

Ability of the front-of-pack nutrition label Nutri-Score to discriminate nutritional quality of food products in 7 European countries (Spain, Switzerland, Belgium, Italy, UK, Netherlands and Sweden) and consistency with nutritional recommendations

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This report describes the ability of the Front-of-Pack nutrition Label (FoPL), namely the Nutri-Score, to discriminate the nutritional quality of pre-packed food products available in the markets of 7 different European countries and its consistency with global nutritional recommendations. It complements specific analysis previously published in scientific peer-reviews journals using the same methodology concerning the French [1] and the German food markets [2].

Material and methods

Food composition table

Data was retrieved the 9th of July from the Open Food Facts project database, a collaborative web project gathering food composition data based on available back-of-pack labeling of products. Data is collected by volunteer contributors and includes information about ingredients and nutrition facts from food products purchased in stores, effectively using crowdsourcing to collect food composition data of the food supply. The collected data is available freely as an open data source and can be downloaded for research purposes.

As the items in the database are collected from stores, foods and beverages included are exclusively manufactured pre-packaged foods. As the single identifier for a given food is the barcode of the food, identical products sold with various packagings (in different amounts mainly) may appear multiple times in the database. The open Food Facts database contains data from national brands, store brands and discount brands, and is available around the world.

Depending on the number of contributors in a given country, the number of products in the database may vary. For this report, we selected only the 7 European countries with more than 1000 products available (Spain, Switzerland, Belgium, Italy, United Kingdom, Netherlands and Sweden).

Food classification

Foods were categorized using a consumer's point of view, grouping foods with similar use and distinct nutritional characteristics. Main food groups included 'Products containing mainly fruits and vegetables', 'Cereals and potatoes', 'Meat, Fish and Eggs', 'Milk and dairy products', 'Fats and sauces', 'Composite foods', 'Sugary snacks', 'Salty snacks' and 'Beverages'. Within each food group, sub-groups were identified (e.g. in the 'Cereals and potatoes', subcategories included 'Bread', 'Cereals', 'Legumes', 'Potatoes' and 'Breakfast cereals'). Each food was categorized in a single food group and sub-group. Herbs and spices, or special use products were excluded from the database, as they are not included in the perimeter of the Nutri-Score application. The number of products available in each group or sub-group varied depending on the country. To avoid misleading representation due to a small number of items, only food groups for which more than 20 foods were available were shown in the graphics. Foods with an incomplete nutritional composition for the Nutri-Score computation were excluded, as well as foods with missing group labelling.

Analyses

FSA score computation

The Nutri-Score relies on the computation of a nutrient profiling system, originally developed in the United Kingdom by the Food Standards Agency (FSA) for the regulation of advertising to children [3-5]. It was adapted for the purpose of nutritional labelling in France by the High Council for Public health, with the goal of ensuring a high degree of alignment between the scoring system and the French nutritional recommendations [6-7]. For each product, the FSA score modified by the Health Council of Public Health (FSAm-NSP) was computed taking into account nutrient content for 100 g. The FSAm-NSP score allocates positive points (0-10) for content in energy (KJ), total sugars (g), saturated fatty acids (g) and sodium (mg). Negative points (0-5) are allocated to content in fruits, vegetables and nuts (%), fibers (g) and proteins (g). Final score, calculated as a combination of the positive and the negative points, is based on a discrete continuous scale ranging theoretically from -15 (higher nutritional quality) to +40 points (lower nutritional

quality). Specific thresholds to attribute points in the different components are used for generic foods, cheese, beverages and fats and oils. Then, cut-off are applied in order to obtain the corresponding Nutri-Score: A below -1 point (in dark green), B from 0 to 2 points (green), C from 3 to 10 points (yellow), D from 11 to 18 points (orange) and E from 19 points and over (dark orange). For beverages, the thresholds were adapted, as follow: A only applied to water, B up to 1 point (green), C from 2 to 5 (yellow), D from 6 to 9 (orange) and E from 10 points and over (dark orange).

Statistical analyses

The distribution of the overall FSAm-NSP score was computed in the different food groups, and displayed using a boxplot, highlighting the median, 25th and 75th percentiles of the distribution. Distribution of foods and beverages in the different categories of the Nutri-Score were computed. Ability of the FoPL to discriminate nutritional quality of foods and beverages was estimated by the number of available colors in each group and sub-groups. When three or more colors were available in a food group, the discriminating ability of the Nutri-Score was considered good, in a pragmatic approach.

Results for Spain

For Spain, the OpenFoodFact table included 29785 foods. From this list, 15982 products could not be affected to a specific food group and were deleted from the list. Then, 3639 products were removed because the nutritional informations necessary to the calculation of the NutriScore were missing. 11 products were deleted after additional quality controls. **Finally, the OpenFoodFact table used for this document included 10153 foods.** The database contained 1132 products composed mainly of fruits and vegetables, 1919 bread and cereal products, 662 meat, fish and eggs products, 1544 milk and dairy, 809 fats and sauces, 586 composite dishes, 2137 sugary snacks, 667 salty snacks. Overall, the mean FSAm-NSP score was 7.5+/- 8.8 points.

The overall distribution of the FSAm-NSP score is represented in Figure 1.

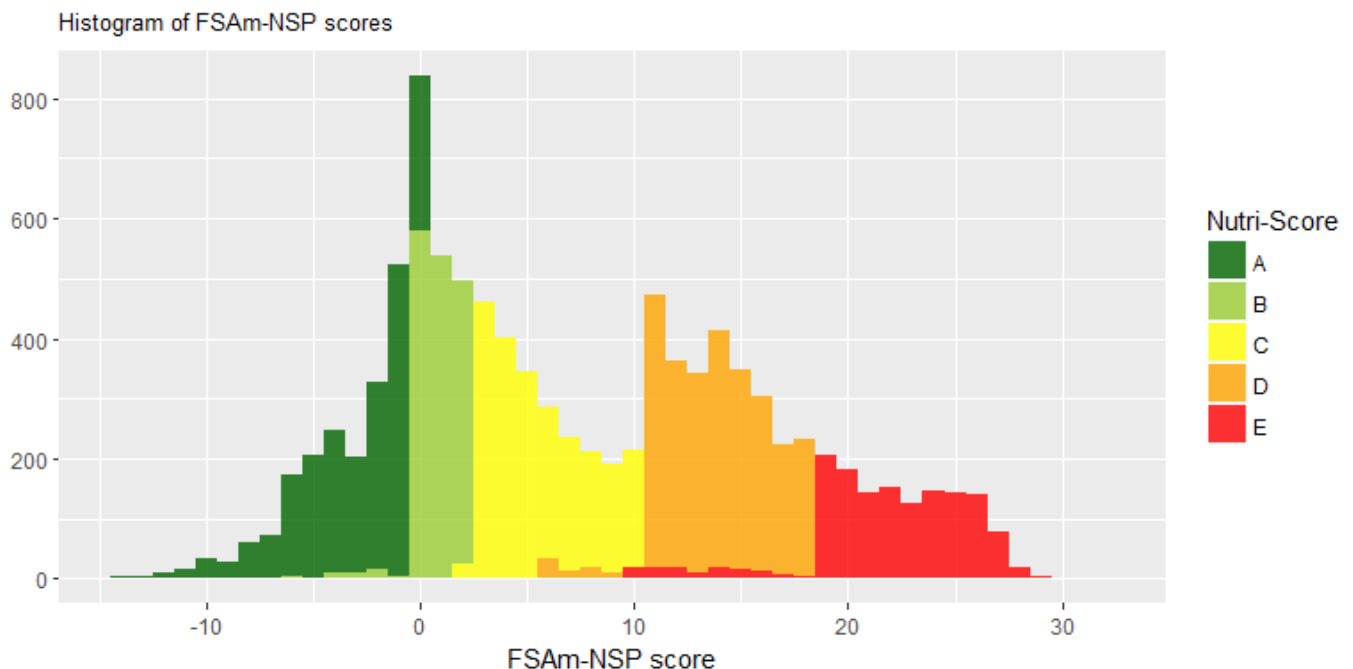


Figure 1: Overall distribution of the FSAm-NSP score

The distribution of the Nutri-Score in the different food groups is represented in Figures 2, 3 and 4.

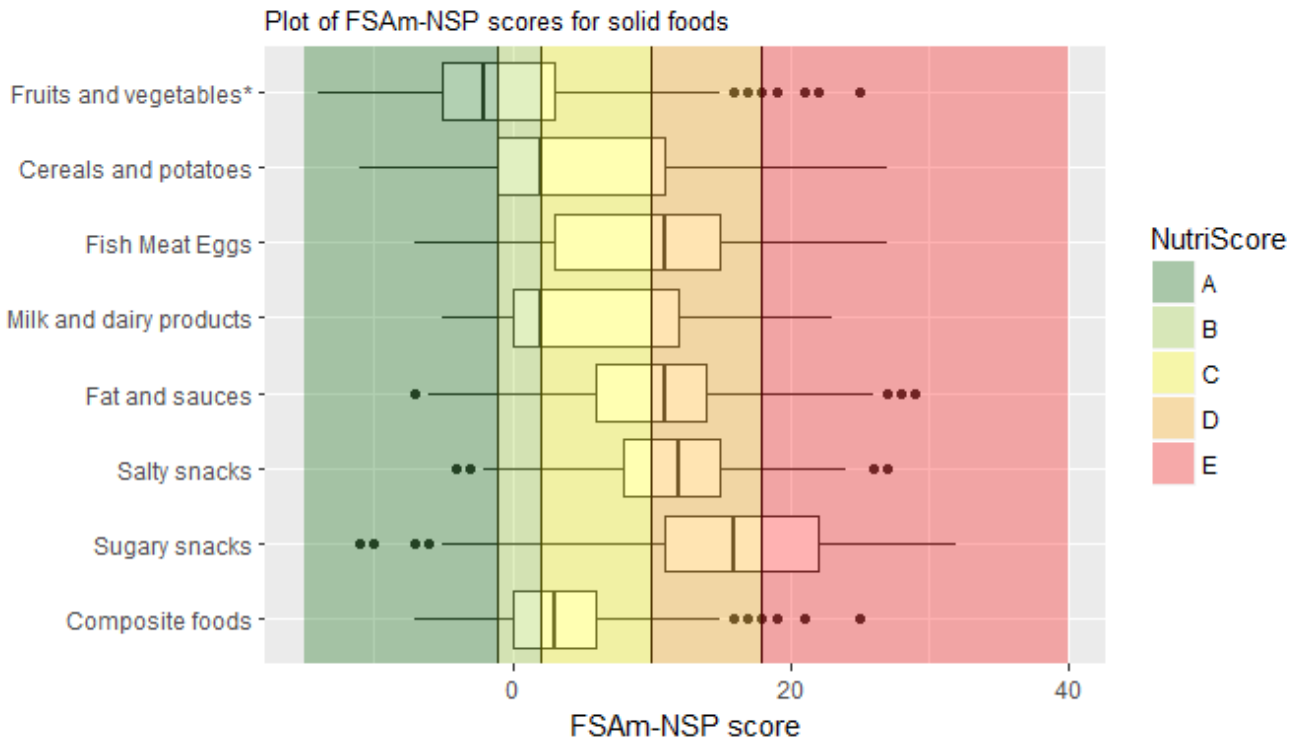


Figure 2: Distribution of the FSAm-NSP score for solid foods. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. *Products containing mainly fruits and vegetables

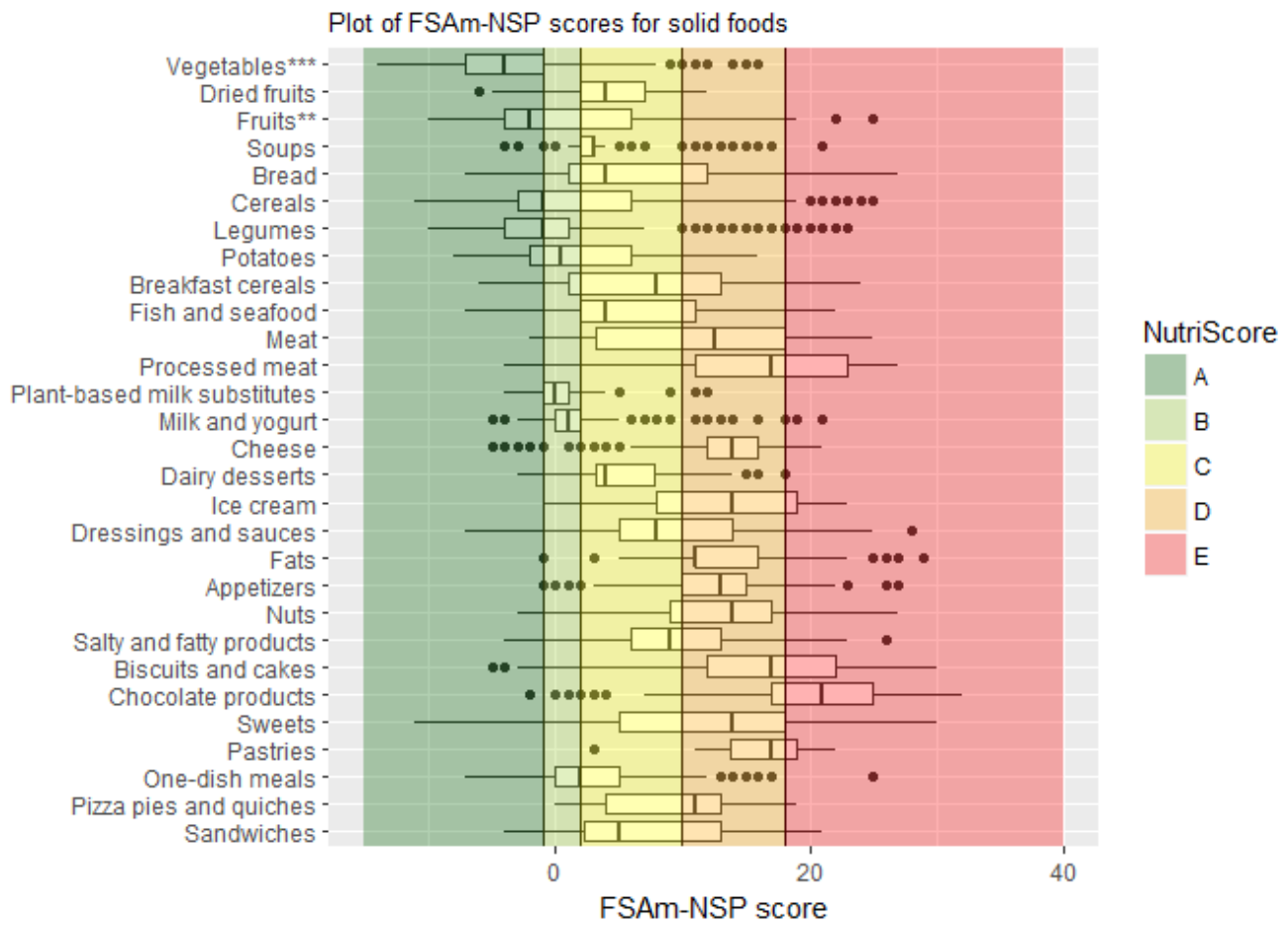


Figure 3: Distribution of the FSAm-NSP score for solid foods in subgroups containing more than 20 items. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. ** Fruits based products ; *** Vegetables based products

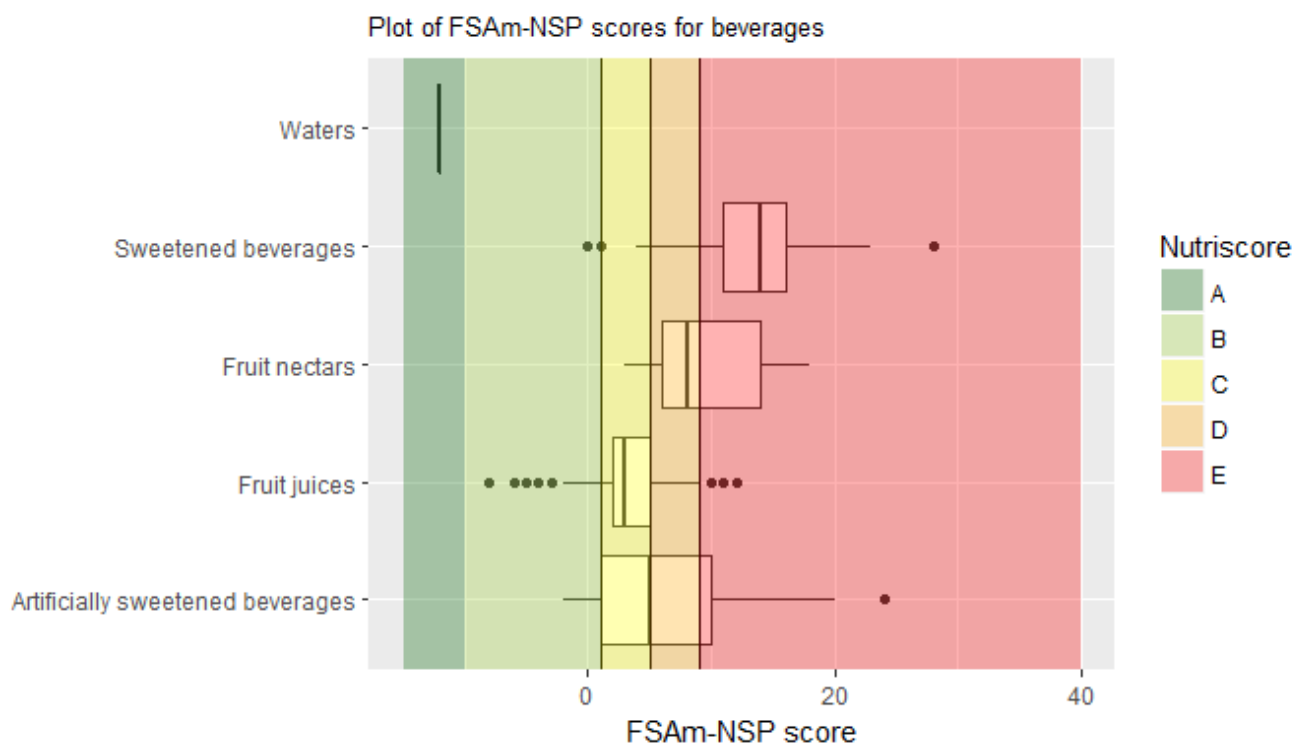


Figure 4: Distribution of the FSAm-NSP score for beverages. Vertical lines represent the cut-offs of the 5-category Nutriscore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. By definition, only water is classified as A.

