

Consistency of the initial and updated version of the Nutri-Score with food-based dietary guidelines: a French perspective

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Supplementary Material 1: Computation of the Nutri-Score

1. The 2017 Nutri-Score

Points are allocated based on the nutritional content per 100g of foods or beverages.

Points are allocated for unfavourable elements (A points) and for favourable elements (C points) using the table below:

Component	A points				C points		
Points	Energy (kJ)	Saturated fat (g)	Sugars (g)	Sodium (mg)	Protein (g)	Fibre (g)	Fruits, vegetables, pulses, nuts(%) ¹
0	≤335	≤1	≤4.5	≤90	≤1.6	≤0.9	≤40%
1	>335	>1	>4.5	>90	>1.6	>0.9	>40%
2	>670	>2	>9	>180	>3.2	>1.9	>60%
3	>1005	>3	>13.5	>270	>4.8	>2.8	
4	>1340	>4	>18	>360	>6.4	>3.7	
5	>1675	>5	>22.5	>450	>8.0	>4.7	>80%
6	>2010	>6	>27	>540			
7	>2345	>7	>31	>630			
8	>2680	>8	>36	>720			
9	>3015	>9	>40	>810			
10	>3350	>10	>45	>900			

¹ Olive, canola and walnut oil are included in the fruit and vegetable component

A points= Points_{Energy}+ Points_{Saturated fat}+ Points_{Sugars}+ Points_{Salt}

C points= Points_{Fiber}+ Points_{Protein}+ Points_{F,V,P}

In the general case:

- If A points<11; Final nutritional score (FNS)=A points – C points
- If A≥11, FNS= A points – (Points_{Fiber} + Points_{F,V,P})

Specific calculation rules:

1) For cheeses:

Same calculations as in the general case except for the FNS

- FNS=A points – C points (regardless of the value of A)

2) For fats and oils:

Points are allocated for unfavourable elements (A points) and for favourable elements (C points) using the table below:

Component	A points				C points		
Points	Energy (kJ)	Ratio SFA/total fat (%)	Sugars (g)	Sodium (mg)	Protein (g)	Fibre (g)	Fruits, vegetables, pulses, nuts(%) ¹
0	≤335	<10	≤4.5	≤90	≤1.6	≤0.9	≤40%
1	>335	>10	>4.5	>90	>1.6	>0.9	>40%
2	>670	>16	>9	>180	>3.2	>1.9	>60%
3	>1005	>22	>13.5	>270	>4.8	>2.8	
4	>1340	>28	>18	>360	>6.4	>3.7	
5	>1675	>34	>22.5	>450	>8.0	>4.7	>80%
6	>2010	>40	>27	>540			
7	>2345	>46	>31	>630			
8	>2680	>52	>36	>720			
9	>3015	>58	>40	>810			
10	>3350	≥64	>45	>900			

¹ Olive, canola and walnut oil are included in the fruit and vegetable component

$$A \text{ points} = \text{Points}_{\text{Energy}} + \text{Points}_{\text{Saturated fat}} + \text{Points}_{\text{Sugars}} + \text{Points}_{\text{Salt}}$$

$$C \text{ points} = \text{Points}_{\text{Fiber}} + \text{Points}_{\text{Protein}} + \text{Points}_{\text{F,V,P}}$$

- If A points < 11; Final nutritional score (FNS) = A points – C points
- If A ≥ 11, FNS = A points – (Points_{Fiber} + Points_{F,V,P})

3) Beverages

Points are allocated for unfavourable elements (A points) and for favourable elements (C points) using the table below:

Component	A points				C points		
Points	Energy (kJ)	Saturated fat (g)	Sugars (g)	Sodium (mg)	Protein (g)	Fibre (g)	Fruits, vegetables, pulses, nuts(%) ¹
0	≤0	≤1	≤0	≤90	≤1.6	≤0.9	≤40%
1	>0	>1	>0	>90	>1.6	>0.9	>40%
2	>30	>2	>1.5	>180	>3.2	>1.9	>60%
3	>60	>3	>3	>270	>4.8	>2.8	
4	>90	>4	>4.5	>360	>6.4	>3.7	
5	>120	>5	>6	>450	>8.0	>4.7	>80%
6	>150	>6	>7.5	>540			
7	>180	>7	>9	>630			
8	>210	>8	>10.5	>720			
9	>240	>9	>12	>810			
10	>270	>10	>13.5	>900			

¹ Olive, canola and walnut oil are included in the fruit and vegetable component

$$A \text{ points} = \text{Points}_{\text{energy}} + \text{Points}_{\text{saturated fat}} + \text{Points}_{\text{sugars}} + \text{Points}_{\text{salt}}$$

$$C \text{ points} = \text{Points}_{\text{Fiber}} + \text{Points}_{\text{protein}} + \text{Points}_{\text{F,V,P}}$$

- If $A \text{ points} < 11$; Final nutritional score (FNS) = $A \text{ points} - C \text{ points}$
- If $A \geq 11$, FNS = $A \text{ points} - (\text{Points}_{\text{Fiber}} + \text{Points}_{\text{F,V,P}})$

Nutri-Score allocation depending on the Final Nutritional score (table below):

FNS		Class
All foods except beverages	Beverages	
≤ -1	Water	A
0 to 2	≤ 1	B
3 to 10	2 to 5	C
11 to 18	6 to 9	D
≥ 19	≥ 19	E

2. The 2023 Nutri-Score

Points are allocated based on the nutritional content per 100g of foods or beverages.

