0	172	2.1	1.2	1.7	2.1	2.4	3.0
Savoury snacks	607	1.6	0.6	1.2	1.5	1.9	2.5	1165	1.7	0.9	1.2	1.5	2.0	3.1
Soups and stocks	414	1.2	0.6	0.7	0.8	0.9	1.3	778	0.7	0.5	0.6	0.7	0.8	1.0
Soups	-	-	-	-	-	-	-	778	0.7	0.5	0.6	0.7	0.8	1.0
Stocks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Savoury spreads	452	1.5	0.4	1.0	1.3	1.7	3.2	89	1.6	0.8	1.0	1.2	1.4	4.1

Food group	GERMANY							THE NETHERLANDS						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bread	815	1.2	0.8	1.0	1.2	1.4	1.8	5643	1.1	0.5	0.9	1.0	1.1	1.8
Whole grain bread	179	1.1	0.9	1.0	1.1	1.2	1.5	555	0.9	0.7	0.9	0.9	1.0	1.2
Refined and mixed grain	304	1.3	1.0	1.0	1.2	1.4	1.8	3620	1.0	0.8	0.9	1.0	1.1	1.4
Other bread	332	1.3	0.7	1.0	1.2	1.4	1.9	1468	1.3	0.2	0.9	1.1	1.4	2.3
Breakfast cereals	639	0.2	0.0	0.0	0.1	0.3	0.9	534	0.3	0.0	0.0	0.1	0.4	1.1
Cheese	-	-	-	-	-	-	-	3226	1.8	0.9	1.5	1.8	2.0	2.6
Solid and semi-solid cheese	-	-	-	-	-	-	-	2607	1.8	1.4	1.7	1.8	2.0	2.3
Soft cheese	-	-	-	-	-	-	-	544	1.6	0.6	1.0	1.4	1.9	3.3
Fresh cheese	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blue cheese	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Processed cheese	-	-	-	-	-	-	-	75	2.3	1.6	2.0	2.1	2.9	3.4
Convenience food	1011	1.0	0.5	0.8	1.0	1.2	1.6							
Partly ready meals	661	1.0	0.5	0.7	0.9	1.1	1.5	-	-	-	-	-	-	-
Ready to eat meals	215	1.1	0.5	0.9	1.1	1.4	1.9	-	-	-	-	-	-	-
Pizza	135	1.3	0.9	1.1	1.3	1.4	1.7	294	1.1	0.7	0.9	1.1	1.3	1.6
Processed meat (composed and single)	450	2.7	1.5	2.0	2.3	3.5	5.0	1612	2.5	1.3	1.9	2.2	3.0	4.7
Sauces	110	2.1	1.0	1.6	2.0	2.4	3.0	849	1.7	0.4	0.8	1.3	1.8	3.5
Meal sauces	-	-	-	-	-	-	-	198	0.9	0.5	0.7	0.8	1.1	1.4
Cold sauces	110	2.1	1.0	1.6	2.0	2.4	3.0	651	1.9	0.4	1.0	1.6	2.0	5.5
Savoury snacks	1311	1.8	0.5	1.2	1.7	2.3	3.5	952	1.8	0.8	1.2	1.7	2.2	3.3
Soups and stocks	-	-	-	-	-	-	-	662	0.8	0.6	0.7	0.7	0.8	1.0
Soups	-	-	-	-	-	-	-	632	0.8	0.6	0.7	0.7	0.8	1.0
Stocks	-	-	-	-	-	-	-	30	0.8	0.5	0.8	0.9	0.9	1.0
Savoury spreads	453	1.5	0.7	1.1	1.4	1.6	2.3	562	1.3	0.5	0.9	1.2	1.4	2.3

Not all food groups were represented in the databases, thus explaining missing data in the table.

1.4.3. Main scenarios tested

Two scenarios were tested (Table 5) for which the points scale was extended to 20 points and for which thresholds were expressed in g salt/100 g up to 2 decimal points when the content is below 1 g/100 g and only up to one decimal point above 1 g/100 g, which is aligned with current EU regulations.

Scenario I

Scenario I was defined using the initial methodology set for the FSA nutrient profile model. The reference intake for salt was retrieved from the FIC regulation [1], as **6 g** of salt. It should be noted that considering a reference value of 5 g, as recommended by some public health authorities, leads to an identical points allocation scale, considering the alignment with the regulation concerning decimals:

$$3.75\% \text{ of } 5 \text{ g} = 0.1875 = 0.2 \text{ g}$$

$$3.75\% \text{ of } 6 \text{ g} = 0.225 = 0.2 \text{ g}$$

Points were then allocated in a linear way by an increase of 0.2 step like in the current algorithm, but with points up to 20 points (or 4 g/100 g of salt).

Scenario II

Scenario II is the scenario with points allocated in a non-linear way, to allow for smaller steps for foods (with salt contents around 1 g/100 g) contributing largely to salt intake (e.g. bread, soups and sauces) and increasing salt points up to 20 (or 3.8 g/100 g of salt).

Table 6 Point allocation of the current Nutri-Score algorithm for sodium and alternative scenarios tested – for salt

Points	Current algorithm (mg sodium/100 g)	Scenario I (g salt/100 g)	Scenario II (g salt/100 g)
0	≤ 90 (\triangleq 0.2 g salt)	≤ 0.2	≤ 0.25
1	> 90	> 0.2	> 0.25
2	> 180	> 0.4	> 0.4
3	> 270	> 0.6	> 0.55
4	> 360	> 0.8	> 0.7
5	> 450	> 1	> 0.85
6	> 540	> 1.2	> 1
7	> 630	> 1.4	> 1.2
8	> 720	> 1.6	> 1.4
9	> 810	> 1.8	> 1.6
10	> 900 (\triangleq 2 g salt)	> 2	> 1.8
11		> 2.2	> 2
12		> 2.4	> 2.2
13		> 2.6	> 2.4
14		2.8	> 2.6
15		> 3	> 2.8
16		> 3.2	> 3
17		> 3.4	> 3.2
18		> 3.6	> 3.4
19		> 3.8	> 3.6
20		> 4	> 3.8

1.4.4. Results

Results for target food groups for salt in average FNS and score (A-E) are shown in Table 7.

Table 7 Distribution (%) of the target food groups in the current and alternate scenarios for sodium/salt and mean current FNS and modified (FNSm) – data from France, Germany and The Netherlands

Food group	N	FNS	Nutri-Score (%) Current algorithm					FNSm	Nutri-Score (%) Scenario I					Nutri-Score (%) Scenario II					
			A	B	C	D	E		A	B	C	D	E	FNSm	A	B	C	D	E
France																			
Whole grain bread	239	-1	77	20	3	0	0	-1	69	25	5	1	0	1	35	47	17	1	0
Refined grain bread	575	1	27	55	15	3	0	2	20	46	30	3	1	4	10	32	53	4	1
Other bread	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Breakfast cereals	652	6	16	12	46	25	1	7	16	10	45	27	1	7	16	9	44	29	2
Solid and semi-solid cheese	162	14	0	0	5	93	2	15	0	0	3	90	7	16	0	0	1	81	18
Soft cheese	123	14	0	0	3	97	0	15	0	0	2	97	1	16	0	0	2	97	1
Fresh cheese	39	12	0	0	36	62	2	13	0	0	36	41	23	14	0	0	33	41	26
Blue cheese	20	18	0	0	0	25	75	22	0	0	0	25	75	23	0	0	0	20	80
Processed cheese	41	14	0	0	12	88	0	14	0	0	10	78	12	15	0	0	7	78	15
Meat preparations (un)prepared	49	6	0	14	66	20	0	8	0	10	55	35	0	10	0	2	47	51	0
Processed meat (composed and single)	1061	16	0	2	21	31	46	20	0	1	15	23	61	21	0	1	9	26	64
Meat substitutes	677	0	58	25	13	4	0	1	52	27	14	6	1	2	40	30	21	8	1
Soups and stocks	778	1	10	61	29	0	0	2	7	56	37	0	0	2	7	44	49	0	0
Meal sauces based on tomato/vegetables	370	1	52	17	21	9	1	2	47	20	22	9	2	3	37	23	28	9	3
Cold sauces (emulsified and based on tomato/vegetables)	172	15	0	0	12	68	20	16	0	0	6	67	27	17	0	0	3	61	36
Savoury snacks	1165	14	1	3	22	50	24	16	1	2	18	49	30	17	0	2	11	51	36
Partly-ready meals	3330	2	31	36	26	6	1	2	28	35	29	7	1	3	23	32	34	10	1
Ready-to-eat meals	523	3	21	40	24	14	1	4	19	38	27	15	1	5	14	32	35	17	2
Pizza	636	8	2	20	41	37	0	9	1	15	40	44	1	10	0	8	37	53	2
Germany																			

Food group	Nutri-Score (%)							Nutri-Score (%)							Nutri-Score (%)						
	Current algorithm							Scenario I							Scenario II						
	N	FNS	A	B	C	D	E	FNSm	A	B	C	D	E	FNSm	A	B	C	D	E		
Whole grain bread	179	-1	78	22	1	0	0	-1	64	35	1	0	0	0	35	59	6	0	0		
Mixed grain and refined grain bread	304	0	53	39	7	1	0	1	43	38	16	1	1	3	29	40	28	2	1		
Other bread	332	2	40	31	23	6	0	3	30	32	30	8	0	4	16	32	43	9	0		
Breakfast cereals	639	2	50	10	30	10	0	2	50	9	31	10	0	2	50	8	30	11	0		
Solid and semi-solid cheese	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soft cheese	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Processed cheese	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meat preparations (un)prepared	96	9	2	22	27	41	8	10	2	17	28	36	17	12	0	6	29	44	21		
Processed meat (composed and single)	450	18	0	0	6	43	50	21	0	0	3	32	65	22	0	0	1	27	71		
Meat substitutes	361	5	22	24	37	16	1	6	19	21	36	23	2	7	14	13	41	30	3		
Soups	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stocks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meal sauces based on tomato/vegetables	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cold sauces (emulsified and based on tomato/vegetables)	110	10	5	3	37	49	5	12	5	2	29	54	10	13	5	3	23	60	10		
Savoury snacks	1311	11	4	3	34	54	5	13	3	3	27	52	15	14	3	2	21	56	18		
Partly-ready meals	655	2	23	41	32	5	0	2	18	39	38	5	0	3	15	28	38	18	1		
Ready-to-eat meals	211	3	21	31	37	9	1	4	19	29	39	11	1	5	1	6	50	43	1		
Pizza	135	7	1	18	59	22	0	8	1	13	55	30	1	9	1	6	50	43	1		
The Netherlands (database 2018)																					
Whole grain bread	555	-4	98	1	1	0	0	-3	98	1	1	0	0	-2	93	5	1	0	0		
Refined grain bread	1465	1	14	71	14	1	0	2	11	68	20	1	0	3	5	47	46	2	0		
Mixed grain bread	1797	-2	83	14	3	0	0	-1	75	21	4	1	0	0	56	35	8	1	0		
Other bread (substitutes)	2628	6	18	23	33	22	4	7	14	22	33	25	6	8	10	18	37	26	9		

Food group	Nutri-Score (%)							Nutri-Score (%)							Nutri-Score (%)						
	Current algorithm							Scenario I							Scenario II						
	N	FNS	A	B	C	D	E	FNSm	A	B	C	D	E	FNSm	A	B	C	D	E		
Breakfast cereals	534	3	37	14	39	10	0	3	37	13	39	11	0	4	36	13	39	11	0		
Solid and semi-solid cheese	2607	17	0	0	0	87	12	18	0	0	0	67	32	19	0	0	0	50	50		
Soft cheese	544	15	0	1	5	80	14	16	0	1	5	74	20	17	0	1	2	68	29		
Processed cheese	75	16	0	0	8	68	24	18	0	0	8	49	43	19	0	0	8	29	63		
Meat preparations (un)prepared	2748	8	7	22	25	40	6	9	5	18	26	42	9	10	3	15	22	46	14		
Processed meat (composed and single)	1612	17	1	3	6	39	51	20	1	2	5	32	60	21	1	1	4	31	64		
Meat substitutes	557	3	39	19	25	16	1	4	33	22	24	19	2	5	22	22	30	23	3		
Soups	632	1	12	75	13	0	0	2	9	63	28	0	0	2	6	51	43	0	0		
Stocks	30	3	0	17	83	0	0	4	0	10	90	0	0	4	0	10	90	0	0		
Meal sauces based on tomato/vegetables	198	3	2	45	52	1	0	3	1	38	60	0	1	4	1	24	73	1	1		
Cold sauces (emulsified and based on tomato/vegetables)	651	13	1	5	22	49	23	15	1	4	18	43	34	16	1	4	14	43	38		
Savoury snacks	952	13	1	5	22	49	23	14	0	2	29	46	22	15	0	1	20	51	27		
Partly-ready meals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Ready-to-eat meals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Pizza	294	5	2	35	45	18	0	6	2	23	51	24	0	8	1	15	46	37	0		

Not all food groups were represented in the databases, thus explaining missing data in the table.

In the current algorithm score, **meat preparations** mainly score B-C-D and D-E for the **processed meats**. Scenario I increases FNS for these food groups by an average 2 to 4 points and scenario II by an average 3 to 5 points. In both scenarios, Nutri-Score shifts towards less favourable ratings, especially for the highly salted varieties. The effect is slightly stronger in scenario II compared with scenario I.

For **cheese**, in the current algorithm Nutri-Score D is obtained for a large majority of products. Scenario I increases the mean FNS by 1 point and scenario II by 2 points. This results in less favourable Nutri-Score, especially for the highly salted varieties of cheeses exceeding 2 g/100 g of salt. The majority of cheeses are still classified as Nutri-Score D, highlighting that the impact is largely on high salted variants of cheese.

Bread currently classifies as A or B in the Nutri-Score. In scenario I, more breads with higher salt content shift to less favourable Nutri-Score ratings. The effects of scenario II are slightly stronger than the effects of scenario I. More salty breads have higher FNS in scenario II compared with scenario I. This is especially the case for the refined bread (in France and Germany) and bread substitutes (in Germany and the Netherlands) categories. Salt contents of breads in the Netherlands show less variation, due to the local salt regulations for bread.

For other types of target food groups, e.g. cold sauces or pizza, scenario I and II result in more salty varieties to be classified in more unfavourable Nutri-Score ratings, whereas more favourable Nutri-Score ratings could also be achieved. This might allow for food reformulations towards lower salt levels.

1.4.5. Main scenario retained

Considering that both Scenario I and Scenario II performed well in shifting the Nutri-Score of foods with higher salt content, but that allocating points in a linear approach is more in line with the current structure of the algorithm, **the ScC recommends for the sodium component of the algorithm to be modified to a salt component and for Scenario I to be retained in the update of the Nutri-Score algorithm.**

1.5. Dietary fibres

1.5.1. Rationale

The current Nutri-Score classification does not fully discriminate between similar whole grain and refined grain foods, containing higher and lower amounts of dietary fibre, respectively.

The consensus to improve discrimination between similar whole grain and refined grain products was based on scientific evidence embedded in FBDG. Dietary guidelines of Belgium, France, Germany, Netherlands, Spain, and Switzerland, consistently recommend the consumption of whole grain over refined foods, although some variation in quantities and specific guidance exists. These recommendations are based on a large body of literature on the relationships of whole grain consumption with risk of chronic diseases and effects of whole grain consumption on established biomarkers of chronic diseases (see the annual 2021 report from the Scientific Committee of the Nutri-Score).

Defining what is a whole grain food from a European rather than a national perspective is complex. Whole grain foods (including whole grain flour) are defined differently across countries, also within the European Union (EU).

- In Germany, whole grain bread is defined as bread that contains at least 90% whole grains [13].
- In the Netherlands and in Spain, whole grain bread is defined as bread of which the starchy corn, germ and/or bran of the grains are still intact [14] and made up from 100% of those intact grains [15].
- The Belgian legislation stipulates that whole meal bread must be made with 100% whole meal flour [16]. In the Belgian FBDG (2019), the used definition of whole grain is based on the Healthgrain EU project [17] and on the one provided by Ross et al., whereby a whole grain product is “a food product containing ≥ 30% whole grain ingredients in the overall product and contains more whole grain than refined grain ingredients, both on a dry-weight basis” [18].

Outside of the COEN, in the United Kingdom (UK) and the United States of America (USA), whole grain foods must contain ≥ 51% whole grain ingredients by wet weight, whereas in Sweden and Denmark the requirement is ≥ 50% whole grain ingredients on a dry matter basis [19].

EFSA concluded that on the basis of the data presented and lack of a definition of whole grain foods, a cause and effect relationship cannot be established between the consumption of whole grain and the claimed effects considered [19]. For fibre, on the other hand, EFSA considers dietary fibre intakes of 25 g/day to be adequate for normal laxation in adults [20].

Finally, the reference value for fibres intakes is set at 30 g/day in most COEN countries (see annual 2021 report from the Scientific Committee of the Nutri-Score for more detailed information).

Some stakeholders have proposed for ‘whole grains’ as ingredients to be included in the ‘fruit, vegetables and legumes’ component of the Nutri-Score algorithm, arguing of its alignment with FBDG [21]. However, the ScC considered that the update of the fibres scenario would be more adequate. Also, considering the lack of uniformity and regulation across the EU in the disclosure of the ingredients list, the addition of ‘whole grain’ as an ingredient to the ‘Fruit, vegetable and legumes’ component was also considered as a risk for the transparency of the system and not retained.

Finally, the ScC considered that achieving an adequate discrimination between whole grain and refined grain products would potentially require investigating both a decrease in FNS average points for whole grain products (i.e. a more favourable average rating) and an increase in FNS average points for refined grain products (i.e. a less favourable average rating) that the inclusion of a new ‘whole grain’ component would not necessarily achieve.

Therefore, the ScC, did not consider the inclusion of whole grain products as a positive component in the algorithm but explored the option to differentiate between whole grain and refined grain foods through the fibre component of the Nutri-Score.

Of note: the fibre content is not a mandatory element in the nutritional declaration at the back of the pack. However, for most cereal products it is mentioned.

The main food groups contributing to fibre intake are “grain products” and “vegetables, fruits, and legumes” in most countries. Vegetables, fruits and legumes are covered by the Fruits, vegetables, pulses, nuts and selected oils component of the Nutri-Score algorithm. Depending on the fibre content of products, the EFSA health claims such as “source of fibre” or “high in fibre” [19] are allowed to be used on product packaging in the EU. The current Nutri-Score algorithm does not link to this type of information.

Hence, the ScC considered a modification of the fibres component of the Nutri-Score, to allow for an improvement of the discrimination between whole grain and refined grain products.

1.5.2. Target groups

The primary target food groups to be used for optimizing the Nutri-Score algorithm for fibre rich foods are those with whole grain and refined grain varieties such as bread, pasta and rice. For testing the algorithm for similar whole grain and refined grain products via fibre contents (Table 8), the ScC focussed on the following food groups:

- Bread
 - Whole grain
 - Refined grain
- Pasta (as sold)
 - Whole grain
 - Refined grain
- Rice (as sold)
 - Whole grain
 - Refined grain

It is also important to verify that there are no unintended consequences after adapting the algorithm, meaning that products generally considered unfavourable or less favourable would improve their Nutri-Score classification. Therefore, other selected indicator food groups that might change in rating according to fibre contents were included in the assessment, such as: breakfast cereals, (cereal/muesli/fruit/nut) bars and (sweet and savoury) fine bakery products (according Eurocode 2 [22]).

Table 8 Average fibre composition of the target food groups and distributions (g/100g) across percentiles (P) – data from Belgium, France, Germany and The Netherlands

Food group	BELGIUM							FRANCE						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bread (substitutes)	539	3.9	1.6	2.3	3.0	4.8	8.6	814	4.5	1.8	2.8	4.0	5.9	9.0
Whole grain bread	100	6.7	3.5	4.8	6.9	8.2	12.5	239	6.4	4.2	5.0	6.4	7.2	10.1
Refined and mixed grain	191	3.4	1.7	2.4	3.0	3.9	6.6	575	3.6	1.5	2.5	3.1	4.3	7.3
Other bread	195	3.1	1.4	1.9	2.3	3.4	7.2	-	-	-	-	-	-	-
Bars	172	7.7	2.5	5.0	6.7	9.1	17.0	173	4.5	2.0	3.5	4.2	4.8	7.9
Breakfast cereals	347	7.6	3.0	4.6	6.7	9.1	13.6	652	6.7	2.5	5.0	6.5	8.4	11.1
Fine bakery products -sweet	1786	3.2	0.8	1.5	2.4	3.6	9.0	2553	2.7	1.0	1.8	2.4	3.4	5.5
Pasta	550	3.1	1.3	2.5	2.8	3.1	6.8	1435	3.5	2.0	3.0	3.0	3.6	7.4
Whole grain pasta	49	6.8	5.0	6.8	6.8	6.8	8.0	55	7.2	4.7	6.0	7.3	8.0	9.3
Refined grain pasta	501	2.7	1.3	2.4	2.6	3.0	3.6	1380	3.3	2.0	3.0	3.0	3.6	6.0
Rice	198	1.5	0.5	1.0	1.2	1.6	4.4	781	1.7	0.0	0.8	1.4	1.9	4.6
Whole grain rice	34	3.1	1.0	2.0	3.2	4.4	4.5	77	3.4	0.4	2.4	3.5	4.4	5.6
Mixed grain rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refined grain rice	164	1.2	0.5	0.9	1.0	1.2	2.5	704	1.5	0.0	0.7	1.3	1.6	4.4

Food group	GERMANY							THE NETHERLANDS						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bread (substitutes)	815	7.7	2.6	4.1	6.9	9.8	19.0	5643	4.3	1.4	2.2	3.7	5.7	8.9
Whole grain bread	179	9.0	6.0	8.0	9.2	10.2	11.5	555	6.9	5.1	6.3	6.8	7.4	8.1
Refined and mixed grain	304	4.5	2.5	3.0	4.0	5.5	8.2	3620	3.6	1.4	2.1	3.3	4.7	7.1
Other bread	332	10.0	3.1	5.5	8.7	13.2	21.0	1468	4.9	1.3	2.2	3.5	6.5	12.8
Bars	788	8.4	1.8	5.0	6.7	10.0	23.2	238	8.4	2.5	4.5	6.3	9.9	24.0
Breakfast cereals	639	8.5	4.0	6.9	8.7	10.0	13.0	534	8.8	3.0	6.2	8.5	11.0	16.0
Fine bakery products -sweet	2074	3.5	0.9	1.9	2.9	4.2	7.8	6921	2.3	0.4	1.0	1.7	3.0	6.0
Pasta	895	3.8	1.6	3.0	3.1	3.5	8.6	339	4.2	1.6	2.9	3.0	5.5	8.9
Whole grain pasta	128	8.0	5.7	6.8	8.0	8.9	11.0	66	7.2	5.0	6.8	7.0	8.0	8.9
Refined grain pasta	767	3.1	1.6	2.9	3.0	3.3	4.1	273	3.4	1.6	2.6	3.0	3.5	8.0
Rice	315	2.0	0.5	1.1	1.5	2.4	4.2	313	2.4	0.6	1.1	1.6	3.0	6.2
Whole grain rice	63	3.2	1.4	2.0	3.2	4.0	6.4	71	4.0	1.9	3.0	3.0	5.8	9.6
Mixed grain rice	36	2.7	1.3	1.9	2.2	3.2	5.4	30	3.0	1.0	1.6	3.1	4.3	5.7
Refined grain rice	216	1.5	0.5	1.0	1.4	1.8	3.3	212	1.8	0.5	1.0	1.3	1.9	4.2

Not all food groups were represented in the databases, thus explaining missing data in the table.

1.5.3. Main scenarios tested

Two scenarios of modification were tested for the dietary fibres component (Table 9). Of note, all scenarios refer to the AOAC method for determining the fibres content in foods.

Scenario I

Scenario I was defined starting from the preferred point allocation for dietary fibre content of foods from the 2018 Nutrient Profiling Model testing in the UK, using a 30 g reference value [10]. The fibre scale starts 0.7 g/100 g up to 5.8 g/100 g, extending the scale up to 8 points instead of 5 points in the current Nutri-Score algorithm. With extending the scale to 8 points (instead of 5), foods with a higher fibre content are able to gain additional ‘favourable’ (i.e. negative) points in the algorithm.

Scenario II

For scenario II, the point allocation was based on the current fibre point allocation with increases of 3.75% using a 30 g reference value, as for Scenario I. However, instead of starting at the 3.75% (i.e. 1.1 g/100 g) of the reference value, the point allocation scale starts at EFSA’s defined cut-off for the health claim for a product being a “source of fibre” (≥ 3 g fibre per 100 g) and its increases of 3.75% for each point were rounded to 1.1 g per 100 g for each point.

Table 9 Point allocation of the current Nutri-Score algorithm for fibres and alternative scenarios tested

Points (g fibre/100 g)	Current algorithm (g fibre/100 g)	Scenario I (g fibre/100 g)	Scenario II (g fibre/100 g)
0	≤ 0.9	≤ 0.7	≤ 3
1	> 0.9	> 0.7	> 3
2	> 1.9	> 1.4	> 4.1
3	> 2.8	> 2.2	> 5.2
4	> 3.7	> 2.9	> 6.3
5	> 4.7	> 3.6	> 7.4
6		> 4.3	
7		> 5.0	
8		> 5.8	

1.5.4. Results

The results for Nutri-Score current algorithm compared with scores in scenario I and II are presented in Table 10.

Table 10 Distribution (%) of the target food groups in the current and alternate scenarios for fibres and mean current FNS and modified (FNSm) – data from Belgium, France, Germany and The Netherlands

Food group	Nutri-Score (%)							Nutri-Score (%)							Nutri-Score (%)					
	Current algorithm							Scenario I							Scenario II					
	N	FNS	A	B	C	D	E	FNSm	A	B	C	D	E	FNSm	A	B	C	D	E	
Belgium																				
Whole grain bread	33	-1	65	32	3	0	0	-3	94	3	3	0	0	1	26	55	19	0	0	
Refined grain bread and other breads	93	5	18	9	45	26	2	4	26	31	23	19	1	7	3	23	37	33	3	
Whole grain rice	14	-3	77	23	0	0	0	-4	77	23	0	0	0	-1	62	38	0	0	0	
White rice	35	-1	67	30	3	0	0	-1	77	23	0	0	0	0	17	77	7	0	0	
Whole grain pasta	9	-6	100	0	0	0	0	-9	100	0	0	0	0	-5	100	0	0	0	0	
White pasta (incl. fresh, canned, packet)	138	-2	79	3	14	4	0	-2	80	6	12	2	0	1	71	9	9	11	0	
Breakfast cereals	203	6	22	10	44	22	2	4	31	3	51	14	1	8	21	9	27	36	7	
Cakes and muffins	268	19	1	1	5	37	56	18	1	2	7	36	54	20	0	1	5	28	66	
Biscuits	472	17	5	3	11	33	49	16	7	1	15	33	44	19	3	4	6	30	58	
Bars (muesli, cereal), excl. fruit bars	48	12	2	4	34	49	11	9	6	0	55	30	9	13	0	6	23	57	13	
France																				
Whole grain bread	239	-1	77	20	3	0	0	-4	93	4	3	0	0	0	44	47	8	1	0	
Refined grain bread	575	1	27	55	15	3	0	0	40	48	10	2	0	3	9	27	60	3	0	
Whole grain rice	77	-3	91	6	3	0	0	-4	93	6	1	0	0	-1	71	27	1	1	0	
White rice	704	-1	69	27	3	1	0	-1	73	23	3	1	0	0	25	72	2	2	0	
Whole grain pasta	55	-6	100	0	0	0	0	-9	100	0	0	0	0	-5	100	0	0	0	0	
White pasta (incl. fresh, canned, packet)	1380	-4	98	1	1	0	0	-5	98	1	1	0	0	-1	79	20	1	0	0	
Breakfast cereals	652	6	16	12	46	25	1	4	26	4	58	12	0	8	13	11	38	35	3	
Bars (muesli, cereal), excl. fruit bars	173	12	0	1	40	50	9	11	0	2	48	44	6	14	0	0	19	60	21	
Fine bakery products- sweet	2553	18	0	0	5	45	50	17	1	0	8	48	43	20	0	0	2	33	65	
Germany																				

Food group	Nutri-Score (%)								Nutri-Score (%)								Nutri-Score (%)								
	Current algorithm								Scenario I								Scenario II								
	N	FNS	A	B	C	D	E	FNSm	A	B	C	D	E	FNSm	A	B	C	D	E	FNSm	A	B	C	D	E
Whole grain bread	179	-1	78	22	1	0	0	-4	99	0	1	0	0	-1	73	26	1	0	0	-1	73	26	1	0	0
Mixed grain and refined grain bread	304	0	53	39	7	1	0	-2	67	28	5	0	0	2	20	38	39	3	0	2	20	38	39	3	0
Other type of breads	332	2	40	31	23	6	0	-1	67	6	27	0	0	2	30	33	30	8	0	2	30	33	30	8	0
Whole grain rice	63	-3	97	3	0	0	0	-4	98	2	0	0	0	-1	68	31	2	0	0	-1	68	31	2	0	0
Mixed rice	36	-3	97	3	0	0	0	-4	97	3	0	0	0	-1	77	23	0	0	0	-1	77	23	0	0	0
Refined rice	216	-1	82	15	2	0	0	-2	85	13	1	0	0	0	24	74	2	0	0	0	24	74	2	0	0
Whole grain pasta	126	-6	100	0	0	0	0	-9	100	0	0	0	0	-5	99	1	0	0	0	-5	99	1	0	0	0
White pasta	759	-4	96	3	1	0	0	-4	97	2	1	0	0	-1	87	12	1	0	0	-1	87	12	1	0	0
Breakfast cereals	639	2	50	10	30	10	0	-1	59	3	34	4	0	3	48	11	26	15	1	3	48	11	26	15	1
Fine bakery products-sweet	2074	18	0	1	6	46	46	16	1	1	11	48	39	19	0	0	5	33	61	19	0	0	5	33	61
Bars (muesli, cereal, fruit)	788	9	6	4	57	30	3	6	10	11	58	18	2	10	4	4	48	37	5	10	4	4	48	37	5
The Netherlands (database 2018)																									
Whole grain bread	299	-4	98	2	0	0	0	-7	100	0	0	0	0	-3	93	7	0	0	0	-3	93	7	0	0	0
Refined grain bread	997	1	17	72	10	1	0	0	38	54	8	1	0	3	8	48	43	1	0	3	8	48	43	1	0
Whole grain rice	37	-5	97	3	0	0	0	-7	100	0	0	0	0	-3	92	8	0	0	0	-3	92	8	0	0	0
White rice	141	-2	87	10	1	3	0	-2	88	9	1	2	0	-0	40	55	1	3	0	-0	40	55	1	3	0
Whole grain pasta	56	-6	100	0	0	0	0	-9	100	0	0	0	0	-5	100	0	0	0	0	-5	100	0	0	0	0
White pasta	139	-4	99	1	0	0	0	-5	100	0	0	0	0	-2	99	1	1	0	0	-2	99	1	1	0	0
Breakfast cereals	498	3	40	10	39	11	0	1	47	3	44	6	0	4	38	10	34	17	1	4	38	10	34	17	1
Cakes	692	21	20	0	1	15	63	21	20	0	2	16	62	22	20	0	1	12	66	22	20	0	1	12	66
Fine bakery products-sweet	642	19	15	1	7	27	50	18	16	1	11	26	46	20	15	0	5	24	56	20	15	0	5	24	56
Bars (muesli, cereal, fruit)	145	10	3	17	36	39	6	8	18	4	41	35	1	11	3	12	36	38	11	11	3	12	36	38	11

Not all food groups were represented in the databases, thus explaining missing data in the table.



In the current algorithm, 17-27% of the refined grain breads were rated A and 9-72% rated B. Scenario I resulted in increased points for fibre content and thus in a lower, more favourable mean FNS for both whole grain and refined grain bread, pasta and rice. In scenario I, almost all (94-100%) whole grain breads were rated A as with the current algorithm. In scenario I, 31-54% of the refined grain breads shifted from Nutri-Score rating A towards B or higher.

Scenario II led to less points scored for fibre in the indicator foods and thus to a reduction of the mean sum of positive points and an increase of the mean FNS in all groups. In addition, scenario II led to a shift of the distribution for refined grain breads towards rating C in Germany, B (48%) and C (43%) in the Netherlands, C (37%) in Belgium and C (67%) in France. The majority of whole grain bread remained rated A or B. In France, a proportion of whole grain breads shifted from A in the current algorithm to B. This can be explained by their mixed flour content, since the “whole grain” denomination is not regulated in this country. Overall, scenario II resulted in an improved differentiation between whole grain and refined grain breads.

In scenario I, classification of rice did not change significantly as white rice remained mainly in Nutri-Score A (80% in Belgium, 73% in France, 85% in Germany, 88% in the Netherlands). Scenario II improved the discrimination between rice variants by shifting the distribution for white rice from A to B (77% in Belgium, 72% in France, 74% in Germany, 55% in the Netherlands), while the majority of whole grain rice was still rated A.

In scenario I, refined grain pasta products remained mainly in Nutri-Score A. Scenario II led to a minor shift for white pasta towards B (12% in Germany, 9% in Belgium), C (1% in Germany, 9% in Belgium) and D (11% in Belgium), while in the Netherlands there was no difference. The score for whole grain pasta did not change and remained scored A.

The observed changes were without unintended effects for the food groups tested, including the less favourable food products such as the refined grain and bakery products.

1.5.5. Main scenario retained

Considering that scenario II performed best in discriminating whole grain and refined grain foods based on their fibre content for bread, the ScC recommends for Scenario II to be retained in the update of the Nutri-Score algorithm.

Of note, discrimination between whole grain and refined grain pasta and rice did not improve or improved only slightly. However, considering the across-the board nature of the modifications proposed and the more limited contribution of those food groups to fibre intake in European countries compared to bread, the discrimination between whole grain and refined grain version of pasta and rice were considered of lower priority by the ScC. Additionally, the classification of whole grain pasta and rice, in majority in the A category, was considered adequate and aligned with the objective of the ScC. Therefore, the limitation appeared to stem rather from the fact that refined grain pasta achieved similarly favourable classifications. Hence, from an algorithmic perspective, the limitation would necessitate to address refined grain products classification rather than whole grain products classification.

The final distributions using the combination of the scenarios on multiple components will be used to assess whether the overall update is considered adequate for this specific category of products.



1.6. Proteins

1.6.1. Rationale

Proteins are not considered as a nutrient of concern by the EFSA NDA panel for nutrient profiling models [7]. The report from the NDA panel on nutrient profiling stated that the average protein intakes in European adult populations, including older adults, were mostly at or above the Population Reference Intake (PRI) in most population groups and countries and that no beneficial effects on muscle mass or function can be expected from increasing protein intake further [7].

Of note, the analysis of the literature provided by the EFSA NDA panel investigated mainly elements regarding nitrogen balance and indispensable amino-acid requirements in the analysis of proteins as nutrients of concern in the case of their inclusion in nutrient profiling models.

Historically, in the development of the Food Standards Agency/Office of Communication nutrient profile model, proteins were not included as a component [23,24]. The initial nutrient profile models that were developed and tested rather included as nutrients of concern with low intakes in the population iron, calcium and n-3 fatty acids [25]. Proteins were included in the model as a replacement for calcium and iron during the consultation process with stakeholders, and the replacement was found to provide an adequate classification of foods compared to the initial algorithms [24]. Therefore, proteins should not be considered in the algorithm as nutrients of concern *per se* but rather as a proxy for other elements, namely iron and calcium. Indeed, several studies show a positive correlation between (heme) iron intake and protein [26,27].

When considering iron and calcium, the EFSA NDA panel on nutrient profile models acknowledged that some groups of the population were at higher risks of inadequate intakes, though standardised elements of evaluation across countries are somewhat scarce [12]. Finally, the panel acknowledged the possibility of including in nutrient profile models nutrients as a proxy for other nutrients of public health importance.

The component in its current form has been defined considering the protein requirements for children aged 11-16 years, with a linear point allocation based on a fixed percentage of the requirement.

The application of the current point allocation scale does not appear to provide an adequate discrimination between foods high in calcium and iron and those with a lower content. In particular, food groups with a limited content in iron and calcium may be awarded a substantial number of points, including appetizers, cereal products and convenience foods (ready-to-eat meals, pizzas).

Overall, these elements concur for the ScC to consider the protein component of the Nutri-Score algorithm as a proxy for iron and calcium content in foods and not primarily for the protein content itself. Given these considerations, the protein component of the Nutri-Score allows for a discrimination between and within food groups for iron and calcium contents. This could allow for fish and seafood scoring more favourable points via its protein content as well as certain cheeses with high contents of calcium. In addition, it would allow meat to score protein points in a similar way, which is not necessarily considered adequate e.g. for red and processed meats. Meat products are described in more detail in the chapter on Meat and meat products page 86.

Hence, the ScC considered a modification of the protein component, in order to allow for a better discrimination between foods with a high content in iron and calcium and foods with lower contents.

1.6.2. Target groups

Target groups for this modification were identified considering the content in iron and calcium of food products and contributor groups to the intakes in iron and calcium at the population level (Table 11).