The distribution of the Nutri-Score within the different food groups is displayed in Table 1.

Table 1: Distribution of the Nutri-Score within the different food groups. ** Fruits based products ; *** Vegetables based products.

	A	B	C	D	E	Total
Fruits and vegetables*	663(58.6%)	169(14.9%)	263(23.2%)	32(2.8%)	5(0.4%)	1132
Vegetables***	510(78%)	72(11%)	64(9.8%)	8(1.2%)	0(0%)	654
Dried fruits	13(15.9%)	15(18.3%)	52(63.4%)	2(2.4%)	0(0%)	82
Fruits**	134(61.2%)	8(3.7%)	61(27.9%)	13(5.9%)	3(1.4%)	219
Soups	6(3.4%)	74(41.8%)	86(48.6%)	9(5.1%)	2(1.1%)	177
Cereals and potatoes	688(35.9%)	311(16.2%)	408(21.3%)	435(22.7%)	77(4%)	1919
Bread	91(17.4%)	86(16.5%)	173(33.1%)	162(31%)	10(1.9%)	522
Cereals	379(51.4%)	112(15.2%)	97(13.1%)	110(14.9%)	40(5.4%)	738
Legumes	140(58.6%)	58(24.3%)	14(5.9%)	20(8.4%)	7(2.9%)	239
Potatoes	16(44.4%)	4(11.1%)	15(41.7%)	1(2.8%)	0(0%)	36
Breakfast cereals	62(16.1%)	51(13.3%)	109(28.4%)	142(37%)	20(5.2%)	384
Fish Meat Eggs	43(6.5%)	114(17.2%)	171(25.8%)	215(32.5%)	119(18%)	662
Fish and seafood	28(8.2%)	91(26.6%)	122(35.7%)	97(28.4%)	4(1.2%)	342

	Meat	4(6.9%)	5(8.6%)	14(24.1%)	23(39.7%)	12(20.7%)	58
	Processed meat	2(0.8%)	8(3.3%)	35(14.4%)	95(39.1%)	103(42.4%)	243
	Eggs	9(47.4%)	10(52.6%)	0(0%)	0(0%)	0(0%)	19
Milk and dairy products		242(15.7%)	576(37.3%)	272(17.6%)	377(24.4%)	77(5%)	1544
	Plant-based milk substitutes	78(26%)	198(66%)	14(4.7%)	8(2.7%)	2(0.7%)	300
	Milk and yogurt	147(22.9%)	353(55.1%)	122(19%)	16(2.5%)	3(0.5%)	641
	Cheese	12(3.6%)	4(1.2%)	47(14%)	255(76.1%)	17(5.1%)	335
	Dairy desserts	4(6.5%)	10(16.1%)	37(59.7%)	11(17.7%)	0(0%)	62
	Ice cream	1(0.5%)	11(5.3%)	52(25.2%)	87(42.2%)	55(26.7%)	206
Fat and sauces		44(5.4%)	33(4.1%)	284(35.1%)	342(42.3%)	106(13.1%)	809
	Dressings and sauces	43(7%)	33(5.4%)	262(42.9%)	208(34%)	65(10.6%)	611
	Fats	1(0.5%)	0(0%)	22(11.1%)	134(67.7%)	41(20.7%)	198
Salty snacks		10(1.5%)	45(6.7%)	211(31.6%)	352(52.8%)	49(7.3%)	667
	Appetizers	2(0.7%)	11(3.8%)	74(25.3%)	191(65.2%)	15(5.1%)	293
	Nuts	6(3.8%)	5(3.2%)	36(22.9%)	82(52.2%)	28(17.8%)	157
	Salty and fatty products	2(0.9%)	29(13.4%)	101(46.5%)	79(36.4%)	6(2.8%)	217
Sugary snacks		52(2.4%)	153(7.2%)	293(13.7%)	752(35.2%)	887(41.5%)	2137
	Biscuits and cakes	16(1.9%)	31(3.7%)	115(13.6%)	309(36.5%)	375(44.3%)	846
	Chocolate products	1(0.2%)	5(1.1%)	25(5.3%)	132(27.7%)	313(65.8%)	476
	Sweets	35(4.4%)	117(14.9%)	151(19.2%)	293(37.2%)	191(24.3%)	787
	pastries	0(0%)	0(0%)	2(7.1%)	18(64.3%)	8(28.6%)	28
Composite foods		117(20%)	150(25.6%)	224(38.2%)	89(15.2%)	6(1%)	586
	One-dish meals	115(24.1%)	135(28.2%)	189(39.5%)	37(7.7%)	2(0.4%)	478
	Pizza pies and quiches	0(0%)	7(10%)	23(32.9%)	37(52.9%)	3(4.3%)	70
	Sandwiches	2(5.3%)	8(21.1%)	12(31.6%)	15(39.5%)	1(2.6%)	38
Beverages		260(37.3%)	82(11.8%)	151(21.7%)	73(10.5%)	131(18.8%)	697
	Waters	260(100%)	0(0%)	0(0%)	0(0%)	0(0%)	260
	Teas and herbal teas and coffees	0(0%)	1(14.3%)	2(28.6%)	2(28.6%)	2(28.6%)	7
	Fruit juices	0(0%)	49(24.1%)	119(58.6%)	28(13.8%)	7(3.4%)	203
	Fruit nectars	0(0%)	0(0%)	8(19.5%)	15(36.6%)	18(43.9%)	41
	Artificially sweetened beverages	0(0%)	27(29.3%)	21(22.8%)	18(19.6%)	26(28.3%)	92
	Sweetened beverages	0(0%)	5(5.3%)	1(1.1%)	10(10.6%)	78(83%)	94
Sum		2119(20.9%)	1633(16.1%)	2277(22.4%)	2667(26.3%)	1457(14.4%)	10153

Results for Switzerland

For Switzerland, the OpenFoodFact table included 34084 foods. From this list, 24468 products could not be affected to a specific food group and were deleted from the list. Then, 1105 products were removed because the nutritional informations necessary to the calculation of the NutriScore were missing. 18 products were deleted after additional quality controls. **Finally, the OpenFoodFact table used for this document included 8493 foods.** The database contained 588 products composed mainly of fruits and vegetables, 1303 bread and cereal products, 619 meat, fish and eggs products, 1358 milk and dairy, 731 fats and sauces, 630 composite dishes, 1972 sugary snacks, 427 salty snacks. Overall, the mean FSAm-NSP score was 9.2+/- 9.2 points.

The overall distribution of the FSAm-NSP score is represented in Figure 1.

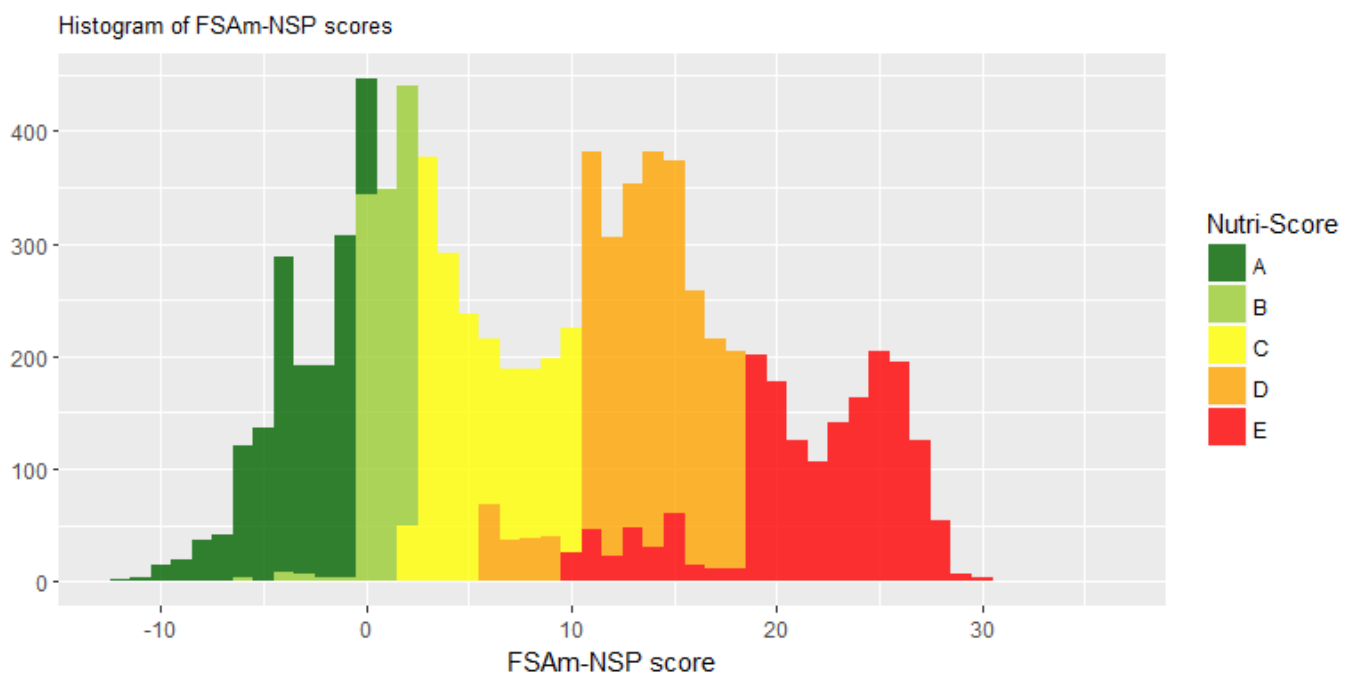


Figure 1: Overall distribution of the FSAm-NSP score

The distribution of the Nutri-Score in the different food groups is represented in Figures 2, 3 and 4.

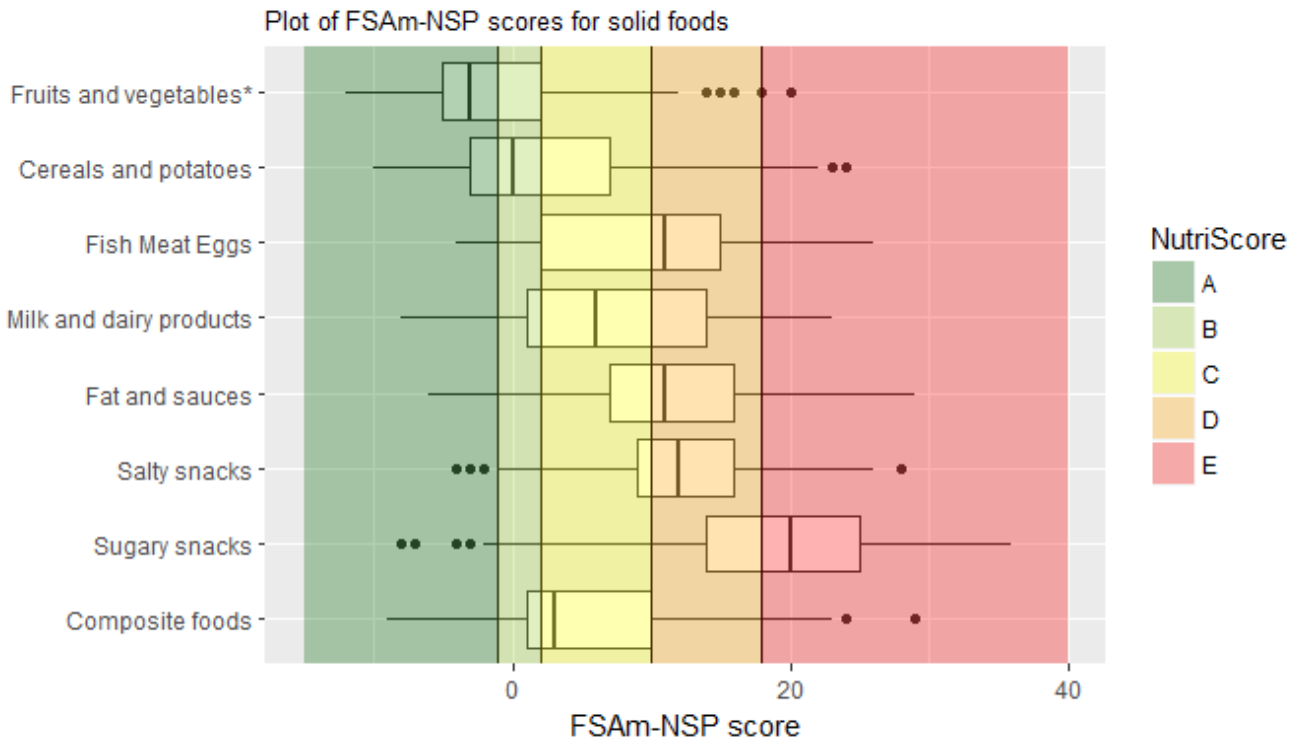


Figure 2: Distribution of the FSAm-NSP score for solid foods. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. *Products containing mainly fruits and vegetables

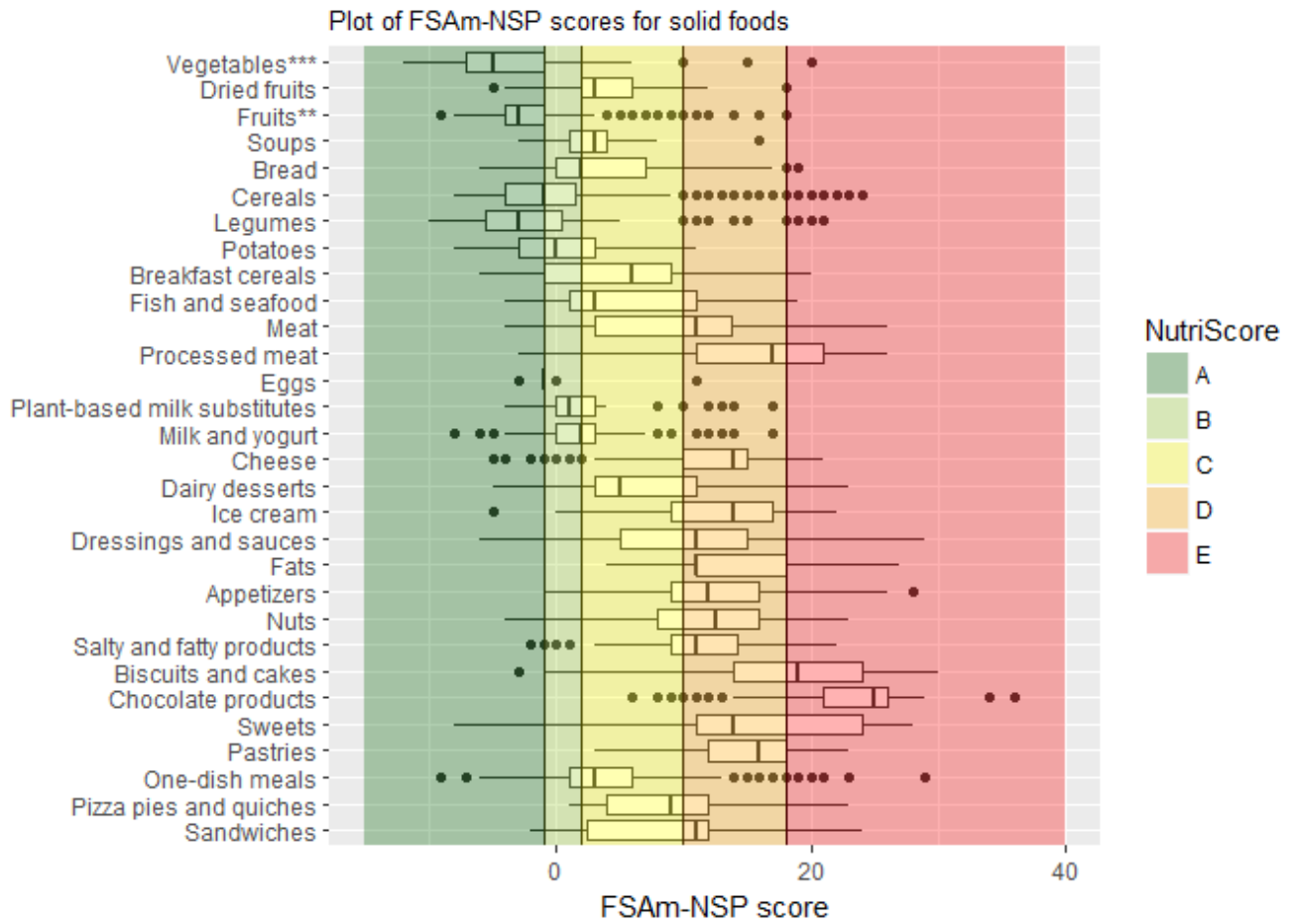


Figure 3: Distribution of the FSAm-NSP score for solid foods in subgroups containing more than 20 items. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. ** Fruits based products ; *** Vegetables based products

