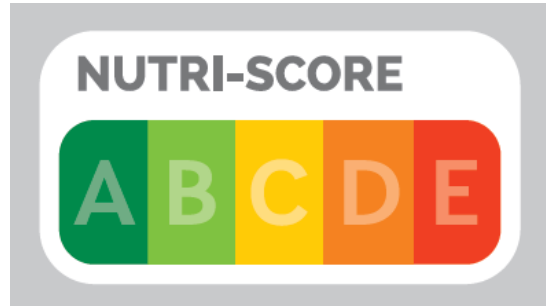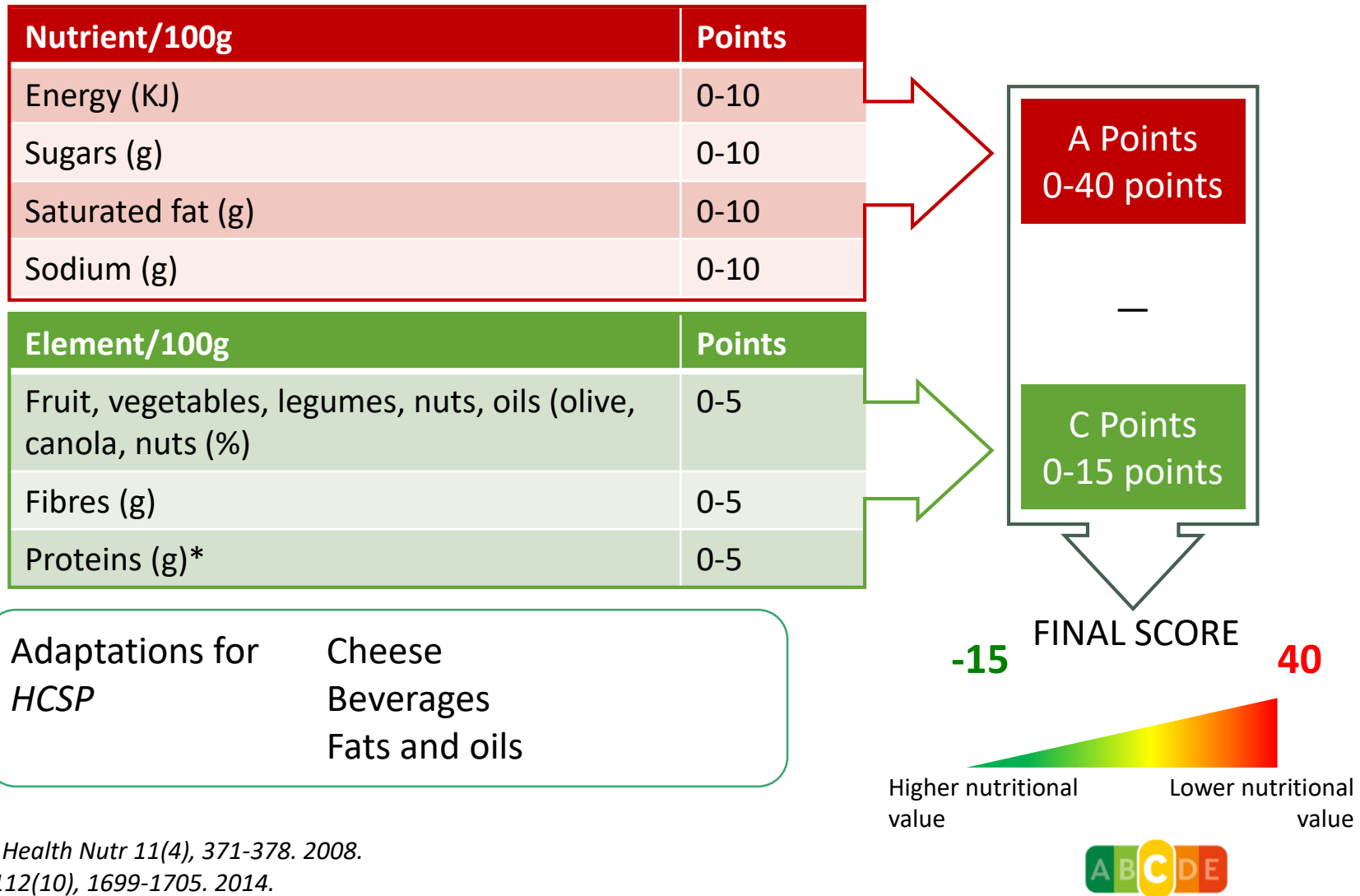# Nutri-Score algorithm : introduction and update