The main contributors to calcium intakes [12] are milk and dairy products that are responsible of between 38 and 85% of the intake, followed by grain and grain-based products (2-35%). The main contributors to iron intakes are meat, fish, cereals, beans, and nuts.

The primary target groups for the modification of the protein component, as groups with high content in iron or calcium, are the following:

- For calcium
 - Dairy products— including cheese
- For iron
 - Meat and fish
 - Legumes

Of note, legumes were not available within the available food composition database from France, Germany and the Netherlands. However, legumes are the products with the most favourable ratings of all within the Nutri-Score algorithm, as they score high favourable (i.e. negative) FNS points for proteins, fibres and ‘fruit, vegetables and legumes’ component. Hence, the ScC only investigated briefly whether their overall favourable classification was maintained through generic food databases.

While these food groups, as groups with high contents in iron and calcium, should be awarded the maximum number of points for their protein content, other groups would be considered as low content in iron and calcium, and should therefore be awarded a limited number of points considering the proxy nature of proteins in the system.

The secondary target groups for the protein modification are therefore in particular mixed products such as convenience foods (ready-to-eat meals, pizza), and cereal-based products (bread).



Table 11 Average protein composition of the target food groups and distributions (g/100g) across percentiles (P) – data from Belgium, France, Germany and The Netherlands

	BELGIUM							FRANCE						
Food group	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bread	539	8.2	3.9	7.1	8.1	9.1	12.0	814	8.3	4.6	7.6	8.4	9.2	11.0
Whole grain bread	100	9.0	4.3	6.7	8.6	10.6	16.5	239	8.7	4.9	8.0	8.6	9.7	11.3
Refined and mixed grain	191	7.9	3.2	7.1	8.1	8.9	10.6	575	8.2	3.8	7.5	8.3	9.0	10.6
Other bread	195	8.0	4.3	7.2	7.8	9.1	10.9	-	-	-	-	-	-	-
Cheese	2610	17.4	5.3	9.1	18.0	24.0	29.0	385	19.5	6.8	16.0	19.0	25.0	29.0
Solid and semi-solid cheese	999	25.4	20.6	23.0	25.0	27.0	33.0	162	26.2	20.3	24.0	26.9	28.0	33.0
Soft cheese	1084	11.5	4.0	6.3	9.0	17.0	21.0	123	18.6	16.0	17.0	19.0	20.0	22.0
Fresh cheese	244	15.0	8.0	9.8	16.0	19.0	24.0	39	15.3	8.9	13.5	16.0	18.0	20.0
Blue cheese	69	18.6	13.0	18.0	19.0	21.0	22.0	20	18.0	15.4	16.5	18.9	19.0	20.0
Processed cheese	203	12.9	8.5	11.0	13.0	15.0	17.0	41	10.8	8.0	9.0	9.0	13.0	15.0
Convenience food	1375	7.3	2.0	5.2	7.1	9.3	12.0	4489	7.4	1.6	5.0	7.0	9.5	14.0
Partly ready meals	202	6.9	1.3	4.0	5.8	8.9	12.0	3330	7.2	1.6	4.7	6.5	8.9	15.0
Ready to eat meals	892	6.7	2.0	4.8	6.5	8.1	12.0	523	6.8	1.0	4.2	6.8	9.5	12.0
Pizza	281	9.4	7.0	8.3	9.5	10.2	12.0	636	9.2	5.1	7.8	9.4	10.9	12.5
Fish (and seafood)	1723	13.5	0.0	7.3	16.0	20.0	25.0	13192	17.8	7.5	13.0	18.9	22.0	26.0
Lean fish	-	-	-	-	-	-	-	2335	12.3	5.8	8.2	12.0	15.2	19.4
Fatty fish	-	-	-	-	-	-	-	9392	19.5	10.0	16.0	21.0	23.0	26.0
Seafood	-	-	-	-	-	-	-	1465	15.9	6.3	12.6	17.0	20.0	22.3



	GERMANY								THE NETHERLANDS							
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95		
Bread	815	8.6	3.9	6.0	8.2	9.5	16.8	5643	9.8	6.4	8.3	9.4	11.0	14.3		
Whole grain bread	179	6.3	4.4	5.3	5.7	7.5	8.8	555	10.4	6.5	9.5	10.5	11.5	13.2		
Refined and mixed grain	304	8.5	6.5	7.9	8.5	9.0	10.5	3620	9.4	6.8	8.3	9.1	10.4	13.2		
Other bread	332	9.9	2.9	5.7	9.0	12.9	21.7	1468	10.3	5.7	8.0	9.8	12.0	16.7		
Cheese	-	-	-	-	-	-	-	3226	24.1	13.6	23.1	25.0	26.6	31.1		
Solid and semi-solid cheese	-	-	-	-	-	-	-	2607	26.1	22.9	24.4	25.8	27.0	31.5		
Soft cheese	-	-	-	-	-	-	-	544	15.4	5.3	13.4	17.0	19.0	23.0		
Fresh cheese	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Blue cheese	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Processed cheese	-	-	-	-	-	-	-	75	19.4	13.0	15.0	21.4	21.8	22.8		
Convenience food	1011	6.0	2.0	4.0	5.4	7.7	11.4	-	-	-	-	-	-	-	-	
Partly ready meals	661	5.4	2.0	3.8	5.0	6.4	10.7	-	-	-	-	-	-	-		
Ready to eat meals	215	5.7	1.1	3.5	5.0	7.7	11.7	-	-	-	-	-	-	-		
Pizza	135	9.4	5.9	8.3	9.9	10.7	12.0	294	9.5	6.2	8.8	9.7	10.5	11.7		
Fish (and seafood)	408	15.5	8.7	11.7	14.0	19.3	24.5	840	15.7	9.9	12.7	15.8	18.7	22.0		
Lean fish	168	12.9	9.5	11.0	12.1	14.0	18.1	304	14.2	8.4	11.9	13.1	16.0	24.0		
Fatty fish	162	18.9	8.7	15.1	20.0	23.0	25.2	284	17.9	13.0	15.3	18.4	21.0	22.0		
Seafood	78	13.9	7.5	10.9	14.0	17.0	19.9	252	15.2	9.9	12.2	15.5	18.0	20.0		

Not all food groups were represented in the databases, thus explaining missing data in the table.



1.6.3. Main scenarios tested

Scenario I

Scenario I was defined using the initial methodology set for the FSA nutrient profile model. A modified reference value for proteins was set at 64 g of protein, which is equivalent to 12 En% of the energy reference of 8950 kJ that is currently used in the Nutri-Score algorithm. The 12 En% for protein are corresponding to the cut-off for the nutrition claim “source of protein” given in the claims regulation [28]. The point allocation scale then follows the initial methodology, with a linear increasing point allocation step of 3.75% of the modified reference value to a maximum of 7 protein points. Values for protein contents above 10 g/100 g were rounded to the nearest integer value.

Scenario II

Scenario II was defined following *a posteriori* approach, taking into account the distribution of proteins in primary target groups, with the minimal number of points (i.e. at least one point) for contributors to calcium and iron intakes, but with a limited amount of proteins (e.g. yogurts, bread) and maximal number of points for products with high contents of iron and calcium (e.g. meat, poultry, cheese). The point allocation scale starts at 3 g protein/100 g increasing linearly in 3 g-steps to a maximum of 7 protein points.

The point allocation scale was extended to 7 points.

Table 12 Point allocation of the current Nutri-Score algorithm for proteins and alternative scenarios tested

Points	Current algorithm (g protein/100 g)	Scenario I (g protein/100 g)	Scenario II (g protein/100 g)
0	≤ 1.6	≤ 2.4	≤ 3.0
1	> 1.6	> 2.4	> 3.0
2	> 3.2	> 4.8	> 6.0
3	> 4.8	> 7.2	> 9.0
4	> 6.4	> 9.6	> 12
5	> 8.0	> 12	> 15
6		> 14	> 18
7		> 17	> 21

1.6.1. Results

The results for the current and alternate scenarios for the protein component of the Nutri-Score algorithm are presented in Table 13.



Table 13 Distribution (%) of the target food groups in the current and alternate scenarios for proteins and mean current FNS and modified (FNSm) – data from France, Germany and The Netherlands

Food group	N	Nutri-Score (%) Current algorithm						Nutri-Score (%) Scenario I						Nutri-Score (%) Scenario II					
		FNS	A	B	C	D	E	FNSm	A	B	C	D	E	FNSm	A	B	C	D	E
France																			
Solid and semi-solid cheese	162	14	0	0	5	93	2	12	0	0	26	74	0	12	0	0	26	74	0
Soft cheese	123	14	0	0	3	97	0	12	0	0	11	89	0	13	0	0	3	97	0
Fresh cheese	39	12	0	0	36	62	2	12	0	0	44	51	5	13	0	0	36	56	8
Blue cheese	20	18	0	0	0	25	75	17	0	0	0	100	0	18	0	0	0	85	15
Processed cheese	41	14	0	0	12	88	0	15	0	0	10	83	7	16	0	0	7	78	15
Meat substitutes	677	0	58	25	13	4	0	0	57	25	14	4	0	1	46	30	20	4	0
Lean fish	2224	2	36	26	24	14	0	2	33	24	29	14	0	3	25	25	36	14	0
Fatty fish	9391	7	8	20	24	47	1	7	17	23	13	47	0	7	15	19	19	46	1
Seafood	1465	2	26	28	37	8	1	1	34	33	25	8	0	2	26	27	38	8	1
Partly-ready meals	3330	2	31	36	26	6	1	2	22	34	38	6	0	3	18	31	45	6	0
Ready-to-eat meals	523	3	21	40	24	14	1	4	14	36	35	14	1	4	12	30	43	14	1
Pizza	636	8	2	20	41	37	0	8	0	8	55	37	0	9	0	4	59	37	0
Whole grain bread	239	-1	77	20	3	0	0	0	38	54	7	1	0	1	20	69	10	1	0
Refined grain bread	575	1	27	55	15	3	0	3	11	38	49	2	0	3	6	29	63	2	0
Other type of breads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Germany																			
Solid and semi-solid cheese	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Soft cheese	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Processed cheese	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Meat substitutes	361	5	22	24	37	16	1	4	29	20	35	16	1	5	23	22	39	16	1
Lean fish	168	0	36	53	10	2	0	0	36	45	17	2	0	1	23	45	30	2	0



Food group		Nutri-Score (%)								Nutri-Score (%)						Nutri-Score (%)					
		Current algorithm								Scenario I						Scenario II					
		N	FNS	A	B	C	D	E	FNSm	A	B	C	D	E	FNSm	A	B	C	D	E	
Fatty fish	162	5	20	23	19	38	0	5	33	17	12	38	0	5	29	19	14	38	0		
Seafood	78	1	41	36	13	10	0	1	49	26	15	10	0	2	36	31	23	10	0		
Partly-ready meals	655	2	23	41	32	5	0	3	14	36	45	5	0	3	11	32	53	5	0		
Ready-to-eat meals	211	3	21	31	37	9	1	4	17	28	45	9	1	4	15	27	48	9	1		
Pizza	135	7	1	18	59	22	0	7	1	6	71	22	0	8	0	4	74	22	0		
Whole grain bread	179	-1	78	22	1	0	0	0	46	53	1	0	0	1	13	79	8	0	0		
Mixed grain and refined grain bread	304	0	53	39	7	1	0	1	26	42	31	1	0	2	10	51	37	1	0		
Other type of breads	332	2	40	31	23	6	0	2	21	47	25	6	0	3	15	50	29	6	0		
The Netherlands																					
Solid and semi-solid cheese	2607	17	0	0	0	87	12	15	0	0	2	98	0	15	0	0	2	98	0		
Soft cheese	544	15	0	1	5	80	14	14	0	1	8	91	1	15	0	0	5	92	3		
Processed cheese	75	16	0	0	8	68	24	15	0	1	7	92	0	15	0	0	8	79	13		
Meat preparations (un)prepared	2748	8	7	22	25	40	6	8	19	20	16	40	6	8	15	17	22	40	6		
Lean fish	304	1	31	44	18	7	0	1	38	31	24	7	0	2	23	38	31	7	0		
Fatty fish	284	10	2	13	23	62	1	9	5	23	10	62	1	10	3	10	24	62	1		
Seafood	252	4	21	26	24	28	0	4	25	33	13	28	0	5	12	28	32	28	0		
Partly-ready meals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Ready-to-eat meals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Pizza	294	5	2	35	45	18	0	6	0	13	68	18	0	6	0	7	75	18	0		
Whole grain bread	555	-4	98	1	1	0	0	-2	96	3	1	0	0	-2	89	10	1	0	0		
Mixed grain and refined grain bread	3620	0	51	40	9	1	0	1	35	37	26	1	0	2	23	38	38	1	0		
Other type of breads	1468	6	20	25	27	23	4	6	14	23	35	23	4	7	7	25	41	23	4		

Not all food groups were represented in the databases, thus explaining missing data in the table.



Overall, both scenarios allowed for a discrimination between foods based on their protein content, with products containing higher levels of proteins shifting towards more favourable ratings. However, scenario II appeared to be stricter than scenario I, with higher average FNS in all categories of products.

Improvements towards more favourable ratings were observed for the main target groups, including:

- **Fish** and more specifically **fatty fish** in the French database, reaching more frequently the A and B ratings
- **Solid and semi-solid cheeses**, which have higher contents in calcium, reached more often the C category, which the current algorithm does not allow for.

Secondary target groups, on the contrary such as Convenience foods (ready-to-eat and partly ready-to-eat meals) were shifted towards less favourable ratings.

1.6.2. Main scenario retained

Considering that Scenario I, as opposed to Scenario II, has a point allocation scale defined *a priori* and provides a better consistency with other components' definitions, and the adequate results observed for the target groups in the Nutri-Score testing, **the ScC recommends for Scenario I to be included in the update of the Nutri-Score algorithm**

1.7. Fruit, vegetables, legumes, nuts and plant-based oils

The current “fruit, vegetables, legumes and nuts” component was revised in 2019 to include elements that are specific to FBDG of one country, i.e. France [29]. Indeed, in order to align the classification of plant-based oils with the French dietary guidelines, olive, canola and nut oils were included in the “Fruit, vegetables, legumes, and nuts” component. This modification allows for the oils preferred in the French dietary guidelines (i.e. canola, olive and nuts) to be discriminated with more favourable ratings than other oils.

However, considering the international scope of the ScC and the potential differences between dietary guidelines in the COEN, it appeared necessary to consider this later modification in the light of other countries’ perspectives.

Therefore, the ScC recommends removing oils from the ingredients qualifying under the “fruit, vegetables and nuts” component of the Nutri-Score.

For nuts, their classification was modified from the ‘main algorithm for general foods’ algorithm to the ‘fats, oils and nuts’ algorithm, (see Fats, oils, nuts and seeds page 68) to allow for a more adequate discrimination and comparison between products. This new classification for nuts also allows for a simplification in the main algorithm, whereby the ‘protein cap’ exemption for products with A points ≥ 11 and ≥ 5 points for fruit and vegetables can be removed (see Final combination pages 49).

Therefore, considering the specific classification for nuts, the ScC recommends their exclusion as ingredients in the component “fruit, vegetables and nuts”.

The Eurocodes identifying products qualifying for the “fruit, vegetables and legumes” component are therefore now restricted to vegetable groups (8.10 to 8.60), fruit groups (9.10 to 9.60) and pulses groups (7.10). Detailed Eurocodes classifying for the component are mentioned in the Appendix.



Of note, to date the full classification (currently based on the Eurocode 2) and the transformation processes allowed for the inclusion in the component have not been reviewed by the ScC. The revision of the ingredients list and the types of processes qualifying under the component will be undertaken by the ScC in the next year (see Next steps – agenda of the ScC page 91).

1.8. Final combination and adjustment of thresholds

1.8.1. Final combination

The combined algorithm included the following modifications (see Recap of the update in the main algorithm page 129):

– Component modifications

- A modified Sugars component, using a point allocation scale aligned with the FIC regulation of 3.75% of the 90 g reference value, with up to 15 points
- A modified Salt component, using a point allocation scale aligned with the FIC regulation of 3.75% of the 6 g reference value, with up to 20 points
- A modified Fibres component, using a point allocation scale of 3.75% of the 30 g reference value (as recommended in various EU countries), and with a starting point set at the value aligned with the claims regulation for the claim of “source of fibre”, with up to 5 points
- A modified Proteins component, using a point allocation scale aligned with the claims regulation of “source of proteins” of 3.75% of the 64 g reference value, with up to 7 points
- A modified ‘Fruit, vegetables, legumes’ component, with the removal of nuts and oils from the ingredients qualifying for the component

– Overall computation component

- A simplification of the final computation, with a removal of the protein cap exemption for products with A points ≥ 11 and fruit and vegetable points ≥ 5

Of note, the protein cap exemption for cheeses is maintained in the main algorithm for general foods.

The overall computation is however simplified, considering that nuts and seeds are now classified within the fats, oils, nuts and seeds category. Indeed, the protein cap exemption rule targeted specifically these products and is therefore obsolete in the main algorithm for general foods.

Overall, the updated algorithm appeared stricter, with shifts towards less favourable ratings in general, due to the stricter nature of the individual changes operated for each component.

Shifts towards more favourable ratings were observed specifically for fish and fatty fish with very limited amounts of added nutrients and for hard cheeses with limited amounts of salt.

Shifts towards less favourable ratings were observed in particular for high salt and high-sugar products, in line with the modifications of the respective components for these nutrients. For convenience foods, modifications stemmed in particular from the limitation in the number of favourable (i.e. negative points) attributed to proteins and fibres, in alignment with their relative nutritional value.



1.8.2. Thresholds adjustment

The thresholds were explored taking into account the main areas of priority of the ScC, with the following food groups as indicators for the various thresholds:

- **The A/B threshold**, perceived relevant for especially:
 - dairy products (with unsweetened versus sweetened versions),
 - whole grain and refined grain products (bread, pasta and rice),
 - fatty fish
 - compotes (meaning unsweetened versus sweetened variants)
- **The B/C threshold**, perceived relevant for especially:
 - discrimination between dairy products, i.e. between unsweetened dairy compared to sweetened dairy and dairy desserts,
 - whole grain and refined grain bread
 - discrimination between fishes according to salt content
- **The C/D threshold**, perceived relevant for:
 - fish, with a specific attention given to the discrimination of high salted species found in the C/D categories for fatty fish (e.g. smoked/salted fish)
 - cheese, with a specific attention given to hard cheeses, with an aim to allow for some to reach the C category, on the account of their higher calcium content
- **The D/E threshold** was perceived relevant mainly for groups of lower priority:
 - fine bakery ware,
 - confectionery (chocolates, candies, and ice cream) that are very high in sugar and fat,
 - and also processed meat products

Overall, the testing of the thresholds showed that the updated algorithm required a modification of the A/B threshold only, up by one point.

The ScC therefore recommends the following final thresholds for the Nutri-Score algorithm

FNS points	Nutri-Score classification	Colour
-15 to 0	A	Dark green
1 to 2	B	Light green
3 to 10	C	Yellow
11 to 18	D	Light orange
19 to 40	E	Dark orange

Threshold between A/B

With the adaptation of the shift from 0/-1 to 0/1, the following improvements were observed in discrimination or categorization (Figure 1 to Figure 8), first in the French database and then confirmed with the databases from The Netherlands and Germany:



- Wholegrain breads: higher proportion now in A category, though mostly in B category, with refined grain bread mostly in C category. In databases of countries with a regulated and more strict definition for wholegrain bread, higher proportions, up to 89% (The Netherlands), reach the A category,
- Wholegrain rice and white rice: Higher proportion of wholegrain rice in A (63%) compared to without threshold adaptation, allowing for a better discrimination to white rice, being mostly in the B category,
- Sweetened dairy products have their median in the C category and are discriminated compared to unsweetened dairy products (median in B category), of which 43% reach the A category
- Fatty fish were at 8% (current situation in Nutri-Score) and are now at 24% in the A category, which would be significantly less without the threshold adaptation,

Some limitations were identified, although the current situation was nonetheless improved:

breakfast cereals: still 10% in A category, though this may be appropriate

refined pasta: majority in category A, thus limiting any discrimination with wholegrain pasta

partly-prepared meals and ready-to-eat meals: respectively 14% and 9% in the A category, though this may be appropriate

compote: limited discrimination for sweetened and unsweetened versions, still mainly classified in the A category, except for the very sweet versions

sweetened dairy products: still 13% in the A category

plant-based meat substitutes: still 44% in the A category, though this may be appropriate

There were no main changes for lean fish (35% in the A category) and legumes (99% versus 97% in the A category).

These results were considered sufficiently satisfactory and aligned with the objectives and priority groups identified by the group initially. Some limitations were maintained in the algorithm (compotes, whole grain vs. refined grain pasta), but these were of either similar or limited magnitude compared to the previous algorithm. Thus, the change was finally approved by consensus in the ScC, based on the overall improvement reached.

Threshold between B/C, C/D and D/E

The only additional threshold considered of interest for a potential shift was threshold B/C at 2/3 points vs. 3/4 points overall and in individual food groups, but no benefits were found in terms of better discrimination of the prioritized food groups, thus it was decided to keep the status quo.



1.8.3. Impact on food product classification

Belgium

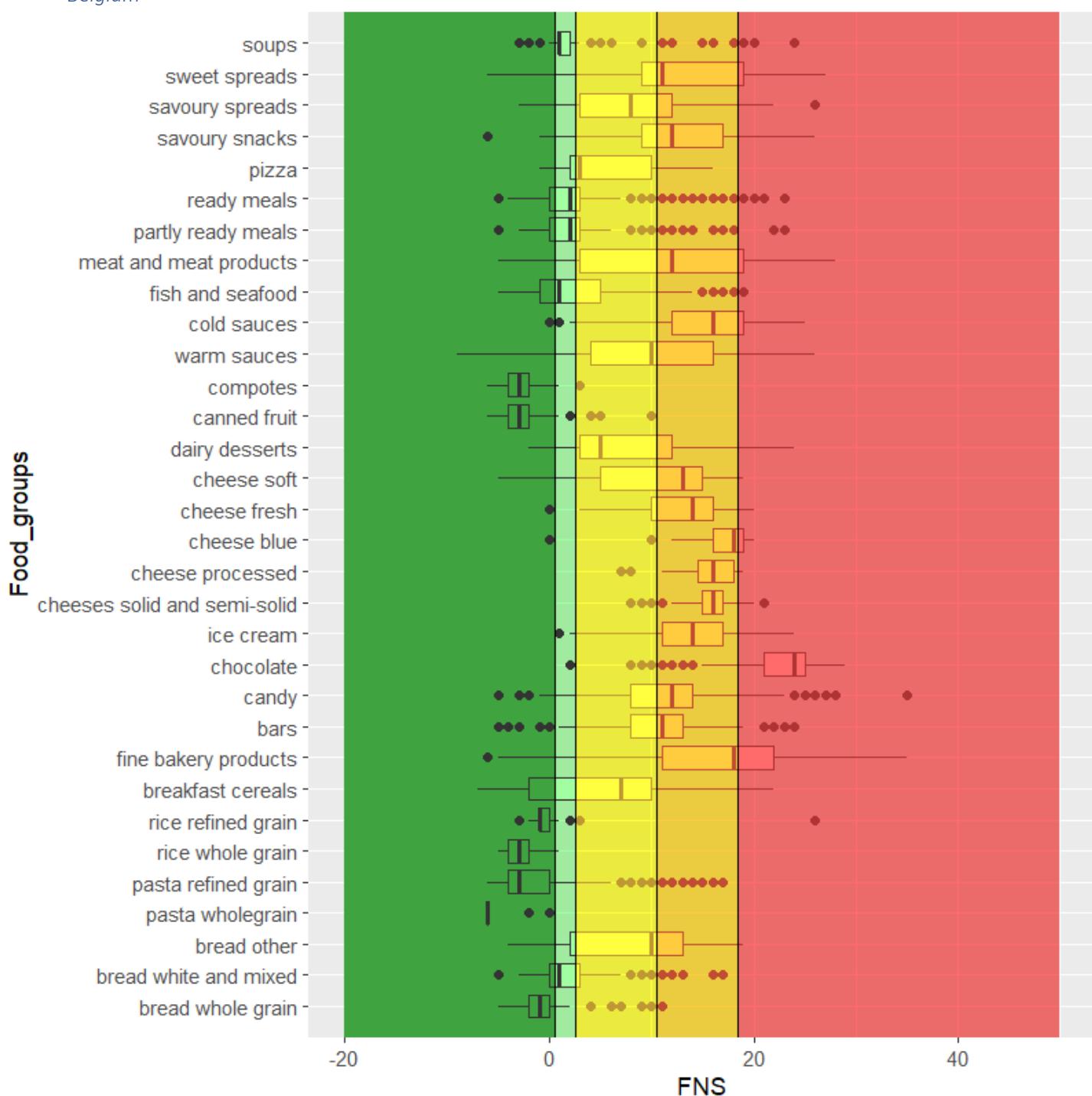


Figure 1 Current distribution of food groups in the FNS and corresponding Nutri-Score classification – Belgium

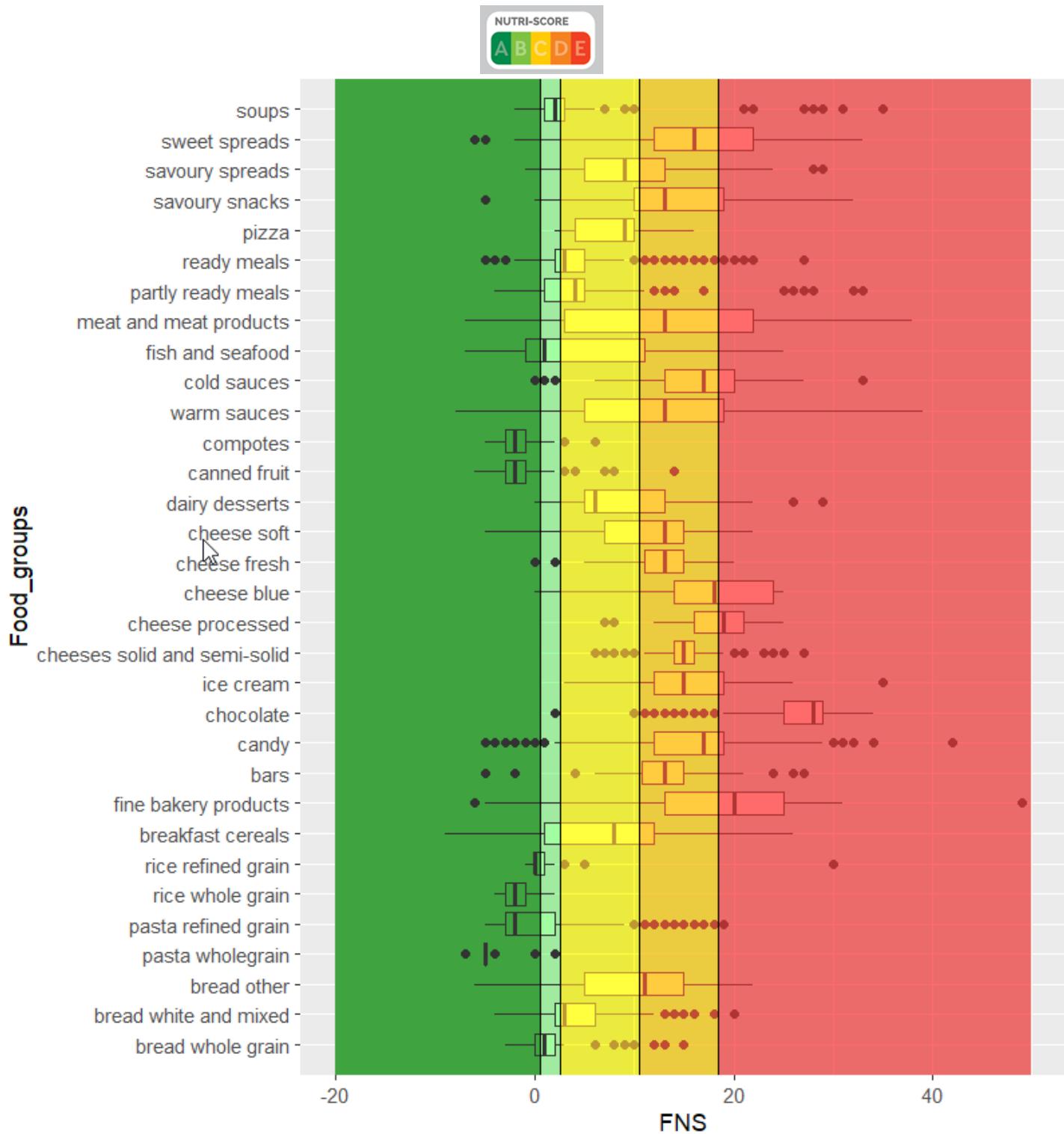


Figure 2 Updated distribution of food groups in the FNS score and corresponding Nutri-Score classification – Belgium

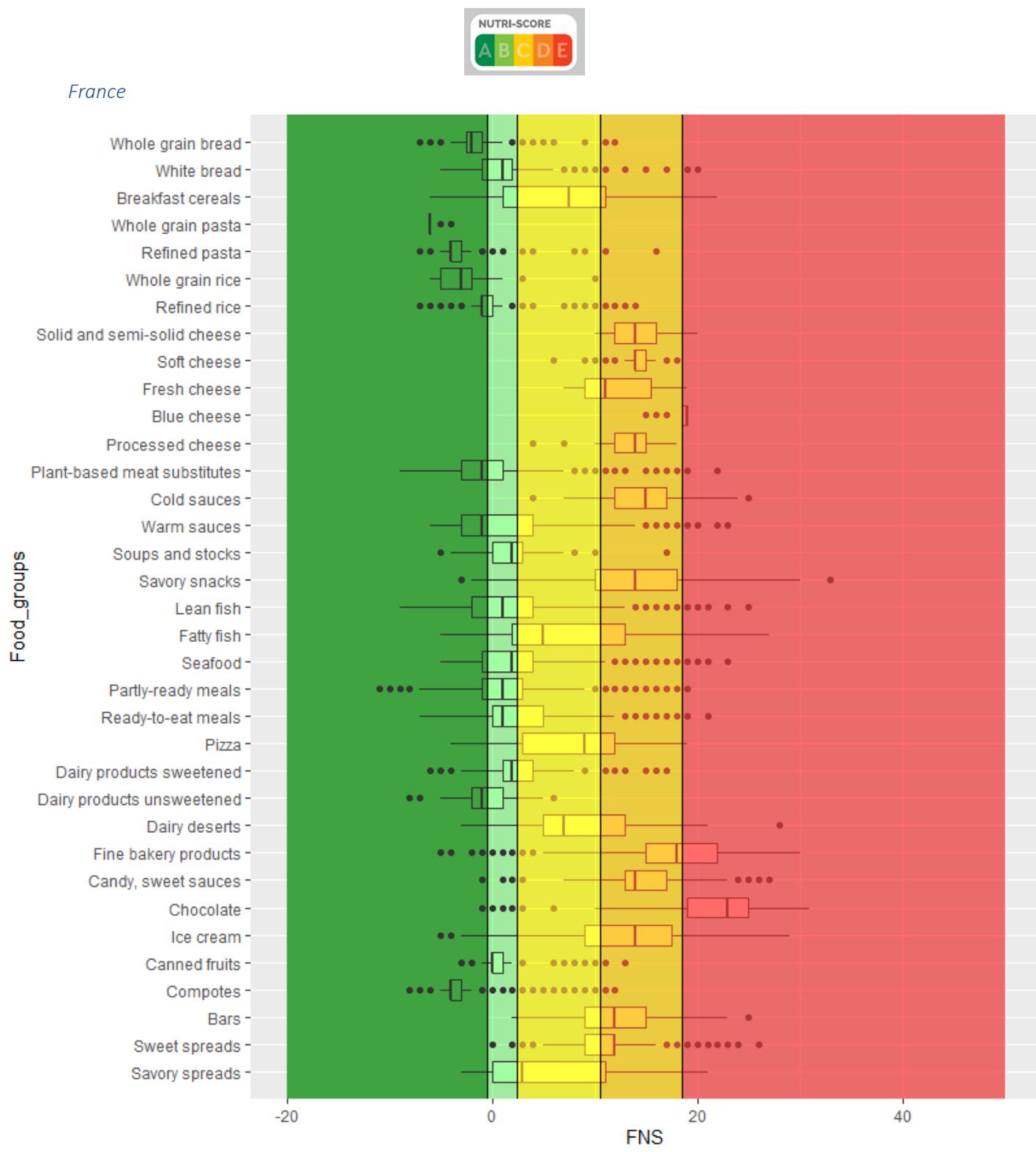


Figure 3 Current distribution of food groups in the FNS score and corresponding Nutri-Score classification – France



Figure 4 Updated distribution of food groups in the FNS score and corresponding Nutri-Score classification – France

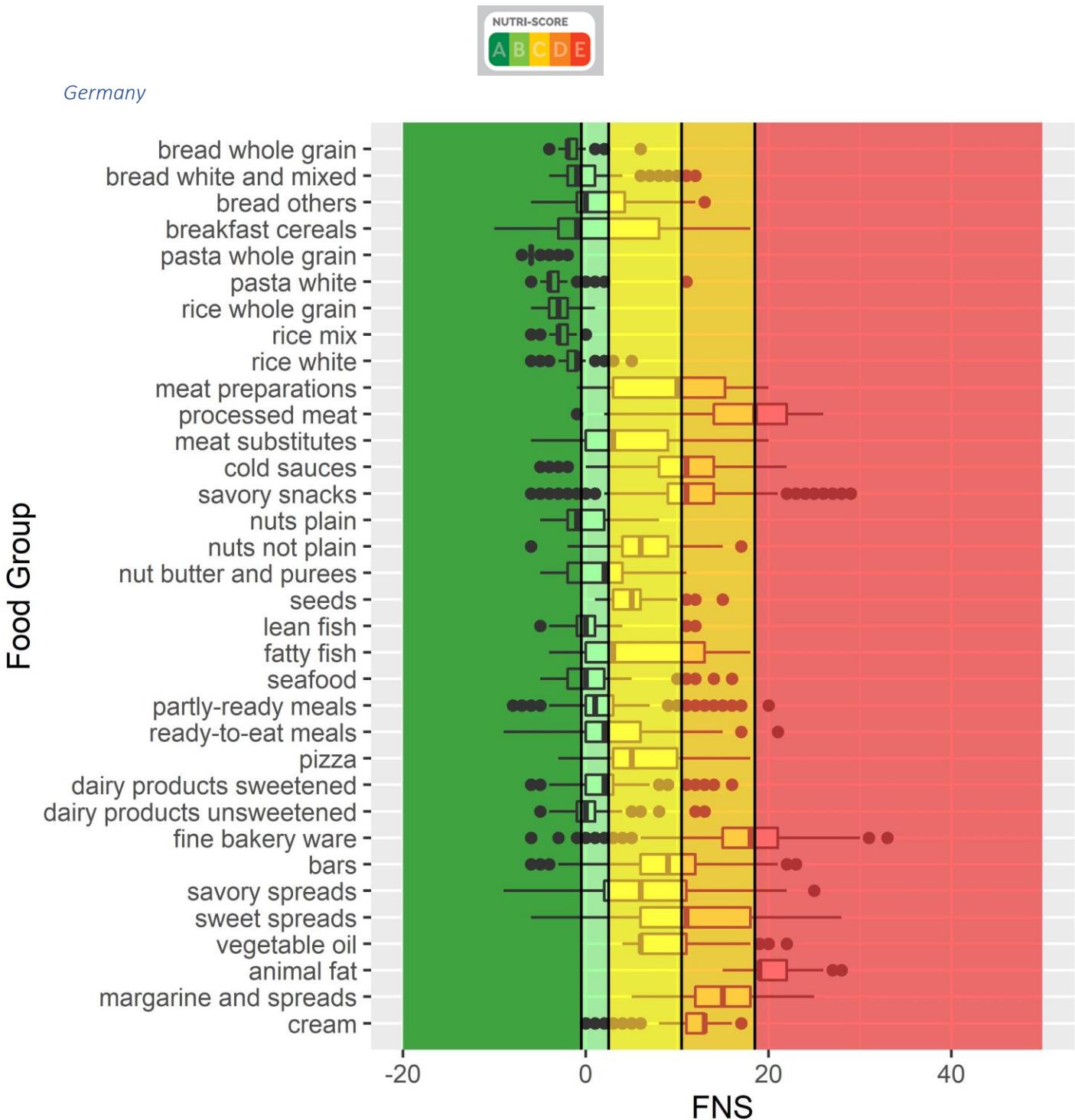


Figure 5 Current distribution of food groups in the FNS score and corresponding Nutri-Score classification – Germany