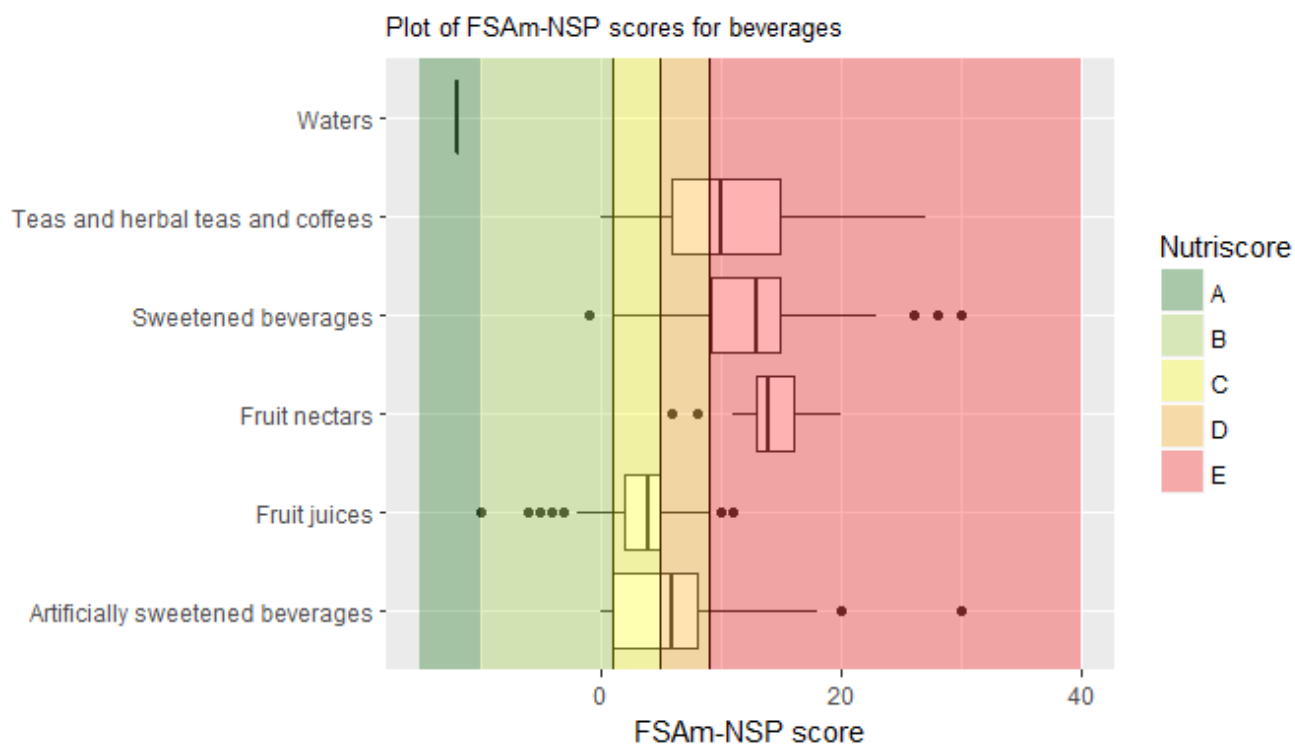


Figure 4: Distribution of the FSAm-NSP score for beverages. Vertical lines represent the cut-offs of the 5-category Nutriscore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. By definition, only water is classified as A.

The distribution of the Nutri-Score within the different food groups is displayed in Table 1.

Table 1: Distribution of the Nutri-Score within the different food groups. ** Fruits based products ; *** Vegetables based products.

	A	B	C	D	E	Total
Fruits and vegetables*	359(61.1%)	89(15.1%)	127(21.6%)	12(2%)	1(0.2%)	588
Vegetables***	211(77.9%)	36(13.3%)	22(8.1%)	1(0.4%)	1(0.4%)	271
Dried fruits	11(11.7%)	28(29.8%)	53(56.4%)	2(2.1%)	0(0%)	94
Fruits**	133(76.4%)	5(2.9%)	28(16.1%)	8(4.6%)	0(0%)	174
Soups	4(8.2%)	20(40.8%)	24(49%)	1(2%)	0(0%)	49
Cereals and potatoes	613(47%)	234(18%)	266(20.4%)	159(12.2%)	31(2.4%)	1303
Bread	74(24.7%)	103(34.3%)	84(28%)	37(12.3%)	2(0.7%)	300
Cereals	364(64.7%)	66(11.7%)	48(8.5%)	62(11%)	23(4.1%)	563
Legumes	60(69%)	9(10.3%)	5(5.7%)	10(11.5%)	3(3.4%)	87

	Potatoes	34(41%)	24(28.9%)	24(28.9%)	1(1.2%)	0(0%)	83
	Breakfast cereals	81(30%)	32(11.9%)	105(38.9%)	49(18.1%)	3(1.1%)	270
Fish Meat		71(11.5%)	103(16.6%)	127(20.5%)	224(36.2%)	94(15.2%)	619
Eggs							
	Fish and seafood	29(13.1%)	73(33%)	52(23.5%)	66(29.9%)	1(0.5%)	221
	Meat	17(9.8%)	23(13.2%)	38(21.8%)	80(46%)	16(9.2%)	174
	Processed meat	2(1%)	5(2.5%)	37(18.8%)	76(38.6%)	77(39.1%)	197
	Eggs	23(88.5%)	2(7.7%)	0(0%)	1(3.8%)	0(0%)	26
	Offals	0(0%)	0(0%)	0(0%)	1(100%)	0(0%)	1
Milk and dairy products		155(11.4%)	306(22.5%)	338(24.9%)	525(38.7%)	34(2.5%)	1358
	Plant-based milk substitutes	19(22.9%)	43(51.8%)	4(4.8%)	17(20.5%)	0(0%)	83
	Milk and yogurt	90(17.2%)	215(41%)	186(35.5%)	33(6.3%)	0(0%)	524
	Cheese	34(6.6%)	29(5.6%)	75(14.6%)	366(71.1%)	11(2.1%)	515
	Dairy desserts	9(9.7%)	13(14%)	42(45.2%)	26(28%)	3(3.2%)	93
	Ice cream	3(2.1%)	6(4.2%)	31(21.7%)	83(58%)	20(14%)	143
Fat and sauces		21(2.9%)	45(6.2%)	205(28%)	347(47.5%)	113(15.5%)	731
	Dressings and sauces	21(3.9%)	45(8.3%)	167(30.8%)	237(43.6%)	73(13.4%)	543
	Fats	0(0%)	0(0%)	38(20.2%)	110(58.5%)	40(21.3%)	188
Salty snacks		12(2.8%)	21(4.9%)	127(29.7%)	206(48.2%)	61(14.3%)	427
	Appetizers	2(0.9%)	12(5.4%)	64(29%)	111(50.2%)	32(14.5%)	221
	Nuts	6(6.1%)	6(6.1%)	22(22.4%)	50(51%)	14(14.3%)	98
	Salty and fatty products	4(3.7%)	3(2.8%)	41(38%)	45(41.7%)	15(13.9%)	108
Sugary snacks		17(0.9%)	61(3.1%)	166(8.4%)	633(32.1%)	1095(55.5%)	1972
	Biscuits and cakes	5(0.6%)	4(0.5%)	75(9.2%)	288(35.5%)	439(54.1%)	811
	Chocolate products	0(0%)	0(0%)	5(1.1%)	61(12.8%)	410(86.1%)	476
	Sweets	12(2%)	57(9.7%)	65(11.1%)	231(39.4%)	222(37.8%)	587
	pastries	0(0%)	0(0%)	21(21.4%)	53(54.1%)	24(24.5%)	98
Composite foods		78(12.4%)	179(28.4%)	227(36%)	123(19.5%)	23(3.7%)	630
	One-dish meals	76(16.1%)	157(33.2%)	161(34%)	65(13.7%)	14(3%)	473
	Pizza pies and quiches	0(0%)	12(10.9%)	56(50.9%)	36(32.7%)	6(5.5%)	110
	Sandwiches	2(4.3%)	10(21.3%)	10(21.3%)	22(46.8%)	3(6.4%)	47
Beverages		105(12.1%)	70(8.1%)	180(20.8%)	183(21.2%)	327(37.8%)	865

	Waters	104(100%)	0(0%)	0(0%)	0(0%)	0(0%)	104
	Teas and herbal teas and coffees	0(0%)	5(12.5%)	2(5%)	12(30%)	21(52.5%)	40
	Fruit juices	1(0.5%)	26(12.6%)	144(69.6%)	30(14.5%)	6(2.9%)	207
	Fruit nectars	0(0%)	0(0%)	0(0%)	4(13.3%)	26(86.7%)	30
	Artificially sweetened beverages	0(0%)	37(26.8%)	23(16.7%)	63(45.7%)	15(10.9%)	138
	Sweetened beverages	0(0%)	2(0.6%)	11(3.2%)	74(21.4%)	259(74.9%)	346
Sum		1431(16.8%)	1108(13%)	1763(20.8%)	2412(28.4%)	1779(20.9%)	8493

Results for Belgium

For Belgium, the OpenFoodFact table included 30435 foods. From this list, 22415 products could not be affected to a specific food group and were deleted from the list. Then, 800 products were removed because the nutritional informations necessary to the calculation of the NutriScore were missing. 13 products were deleted after additional quality controls. **Finally, the OpenFoodFact table used for this document included 7207 foods.** The database contained 538 products composed mainly of fruits and vegetables, 892 bread and cereal products, 638 meat, fish and eggs products, 1209 milk and dairy, 676 fats and sauces, 553 composite dishes, 1485 sugary snacks, 417 salty snacks. Overall, the mean FSAm-NSP score was 9.3+/- 8.9 points.

The overall distribution of the FSAm-NSP score is represented in Figure 1.

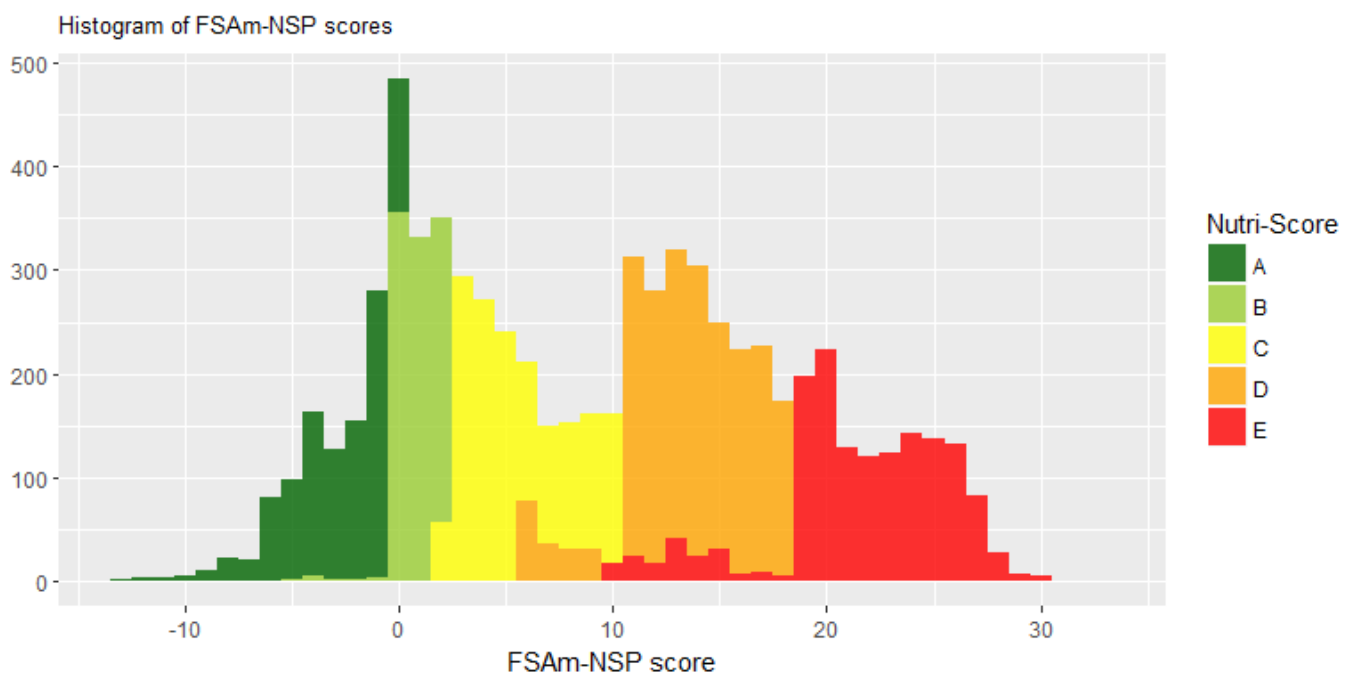


Figure 1: Overall distribution of the FSAm-NSP score

The distribution of the Nutri-Score in the different food groups is represented in Figures 2, 3 and 4.

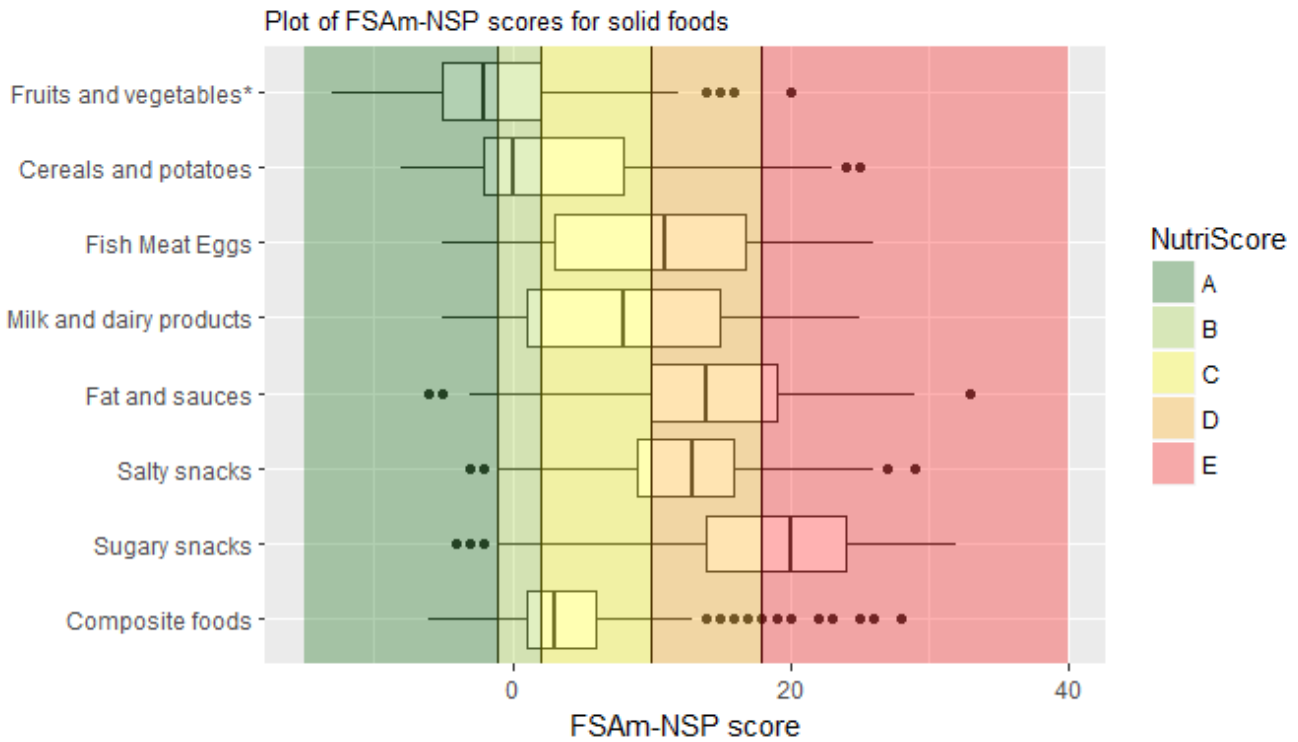


Figure 2: Distribution of the FSAm-NSP score for solid foods. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. *Products containing mainly fruits and vegetables

