Dear NNR Committee,

As authors of the ultra-processed foods (UPF) background chapter of the NNR2022, we would like to voice our concerns about the draft NNR report that is currently published for public consultation. Specifically, we do not think that the text regarding ultra-processed foods (page 152-153) reflects the current evidence base and our review of the available peer-reviewed literature.

Our review of 5 meta-analyses, 8 systematic reviews, over 50 prospective cohort studies and one RCT strongly supports that diets high in UPF are consistently associated with mortality and increased risk of obesity/weight gain and multiple chronic diseases, including CVD and type 2 diabetes. The reviewed studies were generally of very high quality. Our recommendation to the Committee was therefore to include advice to limit the consumption of UPF in the NNR2022.

Although we disagree with the Committee’s decision to omit any guidance regarding UPF from the NNR, we are most concerned the arguments used for doing so, many of which are factually incorrect. The NNR is proposed to be based on rigorous scientific methods and open processes, yet it is unclear what evidence the Committee’s decision and the text regarding UPF in the NNR report are based on.

Below, we address each of the Committees’ arguments for not issuing advice on UPF consumption from pages 152-153:

1. The Committee states that “There is currently no consensus on classification of processing of foods, including UPFs.” The statement is also incorrect. The term “ultra-processed” was introduced with the NOVA framework and is exclusively used within this context. We were specifically instructed to evaluate health effects from ultra-processed foods, not industrial food processing or processed foods. The NOVA definition of UPF was used by all of the reviewed studies. This argument is also invalid. There is currently no consensus on the definition of a “healthy diet” either, yet this term appears 11 times in the NNR report.
2. The Committee writes that “there is currently no good, coherent way to estimate intake [of UPF]”. Challenges with measuring food intake is a limitation of all nutrition research, and not a specific issue of UPF.Yet, it does not prevent the Committee from making recommendations regarding other food groups.
3. The Committee states “Other potentially more nutrient dense foods also classified as UPF include factory-produced whole grain bread, many breakfast cereals and fish products.” This is not correct and must be revised, as several of the mentioned foods are categorized as processed according to NOVA, not UPF. Importantly, being factory produced does not automatically make a food UPF. Foods are classified as UPF according to their formulation (i.e., ingredients) and the processing they have been submitted to, not depending on if they are factory-made.
4. The Committee writes that the health benefits of UPF are that (1) if UPF are fortified (added nutrients) they might support nutrient intake, and (2) some UPF are considered healthy because they include nutrients. We have several issues with this argument:
	1. There is no evidence that UPF are an important source of essential nutrients. On the contrary, research consistently shows that diets that are higher in UPF have worse nutritional profiles, with higher levels of added sugar and saturated fats and lower content of protein, fiber and multiple essential micronutrients, including potassium, vitamins A, C, D, E, B12, niacin, zinc and magnesium (see e.g., Martini et al. 2021 PMID: 34684391).
	2. UPF is not necessary for fortification. Several minimally processed and processed foods are fortified (or could be fortified) and support nutrient intakes (e.g., vitamin D fortification of milk).
	3. Current evidence supports that UPF are associated with poor health outcomes independently of diet quality and nutrient profile (see e.g., Dicken and Batterham 2021, PMID: 35010898). In fact, a recent study showed that the association between diet nutrient profile and mortality was partially confounded by UPF intake, while UPF intake was associated with mortality independently of diet nutrient profile (Bonaccio et al. 2022, PMID: 36450651). By solely focusing on nutrients, we may unintentionally promote the consumption of fortified UPF that negatively impact health through non-nutrient mediated pathways.
5. The Committee writes that “Regular intake of UPF encourages over-eating and intake of foods in the UPF category of the NOVA classification has been suggested associated with increased risk of…”. This statement is incorrect. The evidence supports that *high* consumption of UPF, not *regular* consumption, is associated with chronic diseases.