Points are allocated for unfavorable elements (A points) and for favorable elements (C points) using the table below:

Component	A points				C points		
	Points	Energy (kJ)	Saturated fat (g)	Sugars (g)	Salt (g)	Protein (g)	Fiber (g)
0	≤ 335	≤ 1	≤ 3.4	≤ 0.2	≤ 2.4	≤ 3	$\leq 40\%$
1	> 335	> 1	> 3.4	> 0.2	> 2.4	> 3	$> 40\%$
2	> 670	> 2	> 6.8	> 0.4	> 4.8	> 4.1	$> 60\%$
3	> 1005	> 3	> 10	> 0.6	> 7.2	> 5.2	
4	> 1340	> 4	> 14	> 0.8	> 9.6	> 6.3	
5	> 1675	> 5	> 17	> 1	> 12	> 7.4	$> 80\%$
6	> 2010	> 6	> 20	> 1.2	> 14		
7	> 2345	> 7	> 24	> 1.4	> 17		
8	> 2680	> 8	> 27	> 1.6			
9	> 3015	> 9	> 31	> 1.8			
10	> 3350	> 10	> 34	> 2.0			
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			

A points= Points_{energy}+ Points_{Saturated fat}+ Points_{Sugars}+ Points_{Salt}

C points= Points_{Fiber}+ Points_{Protein}+ Points_{F,V,P}

In the general case:

- If A points<11; Final nutritional score (FNS)=A points – C points
- If A≥11, FNS= A points – (Points_{Fiber} + Points_{F,V,P})

Specific calculation rules:

1) For cheeses:

Same calculations as in the general case except for the FNS

- FNS=A points – C points (regardless of the value of A)

2) For red meat and processed meat:

Same calculations as in the general case except maximum number of protein points is set at 2.

- If A points<11; FNS=A points – (Points_{Fiber}+ min(Points_{Protein},2)+ Points_{F,V,P})
- If A≥11, FNS= A points – (Points_{Fiber} + Points_{F,V,P})

3) For nuts, seeds and oils:

Points are allocated for unfavourable elements (A points) and for favourable elements (C points) using the table below:

Component	A points				C points		
Points	Energy from SFA (kJ) ¹	Ratio SFA/total fat (%)	Sugars (g)	Salt (g)	Protein (g)	Fiber (g)	Fruits, vegetables, pulses (%) ²
0	≤120	<10	≤3.4	≤0.2	≤2.4	≤3	≤40%
1	>120	>10	>3.4	>0.2	>2.4	>3	>40%
2	>240	>16	>6.8	>0.4	>4.8	>4.1	>60%
3	>360	>22	>10	>0.6	>7.2	>5.2	
4	>480	>28	>14	>0.8	>9.6	>6.3	
5	>600	>34	>17	>1	>12	>7.4	>80%
6	>720	>40	>20	>1.2	>14		
7	>840	>46	>24	>1.4	>17		
8	>960	>52	>27	>1.6			
9	>1080	>58	>31	>1.8			
10	>1200	≥64	>34	>2.0			
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			

¹Energy from SFA= Saturated fat content (g/100g)*9*4.18

²Oils derived from elements qualifying in the fruit and vegetable component qualify for fruit and vegetable component

A points= Points_{energy}+ Points_{Saturated fat}+ Points_{Sugars}+ Points_{Salt}

C points= Points_{Fiber}+ Points_{Protein}+ Points_{F,V,P}

- If A points<7; Final nutritional score (FNS)=A points – C points
- If A≥7 FNS= A points – (Points_{Fiber} + Points_{F,V,P})

4) Beverages:

Points are allocated for unfavourable elements (A points) and for favourable elements (C points) using the table below:

Component	A points					C points		
Points	Energy (kJ)	Saturated fat (g)	Sugars (g)	Salt (g)	NNS ¹	Protein (g)	Fiber (g)	Fruits, vegetables, pulses (%)
0	≤30	≤1	≤0.5	≤0.2	Absence	≤1.2	≤3	≤40%
1	>30	>1	>0.5	>0.2		>1.2	>3	
2	>90	>2	>2	>0.4		>1.5	>4.1	>40%
3	>150	>3	>3.5	>0.6		>1.8	>5.2	
4	>210	>4	>5	>0.8	Presence	>2.1	>6.3	>60%
5	>240	>5	>6	>1		>2.4	>7.4	
6	>270	>6	>7	>1.2		>2.7		>80%
7	>300	>7	>8	>1.4		>3		
8	>330	>8	>9	>1.6				
9	>360	>9	>10	>1.8				
10	>390	>10	>11	>2.0				
11				>2.2				
12				>2.4				
13				>2.6				
14				>2.8				
15				>3				
16				>3.2				
17				>3.4				
18				>3.6				
19				>3.8				
20				>4				

¹NNS stands for Non-nutritive sweeteners, as listed in Appendix 2 of the EU Regulation n°1333/2008

A points= Points_{Energy}+ Points_{Saturated fat}+ Points_{Sugars}+ Points_{Salt}+ Points_{NNS}

C points= Points_{Fiber}+ Points_{Protein}+ Points_{F,V,P}

- FNS=A points – C points

Nutri-Score allocation depending on the Final Nutritional Score:

FNS			Class
Solid foods	Nuts, seeds, oils	Beverages	
≤0	≤-6	Water	A
0 to 2	-5 to 2	≤2	B
3 to 10	3 to 10	3 to 6	C
11 to 18	11 to 18	7 to 9	D
≥19	≥19	≥10	E

Supplementary Material 2: Databases used and details regarding the composition of each food group

Group	Database used	Products covered
Unprocessed vegetables	Ciqual	Raw vegetables
Prepared vegetables	OpenFoodFacts	Frozen vegetables mixes, canned vegetables or mixed vegetables (e.g. vegetable stew), vegetable salad
Unprocessed fruits	Ciqual	Raw fruits
Unprocessed pulses	Ciqual	Raw pulses
Prepared pulses	OpenFoodFacts	Canned pulses (e.g. beans with tomato sauce)
White pasta	OpenFoodFacts	Dried refined pasta
Whole grain pasta	OpenFoodFacts	Dried whole grain pasta
White rice	OpenFoodFacts	White rice dry
Whole grain rice	OpenFoodFacts	Whole grain rice dry
White bread	OpenFoodFacts	Refined bread and buns
Whole grain bread	OpenFoodFacts	Bread and buns (made out of whole-grain flour, no minimum proportion required)
Savoury snacks	OQALI	crackers, puff pastry-based appetizers, potato crisps, tortilla chips
Unprocessed beef	Ciqual	Different cuts of beef
Unprocessed pork	Ciqual	Different cuts of pork
Unprocessed poultry	Ciqual	Different cuts of poultry
Meat preparations	OQALI	Breaded meat, cordon bleu
Processed meat other than ham	OQALI	Cold cuts, patés, sausages (cured), hot dogs, cured ham
Ham	OQALI	White ham (pork, poultry)
Cheese	OQALI	Hard cheese, soft cheese, fresh cheese, processed cheese and blue cheese
Unsalted nuts	OpenFoodFacts	Nuts with no addition of salt or sugar
Seasoned nuts	OpenFoodFacts	Nuts with addition of salt or sugar
Fats and oils	OpenFoodFacts	Olive, canola, walnut, sunflower, coconut oil, butter, cream
Oily fish	OpenFoodFacts	Both unprocessed and processed fish (Salmon, herring, mackerel, tuna, anchovies, eel, trout...). Processed fish includes canned fish, smoked fish, and fish preparations
Lean fish	OpenFoodFacts	Both unprocessed and processed fish (Cod, haddock, hake, tilapia...) Processed fish includes fish sticks, and fish preparations
Partly-ready meals	OQALI	Meals with fish/ meat/ vegetarian/legumes/ pasta. Hot sandwiches. Includes canned, fresh and frozen meals.
Ready-to-eat meals	OQALI	Salads, sandwiches, sushis...
Pizza	OQALI	Pizza, pies
Warm sauces	OQALI	Ready-to-eat sauces used for meals and in which the main components are vegetables, such as pasta sauces. Also include pesto or Indian curry sauces.
Cold sauces	OQALI	Ketchup, vinaigrette, mayonnaise...
Soups	OQALI	Soups (both prepared and unprepared, but with compositions based on prepared product).

Dairy products unsweetened	OQALI	Yogurts, quark, plant-based yogurts (no sweetener sugar)
Dairy products sweetened	OQALI	Yogurts, quark, plant-based yogurts (added sugar or artificial sweeteners)
Dairy desserts	OQALI	Custards, flans, mousses
Compotes	OQALI	Unsweetened and sweetened fruit compotes.
Canned fruits	OQALI	Canned fruits in sugar syrups
Breakfast cereals	OQALI	Plain/flavored mueslis/cornflakes, chocolate or honey flavored cereals, cereals with a filling, puffed cereals...
Fine bakery ware -sweet	OQALI	Biscuits and cakes (cakes, cookies, biscuits...); pastries (brioche-based products, croissants...)
Chocolate	OQALI	Chocolate products (chocolate bars, chocolate candies, dark/milk/white chocolate).
Confectionery	OQALI	Confectionery, which includes candies (caramels, marshmallows, nougats, sugar candies), chewing-gums.
Ice creams and sorbets	OQALI	Ice cream and sorbets.
Sweet spreads	OQALI	Jams, marmalades, chocolate spreads
Skimmed milk	OpenFoodFacts	Skimmed cow milk
Partially-skimmed milk	OpenFoodFacts	Semi-skimmed cow milk
Whole milk	OpenFoodFacts	Whole cow milk
Sweetened flavoured milk	OpenFoodFacts	Non-fermented sweetened milk- based beverages (chocolate milk, vanilla milk...)
Sweetened yogurts to drink	OpenFoodFacts	Fermented sweetened milk- based beverages
Plant-based beverages	OpenFoodFacts	Soy, almond, oat, rice beverages
Flavoured waters	OQALI	Water, carbonated or not, flavored, with no fruit juices
Tea-based beverages	OQALI	Beverages based on tea extracts, carbonated or not, plain or flavored
Colas	OQALI	Beverages flavoured with cola
Soft drinks with fruit	OQALI	Beverages, carbonated or not, containing fruit juices
Lemonades, tonic waters and bitters	OQALI	Beverages based on water and flavors (lemon or other flavors), without juices, and/or sold under the name "Lemonade », and beverages, carbonated or not, that contain quinin
Fruit juices	OQALI	Fresh fruit juices and fruit juices obtained from concentrate (following the criteria listed in French decree n°2013-1049), smoothies and vegetable juices
Fruit nectars	OQALI	Fruit nectars (following the criteria listed in French decree n°2013-1049): contain more than 25% or 50% fruit purees depending on the fruit and with potential addition of a sweetener
Smoothies	OQALI	Smoothies

Supplementary Material 3: methodology to transpose the French dietary guidelines into criteria:

Documents used:

- Dietary guidelines as communicated by the French Public health Agency
- Report from the High council of Public health

Principle:

Considering the documents that communicate the food-based dietary guidelines, the aim of this method was to establish criteria to assess the complementarity between the Nutri-Score and the French dietary guidelines.