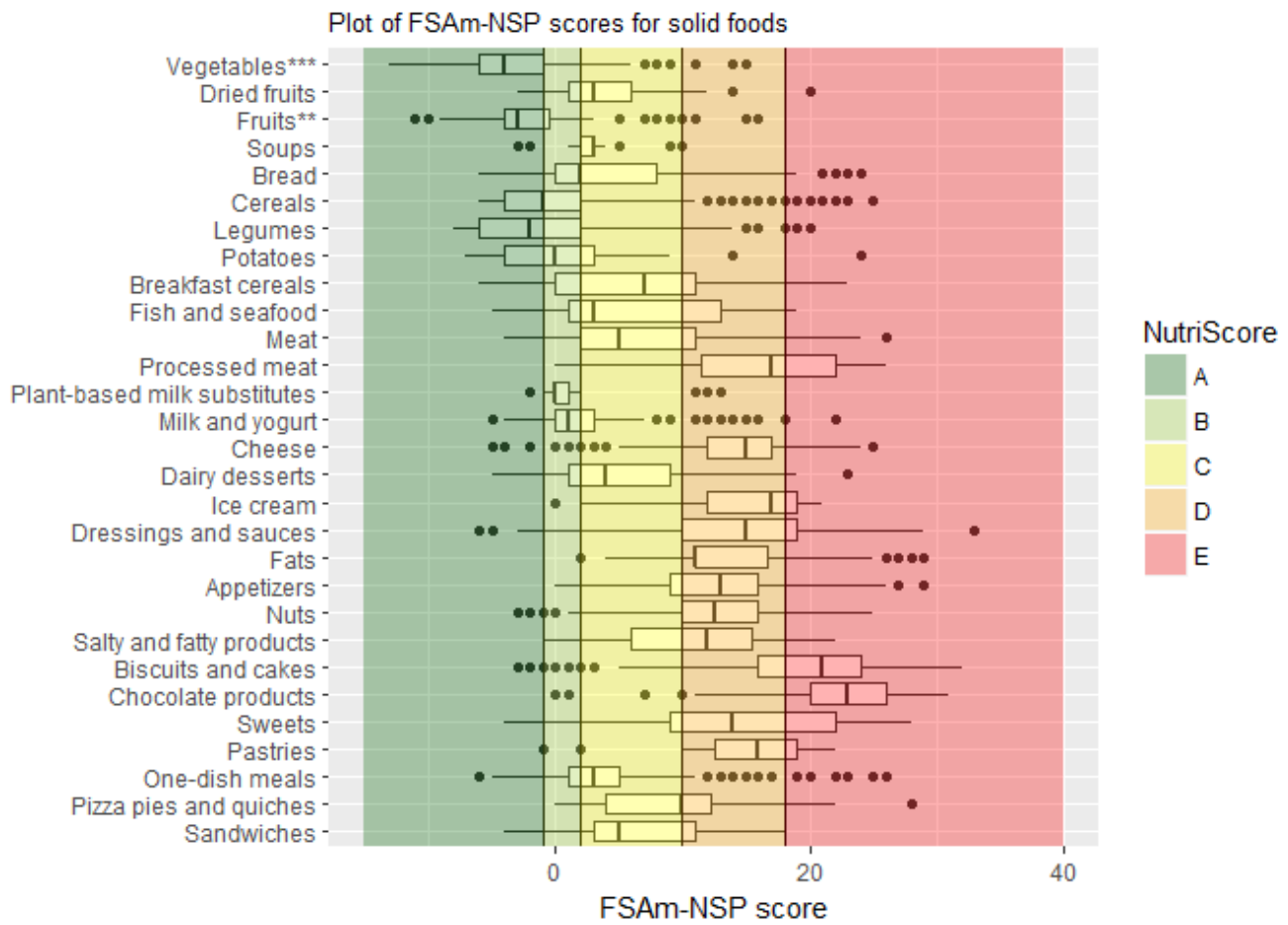


Figure 3: Distribution of the FSAm-NSP score for solid foods in subgroups containing more than 20 items. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. ** Fruits based products ; *** Vegetables based products

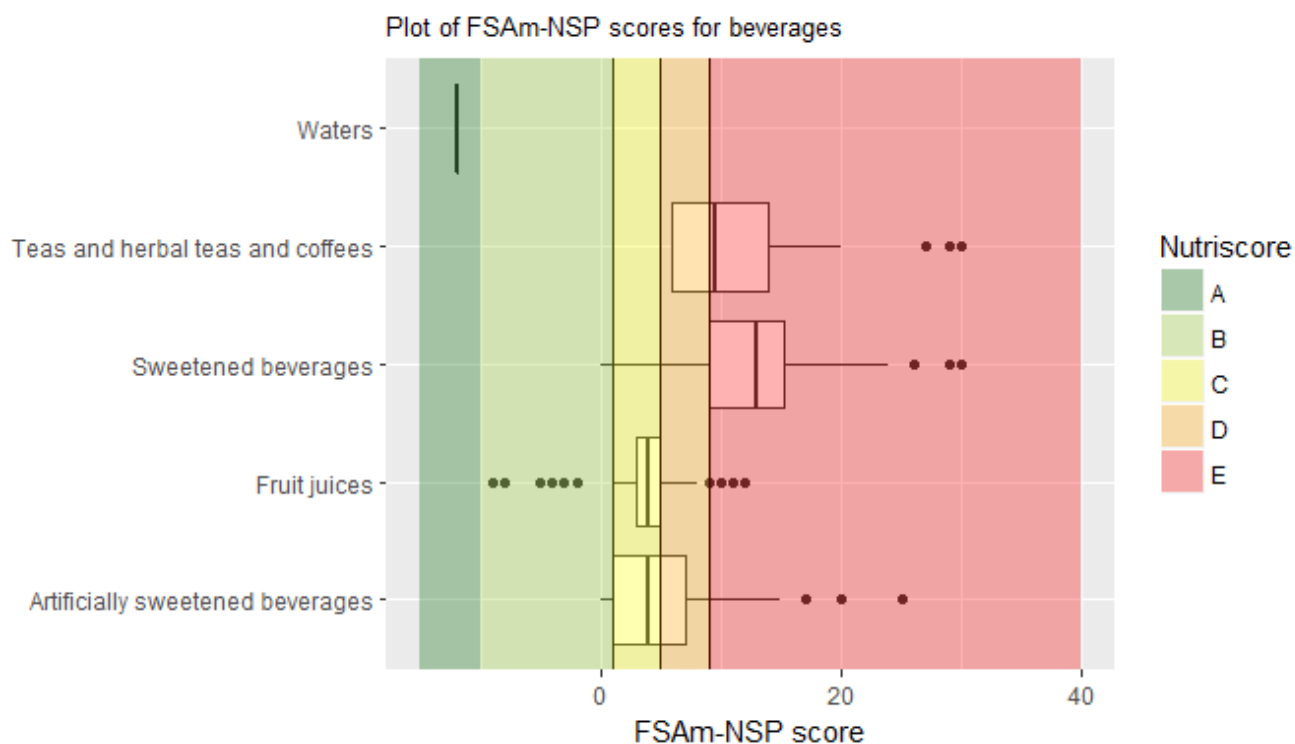


Figure 4: Distribution of the FSAm-NSP score for beverages. Vertical lines represent the cut-offs of the 5-category Nutriscore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. By definition, only water is classified as A.

The distribution of the Nutri-Score within the different food groups is displayed in Table 1.

Table 1: Distribution of the Nutri-Score within the different food groups. ** Fruits based products ; *** Vegetables based products.

	A	B	C	D	E	Total
Fruits and vegetables*	324(60.2%)	90(16.7%)	111(20.6%)	12(2.2%)	1(0.2%)	538
Vegetables***	207(77.5%)	27(10.1%)	29(10.9%)	4(1.5%)	0(0%)	267
Dried fruits	8(12.5%)	22(34.4%)	31(48.4%)	2(3.1%)	1(1.6%)	64
Fruits**	107(74.8%)	17(11.9%)	13(9.1%)	6(4.2%)	0(0%)	143
Soups	2(3.1%)	24(37.5%)	38(59.4%)	0(0%)	0(0%)	64
Cereals and potatoes	367(41.1%)	159(17.8%)	212(23.8%)	134(15%)	20(2.2%)	892
Bread	44(23.5%)	50(26.7%)	62(33.2%)	25(13.4%)	6(3.2%)	187
Cereals	195(59.3%)	58(17.6%)	33(10%)	36(10.9%)	7(2.1%)	329
Legumes	50(68.5%)	5(6.8%)	9(12.3%)	7(9.6%)	2(2.7%)	73

	Potatoes	22(41.5%)	13(24.5%)	16(30.2%)	1(1.9%)	1(1.9%)	53
	Breakfast cereals	56(22.4%)	33(13.2%)	92(36.8%)	65(26%)	4(1.6%)	250
Fish Meat		54(8.5%)	102(16%)	144(22.6%)	224(35.1%)	114(17.9%)	638
Eggs							
	Fish and seafood	26(11.3%)	71(30.9%)	45(19.6%)	86(37.4%)	2(0.9%)	230
	Meat	18(12.5%)	21(14.6%)	50(34.7%)	47(32.6%)	8(5.6%)	144
	Processed meat	0(0%)	6(2.4%)	47(19%)	90(36.4%)	104(42.1%)	247
	Eggs	10(66.7%)	4(26.7%)	1(6.7%)	0(0%)	0(0%)	15
	Offals	0(0%)	0(0%)	1(50%)	1(50%)	0(0%)	2
Milk and dairy products		118(9.8%)	302(25%)	248(20.5%)	471(39%)	70(5.8%)	1209
	Plant-based milk substitutes	13(16.9%)	47(61%)	0(0%)	17(22.1%)	0(0%)	77
	Milk and yogurt	81(18%)	216(48.1%)	117(26.1%)	34(7.6%)	1(0.2%)	449
	Cheese	9(1.9%)	10(2.1%)	67(14.3%)	348(74.4%)	34(7.3%)	468
	Dairy desserts	15(13.8%)	23(21.1%)	48(44%)	21(19.3%)	2(1.8%)	109
	Ice cream	0(0%)	6(5.7%)	16(15.1%)	51(48.1%)	33(31.1%)	106
Fat and sauces		6(0.9%)	17(2.5%)	148(21.9%)	335(49.6%)	170(25.1%)	676
	Dressings and sauces	6(1.3%)	15(3.1%)	102(21.3%)	229(47.9%)	126(26.4%)	478
	Fats	0(0%)	2(1%)	46(23.2%)	106(53.5%)	44(22.2%)	198
Salty snacks		6(1.4%)	20(4.8%)	119(28.5%)	224(53.7%)	48(11.5%)	417
	Appetizers	0(0%)	8(3.2%)	76(30.6%)	144(58.1%)	20(8.1%)	248
	Nuts	3(3.7%)	4(4.9%)	15(18.3%)	46(56.1%)	14(17.1%)	82
	Salty and fatty products	3(3.4%)	8(9.2%)	28(32.2%)	34(39.1%)	14(16.1%)	87
Sugary snacks		16(1.1%)	62(4.2%)	129(8.7%)	443(29.8%)	835(56.2%)	1485
	Biscuits and cakes	3(0.5%)	9(1.4%)	42(6.6%)	168(26.4%)	415(65.1%)	637
	Chocolate products	0(0%)	4(1.3%)	4(1.3%)	56(17.8%)	250(79.6%)	314
	Sweets	12(2.4%)	48(9.7%)	80(16.2%)	197(39.8%)	158(31.9%)	495
	pastries	1(2.6%)	1(2.6%)	3(7.7%)	22(56.4%)	12(30.8%)	39
Composite foods		67(12.1%)	176(31.8%)	207(37.4%)	90(16.3%)	13(2.4%)	553
	One-dish meals	65(14.4%)	160(35.4%)	167(36.9%)	50(11.1%)	10(2.2%)	452
	Pizza pies and quiches	0(0%)	10(15.6%)	23(35.9%)	28(43.8%)	3(4.7%)	64
	Sandwiches	2(5.4%)	6(16.2%)	17(45.9%)	12(32.4%)	0(0%)	37
Beverages		130(16.3%)	68(8.5%)	187(23.4%)	177(22.2%)	237(29.7%)	799

	Waters	130(100%)	0(0%)	0(0%)	0(0%)	0(0%)	130
	Teas and herbal teas and coffees	0(0%)	0(0%)	0(0%)	24(50%)	24(50%)	48
	Fruit juices	0(0%)	16(8.6%)	140(74.9%)	26(13.9%)	5(2.7%)	187
	Fruit nectars	0(0%)	0(0%)	0(0%)	3(27.3%)	8(72.7%)	11
	Artificially sweetened beverages	0(0%)	45(29%)	36(23.2%)	65(41.9%)	9(5.8%)	155
	Sweetened beverages	0(0%)	7(2.6%)	11(4.1%)	59(22%)	191(71.3%)	268
Sum		1088(15.1%)	996(13.8%)	1505(20.9%)	2110(29.3%)	1508(20.9%)	7207

Results for Italy

For Italy, the OpenFoodFact table included 6490 foods. From this list, 4326 products could not be affected to a specific food group and were deleted from the list. Then, 264 products were removed because the nutritional informations necessary to the calculation of the NutriScore were missing. 1 product was deleted after additional quality controls. **Finally, the OpenFoodFact table used for this document included 1899 foods.** The database contained 62 products composed mainly of fruits and vegetables, 367 bread and cereal products, 122 meat, fish and eggs products, 419 milk and dairy, 117 fats and sauces, 73 composite dishes, 519 sugary snacks, 85 salty snacks. Overall, the mean FSAm-NSP score was 8.8 ± 8.8 points.

The overall distribution of the FSAm-NSP score is represented in Figure 1.

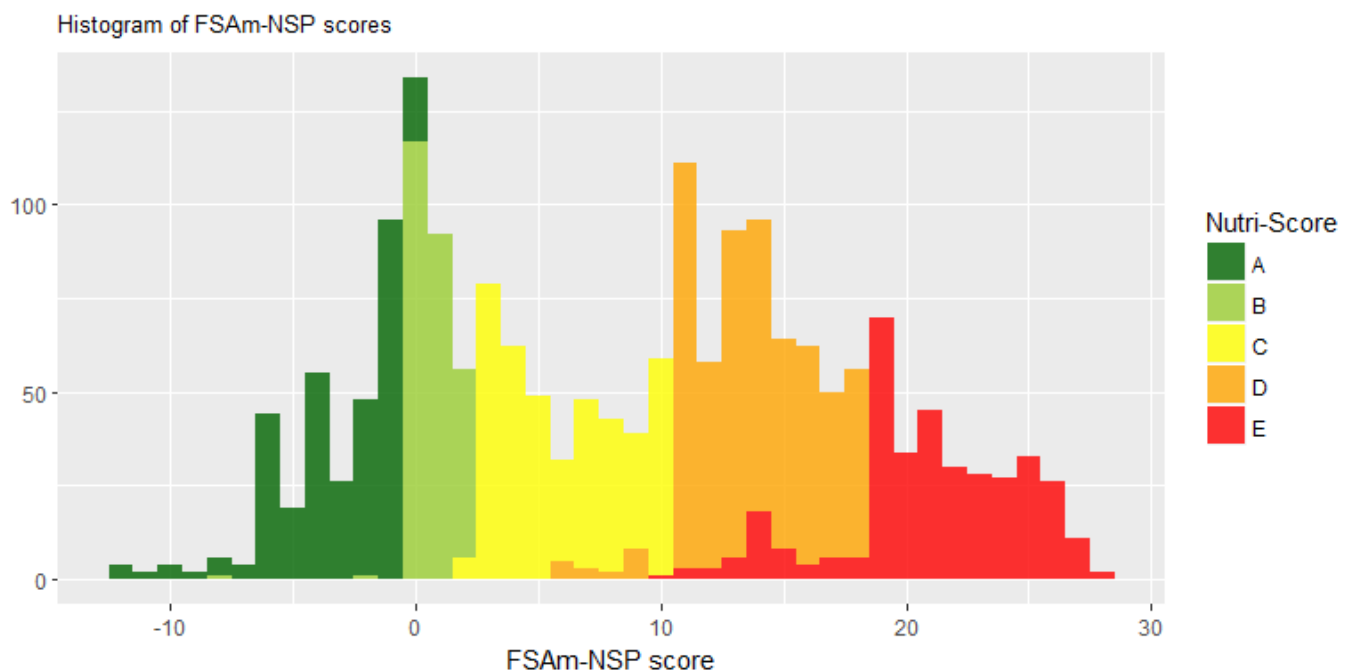


Figure 1: Overall distribution of the FSAm-NSP score

The distribution of the Nutri-Score in the different food groups is represented in Figures 2, 3 and 4.