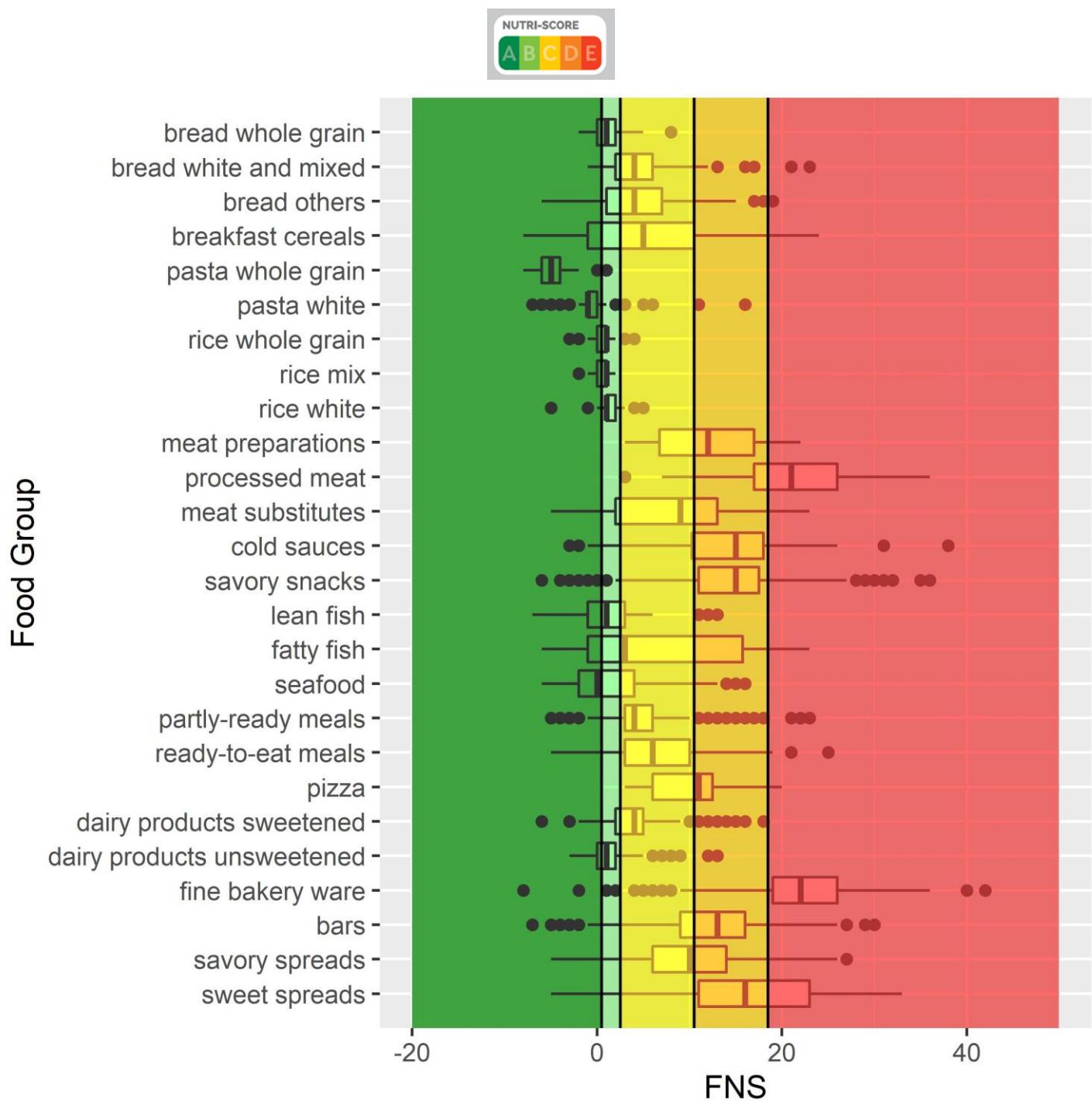


Figure 6 Updated distribution of food groups in the FNS score and corresponding Nutri-Score classification – Germany



The Netherlands

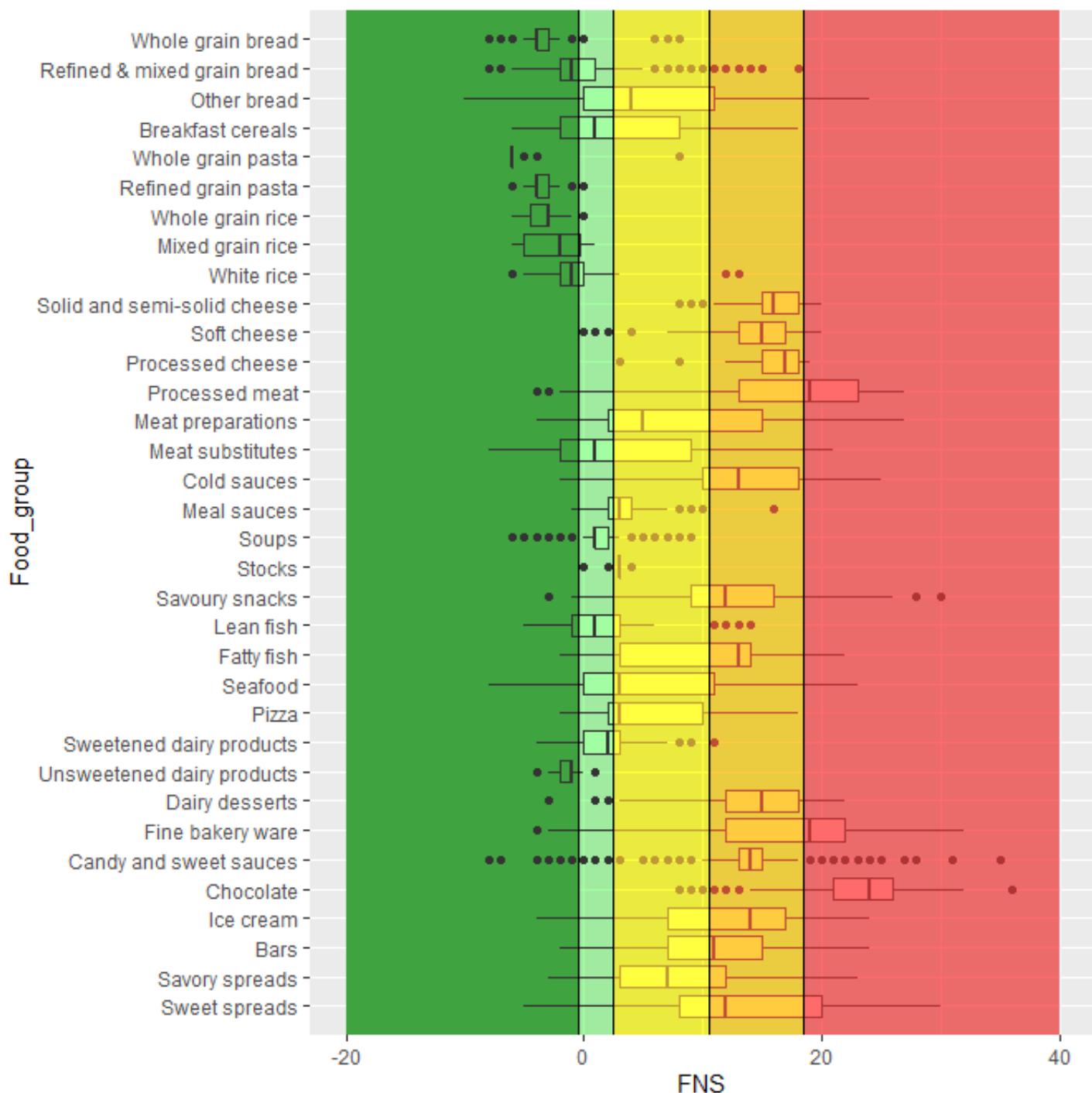


Figure 7 Current distribution of food groups in the FNS score and corresponding Nutri-Score classification – The Netherlands

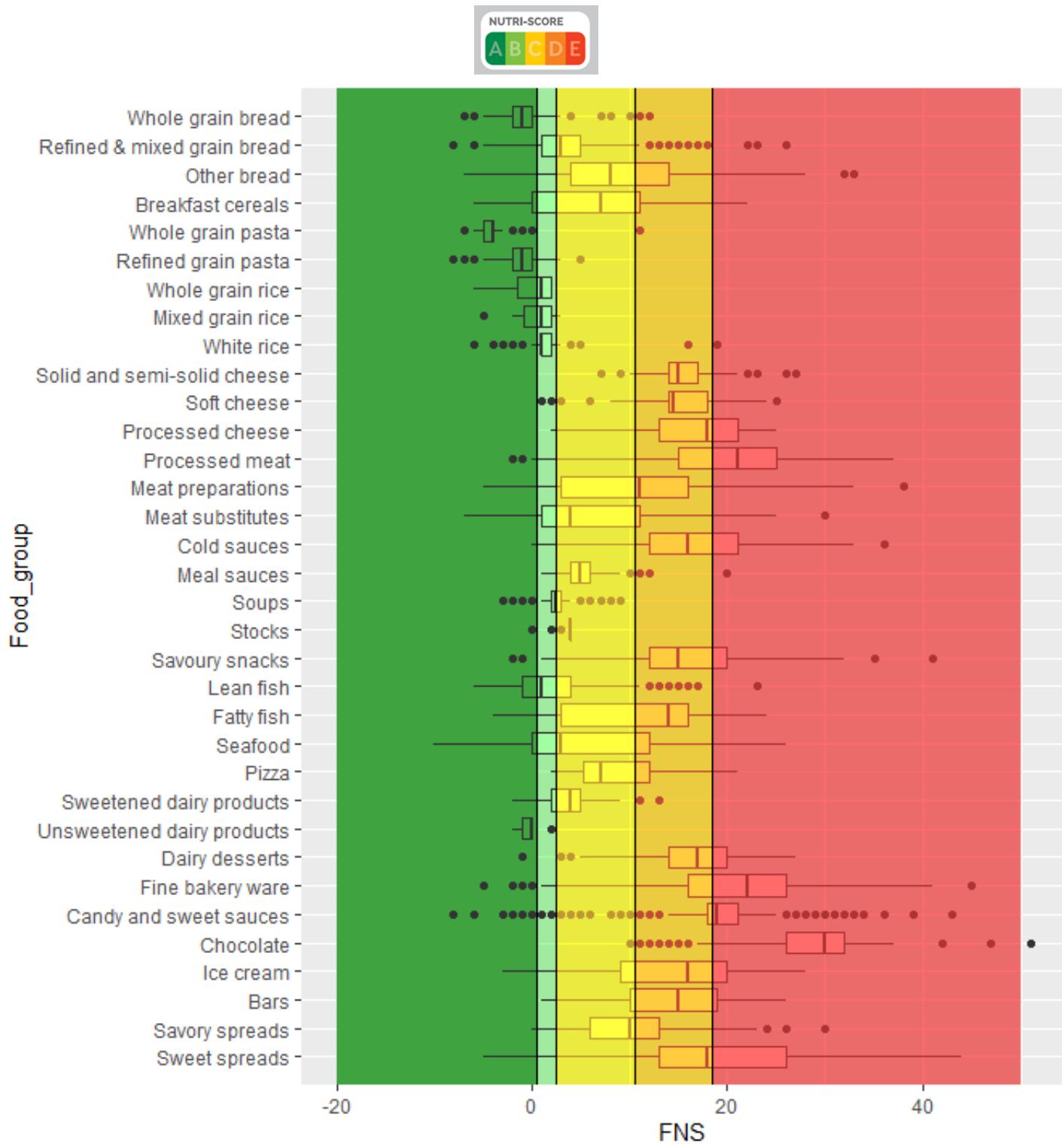


Figure 8 Updated distribution of food groups in the FNSm score and corresponding Nutri-Score classification – The Netherlands



Overall classification

Table 14 Classification in the current and updated Nutri-Score for general foods – overall distribution (%) tables from Belgium, France, Germany and The Netherlands

Food group	Nutri-Score (%)					Nutri-Score (%)				
	Current algorithm					Updated algorithm				
	A	B	C	D	E	A	B	C	D	E
Belgium										
Bread										
Whole grain bread	64	28	6	2	0	41	44	12	3	0
Mixed grain and refined grain bread	16	57	18	9	0	7	25	55	13	1
Other type of breads	7	20	28	45	1	3	9	35	51	4
Breakfast cereals	31	10	37	20	2	24	8	32	31	5
Pasta										
Whole grain pasta	98	2	0	0	0	98	2	0	0	0
Refined grain pasta	74	5	12	10	0	71	5	12	12	0
Rice										
Whole grain rice	90	10	0	0	0	87	13	0	0	0
Refined grain rice	69	29	1	0	1	62	33	4	0	1
Cheese										
Solid and semi-solid	0	0	2	91	8	0	0	8	86	7
Soft cheese	6	11	19	62	1	4	3	29	60	4
Fresh cheese	0	1	25	73	0	0	1	18	69	11
Blue cheese	0	1	1	48	49	0	1	0	54	45
Processed cheese	0	0	5	83	12	0	0	5	44	51
Plant-based meat substitutes	51	25	20	4	0	51	14	27	8	0
Sauces										
Sauces -used cold	5	10	38	35	12	5	5	35	29	26
Sauces based on tomatoes and vegetables -warm	0	7	13	50	31	5	2	7	48	38
Soups and stock	7	69	20	3	1	9	58	29	0	4
Savoury snacks (crisps, savoury biscuits)	1	3	39	38	19	1	1	31	41	26
Fish and seafood	26	39	13	21	0	41	21	12	21	4



Convenience foods											
Partly-ready meals	21	39	31	8	1	15	27	47	7	4	
Ready-to-eat meals	17	48	28	6	1	13	23	55	7	2	
Pizza	0	30	54	16	0	0	1	77	22	0	
Dairy products											
Dairy products mixed (sweetened and unsweetened)	28	49	21	2	0	31	29	37	3	0	
Dairy desserts	1	16	52	28	3	1	3	62	27	7	
Fine bakery products -sweet	5	3	14	31	47	4	2	11	28	55	
Confectionery											
Candy, sweet sauces	5	12	16	54	12	5	12	5	37	40	
Chocolate	0	0	1	8	91	0	0	1	5	95	
Ice cream	0	4	21	64	11	0	0	22	53	26	
Canned fruits	89	8	3	0	0	89	7	4	1	0	
Compotes	85	13	1	0	0	85	13	2	0	0	
Bars	3	4	41	43	10	1	0	23	63	13	
Spreads											
Sweet spreads	4	2	37	32	25	4	2	9	55	31	
Savoury spreads	4	18	44	31	3	3	9	45	34	10	
France											
Bread	42	44	12	2	0	10	17	67	6	0	
Whole grain bread	77	20	3	0	0	21	38	40	1	0	
Refined grain bread	27	55	15	3	0	5	8	78	8	1	
Other type of breads											
Breakfast cereals	16	12	46	25	1	10	4	35	44	6	
Pasta	98	1	1	0	0	85	13	1	1	0	
Whole grain pasta	100	0	0	0	0	100	0	0	0	0	
Refined grain pasta	98	1	1	0	0	84	14	1	1	0	
Rice	71	25	3	1	0	18	76	4	2	0	
Whole grain rice	91	6	3	0	0	64	31	4	1	0	
Mixed grain rice											
Refined grain rice	69	27	3	1	0	13	81	4	2	0	



	0	0	8	87	5	0	0	15	75	10
Cheese	0	0	8	87	5	0	0	15	75	10
Solid and semi-solid	0	0	5	93	2	0	0	19	78	3
Soft cheese	0	0	3	97	0	0	0	5	95	0
Fresh cheese	0	0	36	62	2	0	0	38	39	23
Blue cheese	0	0	0	25	75	0	0	0	25	75
Processed cheese	0	0	12	88	0	0	0	7	66	27
Plant-based meat substitutes	58	25	13	4	0	43	20	26	10	1
Sauces	35	12	18	28	7	25	11	25	27	13
Sauces -used cold	0	0	12	68	20	0	0	2	67	31
Sauces based on tomatoes and vegetables -warm	52	17	21	9	1	36	15	36	9	4
Soups and stock	10	61	29	0	0	7	42	51	0	0
Savoury snacks (crisps, savoury biscuits)	1	3	22	50	24	1	1	6	52	41
Fish (and seafood)	15	22	25	37	1	24	17	17	34	8
Lean fish	36	26	24	14	0	36	16	29	16	3
Fatty fish	8	20	24	47	1	20	16	13	41	10
Seafood	26	28	37	8	1	37	20	24	17	1
Convenience foods	26	34	28	12	0	12	16	50	21	1
Partly-ready meals	31	36	26	6	1	14	21	53	12	1
Ready-to-eat meals	21	40	24	14	1	9	8	56	23	4
Pizza	2	20	41	37	0	0	0	30	69	1
Dairy products	15	21	46	16	2	11	12	52	17	8
Dairy products sweetened	18	36	44	2	0	13	16	67	1	3
Dairy products unsweetened	54	30	16	0	0	43	29	28	0	0
Dairy desserts	2	4	54	35	5	0	2	45	38	15
Fine bakery products -sweet	0	0	5	45	50	0	0	1	22	77
Confectionery	0	4	17	42	37	0	2	12	26	60
Candy, sweet sauces	0	7	12	62	19	0	6	4	11	79
Chocolate	0	7	1	14	78	0	1	7	6	86
Ice cream	0	1	28	54	17	0	0	18	42	40
Canned fruits	23	64	12	1	0	4	72	19	1	4
Compotes	83	7	10	0	0	77	8	8	6	1



	0	1	40	50	9	0	0	3	63	34
Bars	0	1	40	50	9	0	0	3	63	34
Spreads	4	5	34	50	7	1	2	12	70	16
Sweet spreads	0	0	36	55	9	0	0	5	79	16
Savoury spreads	21	21	26	28	4	4	14	44	22	16
Germany										
Bread	53	32	12	3	0	20	27	45	7	0
Whole grain bread	78	22	1	0	0	37	52	11	0	0
Mixed grain and refined grain bread	53	39	7	1	0	8	20	61	10	1
Other type of breads	40	31	23	6	0	21	21	48	9	0
Breakfast cereals	50	10	30	10	0	37	9	28	24	1
Pasta										
Whole grain pasta	100	0	0	0	0	98	2	0	0	0
Refined grain pasta	98	2	0	0	0	88	10	1	0	0
Rice										
Whole grain rice	97	3	0	0	0	48	49	3	0	0
Mixed grain rice	97	3	0	0	0	39	61	0	0	0
Refined grain rice	82	15	2	0	0	10	86	4	0	0
Cheese	-	-	-	-	-	-	-	-	-	-
Solid and semi-solid	-	-	-	-	-	-	-	-	-	-
Soft cheese	-	-	-	-	-	-	-	-	-	-
Fresh cheese	-	-	-	-	-	-	-	-	-	-
Blue cheese	-	-	-	-	-	-	-	-	-	-
Processed cheese	-	-	-	-	-	-	-	-	-	-
Plant-based meat substitutes	22	24	37	16	1	17	12	30	35	5
Sauces										
Sauces -used cold	-	-	-	-	-	-	-	-	-	-
Sauces based on tomatoes and vegetables -warm	5	3	37	49	5	5	1	20	54	21
Soups and stock	-	-	-	-	-	-	-	-	-	-
Savoury snacks (crisps, savoury biscuits)	4	3	34	54	5	2	2	15	61	21
Fish (and seafood)	31	38	14	18	0	40	20	21	15	4
Lean fish	36	53	10	2	0	38	30	31	2	0



	20	23	19	38	0	35	13	10	30	11
Fatty fish										
Seafood	41	36	13	10	0	56	12	19	13	0
Convenience foods	19	36	37	8	0	6	14	63	17	1
Partly-ready meals	23	41	32	5	0	6	19	68	7	1
Ready-to-eat meals	21	31	37	9	1	9	9	58	21	2
Pizza	1	18	59	22	0	0	0	45	54	1
Dairy products	18	53	29	1	0	18	33	47	1	0
Dairy products sweetened	13	47	39	1	0	11	24	64	1	0
Dairy products unsweetened	28	67	4	0	0	37	56	6	0	0
Dairy desserts	-	-	-	-	-	-	-	-	-	-
Fine bakery products -sweet	0	1	6	46	46	0	0	4	21	75
Confectionery	-	-	-	-	-	-	-	-	-	-
Candy, sweet sauces	-	-	-	-	-	-	-	-	-	-
Chocolate	-	-	-	-	-	-	-	-	-	-
Ice cream	-	-	-	-	-	-	-	-	-	-
Canned fruits	-	-	-	-	-	-	-	-	-	-
Compotes	-	-	-	-	-	-	-	-	-	-
Bars	6	4	57	30	3	5	2	24	58	11
Spreads	9	10	41	28	11	3	4	30	39	23
Sweet spreads	6	9	35	30	21	3	2	20	39	37
Savoury spreads	13	12	48	25	1	4	6	41	40	9
The Netherlands										
Bread										
Whole grain bread	98	1	1	0	0	89	8	2	1	0
Mixed grain and refined grain bread	51	40	9	1	0	14	25	57	3	0
Other type of breads	20	25	27	23	4	10	8	41	28	12
Breakfast cereals	37	14	39	10	0	26	11	35	25	3
Pasta										
Whole grain pasta	98	0	2	0	0	98	0	0	2	0
Refined grain pasta	99	1	0	0	0	84	15	1	0	0
Rice										



	98	0	2	0	0	37	63			
Whole grain rice	98	0	2	0	0	37	63			
Mixed grain rice	73	27	0	0	0	47	33	20	0	0
Refined grain rice	69	28	1	1	0	22	68	9	0	0
Cheese										
Solid and semi-solid	0	0	0	87	12	0	0	1	93	6
Soft cheese	0	1	5	80	14	0	1	3	76	21
Fresh cheese	-	-	-	-	-	-	-	-	-	-
Blue cheese	-	-	-	-	-	-	-	-	-	-
Processed cheese	0	0	8	68	24	0	1	7	49	43
Plant-based meat substitutes	39	19	25	16	1	22	17	28	29	3
Sauces										
Sauces -used cold	1	5	22	49	23	1	1	16	43	39
Sauces based on tomatoes and vegetables -warm	2	45	52	1	0	0	3	95	2	1
Soups	12	75	13	0	0	3	47	50	0	0
Stock	0	17	83	0	0	3	7	90	0	0
Savoury snacks (crisps, savoury biscuits)	0	2	35	50	13	0	0	13	55	32
Fish (and seafood)										
Lean fish	31	44	18	7	0	38	23	26	12	1
Fatty fish	2	13	23	62	1	6	16	13	63	3
Seafood	21	26	24	28	0	29	15	25	29	2
Convenience foods										
Partly-ready meals	-	-	-	-	-	-	-	-	-	-
Ready-to-eat meals	-	-	-	-	-	-	-	-	-	-
Pizza	2	35	45	18	0	0	1	57	42	0
Dairy products										
Dairy products sweetened	16	43	41	0	0	6	31	60	3	0
Dairy products unsweetened	92	8	0	0	0	92	8	0	0	0
Dairy desserts	1	5	18	58	18	1	0	19	39	42
Fine bakery products -sweet	1	2	16	31	50	0	1	5	29	65
Confectionery										
Candy, sweet sauces	5	10	5	71	10	4	8	6	13	69



	0	0	1	12	87	0	0	0	5	95
Chocolate	0	0	1	12	87	0	0	0	5	95
Ice cream	3	5	22	57	13	1	3	23	40	34
Canned fruits	-	-	-	-	-	-	-	-	-	-
Compotes	-	-	-	-	-	-	-	-	-	-
Bars	2	14	32	47	6	0	3	26	45	26
Spreads	-	-	-	-	-	-	-	-	-	-
Sweet spreads	1	3	32	32	31	1	1	16	47	35

Not all food groups were represented in the databases, thus explaining missing data in the table.

1.8.4. Conclusion

Overall, the modifications in the Nutri-Score classification are aligned with the objectives set by the ScC, in particular for the high-priority groups initially identified (see Priority areas of the ScC – summary, page 9).

The updated Nutri-Score classification allows for more favourable classifications for fish – in particular fatty fish – compared to the current classification. This improvement is shown rather for products with a limited amount of added nutrients (for canned products in particular), while products with high levels of salt (i.e. smoked fish with high content of salt) are maintained in the same classification. Also, the updated algorithm shows a more favourable classification of some cheeses, namely hard cheeses with limited amounts of salt.

Additionally, consistently with the objectives of the ScC, high sugar and high salt content products were shifted towards less favourable ratings, with confectionery reaching the E category, as well as high-salt products (i.e. high salt condiments). Also, there was higher discrimination for products according to their sugar content, in particular in the dairy and the breakfast cereal categories, with a limited number of products with relatively high amounts of sugars (reflecting most likely free/added sugars) reaching the A or B categories. In these categories, a discrimination was operated between non-sweetened and sweetened variants.

A better discrimination was also achieved between whole grain and refined grain bread, the former achieving in general an A rating. For whole grain breads, a wide variability was observed between databases and countries, mostly due to the relative regulations in place in each country regarding whole grain bread. In the database from the Netherlands, where the regulation is strict on the composition of whole grain bread, a wide majority of products reached the A category, while in France, where there is no such regulation, the distribution reflects rather whole and mixed grain products, with products ranging from A to C. By contrast, refined grain bread achieved a C rating in general, with products with lower salt contents reaching more favourable ratings. Convenience foods were in general shifted towards less favourable ratings, aligned with their overall nutritional value, with somewhat high contents in salt and low contents in fibres or proteins.

Some limitations to the algorithm persist, though they appear of lesser magnitude than the current system. These relate in particular to the limited discrimination observed between refined and whole grain pasta. Specifically, while the distribution of whole grain pasta and rice are aligned with recommendations, the distribution of refined-grain variants appears not sufficiently separated to allow a meaningful discrimination within the Nutri-Score. Additional modifications to address this specific issue were considered by the ScC. These included the removal of protein points specifically for refined grain products, the use of nutritional composition for foods ‘as prepared’ rather than ‘as sold’ and finally the inclusion of a new specific exception rule whereby only ‘whole grain products’ would be able to reach the A category. Overall, the ScC concluded that the balance between the introduced complexity of these potential modifications compared to the additional gains obtained was not adequate to support additional modifications at this stage. A limitation was also identified in fruit-based products, with a limited discrimination between products with added sugars and products with no added sugars. Indeed, for compotes only the highest in sugar were classified in the B or C categories.

Overall, the improvements to the algorithm in the main priority areas of the ScC were important, and the limitations were considered acceptable.

The ScC therefore recommends for the final combination, along with the adjustment of the A/B thresholds, to be retained in the update of the Nutri-Score algorithm.



2. Fats, oils, nuts and seeds

2.1. Rationale

2.1.1. Fats and oils classification

The rationale pertaining to the relative classification of plant-based oils within the Nutri-Score algorithm has been presented in the 2021 annual report from the ScC. Herein we report the main conclusion of this report, as follows:

Overall, the analysis of the literature showed that there was substantial evidence of the beneficial effect of olive oil on the risk of type 2 diabetes, cardiovascular diseases and all-cause mortality, with a significant number of studies being performed. The lack of studies on the effect of other vegetable oils with favourable nutrient profiles (i.e. low in saturated and high in poly-unsaturated fatty acids) on chronic diseases and mortality precluded a direct comparison of the effects of the various types of oils on health outcomes (see annual 2021 report from the Scientific Committee of the Nutri-Score for more detailed information).

Given the evidence that vegetable oils, in particular olive oil, have demonstrated beneficial effects on health, modifications to the algorithm could be performed to improve the scoring of olive and other vegetable oils with favourable nutrient profiles in the system and support dietary guidelines that advocate the moderate use of vegetable oils preferably to other fats.

2.1.2. Nuts classification

The position of nuts in the dietary guidelines varies somewhat between countries. In Germany, nuts are currently mentioned within the category of fruits and vegetables. In France, nuts are mentioned in a separate category in the FBDG. Also in Belgium, nuts (and seeds) are considered as a separate category, but additionally they are mentioned as a source of ‘healthy fat’, and some nuts, such as walnuts, are mentioned as being rich in n-3 fatty acids. In Switzerland, nuts are part of the category of fats or sources of (healthy) fats. In the Netherlands and Spain, nuts are positioned within the protein-rich foods, noting in Spain their high fat content. Luxemburg does not have national guidelines in this regard.

Therefore, nuts do not have a consistent position as a food group across European dietary guidelines. However, (unsalted) nuts have a favourable nutrient profile as a source of unsaturated fatty acids, dietary fibres and proteins. A diet low in nuts is associated with an increased risk of cardiovascular disease and diabetes [30–32]. For these reasons, consumption of nuts and seeds *without added salt* are recommended in Belgium, France, Germany, the Netherlands, Spain and Switzerland. Nevertheless, nuts have a high energy density because of their relatively high fat content, which is penalized in the Nutri-Score algorithm. Additionally, if nuts were to be placed in a separate category from the oils that are extracted from them (i.e. updated main algorithm), then some discrepancies could arise from the direct comparison of the classification of nuts and their respective oils. For this reason, nuts have been placed in the same category as fats and oils. With a perspective of simplification of the algorithm, nuts were also removed from the list of ingredients qualifying for the “fruit, vegetables, legumes” of the algorithm (see Fruit, vegetables, legumes, nuts and plant-based oils page 48).



The ScC recommends the addition of nuts and seeds to the fats and oils category, along with the removal of nuts from the ingredients list qualifying for the “Fruit, vegetables and legumes” component of the Nutri-Score.

2.2. Target group for modification

Target groups for the modification were identified considering the current definition of the fats and oils category of the Nutri-Score. Nuts and seeds were added to the component.

- Nuts
 - Both unseasoned (plain) and seasoned
 - Processed nuts: nut butter
- Seeds
 - Both unseasoned (plain) and seasoned
- Fats and oils
 - Including cream. Of note, cream is classified in the Dutch and German FBDG in the dairy category, and as such could also be classified in the main algorithm. However, a majority vote in the ScC maintained cream as fat.

In order for nuts to be identified easily as food products entering this classification, the ScC considered the Harmonized System Nomenclature (HS) [33], an international detailed classification of goods developed under the umbrella of the World Customs Organization and for the purpose of tariffs setting [34], or the Codex/FAO classification of goods and animal feed [35]. Of note, though Codex/FAO standards are the reference for food safety and information, the available classification may be less detailed than the HS.

Hence, the ScC retrieved codes from the HS as a starting point for identification, though the exact classification used could depend on implementation efficacy considerations outside of the mandate of the ScC.

For nuts, the products that could be qualified into this category could be derived from the HS, under the codes:

- Nuts: 0801 0802
 - Including coconuts
- Processed nuts: 200811 200819
 - >50% nuts to qualify
- Ground nuts and seeds
 - 1202 ground nut

Of note, *chestnuts* are excluded from this category, as their nutritional composition rather warrants their classification within starchy vegetables.

2.3. Main scenarios tested

2.3.1. Energy component

The energy density imbalance identified for the main algorithm is more pronounced in the fats, nuts and oils category, as – by definition – these correspond to high-fat products.



As such, while the ScC did not consider that a modification of the energy component in the main algorithm was adequate, a modification of the energy component specifically for the fats, oils and nuts category was considered.

Capitalizing on the investigation undertaken in the main algorithm (see chapter Energy page 11 in the main algorithm), the ScC considered that a modification of the energy component for a component based on energy from saturates only was adequate.

Among the investigated options for the modification in the main algorithm, this modification was indeed the most adequate to achieve the required objectives. In the fats, oils and nuts category, foods with higher contents in unsaturated fatty acids should rather be encouraged, which a modified energy from saturates component allows for.

The energy component would therefore be defined as

$$Energy_{saturates}(\text{kJ}/100 \text{ g}) = \text{Saturates} (\text{g}/100 \text{ g}) \times 37$$

Again, capitalizing on the previous investigation of a modification of the energy component for an 'energy from saturates and sugars' component, the ScC retained 3 potential point allocation steps, based on the reference points for maximum levels of energy intakes from saturates and sugars recommended in the general adult population.

Potential point allocation steps retained for investigation were: 100 kJ, 120 kJ, 140 kJ.

In the case of products for which the only element of discrimination in nutritional content are saturated fatty acids, then the point allocation would lead to the following distributions in the updated FSA score:

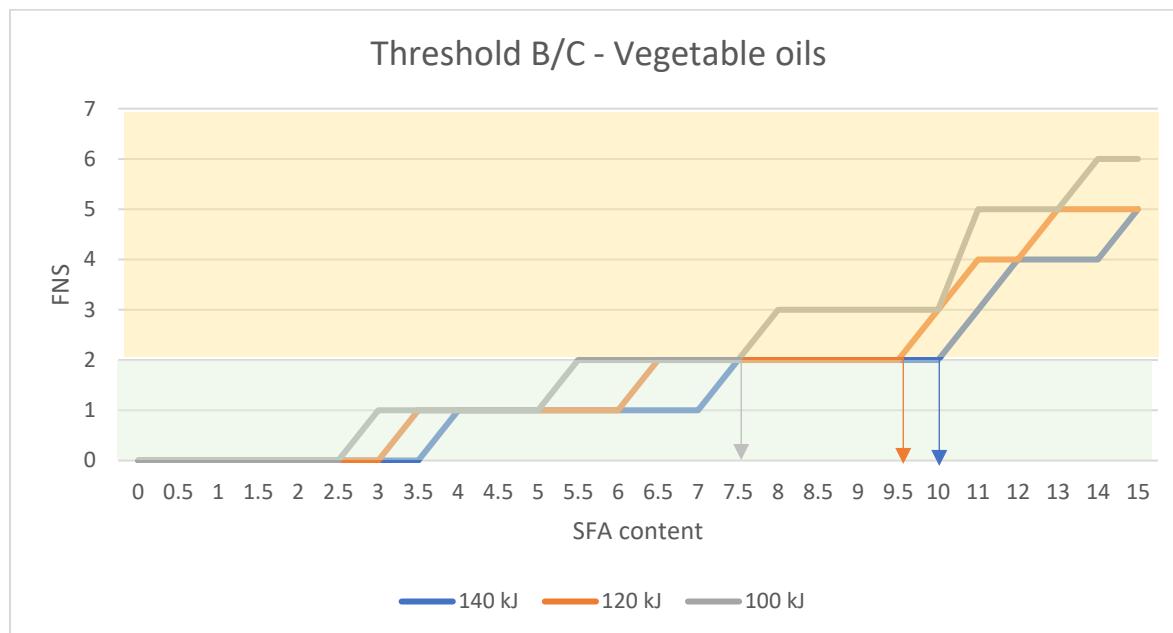


Figure 9 Evolution of the FNS score according to SFA content and critical SFA content (in per cent) between B and C, in dependency of various energy point allocation scales (100, 120 and 140 kJ)

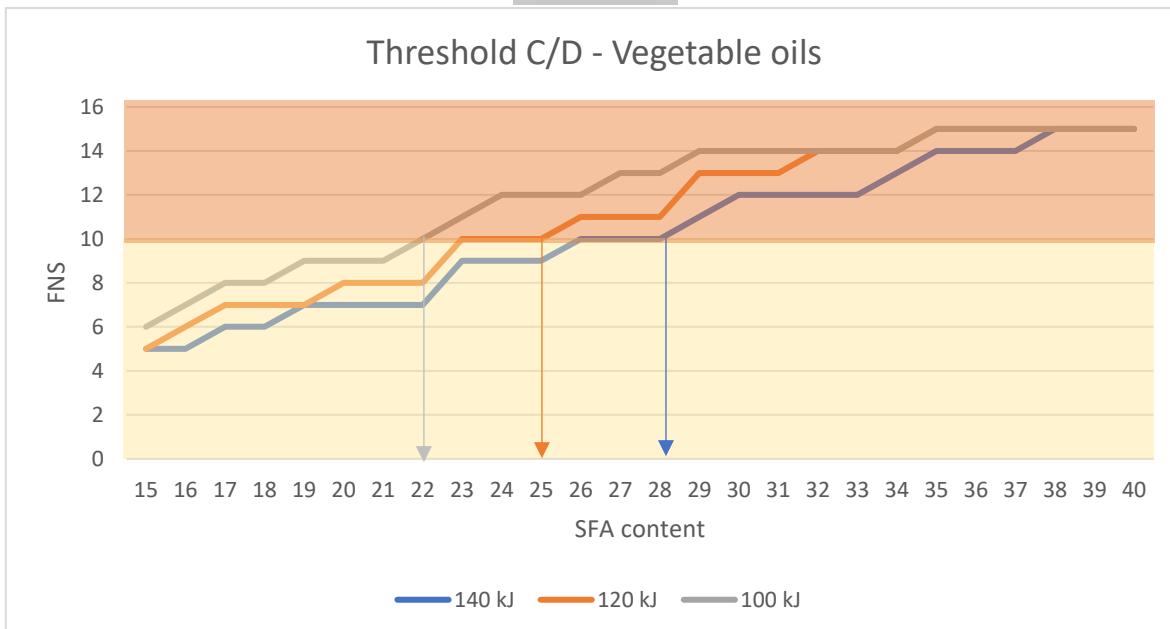


Figure 10 Evolution of the FNS score according to SFA content and critical SFA content between C and D, in dependency of various energy point allocation scales (100, 120 and 140 kJ)

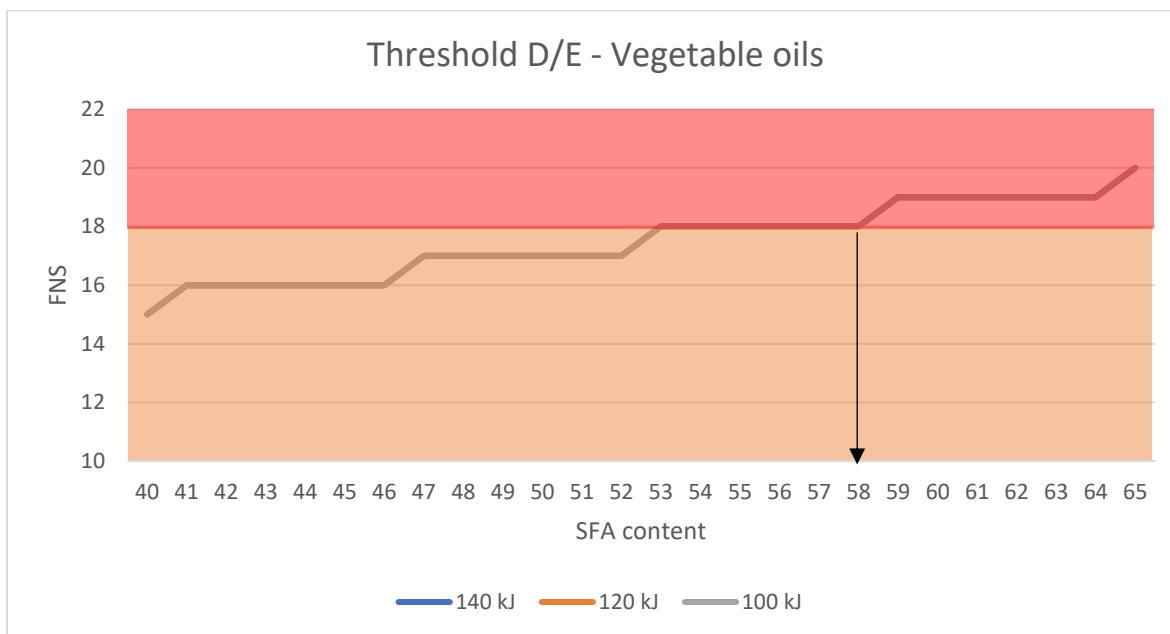


Figure 11 Evolution of the FNS score according to SFA content and critical SFA content between D and E, in dependency of various energy point allocation scales (100, 120 and 140 kJ). From 40g onward, all curves overlap and are represented in brown.