1) Dietary guidelines as communicated by the French Public health Agency:

To translate dietary guidelines into criteria, we first used dietary guidelines as communicated by the French Public health Agency, which presents dietary guidelines under 3 categories:

- 1) Food groups to increase
- 2) Food groups to go towards
- 3) Food groups to limit

Food groups to increase corresponds to food groups for which an increased consumption is recommended. For these groups, we considered that an adequate Nutri-Score classification would rate these products in the A and B class, the most favourable classes.

Conversely, and using a similar method, we considered that food groups to limit would be adequately rated if the products belonging to these categories would be rated D or E, the most unfavourable classes.

Increase	Limit
Fruits and vegetables (R 1.1)	Sweet products (R 1.5)
Pulses (R 1.2)	Sweetened beverages (R 1.6)
Unsalted nuts (R1.3)	Salty products (R 1.7)
	Processed meat (R 1.8)
	Red meat (R 1.9)

Given the heterogeneity of the group « Go towards », it required a case-by-case analysis:

Number	Group	Guideline	Translation
R2.1	Whole grain cereals and starchy foods	[Go toward] Whole grain bread or multigrain bread, whole grain pasta, couscous or rice	Whole grain cereals and starchy foods should have a more favourable rating than their refined alternatives
R 2.2	Fish	[Go toward] Lean and oily fish in rotation	Oily and lean fishes should have similar rating
R 2.3	Fats and oils	[Go toward] Olive, canola and walnut oils	Olive, canola and walnut oils should have the most favourable rating the fat and oil category
R 2.4	Dairy products	[Go toward] An adequate but limited consumption	No translation

2) Report from the High council of Public health

In order to establish criteria for all food groups covered by the dietary guidelines, we complemented the first analysis with the report from the HCPH on the revision of the dietary guidelines for adults for the 2017-2021 national nutrition program, which covers a wide variety of food groups.

When in the report a recommendation consists in "preferring" a group over another, this is translated by the presence of a Nutri-Score class discrimination between the different groups in question.

When in the report a recommendation is to "limit" the consumption of a group, this is translated by an unfavourable rating for the group in question, which corresponds to a D or E.

When the report recommends "increasing" a group without limitation ("At least"), this is translated into a favourable rating for the group in question, which corresponds to an A or B.

If some guidelines could not be translated using criteria detailed above, they were analysed and translated on a case-to-case basis:

Number	Group	Guideline	Translation
R 3.1	Fruit juices	<ol style="list-style-type: none"> 1) No more than one glass of fruit juice per day, which within this limit can count as one serving of fruits and vegetables. 2) Consumption of sweetened beverages should remain exceptional, and for consumers, should be limited to one glass per day. In this category of products, give preference to fruit juices. 	Fruit juices should be discriminated (negatively) from other fruits and vegetables and should be (positively) discriminated from other sweetened beverages.
R 3.2	Canned fruits	<ol style="list-style-type: none"> 1) All forms of fruits and vegetables counts as servings of fruits and vegetables: fresh, frozen or canned. For canned fruits, prefer fruits in light syrup, without using the syrup 	Canned fruits should be discriminated depending on the sugar content.
R 3.3	Breakfast cereals	<ol style="list-style-type: none"> 1) Only unsweetened whole grain breakfast cereals can be included in this group [Whole grain product] 	Unsweetened whole grain breakfast cereals should have a more favourable rating than unsweetened refined breakfast cereals
R 3.4	Dairy products	<ol style="list-style-type: none"> 1) Limit the consumption of sweet products 2) Reduce salt consumption throughout the day 	Plain dairy products (milk, plain yogurts) should have a more favourable rating than sweetened dairy products (sweetened yogurts, dairy desserts, sweetened dairy beverages) and salted dairy products (cheeses)
R 3.5	Cheeses	<ol style="list-style-type: none"> 1) Prefer cheeses that are richer in calcium, less rich in fat 2) Reduce salt consumption throughout the day 	The more favourably rated cheeses should be those with lower content in fat, and salt and calcium