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Nutri-Score algorithm

Introduction and initial validation
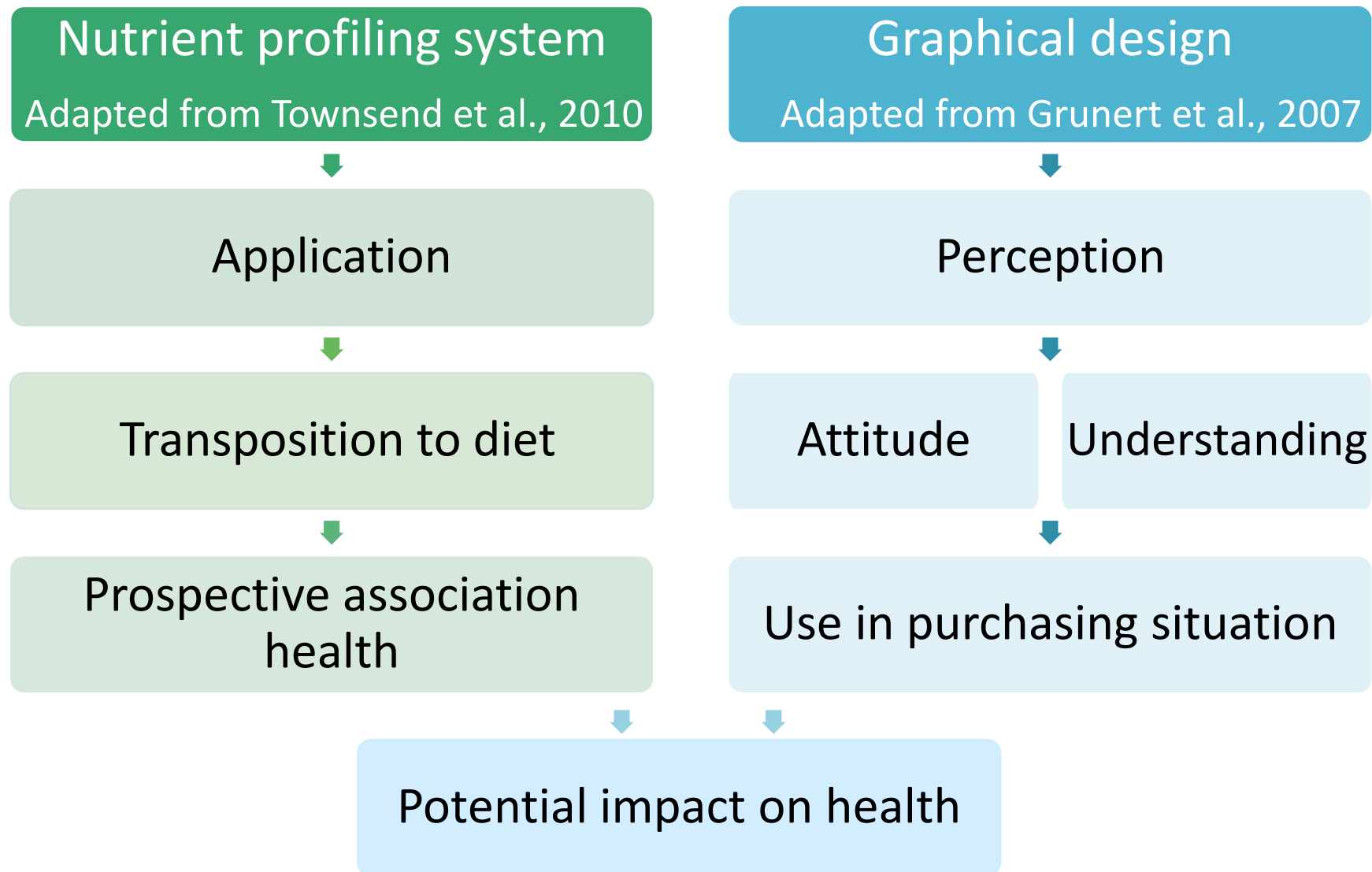
Nutrient profiling model : FSA/ofcom score

