

Preliminary assessment of the revised Nutri-Score algorithm

- Do the proposed revisions contribute to solve the challenges that previously have been identified in the Nordic countries for the existing Nutri-Score?

Brief assessment for The Norwegian Ministry of Health and Care Services

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Background for this brief assessment

The European Commission aims to introduce a harmonised and mandatory front-of-pack nutrition labelling on food and beverages. In June 2022, the Nordic Council of Ministers, on behalf of the Nordic health ministers, sent a letter to the European Commission supporting the development of a harmonised front-of-pack nutrition labelling. The letter highlighted factors that are important to consider when developing a nutrition label from a Nordic perspective. It was stated that a more specific assessment of the challenges with different types of labels would follow. The Nutri-Score nutrition label has previously been compared to local dietary guidelines and to the Nordic Keyhole nutrition label and the Finnish Heart Label, and some challenges were identified.

In August 2022, the Scientific Committee for the Nutri-Score published a revision of the Nutri-Score criteria. A brief assessment of the revised Nutri-Score criteria should thus be included in the feedback to the European Commission.

The Norwegian Ministry of Health and Care Services asked the Norwegian Institute of Public Health to make an overall and brief assessment of the revised Nutri-Score and whether the updates solve challenges that has previously been identified in the Nordic countries for the existing Nutri-Score criteria.

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The proposed revision of the Nutri-Score (NS) algorithm (1) targets several of the challenges that have been identified, also in the Nordic countries (Table 1). To fully assess the impact of the revised NS in the Nordic countries one would need to calculate the revised NS for the foods on the market in the Nordic countries. For this quick assessment, we have mainly looked at results in the NS revision report (1), but also performed some (preliminary) calculations based on data in the Norwegian Food Composition Database. Data presented in the new NS revision report (1) are based on calculations on food products in France, Belgium, Germany and the Netherlands, and overall indicate that the algorithm now performs better in discriminating foods and food categories and shows better agreement with food based dietary guidelines.

Specifically, more fish products now reach a top score (A or a B) due to more points rewarded for protein, but fish products may also still obtain an E (lowest score) if the content of salt and/or sugar is high (like for caviar and smoked salmon). Fish and poultry now get a slightly more favourable score than comparable products of red meat due to lower maximum points for protein for red meat products specifically. Whole grain bread seems to get a higher score (mainly A and B) and to be better discriminated from refined grain bread (mainly C) due to more points rewarded for a high fibre content in the revised NS.

The proposed new category for fats, oils, nuts, and seeds provides more tailored scoring for energy-/fat-rich foods. Pure nuts and vegetable oils with a favourable fatty acid composition now score slightly better (e.g., olive oil score B). There is also a better discrimination between fats with different fat content/quality (e.g., margarines and butter blends) although the algorithm might not be sensitive enough to capture all relevant variation in energy content and saturated fats between for example low fat and full fat margarine.

The revision of the model for beverages is not yet published but will now also include dairy beverages. Including milk in this category will allow for a better distinction from criteria for other dairy products and may provide an opportunity for better discrimination between beverages such as by sugar-, energy-, and saturated fat content, and maybe also acidity. The revision is to be published by the end of 2022.

Some challenges are not solved in the revision. Ideally, whole grains should have been included, but it is not since there is no unified definition of whole grains. However, fibre seems to perform adequately as a proxy for whole grain in bread. Refined pasta and rice may receive an A which provides no guidance towards whole grain pasta and rice. Full fat cheese may not be adequately discriminated from reduced fat cheese since reduced fat cheeses often reach the maximum score for high content of saturated fat (>10 g/100 g). Since the NS has a 5-point scale, it may not be sensitive enough to capture small, but sometimes important, differences in nutritional composition.

A European nutrient profiling system cannot be expected to capture *all* factors relevant for the nutritional quality of foods and all nutritional challenges in the Nordic countries. Thus, the NS cannot be expected to perform perfectly. Overall, the revised NS seems to represent a move in the right direction, and many shortcomings/challenges in the previous version appears to be improved. However, a thorough evaluation is needed to fully assess the validity of the revised NS in a Nordic setting.