R 3.6	Meat and meat products	<ol style="list-style-type: none"> 1) Limit the consumption of red meat 2) Prefer poultry over red meat 	Poultry should have a more favourable rating than red meat, which should have an unfavourable rating.
R 3.7	Processed meat	<ol style="list-style-type: none"> 1) Limit the consumption of processed meat 2) Within this group, prefer white ham 	Processed meat should have an unfavourable rating and white ham should have a more favourable rating than other processed meat products
R 3.8	Fat and oils	<ol style="list-style-type: none"> 1) Prefer canola and walnut oils (rich in ALA) and olive oil over other oils low in ALA [e.g. sunflower, peanut and coconut oils] 2) Animal fats should be reserved for raw or spreadable use and used sparingly 	Favourable vegetable oils (olive, canola, walnut) should be more favourably rated than other vegetable oils (sunflower, peanut, coconut). Animal fats (cream, butter) should have an unfavourable rating.
R 3.9	Sugar-sweetened beverages	<ol style="list-style-type: none"> 1) Limit consumption of sweetened beverages or sweet-tasting beverages 	Rating of such beverages should be unfavourable
R 3.10	Artificially-sweetened beverages	<ol style="list-style-type: none"> 1) Limit consumption of sweetened beverages or sweet-tasting beverages 	Rating of such beverages should be unfavourable
R 3.11	Sweet products	<ol style="list-style-type: none"> 1) Limit consumption of sweet products as well as sweet and fatty products (pastries, chocolate, dairy desserts et ice creams) 2) Breakfast cereals are usually sweet, and sometimes sweet and fatty 	The rating of sweet (and potentially fatty) products should be unfavourable. Sweet breakfast cereals are also included in this category.
R 3.12	Water, tea, coffee, herbal tea	<ol style="list-style-type: none"> 1) The only recommended drink is water 2) Tea, coffee and herbal teas, when unsweetened, can contribute to water intake 	Plain water, tea, coffee and herbal teas (unsweetened) should be rated favourably.
R 3.13	Salt	<ol style="list-style-type: none"> 1) Reduce salt consumption throughout the day 2) Salty products include products that have a high salt content and products that are highly contributing to the daily salt intake (e.g. bread) 	Products high in salt should be unfavourably rated and foods contributing to the overall salt intake that are not considered high in salt should be discriminated depending on the salt content
R 3.14	Fruits and vegetables	<ol style="list-style-type: none"> 1) At least 5 a day 	Fruits and vegetables should have a favourable rating
R 3.15	Pulses	<ol style="list-style-type: none"> 2) A least twice a week 	Pulses should have a favourable rating

Additional comments:

Given the guideline to reduce the consumption of sweet products (resp. salty products), it is necessary to identify which products are considered as such. To do so, we based our assessment on the classification used for the national representative nutrition and health study Esteban, carried out in 2015.

The cut-offs used are detailed in the tables below:

Sweet products	Qualifying sugar threshold
Honey	All
Marmalade and jam	All
Chocolate	All
Biscuits and cakes	All
Pastries	All
Dairy desserts	≥12% sugars per 100g
Ice creams	All
Confectionery	All
Sweet breakfast cereals	≥20% sugars per 100g

Sweet beverages products	Qualifying sugar threshold
Any beverages with added sugar <ul style="list-style-type: none">• Soft drinks• Syrups• Fruit nectars• Sweetened water or milk	All

Products high in salt	Qualifying salt threshold
Processed meat	All
Some cheeses	No threshold provided. Median salt content was used as a cut-off.
Savoury snacks (including potato crisps)	All

For products that contribute to the daily salt intake, without being classified as high in salt, we selected food groups contributing to at least 5% to the daily intake in salt in the national representative food consumption survey INCA 3¹, carried out in 2017.

The following groups were selected:

- Bread
- Cheeses
- Soups and broths
- Prepared dishes
- Sauces (sauces-used warm)
- Condiment sauces¹

¹ <https://www.vie-publique.fr/rapport/36772-etude-individuelle-nationale-des-consommations-alimentaires-3-inca-3>

Following this initial analysis, the analysis was summarized in the following table presenting the list of criteria defined:

Group	Guideline number	Covered categories	Criteria
Solid foods			
Bread	R 2.1 R 3.13	White bread Whole grain bread	1) Discrimination between whole grain and white bread 2) Discrimination according to salt content
Breakfast cereals	R 3.3 R 3.11	Breakfast cereals	1) Unfavourable classification for sweet breakfast cereals 2) Discrimination according to fibre (proxy of whole grain) content among unsweetened or minimally sweetened breakfast cereals
Cereals	R 2.1	White pasta White rice Whole grain pasta Whole grain rice	1) Discrimination between whole grain and refined cereals
Fruits and vegetables	R 1.1 R 3.14	Unprocessed fruits Unprocessed vegetables	1) Favourable classification for unprocessed fruits and vegetables
Pulses	R 1.2 R 3.15	Pulses (unprocessed and prepared)	1) Favourable classification for pulses
Meat (non-processed meat)	R 1.9 R 3.6	Unprocessed beef/ pork/ poultry Meat preparations	1) Unfavourable classification for red meat 2) Discrimination between poultry and red meat
Processed meat	R 3.7 R 3.13	Ham Processed meat except ham	1) Unfavourable classification for processed meat 2) Discrimination between ham and other processed meat
Cheese	R 3.4 R 3.5 R 3.13	Cheese	1) Unfavourable classification for cheeses with the higher salt content 2) Discrimination between cheeses and unsweetened yogurts 3) In the cheese category, the best rated products should be those with a lower salt or fat content and those with a high amount of calcium
Fish	R 2.2 R 3.13	Oily fish Lean fish	1) Similar classification for oily and lean fish (with similar salt content)
Sauces	R 3.13	Cold sauces Sauces- used warm	1) Discrimination according to salt content
Soups	R 3.13	Soups and broths	1) Discrimination according to salt content