Nutrient/100g	Points
Energy (KJ)	0-10
Sugars (g)	0-10
Saturated fat (g)	0-10
Sodium (g)	0-10

Element/100g	Points
Fruit, vegetables, legumes, nuts, oils (olive, canola, nuts (%)	0-5
Fibres (g)	0-5
Proteins (g)*	0-5

A Points
0-40 points

—

C Points
0-15 points

FINAL SCORE

-15   **40**

Higher nutritional value   Lower nutritional value

A B C D E

Adaptations for *HCSP*
Cheese
Beverages
Fats and oils

Arambepola, C., Rayner et al. Pub Health Nutr 11(4), 371-378. 2008.
Julia, Kesse-Guyot et al. Br J Nut, 112(10), 1699-1705. 2014.
Julia, Kesse-Guyot et al., Nutrition Journal, (2015) 14:100

Theoretical framework of validation

Nutrient profiling system
Adapted from Townsend et al., 2010

Graphical design
Adapted from Grunert et al., 2007

Application

Perception

Transposition to diet

Attitude

Understanding

Prospective association health

Use in purchasing situation

Potential impact on health

Prospective association with health outcomes

The consumption of foods with **higher scores on the FSA nutrient profiling system** *(foods with less favourable rating in the Nutri-Score scale)*, is associated with a significant increased risk of developing chronic diseases:

Cardiovascular disease

Cancer

Type 2 diabetes

And increased risk of **mortality**

Consistent results in French and international cohort studies

46 864 subjects
6 y follow-up

6435 subjects
13 y follow-up

SUN
20 503 subjects
10.9 y follow-up

ENRICA
12,054 subjects
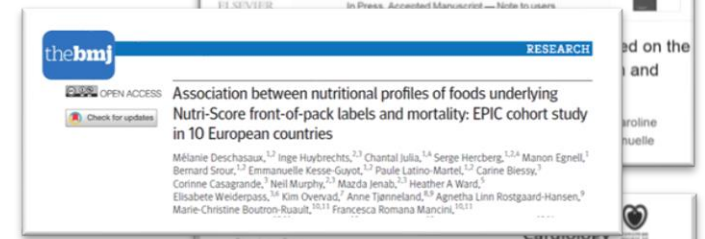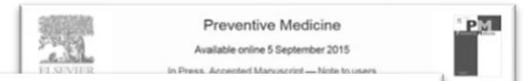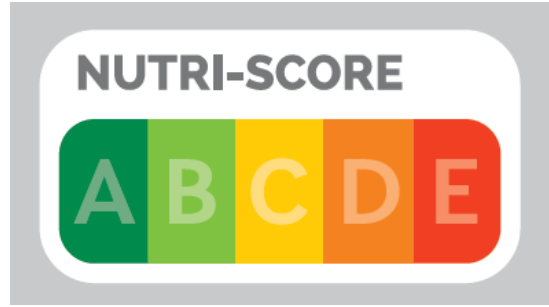**8.7 y follow-up**