Table 1. Challenges to the existing Nutri-Score (NS) identified in the Nordic countries, relevant revisions to the NS proposed by the NS Scientific Committee, and our (quick) assessment of the impacts of the proposed revisions

Dietary advice or factor	Previously identified challenges to the existing Nutri-Score from a Nordic perspective*	Proposed revisions to the Nutri-Score by the NS Scientific Committee (1)	Preliminary assessment of the revision – from a Nordic perspective
Eat more seafood	Processed products of fatty fish such as smoked salmon, mackerel etc. may obtain an unfavourable score due to the salt content although they are promoted in the food based dietary guidelines. Ideally, these products should receive a slightly less unfavourable score.	Fish should obtain a more favourable score, but unfavourable ingredients (like salt) should lead to poorer score: The scoring of protein is revised and rewards a higher protein content.	The revised NS seems to give a slightly better score for fish. According to the French data, fish, and more specifically fatty fish, more frequently reaches A or B ratings. However, a high content of salt/sugar/saturated fatty acids in some fish products will still provide a low score (D and E). Smoked salmon and caviar still obtain an E, and mackerel fillets in tomato sauce (spread) may obtain a C with the revised score (preliminary calculations based on the Norwegian Food Composition Table). With the revised score, red meat cannot obtain as many points for protein as fish or poultry which contributes to a more favourable score for fish/seafood compared to red meat.

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Switch to wholemeal	<p>The content of whole grain does not promote a preferable score and the content of whole grain is only promoted indirectly through the content of fibre. The score does not distinguish between e.g., wholemeal flour and sifted flour, whole grain rice and polished rice and whole grain pasta and normal pasta. White bread can obtain an A.</p>	<p>Whole grain products (rice, pasta, bread) should be classified more favourable than refined products:</p> <p>The scoring for fibre is revised so that the scoring rewards a higher whole grain/fibre content.</p> <p>Whole grain is not included in the NS algorithm since there is no consensus on the definition for whole grain, and the definition varies in different countries. Also, the information on the whole grain content is not readily available for foods.</p>	<p>Whole grain: Whole grain is promoted in the food based dietary guidelines, and ideally it should be included as an indicator in the NS. This indicator is included in the Keyhole criteria, but the definition of whole grain is specific to the Nordics. Fibre seems to perform ok as a proxy for whole grain content in the revised NS, especially for the bread category. Including fibre in the NS-model may, however, increase the risk of “healthwashing” by adding pure fibre ingredients which may not necessarily improve the nutritional quality.</p> <p>Bread: The revised NS seems to provide a better discrimination between whole grain and refined grain bread. Refined grain breads mainly receive a C rating in the NS report, while whole grain breads mainly receive an A or B. Major determinants of the scoring in the bread category seems to be the fibre content and the salt content.</p> <p>Pasta and rice: Still a limitation regarding whole grain vs refined grain pasta and rice as the discrimination between these are limited. Most refined grain pasta and some refined grain rice still obtain an A in the NS report.</p>