Using the proposed thresholds, to be discriminated between B and C rating, plant-based oils would need to have contents in SFA < 10 g in the scenario with 140 kJ per point, < 9.5g in the 120 kJ scenario and < 7.5 g in the 100 kJ scenario (see Figure 9).



2.3.2. Fruit, vegetables, legumes and oils component

Considering the addition of nuts in the fats and oils category, the ScC recommends that the current fruit, vegetables, legumes, nuts and oils component of the Nutri-Score be simplified (see chapter Fruit, vegetables, legumes, nuts and plant-based oils page 48 in the main algorithm) to exclude both nuts and oils.

However, considering the specific products included in the fats, oils, nuts and seeds category, the ScC recommends that *in this specific category only, oils from ingredients qualifying in the remaining list of ‘fruit, vegetables and legumes’ (e.g. olive and avocado) be counted within this component.*

2.3.3. Protein cap threshold

Considering the overall category that now includes fats, oils and nuts, in which only nuts are an important source of proteins, then the protein cap threshold could be further used to allow a better discrimination between plain versions of nuts that are recommended within dietary guidelines and seasoned versions of nuts that contain an addition of salt or sugar.

Indeed, the protein cap threshold could ensure that no nuts with added ingredients (either salt or sugar) can benefit from the protein points, and therefore be unduly improved in the system.

After an evaluation of the point allocation for plain and seasoned version of nuts, the protein cap threshold value was further investigated, with a decrease from 11 points to 7 points to allow for an adequate discrimination between plain and seasoned versions of nuts.

2.3.4. Final Nutri-Score thresholds

Considering the new categorization, the ScC considered modifying the final Nutri-Score thresholds specifically in the fats, oils and nuts category to better align with FBDG and ensure a good discrimination between various types of fats, oils and nuts.

The final thresholds were therefore positioned based on the distribution of the various types of fats, oils and nuts in the updated algorithm, to ensure maximal discrimination within the category.

Considering the investigation of the adequacy of various scenarios for energy component modifications, the A/B threshold was targeted for modification in priority.

2.4. Selection of the main modifications

2.4.1. Selection of the Energy component point allocation scale

The investigation of the impact of the change of the energy to energy from saturates, with the various point allocation scales was conducted mainly in the French food composition database of branded food products Open Food Facts. Confirmation of similar distributions were obtained for Germany and the Netherlands.

Among **canola oils** found on the French market (N=221), 212 references (96%) contained less than 9.5 g/100 g of saturates and 150 references (68%) contained less than 7.5 g/100 g of saturates (data from Open Food Facts, France).

Among **olive oils** found on the French market (N=2,550), 2,524 references (99%) contained between 10 g/100 g of saturates and 21.5 g/100 g of saturates (data from Open Food Facts France). However, considering that olives qualify in the ‘fruit, vegetables and legumes’ updated component for fats and oils, then they would mainly be classified as B.



Among **sunflower oils** found on the French market (N=229), 204 references (90%) contained more than 9.5 g/100 g saturates (and less 21.5 g of saturates) and 148 references (64%) contained strictly more than 10 g/100 g of saturates (Figure 9). Among those below 9.5 g/100 g of saturates (N=25), 21 (84%) were oleic sunflower oils. Above 9.5 g/100 g of saturates, there were no oleic sunflower oil (data Open Food Facts France). Thus, scenarios with point allocations scales of 120 kJ per point and 140 kJ per point were able to discriminate between 'regular' sunflower oil and oleic sunflower oil.

Of note, confirmation of the composition in saturates of sunflower oils in the market in the Netherlands showed a larger proportion of oils with < 9.5 g/100 g of saturates.

Among **peanut oils** found on the French market (N=35) (no graph due to the small sample size), the average FNS score is 11-12 (classified as D) and regardless the scenario; they were improved to FNS 6-8 points depending on the scenario (classified as C) (data Open Food Facts France).

Among **coconut oils** found on the French market (N=394), they were systematically > 18 FNS points (graded E), whatever the computation of the energy component and were unaffected by the modifications (data Open Food Facts France).

Overall, considering the objectives of the ScC in terms of priority areas for improvement of the algorithm, the scale of 100 kJ was considered too strict. Additionally, the 140 kJ-scale was found to not be appropriate to discriminate oils as some threshold effects were identified in particular for sunflower oils. Finally, the 120 kJ point allocation scale appeared to reach the objectives set by the group, with a meaningful distinction from a nutritional perspective between types of plant-based oils.

However, a limitation was identified, given that both the 140 kJ-scale nor the 120 kJ-scale were found to lead to threshold effects in nut oils. However, given the limited consumption of nut oils when compared with previously mentioned oils, this limitation was weighted against the overall benefits of the scenario and considered acceptable by the ScC.

The ScC recommends the modification of the Energy component for an Energy from saturates component with a point allocation scale of 120 kJ within the group "fats, oils, nuts and seeds".

2.4.2. Protein cap threshold

The ScC investigated the impact of a modification of the protein cap threshold, which was found to allow for a better discrimination between plain and seasoned versions of nuts in particular. Seasoned nuts obtained a wider distribution, with a limited overlap with the distribution of plain nuts.

The ScC recommends that the protein cap threshold for fats, oils, nuts and seeds be set at 7 positive (i.e. 'unfavourable' nutrients) points.



2.4.3. Final thresholds

Considering the distribution of products in the fats, oils, nuts and seeds category, the ScC recommends the following set of thresholds:

FNS points	Nutri-Score classification	Colour
Min to -6	A	Dark green
-5 to 2	B	Light green
3 to 10	C	Yellow
11 to 18	D	Light Orange
19 to Max	E	Dark orange

2.5. Results

The following boxplots and distribution tables describe the current Nutri-Score classification of the main fats and oils products and the corresponding distribution and classification in the updated algorithm based on data from Belgium, France, Germany and the Netherlands (see Figure 12 tot Figure 19 and Overall classification

Table 15).

As commented above, the aim of the modification of the current Nutri-Score algorithm was to improve the classification (a shift from C to B) of plant-based oils rich in unsaturated fats, without substantially changing the classification of other products in this category, including less favourable oils (high in saturated fatty acids), butter, margarines and cream. For nuts, at least the status quo in terms of classification was considered adequate.

As it was sought, with the revised algorithm most canola oils, walnut oils, and olive oils are now classified as B, while some types of sunflower oil (high-oleic acid sunflower oil) also reach this classification. However, most forms of coconut oil remain in the E category. As regards to other types of fat (e.g., margarine, cream and butter), they are classified from C (mostly 30% fat margarine) to D (80% fat margarine and cream) and E (mostly butter) according to their saturated fat content. This classification improves the ability of Nutri-Score to discriminate fats and oils based on the saturated fatty acid content.

The resulting classification of nuts has been already described above; however, an additional benefit of the revised algorithm is that seeds can now be added to this category of fats, oils and nuts with a similar classification. The following boxplots using data from Belgium, France, Germany and The Netherlands show that plain sunflower, chia, sesame and pumpkin seeds as well as plain flaxseed are in the A classification, while their salted counterparts are placed in the D category.

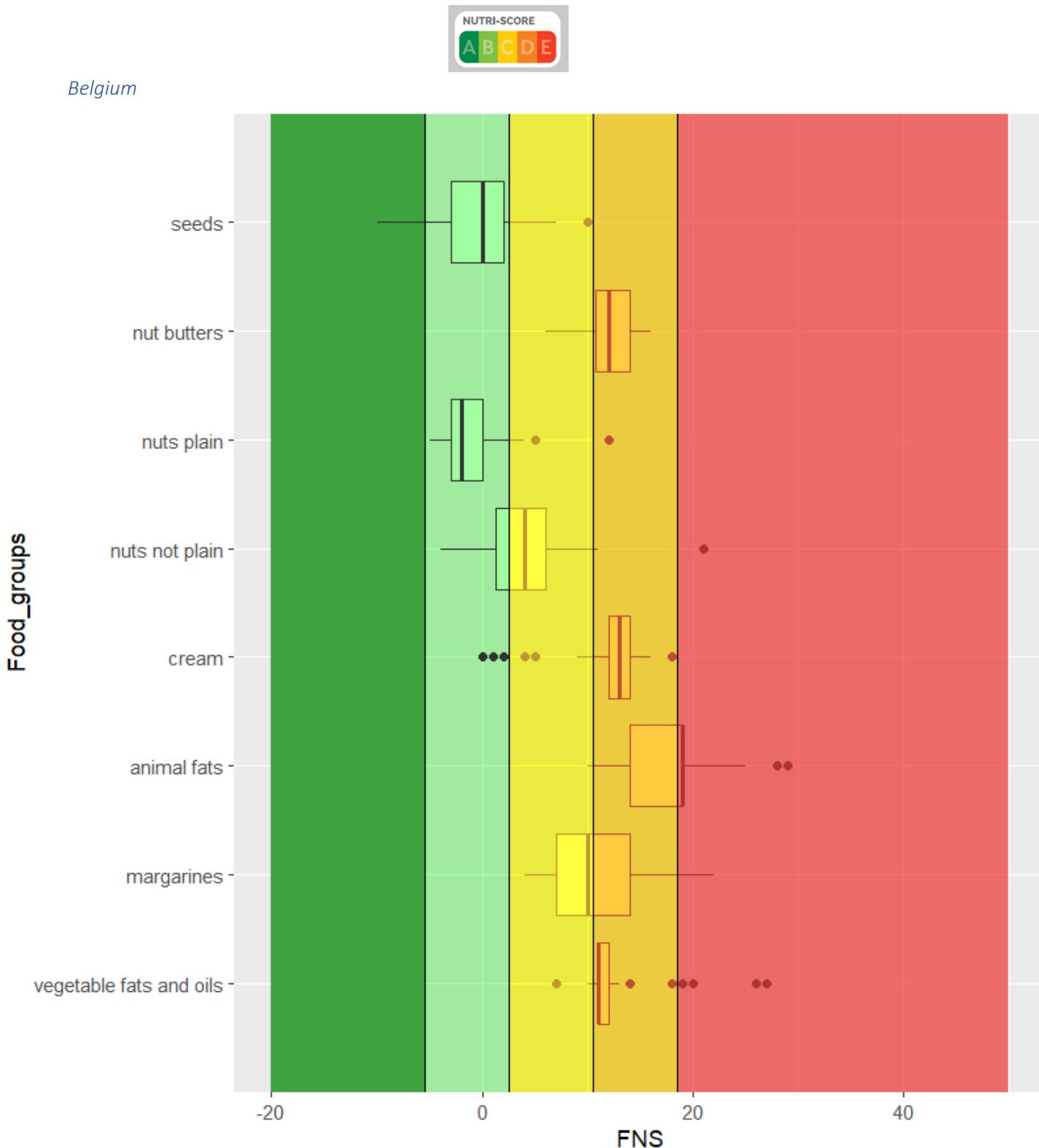


Figure 12 Current distribution of fats, oils, nuts and seeds in the FNS score and corresponding Nutri-Score classification – Belgium

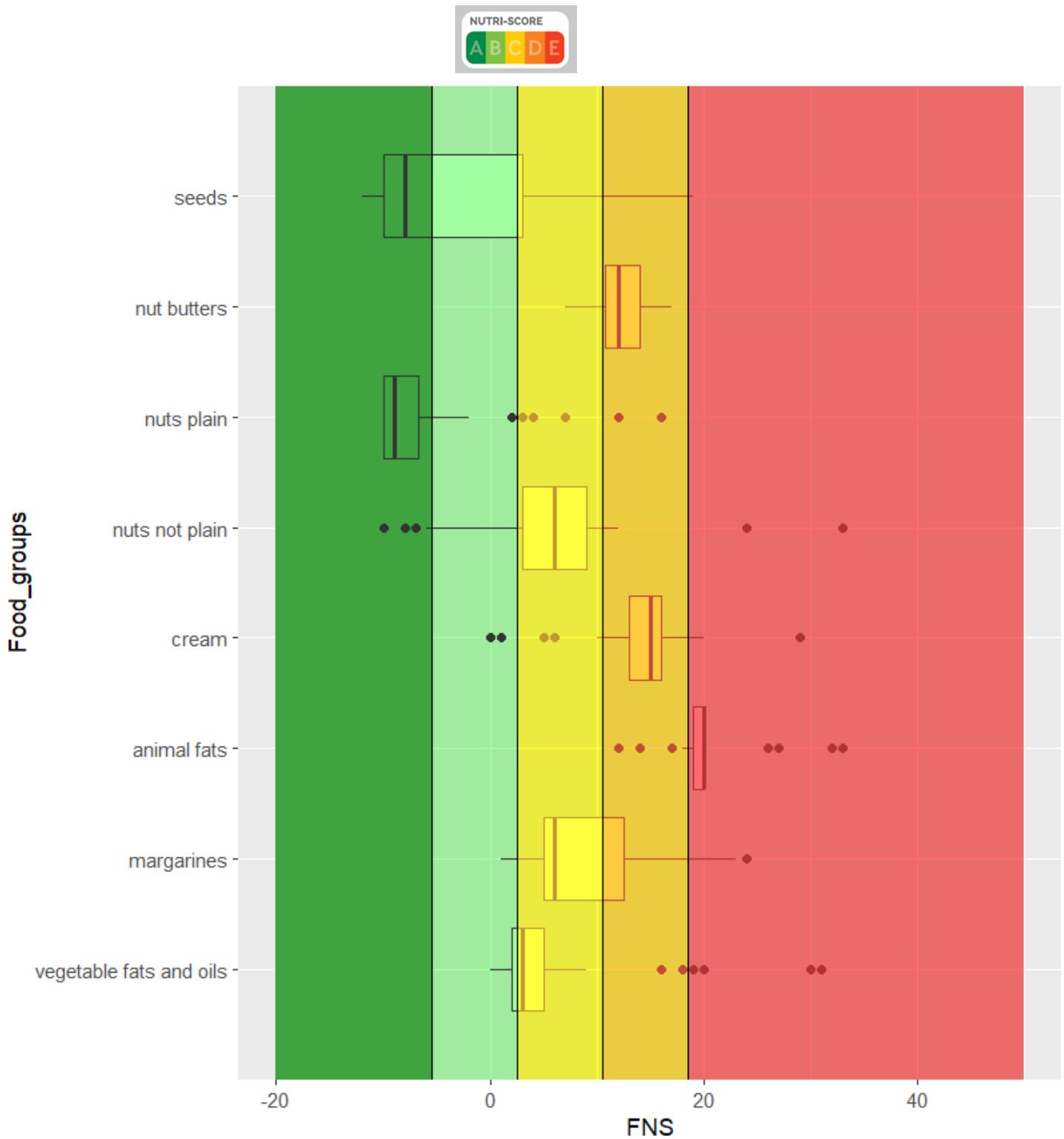


Figure 13 Updated distribution of fats, oils, nuts and seeds in the FNSm score and corresponding Nutri-Score classification – Belgium



France

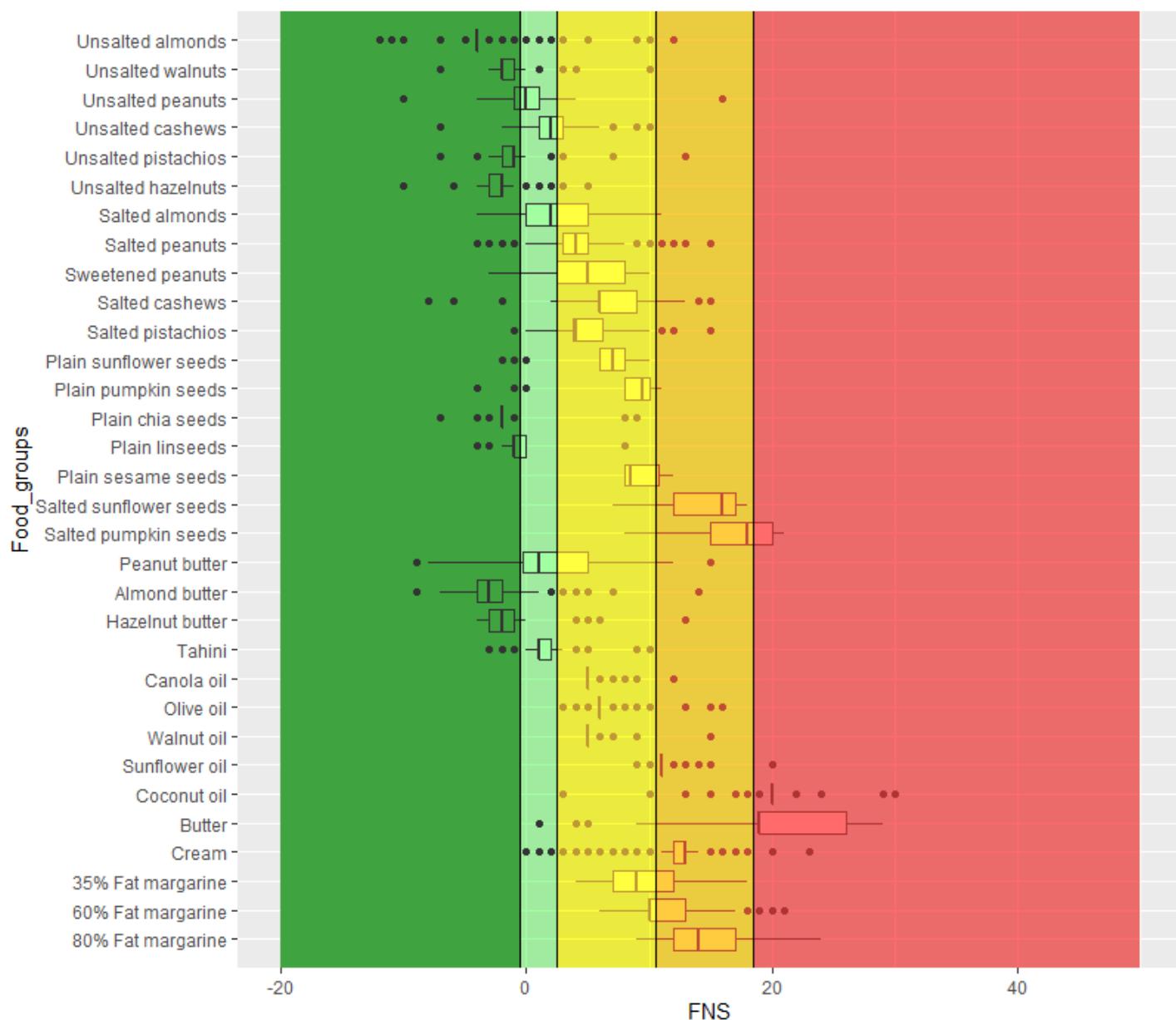


Figure 14 Current distribution of fats, oils, nuts and seeds in the FNS score and corresponding Nutri-Score classification – France

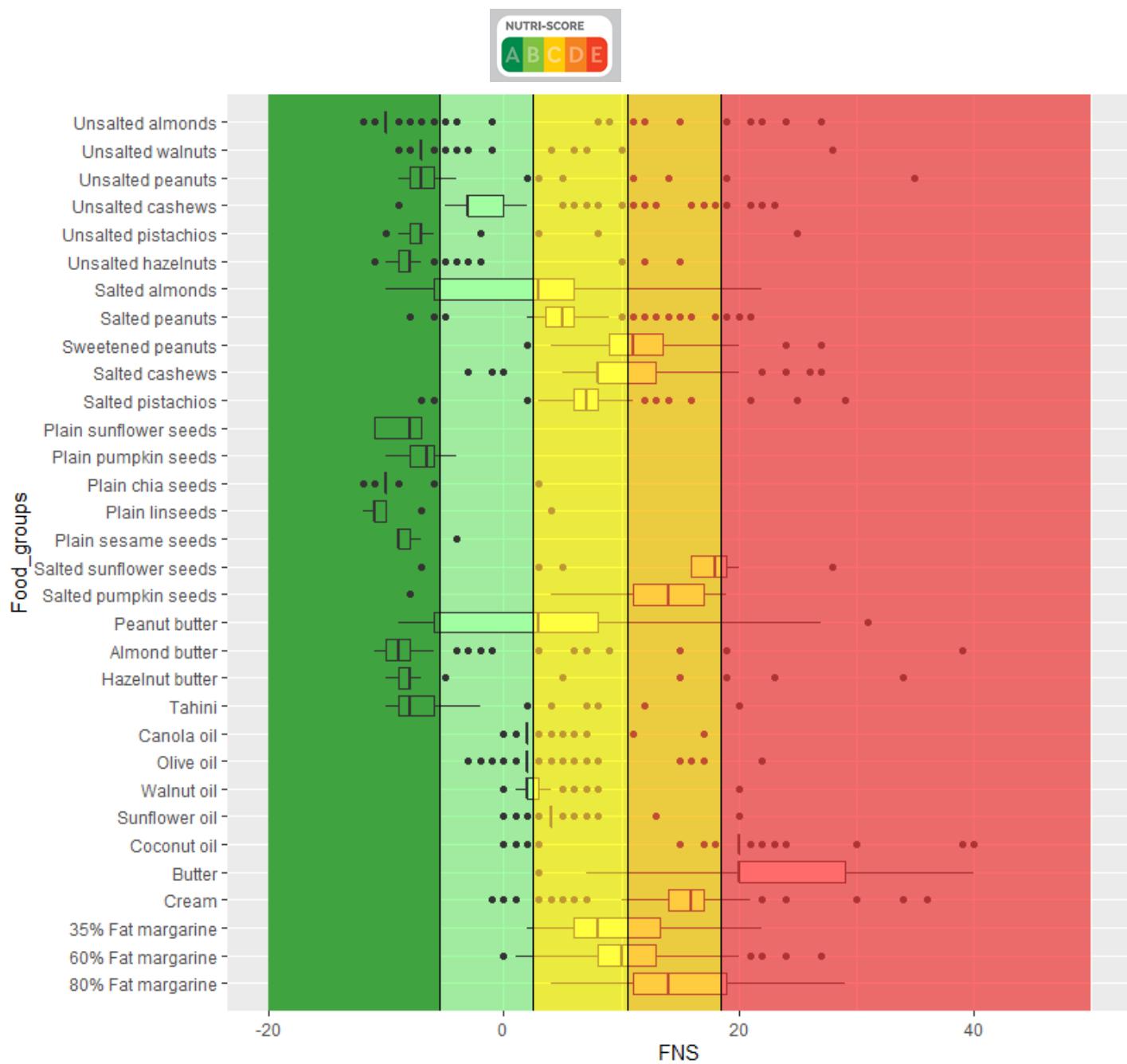


Figure 15 Updated distribution of fats, oils, nuts and seeds in the FNSm score and corresponding Nutri-Score classification – France



Germany

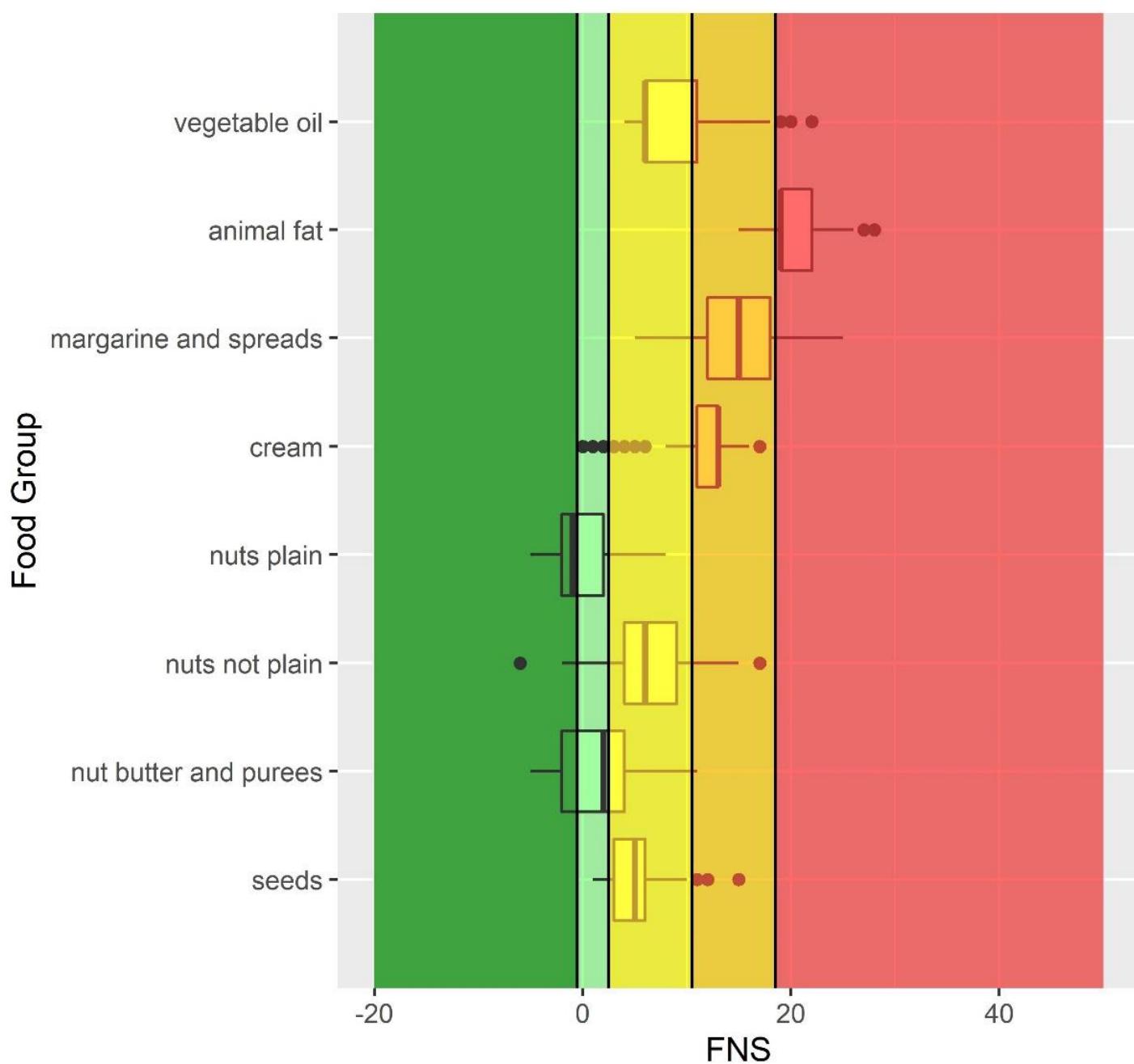


Figure 16 Current distribution of fats, oils, nuts and seeds in the FNS score and corresponding Nutri-Score classification – Germany

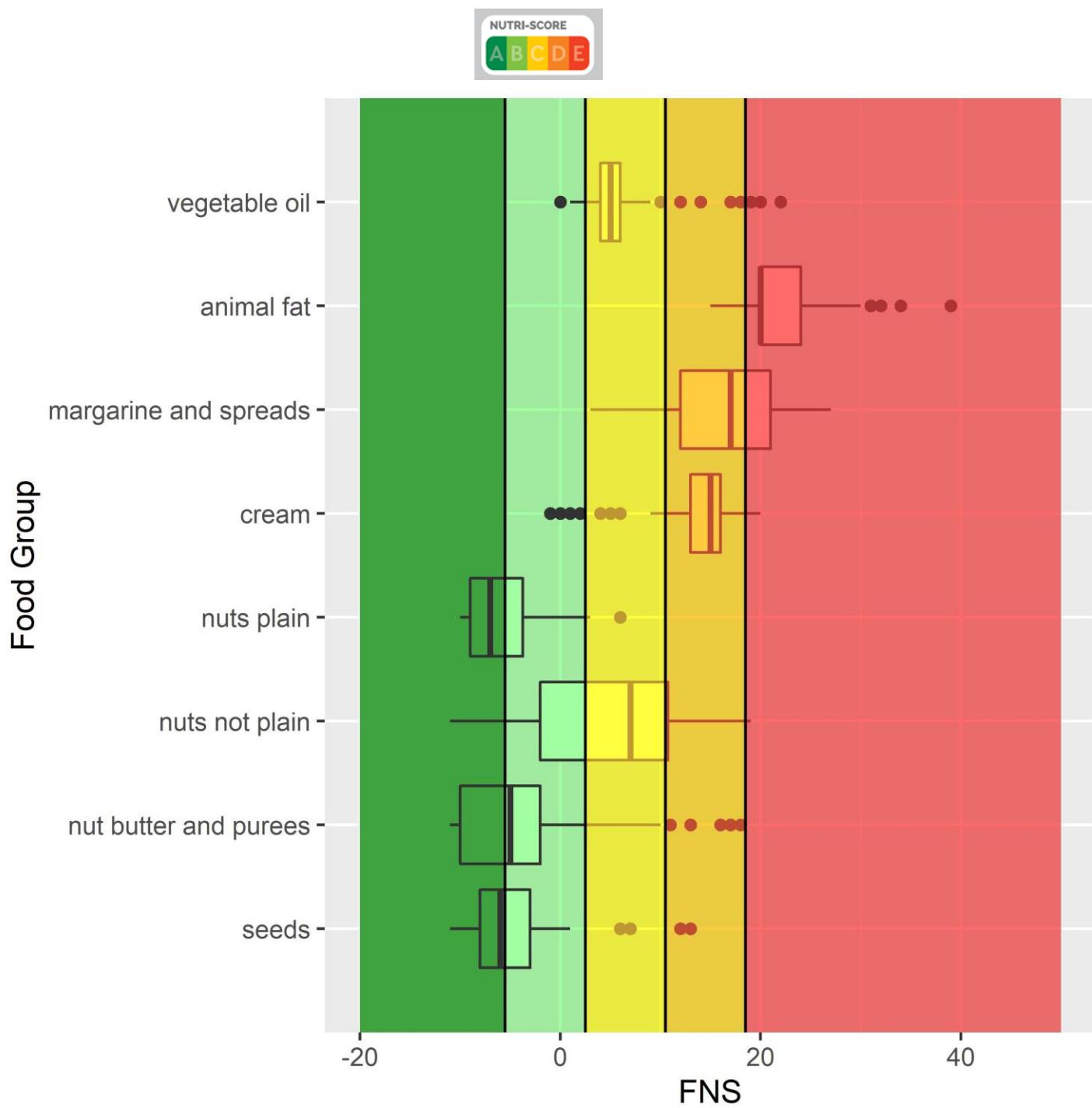


Figure 17 Updated distribution of fats, oils, nuts and seeds in the FNSm score and corresponding Nutri-Score classification – Germany



The Netherlands

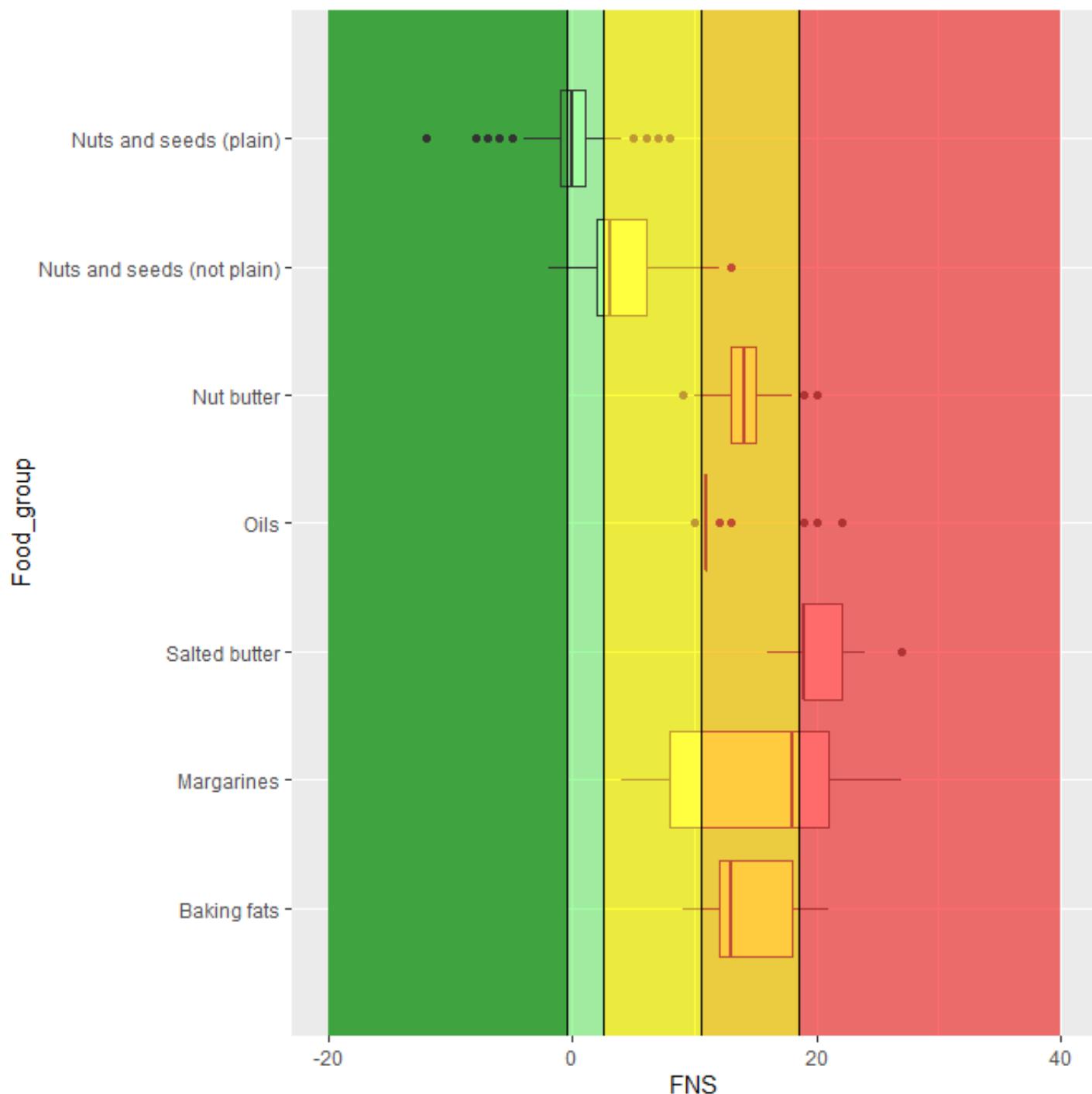


Figure 18 Current distribution of fats, oils, nuts and seeds in the FNS score and corresponding Nutri-Score classification – The Netherlands