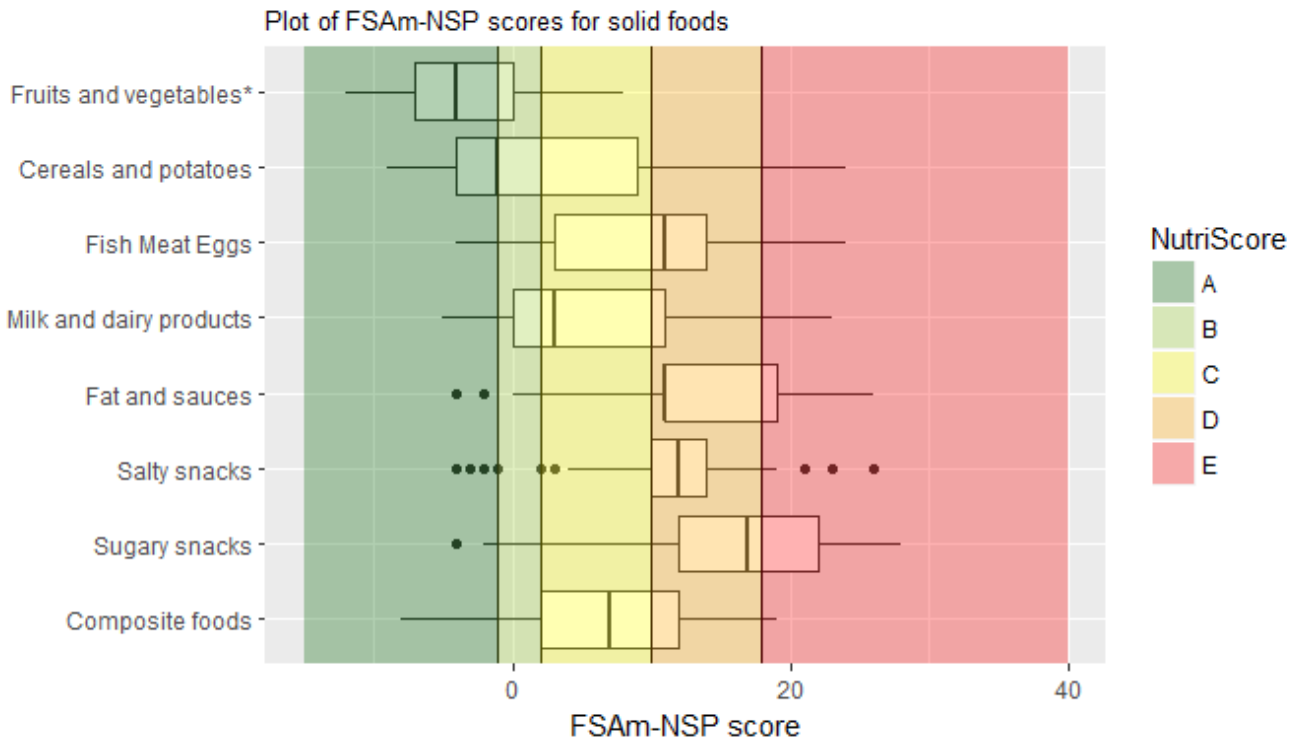


Figure 2: Distribution of the FSAm-NSP score for solid foods. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. *Products containing mainly fruits and vegetables

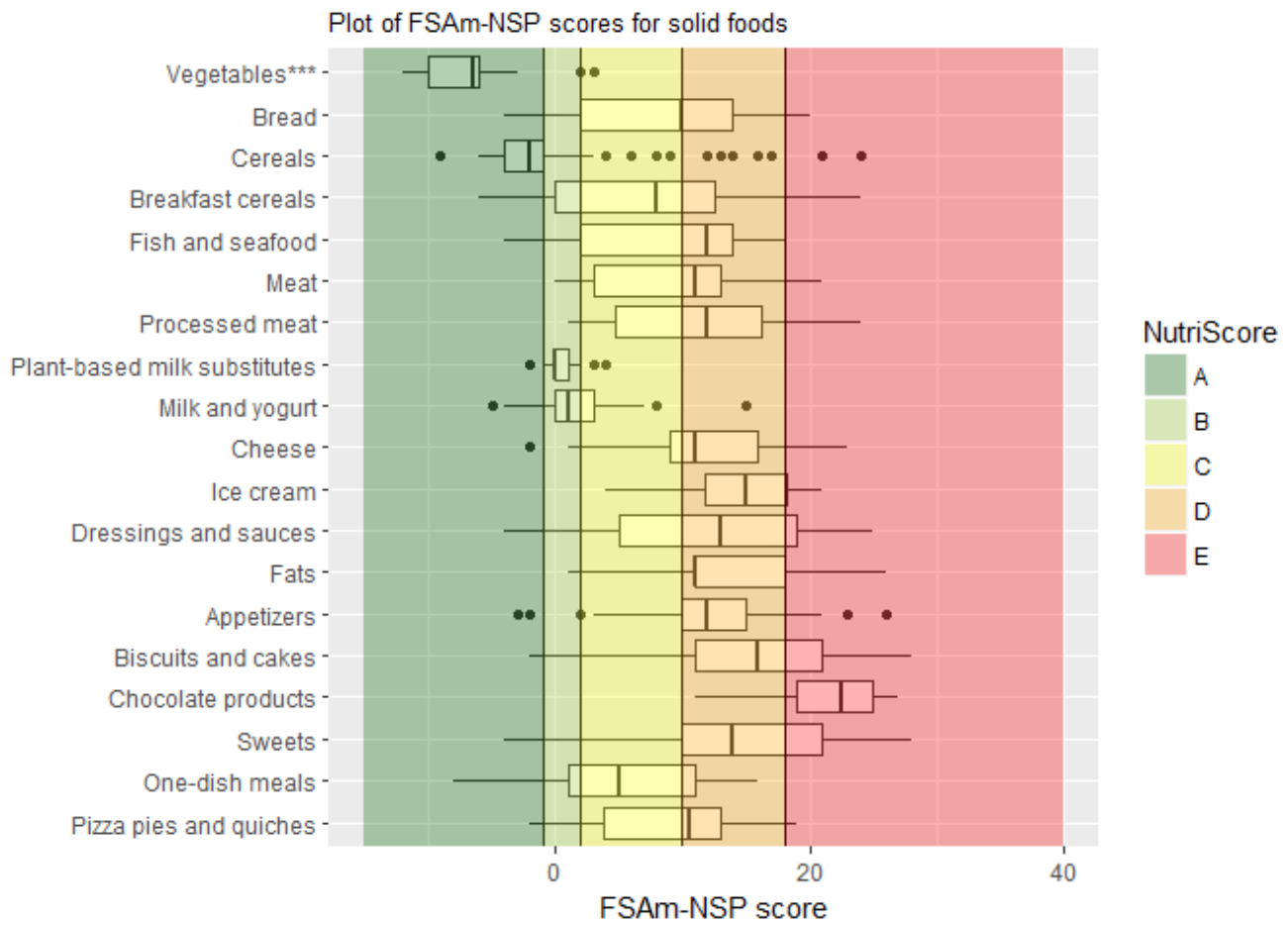


Figure 3: Distribution of the FSAm-NSP score for solid foods in subgroups containing more than 20 items. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. ** Fruits based products ; *** Vegetables based products

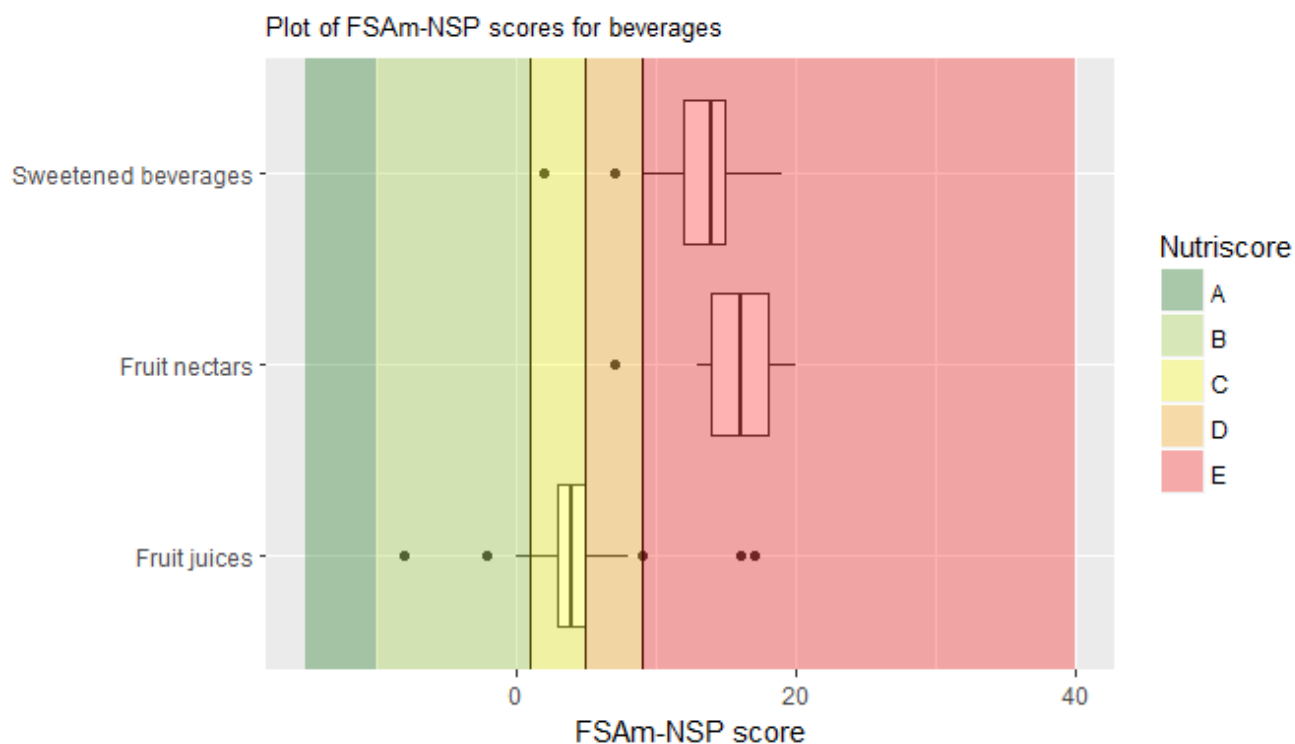


Figure 4: Distribution of the FSAm-NSP score for beverages. Vertical lines represent the cut-offs of the 5-category Nutriscore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. By definition, only water is classified as A.

The distribution of the Nutri-Score within the different food groups is displayed in Table 1.

Table 1: Distribution of the Nutri-Score within the different food groups. ** Fruits based products ; *** Vegetables based products.

	A	B	C	D	E	Total
Fruits and vegetables*	44(71%)	9(14.5%)	9(14.5%)	0(0%)	0(0%)	62
Vegetables***	32(94.1%)	1(2.9%)	1(2.9%)	0(0%)	0(0%)	34
Dried fruits	1(12.5%)	4(50%)	3(37.5%)	0(0%)	0(0%)	8
Fruits**	10(66.7%)	0(0%)	5(33.3%)	0(0%)	0(0%)	15
Soups	1(20%)	4(80%)	0(0%)	0(0%)	0(0%)	5
Cereals and potatoes	187(51%)	47(12.8%)	56(15.3%)	68(18.5%)	9(2.5%)	367
Bread	10(14.5%)	9(13%)	17(24.6%)	30(43.5%)	3(4.3%)	69
Cereals	140(76.1%)	22(12%)	11(6%)	8(4.3%)	3(1.6%)	184
Legumes	14(87.5%)	1(6.2%)	0(0%)	1(6.2%)	0(0%)	16

	Potatoes	5(45.5%)	4(36.4%)	2(18.2%)	0(0%)	0(0%)	11
	Breakfast cereals	18(20.7%)	11(12.6%)	26(29.9%)	29(33.3%)	3(3.4%)	87
Fish Meat Eggs		3(2.5%)	26(21.3%)	31(25.4%)	56(45.9%)	6(4.9%)	122
	Fish and seafood	3(7%)	11(25.6%)	5(11.6%)	24(55.8%)	0(0%)	43
	Meat	0(0%)	2(9.5%)	8(38.1%)	10(47.6%)	1(4.8%)	21
	Processed meat	0(0%)	3(6.2%)	18(37.5%)	22(45.8%)	5(10.4%)	48
	Eggs	0(0%)	10(100%)	0(0%)	0(0%)	0(0%)	10
Milk and dairy products		56(13.4%)	137(32.7%)	119(28.4%)	92(22%)	15(3.6%)	419
	Plant-based milk substitutes	12(22.6%)	37(69.8%)	4(7.5%)	0(0%)	0(0%)	53
	Milk and yogurt	43(20.8%)	96(46.4%)	67(32.4%)	1(0.5%)	0(0%)	207
	Cheese	1(0.8%)	4(3.2%)	41(32.8%)	72(57.6%)	7(5.6%)	125
	Dairy desserts	0(0%)	0(0%)	1(50%)	1(50%)	0(0%)	2
	Ice cream	0(0%)	0(0%)	6(18.8%)	18(56.2%)	8(25%)	32
Fat and sauces		2(1.7%)	12(10.3%)	12(10.3%)	59(50.4%)	32(27.4%)	117
	Dressings and sauces	2(3.1%)	11(17.2%)	10(15.6%)	21(32.8%)	20(31.2%)	64
	Fats	0(0%)	1(1.9%)	2(3.8%)	38(71.7%)	12(22.6%)	53
Salty snacks		4(4.7%)	1(1.2%)	27(31.8%)	46(54.1%)	7(8.2%)	85
	Appetizers	2(2.9%)	1(1.4%)	20(29%)	39(56.5%)	7(10.1%)	69
	Nuts	2(33.3%)	0(0%)	2(33.3%)	2(33.3%)	0(0%)	6
	Salty and fatty products	0(0%)	0(0%)	5(50%)	5(50%)	0(0%)	10
Sugary snacks		6(1.2%)	9(1.7%)	87(16.8%)	189(36.4%)	228(43.9%)	519
	Biscuits and cakes	3(1.1%)	3(1.1%)	55(20.7%)	103(38.7%)	102(38.3%)	266
	Chocolate products	0(0%)	0(0%)	0(0%)	20(23.3%)	66(76.7%)	86
	Sweets	3(2%)	6(4%)	30(20.1%)	60(40.3%)	50(33.6%)	149
	pastries	0(0%)	0(0%)	2(11.1%)	6(33.3%)	10(55.6%)	18
Composite foods		6(8.2%)	13(17.8%)	25(34.2%)	26(35.6%)	3(4.1%)	73
	One-dish meals	3(8.6%)	10(28.6%)	11(31.4%)	11(31.4%)	0(0%)	35
	Pizza pies and quiches	1(2.8%)	3(8.3%)	14(38.9%)	15(41.7%)	3(8.3%)	36
	Sandwiches	2(100%)	0(0%)	0(0%)	0(0%)	0(0%)	2
Beverages		17(12.6%)	7(5.2%)	32(23.7%)	18(13.3%)	61(45.2%)	135
	Waters	17(100%)	0(0%)	0(0%)	0(0%)	0(0%)	17
	Teas and herbal teas and coffees	0(0%)	1(100%)	0(0%)	0(0%)	0(0%)	1
	Fruit juices	0(0%)	4(10%)	28(70%)	6(15%)	2(5%)	40
	Fruit nectars	0(0%)	0(0%)	0(0%)	1(4%)	24(96%)	25
	Artificially	0(0%)	2(15.4%)	3(23.1%)	8(61.5%)	0(0%)	13

	sweetened beverages						
	Sweetened beverages	0(0%)	0(0%)	1(2.6%)	3(7.7%)	35(89.7%)	39
Sum		325(17.1%)	261(13.7%)	398(21%)	554(29.2%)	361(19%)	1899

Results for United-Kingdom

For United-Kingdom, the OpenFoodFact table included 11924 foods. From this list, 8051 products could not be affected to a specific food group and were deleted from the list. Then, 811 products were removed because the nutritional informations necessary to the calculation of the NutriScore were missing. 4 products were deleted after additional quality controls. **Finally, the OpenFoodFact table used for this document included 3058 foods.** The database contained 186 products composed mainly of fruits and vegetables, 346 bread and cereal products, 285 meat, fish and eggs products, 421 milk and dairy, 311 fats and sauces, 271 composite dishes, 805 sugary snacks, 198 salty snacks. Overall, the mean FSAm-NSP score was 8.9+/- 9.2 points.

The overall distribution of the FSAm-NSP score is represented in Figure 1.

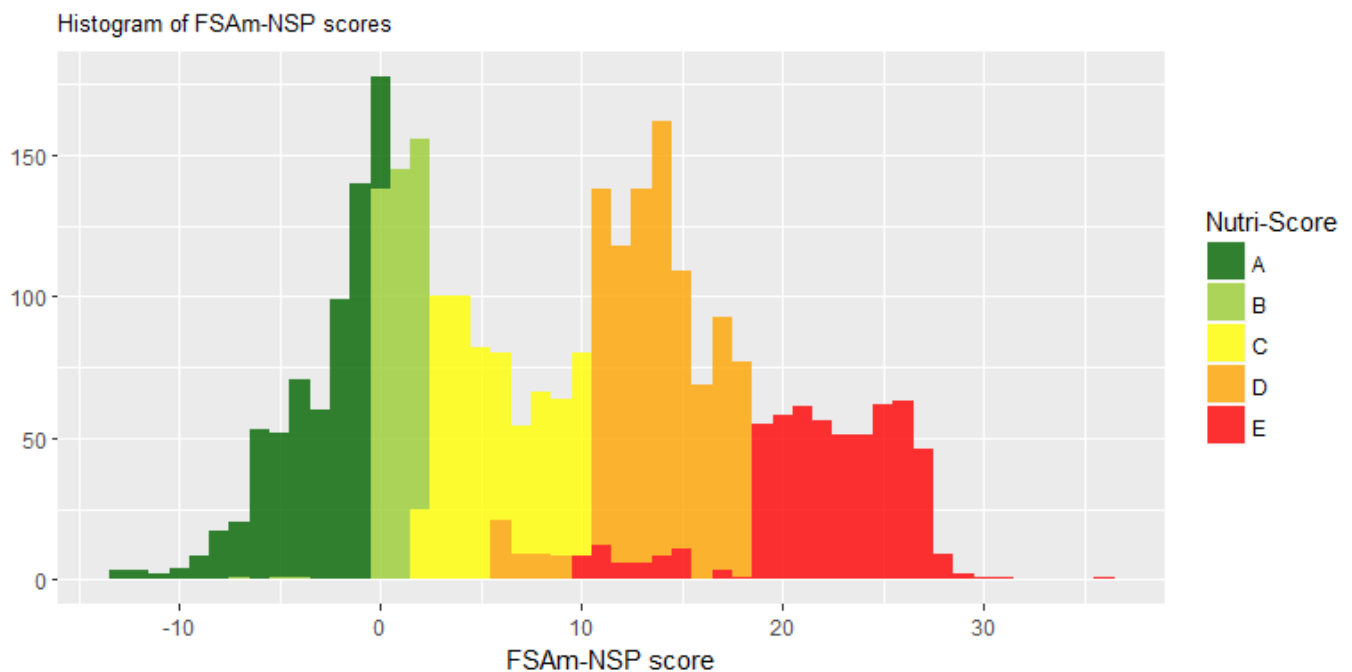


Figure 1: Overall distribution of the FSAm-NSP score

The distribution of the Nutri-Score in the different food groups is represented in Figures 2, 3 and 4.