Prepared dishes	R 3.13	Prepared dishes	1) Discrimination according to salt content
Savoury snacks	R 3.13	Savoury snacks	1) Unfavourable classification for savoury snacks
Nuts	R 1.3 R 3.11 R 3.13	Unsalted nuts Seasoned nuts	1) Favourable classification for unsalted nuts 2) Discrimination between unsalted nuts and seasoned nuts
Fats and oils	R 2.3 R 3.8	Olive/ canola /walnut oil Sunflower / coconut oil Cream/ butter	1) Discrimination between recommended vegetable oils (canola, walnut, olive) and other vegetable oils 2) Unfavourable classification for animal fats
Dairy products (except cheeses)	R 3.4	Unsweetened yogurts Sweetened yogurts Dairy desserts	1) Discrimination between unsweetened and sweetened dairy products
Fine bakery ware-sweet	R 3.11	Fine bakery ware-sweet	1) Unfavourable classification for fine bakery ware - sweet
Chocolate products	R 3.11	Chocolate products	1) Unfavourable classification for chocolate and chocolate products
Ice creams	R 3.11	Ice creams and sorbets	1) Unfavourable classification for ice creams
Confectionery	R 3.11	Confectionery	1) Unfavourable classification for confectionery
Dairy desserts	R 3.11	Dairy desserts	1) Unfavourable classification for sweet dairy desserts
Prepared fruits	R 3.2	Canned fruits Compotes	1) Discrimination according to sugar content for canned fruits 2) Discrimination according to sugar content for compotes
Sweet spreads	R 3.11	Sweet spreads	1) Unfavourable classification for sweet spreads
<u>Beverages</u>			
Water, tea, coffee, herbal teas	R 3.12	Water	1) Favourable classification for all water-based beverages with no sugar added
Sugar and artificially sweetened beverages	R 3.9 R. 3.10	Flavoured waters Colas Soft drinks with fruits Lemonades, tonic waters Tea-based beverages Fruit nectars Sweetened flavoured milk Sweetened yogurt to drink	1) Unfavourable classification for sugar-sweetened beverages 2) Unfavourable classification for artificially-sweetened beverages

Fruit juices	R 3.1	Fruit juices	<ol style="list-style-type: none"> 1) Discrimination between fruit juices and fruits and vegetables 2) Discrimination between fruit juices and other sugar-sweetened beverages 3) Discrimination between fruit juices and other artificially-sweetened beverages
Dairy beverages	R 3.4	Skimmed milk Partially-skimmed milk Whole milk Sweetened flavoured milk Sweetened yogurt to drink	<ol style="list-style-type: none"> 1) Discrimination between unsweetened milks and sweetened dairy beverages

Supplementary Material 4: Detailed distribution of all food categories used in the study

Group	N	2017 Nutri-Score					2023 Nutri-Score				
		A	B	C	D	E	A	B	C	D	E
Unprocessed vegetables	113	100	0	0	0	0	100	0	0	0	0
Prepared vegetables	729	94	5	1	0	0	85	10	5	0	0
Unprocessed fruits	73	99	1	0	0	0	99	0	1	0	0
Unprocessed pulses	33	100	0	0	0	0	100	0	0	0	0
Prepared pulses	64	100	0	0	0	0	100	0	0	0	0
White pasta	1380	98	1	1	0	0	85	14	1	0	0
Whole grain pasta	55	100	0	0	0	0	100	0	0	0	0
White rice	704	69	27	3	1	0	13	81	4	2	0
Whole grain rice	77	91	6	3	0	0	64	31	4	1	0
White bread	571	27	55	15	3	0	5	8	78	8	1
Whole grain bread	238	76	20	3	1	0	21	38	40	1	0
Whole grain bread rich in fibre	143	83	14	2	1	0	32	52	15	1	0
Savoury snacks	1309	1	4	23	51	21	0	1	8	52	39
Unprocessed beef	28	46	32	7	11	4	14	33	39	11	3
Unprocessed pork	29	67	20	10	3	0	30	37	30	3	0
Unprocessed poultry	32	78	22	0	0	0	100	0	0	0	0
Meat preparations	111	4	25	59	13	0	0	1	59	40	0
Processed meat other than ham	749	0	0	3	33	64	0	0	2	14	84
Ham	222	0	7	68	25	0	3	14	35	48	0
Cheese	413	0	0	8	87	5	0	0	14	76	10
Cheese high in salt	207	0	0	2	88	10	0	0	2	79	19
Hard cheese	157	0	0	5	92	3	0	0	19	78	3
Soft cheese	126	0	0	5	95	0	0	0	7	93	0
Fresh cheese	40	0	0	35	63	2	0	0	38	40	22
Other cheese	90	0	0	3	80	17	0	0	3	68	29
Unsalted nuts	1483	66	24	10	0	0	70	22	8	0	0
Seasoned nuts	1248	6	14	76	4	0	5	6	66	18	5
Olive oil	2552	0	0	100	0	0	0	98	2	0	0