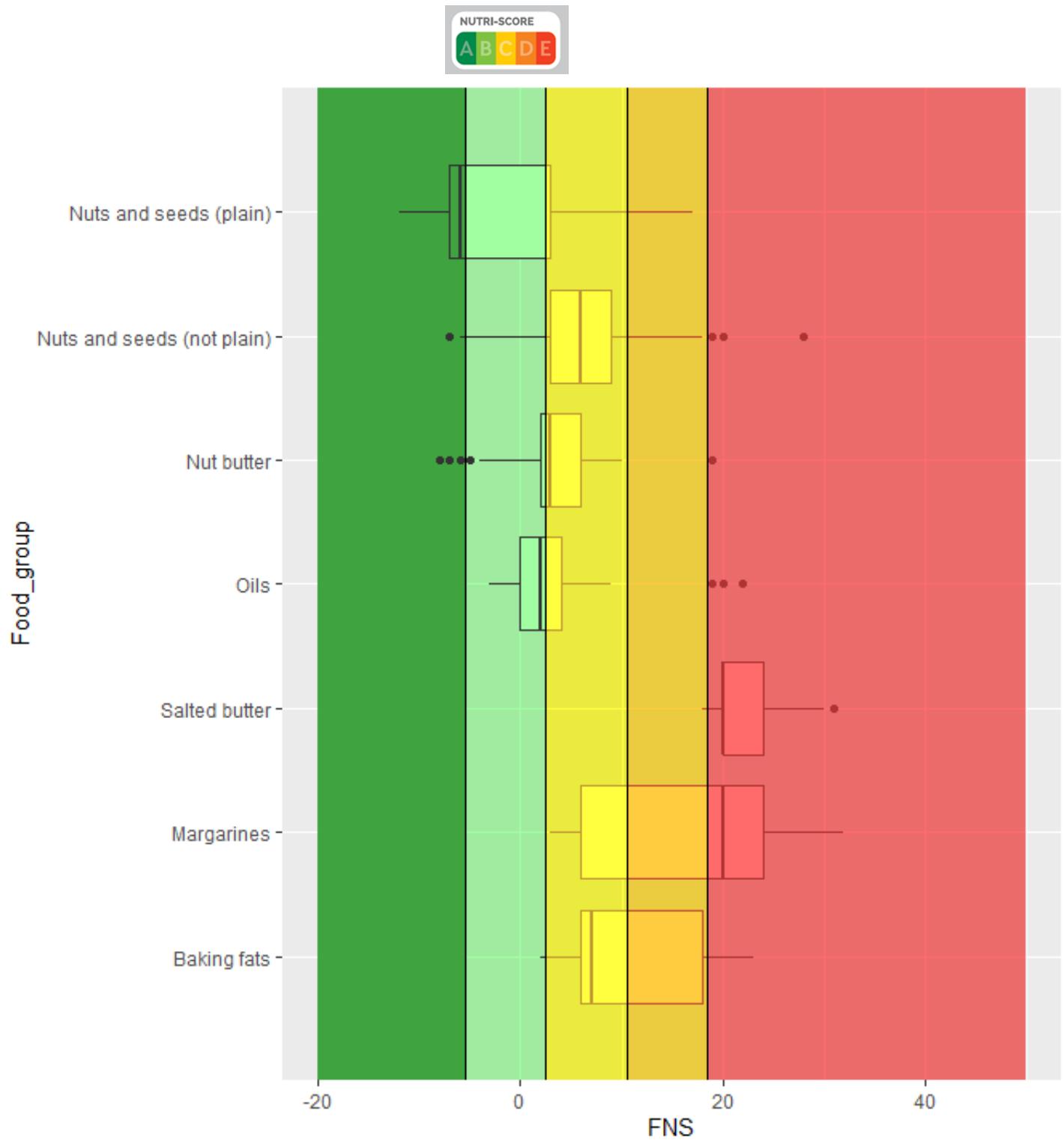


Figure 19 Updated distribution of fats, oils, nuts and seeds in the FNSm score and corresponding Nutri-Score classification – The Netherlands

Overall classification

Table 15 Classification in the current and updated Nutri-Score of fats, oils, nuts and seeds – Distribution (%)tables from Belgium, France, Germany and The Netherlands

Food group	Nutri-Score (%) Current algorithm					Nutri-Score (%) Updated algorithm				
	A	B	C	D	E	A	B	C	D	E
Belgium										
Nuts and seeds										
Nuts plain	63	23	8	6	0	83	5	5	7	0
Nuts not plain	14	17	66	1	2	16	3	73	5	2
Seeds	44	42	14	0	0	65	8	21	0	6
Nut butter and purees	0	0	25	75	0	0	0	25	75	0
Fats and oils										
(Vegetable) fats and oils	0	0	23	72	5	0	40	51	4	5
Animal, hardened fats and butter	0	0	3	43	54	0	0	0	24	76
Cream	0	7	2	91	0	0	7	2	84	7
Margarines and spreads for bread	0	0	50	37	13	0	4	62	18	16
Baking fats (excl. oils)										
France										
Nuts and seeds	38	21	38	3	0	42	14	32	9	3
<u>Nuts plain</u>	66	24	10	0	0	70	22	8	0	0
Unsalted almonds	95	4	1	0	0	96	2	2	0	0
Unsalted walnuts	89	8	3	1	0	91	6	3	0	0
Unsalted peanuts	41	50	8	1	0	81	11	4	2	2
Unsalted cashews	3	68	29	0	0	0	76	19	5	0
Unsalted pistachios	86	8	5	1	0	0	0	0	0	0
Unsalted hazelnuts	88	8	4	0	0	88	10	2	0	0
<u>Nuts not plain</u>	6	14	75	4	0	5	6	66	18	5
Salted almonds	21	33	46	0	0	32	9	54	3	2
Salted peanuts	2	16	80	2	0	2	10	82	4	2



	5	21	74	0	0	0	3	46	38	13
Sweetened peanuts	5	21	74	0	0	0	3	46	38	13
Salted cashews	1	2	91	6	0	0	1	63	33	3
Salted pistachios	1	19	76	4	0	3	4	84	7	2
<u>Seeds</u>	45	8	27	19	0	77	3	5	10	5
Plain sunflower seeds	12	12	76	0	0	100	0	0	0	0
Plain pumpkin seeds	17	6	56	21	0	96	4	0	0	0
Plain chia seeds	96	4	0	0	0	95	5	0	0	0
Plain linseeds	72	24	4	0	0	97	3	0	0	0
Plain sesame seeds	0	0	71	29	0	93	7	0	0	0
Salted sunflower seeds	0	0	6	94	0	0	0	18	44	38
Salted pumpkin seeds	0	0	11	56	34	0	0	88	12	0
<u>Nut butter and purees</u>	37	30	31	2	0	48	13	30	6	2
Peanut butter	25	33	40	2	0	31	15	43	9	2
Almond butter	84	7	8	1	0	86	6	6	2	0
Hazelnut butter	83	4	10	3	0	81	3	3	3	10
Tahini	7	75	18	0	0	83	7	7	2	1
Fats and oils	0	0	45	35	20	0	39	25	14	22
(Vegetable) fats and oils	0	0	63	29	8	0	60	31	1	8
Animal, hardened fats and butter	0	0	0	18	82	0	0	1	8	91
Cream	0	3	11	86	0	0	3	10	86	1
Margarines and spreads for bread	0	0	45	51	4	0	1	53	35	11
Baking fats (excl. oils)										
Germany										
Nuts and seeds	25	20	49	7	0	39	34	16	11	0
Nuts plain	52	28	20	0	0	63	36	1	0	0
Nuts not plain	2	11	72	15	0	6	31	38	25	0
Seeds	0	24	66	10	0	62	28	3	7	0
Nut butter and purees	38	19	43	1	0	49	38	8	6	0
Fats and oils	0	2	39	34	25	0	10	42	18	30
Vegetable oil	0	0	68	21	11	0	15	73	0	11



	0	0	0	18	82	0	0	0	3	97
Animal fat	0	0	0	18	82	0	0	0	3	97
Cream	0	10	5	84	0	0	12	4	83	2
Margarines and spreads for bread	0	0	14	61	25	0	0	16	49	35
Baking fats (excl. oils)	-	-	-	-	-	-	-	-	-	-
Netherlands										
Nuts and seeds	34	56	10	0	0	54	20	20	6	0
Nut plain	1	26	70	2	0	6	9	69	16	1
Nut not plain										
Seed	0	0	3	92	5	9	18	72	0	1
Nut butter ad purees										
Fats and oils	0	0	12	81	7	0	57	36	0	7
(Vegetable) fats and oils	0	0	0	7	93	0	0	0	2	98
Animal, hardened fats and butter										
Cream	0	0	41	9	50	0	0	45	3	52
Margarines and spreads for bread	0	0	15	76	9	0	4	59	19	18
Baking fats (excl. oils)	34	56	10	0	0	54	20	20	6	0

Not all food groups were represented in the databases, thus explaining missing data in the table.

3. Meat and meat products

3.1. Rationale

Dietary guidelines in most COEN countries recommend to limit the consumption of red and processed meat. Belgium, the Netherlands, Spain and France recommend to limit the intake of red meat, but the level of intake differs from a maximum of 200 to 500 g/week depending on the country. Recommendations to limit the intake of processed meat are also included in the dietary guidelines of Belgium, The Netherlands and France, while a general recommendation to limit meat intake – including processed meat – is included for Germany and the new recommendations to be introduced in Spain mention the prioritization of the consumption of plant-based foods as the main sources of protein in the diet. Switzerland recommends variation between different protein sources and thus limits consumption of meat (incl. red meat) implicitly.

The recommendations to limit the intake of red and processed meat are based on consistent evidence from prospective cohort studies on the association with several disease outcomes. In 2015, the evidence was summarized as a basis for the Dutch Dietary Guidelines. This report showed consistent evidence for associations (meta-analysis of cohort studies), which were found for the following associations [36]:

A high consumption (100-120 g/d) of red meat is associated with a 10% higher risk of stroke, 15% higher risk of type 2 diabetes, 10% higher risk of colon cancer and a 20% higher risk of lung cancer. A higher consumption (100-120 g/d) of unprocessed red meat is associated with an approximately 10% higher risk of stroke and an approximately 15% higher risk of type 2 diabetes. A high consumption (50 g/d) of processed meat (which is to a large extent from red meat) is associated with a 10% higher risk of stroke, and approximately 20% higher risk of type 2 diabetes and a 15% higher risk of colon cancer. A quick search of more recent literature confirmed these findings. The WCRF report of 2018 (Meat, fish and dairy products and the risk of cancer) [37] confirmed the previous conclusion that processed meat and red meat were associated with a higher risk of colon cancer. The WCRF report also concluded that intakes of red meat and processed meat were associated with an increased risk of lung cancer (2017), oesophagus cancer (2016), stomach cancer (2016) and pancreas cancer (2012), with limited evidence. Recent meta-analyses confirmed previous conclusions on the associations of red meat and processed meat with cardiovascular mortality, stroke, type 2 diabetes and breast, colorectal and lung cancer [38–41].

One of the most important mechanisms by which intakes of red and processed meat are associated with disease outcomes is through their high content of heme iron specifically. Indeed, meta-analyses have consistently shown that a highest versus lowest category of heme iron intake is associated with an increased relative risks of diabetes (5 studies) [42], cardiovascular disease mortality (19 studies) [43], breast cancer (23 studies) [44], esophageal cancer (6 studies) [45] and colorectal cancer (3 studies) [46].

In the Nutri-score algorithm – both in the current and in the updated algorithm for general foods – lean plain meat generally is allocated in the A or B categories, hence is promoted as a more favourable product. This is due to the favourable points allocated in the protein element of the algorithm, while lean plain meat will have relatively little unfavourable points on energy density, saturated fat or salt. However, this classification is not entirely aligned with the above-mentioned elements concerning the association between meat intake and health, related in particular to its content in heme iron.



3.2. Target groups for modifications

The target group for modifications were the groups for which FBDG recommend a limitation in consumption

- Red meat products: identified in the literature as typically products from beef, veal, swine and lamb, including also game/venison, horse, donkey, goat, camel and kangaroo.

The target groups for the Nutri-Score could be defined using international classifications of food products, either using the Harmonized System Nomenclature, or the Codex Alimentarius/FAO classifications [35]. As for the identification of nuts, the ScC retrieved codes from the HS as a starting point for identification, though the exact classification used could depend on implementation efficacy considerations outside of the mandate of the ScC.

Regarding the Codex Alimentarius classifications, the entire group 08.0 (Meat and meat products, including poultry and game and all its subgroups) is concerned, though not all food items in the individual sub-groups are concerned, only those containing red meat (see above).

In the Harmonized System Classification, the codes correspond to the following:

- Beef:
 - 0201 Meat of bovine animals, fresh or chilled
 - 0202 Meat of bovine animals, frozen
- Pork
 - 0203 Meat of swine, fresh, chilled or frozen
- Lamb:
 - 0204 Meat of sheep or goats, fresh, chilled or frozen
- Horse
 - 0205 Horse and equine meat
- Game and venison
 - 0208903000 Of game, other than of rabbits or hares
 - 02089060 Fresh, chilled or frozen reindeer meat and edible offal thereof
- Offals and processed meat (as red meat)
 - 0206 Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled or frozen
 - 0210 Meat and edible offal, salted, in brine, dried or smoked; edible flours and meals of meat or meat offal
 - 1601 sausages
 - 1602 Prepared or preserved meat, meat offal, blood or insects (excl. sausages and similar products, and meat extracts and juices)
 - All those from **swine, lamb or beef** even as mixtures

3.3. Main scenarios tested

One of the main hypotheses for the mechanisms explaining the observed association between red meat and health is through deleterious effects of heme iron as described above.

However, heme iron has a higher bioavailability than non-heme iron, and iron deficiency may remain a concern for certain groups of the population with low iron intake, even considering the wide availability of other sources of iron.

In the Nutri-Score algorithm, the protein component is used to reflect the content of the foods in calcium and iron [24,25]. Proteins are considered in the system as a favourable component in the



nutritional composition of the food, yielding ‘negative’ points improving the classification of the foods towards more favourable.

Considering that the algorithm classification for meat necessitates a modification and that the main hypothesis for the deleterious effect of meat on health involves heme iron, then it appears that a modification of the algorithm through the protein component would be the most adequate avenue. This simplification is reasonable considering that this modification would be an adjustment to the main algorithm for ‘general foods’, within the boundaries of the nutritional declaration within which the ScC agreed to operate.

The ScC therefore recommends the decrease in the number of maximal points for proteins attributed to red meat and red meat products, proportionally to the average ratio of heme iron to total iron in red meat products.

Considering the absence of direct evidence as to the effect of various sources of heme iron (in terms of specific types or cuts of meat) and the impossibility of a proportional reduction that would directly take into account the ratio of heme iron to total iron in the various types of meat, the ScC elected to apply a uniform reduction in the number of protein points for red meat products.

Iron content in red meat is somewhat variable depending on the cuts [47,48], the type of meat and preparation. However, on average, the ratio of heme iron to total iron in red meat (including veal, beef, pork lamb and horse, from Lombardi-Boccia et al.[48]) is 75%. Therefore, the number of maximal protein points attributable to red meat should be reduced by the same ratio (-75% compared to the maximum number of 7 points), leading to **2 maximal points** for proteins in red meat products.

POINTS	Proteins (g per 100 g)
0	≤ 2.4
1	> 2.4
2	> 4.8

Of note, considering that for its assessment the ScC aimed at taking into account both pre-packed branded products and minimally processed products that would not necessarily fall under the FIC regulation (and the Nutri-Score perimeter), additional databases of generic foods were used (France – CIQUAL database) [49].

3.4. Results

Table 16 Distribution (%) of meat and meat products in the current and the updated Nutri-Score algorithm – data from Belgium, France, Germany and The Netherlands

Food group	Nutri-Score (%)					Nutri-Score (%)				
	Current algorithm					Updated algorithm				
	A	B	C	D	E	A	B	C	D	E
Belgium										
Meat and meat products*	15	9	16	34	25	18	5	14	31	33
France										
Processed meat*	0	2	21	31	46	0	0	16	23	62
Meat preparations	0	14	66	20	0	0	0	39	61	0
Unprocessed and minimally processed meat	29	20	28	21	2	36	16	20	22	6
Pork	15	7	24	45	9	11	4	23	48	14
Beef	28	14	27	31	0	13	15	38	18	16
Poultry	34	27	31	8	0	53	21	13	12	1
Unprocessed meat (generic database)	64	24	6	4	1	50	22	23	4	1
Unprocessed pork (generic database)	46	32	7	11	4	14	33	39	11	4
Unprocessed beef (generic database)	67	20	10	3	0	30	37	30	3	0
Unprocessed poultry (generic database)	78	22	0	0	0	100	0	0	0	0
Germany										
Meat	1	4	10	42	43	0	0	10	33	57
Processed meat*	2	22	27	41	8	0	0	44	40	17
Meat preparations	0	0	6	43	50	0	0	3	31	66
Netherlands										
Meat										
Processed meat*	1	3	6	39	51	2	1	4	32	60
Meat preparations	7	22	25	40	6	10	11	24	45	10

Generic database is CIQUAL in France

*Distinction between processed poultry and processed red meat could not be done in the databases. The modification was therefore applied to all products indistinctively. Different ratings are expected for processed poultry.

3.5. Conclusion

Overall, the modification allows for a better alignment between the classification of meat products and FBDG, with a clear discrimination between red meat and poultry products. Of note, some lean red meat cuts are still able to reach the A classification, but in a lower proportion than in the current classification, and mostly for unprepared and unseasoned products. For poultry, it is to be noted that the improvement observed in the classification is not related to processed variants of these foods (chicken nuggets or ‘cordon bleu’) that are rather shifted towards less favourable ratings.

In conclusion, the ScC recommends the inclusion of a specific rule for red meat and red meat products within the main algorithm, with a reduction in the number of maximal protein points to 2 points.



4. Conclusion

The ScC proposes an update of the Nutri-Score algorithm for the following categories:

- Main algorithm for general foods
 - With a specific rule for red meat and meat products
- Fats, oils, nuts and seeds

The ScC followed a standardized methodology for the definition of areas of improvement to the algorithm, guided by the scientific evidence. For the update of each component, the ScC used the FIC regulation or EU regulations on claims for reference values to determine point allocation scales in the components.

Overall, the results obtained for the updated classification are aligned with the objectives of the group, and remaining limitations are considered acceptable considering the balance between gains and limitations obtained in the update.

5. Next steps – agenda of the ScC

The ScC has been set by the transnational governance of the Nutri-Score for a period of three years. While the current report provides the main recommendations for the update of the algorithm in a number of areas and food categories (namely general foods, fats, oils and nuts and meat), a number of issues are covered by the ScC in ongoing discussions.

5.1. Beverages

As outlined in the 2021 annual report, the ScC is currently working on the update of the Nutri-Score for the beverages category. One of the aims of the update of the beverages category algorithm is to allow for all beverages, including milk-based beverages to be included in the same algorithm category. Also, by extension, the algorithm update for beverages would apply to products that provide a nutritional declaration after reconstitution with water or milk (i.e. syrups and hot beverages powders). As such, the current modifications proposed for general foods should not be considered for milk and milk-based beverages, as these would not be covered in the ‘general foods’ category anymore. Also, considering the larger number of products included in the category, the algorithm will need to be updated to align with FBDG.

The ScC is currently finalizing the algorithm update recommendations, and aims at providing a report on the specific topic of beverages in the fall of 2022.

5.2. Fruit and vegetable component definition

As mentioned in the chapter pertaining to fruit, vegetables and legumes, the ScC already modified the list of ingredients qualifying in the ‘fruit, vegetables and legumes’ component of the algorithm.

However, beyond these broad modifications, multiple comments have been made regarding the practical definition of the ingredients that may qualify in the component. Comments include issues relating to the exhaustiveness of the qualifying ingredient list, and/or the processes that are allowed within the component, with the concern that the component could be used to promote highly processed ingredients, in opposition to the initial aim of the component.

The ScC aims at revising the list of ingredients and processes qualifying for the ‘fruit, vegetables and legumes’ component of the algorithm during the year 2023.



Of note, the update is not aimed at revising in depth the nature of the list, but rather to clarify which types of ingredients and processes would be allowed under the component, to align it with definitions used in FBDG.

Acknowledgements

The ScC would like to thank more particularly Charlotte Kühnelt, Barthélémy Sarda and Elly Steenbergen, for the data management and analyses of the databases from Germany, France and the Netherlands respectively. They were instrumental in the investigation of the various scenarios, the exploration of additional avenues and data.

The ScC would also like to thank Prof. Anette Buyken, appointed to the Scientific Committee of the Nutri-Score in May 2022, for her input in the revision of this report.



References

- 1 Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004 Text with EEA relevance. 2011. <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32011R1169> (accessed 22 Jun 2022).
- 2 ANSES. Évaluation de la faisabilité du calcul d'un score nutritionnel tel qu'élaboré par Rayner et al. Rapport d'appui scientifique et technique. Maison-Alfort:: Agence Nationale de Sécurité Sanitaire de l'Alimentation de l'Environnement et du Travail 2015.
- 3 HCSP. Information sur la qualité nutritionnelle des produits alimentaires. Paris:: Haut Conseil de la Santé Publique 2015. <https://www.hcsp.fr/Explore.cgi/avisrapportsdomaine?clefr=519> (accessed 14 Dec 2018).
- 4 Julia C, Ducrot P, Péneau S, et al. Discriminating nutritional quality of foods using the 5-Color nutrition label in the French food market: consistency with nutritional recommendations. *Nutr J* 2015;14:100. doi:10.1186/s12937-015-0090-4
- 5 Obesity and overweight. <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight> (accessed 27 Jun 2022).
- 6 World Health Organization. Regional Office for Europe. *WHO European Regional Obesity Report 2022*. World Health Organization. Regional Office for Europe 2022. <https://apps.who.int/iris/handle/10665/353747> (accessed 27 Jun 2022).
- 7 EFSA Panel on Nutrition, Novel Foods and Food Allergens (NDA), Turck D, Bohn T, et al. Scientific advice related to nutrient profiling for the development of harmonised mandatory front-of-pack nutrition labelling and the setting of nutrient profiles for restricting nutrition and health claims on foods. *EFSA J* 2022;20:e07259. doi:10.2903/j.efsa.2022.7259
- 8 EFSA Panel on Nutrition, Novel Foods and Food Allergens (NDA), Turck D, Bohn T, et al. Tolerable upper intake level for dietary sugars. *EFSA J* 2022;20:e07074. doi:10.2903/j.efsa.2022.7074
- 9 World Health Organization. Guideline: Sugars intakes for adults and children. Geneva:: World Health Organization (WHO) 2015. <https://apps.who.int/iris/rest/bitstreams/668769/retrieve> (accessed 5 Jan 2022).
- 10 Public Health England. Annex A. The 2018 review of the UK Nutrient Profiling Model. London, UK:: Public Health England 2018. <https://www.gov.uk/government/consultations/consultation-on-the-uk-nutrient-profiling-model-2018-review> (accessed 19 Jan 2022).
- 11 Azaïs-Braesco V, Sluik D, Maillot M, et al. A review of total & added sugar intakes and dietary sources in Europe. *Nutr J* 2017;16:6. doi:10.1186/s12937-016-0225-2
- 12 EFSA Panel on Nutrition, Novel Foods and Food Allergens (NDA). Draft Scientific Opinion advising on the development of harmonised mandatory front-of-pack nutrition labelling and the setting of nutrient profiles for restricting nutrition and health claims on foods. EFSA 2021. <https://connect.efsa.europa.eu/RM/s/publicconsultation2/a0l1v00000E877g/pc0108>



- 13 Leitsätze für Brot und Kleingebäck. BMEL.
https://www.bmel.de/SharedDocs/Downloads/DE/_Ernaehrung/Lebensmittel-Kennzeichnung/LeitsaetzeBrot.pdf?__blob=publicationFile&v=4 (accessed 27 Jun 2022).
- 14 Koninkrijksrelaties M van BZ en. Warenwetbesluit Meel en brood.
<https://wetten.overheid.nl/BWBR0009669/2017-10-01> (accessed 27 Jun 2022).
- 15 Ministerio de la Presidencia, Relaciones con las Cortes e Igualdad. Real Decreto 308/2019, de 26 de abril, por el que se aprueba la norma de calidad para el pan. 2019.
<https://www.boe.es/eli/es/rd/2019/04/26/308> (accessed 27 Jun 2022).
- 16 Arrêté royal du 2 septembre 1985 relatif aux pains et autres produits de la boulangerie (MB 1985 11 07) *** tel que modifié par AR 20020204 - MB 20020319 *** *** tel que modifié par AR 20090619 - MB 20090706 ***. Bruxelles: 1985.
https://ng3.economie.fgov.be/NI/metrology/showole_FR.asp?cParam=3559 (accessed 22 Jun 2022).
- 17 van der Kamp JW, Poutanen K, Seal CJ, *et al.* The HEALTHGRAIN definition of 'whole grain'. *Food Nutr Res* 2014;**58**. doi:10.3402/fnr.v58.22100
- 18 Ross AB, van der Kamp J-W, King R, *et al.* Perspective: A Definition for Whole-Grain Food Products-Recommendations from the Healthgrain Forum. *Adv Nutr Bethesda Md* 2017;**8**:525–31. doi:10.3945/an.116.014001
- 19 EFSA Panel on Dietetic Products N and A (NDA). Scientific Opinion on the substantiation of health claims related to whole grain (ID 831, 832, 833, 1126, 1268, 1269, 1270, 1271, 1431) pursuant to Article 13(1) of Regulation (EC) No 1924/2006. *EFSA J* 2010;**8**:1766.
- 20 EFSA. Scientific opinion on Dietary Reference Values for carbohydrates and dietary fibers. EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). Parma, Italy:: European Food Safety Authority (EFSA) 2010.
- 21 Kissock KR, Vieux F, Mathias KC, *et al.* Aligning nutrient profiling with dietary guidelines: modifying the Nutri-Score algorithm to include whole grains. *Eur J Nutr* 2022;**61**:541–53. doi:10.1007/s00394-021-02718-6
- 22 Ireland J, van Erp-Baart AMJ, Charrondière UR, *et al.* Selection of a food classification system and a food composition database for future food consumption surveys. *Eur J Clin Nutr* 2002;**56**:S33–45. doi:10.1038/sj.ejcn.1601427
- 23 Rayner M, Scarborough P, British Heart Foundation Health Promotion Research Group, *et al.* The UK Ofcom Nutrient Profiling Model. Defining 'healthy' and 'unhealthy' foods and drinks for TV advertising to children. London: 2009.
- 24 Rayner M, Scarborough P, Stockley L, *et al.* Nutrient profiles: Further refinement and testing of Model SSCg3d. Final Report. London, UK: 2005.
<https://webarchive.nationalarchives.gov.uk/ukgwa/20120404001002/http://www.food.gov.uk/multimedia/pdfs/npreportsept05.pdf>
- 25 Rayner M, Scarborough P, Stockley L. Nutrient profiles: Options for definitions for use in relation to food promotion and children's diets. Final report. London, UK: 2004.



- 26 Brussaard JH, Brants HA, Bouman M, *et al.* Iron intake and iron status among adults in the Netherlands. *Eur J Clin Nutr* 1997;51 Suppl 3:S51-58.
- 27 Galan P, Yoon HC, Preziosi P, *et al.* Determining factors in the iron status of adult women in the SU.VI.MAX study. SUpplementation en VItamines et Minéraux AntioXydants. *Eur J Clin Nutr* 1998;52:383–8. doi:10.1038/sj.ejcn.1600561
- 28 Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods. 2006. <http://data.europa.eu/eli/reg/2006/1924/oj/eng> (accessed 27 Jun 2022).
- 29 ANSES. Avis de l'Agence nationale de sécurité sanitaire de l'alimentation de l'environnement et du travail relatif à l'actualisation des repères alimentaires du PNNS pour les femmes dès la ménopause et les hommes de plus de 65 ans. Maison-Alfort:: Agence Nationale de Sécurité Sanitaire de l'Alimentation de l'Environnement et du Travail 2019. <https://www.anses.fr/fr/system/files/NUT2017SA0143.pdf> (accessed 25 Nov 2020).
- 30 GBD 2017 Diet Collaborators. Health effects of dietary risks in 195 countries, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet Lond Engl* 2019;393:1958–72. doi:10.1016/S0140-6736(19)30041-8
- 31 Guasch-Ferré M, Hu FB, Martínez-González MA, *et al.* Olive oil intake and risk of cardiovascular disease and mortality in the PREDIMED Study. *BMC Med* 2014;12:78. doi:10.1186/1741-7015-12-78
- 32 Becerra-Tomás N, Paz-Graniel I, Hernández-Alonso P, *et al.* Nut consumption and type 2 diabetes risk: a systematic review and meta-analysis of observational studies. *Am J Clin Nutr* 2021;113:960–71. doi:10.1093/ajcn/nqaa358
- 33 Harmonized System - General information. https://ec.europa.eu/taxation_customs/business/calculation-customs-duties/customs-tariff/harmonized-system-general-information_en (accessed 28 Jun 2022).
- 34 World Customs Organization. <http://www.wcoomd.org/en/topics/nomenclature.aspx> (accessed 28 Jun 2022).
- 35 GSFA Online Food Categories. <https://www.fao.org/gsfaonline/foods/index.html?lang=en> (accessed 28 Jun 2022).
- 36 Kromhout D, Spaaij CJK, de Goede J, *et al.* The 2015 Dutch food-based dietary guidelines. *Eur J Clin Nutr* 2016;70:869–78. doi:10.1038/ejcn.2016.52
- 37 World Cancer Research Fund. Meat, fish and dairy products and the risk of cancer. Continuous update project. 2018. <https://www.wcrf.org/wp-content/uploads/2021/02/Meat-fish-and-dairy-products.pdf> (accessed 5 Jan 2022).
- 38 Yang X, Li Y, Wang C, *et al.* Meat and fish intake and type 2 diabetes: Dose-response meta-analysis of prospective cohort studies. *Diabetes Metab* 2020;46:345–52. doi:10.1016/j.diabet.2020.03.004
- 39 Zhang R, Fu J, Moore JB, *et al.* Processed and Unprocessed Red Meat Consumption and Risk for Type 2 Diabetes Mellitus: An Updated Meta-Analysis of Cohort Studies. *Int J Environ Res Public Health* 2021;18:10788. doi:10.3390/ijerph182010788



- 40 Zeraatkar D, Han MA, Guyatt GH, *et al.* Red and Processed Meat Consumption and Risk for All-Cause Mortality and Cardiometabolic Outcomes: A Systematic Review and Meta-analysis of Cohort Studies. *Ann Intern Med* 2019;171:703–10. doi:10.7326/M19-0655
- 41 Farvid MS, Sidahmed E, Spence ND, *et al.* Consumption of red meat and processed meat and cancer incidence: a systematic review and meta-analysis of prospective studies. *Eur J Epidemiol* 2021;36:937–51. doi:10.1007/s10654-021-00741-9
- 42 Bao W, Rong Y, Rong S, *et al.* Dietary iron intake, body iron stores, and the risk of type 2 diabetes: a systematic review and meta-analysis. *BMC Med* 2012;10:119. doi:10.1186/1741-7015-10-119
- 43 Han M, Guan L, Ren Y, *et al.* Dietary iron intake and risk of death due to cardiovascular diseases: A systematic review and dose-response meta-analysis of prospective cohort studies. *Asia Pac J Clin Nutr* 2020;29:309–21. doi:10.6133/apjcn.202007_29(2).0014
- 44 Chang VC, Cotterchio M, Khoo E. Iron intake, body iron status, and risk of breast cancer: a systematic review and meta-analysis. *BMC Cancer* 2019;19:543. doi:10.1186/s12885-019-5642-0
- 45 Ma J, Li Q, Fang X, *et al.* Increased total iron and zinc intake and lower heme iron intake reduce the risk of esophageal cancer: A dose-response meta-analysis. *Nutr Res* 2018;59:16–28. doi:10.1016/j.nutres.2018.07.007
- 46 Cao H, Wang C, Chai R, *et al.* Iron intake, serum iron indices and risk of colorectal adenomas: a meta-analysis of observational studies. *Eur J Cancer Care Engl* 2017;26. doi:10.1111/ecc.12486
- 47 Cross AJ, Harnly JM, Ferrucci LM, *et al.* Developing a heme iron database for meats according to meat type, cooking method and doneness level. *Food Nutr Sci* 2012;3:905–13. doi:10.4236/fns.2012.37120
- 48 Lombardi-Boccia G, Martinez-Dominguez B, Aguzzi A. Total Heme and Non-heme Iron in Raw and Cooked Meats. *J Food Sci* 2002;67:1738–41. doi:10.1111/j.1365-2621.2002.tb08715.x
- 49 Anses. Table de composition nutritionnelle des aliments Cional. 2020. doi:10.5281/zenodo.4770600

Appendix

Members of the Scientific Committee of the Nutri-Score

Hélène ALEXIOU

Lecturer in Nutrition and Dietetics, at Haute Ecole Leonard de Vinci, Health Sector, Dietetics department, Brussels, Belgium

Pr Joline WJ BEULENS

Professor of lifestyle and cardiometabolic disease Epidemiology ; Department of Epidemiology and Data Science, Amsterdam UMC, the Netherlands

Pr Torsten BOHN

Group Leader Nutrition and Health Research in the Luxembourg Institute of Health, Department of Precision Health, Luxembourg

Dr Pauline DUCROT

Scientist Nutrition and Public health in Santé publique France, French national public health agency, France

Marie-Noëlle FALQUET

Lecturer in food science in Bern University of applied Sciences, Department of Agricultural, Forest and Food Sciences, Switzerland

Dr Marta GARCÍA SOLANO

Technical Advisor of the Observatory of Nutrition and Study of Obesity in Spanish Agency for Food Safety and Nutrition, Spain

Pr Chantal JULIA

Professor of Nutrition Nutritional Epidemiology Research Team - Sorbonne Paris Nord University, INSERM U1153, INRAE U1125, CNAM, Epidemiology and Statistics Research Center – University of Paris (CRESS), Bobigny, France

Dr Benedikt MERZ

Head, Working Group Epidemiology at Max Rubner-Institut, Federal Research Institute of Nutrition and Food, Department of Physiology and Biochemistry of Nutrition, Germany

Pr Fernando RODRÍGUEZ ARTALEJO

Professor of Preventive Medicine and Public Health. Universidad Autónoma de Madrid Head of the Cardiovascular and Nutritional Epidemiology Group at CIBER of Epidemiology and Public Health, Spain

Dr Elisabeth HM TEMME

Senior scientist Nutrition and Health in the National Institute for Public Health and the Environment, the Netherlands

Dr Stefanie VANDEVIJVERE

Senior Scientist Nutrition & Health, Department of Epidemiology and Public Health, Sciensano, Belgium



List of abbreviations

COEN	Countries officially engaged in the Nutri-Score
DHA	docosahexaenoic acid
EFSA	European Food Safety Agency
EPA	eicosapentaenoic acid
FBDG	Food-based dietary guidelines
FIC regulation	provision of food information to consumers regulation
FNS	Final nutritional score - final number of points in the algorithm of the Nutri-Score
FSA	Food Standards Agency
NDA panel	Panel on Nutrition, Novel Foods and Food Allergens
NPS	Nutrient profile model
PRI	Population Reference Intakes
ScC	Scientific Committee of the Nutri-Score
SFA	Saturated fatty acids
StC	Steering Committee of the Nutri-Score
WHO	World Health Organization



Available databases from COEN for Nutri-Score algorithm testing

Supplemental Table 1 Description of the food groups available in the databases of nutritional composition of branded food products – Data from Belgium, France, Germany, The Netherlands

Food group	Definition of food group France-Oqali/Open Food Facts	Germany-MINTEL/National Product Monitoring database	The Netherlands-Major supermarkets-GS1-SIM (Dutch Branded Food database, 2020)	Belgian Nutritrack database
Bread				
Whole grain bread	<i>Bread and buns (made out of whole grain flour, no minimum proportion required).</i>	Bread and buns ($\geq 90\%$ whole grain flour).	Whole grain 'every day' bread and buns ($\geq 90\%$ whole grain flour), and only the luxury breads without sweet or salty ingredients.	Whole grain 'every day' bread and buns (whole grain as part of the product name or in the ingredient list, no minimum proportion required).
Mixed grain and refined grain bread	<i>Refined bread and buns, mixed bread not available.</i>	Mixed grain and refined grain bread.	Mixed grain 'every day' bread and buns, and only the luxury breads without sweet or salty ingredients. Refined grain 'every day' bread and buns, and only the luxury breads without sweet or salty ingredients.	Mixed grain and refined grain bread and buns.
Other type of breads	Not available	crisp bread, protein bread, gluten free bread, bread with herbs.	'Luxury' bread, such as croissants, currant buns, Focaccia. Bread substitutes such as rusks, knäckebröd, breadsticks, toasts. Bases for pizza and wraps. And other types such as rye bread, corn bread and bread with herbs.	Fruit bread, sweet breads, bread rolls, bases for pizza, bagels, bread with herbs.
Breakfast cereals				
Plain/flavored mueslis/cornflakes, chocolate or honey flavored cereals, cereals with a filling.	Cornflakes, other crispy cereal products, (nut/fruit/chocolate) muesli, porridges.	Cereals such as cornflakes and other crispy cereal products, (nut/fruit/chocolate) muesli and porridges, primarily meant for consumption in combination with milk or yoghurt for breakfast	Cereals such as cornflakes and other crispy cereal products, (nut/fruit/chocolate) muesli and porridges, breakfast biscuits, primarily meant for consumption in combination with milk or yoghurt for breakfast.	
Pasta				
Whole grain pasta	<i>Whole grain pasta as sold.</i>	Whole grain pasta as sold; fresh pasta excluded.	Whole grain pasta, not checked whether the composition is based on dry (uncooked) or wet (as cooked) weight.	Whole grain pasta (whole grain as part of the product name or in the ingredient list), not checked whether the composition is based on dry (uncooked) or wet (as cooked) weight.
Refined grain pasta	<i>Refined pasta as sold.</i>	Refined grain pasta as sold; fresh pasta excluded.	Refined grain pasta, not checked whether the composition is based on dry (uncooked) or wet (as cooked) weight.	Refined grain pasta, not checked whether the composition is based on dry (uncooked) or wet (as cooked) weight.