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Switch to healthy fats	<ul style="list-style-type: none"> Oils high in unsaturated fatty acids are classified as D or C (e.g., rapeseed oil would get a C), which signals that fats high in unsaturated fatty acids have relatively unhealthy nutritional composition. No difference in scores between spreads with different fat content (does not include total fat, only saturated fat) Butter-plant oil blends and plant-based fat spreads are classified into the same category. 	<p>More favourable oils should be discriminated from less favourable:</p> <p>There is a new “fats, oils, nuts and seeds” group with modified criteria. For example, the scale for saturated fat covers higher concentrations compared to the model for the main food group (up to 33g/100g vs. up to 10g/100g), and there is an additional indicator for fat quality (saturated fat/total lipids (%)). The threshold between A and B is also modified for this group.</p> <p>The modifications allow for better discrimination between products with different fat quality and quantity in this category.</p>	<p>High energy foods, like vegetable oils and nuts, which are promoted in the food based dietary guidelines can now reach a better score. (Olive oils now mainly obtain a B and plain nuts mainly A or B). The revision also promotes the discrimination between various types of fats, oils, and nuts, like margarines and butter/butter blends with different total fat and saturated fat content. Oils derived from fruits/vegetables (like olives and avocado) get points for the fruit and vegetable-component and may obtain a better score than other oils (rapeseed, sunflower etc.). This is poorly substantiated.</p>
Switch to low fat dairy products	<p>Not in line with food based dietary guidelines: Does not discriminate between cheese with 17% fat from 42% fat or milk with 0.5% fat from 1.5%.</p> <p>Same criteria for milk (drink) as for cream and yoghurt. There should be stricter criteria for drinks (fat content) since it is consumed in a larger amount.</p>	<p>All beverages (incl. milk) are moved to a separate beverages category, and the algorithm for this category is not yet updated (to be published late 2022).</p> <p>The revision aimed at improving the discrimination of unsweetened and sweetened dairy products.</p>	<p>Non-beverage dairy products: The saturated fatty acids component in the NS model provides a maximum unfavourable score at >10 g/100 g. Thus, both full fat and many reduced fat cheeses and cream products obtain maximum “penalty” for saturated fat content, and this leads to poor differentiation by fat content. Cheeses as a category gain slightly better scores with the revision due to more points for high protein content.</p>

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Limit red and processed meat	Partly in line with the food based dietary guidelines: Minced meat with up to 15% fat can obtain an A.	To reflect the food based dietary guidelines, red meat should receive a lower rating than similar products of fish or poultry: Red meat can only obtain 2 points (of 7) for protein in the revised NS.	With lower maximum points for protein content, red meat products now score lower than otherwise comparable products of poultry and fish. However, lean, unprocessed meat can still obtain an A. Non salted minced meat (cow) with 6% fat obtains an A, while with 14% fat obtains a C with the revised algorithm (preliminary calculations based on the Norwegian Food Composition Table).
Fruits and vegetables	Juice is calculated as fresh fruits although it should only be consumed in a limited amount (1 glass/day), but it is somewhat compensated for since sugar in the juice provide a less favourable score.	The NS algorithm for beverages, including juice, has not been revised (expected by end 2022). The definitions of fruit, vegetables and legumes that provides favourable points in the algorithm will be subject to revision early 2023. Today, concentrated fruit juice does not count favourably in NS.	
Breads	Does not differentiate high/low in salt or high/low in fibre. Breads with a relatively low fibre content and high salt content can obtain an A.	In the revised NS, both the salt and the fibre scores now have extended the concentrations covered and the total amount of points that can be obtained.	The revised NS better differentiate breads with different whole grain/fibre content. Breads with a low fibre content are now much less likely to receive an A. Most bread products were already covered by the original NS scale for salt, so the revision does not to a large extent improve the differentiation by salt content, but a higher salt-content will lead to a somewhat poorer score (like before).