Canola oil	220	0	0	100	0	0	0	95	5	0	0
Walnut oil	204	0	0	99	1	0	0	54	46	0	0
Sunflower oil	228	0	0	14	85	1	0	11	89	0	0
Coconut oil	387	0	0	2	3	95	0	0	0	2	98
Cream	946	0	1	4	95	0	0	1	1	86	12
Butter	1399	0	0	1	18	81	0	0	1	9	90
Oily fish	9368	8	20	24	47	1	20	16	13	41	10
Oily fish (less than 0.9g of salt/100g)	2287	32	31	26	11	0	50	23	15	12	0
Lean fish	2218	36	26	24	14	1	36	16	29	16	3
Lean fish (less than 0.9g of salt/100g)	1101	70	23	4	3	0	69	21	7	3	0
Partly-ready meals	3266	33	38	24	5	0	16	22	53	8	1
Ready-to-eat meals	827	14	29	27	29	1	6	5	47	36	6
Pizza	636	2	20	41	37	0	0	0	30	69	1
Warm sauces	370	52	17	21	9	1	36	15	36	9	4
Cold sauces	172	0	0	12	68	20	0	0	2	65	33
Soups	663	10	60	30	0	0	6	41	52	1	0
Dairy products unsweetened	142	54	29	17	0	0	43	28	28	0	0
Dairy products sweetened	445	11	39	49	1	0	8	16	75	1	0
Compotes	754	91	7	2	0	0	83	9	7	0	0
Canned fruits	183	5	81	14	0	0	1	21	78	0	0
Breakfast cereals	626	17	13	46	24	0	11	4	36	44	5
Sweet breakfast cereals (>20g sugar/100g)	383	2	9	51	37	0	0	0	31	61	8
Fine bakery ware -sweet	2439	0	1	7	44	48	0	0	2	23	75
Chocolate	753	0	7	1	15	77	0	1	7	6	86
Confectionery	273	0	7	12	70	11	0	7	4	11	78
Ice creams and sorbets	1303	1	1	31	53	14	1	0	19	44	36
Dairy desserts (>12g of sugar/100g)	516	4	2	54	35	5	3	1	43	38	15
Sweet spreads	440	0	1	42	53	4	0	0	8	86	6
Skimmed milk	160	39	61	0	0	0	0	100	0	0	0
Partially-skimmed milk	1041	28	72	0	0	0	0	98	2	0	0

Whole milk	323	4	94	2	0	0	0	6	87	4	3
Sweetened flavoured milk	94	5	88	7	0	0	0	0	22	29	49
Sweetened yogurts to drink	308	7	79	13	1	0	0	5	5	27	63
Plant-based beverages	972	30	69	1	0	0	0	30	31	23	16
Flavoured waters	88	0	49	30	21	0	0	48	43	9	0
Flavoured waters w/o NNS	68	0	52	20	28	0	0	62	38	0	0
Flavoured waters w/ NNS	20	0	40	60	0	0	0	0	60	40	0
Tea-based beverages	141	0	5	16	60	19	0	0	38	62	0
Tea-based beverages w/o NNS	104	0	1	0	73	26	0	1	28	71	0
Tea-based beverages w/ NNS	37	0	16	59	24	0	0	0	65	35	0
Colas	142	0	22	35	7	36	0	0	57	1	42
Colas w/o NNS	39	0	0	0	0	100	0	0	0	0	100
Colas w/ NNS	103	0	30	49	10	12	0	0	79	2	19
Soft drinks with fruit	580	0	1	15	15	69	0	1	17	22	60
Soft drinks with fruits w/o NNS	461	0	0	4	12	84	0	1	7	26	66
Soft drinks with fruits w/ NNS	119	0	2	58	28	14	0	0	59	7	34
Lemonades, tonic waters and bitters	150	0	10	11	24	55	0	0	19	33	48
Lemonades, tonic waters and bitters w/o NNS	80	0	0	0	5	95	0	0	0	50	50
Lemonades, tonic waters and bitters w/NNS	70	0	21	24	46	9	0	0	41	13	46
Fruit juices	1080	0	5	54	15	26	0	4	49	20	26
Fruit nectars	262	0	0	2	11	87	0	0	2	30	68
Smoothies	37	0	0	54	30	16	0	0	24	57	19

Supplementary Material 5: Detailed comparison between food-based dietary guidelines and both versions of the Nutri-Score

Group	Covered categories	Type of criteria	Criteria	Results	Comments
Solid foods					
Fruits and vegetables	Unprocessed fruits Unprocessed vegetables	Position Position	1) Favourable classification for unprocessed fruits 2) Favourable classification for unprocessed vegetables	For 1, 2, both algorithms met the criteria	
Pulses	Unprocessed pulses	Position	3) Favourable classification for pulses	For 3, both algorithms met the criteria	
Cereals	White pasta White rice Whole grain pasta Whole grain rice	Group discrimination Group discrimination	4) Discrimination between whole grain and white rice 5) Discrimination between whole grain and white pasta	For 4, only revised algorithm met the criteria For 5, both algorithms did not meet the criteria	
Bread	White bread Whole grain bread	Group discrimination Nutrient discrimination	6) Discrimination between whole grain and white bread 7) Discrimination according to salt content	For 6, both algorithms met the criteria For 7, revised algorithm was superior to the initial	For 1, the apparent lack of discrimination for the revised algorithm was interpreted to be related to the rather low content in fibres of whole grain bread in France. To consider whole grain products more adequately, the comparison was based on whole grain bread rich in fibre.
Savoury snacks	Savoury snacks	Position	8) Unfavourable classification for savoury snacks	For 8, only revised algorithm met the criteria	
Meat (non-processed)	Unprocessed beef/ pork/ poultry	Position	9) Unfavourable classification for red meat	For 9, both algorithms did not	