Food group	Definition of food group France-Oqali/ <i>Open Food Facts</i>	Germany-MINTEL/National Product Monitoring database	The Netherlands-Major supermarkets-GS1-SIM (Dutch Branded Food database, 2020)	Belgian Nutritrack database
Rice				
Whole grain rice	<i>Whole grain rice as sold.</i>	Whole grain rice as sold.	Whole grain rice, not checked whether the composition is based on dry (uncooked) or wet (as cooked) weight.	Whole grain rice (whole grain as part of the product name or in the ingredient list), not checked whether the composition is based on dry (uncooked) or wet (as cooked) weight.
Mixed grain rice	Not available.	Mixed grain rice as sold (can also contain black rice).	Mixed grain rice, not checked whether the composition is based on dry (uncooked) or wet (as cooked) weight.	Not available.
Refined grain rice	<i>Refined grain rice as sold, no plain express rice.</i>	Refined grain rice as sold, include plain express rice.	Refined grain rice, not checked whether the composition is based on dry (uncooked) or wet (as cooked) weight.	Refined grain rice, not checked whether the composition is based on dry (uncooked) or wet (as cooked) weight.
Cheese				
Solid and semi-solid	Hard cheese (e.g. Gruyère or Emmenthal).	Not available.	All types of solid and semi-solid cheeses such as Gouda, Maasland and Emmenthal.	All types of solid and semi-solid cheeses such as block cheeses, sliced cheeses, grated cheeses.
Soft cheese	Soft cheese (e.g. Camembert or Brie or cream cheese).	Not available.	All types of soft cheeses (sliceable and spread without melting salts as ingredient) such as brie, camembert.	All types of soft cheeses such as cream cheeses, brie, camembert.
Fresh cheese	Fresh cheese (e.g. fresh goat cheese, mozzarella, ricotta or feta cheese).	Not available.	Not available.	Feta, ricotta, mascarpone, Sheep/goat milk cheese, mozzarella.
Blue cheese	Blue cheese (e.g. Roquefort and assimilated).	Not available.	Not available.	Blue cheese (e.g. Roquefort and assimilated).
Processed cheese	Processed and smoked cheese, with melting salts as ingredient.	Not available.	Processed and smoked cheeses, with or without flavor additives, with melting salts as ingredient.	Processed and smoked cheeses.
Meat				
Processed meat	Composed and single processed raw/cured meat including cold cuts and smoked sausage. Most represented foods are cold cuts, patés, sausages (cured), smoked ham.	sausages, sausage spread & other cold cuts, salami, ham, minced meat products.	Composed and single processed raw/cured meat including cold cuts and smoked sausages.	Salami and cured meats, bacon, canned meat, sausage rolls, meat pies, meat burgers, sausages, sliced meat, dried meat, Pate and meat spreads, Kebabs.
Meat preparations	Breaded meat, nuggets, cordon bleu.	Breaded meat, chicken nuggets, meat (marinated), no raw unseasoned meat.	Meat preparations usually consumed with a hot meal. Includes composite meat products with at least 70% meat components. Meat based ragout is also classified in this group. Includes seasoned raw meat (e.g.	



Food group	Definition of food group France-Oqali/ <i>Open Food Facts</i>	Germany-MINTEL/National Product Monitoring database	The Netherlands-Major supermarkets-GS1-SIM (Dutch Branded Food database, 2020)	Belgian Nutritrack database
Plant-based meat substitutes	<i>Meat substitutes.</i>	Plant based burger, sausages, meat preparations, cold cuts.	hamburger patty). No raw unseasoned meat. Plant-based meat substitutes.	Meat-free burgers, meat-free sausages, meat-free bacon, falafel, plain and flavoured tofu.
Sauces				
Sauces -used cold	Same category with dressings and sauces (ketchup, vinaigrette, mayonnaise).	Ketchups, curry/garlic/barbecue/cocktail sauces.	Emulsified sauces which are used in "small(er)" quantities, such as mayonnaise, French fry sauce, and salad dressings. Cold sauces based on tomato/vegetables such as (spicy) ketchup. Also includes pesto.	Mayonnaise and salad dressings, vinegars, ketchup.
Sauces based on tomatoes and vegetables -warm	Ready-to-eat sauces used for meals and in which the main components are vegetables, such as pasta sauces. Also included pesto or Indian curry sauces.	Not available.	Ready-to-eat sauces used for hot meals and in which the main components are vegetables, such as pasta sauces.	Ready to eat sauces for hot meals, including pasta sauces, curry-based sauces, marinades, Asian sauces.
Soups and stock	Soups and broth (both prepared and unprepared, but with compositions based on prepared product).	Not available.	All types of soups and stocks (both prepared and unprepared, but with compositions based on prepared product).	All types of soups and stocks (both prepared and unprepared, but with compositions based on prepared product).
Savoury snacks (crisps, savoury biscuits)	Appetizers category: crackers, puff pastry-based appetizers, potato crisps, tortillas NB: No nuts.	Crisps (potato, flour from legumes, vegetables), formed crisps, baked legumes, crackers, savoury biscuits, salty popcorn.	Crisps (potato, flour from legumes, vegetables), formed crisps, extruded snacks, crackers, savoury biscuits.	Crisps (potato, flour from legumes, vegetables), formed crisps, extruded snacks, crackers, savoury biscuits.
Nuts and seeds				
Nut plain	<i>Unsalted nuts could be selected via nuts < 90 mg sodium without added sugar.</i>	Unsalted nuts and seeds selected via ingredient list.	Unsalted nuts, seeds and peanuts containing < 90 mg sodium without added sugar.	Unsalted nuts and mixed nuts.
Nut not plain	<i>Nuts with more than ≥ 90 mg sodium + nut butter.</i> NO CHOCOLATE NUTS.	Salted/sweetened nuts and seeds, also includes coated nuts. NO CHOCOLATE NUTS.	Salted and pure nuts, seeds and peanuts, also includes coated nuts, containing ≥ 90 mg sodium.	Salted and savoury-coated and sweet-coated nuts and mixed nuts.
Seed	<i>Salted and plain seeds (pumpkin, chia, sunflower...).</i>	plain and sweetened/salted seeds (pumpkin, sunflower, sesame, ...). Nut/seed butter and purees (main ingredient nut/seed).	Nut/peanut/tahini/sesame butter.	Salted and plain seeds.
Nut butter and purees	<i>Nut butter (peanut, almond...).</i>			Crunchy and smooth peanut butter, other nut-based spreads.



Food group	Definition of food group France-Oqali/ <i>Open Food Facts</i>	Germany-MINTEL/National Product Monitoring database	The Netherlands-Major supermarkets-GS1-SIM (Dutch Branded Food database, 2020)	Belgian Nutritrack database
Fats and oils	<i>Fats and oils includes animal as well as vegetable fats (margarines, oils).</i>	lard, vegetable oils and fats (independent of intended use).	Fats and oils used during the cooking process as well as used as spread on bread, including both animal and vegetable fats (margarines, oils).	Fats and oils used during the cooking process as well as used as spread on bread, including both animal and vegetable fats (margarines, oils).
(Vegetable) fats and oils	<i>All types of vegetable oils included cooking and frying oils.</i>	Olive oils and other vegetable oils, including hard oil like coconut oil.	Different types of oils; vegetable oils, wok/stir-fry oils, herbal oil.	All types of vegetable oils included cooking and frying oils.
Animal, hardened fats and butter	<i>Animal fats (butter (all types), ghee, Marginally lard, duck fat.</i>	Salted and unsalted butter, ghee, lard.	Salted butter.	Unsalted and salted butter.
Cream	<i>Full-fat cream, and reduced-fat cream.</i>	Full fat, reduced fat, plant-based cream.	Not available.	Full-fat cream, and reduced-fat cream.
Margarines and spreads for bread	<i>Margarines.</i>	Margarine (different fat content) butter spreads.	Margarine/halvarine (half the amount of fat that normal margarine contains) products.	Margarines.
Baking fats (excl. oils)	<i>Not available.</i>	Not available.	Baking fats such as frying fat, liquid margarine.	Not available.
Fish (and seafood)	<i>Fish fillet, smoked fish, canned fish, seafood.</i>	Fish fillet, breaded fish, canned fish, smoked fish, seafood.	Fish fillet, breaded fish, canned fish, smoked fish, seafood.	
Lean fish	<i>Cod, haddock, hake, tilapia... Unprocessed, smoked and preparation.</i>	Pollack/sea salmon, cod, hake, haddock, Kingklip, plaice, pike, red fish, rose fish, loach, tilapia, flounder, zander	Processed lean fish.	One category of all lean and fatty fish and seafood.
Fatty fish	<i>Salmon, herring, mackerel, tuna, anchovies, eel, trout. Unprocessed, canned, smoked and preparation.</i>	Salmon, herring, mackerel, tuna, catfish, trout, cobbler, sardine, carp, eel	Processed fatty fish including smoked fish (fatty).	
Seafood	<i>Shellfish (prawns, crabs, lobsters); Molluscs (clams, scallops, oysters, squid). Mostly unprepared.</i>	Prawns, mussel, lobster, scallops, squid, shrimp	Seafood.	
Convenience foods				
Partly-ready meals	Meals with fish/ meat/ vegetarian/legumes/ pasta. Hot sandwiches. Includes canned fresh and frozen meals.	Fish/chicken/pork/vegetarian meals, lasagne/pasta meals. Hot sandwiches (excl. instant meals).	Not available.	Pre-prepared salads and sandwiches, sushi.



Food group	Definition of food group France-Oqali/ <i>Open Food Facts</i>	Germany-MINTEL/National Product Monitoring database	The Netherlands-Major supermarkets-GS1-SIM (Dutch Branded Food database, 2020)	Belgian Nutritrack database
Ready-to-eat meals	Salads, sandwiches, sushis...	Salads (fresh mixed salads, pasta-, bulgur-, potato salad, ...), chilled sandwiches.	Not available.	Ambient and chilled and frozen ready meals, including vegetarian/vegan options.
Pizza	Pizza, pies.	Pizza, tarte flambee.	Pizza, tarte flambee, Turkish pizza (Lahmacun).	All pizzas.
Dairy products	Plain and sweetened yogurts, custards, mousses, desserts (flan...), plant-based alternatives (mostly soy-based).	Plain and sweetened yogurts, milk, plain and sweet milk drinks, incl. plant-based alternatives.	Dairy drinks of which the main ingredient is milk, buttermilk and/or yogurt (minimum 50%), plant-based substitute drinks, custard (desserts based on milk, starch, sugar and flavourings) including custard specialties (custard with additives such as cocoa or chocolate), plant-based substitutes, yogurt and quark based on dairy and plant-based substitutes.	Milk, yoghurt, yoghurt drinks, desserts, including plant-based alternatives.
Dairy products sweetened	Yogurts, quark, plant-based yogurts (added sugar or artificial sweeteners).	Sweetened dairy products (categorization with ingredient list) (sugars, sweeteners, fruit extracts, fruits etc.).	Sweetened with sugar or with sugar + artificial sweeteners.	Yogurts, quark, plant-based yogurts, yoghurt drinks, milk and plant-based alternatives.
Dairy products unsweetened	Yogurts, quark, plant-based yogurts (no added sugar).	Unsweetened (ingredient list).	Unsweetened or sweetened artificially.	
Dairy desserts	Custards, flans, mousses.	Not available.	Pudding, mousse, desserts.	Custard, puddings, rice puddings, mousses, cheesecake, other desserts.
Fine bakery products -sweet	Biscuits and cakes (cakes, cookies, biscuits...), pastries (brioche-based products, croissants...).	Cakes (fruit, cream, pound, spice), cookies, sweet biscuits, waffles, pies, pastries, croissants, buns.	Cakes (fruit, cream, pound, spice), cookies, sweet biscuits, waffles, pies, pastries.	Cakes, muffins, sweet biscuits (filled and unfilled), waffles, pies, pastries.
Confectionery		Not available.		
Candy, sweet sauces	Confectionery, which includes candies (caramels, marshmallows, nougats, sugar candies), chewing-gums.		All types of candy and sweet sauces (for desserts).	All types of candy and sweet sauces (for desserts).
Chocolate	Chocolate products (chocolate bars (e.g. Mars, Snickers...), chocolate candies, dark/milk/white chocolate).		All types of chocolate (milk, white, dark).	All types of chocolate (milk, white, dark).
Ice cream	Ice cream and sorbets.		Dairy and non-dairy ice cream and sorbets.	Dairy and non-dairy ice cream and sorbets, frozen yoghurts.



Food group	Definition of food group France-Oqali/<i>Open Food Facts</i>	Germany-MINTEL/National Product Monitoring database	The Netherlands-Major supermarkets-GS1-SIM (Dutch Branded Food database, 2020)	Belgian Nutritrack database
Canned fruits	Canned fruits in syrups.	Not available.	Not available.	Canned fruits in juice and /or syrups.
Compotes	Unsweetened and sweetened fruit compotes.	Not available.	Not available.	Unsweetened and sweetened fruit compotes, purees.
Bars	Cereal and nut bars with possible addition of fruits or chocolate. No chocolate bars.	Cereal, nut, fruit, protein bars (no chocolate bars).	Cereal, muesli, fruit, energy bars.	Cereal, nut, fruit, protein, puff-based bars (no chocolate bars).
Spreads				
Sweet spreads	Jams, marmalades, chocolate spreads.	Jams, marmalades, chocolate spreads (excl. honey), nut/nougat spreads.	Sweet spreads (meant to be put on bread), such as jams, marmalades, chocolate (sprinkles). Excluding honey.	Jams, marmalades.
Savoury spreads	Savoury preparation to spread/ dip: hummus, tzaziki, tarama, fish eggs...	Spreads, dips, salads meant to be put on bread (fish, poultry, meat, sausage salads).	Savoury spreads such as dips and salads meant to be put on bread (meat and vegetable).	Relishes, pickles and chutneys, dips, spreads meant to be put on bread (meat, vegetable, hummus).



Nutrient content distribution in the main available databases

Energy

	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bread	814	1112	900	1050	1117	1171	1280	815	1134	815	947	1067	1220	1716	5643	1158	870	977	1058	1189	1840	539	1292	883	1079	1192	1447	1996
Whole grain bread	239	1055	828	993	1057	1124	1196	179	905	763	821	885	990	1102	555	962	831	896	960	1007	1111	100	1133	862	1014	1086	1172	1718
Refined and mixed grain	575	1136	989	1075	1138	1188	1283	304	1074	915	1016	1072	1126	1235	3620	1049	884	977	1040	1105	1253	191	1150	872	1075	1143	1243	1619
Other bread	-	-	-	-	-	-	-	332	1313	883	1030	1259	1567	1888	1468	1499	885	1134	1608	1792	2045	195	1305	943	1150	1333	1469	1646
Bars	173	1717	1553	1614	1706	1803	1910	788	1710	1314	1514	1647	1871	2278	238	1789	1403	1619	1804	1954	2211	173	1794	1385	1611	1778	2091	2297
Breakfast cereals	652	1714	1489	1606	1666	1849	1971	639	1662	1464	1552	1630	1766	1924	534	1715	1483	1583	1697	1839	1975	347	1727	1485	1586	1695	1883	2025
Canned fruits	183	275	223	255	270	292	339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	226	294	180	238	264	291	606
Cheese	385	1318	949	1134	1322	1516	1706	-	-	-	-	-	-	-	3226	1523	1167	1397	1581	1680	1788	2621	1208	460	1004	1300	1508	1700
Solid and semi-solid cheese	162	1516	1239	1427	1534	1633	1734	-	-	-	-	-	-	-	2607	1568	1198	1532	1594	1695	1788	1000	1498	1160	1413	1517	1623	1760
Soft cheese	123	1246	1082	1154	1228	1366	1490	-	-	-	-	-	-	-	544	1344	892	1217	1372	1453	1801	1088	980	338	586	1039	1300	1632
Fresh cheese	39	1076	648	952	1026	1099	1318	-	-	-	-	-	-	-	-	-	-	-	-	-	-	249	1121	631	816	1143	1324	1685
Blue cheese	20	1487	1348	1478	1505	1516	1538	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69	1450	1155	1375	1456	1558	1799
Processed cheese	41	1080	645	994	1039	1284	1299	-	-	-	-	-	-	-	75	1242	602	1253	1310	1433	1436	204	1028	615	953	1021	1124	1321
Compotes	754	291	211	243	272	318	440	-	-	-	-	-	-	-	-	-	-	-	-	-	-	163	315	153	247	310	347	490
Confectionery	2335	1409	393	890	1289	2140	2390	-	-	-	-	-	-	-	2684	1793	661	1411	2014	2271	2397	2183	1767	728	1448	1732	2264	2413
Candy, sweet sauces	273	1487	970	1390	1465	1648	1865	-	-	-	-	-	-	-	723	1446	746	1368	1460	1675	1874	1197	1385	666	1192	1469	1653	1907
Chocolate	759	2110	353	2138	2273	2349	2442	-	-	-	-	-	-	-	1485	2243	1855	2188	2258	2335	2425	986	2230	1871	2155	2272	2343	2479
Ice cream	1303	965	405	744	967	1221	1457	-	-	-	-	-	-	-	476	916	314	653	925	1184	1469	171	948	421	763	965	1167	1456
Convenience food	4489	664	277	460	612	879	1127	1011	637	278	432	557	837	1131	-	-	-	-	-	-	-	1378	688	357	502	639	874	1105
Partly ready meals	3330	586	256	428	543	691	1090	661	539	268	398	486	610	1071	-	-	-	-	-	-	-	203	748	381	556	711	879	1232
Ready to eat meals	523	785	324	582	806	957	1240	215	743	319	505	732	947	1225	-	-	-	-	-	-	-	894	595	331	454	567	670	1067



	FRANCE							GERMANY							THE NETHERLANDS							BELGIUM						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Pizza	636	978	803	890	976	1054	1180	135	943	752	856	945	1020	1140	294	923	723	846	925	999	1103	281	940	778	872	944	1008	1096
Dairy products	1153	576	192	373	472	684	1384	1937	336	139	224	327	426	569	389	587	138	284	410	903	1393	2180	430	150	249	368	519	1023
Dairy products sweetened	493	401	192	347	396	453	569	1379	380	161	300	390	445	593	219	379	164	270	363	459	638	-	-	-	-	-	-	-
Dairy products unsweetened	142	302	164	196	273	392	520	558	227	106	178	212	274	345	38	156	108	130	138	171	259	-	-	-	-	-	-	-
Dairy desserts	518	817	414	553	700	1001	1607	-	-	-	-	-	-	-	132	1058	410	891	1116	1309	1604	551	707	361	478	594	889	1356
Fats and oils	8088	3099	1013	3038	3448	3528	3766	1721	2871	729	2720	3378	3404	3700	452	2996	1434	2704	3369	3404	3700	822	2172	551	1314	2234	3125	3700
Vegetable fats and oils	5252	3609	3390	3448	3700	3766	3766	942	3446	3367	3386	3400	3405	3700	203	3466	3378	3378	3404	3405	3760	186	3503	3276	3435	3464	3700	3766
Animal fats	1356	3003	2250	3025	3058	3109	3700	357	3002	2377	2972	3056	3075	3680	46	3036	2989	3028	3061	3071	3098	128	2468	844	1585	3060	3109	3130
Margarines	526	2104	1300	1883	2170	2272	3012	142	2488	1412	2422	2600	2801	2970	129	2144	1115	1445	2391	2702	2965	165	2108	946	1431	2191	2886	3050
Cream	954	1070	418	724	1206	1247	1577	280	966	391	679	1148	1210	1315	-	-	-	-	-	-	-	260	1048	330	688	1200	1393	1603
Baking fats (excl. oils)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74	3169	2701	2745	3340	3404	3700	-	-	-	-	-	-	-
Fine bakery products -sweet	2553	1802	1120	1585	1870	2065	2216	2074	1913	1387	1760	1963	2089	2250	6921	1643	983	1302	1720	1958	2185	1791	1791	1002	1632	1854	2033	2226
Fish (and seafood)	13192	770	326	531	766	916	1318	408	622	277	396	597	821	1024	840	707	302	458	728	891	1177	1726	560	6	276	439	824	1336
Lean fish	2335	702	295	423	661	833	1678	168	607	305	393	556	791	1021	304	705	314	526	770	887	1033	-	-	-	-	-	-	-
Fatty fish	9392	829	444	682	816	948	1314	162	724	413	517	741	878	1045	284	874	646	725	788	1027	1214	-	-	-	-	-	-	-
Seafood	1465	499	238	347	401	602	1017	78	441	229	289	330	494	948	252	521	243	358	388	634	1166	-	-	-	-	-	-	-
Meat	1110	1073	441	585	1058	1373	1950	546	1044	450	838	1030	1253	1748	4360	964	487	688	954	1169	1637	3440	947	427	536	887	1180	1908
Meat preparations (un)prepared	49	919	760	854	928	974	1069	96	950	648	830	969	1083	1261	2748	871	493	676	854	1033	1295	-	-	-	-	-	-	-
Processed meat (composed and single)	1061	1080	440	555	1079	1397	1954	450	1065	443	848	1073	1288	1828	1612	1123	463	776	1139	1364	1937	-	-	-	-	-	-	-
Meat substitutes	677	813	418	637	803	979	1197	361	926	553	808	929	1056	1277	557	836	464	670	843	985	1184	-	-	-	-	-	-	-
Nuts and seeds	3342	2541	2046	2489	2586	2699	2908	499	2566	2156	2453	2562	2685	2973	1442	2503	1923	2339	2560	2707	2910	302	2567	1879	2418	2565	2787	2962
Nuts and seeds (not plain)	1252	2482	2007	2484	2561	2607	2770	206	2439	2109	2274	2457	2570	2870	521	2464	1921	2315	2508	2616	2866	94	2352	1665	2259	2478	2582	2703



	FRANCE							GERMANY							THE NETHERLANDS							BELGIUM						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Nuts and seeds (plain)	1486	2591	2059	2523	2640	2787	2941	180	2699	2443	2531	2672	2870	3007	796	2513	1923	2279	2573	2751	2947	136	2795	2404	2565	2787	2896	3000
Nut butter	604	2540	2310	2486	2589	2698	2841	113	2584	2401	2513	2579	2680	2838	125	2601	2284	2564	2665	2697	2775	-	-	-	-	-	-	-
Pasta	1435	1497	1439	1481	1504	1531	1553	895	1467	1202	1483	1510	1528	1584	339	1471	1415	1480	1490	1514	1538	552	1366	941	1235	1471	1500	1537
Whole grain pasta	55	1465	1381	1452	1464	1482	1525	128	1458	1375	1452	1466	1482	1524	66	1446	1415	1446	1462	1485	1538	49	1430	1431	1443	1446	1446	1494
Refined grain pasta	1380	1498	1439	1485	1505	1531	1554	767	1468	1116	1493	1516	1530	1584	273	1477	1419	1483	1495	1518	1540	503	1359	933	1218	1478	1502	1544
Rice	781	1419	682	1460	1479	1495	1539	315	1378	646	1470	1486	1502	1537	313	1323	574	1426	1490	1508	1545	199	1132	569	666	1456	1479	1496
Whole grain rice	77	1388	661	1460	1473	1510	1573	63	1393	705	1467	1490	1516	1565	71	1370	653	1441	1498	1533	1533	34	1179	649	710	1472	1489	1512
mixed grain rice	-	-	-	-	-	-	-	36	1479	1450	1493	1500	1519	1552	30	1398	574	1456	1502	1550	1866	-	-	-	-	-	-	-
Refined grain rice	704	1421	682	1460	1479	1494	1531	216	1356	616	1470	1483	1494	1520	212	1296	549	1424	1487	1504	1526	165	1122	569	665	1456	1479	1494
Sauces	542	715	126	249	371	1005	2281	110	659	338	406	487	770	1496	849	1131	157	289	780	1771	2967	1273	1072	28	317	661	1648	3038
Meal sauces	370	377	113	210	281	388	1102	-	-	-	-	-	-	-	198	268	152	205	248	306	452	1024	873	23	280	513	1314	2556
Cold sauces	172	1442	375	651	1381	2001	2759	110	659	338	406	487	770	1496	651	1394	161	552	1200	2189	3017	249	1891	92	967	1832	2996	3111
Savoury snacks	1165	1811	948	1274	2034	2185	2335	1311	1981	1579	1792	2020	2149	2291	952	2023	1625	1894	2075	2180	2310	612	1675	711	1202	1894	2151	2266
Soups and stocks	778	163	86	127	152	184	285	-	-	-	-	-	-	-	662	190	48	128	190	240	343	414	222	84	126	158	209	381
Soups	778	163	86	127	152	184	285	-	-	-	-	-	-	-	632	198	91	135	193	243	350	-	-	-	-	-	-	-
Stocks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	27	16	21	23	28	52	-	-	-	-	-	-	-
Spreads	529	1011	600	749	1016	1048	2237	944	1264	454	756	1000	1840	2544	1256	1234	511	842	1090	1465	2374	-	-	-	-	-	-	-
Savoury spreads	89	1048	333	700	869	1167	2375	453	988	490	756	918	1191	1592	562	1091	545	830	1107	1289	1649	453	1051	167	729	1075	1291	2083
Sweet spreads	440	1004	674	764	1018	1045	2203	491	1519	451	756	1113	2340	2670	694	1351	502	889	1071	1968	2389	391	1327	640	816	1033	2050	2427



Saturates

	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bread	814	0.7	0.2	0.4	0.5	0.7	1.7	815	0.8	0.2	0.3	0.5	0.9	2.5	5643	1.3	0.2	0.4	0.6	1.1	4.8	539	2.3	0.2	0.5	1.0	2.7	8.2
Whole grain bread	239	0.6	0.2	0.4	0.5	0.7	1.2	179	0.4	0.1	0.2	0.4	0.5	1.0	555	0.6	0.3	0.4	0.5	0.7	1.2	100	0.8	0.3	0.4	0.7	1.0	1.8
Refined and mixed grain	575	0.7	0.2	0.4	0.5	0.7	1.8	304	0.6	0.1	0.3	0.5	0.7	1.5	3620	0.7	0.1	0.3	0.6	0.9	1.6	191	1.0	0.2	0.4	0.6	1.0	3.1
Other bread	-	-	-	-	-	-	-	332	1.2	0.3	0.4	0.8	1.4	3.6	1468	3.0	0.2	0.6	1.4	3.5	12.0	195	3.2	0.3	0.9	2.7	4.6	8.2
Bars	173	4.8	0.6	2.1	4.6	6.8	11.0	788	4.9	0.7	2.0	4.0	6.6	12.0	238	5.9	1.2	2.6	4.3	7.9	17.7	173	5.5	0.7	2.7	4.7	7.4	13.8
Breakfast cereals	652	2.6	0.2	0.7	1.7	4.2	7.7	639	2.6	0.3	1.0	1.7	4.0	7.0	534	2.7	0.2	0.9	2.0	4.0	7.4	347	2.9	0.2	0.9	2.0	3.8	9.3
Canned fruits	183	0.1	0.0	0.0	0.0	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	226	0.0	0.0	0.0	0.0	0.0	0.1
Cheese	385	17.4	9.0	15.2	18.0	20.0	23.0	-	-	-	-	-	-	-	3226	19.8	12.5	17.9	20.9	22.5	24.7	2621	15.5	2.3	12.5	17.0	20.0	23.0
Solid and semi-solid cheese	162	18.9	15.0	18.0	19.0	20.3	23.0	-	-	-	-	-	-	-	2607	20.2	12.8	18.9	21.3	22.9	24.5	1000	18.9	12.5	17.7	19.0	21.0	23.3
Soft cheese	123	17.6	14.0	15.5	17.0	20.0	22.5	-	-	-	-	-	-	-	544	18.4	10.0	16.0	18.0	20.4	27.4	1088	12.7	1.8	5.8	14.0	18.0	23.0
Fresh cheese	39	12.9	8.0	12.0	13.0	15.0	16.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	249	14.5	8.0	10.6	15.0	17.3	23.0
Blue cheese	20	22.0	15.2	21.1	22.5	24.0	24.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69	20.2	16.4	19.0	20.0	22.0	27.0
Processed cheese	41	13.4	6.1	11.3	13.5	14.7	21.0	-	-	-	-	-	-	-	75	15.6	5.0	14.8	17.6	18.6	18.6	204	13.0	4.7	11.0	13.0	15.0	19.5
Compotes	754	0.1	0.0	0.0	0.0	0.1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	163	0.1	0.0	0.0	0.1	0.1	0.2
Confectionery	2335	10.0	0.0	3.5	9.0	16.0	24.0	-	-	-	-	-	-	-	2684	11.6	0.0	1.6	12.8	19.0	23.2	2183	9.1	0.0	0.1	5.7	18.0	23.0
Candy, sweet sauces	273	1.3	0.0	0.1	0.1	1.3	6.7	-	-	-	-	-	-	-	723	1.5	0.0	0.0	0.2	1.5	9.0	1197	1.8	0.0	0.0	0.2	1.5	9.2
Chocolate	759	17.6	1.2	15.5	18.0	22.0	26.9	-	-	-	-	-	-	-	1485	17.9	9.1	15.0	18.3	21.0	24.9	986	18.0	9.4	15.0	18.0	21.0	26.0
Ice cream	1303	7.3	0.0	3.8	7.0	11.1	15.6	-	-	-	-	-	-	-	476	7.3	0.0	3.3	7.4	10.6	16.0	171	8.1	1.7	5.4	8.3	10.4	15.0
Convenience food	4489	2.8	0.3	1.0	2.2	3.8	7.2	1011	2.0	0.2	0.6	1.6	2.9	5.6	-	-	-	-	-	-	-	1378	2.8	0.4	1.2	2.4	3.6	6.2
Partly ready meals	3330	2.5	0.3	0.9	1.9	3.3	6.2	661	1.8	0.2	0.5	1.3	2.5	4.9	-	-	-	-	-	-	-	203	1.9	0.4	0.8	1.1	2.3	5.6



	FRANCE							GERMANY							THE NETHERLANDS							BELGIUM						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Ready to eat meals	523	2.2	0.3	0.7	1.1	2.8	7.1	215	1.9	0.2	0.6	1.3	2.4	5.9	-	-	-	-	-	-	-	894	2.6	0.3	1.1	2.2	3.3	6.5
Pizza	636	4.9	2.0	2.9	4.3	6.2	10.0	135	3.7	2.1	2.7	3.5	4.3	6.9	294	3.6	2.0	2.8	3.3	4.2	6.1	281	3.8	2.1	2.8	3.4	4.4	6.1
Dairy products	1153	3.7	0.1	1.6	2.3	5.0	10.9	1937	1.6	0.1	0.3	1.2	2.2	4.8	389	4.1	0.0	0.6	2.0	6.1	15.0	2180	2.5	0.1	0.4	1.7	2.6	8.8
Dairy products sweetened	493	1.9	0.0	0.9	1.8	2.3	5.0	1379	1.7	0.1	0.5	1.7	2.2	4.9	219	1.8	0.0	0.5	1.8	2.3	5.2	-	-	-	-	-	-	-
Dairy products unsweetened	142	2.4	0.0	0.4	2.1	4.0	6.8	558	1.2	0.1	0.2	0.6	2.2	2.7	38	0.3	0.0	0.0	0.0	0.2	2.1	-	-	-	-	-	-	-
Dairy desserts	518	5.7	1.0	2.3	4.7	7.8	14.0	-	-	-	-	-	-	-	132	9.2	1.1	6.0	9.0	13.3	17.5	551	4.6	0.5	2.0	2.6	6.7	14.0
Fats and oils	8088	24.6	7.7	12.6	15.0	24.0	83.7	1721	27.0	6.5	13.0	15.0	40.0	85.0	452	25.0	7.1	10.0	14.0	44.0	58.0	822	22.9	4.6	10.0	17.0	28.0	57.0
Vegetable fats and oils	5252	20.0	7.8	12.0	14.0	55.0	89.0	942	21.1	7.0	11.9	13.4	15.0	91.3	203	17.6	8.0	10.0	13.3	15.0	83.7	186	16.8	8.0	10.0	13.0	15.0	52.0
Animal fats	1356	52.0	28.0	52.0	55.0	57.0	60.0	357	51.2	38.8	46.0	53.0	55.0	65.0	46	54.7	45.3	54.0	56.8	58.0	60.8	128	44.0	12.7	24.8	53.0	55.7	60.0
Margarines	526	17.0	7.1	13.0	15.0	20.0	35.0	142	29.4	10.0	21.0	33.0	37.0	42.0	129	28.5	5.9	9.3	33.8	47.3	50.9	165	15.7	5.0	7.7	9.5	22.0	41.0
Cream	954	16.7	3.3	10.7	19.5	21.0	27.6	280	14.6	0.9	8.0	18.3	20.0	22.8	-	-	-	-	-	-	-	260	15.8	1.3	9.8	18.0	23.0	28.0
Baking fats (excl. oils)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74	20.9	7.1	8.7	12.5	34.0	54.0	-	-	-	-	-	-	-
Fine bakery products - sweet	2553	9.9	1.1	5.9	9.9	14.0	18.7	2074	9.9	1.6	6.0	10.0	13.4	19.0	6921	8.8	0.4	3.5	9.0	13.0	18.2	1791	8.6	0.5	3.0	8.6	13.0	19.0
Fish (and seafood)	13192	2.4	0.1	0.7	1.9	3.2	7.2	408	1.6	0.1	0.4	1.0	2.3	4.7	840	1.9	0.2	0.6	1.4	2.6	5.8	1726	1.3	0.0	0.1	0.6	2.2	4.9
Lean fish	2335	1.6	0.0	0.4	0.8	1.5	7.4	168	1.0	0.1	0.4	0.8	1.2	3.6	304	1.3	0.2	0.7	1.0	1.5	3.3	-	-	-	-	-	-	-
Fatty fish	9392	2.8	0.3	1.5	2.4	3.5	7.4	162	2.3	0.2	1.2	2.2	3.2	5.0	284	3.4	1.8	2.5	3.0	3.7	6.6	-	-	-	-	-	-	-
Seafood	1465	1.1	0.0	0.2	0.5	1.2	3.7	78	1.4	0.1	0.3	0.4	1.2	7.5	252	1.0	0.2	0.3	0.5	1.2	2.2	-	-	-	-	-	-	-
Meat	1110	7.2	0.6	2.0	6.9	11.1	16.0	546	7.2	0.6	2.0	7.2	10.5	15.0	4360	5.8	0.7	2.3	5.0	8.8	12.9	3440	5.6	0.5	1.4	4.4	8.2	15.0
Meat preparations (un)prepared	49	3.1	1.5	2.3	3.2	3.6	4.9	96	4.0	0.9	1.3	2.6	7.0	9.0	2748	4.6	0.6	2.2	4.0	7.0	9.9	-	-	-	-	-	-	-



	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
	Processed meat (composed and single)	1061	7.4	0.5	2.0	7.5	11.5	16.0	450	7.9	0.6	4.4	8.1	11.3	16.0	1612	7.8	0.8	3.9	8.4	10.8	15.9	-	-	-	-	-	-
Meat substitutes	677	1.7	0.3	0.9	1.2	1.9	4.0	361	2.5	0.5	1.0	1.4	2.5	9.3	557	2.3	0.3	0.8	1.3	2.9	7.5	-	-	-	-	-	-	-
Nuts and seeds	3342	6.8	3.3	4.5	6.3	8.5	10.8	499	7.5	3.6	5.3	6.8	8.8	13.0	1442	6.8	3.2	4.7	6.8	8.5	10.3	302	6.6	2.9	4.6	5.7	7.7	12.0
Nuts and seeds (not plain)	1252	7.2	3.3	5.6	7.1	8.7	10.5	206	7.1	2.3	5.2	6.8	8.8	11.8	521	6.6	3.0	5.0	6.4	7.9	9.7	94	6.4	1.8	4.4	5.7	7.7	12.0
Nuts and seeds (plain)	1486	6.0	3.2	4.1	5.6	7.5	10.0	180	7.3	4.0	5.6	6.6	8.3	15.4	796	6.4	3.3	4.4	6.1	7.8	9.5	136	6.7	3.8	4.6	5.7	7.6	16.0
Nut butter	604	7.8	3.8	5.5	7.8	9.4	12.3	113	8.7	4.2	5.5	8.0	10.0	14.0	125	9.8	6.9	8.4	9.3	10.1	15.4	-	-	-	-	-	-	-
Pasta	1435	0.5	0.1	0.3	0.4	0.5	1.3	895	0.5	0.2	0.3	0.4	0.6	1.4	339	0.4	0.1	0.2	0.3	0.4	0.8	552	1.2	0.1	0.3	0.4	1.2	4.8
Whole grain pasta	55	0.5	0.2	0.4	0.6	0.7	1.0	128	0.5	0.3	0.4	0.4	0.5	0.8	66	0.4	0.1	0.2	0.4	0.6	0.6	49	0.3	0.1	0.1	0.1	0.5	0.6
Refined grain pasta	1380	0.5	0.1	0.3	0.4	0.5	1.3	767	0.5	0.1	0.3	0.4	0.8	1.5	273	0.4	0.1	0.2	0.3	0.4	1.0	503	1.3	0.1	0.3	0.5	1.5	4.9
Rice	781	0.3	0.0	0.1	0.2	0.4	0.8	315	0.3	0.0	0.2	0.3	0.5	0.8	313	0.5	0.0	0.2	0.4	0.6	1.0	199	0.4	0.0	0.1	0.2	0.4	0.7
Whole grain rice	77	0.6	0.2	0.4	0.6	0.7	1.0	63	0.6	0.0	0.5	0.6	0.7	0.9	71	0.6	0.1	0.5	0.6	0.8	0.8	34	0.5	0.2	0.2	0.5	0.7	0.9
Mixed grain rice	-	-	-	-	-	-	-	36	0.3	0.0	0.2	0.3	0.5	0.8	30	1.0	0.1	0.4	0.6	0.9	2.9	-	-	-	-	-	-	-
Refined grain rice	704	0.3	0.0	0.1	0.2	0.3	0.8	216	0.2	0.0	0.1	0.2	0.3	0.6	212	0.4	0.0	0.2	0.3	0.4	0.9	165	0.4	0.0	0.1	0.2	0.2	0.7
Sauces	542	2.0	0.0	0.2	1.0	3.0	6.2	110	0.5	0.0	0.1	0.1	0.5	2.7	849	2.5	0.0	0.1	1.4	4.1	9.0	1273	2.8	0.0	0.1	1.7	5.0	8.3
Meal sauces	370	1.5	0.0	0.2	0.5	1.6	6.1	-	-	-	-	-	-	-	198	0.6	0.1	0.1	0.3	0.7	2.2	1024	2.5	0.0	0.1	0.9	4.4	8.4
Cold sauces	172	2.9	0.0	0.3	2.7	4.2	6.2	110	0.5	0.0	0.1	0.1	0.5	2.7	651	3.1	0.0	0.1	2.2	5.2	9.1	249	4.0	0.0	1.8	3.9	6.3	8.0
Savoury snacks	1165	7.5	1.0	2.6	4.5	10.0	21.0	1311	3.5	0.8	1.9	2.7	3.6	10.0	952	4.1	0.7	1.8	2.5	3.4	18.0	612	5.8	0.9	2.2	3.2	8.5	18.5