Moli-Sani
22 895 subjects
12.2 y follow-up

>450 000 subjects
>13 y follow-up
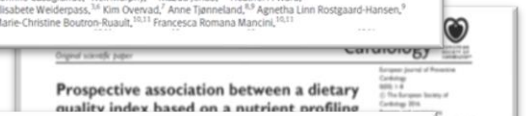
Nutri-Score algorithm

Update by the Scientific Committee of the Nutri-Score

Scientific Committee of the Nutri-Score

- 13 members, appointed by states participating in the transnational governance of the Nutri-Score

  - 1-2 experts per country
  - Expertise in nutrition, epidemiology, public health
  - From academic or public agencies
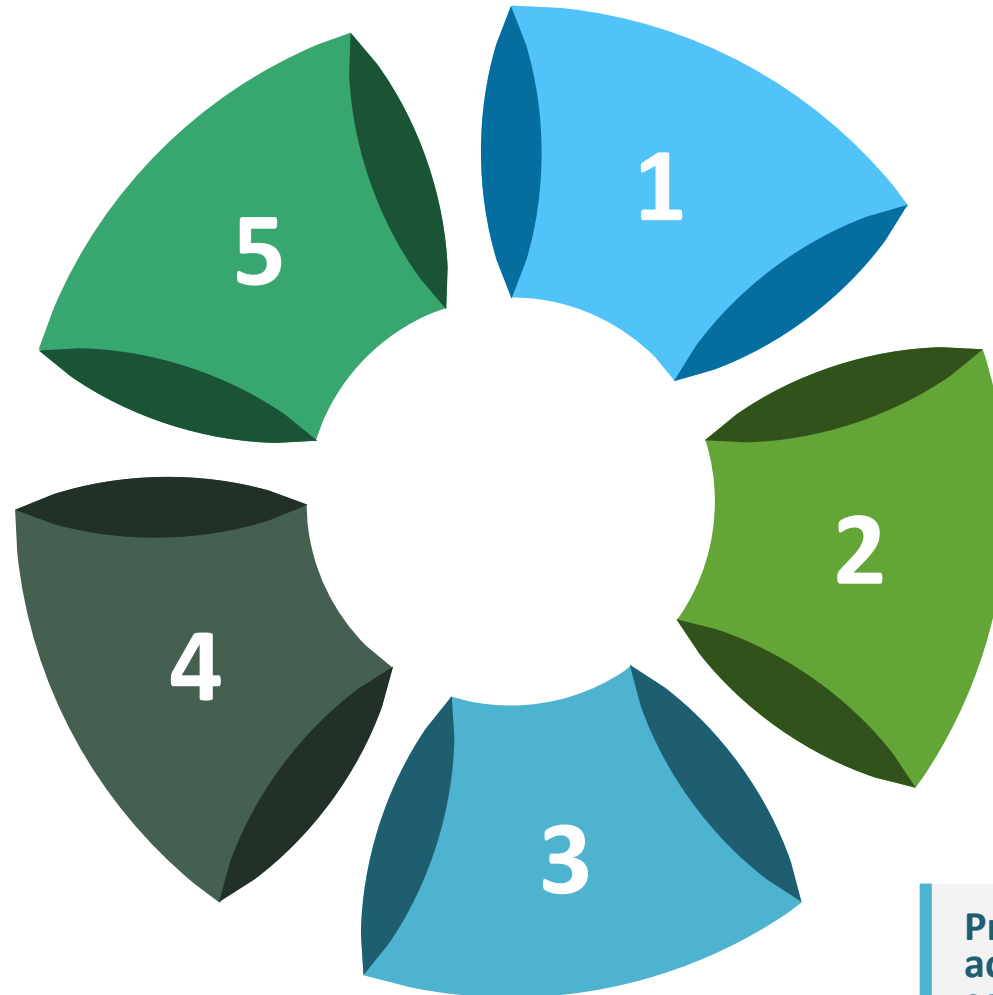 - No conflicts of interest – public declaration available