meat)	Meat preparations	Group discrimination	10) Discrimination between poultry and red meat	meet the criteria For 10, only revised algorithm met the criteria	
Processed meat	Processed meat except ham Ham	Position Group discrimination	11) Unfavourable classification for processed meat 12) Discrimination between ham and other processed meat	For 11, 12, both algorithms met the criteria	
Cheese	Cheese	Position Group discrimination Nutrient discrimination	13) Unfavourable classification for cheeses with the higher salt content 14) Discrimination between cheeses and unsweetened yogurts 15) In the cheese category, the best rated products should be those with a lower salt or fat content and those with a high amount of calcium ¹	For 13, 14, both algorithms met the criteria For 15, revised algorithm was superior to the initial	For 3, revised was considered superior as initial rates C (the best category for cheeses) cheeses that are lower in fat and salt but lower in calcium (i.e. soft cheeses), while updated included more cheeses that are rich in calcium and low in salt (i.e. hard cheeses) in the C category
Nuts	Unsalted nuts Seasoned nuts	Position Group discrimination	16) Favourable classification for unsalted nuts 17) Discrimination between unsalted nuts and seasoned nuts	For 16, 17, both algorithms met the criteria	
Fats and oils	Olive/ canola /walnut oil Sunflower / coconut oil Cream/ butter	Group discrimination Position	18) Discrimination between recommended vegetable oils (canola, walnut, olive) and other vegetable oils 19) Unfavourable classification for animal fats	For 18, 19, both algorithms met the criteria	For 1, the discrimination between walnut oil was more distinct in the initial than with the updated
Fish	Oily fish Lean fish	Group discrimination	20) Similar classification for oily and lean fish (with similar salt content)	For 20, revised algorithm was superior to the initial	

Dairy products (except cheeses)	Unsweetened yogurts Sweetened yogurts Dairy desserts	Group discrimination	21) Discrimination between unsweetened and sweetened dairy products	For 21, both algorithms met the criteria	
Sauces	Cold sauces Sauces- used warm	Nutrient discrimination	22) Discrimination according to salt content	For 22, revised algorithm was superior to initial	
Soups	Soups and broths	Nutrient discrimination	23) Discrimination according to salt content	For 23, no difference was observed between the two algorithms	
Prepared dishes	Prepared dishes	Nutrient discrimination	24) Discrimination according to salt content	For 24, no difference was observed between the two algorithms	
Prepared fruits	Canned fruits Compotes	Nutrient discrimination Nutrient discrimination	25) Discrimination according to sugar content for canned fruits 26) Discrimination according to sugar content for compotes	For 25, no difference was observed between the two algorithms For 26, revised algorithm was superior to the initial	
Breakfast cereals	Breakfast cereals	Position Nutrient discrimination	27) Unfavourable classification for sweet breakfast cereals 28) Discrimination according to fibre (proxy of whole grain) content among unsweetened or minimally sweetened breakfast cereals	For 27, both did not meet the criteria For 28, revised was superior to initial	For 1, while both algorithms did not meet the criteria, revised rated D or E a much greater proportion of sweet breakfast cereals (from 37% to 61%)
Fine bakery ware-sweet	Fine bakery ware-sweet	Position	29) Unfavourable classification for fine bakery ware – sweet	For 29, both algorithms met the criteria	

Chocolate products	Chocolate products	Position	30) Unfavourable classification for chocolate and chocolate products	For 30, both algorithms met the criteria	
Confectionery	Confectionery	Position	31) Unfavourable classification for confectionery	For 31, both algorithms met the criteria	
Ice creams	Ice creams and sorbets	Position	32) Unfavourable classification for ice creams	For 32, only revised algorithm met the criteria	
Dairy desserts	Dairy desserts	Position	33) Unfavourable classification for sweet dairy desserts	For 33, both did meet the criteria	
Sweet spreads	Sweet spreads	Position	34) Unfavourable classification for sweet spreads	For 34, only revised algorithm met the criteria	
<u>Beverages</u>					
Water, tea, coffee, herbal teas	Water	Position	35) Favourable classification for water	For 35, both algorithms met the criteria	
Dairy beverages	Skimmed milk Partially-skimmed milk Whole milk Sweetened flavoured milk Sweetened yogurt to drink	Group discrimination	36) Discrimination between unsweetened milks and sweetened dairy beverages	For 36, only revised algorithms met the criteria	
Sugar and artificially sweetened beverages	Flavoured waters Colas Soft drinks with fruits Lemonades, tonic waters Tea-based beverages Fruit nectars Sweetened flavoured	Position Position	37) Unfavourable classification for sugar-sweetened beverages 38) Unfavourable classification for artificially-sweetened beverages	For 37, both algorithms met the criteria For 38, both algorithms did not meet the criteria	For 1, flavoured water (lightly sweetened water) was mostly rated B. All other sweetened beverages were mostly rated D or E. For 2, while both algorithms did not meet the criteria, revised did not rate any artificially-

	milks Sweetened yogurts to drink				sweetened beverages B, which was not the case for initial.
Fruit juices	Fruit juices	Group discrimination Group discrimination Group discrimination	39) Discrimination between fruit juices and fruits and vegetables 40) Discrimination between fruit juices and other sugar-sweetened beverages 41) Discrimination between fruit juices and other artificially- sweetened beverages	For 39, 40, both algorithms met the criteria For 41, both algorithms did not meet the criteria	For 2, only flavoured received a better rating than fruit juices (among 5 categories)