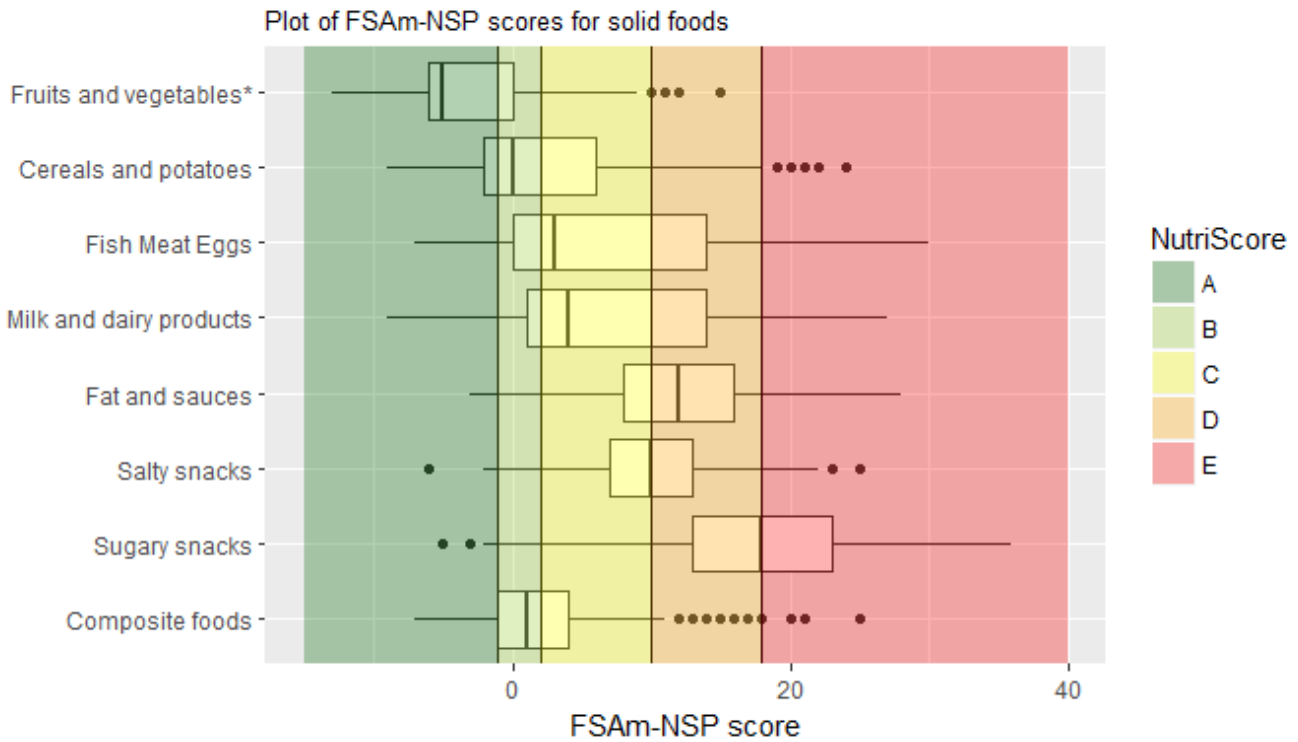


Figure 2: Distribution of the FSAm-NSP score for solid foods. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. *Products containing mainly fruits and vegetables

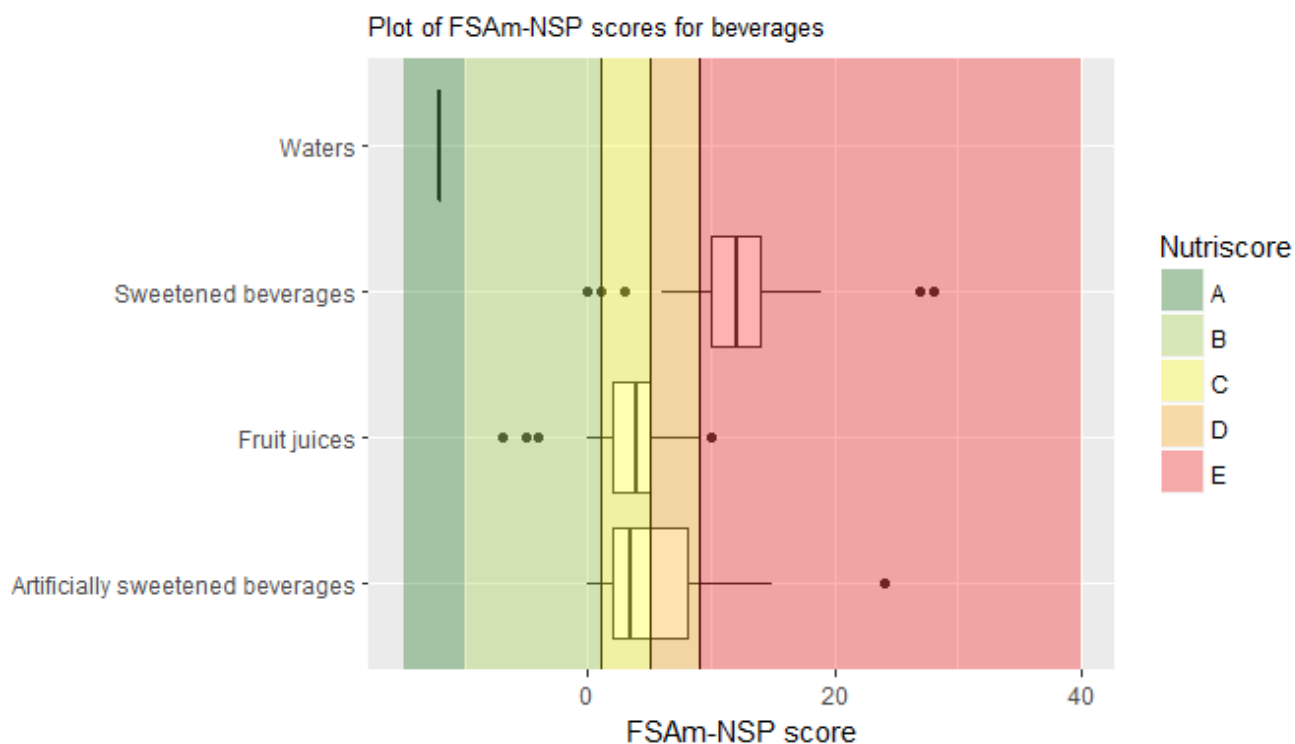


Figure 4: Distribution of the FSAm-NSP score for beverages. Vertical lines represent the cut-offs of the 5-category Nutriscore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. By definition, only water is classified as A.

The distribution of the Nutri-Score within the different food groups is displayed in Table 1.

Table 1: Distribution of the Nutri-Score within the different food groups. ** Fruits based products ; *** Vegetables based products.

	A	B	C	D	E	Total
Fruits and vegetables*	136(73.1%)	19(10.2%)	26(14%)	5(2.7%)	0(0%)	186
Vegetables***	96(91.4%)	6(5.7%)	3(2.9%)	0(0%)	0(0%)	105
Dried fruits	2(10.5%)	6(31.6%)	11(57.9%)	0(0%)	0(0%)	19
Fruits**	37(69.8%)	1(1.9%)	10(18.9%)	5(9.4%)	0(0%)	53
Soups	1(11.1%)	6(66.7%)	2(22.2%)	0(0%)	0(0%)	9
Cereals and potatoes	163(47.1%)	69(19.9%)	66(19.1%)	40(11.6%)	8(2.3%)	346
Bread	31(47.7%)	20(30.8%)	11(16.9%)	3(4.6%)	0(0%)	65
Cereals	78(56.1%)	33(23.7%)	16(11.5%)	7(5%)	5(3.6%)	139
Legumes	13(32.5%)	1(2.5%)	9(22.5%)	15(37.5%)	2(5%)	40

	Potatoes	7(46.7%)	5(33.3%)	3(20%)	0(0%)	0(0%)	15
	Breakfast cereals	34(39.1%)	10(11.5%)	27(31%)	15(17.2%)	1(1.1%)	87
Fish Meat Eggs		57(20%)	67(23.5%)	51(17.9%)	80(28.1%)	30(10.5%)	285
	Fish and seafood	18(21.2%)	31(36.5%)	18(21.2%)	18(21.2%)	0(0%)	85
	Meat	22(20.8%)	28(26.4%)	15(14.2%)	33(31.1%)	8(7.5%)	106
	Processed meat	0(0%)	6(8.6%)	15(21.4%)	27(38.6%)	22(31.4%)	70
	Eggs	17(85%)	2(10%)	1(5%)	0(0%)	0(0%)	20
	Offals	0(0%)	0(0%)	2(50%)	2(50%)	0(0%)	4
Milk and dairy products		67(15.9%)	108(25.7%)	95(22.6%)	139(33%)	12(2.9%)	421
	Plant-based milk substitutes	5(19.2%)	10(38.5%)	1(3.8%)	10(38.5%)	0(0%)	26
	Milk and yogurt	55(22.4%)	94(38.2%)	75(30.5%)	21(8.5%)	1(0.4%)	246
	Cheese	7(6.5%)	0(0%)	7(6.5%)	90(84.1%)	3(2.8%)	107
	Dairy desserts	0(0%)	4(20%)	10(50%)	5(25%)	1(5%)	20
	Ice cream	0(0%)	0(0%)	2(9.1%)	13(59.1%)	7(31.8%)	22
Fat and sauces		3(1%)	16(5.1%)	106(34.1%)	143(46%)	43(13.8%)	311
	Dressings and sauces	3(1.3%)	14(6%)	101(43%)	101(43%)	16(6.8%)	235
	Fats	0(0%)	2(2.6%)	5(6.6%)	42(55.3%)	27(35.5%)	76
Salty snacks		9(4.5%)	17(8.6%)	75(37.9%)	83(41.9%)	14(7.1%)	198
	Appetizers	3(2.6%)	7(6.1%)	37(32.5%)	55(48.2%)	12(10.5%)	114
	Nuts	1(2.8%)	2(5.6%)	17(47.2%)	16(44.4%)	0(0%)	36
	Salty and fatty products	5(10.4%)	8(16.7%)	21(43.8%)	12(25%)	2(4.2%)	48
Sugary snacks		6(0.7%)	14(1.7%)	57(7.1%)	329(40.9%)	399(49.6%)	805
	Biscuits and cakes	3(0.8%)	2(0.5%)	22(5.8%)	148(38.7%)	207(54.2%)	382
	Chocolate products	0(0%)	0(0%)	0(0%)	37(22%)	131(78%)	168
	Sweets	3(1.3%)	12(5.1%)	32(13.5%)	130(54.9%)	60(25.3%)	237
	pastries	0(0%)	0(0%)	3(16.7%)	14(77.8%)	1(5.6%)	18
Composite foods		88(32.5%)	84(31%)	54(19.9%)	38(14%)	7(2.6%)	271
	One-dish meals	75(38.5%)	63(32.3%)	40(20.5%)	17(8.7%)	0(0%)	195
	Pizza pies and quiches	0(0%)	7(17.9%)	10(25.6%)	16(41%)	6(15.4%)	39
	Sandwiches	13(35.1%)	14(37.8%)	4(10.8%)	5(13.5%)	1(2.7%)	37
Beverages		40(17%)	23(9.8%)	66(28.1%)	47(20%)	59(25.1%)	235
	Waters	40(100%)	0(0%)	0(0%)	0(0%)	0(0%)	40
	Teas and herbal teas and coffees	0(0%)	1(16.7%)	0(0%)	4(66.7%)	1(16.7%)	6
	Fruit juices	0(0%)	7(10.9%)	42(65.6%)	12(18.8%)	3(4.7%)	64
	Fruit nectars	0(0%)	0(0%)	1(50%)	0(0%)	1(50%)	2

	Artificially sweetened beverages	0(0%)	12(19.4%)	22(35.5%)	20(32.3%)	8(12.9%)	62
	Sweetened beverages	0(0%)	3(4.9%)	1(1.6%)	11(18%)	46(75.4%)	61
Sum		569(18.6%)	417(13.6%)	596(19.5%)	904(29.6%)	572(18.7%)	3058

Results for the Netherlands

For the Netherlands, the OpenFoodFact table included 5134 foods. From this list, 3810 products could not be affected to a specific food group and were deleted from the list. Then, 128 products were removed because the nutritional informations necessary to the calculation of the NutriScore were missing. 2 products were deleted after additional quality controls. **Finally, the OpenFoodFact table used for this document included 1194 foods.** The database contained 69 products composed mainly of fruits and vegetables, 231 bread and cereal products, 46 meat, fish and eggs products, 209 milk and dairy, 105 fats and sauces, 62 composite dishes, 288 sugary snacks, 84 salty snacks. Overall, the mean FSAm-NSP score was 8.5+/- 9.5 points.

The overall distribution of the FSAm-NSP score is represented in Figure 1.

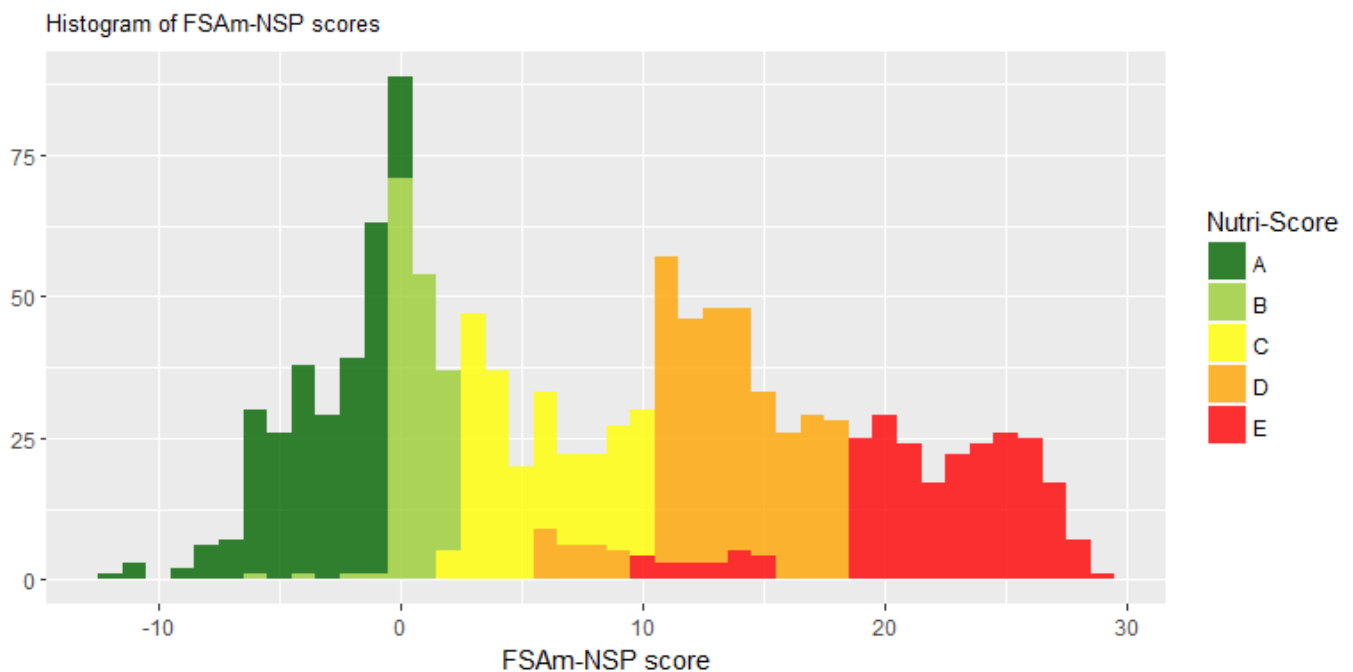


Figure 1: Overall distribution of the FSAm-NSP score

The distribution of the Nutri-Score in the different food groups is represented in Figures 2, 3 and 4.