	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Soups and stocks	778	0.7	0.0	0.2	0.4	0.9	1.9	-	-	-	-	-	-	-	662	0.7	0.1	0.2	0.5	0.9	1.8	414	0.8	0.0	0.2	0.5	1.1	2.0
Soups	778	0.7	0.0	0.2	0.4	0.9	1.9	-	-	-	-	-	-	-	632	0.7	0.1	0.3	0.5	1.0	1.8	-	-	-	-	-	-	-
Stocks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	0.2	0.0	0.1	0.1	0.2	0.4	-	-	-	-	-	-	-
Spreads	529	1.0	0.0	0.0	0.0	0.2	6.3	944	4.9	0.0	0.1	2.2	6.2	18.8	1256	3.3	0.0	0.0	2.1	5.3	10.0	-	-	-	-	-	-	-
Savoury spreads	89	2.8	0.7	1.3	2.2	4.0	7.7	453	3.4	0.7	1.7	2.3	3.6	12.3	562	3.1	1.1	1.8	2.3	3.7	8.5	453	2.7	0.1	1.5	2.2	3.3	6.5
Sweet spreads	440	0.6	0.0	0.0	0.0	0.1	6.2	491	6.3	0.0	0.0	0.2	8.3	28.5	694	3.4	0.0	0.0	0.1	8.6	11.0	391	3.6	0.0	0.1	0.1	7.1	16.7



Sugar

	FRANCE							GERMANY							THE NETHERLANDS							BELGIUM						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bread	814	4.9	1.4	3.0	4.9	6.4	9.0	815	3.2	0.9	2.0	2.9	3.9	6.8	5643	2.9	0.5	1.3	1.9	3.3	6.8	539	5.9	0.5	1.9	3.6	7.2	22.0
Whole grain bread	239	4.3	1.2	2.6	4.3	5.8	7.3	179	3.6	1.5	2.6	3.4	4.0	6.9	555	1.9	0.5	1.2	1.7	2.2	5.0	100	3.2	0.5	1.7	2.6	4.5	6.5
Refined and mixed grain	575	5.2	1.5	3.1	5.2	6.9	9.3	304	3.1	1.1	2.1	2.7	3.8	6.9	3620	2.5	0.5	1.2	1.9	3.0	6.2	191	3.4	0.2	1.5	2.8	5.3	8.0
Other bread	-	-	-	-	-	-	-	332	2.9	0.7	1.5	2.4	3.9	6.7	1468	4.2	0.7	1.5	2.5	4.6	12.0	195	9.4	0.8	2.5	7.5	13.0	25.0
Bars	173	28.9	20.4	26.0	28.6	32.0	37.0	788	28.3	1.7	16.7	28.8	41.1	53.0	238	25.6	8.5	19.2	24.8	32.0	43.8	173	29.6	12.0	19.0	27.0	41.6	50.6
Breakfast cereals	652	20.8	5.9	16.0	22.0	26.3	32.4	639	15.8	3.0	11.0	15.8	21.1	27.6	534	15.1	4.3	9.4	14.9	20.2	27.4	347	17.0	1.0	10.3	17.2	24.0	30.0
Canned fruits	183	13.6	10.0	12.0	13.1	15.0	16.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	226	13.8	5.8	11.0	12.0	15.5	23.2
Cheese	385	1.1	0.0	0.0	0.5	1.2	5.0	-	-	-	-	-	-	-	3226	0.5	0.0	0.0	0.0	0.0	2.8	2621	2.3	0.0	0.0	0.5	3.0	12.4
Solid and semi-solid cheese	162	0.4	0.0	0.0	0.4	0.5	1.5	-	-	-	-	-	-	-	2607	0.0	0.0	0.0	0.0	0.0	0.1	1000	0.2	0.0	0.0	0.0	0.3	0.5
Soft cheese	123	0.6	0.0	0.1	0.5	1.0	1.7	-	-	-	-	-	-	-	544	2.6	0.0	0.1	0.5	3.0	13.0	1088	4.1	0.0	0.5	2.7	4.5	14.6
Fresh cheese	39	1.2	0.0	0.8	1.0	1.5	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	249	1.9	0.0	0.5	1.1	2.6	7.2
Blue cheese	20	0.1	0.0	0.0	0.0	0.1	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69	0.3	0.0	0.0	0.1	0.5	1.0
Processed cheese	41	4.2	0.5	2.0	4.0	6.5	7.0	-	-	-	-	-	-	-	75	1.0	0.0	0.0	0.1	2.8	3.0	204	3.7	0.1	2.3	3.5	5.5	6.8
Compotes	754	14.1	9.7	11.0	14.0	16.0	22.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	163	15.9	8.0	11.0	16.0	18.0	27.0
Confectionery	2335	34.6	13.5	23.6	28.7	47.6	66.4	-	-	-	-	-	-	-	2684	45.9	7.6	29.8	50.0	58.0	78.8	2183	49.2	0.0	43.0	52.0	62.0	83.0
Candy, sweet sauces	273	57.7	0.4	56.0	63.3	69.9	78.0	-	-	-	-	-	-	-	723	56.1	0.0	46.1	62.7	76.0	96.0	1197	50.3	0.0	42.0	58.0	69.0	91.1



	FRANCE							GERMANY							THE NETHERLANDS							BELGIUM						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Chocolate	759	42.1	11.1	36.0	46.5	51.5	58.7	-	-	-	-	-	-	-	1485	48.2	24.0	44.0	51.8	56.0	62.0	986	47.8	24.4	43.5	50.0	54.0	63.0
	1303	25.2	18.7	22.3	25.2	28.2	32.2	-	-	-	-	-	-	-	476	23.5	12.3	20.2	23.8	26.9	31.8	171	21.6	9.9	18.8	22.8	25.4	30.0
Convenience food	4489	2.4	0.5	1.2	2.0	3.2	5.4	1011	2.9	0.8	1.6	2.4	3.5	6.9								1378	2.6	0.5	1.5	2.4	3.2	5.6
Partly ready meals	3330	2.0	0.5	1.0	1.7	2.7	4.6	661	2.6	0.7	1.4	2.1	3.1	6.1	-	-	-	-	-	-	-	203	2.9	0.5	1.6	2.5	3.6	5.9
Ready to eat meals	523	4.0	0.6	2.0	3.1	4.3	15.5	215	4.0	0.9	2.4	3.4	5.6	8.4	-	-	-	-	-	-	-	894	2.4	0.5	1.3	2.1	3.0	5.5
Pizza	636	3.4	1.4	2.3	3.2	4.1	6.1	135	2.3	1.1	1.6	2.1	2.7	4.4	294	2.6	1.3	1.7	2.4	3.3	4.7	281	3.0	1.4	2.0	2.8	3.6	5.6
Dairy products	1153	14.2	3.6	11.0	13.7	18.0	25.5	1937	9.1	1.0	4.9	9.7	13.2	15.5	389	12.9	3.5	8.7	11.3	17.0	24.0	2180	10.5	2.3	5.4	11.0	13.5	20.0
Dairy products sweetened	493	12.0	5.2	11.0	12.4	13.2	15.8	1379	11.1	2.8	9.0	12.0	13.7	16.0	219	10.5	6.9	8.5	10.3	12.0	15.7	-	-	-	-	-	-	-
Dairy products unsweetened	142	3.6	0.4	3.4	3.8	4.3	5.0	558	4.1	0.0	3.8	4.8	5.2	7.0	38	3.7	2.7	3.3	3.5	3.7	5.7	-	-	-	-	-	-	-
Dairy desserts	518	19.2	12.0	15.7	18.4	21.0	30.0	-	-	-	-	-	-	-	132	19.6	10.7	15.4	19.8	21.2	32.6	551	16.5	10.0	13.0	15.7	19.2	24.0
Fats and oils	8088	0.7	0.0	0.0	0.0	0.5	3.5	1721	0.9	0.0	0.0	0.0	0.8	3.8	452	0.4	0.0	0.0	0.0	0.6	1.7	822	1.7	0.0	0.0	0.5	2.9	6.5
Vegetable fats and oils	5252	0.0	0.0	0.0	0.0	0.0	0.0	942	0.0	0.0	0.0	0.0	0.0	0.0	203	0.0	0.0	0.0	0.0	0.0	0.0	186	0.1	0.0	0.0	0.0	0.0	0.5
Animal fats	1356	0.7	0.0	0.5	0.6	0.8	1.0	357	0.8	0.0	0.5	0.6	1.0	2.4	46	0.9	0.6	0.6	0.9	1.0	1.1	128	0.7	0.0	0.5	0.6	0.8	2.5
Margarines	526	0.4	0.0	0.0	0.1	0.5	1.0	142	0.7	0.0	0.0	0.5	1.0	1.8	129	0.8	0.0	0.0	0.8	1.5	2.4	165	0.3	0.0	0.0	0.5	0.5	0.5
Cream	954	4.1	1.6	2.9	3.2	3.9	11.4	280	4.0	0.8	3.2	3.3	4.0	9.0	-	-	-	-	-	-	-	260	4.6	1.2	2.9	3.3	4.6	11.8
Baking fats (excl. oils)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74	0.2	0.0	0.0	0.0	0.5	0.9	-	-	-	-	-	-	-



	FRANCE							GERMANY							THE NETHERLANDS							BELGIUM						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Fine bakery products -sweet	2553	29.0	20.4	26.0	28.6	32.0	37.0	2074	29.9	14.0	23.2	29.0	36.8	48.1	6921	29.4	8.8	22.1	29.6	36.5	46.9	1791	24.9	1.2	13.0	28.0	35.0	47.1
Fish (and seafood)	13192	0.7	0.0	0.0	0.5	0.9	3.0	408	0.9	0.0	0.0	0.4	1.1	3.6	840	0.7	0.0	0.0	0.3	0.9	2.8	1726	1.5	0.0	0.0	0.3	1.4	7.8
Lean fish	2335	1.3	0.0	0.3	0.9	2.1	3.5	168	0.9	0.0	0.2	0.7	1.2	2.3	304	0.9	0.0	0.2	0.6	1.0	3.0	-	-	-	-	-	-	-
Fatty fish	9392	0.6	0.0	0.0	0.4	0.6	2.5	162	1.1	0.0	0.0	0.0	1.1	6.7	284	0.8	0.0	0.0	0.3	0.6	2.7	-	-	-	-	-	-	-
Seafood	1465	0.7	0.0	0.0	0.3	0.7	2.9	78	0.5	0.0	0.0	0.0	0.5	2.4	252	0.5	0.0	0.0	0.1	0.7	1.9	-	-	-	-	-	-	-
Meat	1110	1.1	0.1	0.5	1.0	1.6	3.0	546	0.8	0.1	0.5	0.7	1.0	2.0	4360	0.9	0.0	0.2	0.5	1.0	2.9	3440	0.9	0.0	0.1	0.5	1.0	3.0
Meat preparations (un)prepared	49	2.4	1.0	1.6	2.3	3.0	4.0	96	1.2	0.1	0.8	1.0	1.3	2.4	2748	0.9	0.0	0.1	0.4	1.0	2.9	-	-	-	-	-	-	-
Processed meat (composed and single)	1061	1.1	0.1	0.5	0.9	1.5	2.8	450	0.7	0.1	0.4	0.6	1.0	1.5	1612	1.1	0.0	0.3	0.6	1.1	2.9	-	-	-	-	-	-	-
Meat substitutes	677	1.9	0.0	0.7	1.5	2.7	4.8	361	2.0	0.3	0.8	1.7	2.8	4.9	557	2.1	0.3	0.9	1.6	2.7	5.6	-	-	-	-	-	-	-
Nuts and seeds	3342	6.7	2.3	4.1	5.0	6.5	15.4	499	8.1	2.3	4.0	5.3	7.4	34.0	1442	9.6	2.3	4.2	5.0	8.0	34.9	302	5.9	1.3	3.5	4.6	5.9	15.4
Nuts and seeds (not plain)	1252	7.6	3.3	5.0	5.7	7.7	18.2	206	11.7	2.8	4.7	6.3	9.1	43.3	521	7.8	3.8	4.6	5.6	6.9	23.3	94	9.6	3.1	5.0	6.4	7.4	36.0
Nuts and seeds (plain)	1486	6.0	2.5	3.8	4.4	5.9	13.0	180	5.1	2.0	3.2	4.5	6.0	9.9	796	11.2	1.4	3.8	4.8	17.0	43.0	136	4.4	2.4	3.6	4.2	4.7	5.9
Nut butter	604	6.2	0.3	3.9	5.5	6.7	12.5	113	6.1	3.1	4.1	5.2	6.6	11.4	125	6.9	2.6	4.8	5.7	9.4	14.3	-	-	-	-	-	-	-
Pasta	1435	3.2	1.4	2.6	3.2	3.7	5.0	895	2.7	0.2	2.1	3.0	3.3	4.0	339	3.1	0.6	3.0	3.4	3.5	4.4	552	3.0	0.9	2.5	3.4	3.5	4.9
Whole grain pasta	55	3.4	2.8	3.0	3.1	3.5	6.0	128	3.0	0.9	2.8	3.1	3.5	4.3	66	3.4	1.3	3.1	3.5	4.0	4.7	49	3.2	2.4	3.3	3.5	3.5	3.5



	FRANCE							GERMANY							THE NETHERLANDS							BELGIUM						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Refined grain pasta	1380	3.2	1.4	2.6	3.2	3.7	5.0	767	2.7	0.2	2.0	3.0	3.2	4.0	273	3.0	0.6	3.0	3.4	3.5	3.9	503	2.9	0.7	2.3	3.3	3.5	5.0
Rice	781	0.6	0.0	0.1	0.3	0.5	1.6	315	0.4	0.0	0.1	0.2	0.5	1.4	313	0.8	0.0	0.0	0.3	0.6	2.0	199	0.7	0.0	0.1	0.4	0.5	2.0
Whole grain rice	77	0.8	0.0	0.5	0.7	0.9	1.7	63	0.8	0.0	0.4	0.6	1.2	1.9	71	0.7	0.0	0.4	0.6	0.7	1.4	34	0.6	0.0	0.2	0.5	0.8	1.9
Mixed grain rice	-	-	-	-	-	-	-	36	0.6	0.1	0.3	0.5	0.7	1.5	30	1.9	0.1	0.3	0.7	2.0	7.4	-	-	-	-	-	-	-
Refined grain rice	704	0.5	0.0	0.1	0.3	0.5	1.4	216	0.3	0.0	0.0	0.2	0.4	0.7	212	0.7	0.0	0.0	0.1	0.4	1.1	165	0.7	0.0	0.0	0.3	0.5	2.2
Sauces	542	5.9	1.0	3.4	5.0	6.2	20.0	110	19.4	5.0	12.9	17.0	23.8	40.1	849	9.1	0.3	3.4	5.2	9.0	37.1	1273	7.5	0.2	1.5	4.4	7.9	30.0
Meal sauces	370	5.0	1.2	4.0	5.1	5.9	8.0	-	-	-	-	-	-	-	198	5.3	3.2	4.0	5.0	6.2	8.0	1024	7.8	0.2	2.2	4.6	8.0	29.0
Cold sauces	172	7.8	0.7	1.6	4.4	12.5	23.8	110	19.4	5.0	12.9	17.0	23.8	40.1	651	10.3	0.1	2.9	5.8	12.0	39.2	249	6.5	0.1	0.5	1.5	6.8	33.7
Savoury snacks	1165	3.7	0.4	1.5	2.6	4.4	10.5	1311	4.8	0.3	1.4	2.5	4.4	21.0	952	4.3	0.4	1.3	2.9	5.9	13.0	612	4.6	0.3	1.0	2.7	4.8	14.5
Soups and stocks	778	1.6	0.4	0.9	1.4	2.1	3.2	-	-	-	-	-	-	-	662	1.9	0.3	0.7	1.3	2.8	4.6	414	2.3	0.3	0.9	1.7	2.7	4.5
Soups	778	1.6	0.4	0.9	1.4	2.1	3.2	-	-	-	-	-	-	-	632	2.0	0.5	0.8	1.4	2.9	4.7	-	-	-	-	-	-	-
Stocks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	0.4	0.1	0.1	0.4	0.5	1.5	-	-	-	-	-	-	-
Spreads	529	42.1	0.7	37.9	49.0	58.1	60.0	944	21.4	0.8	3.7	8.5	40.0	57.0	1256	28.2	0.7	4.4	26.7	54.0	65.0	-	-	-	-	-	-	-
Savoury spreads	89	1.5	0.0	0.5	1.2	2.1	3.7	453	4.1	0.1	2.0	3.8	5.7	8.4	562	4.3	0.5	1.6	4.0	5.9	8.8	453	3.8	0.3	1.2	2.5	4.4	9.1
Sweet spreads	440	50.4	35.8	40.0	54.0	59.0	60.0	491	37.4	5.7	26.8	39.0	50.0	59.0	694	47.5	14.4	36.2	53.0	57.5	68.0	391	47.1	4.7	38.5	52.0	57.8	65.4



Salt

	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bread	814	1.2	0.9	1.1	1.1	1.3	1.5	815	1.2	0.8	1.0	1.2	1.4	1.8	5643	1.1	0.5	0.9	1.0	1.1	1.8	539	1.4	0.8	1.0	1.2	1.4	2.3
Whole grain bread	239	1.2	0.9	1.1	1.1	1.3	1.5	179	1.1	0.9	1.0	1.1	1.2	1.5	555	0.9	0.7	0.9	0.9	1.0	1.2	100	1.3	0.8	1.0	1.1	1.2	1.7
Refined and mixed grain	575	1.2	0.9	1.0	1.1	1.3	1.5	304	1.3	1.0	1.0	1.2	1.4	1.8	3620	1.0	0.8	0.9	1.0	1.1	1.4	191	1.4	0.8	1.0	1.2	1.4	2.1
Other bread	-	-	-	-	-	-	-	332	1.3	0.7	1.0	1.2	1.4	1.9	1468	1.3	0.2	0.9	1.1	1.4	2.3	195	1.3	0.8	1.0	1.1	1.3	1.8
Bars	173	0.4	0.2	0.3	0.4	0.5	0.8	788	0.3	0.0	0.0	0.1	0.5	0.8	238	0.3	0.0	0.1	0.3	0.5	0.9	173	0.4	0.0	0.1	0.4	0.6	0.8
Breakfast cereals	652	0.5	0.0	0.1	0.4	0.7	1.4	639	0.2	0.0	0.0	0.1	0.3	0.9	534	0.3	0.0	0.0	0.1	0.4	1.1	347	0.4	0.0	0.0	0.3	0.8	1.0
Canned fruits	183	0.4	0.0	0.0	0.0	0.2	1.5	-	-	-	-	-	-	-								226	0.0	0.0	0.0	0.1	0.2	
Cheese	385	1.5	0.6	1.1	1.4	1.7	2.8	-	-	-	-	-	-	-	3226	1.8	0.9	1.5	1.8	2.0	2.6	2621	1.4	0.1	1.0	1.5	1.8	2.5
Solid and semi-solid cheese	162	1.4	0.6	0.9	1.4	1.8	2.2	-	-	-	-	-	-	-	2607	1.8	1.4	1.7	1.8	2.0	2.3	1000	1.7	0.7	1.5	1.7	1.9	2.4
Soft cheese	123	1.5	1.0	1.3	1.5	1.6	1.9	-	-	-	-	-	-	-	544	1.6	0.6	1.0	1.4	1.9	3.3	1088	1.0	0.1	0.5	1.1	1.4	2.1
Fresh cheese	39	1.3	0.4	0.7	1.0	1.7	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	249	1.3	0.3	1.0	1.3	1.7	2.7
Blue cheese	20	2.8	1.5	2.2	2.9	3.6	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69	2.3	1.2	1.6	2.1	3.6	3.7
Processed cheese	41	1.6	1.0	1.3	1.5	1.8	2.3	-	-	-	-	-	-	-	75	2.3	1.6	2.0	2.1	2.9	3.4	204	2.2	1.4	1.8	2.2	2.6	3.4
Compotes	754	0.3	0.0	0.0	0.0	0.2	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	163	0.0	0.0	0.0	0.0	0.0	0.0
Confectionery	2335	0.4	0.0	0.1	0.2	0.2	1.1	-	-	-	-	-	-	-	2684	0.2	0.0	0.1	0.2	0.2	0.6	2183	0.2	0.0	0.0	0.1	0.2	0.5
Candy, sweet sauces	273	0.5	0.0	0.0	0.1	0.4	2.6	-	-	-	-	-	-	-	723	0.2	0.0	0.0	0.1	0.2	0.8	1197	0.1	0.0	0.0	0.0	0.1	0.5
Chocolate	759	0.2	0.0	0.1	0.2	0.3	0.6	-	-	-	-	-	-	-	1485	0.2	0.0	0.1	0.2	0.3	0.6	986	0.2	0.0	0.1	0.2	0.3	0.5
Ice cream	1303	0.5	0.0	0.1	0.1	0.2	3.0	-	-	-	-	-	-	-	476	0.2	0.0	0.1	0.2	0.2	0.4	171	0.2	0.0	0.1	0.1	0.2	0.4
Convenience food	4489	0.9	0.5	0.7	0.9	1.1	1.6	1011	1.0	0.5	0.8	1.0	1.2	1.6	-	-	-	-	-	-	-	1378	0.9	0.4	0.7	0.9	1.1	1.5
Partly ready meals	3330	0.8	0.4	0.7	0.8	1.0	1.5	661	1.0	0.5	0.7	0.9	1.1	1.5	-	-	-	-	-	-	-	203	1.0	0.3	0.6	0.9	1.2	1.5



	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Ready to eat meals	523	1.1	0.4	0.8	1.1	1.4	1.8	215	1.1	0.5	0.9	1.1	1.4	1.9	-	-	-	-	-	-	-	894	0.8	0.3	0.6	0.8	1.0	1.5
Pizza	636	1.2	0.7	1.0	1.1	1.3	1.6	135	1.3	0.9	1.1	1.3	1.4	1.7	294	1.1	0.7	0.9	1.1	1.3	1.6	281	1.2	0.8	1.0	1.2	1.3	1.6
Dairy products	1153	0.2	0.1	0.1	0.1	0.2	0.3	1937	0.1	0.0	0.1	0.1	0.1	0.2	389	0.2	0.1	0.1	0.1	0.2	0.6	2180	0.2	0.1	0.1	0.1	0.2	0.3
Dairy products sweetened	493	0.2	0.1	0.1	0.1	0.1	0.2	1379	0.1	0.0	0.1	0.1	0.1	0.2	219	0.1	0.1	0.1	0.1	0.1	0.2	-	-	-	-	-	-	-
Dairy products unsweetened	142	0.1	0.1	0.1	0.1	0.1	0.2	558	0.1	0.0	0.1	0.1	0.1	0.2	38	0.1	0.1	0.1	0.1	0.1	0.2	-	-	-	-	-	-	-
Dairy desserts	518	0.2	0.1	0.1	0.2	0.2	0.4	-	-	-	-	-	-	-	132	0.3	0.1	0.1	0.2	0.4	0.8	551	0.2	0.1	0.1	0.1	0.2	0.3
Fats and oils	8088	0.2	0.0	0.0	0.0	0.0	2.0	1721	0.2	0.0	0.0	0.0	0.1	1.5	452	0.3	0.0	0.0	0.0	0.8	1.4	822	0.4	0.0	0.0	0.1	0.3	1.5
Vegetable fats and oils	5252	0.0	0.0	0.0	0.0	0.0	0.0	942	0.0	0.0	0.0	0.0	0.0	0.0	203	0.0	0.0	0.0	0.0	0.0	0.0	186	0.0	0.0	0.0	0.0	0.0	0.0
Animal fats	1356	0.9	0.0	0.0	0.2	2.0	2.8	357	0.6	0.0	0.0	0.0	1.3	2.4	46	0.6	0.0	0.0	0.1	1.0	2.5	128	0.3	0.0	0.0	0.1	0.3	1.2
Margarines	526	0.9	0.0	0.3	0.4	0.7	1.6	142	0.6	0.0	0.0	0.3	1.0	1.7	129	0.7	0.0	0.0	0.8	0.9	1.9	165	0.5	0.0	0.0	0.3	0.8	1.5
Cream	954	0.2	0.0	0.1	0.1	0.1	0.5	280	0.2	0.1	0.1	0.1	0.1	0.7	-	-	-	-	-	-	-	260	0.4	0.0	0.1	0.1	0.1	0.3
Baking fats (excl. oils)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74	0.6	0.0	0.0	0.6	1.1	1.5	-	-	-	-	-	-	-
Fine bakery products - sweet	2553	0.6	0.1	0.3	0.5	0.8	1.3	2074	0.5	0.1	0.2	0.4	0.6	1.1	6921	0.6	0.1	0.3	0.6	0.8	1.2	1791	0.7	0.1	0.3	0.6	0.9	1.8
Fish (and seafood)	13192	1.7	0.2	0.8	1.2	2.0	3.4	408	1.1	0.1	0.7	1.0	1.3	3.0	840	1.4	0.5	0.9	1.2	2.0	2.5	1726	1.1	0.0	0.1	0.8	1.4	3.0
Lean fish	2335	1.2	0.2	0.5	0.9	1.5	2.2	168	0.8	0.2	0.7	0.9	1.1	1.3	304	1.1	0.3	0.7	1.0	1.2	2.0	-	-	-	-	-	-	-
Fatty fish	9392	1.9	0.2	0.9	1.2	2.7	3.6	162	1.5	0.1	0.5	1.2	2.3	3.4	284	1.7	0.6	0.9	1.7	2.5	2.6	-	-	-	-	-	-	-
Seafood	1465	1.4	0.3	0.8	1.3	1.7	2.1	78	1.0	0.4	0.8	1.0	1.3	1.6	252	1.6	0.7	1.0	1.5	2.2	2.4	-	-	-	-	-	-	-
Meat	1110	2.8	1.3	1.7	2.1	4.2	5.6	546	2.5	1.3	1.8	2.1	3.1	5.0	4360	1.7	0.5	1.0	1.5	2.1	3.9	3440	2.0	0.1	1.0	1.8	2.6	4.9
Meat preparations (un)prepared	49	1.5	1.1	1.3	1.4	1.7	1.9	96	1.6	1.0	1.3	1.5	1.9	2.1	2748	1.2	0.4	0.9	1.2	1.6	2.2	-	-	-	-	-	-	-
Processed meat	1061	2.9	1.4	1.7	2.1	4.3	5.6	450	2.7	1.5	2.0	2.3	3.5	5.0	1612	2.5	1.3	1.9	2.2	3.0	4.7	-	-	-	-	-	-	-



(composed and single)	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Meat substitutes	677	1.1	0.0	0.8	1.1	1.3	1.9	361	1.6	0.9	1.3	1.6	1.9	2.4	557	1.4	0.7	1.1	1.4	1.7	2.1	-	-	-	-	-	-	-
Nuts and seeds	3342	0.6	0.0	0.0	0.1	1.0	2.0	499	0.6	0.0	0.0	0.0	1.0	2.1	1442	0.5	0.0	0.0	0.1	0.8	1.7	302	0.6	0.0	0.0	0.1	0.9	2.0
Nuts and seeds (not plain)	1252	1.4	0.3	0.8	1.0	1.6	2.5	206	1.2	0.0	0.8	1.2	1.7	2.4	521	1.1	0.6	0.8	0.9	1.4	2.0	94	1.1	0.0	0.7	1.0	1.7	2.2
Nuts and seeds (plain)	1486	0.0	0.0	0.0	0.0	0.0	0.1	180	0.0	0.0	0.0	0.0	0.0	0.1	796	0.0	0.0	0.0	0.0	0.0	0.1	136	0.0	0.0	0.0	0.0	0.0	0.1
Nut butter	604	0.5	0.0	0.0	0.1	0.7	1.1	113	0.2	0.0	0.0	0.0	0.4	1.0	125	0.6	0.3	0.6	0.6	0.6	1.0	-	-	-	-	-	-	-
Pasta	1435	0.0	0.0	0.0	0.0	0.0	0.1	895	0.1	0.0	0.0	0.0	0.0	0.2	339	0.0	0.0	0.0	0.0	0.0	0.1	552	0.3	0.0	0.0	0.0	0.5	1.5
Whole grain pasta	55	0.0	0.0	0.0	0.0	0.0	0.1	128	0.0	0.0	0.0	0.0	0.0	0.1	66	0.0	0.0	0.0	0.0	0.0	0.1	49	0.0	0.0	0.0	0.0	0.0	0.1
Refined grain pasta	1380	0.0	0.0	0.0	0.0	0.0	0.1	767	0.1	0.0	0.0	0.0	0.1	0.2	273	0.0	0.0	0.0	0.0	0.0	0.1	503	0.4	0.0	0.0	0.0	0.8	1.5
Rice	781	0.1	0.0	0.0	0.0	0.0	0.5	315	0.1	0.0	0.0	0.0	0.0	0.4	313	0.1	0.0	0.0	0.0	0.1	0.4	199	0.1	0.0	0.0	0.0	0.1	0.8
Whole grain rice	77	0.1	0.0	0.0	0.0	0.0	0.4	63	0.1	0.0	0.0	0.0	0.0	0.5	71	0.1	0.0	0.0	0.0	0.1	0.3	34	0.1	0.0	0.0	0.0	0.1	0.6
Mixed grain rice	-	-	-	-	-	-	-	36	0.0	0.0	0.0	0.0	0.0	0.0	30	0.1	0.0	0.0	0.0	0.1	0.4	-	-	-	-	-	-	-
Refined grain rice	704	0.1	0.0	0.0	0.0	0.0	0.5	216	0.1	0.0	0.0	0.0	0.0	0.4	212	0.1	0.0	0.0	0.0	0.1	0.5	165	0.1	0.0	0.0	0.0	0.1	0.8
Sauces	542	1.4	0.4	1.0	1.2	1.9	2.7	110	2.1	1.0	1.6	2.0	2.4	3.0	849	1.7	0.4	0.8	1.3	1.8	3.5	1273	2.8	0.2	0.9	1.2	2.0	10.0
Meal sauces	370	1.1	0.3	0.9	1.0	1.3	2.1	-	-	-	-	-	-	-	198	0.9	0.5	0.7	0.8	1.1	1.4	1024	3.2	0.4	0.9	1.3	2.1	14.0
Cold sauces	172	2.1	1.2	1.7	2.1	2.4	3.0	110	2.1	1.0	1.6	2.0	2.4	3.0	651	1.9	0.4	1.0	1.6	2.0	5.5	249	1.3	0.0	0.9	1.2	1.8	2.9
Savoury snacks	1165	1.7	0.9	1.2	1.5	2.0	3.1	1311	1.8	0.5	1.2	1.7	2.3	3.5	952	1.8	0.8	1.2	1.7	2.2	3.3	612	1.6	0.6	1.2	1.5	1.9	2.5
Soups and stocks	778	0.7	0.5	0.6	0.7	0.8	1.0	-	-	-	-	-	-	-	662	0.8	0.6	0.7	0.7	0.8	1.0	414	1.2	0.6	0.7	0.8	0.9	1.3
Soups	778	0.7	0.5	0.6	0.7	0.8	1.0	-	-	-	-	-	-	-	632	0.8	0.6	0.7	0.7	0.8	1.0	-	-	-	-	-	-	-



	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Stocks	-	-	-	-	-	-	-	-	-	-	-	-	-	30	0.8	0.5	0.8	0.9	0.9	1.0	-	-	-	-	-	-	-	
Spreads	529	0.6	0.0	0.0	0.0	0.7	3.3	944	0.7	0.0	0.0	0.3	1.3	2.0	1256	0.6	0.0	0.0	0.2	1.1	2.0	-	-	-	-	-	-	-
Savoury spreads	89	1.6	0.8	1.0	1.2	1.4	4.1	453	1.5	0.7	1.1	1.4	1.6	2.3	562	1.3	0.5	0.9	1.2	1.4	2.3	453	1.5	0.4	1.1	1.3	1.7	3.2
Sweet spreads	440	0.4	0.0	0.0	0.0	0.1	2.0	491	0.1	0.0	0.0	0.0	0.1	0.3	694	0.1	0.0	0.0	0.0	0.1	0.3	391	0.1	0.0	0.0	0.0	0.1	0.4



Proteins

	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bread	814	8.3	4.6	7.6	8.4	9.2	11.0	815	8.6	3.9	6.0	8.2	9.5	16.8	5643	9.8	6.4	8.3	9.4	11.0	14.3	539	8.2	3.9	7.1	8.1	9.1	12.0
Whole grain bread	239	8.7	4.9	8.0	8.6	9.7	11.3	179	6.3	4.4	5.3	5.7	7.5	8.8	555	10.4	6.5	9.5	10.5	11.5	13.2	100	9.0	4.3	6.7	8.6	10.6	16.5
Refined and mixed grain	575	8.2	3.8	7.5	8.3	9.0	10.6	304	8.5	6.5	7.9	8.5	9.0	10.5	3620	9.4	6.8	8.3	9.1	10.4	13.2	191	7.9	3.2	7.1	8.1	8.9	10.6
Other bread	-	-	-	-	-	-	-	332	9.9	2.9	5.7	9.0	12.9	21.7	1468	10.3	5.7	8.0	9.8	12.0	16.7	195	8.0	4.3	7.2	7.8	9.1	10.9
Bars	173	6.1	4.6	5.3	5.8	6.6	8.5	788	15.7	3.2	6.8	10.0	24.0	36.8	238	8.2	4.0	5.6	7.2	9.4	16.0	173	10.2	4.0	6.8	8.7	14.0	18.4
Breakfast cereals	652	8.5	6.0	7.4	8.3	9.3	12.0	639	10.9	6.8	8.9	10.1	12.0	16.0	534	10.3	6.5	8.5	9.8	11.1	14.8	347	9.3	5.5	7.5	8.7	11.0	14.0
Canned fruits	183	0.4	0.0	0.4	0.5	0.5	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	226	0.5	0.1	0.4	0.5	0.5	1.0
Cheese	385	19.5	6.8	16.0	19.0	25.0	29.0	-	-	-	-	-	-	-	3226	24.1	13.6	23.1	25.0	26.6	31.1	2621	17.4	5.3	9.5	18.0	24.0	29.0
Solid and semi-solid cheese	162	26.2	20.3	24.0	26.9	28.0	33.0	-	-	-	-	-	-	-	2607	26.1	22.9	24.4	25.8	27.0	31.5	1000	25.4	20.6	23.0	25.0	27.0	33.0
Soft cheese	123	18.6	16.0	17.0	19.0	20.0	22.0	-	-	-	-	-	-	-	544	15.4	5.3	13.4	17.0	19.0	23.0	1088	11.5	4.0	6.3	9.0	17.0	21.0
Fresh cheese	39	15.3	8.9	13.5	16.0	18.0	20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	249	15.0	8.0	10.0	16.0	19.0	24.0
Blue cheese	20	18.0	15.4	16.5	18.9	19.0	20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69	18.6	13.0	18.0	19.0	21.0	22.0
Processed cheese	41	10.8	8.0	9.0	9.0	13.0	15.0	-	-	-	-	-	-	-	75	19.4	13.0	15.0	21.4	21.8	22.8	204	12.9	8.5	11.0	13.0	15.0	17.0
Compotes	754	0.3	0.0	0.0	0.4	9.5	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	163	0.5	0.3	0.3	0.5	0.5	0.8
Confectionery	2335	4.1	0.2	2.3	3.8	6.0	8.7	-	-	-	-	-	-	-	2684	4.9	0.0	2.9	4.8	6.4	10.3	2183	4.1	0.0	0.3	4.4	6.8	8.8
Candy, sweet sauces	273	2.6	0.0	0.5	2.1	4.5	6.4	-	-	-	-	-	-	-	723	2.5	0.0	0.1	2.0	4.4	6.6	1197	2.0	0.0	0.0	0.5	3.3	6.6
Chocolate	759	6.9	3.8	5.7	7.0	8.0	9.8	-	-	-	-	-	-	-	1485	6.8	3.8	5.0	6.0	7.4	15.1	986	6.7	3.7	5.3	6.8	8.0	9.5
Ice cream	1303	2.7	0.1	1.8	3.0	3.8	4.7	-	-	-	-	-	-	-	476	2.8	0.1	1.7	3.2	3.7	4.5	171	3.1	0.7	2.2	3.3	4.0	5.4
Convenience food	4489	7.4	1.6	5.0	7.0	9.5	14.0	1011	6.0	2.0	4.0	5.4	7.7	11.4	-	-	-	-	-	-	-	1378	7.3	2.0	5.2	7.1	9.3	12.0
Partly ready meals	3330	7.2	1.6	4.7	6.5	8.9	15.0	661	5.4	2.0	3.8	5.0	6.4	10.7	-	-	-	-	-	-	-	203	7.0	1.3	4.0	5.8	9.0	13.0