Principles guiding the revision of the Nutri-Score

Nutri-Score as one of many policies to address nutrition-related diseases

Adherence to the scope and mandate of the StC
Overall, the algorithm works well, areas of improvement were identified to ensure consistency with recommendations

Evidence-based approach to the update of the algorithm
Modifications made based on scientific evidence

Constraints to scenarios of modification
In line with available information in nutrient declaration

Preference for simple across-the-board scenarios

1
2
3
4
5

NUTRI-SCORE
A B C D E

8

Methods

1 **Identification of main areas of improvement**

Through an analysis of
- Current classification
- Food-based dietary guidelines
- Literature reviews

Prioritization of food groups

2 **Definition of scenarios for components of the algorithm**

- Review of each component
- Scenarios definition
  - Based on reference values in the FIC or claims regulation
  - Linear approach

3 **Testing of the scenarios**
- In national databases of branded food products
  - BE, FR, DE, NL
- Selection of the main component based on results alone and in combination

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

Optimizing the distribution of products across classes of the Nutri-Score within each food group

Main areas of improvement

Fish and fatty fish
- Alignment between classification of lean and fatty fish

Discrimination between whole-grain and refined grain bread
- Based on fibers and salt contents

Discrimination between plant-based oils
- According to fatty acids composition

Discrimination of products based on their sugar content
- In particular high-sugar products, dairy products and breakfast cereals

Discrimination between red meat and poultry
- Aligned with their relative positions in food-based dietary guidelines

Designed by freepik

Modifications

- Update of
  - Components in the Nutri-Score
    - Except energy and saturates – maintained as are
    - Reference points aligned with FIC or claims regulation
    - Decimal points aligned with FIC regulation
  - Overall computation
    - Simplification within the system
  - A/B threshold
- Specific update of the algorithm for
  - Fats, oils, nuts and seeds
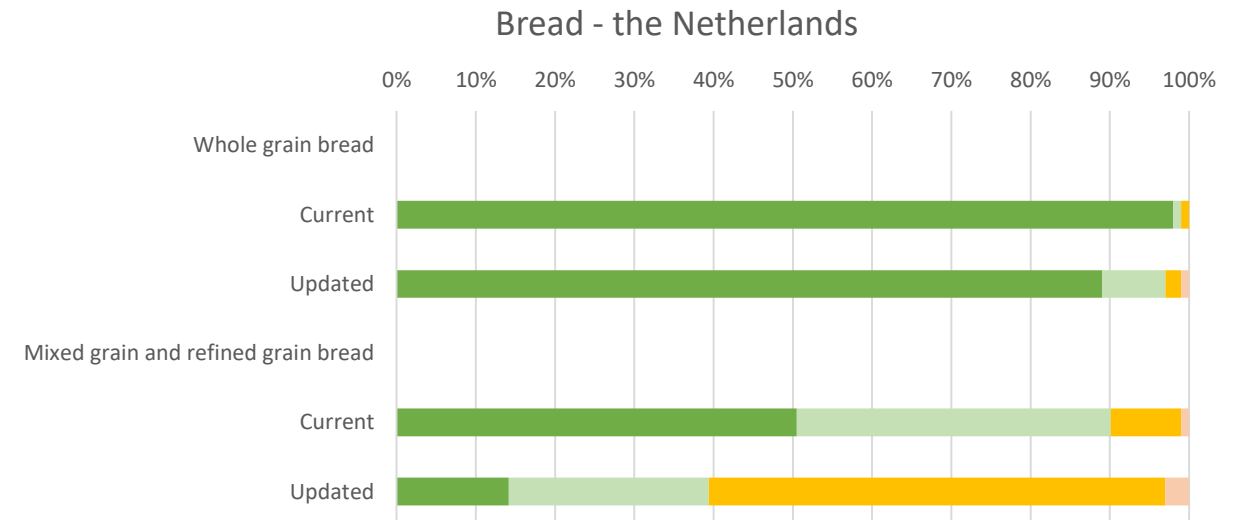 - Meat products