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Dried fruits	Some dried fruits obtain a B (apricot and figs). The intake should be limited according to the food based dietary guidelines (Denmark) due to high calorie content.	Not specifically mentioned as a limitation that should be solved in the revision of the NS.	With the revised NS score it looks like apricots and figs now obtain a C, and that most dried fruits obtain a C or a D (preliminary calculations based on the Norwegian Food Composition Table). The different scoring might be due to multiple revisions in the NS model.
Soft drinks and energy drinks	May obtain a B-score if it contains artificial sweeteners. Should be limited due to dental health effects and that it may cause preference for sweet taste.	The Scientific Committee of the NS have identified that the discriminating power for beverages should be improved, allowing for better alignment with recommendation for high-sugar products. The revised algorithm for beverages will be published late 2022.	The updated/revised NS algorithm for beverages have not been published. Acidity in beverages is associated with dental health (2), however it is unknown if this will be addresses in the revision of NS.
Milk	Flavoured milk with added sugar can obtain an A.	The beverage category algorithm, including milk-based beverages, will be updated in the fall of 2022.	As milk will be covered by the new category for beverages, this will give the opportunity to better discriminate beverages by their content of sugar, energy, protein (as a proxy for calcium) and saturated fats.
Ready to eat meals	Discrepancies between several ready to eat meals is that, as the Heart symbol emphasizes the fat and salt contents in these products and the Nutri-Score seems to focus on protein content and amount of vegetables. High amount salt is a major problem concerning ready to eat meals on the Finnish market, protein content mostly not.	The scale for salt content is extended for the revised NS and now covers higher concentrations (up to >4 g/100 g), and the total amount of points that can be obtained from salt is increased (from 10-20). As a result, the algorithm better discriminate products by salt content and put more relative weight on salt content.	See comments under “Weighting” further down.

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Weighting – the relative importance of different food factors	The Nutri-Score tends to put too much weight on the protein and sugar content compared to the salt content, fat quality and fibre. This is not in line with the dietary challenges (in Finland).	<p>The revised NS gives more negative points to higher levels of sugars and salt than previously. Proteins are not included in NS to increase/promote protein intake but rather as a proxy for other elements, namely iron and calcium (from milk, fish etc.)</p> <p>The revised NS for the new category “fats, oils, nuts and seeds” have different criteria for saturated fats that allows for better discrimination by energy and fat content.</p>	<p>NS is an across-the-board model for most foods* (not product category specific, like the Keyhole that has 33 food categories) providing a continuous score for all foods. More factors are needed in the algorithm to adequately discriminate between food categories. Factors included in the NS (and revised NS) are based on the food-based dietary guidelines and are also recommended as factors in nutrient profiling-models by EFSA.</p> <p>* Except modifications for “beverages” and “fats/oils/nuts/seeds”</p>

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Product reformulation	The Nutri-Score algorithm is complex, and it is difficult to know what kind of reformulation should be done to change the Nutri-score grade.	<p>The revised score is somewhat less complex and based on nutritional information available on-pack on prepacked foods in the EU*:</p> <ul style="list-style-type: none"> • Nuts and oils are removed from the fruit, vegetables and legumes component and defined as a separate category. • Removal of the “protein cap exemption” so that all products in the main food group are calculated by the same algorithm**. • The calculation is not dependent on “added sugars” or “whole grains” which do not have clear definitions and are defined differently in different countries. <p>* Except for the percentage of fruit/vegetables/legumes which is not part of the mandatory product declaration</p> <p>** Except a minor difference for cheese and red meat products</p>	<p>Scoring the nutritional quality of foods is complex because many factors are of importance. In the development of the NS, the researchers have aimed at keeping the algorithm as simple as possible. Although the NS algorithm is quite complex, the tables showing cut-offs for the scoring on different factors are simple, and one can easily see how to improve the score by reformulation. The factors included and the cut-offs chosen are aligned with EU regulation and readily available data on foods and ingredients. Since the scores are derived from on-pack information*, the calculation of the scores is transparent and there are “calculators” (excel-sheets) available online.</p> <p>Dividing into more food categories could potentially facilitate more tailored, and perhaps simpler calculations, but it is challenging to define mutually exclusive food categories for the whole EU.</p> <p>* Except % fruits/vegetables/legumes</p>

* Challenges has been summarized based on previous reports from Denmark (3), Finland (4), and Norway (unpublished) evaluating the Nutri-Score and agreement with food based dietary guidelines, the Keyhole or the Heart Symbol, and regional dietary challenges.

References:

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4. Finnish Heart Association, Kara A, Tuominen M. The comparison of the Heart Symbol and the Nutri-score systems - Similarities and differences between two front-of-package labels. Finnish Heart Association; Association FH; 2022.