	FRANCE							GERMANY							THE NETHERLANDS							BELGIUM						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Ready to eat meals	523	6.8	1.0	4.2	6.8	9.5	12.0	215	5.7	1.1	3.5	5.0	7.7	11.7	-	-	-	-	-	-	-	894	6.7	2.0	4.8	6.5	8.1	12.0
Pizza	636	9.2	5.1	7.8	9.4	10.9	12.5	135	9.4	5.9	8.3	9.9	10.7	12.0	294	9.5	6.2	8.8	9.7	10.5	11.7	281	9.4	7.0	8.3	9.5	10.2	12.0
Dairy products	1153	4.0	2.4	3.0	3.7	4.6	7.4	1937	3.1	0.3	2.5	3.4	3.9	5.4	389	3.9	1.9	2.7	3.4	4.6	6.3	2180	3.6	0.6	2.9	3.4	4.0	6.4
Dairy products sweetened	493	3.8	2.4	3.0	3.4	4.0	7.3	1379	3.4	0.6	2.9	3.4	4.0	5.6	219	3.6	1.7	2.4	3.4	4.1	6.6	-	-	-	-	-	-	-
Dairy products unsweetened	142	5.4	3.1	3.8	4.4	7.0	9.2	558	2.4	0.1	0.7	3.3	3.5	5.0	38	3.7	2.4	3.1	3.1	3.6	6.2	-	-	-	-	-	-	-
Dairy desserts	518	3.9	2.2	2.9	3.8	4.6	6.7	-	-	-	-	-	-	-	132	4.4	2.0	3.0	3.8	4.9	5.8	551	3.5	2.4	2.9	3.3	4.0	5.5
Fats and oils	8088	0.5	0.0	0.0	0.0	0.6	2.5	1721	0.6	0.0	0.0	0.0	0.7	2.8	452	0.3	0.0	0.0	0.0	0.5	1.0	822	1.2	0.0	0.0	0.6	2.1	3.6
Vegetable fats and oils	5252	0.0	0.0	0.0	0.0	0.0	0.1	942	0.0	0.0	0.0	0.0	0.0	0.0	203	0.0	0.0	0.0	0.0	0.0	0.0	186	0.1	0.0	0.0	0.0	0.0	0.5
Animal fats	1356	0.7	0.0	0.6	0.6	0.7	1.0	357	0.8	0.0	0.6	0.7	1.0	1.9	46	0.7	0.4	0.6	0.7	0.7	1.0	128	0.8	0.0	0.5	0.7	1.0	1.9
Margarines	526	0.3	0.0	0.0	0.0	0.5	1.5	142	0.6	0.0	0.0	0.5	0.8	1.3	129	0.5	0.0	0.0	0.5	0.9	1.4	165	0.4	0.0	0.0	0.5	0.5	0.9
Cream	954	2.5	1.2	2.2	2.4	2.7	3.3	280	2.5	0.5	2.3	2.5	2.8	3.8	-	-	-	-	-	-	-	260	2.9	1.9	2.1	2.5	3.0	4.5
Baking fats (excl. oils)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74	0.2	0.0	0.0	0.0	0.5	0.6	-	-	-	-	-	-	-
Fine bakery products - sweet	2553	6.3	3.3	5.3	6.4	7.3	9.0	2074	6.7	3.4	5.2	6.4	7.6	10.1	6921	5.4	2.4	3.8	5.2	6.7	9.2	1791	6.7	3.1	4.9	6.1	7.7	12.0
Fish (and seafood)	13192	17.8	7.5	13.0	18.9	22.0	26.0	408	15.5	8.7	11.7	14.0	19.3	24.5	840	15.7	9.9	12.7	15.8	18.7	22.0	1726	13.5	0.0	7.3	16.0	20.0	25.0
Lean fish	2335	12.3	5.8	8.2	12.0	15.2	19.4	168	12.9	9.5	11.0	12.1	14.0	18.1	304	14.2	8.4	11.9	13.1	16.0	24.0	-	-	-	-	-	-	-
Fatty fish	9392	19.5	10.0	16.0	21.0	23.0	26.0	162	18.9	8.7	15.1	20.0	23.0	25.2	284	17.9	13.0	15.3	18.4	21.0	22.0	-	-	-	-	-	-	-
Seafood	1465	15.9	6.3	12.6	17.0	20.0	22.3	78	13.9	7.5	10.9	14.0	17.0	19.9	252	15.2	9.9	12.2	15.5	18.0	20.0	-	-	-	-	-	-	-
Meat	1110	20.1	11.0	15.3	20.0	24.0	30.0	546	17.8	11.9	14.0	17.0	21.0	27.0	4360	17.1	11.1	14.2	16.9	19.7	24.0	3440	19.4	10.0	16.0	19.2	22.7	30.0
Meat preparations (un)prepared	49	12.3	9.5	11.0	12.4	13.7	15.0	96	15.9	12.6	14.0	15.9	17.3	19.6	2748	16.9	11.6	15.0	16.9	18.8	22.1	-	-	-	-	-	-	-



	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Processed meat (composed and single)	1061	20.4	11.1	16.0	20.0	24.3	30.0	450	18.2	11.8	14.0	18.9	21.5	27.0	1612	17.7	11.0	13.2	17.0	21.0	28.0	-	-	-	-	-	-	-
Meat substitutes	677	13.6	4.6	8.4	14.0	17.0	22.5	361	16.5	5.2	10.3	16.0	22.0	29.7	557	13.1	4.6	8.8	14.0	17.0	20.0	-	-	-	-	-	-	-
Nuts and seeds	3342	20.4	9.9	17.1	21.0	25.0	28.0	499	19.6	9.5	15.9	20.0	24.0	28.8	1442	18.1	8.4	14.0	19.0	21.7	26.0	302	19.1	9.0	15.0	18.6	22.0	28.0
Nuts and seeds (not plain)	1252	20.7	10.8	18.1	20.9	25.0	27.0	206	18.8	8.4	14.3	20.0	24.0	26.7	521	18.7	8.8	14.0	19.7	23.2	25.8	94	18.1	8.0	14.0	19.0	24.0	27.0
Nuts and seeds (plain)	1486	18.9	9.2	15.0	19.6	22.0	27.0	180	18.4	11.0	15.5	17.9	21.0	26.4	796	17.2	8.4	13.9	16.9	21.0	25.8	136	17.9	9.2	15.0	17.0	21.0	26.0
Nut butter	604	23.5	12.7	21.1	25.0	26.5	30.0	113	22.9	13.5	20.0	23.2	26.7	30.0	125	21.9	17.2	20.5	22.4	23.1	26.6	-	-	-	-	-	-	-
Pasta	1435	12.6	10.8	12.0	12.3	13.5	15.0	895	12.3	6.6	12.0	12.5	13.5	15.0	339	13.2	10.5	12.0	13.0	14.0	19.0	552	11.6	6.3	11.0	12.0	13.0	14.0
Whole grain pasta	55	12.7	11.0	12.0	12.6	13.0	15.0	128	12.7	11.1	12.0	13.0	14.0	15.0	66	12.8	11.0	12.0	13.0	13.5	14.0	49	13.2	11.3	13.0	13.5	14.0	15.0
Refined grain pasta	1380	12.6	10.5	12.0	12.2	13.5	15.0	767	12.3	6.4	11.8	12.5	13.5	15.0	273	13.3	10.5	12.0	12.5	14.0	19.6	503	11.4	6.3	10.0	12.0	13.0	14.0
Rice	781	7.4	3.7	6.9	7.4	8.0	9.7	315	7.2	3.2	6.8	7.4	8.4	9.8	313	7.0	2.8	6.3	7.0	8.1	11.1	199	5.8	3.0	3.7	6.7	7.5	8.2
Whole grain rice	77	7.5	3.4	7.0	7.8	8.4	10.2	63	7.5	3.9	7.3	7.8	8.5	9.5	71	7.5	3.8	6.9	6.9	8.6	12.7	34	6.5	3.7	3.9	7.6	8.1	9.7
Mixed grain rice	-	-	-	-	-	-	-	36	9.4	6.9	8.2	9.0	10.1	14.2	30	9.1	2.9	6.7	8.7	10.8	14.7	-	-	-	-	-	-	-
Refined grain rice	704	7.4	3.7	6.8	7.4	7.9	9.6	216	6.8	3.1	6.7	7.1	7.6	9.0	212	6.5	2.6	5.8	7.0	8.1	8.8	165	5.7	3.0	3.5	6.6	7.4	8.0
Sauces	542	1.9	0.6	1.1	1.4	2.0	4.9	110	1.3	0.5	1.0	1.3	1.7	2.7	849	1.7	0.3	0.9	1.3	2.0	4.9	1273	2.5	0.3	1.0	1.4	2.5	7.9
Meal sauces	370	2.2	1.0	1.3	1.6	3.1	5.2	-	-	-	-	-	-	-	198	1.9	1.0	1.3	1.5	2.1	4.0	1024	2.8	0.4	1.1	1.5	3.5	8.1
Cold sauces	172	1.0	0.3	0.7	1.0	1.3	1.8	110	1.3	0.5	1.0	1.3	1.7	2.7	651	1.7	0.3	0.7	1.2	1.8	5.4	249	1.1	0.1	0.7	1.1	1.3	2.0
Savoury snacks	1165	8.5	4.0	6.0	7.6	10.8	16.0	1311	9.4	4.0	5.7	6.8	11.0	21.0	952	7.1	2.3	5.0	6.5	8.0	14.0	612	8.7	3.0	5.7	6.5	10.1	22.0



	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Soups and stocks	778	1.2	0.5	0.7	0.9	1.2	3.9	-	-	-	-	-	-	-	662	1.6	0.5	0.9	1.3	2.0	3.9	414	1.5	0.5	0.7	0.9	1.4	4.9
Soups	778	1.2	0.5	0.7	0.9	1.2	3.9	-	-	-	-	-	-	-	632	1.7	0.6	1.0	1.4	2.1	4.0	-	-	-	-	-	-	-
Stocks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	0.4	0.1	0.1	0.3	0.5	1.3	-	-	-	-	-	-	-
Spreads	529	1.9	0.0	0.4	0.6	1.1	9.9	944	4.4	0.0	1.0	4.0	6.1	10.6	1256	3.3	0.3	0.6	2.7	5.7	7.8	-	-	-	-	-	-	-
Savoury spreads	89	7.1	1.4	2.8	7.1	10.5	14.3	453	4.9	1.3	3.3	4.5	6.1	9.8	562	4.8	1.0	2.0	5.4	6.5	8.6	453	5.8	0.8	1.8	5.3	7.3	14.5
Sweet spreads	440	0.8	0.0	0.3	0.5	0.7	4.0	491	3.9	0.0	0.5	1.1	6.2	13.1	694	2.0	0.3	0.5	0.7	3.1	6.2	391	2.1	0.3	0.5	0.6	3.4	6.7



Fibres

	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Bread	814	4.5	1.8	2.8	4.0	5.9	9.0	815	7.7	2.6	4.1	6.9	9.8	19.0	5643	4.3	1.4	2.2	3.7	5.7	8.9	539	3.9	1.6	2.3	3.0	4.8	8.6
Whole grain bread	239	6.4	4.2	5.0	6.4	7.2	10.1	179	9.0	6.0	8.0	9.2	10.2	11.5	555	6.9	5.1	6.3	6.8	7.4	8.1	100	6.7	3.5	4.8	6.9	8.2	12.5
Refined and mixed grain	575	3.6	1.5	2.5	3.1	4.3	7.3	304	4.5	2.5	3.0	4.0	5.5	8.2	3620	3.6	1.4	2.1	3.3	4.7	7.1	191	3.4	1.7	2.4	3.0	3.9	6.6
Other bread	-	-	-	-	-	-	-	332	10.0	3.1	5.5	8.7	13.2	21.0	1468	4.9	1.3	2.2	3.5	6.5	12.8	195	3.1	1.4	1.9	2.3	3.4	7.2
Bars	173	4.5	2.0	3.5	4.2	4.8	7.9	788	8.4	1.8	5.0	6.7	10.0	23.2	238	8.4	2.5	4.5	6.3	9.9	24.0	173	7.7	2.5	5.0	6.7	9.1	17.0
Breakfast cereals	652	6.7	2.5	5.0	6.5	8.4	11.1	639	8.5	4.0	6.9	8.7	10.0	13.0	534	8.8	3.0	6.2	8.5	11.0	16.0	347	7.6	3.0	4.6	6.7	9.1	13.6
Canned fruits	183	1.3	0.6	0.8	1.1	1.6	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	226	0.9	0.3	0.7	0.9	1.1	1.7
Cheese	385	0.2	0.0	0.0	0.0	0.5	1.2	-	-	-	-	-	-	-	3226	0.1	0.0	0.0	0.0	0.0	0.4	2621	0.3	0.0	0.0	0.2	0.4	0.9
Solid and semi-solid cheese	162	0.3	0.0	0.0	0.0	0.0	1.5	-	-	-	-	-	-	-	2607	0.0	0.0	0.0	0.0	0.0	0.0	1000	0.1	0.0	0.0	0.1	0.2	0.5
Soft cheese	123	0.2	0.0	0.0	0.0	0.1	1.2	-	-	-	-	-	-	-	544	0.3	0.0	0.0	0.0	0.5	1.5	1088	0.3	0.0	0.2	0.2	0.4	0.6
Fresh cheese	39	0.1	0.0	0.0	0.0	0.1	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	249	0.3	0.0	0.0	0.3	0.3	0.5
Blue cheese	20	0.0	0.0	0.0	0.0	0.0	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69	0.1	0.0	0.0	0.1	0.1	0.5
Processed cheese	41	0.5	0.0	0.0	0.5	1.0	1.7	-	-	-	-	-	-	-	75	0.0	0.0	0.0	0.0	0.0	0.0	204	0.9	0.0	0.9	0.9	0.9	0.9
Compotes	754	1.8	1.3	1.5	1.8	2.0	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	163	1.6	0.9	1.0	1.6	1.9	2.8
Confectionery	2335	2.4	0.0	0.5	1.1	2.5	9.7	-	-	-	-	-	-	-	2684	2.8	0.0	0.3	1.5	3.2	10.0	2183	3.1	0.0	0.2	2.8	3.6	10.0
Candy, sweet sauces	273	1.8	0.0	0.0	0.5	0.9	7.4	-	-	-	-	-	-	-	723	2.3	0.0	0.0	0.2	1.1	10.0	1197	2.3	0.0	0.1	0.7	2.9	10.0
Chocolate	759	4.7	0.4	1.6	3.0	7.6	12.4	-	-	-	-	-	-	-	1485	3.7	0.1	1.6	2.6	4.2	10.8	986	4.0	0.3	2.3	3.1	4.7	10.6
Ice cream	1303	1.1	0.1	0.4	0.9	1.5	2.7	-	-	-	-	-	-	-	476	1.0	0.0	0.2	0.4	1.1	2.8	171	1.5	0.0	0.5	1.2	1.7	2.8
Convenience food	4489	2.0	0.6	1.2	1.8	2.5	4.0	1011	2.1	0.7	1.3	1.8	2.5	4.7	-	-	-	-	-	-	-	1378	1.6	0.5	1.1	1.5	2.0	3.0
Partly ready meals	3330	1.9	0.5	1.1	1.7	2.4	4.2	661	2.0	0.6	1.2	1.6	2.4	4.4	-	-	-	-	-	-	-	203	1.9	0.9	1.3	1.8	2.1	3.3



	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Ready to eat meals	523	2.4	1.1	1.8	2.4	3.0	4.1	215	2.6	0.9	1.5	2.4	3.5	5.0	-	-	-	-	-	-	-	894	1.5	0.5	0.9	1.3	1.9	3.0
	636	2.0	0.8	1.4	2.0	2.5	3.2	135	2.0	0.9	1.7	2.0	2.2	3.3	294	1.7	0.3	1.1	1.7	2.1	2.7	281	1.9	1.2	1.6	1.9	2.1	3.0
Dairy products	1153	0.7	0.0	0.0	0.4	1.0	2.4	1937	0.4	0.0	0.0	0.2	0.5	1.5	389	0.7	0.0	0.1	0.4	0.8	2.2	2180	0.5	0.0	0.1	0.5	0.7	1.6
Dairy products sweetened	493	0.4	0.0	0.0	0.2	0.5	1.4	1379	0.5	0.0	0.1	0.3	0.6	1.6	219	0.4	0.0	0.0	0.2	0.5	1.3	-	-	-	-	-	-	-
Dairy products unsweetened	142	0.2	0.0	0.0	0.0	0.1	1.3	558	0.3	0.0	0.0	0.0	0.5	1.0	38	0.2	0.0	0.0	0.0	0.3	1.0	-	-	-	-	-	-	-
Dairy desserts	518	1.1	0.0	0.3	0.9	1.6	3.1	-	-	-	-	-	-	-	132	1.2	0.0	0.3	0.7	1.5	3.0	551	0.7	0.1	0.4	0.6	1.0	1.9
Fats and oils	8088	0.0	0.0	0.0	0.0	0.0	0.0	1721	0.0	0.0	0.0	0.0	0.0	0.0	452	0.1	0.0	0.0	0.0	0.0	0.6	822	0.2	0.0	0.0	0.2	0.2	0.5
Vegetable fats and oils	5252	0.0	0.0	0.0	0.0	0.0	0.0	942	0.0	0.0	0.0	0.0	0.0	0.0	203	0.0	0.0	0.0	0.0	0.0	0.0	186	0.1	0.0	0.0	0.0	0.1	0.5
Animal fats	1356	0.0	0.0	0.0	0.0	0.0	0.0	357	0.0	0.0	0.0	0.0	0.0	0.0	46	0.0	0.0	0.0	0.0	0.0	0.0	128	0.1	0.0	0.1	0.1	0.1	0.5
Margarines	526	0.0	0.0	0.0	0.0	0.0	0.0	142	0.0	0.0	0.0	0.0	0.0	0.0	129	0.3	0.0	0.0	0.2	0.5	0.7	165	0.2	0.0	0.2	0.2	0.2	0.5
Cream	954	0.0	0.0	0.0	0.0	0.0	0.0	280	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	260	0.2	0.0	0.1	0.2	0.2	0.5
Baking fats (excl. oils)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74	0.0	0.0	0.0	0.0	0.0	0.5	-	-	-	-	-	-	-
Fine bakery products - sweet	2553	2.7	1.0	1.8	2.4	3.4	5.5	2074	3.5	0.9	1.9	2.9	4.2	7.8	6921	2.3	0.4	1.0	1.7	3.0	6.0	1791	3.2	0.8	1.5	2.4	3.6	9.0
Fish (and seafood)	13192	0.1	0.0	0.0	0.0	0.0	0.9	408	0.4	0.0	0.0	0.2	0.8	1.4	840	0.4	0.0	0.0	0.2	0.6	1.7	1726	0.3	0.0	0.0	0.1	0.5	1.1
Lean fish	2335	0.3	0.0	0.0	0.0	0.4	1.3	168	0.7	0.0	0.0	0.6	0.9	1.6	304	0.7	0.0	0.2	0.6	0.9	2.1	-	-	-	-	-	-	-
Fatty fish	9392	0.1	0.0	0.0	0.0	0.0	0.5	162	0.3	0.0	0.0	0.0	0.5	1.2	284	0.3	0.0	0.0	0.2	0.5	1.4	-	-	-	-	-	-	-
Seafood	1465	0.1	0.0	0.0	0.0	0.0	0.5	78	0.3	0.0	0.0	0.0	0.2	1.6	252	0.3	0.0	0.0	0.0	0.3	1.0	-	-	-	-	-	-	-
Meat	1110	0.4	0.0	0.0	0.0	0.5	1.5	546	0.5	0.0	0.0	0.5	0.5	1.4	4360	0.5	0.0	0.0	0.2	0.7	1.8	3440	0.5	0.0	0.0	0.5	0.7	1.5
Meat preparations (un)prepared	49	2.0	1.0	1.5	1.8	2.3	4.2	96	0.8	0.0	0.4	0.6	1.0	1.8	2748	0.6	0.0	0.1	0.4	0.9	2.1	-	-	-	-	-	-	-
Processed meat	1061	0.3	0.0	0.0	0.0	0.5	1.0	450	0.4	0.0	0.0	0.3	0.5	1.0	1612	0.2	0.0	0.0	0.1	0.3	1.3	-	-	-	-	-	-	-



(composed and single)	FRANCE							GERMANY							THE NETHERLANDS							BELGIUM						
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Meat substitutes	677	4.0	0.4	2.4	4.0	5.4	8.0	361	4.0	1.0	2.5	3.8	5.1	7.3	557	4.1	0.8	2.5	4.0	5.5	7.3	-	-	-	-	-	-	-
Nuts and seeds	3342	7.2	2.8	4.5	7.5	9.5	11.0	499	7.3	3.0	5.3	7.2	9.2	12.1	1442	6.9	3.0	5.0	6.7	7.6	10.9	302	8.0	2.8	5.7	7.6	9.7	13.4
Nuts and seeds (not plain)	1252	6.6	2.6	4.5	7.2	8.5	10.0	206	7.2	3.0	5.0	7.4	9.2	12.5	521	6.0	2.8	4.3	6.3	7.1	9.5	94	5.7	2.3	3.2	5.9	7.6	9.8
Nuts and seeds (plain)	1486	7.5	3.3	5.7	8.2	9.9	11.2	180	7.1	3.0	4.9	6.7	9.0	12.0	796	7.3	3.7	5.2	6.7	7.6	11.2	136	7.9	3.3	6.7	8.1	9.9	10.7
Nut butter	604	7.5	1.0	6.2	7.6	9.2	12.0	113	7.7	3.0	6.1	7.7	9.3	11.4	125	7.9	4.7	6.5	7.5	8.0	11.6	-	-	-	-	-	-	-
Pasta	1435	3.5	2.0	3.0	3.0	3.6	7.4	895	3.8	1.6	3.0	3.1	3.5	8.6	339	4.2	1.6	2.9	3.0	5.5	8.9	552	3.1	1.3	2.5	2.8	3.1	6.8
Whole grain pasta	55	7.2	4.7	6.0	7.3	8.0	9.3	128	8.0	5.7	6.8	8.0	8.9	11.0	66	7.2	5.0	6.8	7.0	8.0	8.9	49	6.8	5.0	6.8	6.8	6.8	8.0
Refined grain pasta	1380	3.3	2.0	3.0	3.0	3.6	6.0	767	3.1	1.6	2.9	3.0	3.3	4.1	273	3.4	1.6	2.6	3.0	3.5	8.0	503	2.7	1.3	2.4	2.6	3.0	3.6
Rice	781	1.7	0.0	0.8	1.4	1.9	4.6	315	2.0	0.5	1.1	1.5	2.4	4.2	313	2.4	0.6	1.1	1.6	3.0	6.2	199	1.5	0.5	1.0	1.2	1.6	4.4
Whole grain rice	77	3.4	0.4	2.4	3.5	4.4	5.6	63	3.2	1.4	2.0	3.2	4.0	6.4	71	4.0	1.9	3.0	3.0	5.8	9.6	34	3.1	1.0	2.0	3.2	4.4	4.5
Mixed grain rice	-	-	-	-	-	-	-	36	2.7	1.3	1.9	2.2	3.2	5.4	30	3.0	1.0	1.6	3.1	4.3	5.7	-	-	-	-	-	-	-
Refined grain rice	704	1.5	0.0	0.7	1.3	1.6	4.4	216	1.5	0.5	1.0	1.4	1.8	3.3	212	1.8	0.5	1.0	1.3	1.9	4.2	165	1.2	0.5	0.9	1.0	1.2	2.5
Sauces	542	1.5	0.2	0.6	1.5	2.3	3.2	110	1.8	0.5	1.0	1.4	1.8	5.5	849	1.2	0.0	0.3	1.0	1.5	3.1	1273	1.2	0.0	0.5	0.9	1.5	3.2
Meal sauces	370	1.9	0.5	1.4	1.9	2.5	3.3	-	-	-	-	-	-	-	198	1.3	0.8	1.0	1.2	1.5	2.5	1024	1.4	0.2	0.6	1.0	1.6	3.5
Cold sauces	172	0.8	0.1	0.3	0.5	1.0	1.9	110	1.8	0.5	1.0	1.4	1.8	5.5	651	1.1	0.0	0.2	0.7	1.5	3.4	249	0.3	0.0	0.1	0.3	0.5	1.0
Savoury snacks	1165	3.1	0.8	1.8	3.0	4.2	5.5	1311	6.4	2.0	3.4	4.5	7.7	16.2	952	3.4	0.8	2.0	3.1	4.3	6.6	612	3.3	0.5	1.1	2.9	4.2	8.6
Soups and stocks	778	1.0	0.2	0.6	0.9	1.3	1.9	-	-	-	-	-	-	-	662	0.9	0.2	0.5	0.6	1.0	2.8	414	1.2	0.2	0.6	0.9	1.3	3.4
Soups	778	1.0	0.2	0.6	0.9	1.3	1.9	-	-	-	-	-	-	-	632	0.9	0.2	0.5	0.6	1.0	2.8	-	-	-	-	-	-	-



	FRANCE						GERMANY						THE NETHERLANDS						BELGIUM									
	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95	N	Mean	P5	P25	P50	P75	P95
Stocks	-	-	-	-	-	-	-	-	-	-	-	-	-	30	0.2	0.0	0.0	0.1	0.5	0.5	-	-	-	-	-	-	-	
Spreads	529	1.9	0.5	1.0	1.4	2.3	4.4	944	3.6	0.5	1.7	2.6	4.2	9.4	1256	2.8	0.3	1.0	2.0	3.8	7.3	-	-	-	-	-	-	-
Savoury spreads	89	2.4	0.0	0.9	1.6	4.2	5.8	453	2.9	0.5	1.9	2.5	3.6	7.0	562	2.9	0.2	0.8	2.4	4.2	7.3	453	2.5	0.2	1.1	1.8	3.5	5.6
Sweet spreads	440	1.7	0.7	1.0	1.4	2.2	3.6	491	4.1	0.8	1.6	2.8	4.7	11.0	694	2.8	0.8	1.2	1.8	3.4	7.2	391	2.5	0.5	1.1	1.8	3.6	6.6



Algorithm modifications – recap

1. Recap of the update in the main algorithm

1.1. Unfavourable components – A point allocation

POINTS	Energy (kJ per 100 g)	Sugars (g per 100 g)	Saturates (g per 100 g)	Salt (g per 100 g)
0	≤ 335	≤ 3.4	≤ 1	≤ 0.2
1	> 335	> 3.4	> 1	> 0.2
2	> 670	> 6.8	> 2	> 0.4
3	> 1005	> 10	> 3	> 0.6
4	> 1340	> 14	> 4	> 0.8
5	> 1675	> 17	> 5	> 1
6	> 2010	> 20	> 6	> 1.2
7	> 2345	> 24	> 7	> 1.4
8	> 2680	> 27	> 8	> 1.6
9	> 3015	> 31	> 9	> 1.8
10	> 3350	> 34	> 10	> 2
11		> 37		> 2.2
12		> 41		> 2.4
13		> 44		> 2.6
14		> 48		> 2.8
15		> 51		> 3
16				> 3.2
17				> 3.4
18				> 3.6
19				> 3.8
20				> 4

1.2. Favourable components – C points allocation

1.2.1. Point allocation

POINTS	Proteins (g per 100 g)	Fibres (g per 100 g)	Fruit, vegetables and legumes (%)
0	≤ 2.4	≤ 3.0	≤ 40
1	> 2.4	> 3.0	> 40
2	> 4.8	> 4.1	> 60
3	> 7.2	> 5.2	-
4	> 9.6	> 6.3	-
5	> 12	> 7.4	> 80
6	> 14		
7	> 17		



For red meat products, the **number of maximum protein points is set at 2 points**

Red meat products qualifying for this specific rule are products from beef, veal, swine and lamb, though they include also game/venison, horse, donkey, goat, camel and kangaroo.

1.2.2. Ingredients contributing to the ‘Fruit, vegetables and legumes’ component

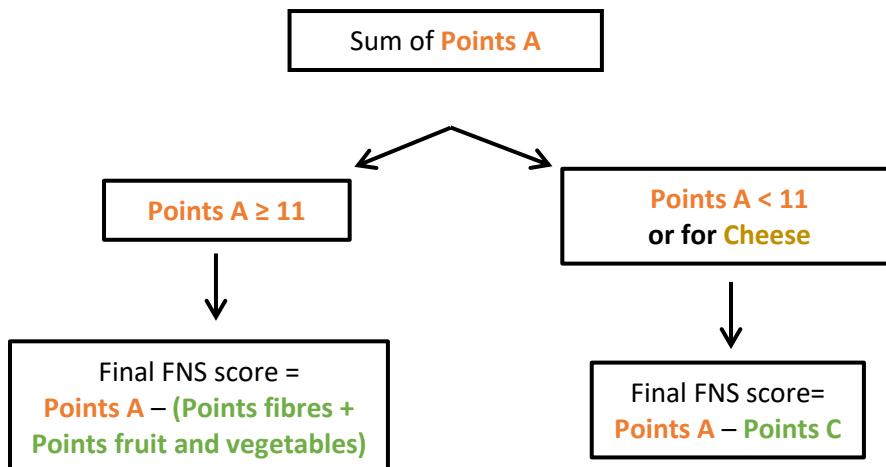
The list of ingredients qualifying for the “Fruit, vegetables and legumes” component has been revised to include the following Eurocodes:

- Vegetables groups
 - 8.10 (Leaf vegetables);
 - 8.15 (Brassicas);
 - 8.20 (Stalk vegetables);
 - 8.25 (Shoot vegetables);
 - 8.30 (Onion-family vegetables);
 - 8.38 (Root vegetables);
 - 8.40 (Fruit vegetables);
 - 8.42 (Flower-head vegetables);
 - 8.45 (Seed vegetables and immature pulses);
 - 8.50 (Edible fungi);
 - 8.55 (Seaweeds and algae);
 - 8.60 (Vegetable mixtures)
- Fruits groups
 - 9.10 (Malaceous fruit);
 - 9.20 (Prunus species fruit);
 - 9.25 (Other stone fruit);
 - 9.30 (Berries);
 - 9.40 (Citrus fruit);
 - 9.50 (Miscellaneous fruit);
 - 9.60 (Fruit mixtures).
- Pulses groups
 - 7.10 (Pulses).

NB: nuts and oils as ingredients are no longer considered within the general algorithm for the fruit, vegetables and oils component.



1.3. Algorithm computation



1.4. Final Nutri-Score thresholds

FNS points	Class	Colour
Min to 0	A	Dark green
1 to 2	B	Light green
3 to 10	C	Yellow
11 to 18	D	Light Orange
19 to Max	E	Dark orange



2. Recap of the update for the fats, oils, nuts and seeds category

2.1. Products in the category

This category includes fats and oils from plant or animal sources, including cream, margarines, butters and oils (as the current situation).

Additionally, the following products are included in this category, using the Harmonized System Nomenclature¹ codes:

- Nuts: 0801 0802
- Processed nuts: 200811 200819
- Ground nuts: 1202
- Seeds: 1204 (linseed) 1206 (sunflower) 1207 (other seeds)

Of note *chestnuts* are excluded from the category.

2.2. Unfavourable components – A points allocation

POINTS	Energy from saturates (kJ per 100 g)*	Sugars (g per 100 g)	Saturates/lipids (%)	Salt (g per 100 g)
0	≤ 120	≤ 3.4	< 10	≤ 0.2
1	> 120	> 3.4	< 16	> 0.2
2	> 240	> 6.8	< 22	> 0.4
3	> 360	> 10	< 28	> 0.6
4	> 480	> 14	< 34	> 0.8
5	> 600	> 17	< 40	> 1.0
6	> 720	> 20	< 46	> 1.2
7	> 840	> 24	< 52	> 1.4
8	> 960	> 27	< 58	> 1.6
9	> 1080	> 31	< 64	> 1.8
10	> 1200	> 34	≥ 64	> 2.0
11		> 37		> 2.2
12		> 41		> 2.4
13		> 44		> 2.6
14		> 48		> 2.8
15		> 51		> 3.0
16				> 3.2
17				> 3.4
18				> 3.6
19				> 3.8
20				> 4.0

*Energy from saturates is retrieved from the mandatory back-of-pack nutritional declaration as:

$$\text{Energy from saturates} = \text{Saturates} \left(\frac{\text{g}}{100\text{g}} \right) \times 37$$

¹ <http://www.wcoomd.org/en/topics/nomenclature.aspx>



2.3. Favourable components – C points allocation

2.3.1. Point allocation

POINTS	Proteins (g per 100g)	Fibres (g per 100 g)	Fruit, vegetables and legumes (%)
0	≤ 2.4	≤ 3.0	≤ 40
1	> 2.4	> 3.0	> 40
2	> 4.8	> 4.1	> 60
3	> 7.2	> 5.2	-
4	> 9.6	> 6.3	-
5	> 12	> 7.4	> 80
6	> 14		
7	> 17		

2.3.2. Ingredients contributing to the ‘Fruit, vegetables and legumes’ component

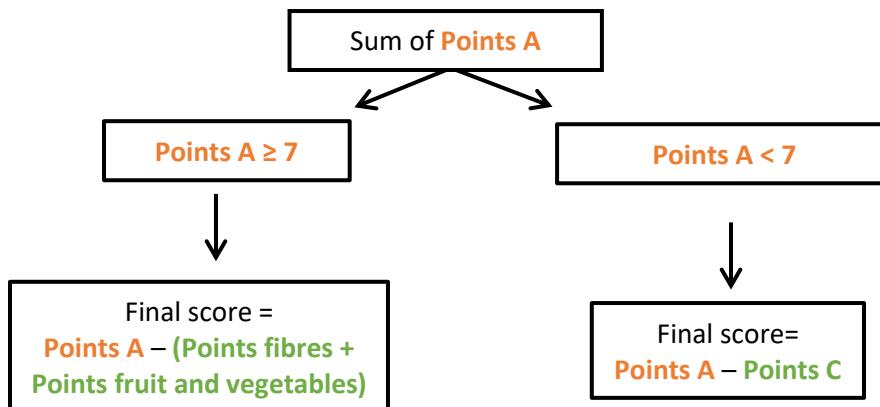
The list of ingredients qualifying for the “Fruit, vegetables and legumes” component has been revised to include the following Eurocodes:

- Vegetables groups
 - 8.10 (Leaf vegetables);
 - 8.15 (Brassicaceae);
 - 8.20 (Stalk vegetables);
 - 8.25 (Shoot vegetables);
 - 8.30 (Onion-family vegetables);
 - 8.38 (Root vegetables);
 - 8.40 (Fruit vegetables);
 - 8.42 (Flower-head vegetables);
 - 8.45 (Seed vegetables and immature pulses);
 - 8.50 (Edible fungi);
 - 8.55 (Seaweeds and algae);
 - 8.60 (Vegetable mixtures).
- Fruits groups
 - 9.10 (Malaceous fruit);
 - 9.20 (Prunus species fruit);
 - 9.25 (Other stone fruit);
 - 9.30 (Berries);
 - 9.40 (Citrus fruit);
 - 9.50 (Miscellaneous fruit);
 - 9.60 (Fruit mixtures).
- Pulses groups
 - 7.10 (Pulses).

Additionally, in the fats and oils category specifically, oils derived from ingredients in the list qualify for the component (e.g. olive and avocado).



2.4. Algorithm computation



2.1. Final Nutri-Score thresholds

FNS points	Class	Colour
Min to -6	A	Dark green
-5 to 2	B	Light green
3 to 10	C	Yellow
11 to 18	D	Light Orange
19 to Max	E	Dark orange