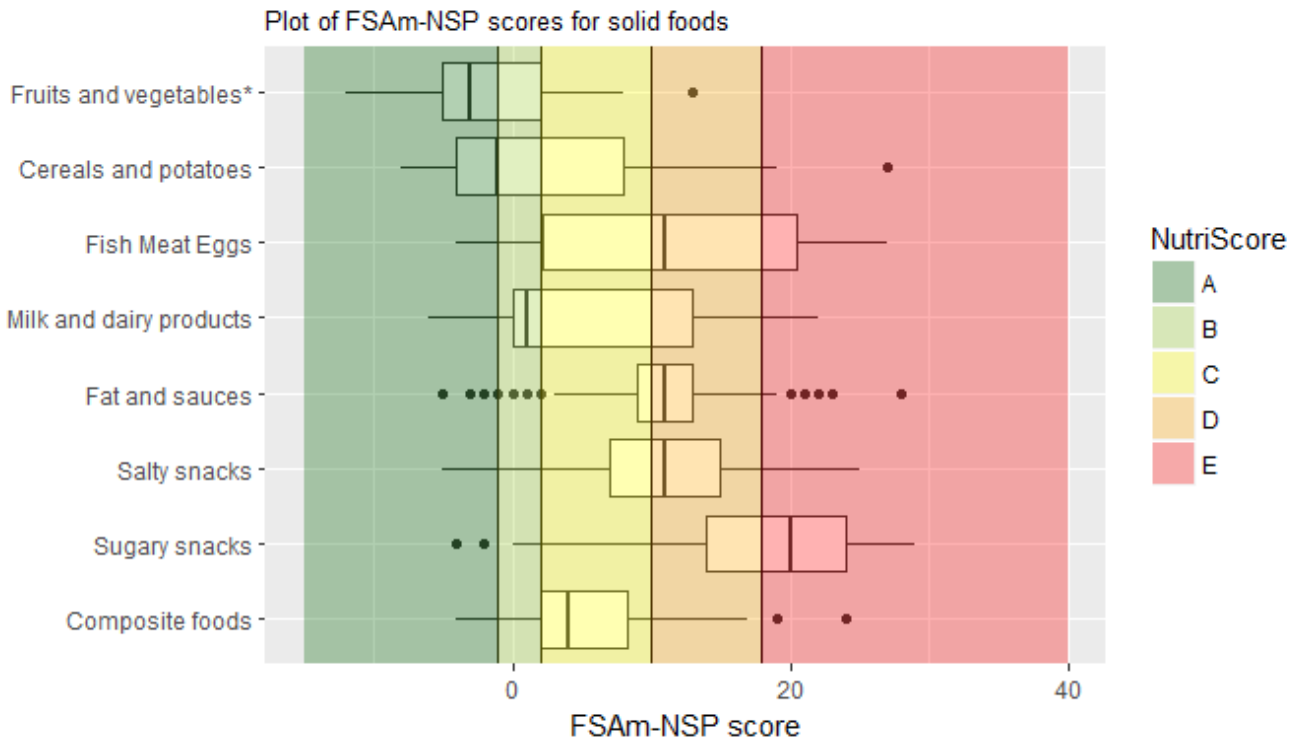


Figure 2: Distribution of the FSAm-NSP score for solid foods. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. *Products containing mainly fruits and vegetables

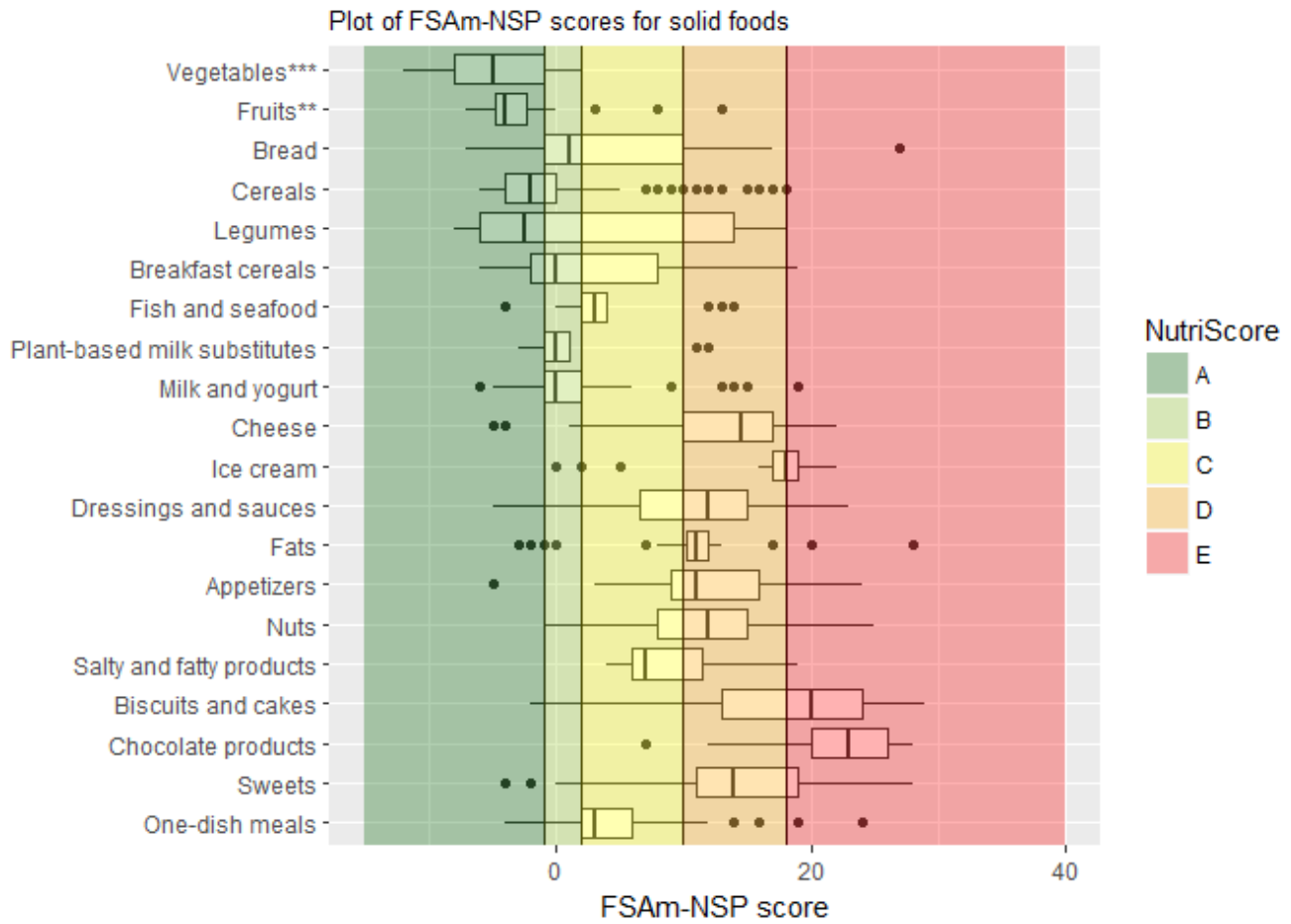


Figure 3: Distribution of the FSAm-NSP score for solid foods in subgroups containing more than 20 items. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. ** Fruits based products ; *** Vegetables based products

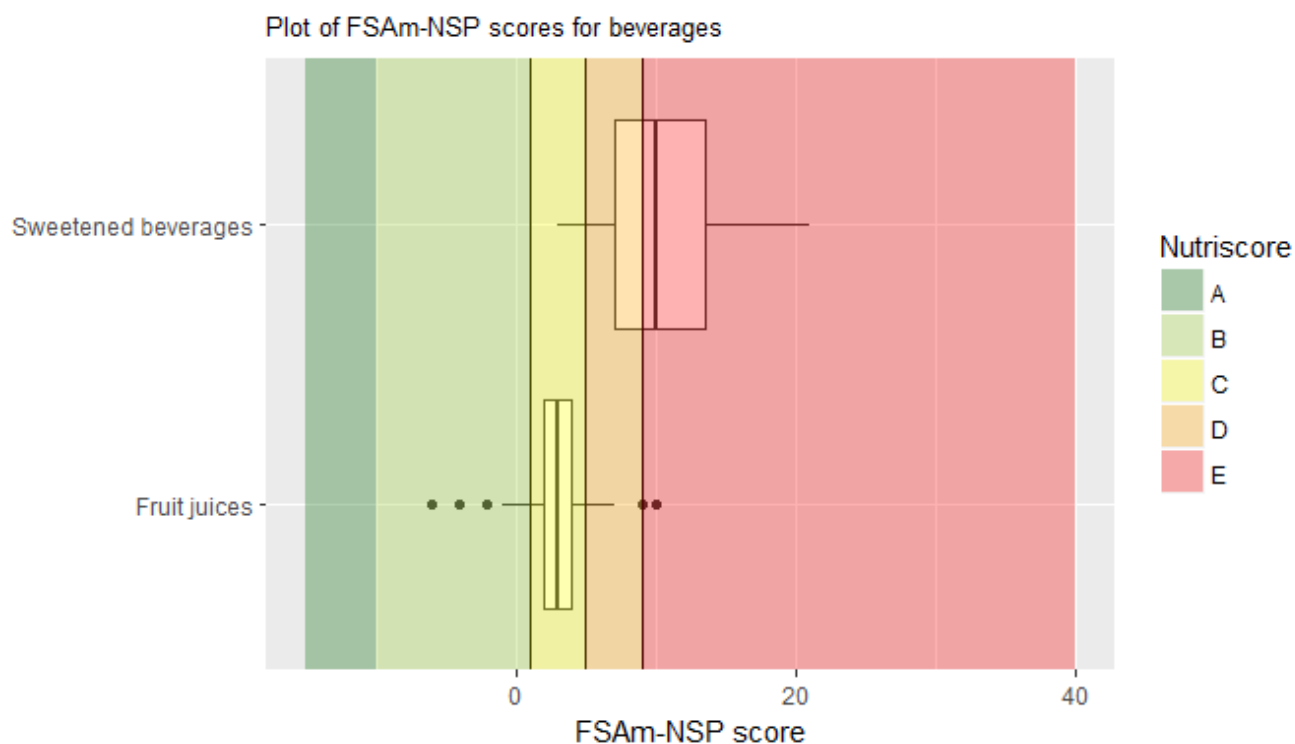


Figure 4: Distribution of the FSAm-NSP score for beverages. Vertical lines represent the cut-offs of the 5-category Nutriscore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. By definition, only water is classified as A.

The distribution of the Nutri-Score within the different food groups is displayed in Table 1.

Table 1: Distribution of the Nutri-Score within the different food groups. ** Fruits based products ; *** Vegetables based products.

	A	B	C	D	E	Total
Fruits and vegetables*	44(63.8%)	12(17.4%)	12(17.4%)	1(1.4%)	0(0%)	69
Vegetables***	26(81.2%)	6(18.8%)	0(0%)	0(0%)	0(0%)	32
Dried fruits	0(0%)	3(33.3%)	6(66.7%)	0(0%)	0(0%)	9
Fruits**	18(81.8%)	1(4.5%)	2(9.1%)	1(4.5%)	0(0%)	22
Soups	0(0%)	2(33.3%)	4(66.7%)	0(0%)	0(0%)	6
Cereals and potatoes	126(54.5%)	29(12.6%)	33(14.3%)	41(17.7%)	2(0.9%)	231
Bread	13(35.1%)	10(27%)	6(16.2%)	7(18.9%)	1(2.7%)	37
Cereals	69(70.4%)	9(9.2%)	11(11.2%)	9(9.2%)	0(0%)	98
Legumes	28(53.8%)	2(3.8%)	3(5.8%)	19(36.5%)	0(0%)	52

	Potatoes	0(0%)	1(50%)	1(50%)	0(0%)	0(0%)	2
Fish Meat Eggs	Breakfast cereals	16(38.1%)	7(16.7%)	12(28.6%)	6(14.3%)	1(2.4%)	42
		3(6.5%)	9(19.6%)	10(21.7%)	11(23.9%)	13(28.3%)	46
	Fish and seafood	1(4.3%)	9(39.1%)	9(39.1%)	4(17.4%)	0(0%)	23
	Meat	1(16.7%)	0(0%)	1(16.7%)	4(66.7%)	0(0%)	6
	Processed meat	0(0%)	0(0%)	0(0%)	3(18.8%)	13(81.2%)	16
Milk and dairy products	Eggs	1(100%)	0(0%)	0(0%)	0(0%)	0(0%)	1
		47(22.5%)	79(37.8%)	20(9.6%)	48(23%)	15(7.2%)	209
	Plant-based milk substitutes	16(29.6%)	33(61.1%)	0(0%)	5(9.3%)	0(0%)	54
	Milk and yogurt	27(31.8%)	40(47.1%)	11(12.9%)	6(7.1%)	1(1.2%)	85
	Cheese	3(6.5%)	4(8.7%)	6(13%)	29(63%)	4(8.7%)	46
Fat and sauces	Dairy desserts	1(33.3%)	0(0%)	2(66.7%)	0(0%)	0(0%)	3
	Ice cream	0(0%)	2(9.5%)	1(4.8%)	8(38.1%)	10(47.6%)	21
		7(6.7%)	4(3.8%)	26(24.8%)	57(54.3%)	11(10.5%)	105
	Dressings and sauces	4(6.3%)	3(4.8%)	19(30.2%)	31(49.2%)	6(9.5%)	63
	Fats	3(7.1%)	1(2.4%)	7(16.7%)	26(61.9%)	5(11.9%)	42
Salty snacks		2(2.4%)	1(1.2%)	36(42.9%)	39(46.4%)	6(7.1%)	84
	Appetizers	1(2.5%)	0(0%)	16(40%)	20(50%)	3(7.5%)	40
	Nuts	1(4.8%)	1(4.8%)	6(28.6%)	11(52.4%)	2(9.5%)	21
Sugary snacks	Salty and fatty products	0(0%)	0(0%)	14(60.9%)	8(34.8%)	1(4.3%)	23
		4(1.4%)	8(2.8%)	22(7.6%)	88(30.6%)	166(57.6%)	288
	Biscuits and cakes	1(1%)	2(1.9%)	12(11.4%)	31(29.5%)	59(56.2%)	105
	Chocolate products	0(0%)	0(0%)	1(1%)	14(14%)	85(85%)	100
	Sweets	3(3.7%)	6(7.4%)	9(11.1%)	41(50.6%)	22(27.2%)	81
Composite foods	pastries	0(0%)	0(0%)	0(0%)	2(100%)	0(0%)	2
		7(11.3%)	12(19.4%)	29(46.8%)	12(19.4%)	2(3.2%)	62
	One-dish meals	6(13.3%)	10(22.2%)	20(44.4%)	7(15.6%)	2(4.4%)	45
	Pizza pies and quiches	0(0%)	0(0%)	7(63.6%)	4(36.4%)	0(0%)	11
	Sandwiches	1(16.7%)	2(33.3%)	2(33.3%)	1(16.7%)	0(0%)	6
Beverages		18(18%)	7(7%)	25(25%)	26(26%)	24(24%)	100
	Waters	18(100%)	0(0%)	0(0%)	0(0%)	0(0%)	18
	Teas and herbal teas and coffees	0(0%)	0(0%)	1(8.3%)	9(75%)	2(16.7%)	12
	Fruit juices	0(0%)	5(20%)	16(64%)	3(12%)	1(4%)	25
	Fruit nectars	0(0%)	0(0%)	0(0%)	0(0%)	1(100%)	1
	Artificially	0(0%)	2(22.2%)	3(33.3%)	4(44.4%)	0(0%)	9

	sweetened beverages					
	Sweetened beverages	0(0%)	0(0%)	5(14.3%)	10(28.6%)	20(57.1%) 35
Sum		258(21.6%)	161(13.5%)	213(17.8%)	323(27.1%)	239(20%) 1194

Results for Sweden

For Sweden, the OpenFoodFact table included 2073 foods. From this list, 912 products could not be affected to a specific food group and were deleted from the list. Then, 93 products were removed because the nutritional informations necessary to the calculation of the NutriScore were missing. **Finally, the OpenFoodFact table used for this document included 1068 foods.** The database contained 47 products composed mainly of fruits and vegetables, 121 bread and cereal products, 82 meat, fish and eggs products, 202 milk and dairy, 95 fats and sauces, 203 composite dishes, 151 sugary snacks, 90 salty snacks. Overall, the mean FSAm-NSP score was 8.3+/- 9 points.

The overall distribution of the FSAm-NSP score is represented in Figure 1.

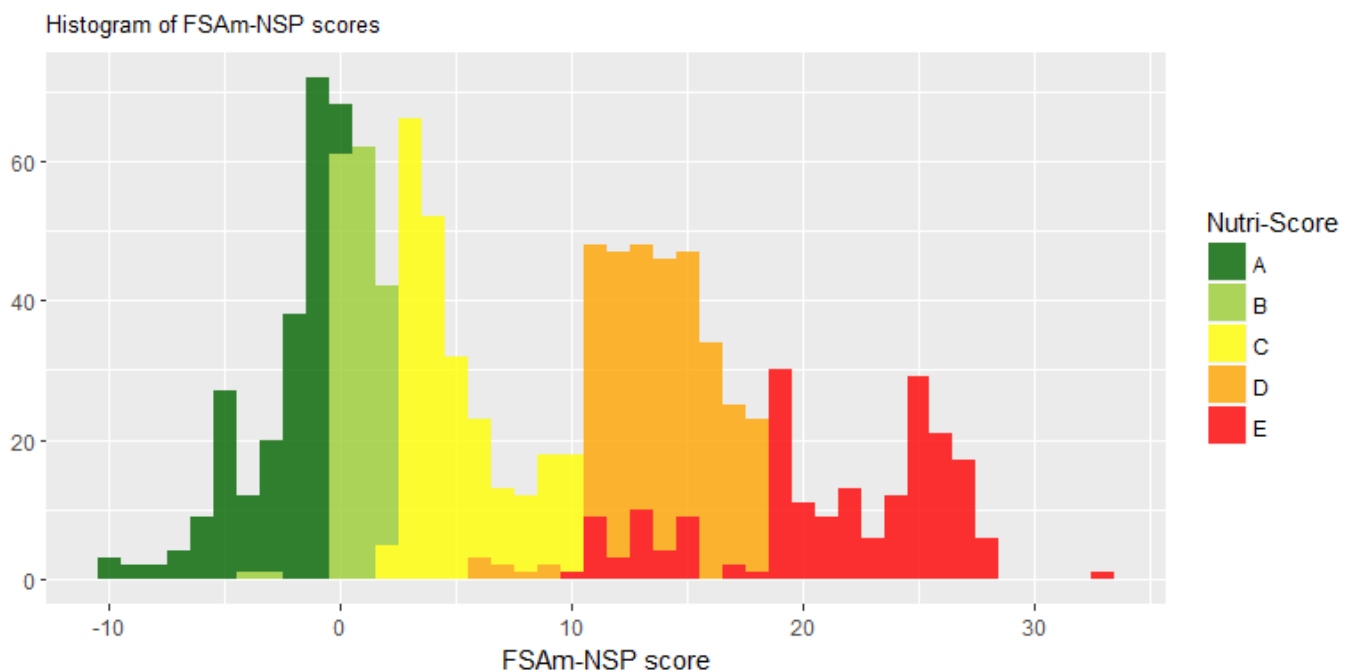


Figure 1: Overall distribution of the FSAm-NSP score

The distribution of the Nutri-Score in the different food groups is represented in Figures 2, 3 and 4.