Impact on the classification

- High variability of the nutritional composition of products in the food market
  - Within food categories
  - Across brands for similar products
- Modifications shift the overall distribution of food products
  - Distribution across 3 to 5 categories of Nutri-Score represented for main food categories
- Presentation of average impact of modifications
  - Distribution of products on either side of the 'average' composition
    - Depending on the composition in both nutrients of concern and nutrients to encourage
    - Not all products have their classification modified in the system

Wholegrain bread   Refined bread

Bread - the Netherlands

Whole grain bread

Current

Updated

Mixed grain and refined grain bread

Current

Updated
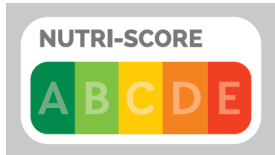
Impact of the modifications

- Improved classification for specific products
  - Fish and fatty fish
    - Aligned in A/B categories
  - Vegetable oils with limited amounts of saturates
    - Olive, canola and nut oils reach the B category
  - Unseasoned nuts
    - In majority in A/B categories
  - Hard cheeses with limited amounts of salt
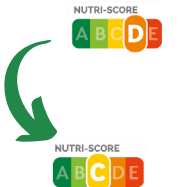   - Reach the C category

Designed by freepik, canva

Sardines in oil (oil removed)

Tuna fish

Olive oil

Canola oil

Sunflower oil

Unsalted sunflower seeds
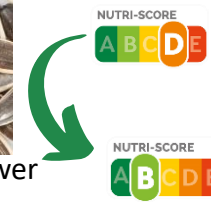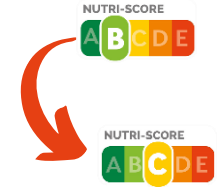
Unsalted cashew nuts

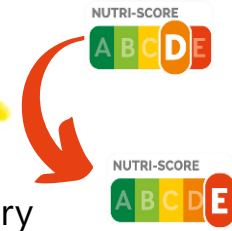Emmenthal

13
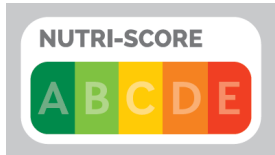
Impact of the modifications

- Increased discrimination of products based on content in nutrients of concern
  - Salt
  - Sugar
- Increased discrimination for products with limited contribution to intakes of favourable nutrients
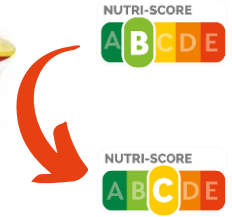 - Fibers
  - Proteins

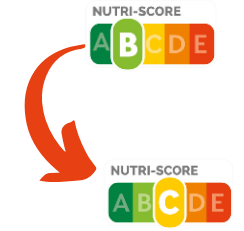Refined bread

Confectionery

Sweetened dairy

Breakfast cereals

Pizza

Ready to eat meals

Designed by freepik, canva
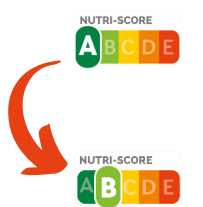
Impact of modifications

- Specific rules for meat
  - Increased discrimination between meat and poultry products
  - Lean meat products keep in the A category
    - More strict classification based on saturates content

Wiener Schnitzel

Beef stew steak

Rib steak

Minced steak 5% fat

Conclusion

- Overall, the modifications to the algorithm have improved the alignment between the Nutri-Score classification and food-based dietary guidelines
  - The objectives set by the ScC have been met

- Some limitations to the algorithm persist
  - Limited discrimination between whole-grain and refined grain pasta and rice
    - Both ranked A
  - Overall, limitations considered acceptable and of lower magnitude than in the current system