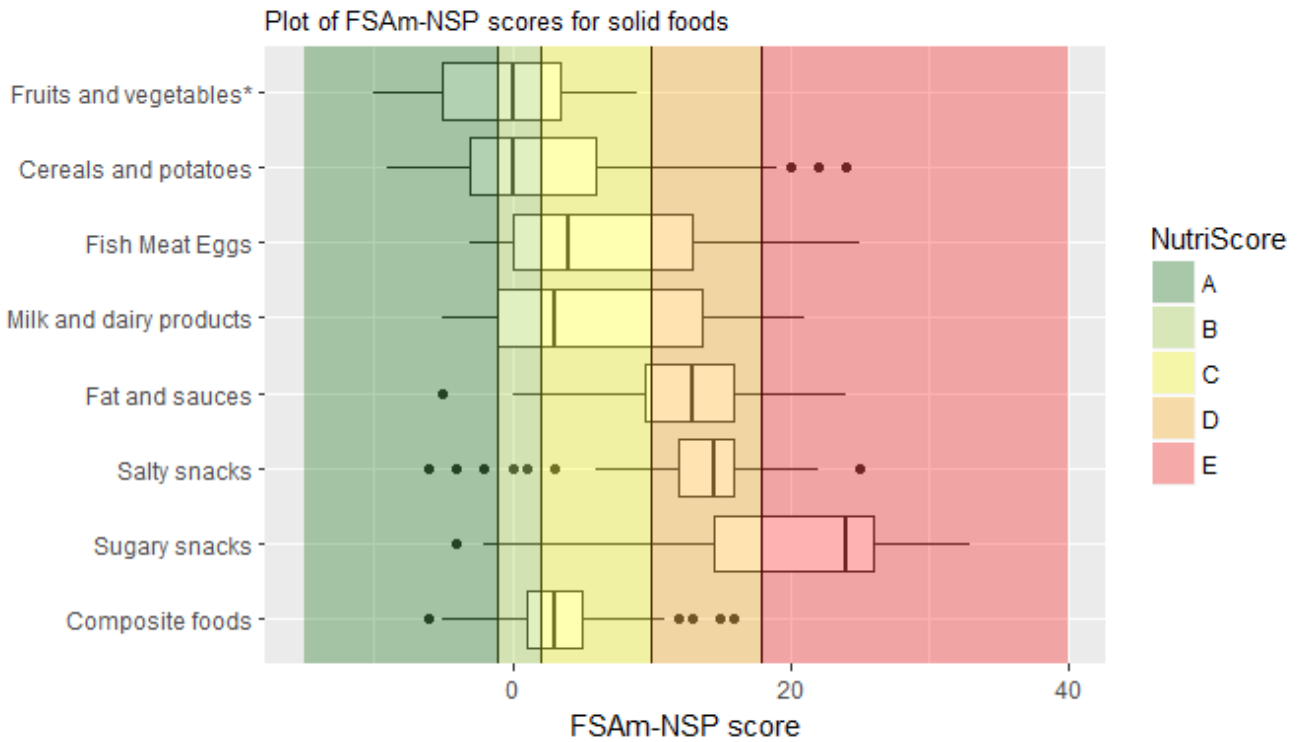


Figure 2: Distribution of the FSAm-NSP score for solid foods. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. *Products containing mainly fruits and vegetables

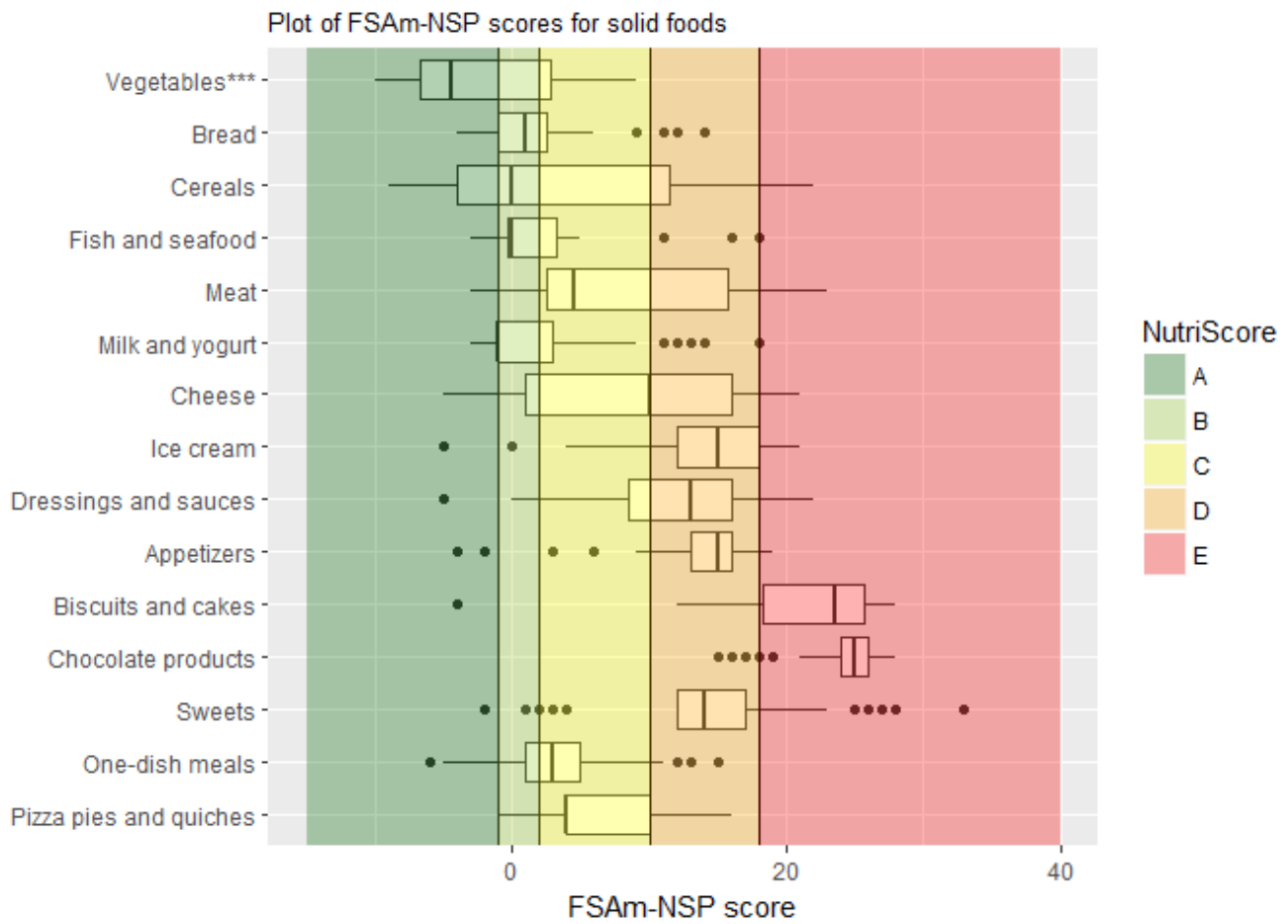


Figure 3: Distribution of the FSAm-NSP score for solid foods in subgroups containing more than 20 items. Vertical lines represent the cut-offs of the 5-category NutriScore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. ** Fruits based products ; *** Vegetables based products

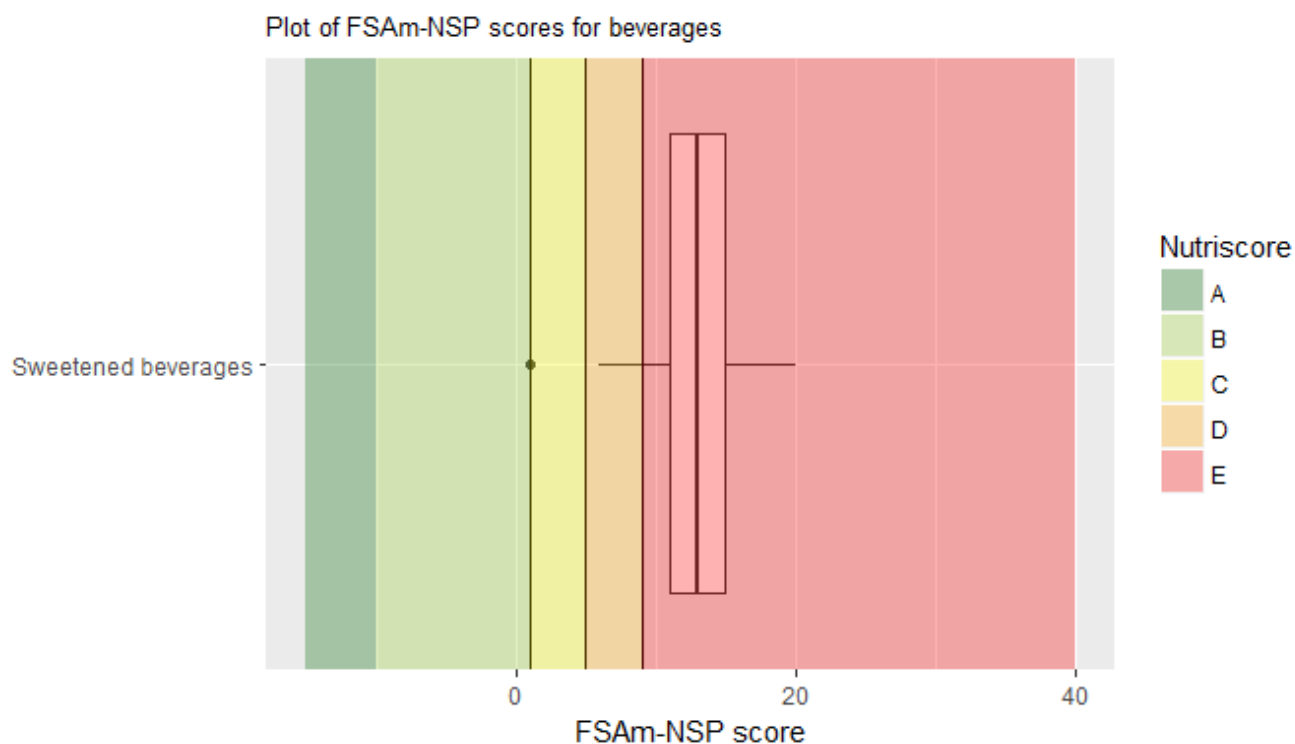


Figure 4: Distribution of the FSAm-NSP score for beverages. Vertical lines represent the cut-offs of the 5-category Nutriscore. The boundary of the box nearest to the left indicates the 25th percentile, the line within the box marks the median, and the boundary of the box furthest from the left indicates the 75th percentile. Whiskers (error bars) left and right of the box indicate the lower limit (25th percentile - 1.5 * (Inter-quartile range)) and the upper limit (75th percentile + 1.5 * (Inter-quartile range)). The circles are individual outlier points. By definition, only water is classified as A.

The distribution of the Nutri-Score within the different food groups is displayed in Table 1.

Table 1: Distribution of the Nutri-Score within the different food groups. ** Fruits based products ; *** Vegetables based products.

	A	B	C	D	E	Total
Fruits and vegetables*	23(48.9%)	7(14.9%)	17(36.2%)	0(0%)	0(0%)	47
Vegetables***	20(66.7%)	2(6.7%)	8(26.7%)	0(0%)	0(0%)	30
Dried fruits	0(0%)	3(60%)	2(40%)	0(0%)	0(0%)	5
Fruits**	2(33.3%)	0(0%)	4(66.7%)	0(0%)	0(0%)	6
Soups	1(16.7%)	2(33.3%)	3(50%)	0(0%)	0(0%)	6
Cereals and potatoes	56(46.3%)	28(23.1%)	12(9.9%)	16(13.2%)	9(7.4%)	121
Bread	14(45.2%)	9(29%)	4(12.9%)	4(12.9%)	0(0%)	31
Cereals	27(49.1%)	10(18.2%)	3(5.5%)	7(12.7%)	8(14.5%)	55
Legumes	4(44.4%)	1(11.1%)	1(11.1%)	3(33.3%)	0(0%)	9

	Potatoes	4(57.1%)	2(28.6%)	1(14.3%)	0(0%)	0(0%)	7
	Breakfast cereals	7(36.8%)	6(31.6%)	3(15.8%)	2(10.5%)	1(5.3%)	19
Fish Meat Eggs		17(20.7%)	16(19.5%)	15(18.3%)	22(26.8%)	12(14.6%)	82
	Fish and seafood	7(25%)	11(39.3%)	6(21.4%)	4(14.3%)	0(0%)	28
	Meat	3(9.4%)	5(15.6%)	9(28.1%)	8(25%)	7(21.9%)	32
	Processed meat	0(0%)	0(0%)	0(0%)	10(66.7%)	5(33.3%)	15
	Eggs	7(100%)	0(0%)	0(0%)	0(0%)	0(0%)	7
Milk and dairy products		61(30.2%)	34(16.8%)	36(17.8%)	57(28.2%)	14(6.9%)	202
	Plant-based milk substitutes	0(0%)	1(50%)	0(0%)	1(50%)	0(0%)	2
	Milk and yogurt	43(50.6%)	20(23.5%)	13(15.3%)	9(10.6%)	0(0%)	85
	Cheese	14(17.9%)	12(15.4%)	15(19.2%)	30(38.5%)	7(9%)	78
	Dairy desserts	3(37.5%)	0(0%)	4(50%)	1(12.5%)	0(0%)	8
	Ice cream	1(3.4%)	1(3.4%)	4(13.8%)	16(55.2%)	7(24.1%)	29
Fat and sauces		1(1.1%)	3(3.2%)	21(22.1%)	54(56.8%)	16(16.8%)	95
	Dressings and sauces	1(1.3%)	3(3.8%)	20(25.3%)	43(54.4%)	12(15.2%)	79
	Fats	0(0%)	0(0%)	1(6.2%)	11(68.8%)	4(25%)	16
Salty snacks		4(4.4%)	2(2.2%)	12(13.3%)	66(73.3%)	6(6.7%)	90
	Appetizers	3(4.6%)	0(0%)	6(9.2%)	53(81.5%)	3(4.6%)	65
	Nuts	0(0%)	1(6.7%)	5(33.3%)	7(46.7%)	2(13.3%)	15
	Salty and fatty products	1(10%)	1(10%)	1(10%)	6(60%)	1(10%)	10
Sugary snacks		3(2%)	6(4%)	3(2%)	43(28.5%)	96(63.6%)	151
	Biscuits and cakes	1(2.2%)	0(0%)	0(0%)	11(23.9%)	34(73.9%)	46
	Chocolate products	0(0%)	0(0%)	0(0%)	8(13.3%)	52(86.7%)	60
	Sweets	2(4.4%)	6(13.3%)	3(6.7%)	24(53.3%)	10(22.2%)	45
Composite foods		22(10.8%)	56(27.6%)	103(50.7%)	22(10.8%)	0(0%)	203
	One-dish meals	21(13.7%)	50(32.7%)	72(47.1%)	10(6.5%)	0(0%)	153
	Pizza pies and quiches	1(2.1%)	6(12.8%)	29(61.7%)	11(23.4%)	0(0%)	47
	Sandwiches	0(0%)	0(0%)	2(66.7%)	1(33.3%)	0(0%)	3
Beverages		7(9.1%)	10(13%)	11(14.3%)	8(10.4%)	41(53.2%)	77
	Waters	7(100%)	0(0%)	0(0%)	0(0%)	0(0%)	7
	Teas and herbal teas and coffees	0(0%)	0(0%)	0(0%)	0(0%)	1(100%)	1
	Fruit juices	0(0%)	4(28.6%)	8(57.1%)	1(7.1%)	1(7.1%)	14
	Fruit nectars	0(0%)	0(0%)	0(0%)	0(0%)	1(100%)	1
	Artificially sweetened beverages	0(0%)	5(45.5%)	3(27.3%)	3(27.3%)	0(0%)	11

	Sweetened beverages	0(0%)	1(2.3%)	0(0%)	4(9.3%)	38(88.4%)	43
Sum		194(18.2%)	162(15.2%)	230(21.5%)	288(27%)	194(18.2%)	1068

Conclusion

Overall, the distribution of the FSAm-NSP score displayed a high variability in the 7 countries, confirming its validity for use in the 5-category label Nutri-Score in different sociocultural contexts. Moreover, the distribution in the FSAm-NSP score showed a high consistency between the classification and dietary recommendations: overall, products composed mainly of fruits and vegetables, bread and cereals scored consistently more favorably than sugary or salty snacks. Composite dishes displayed a very large distribution, highlighting the variability of the products in this specific category.

The classification of the different food groups in the Nutri-Score displayed a high consistency with nutritional recommendations: the majority of products containing mainly fruits and vegetables were classified as A or B, while a majority of sugary snacks were classified as D or E. This variability was also displayed within food groups: in the bread and cereals group, legumes + pasta and rice were consistently better classified than breakfast cereals; in dairy, milk and yogurt were better classified than cheese.

Finally, in beverages, while a majority of fruit juices were classified as C, soft drinks were classified as E, consistently with nutritional recommendations (only water is in A).

Overall, the discriminating power of the Nutri-Score (number of categories in the Nutri-Score available for each food group) was high, as foods were classified in more than 3 categories of the Nutri-Score, both for food groups and for subgroups of foods.

Therefore, overall, the Nutri-Score displays a high consistency with nutritional recommendations, and allows consumers to grasp the very high variability in the nutritional composition of foods. The discriminating power of the Nutri-Score can be used to help consumers making healthier choices at the point of purchases, by displaying with at-a-glance labelling the nutritional quality of products.

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