6. The Committee writes that “no qSRs support these suggestions” (i.e., the coherent associations between UPF and poor health outcomes). The scooping review provided by the Committee in 2020 identified two qSR that both support an association between UPF and poor health outcomes. Are these no longer considered qSR? In our systematic search of the literature, we identified 6 additional systematic reviews and 5 meta-analyses regarding UPF and health outcomes, all of which supported the association between UPF and increased risk of the examined health outcomes. Since our last literature search, several additional meta-analyses have been published. There are currently 9 published meta-analyses, all of which supports an association between UPF intake and mortality, obesity, cardiovascular disease and other cardiometabolic conditions (listed below). Why is this evidence disregarded?
	1. Suksatan W, Moradi S, Naeini F, Bagheri R, Mohammadi H, Talebi S, et al. Ultra-Processed Food Consumption and Adult Mortality Risk: A Systematic Review and Dose-Response Meta-Analysis of 207,291 Participants. Nutrients. 2021 Dec 30;14(1):174.
	2. Lane et al. Ultraprocessed food and chronic noncommunicable diseases: A systematic review and meta-analysis of 43 observational studies. Obesity Reviews. 2021;22:e13146.
7. Delphino et al. Ultra-processed food and risk of type 2 diabetes: a systematic review and meta-analysis of longitudinal studies. International Journal of Epidemiology, 2022, 1120–1141
	1. Chen Z, Khandpur N, Desjardins C, Wang L, Monteiro CA, Rossato SL, et al. Ultra-Processed Food Consumption and Risk of Type 2 Diabetes: Three Large Prospective U.S. Cohort Studies. Diabetes Care. 2023 Feb 28;dc221993.
	2. Yuan L, Hu H, Li T, Zhang J, Feng Y, Yang X, et al. Dose–response meta-analysis of ultra-processed food with the risk of cardiovascular events and all-cause mortality: evidence from prospective cohort studies. Food Funct. 2023 Mar 20;14(6):2586–96.
	3. Taneri PE, Wehrli F, Roa-Díaz ZM, Itodo OA, Salvador D, Raeisi-Dehkordi H, et al. Association Between Ultra-Processed Food Intake and All-Cause Mortality: A Systematic Review and Meta-Analysis. American Journal of Epidemiology. 2022 Jun 27;191(7):1323–35.
	4. Moradi S, Entezari MH, Mohammadi H, Jayedi A, Lazaridi AV, Kermani MAH, et al. Ultra-processed food consumption and adult obesity risk: a systematic review and dose-response meta-analysis. Crit Rev Food Sci Nutr. 2021 Jun 30;1–12.
	5. Wang M, Du X, Huang W, Xu Y. Ultra-processed Foods Consumption Increases the Risk of Hypertension in Adults: A Systematic Review and Meta-analysis. Am J Hypertens. 2022 Oct 3;35(10):892–901.
	6. Pagliai G, Dinu M, Madarena MP, Bonaccio M, Iacoviello L, Sofi F. Consumption of ultra-processed foods and health status: a systematic review and meta-analysis. British Journal of Nutrition. 2021 Feb;125(3):308–
8. The Committee writes that “There is currently no evidence of health impacts of a diet high in highly processed but healthy foods”. This is incorrect. While there is no official definition of “healthy foods”, it is usually defined by content of critical nutrients (e.g., added sugar, sodium, vitamins and minerals) and food components (e.g., fiber, whole grains). Multiple studies support that UPF intake is associated with poor health outcomes independent of nutrient intakes or adherence to ‘healthy’ dietary patterns (again, see Dicken and Batterham 2021, PMID: 35010898, and Bonaccio et al. 2022, PMID: 36450651). As a result, the healthfulness of a food cannot be solely determined by its nutrient composition. The concept of UPF adds an important additional and complementary dimension to the concept of diet quality and how foods may support or compromise health. Furthermore, there is no evidence to support that ultra-processed versions of healthy foods such as whole-grain bread and yoghurt are healthier than non-ultra-processed versions of these foods.
9. The Committee writes that UPF “contributes to using the whole animal/waste etc” and that “processing of foods may have a positive environmental impact by reducing waste and utilization of by-products”. This is a strange argument – does the Committee mean that UPF are necessary to minimize waste? Preservation of foods and reduction of waste can be achieved by manufacturing processed foods that are not UPF (e.g., canned fish and vegetables). There is no question that food processing is essential to ensure a safe and nutritious food supply, but there is no evidence that ultra-processing is necessary or offer additional benefits over less intensive processing.
10. The committee writes that “The mechanisms for the role of degree or type of processing on health outcomes are unknown”. This is incorrect. There are several plausible mechanisms that are supported by the literature. These are explained in the background chapter and in further detail in several peer-reviewed publications (e.g., Juul et al. 2021, PMID: 33942057; Srour et al. 2022, PMID: 35952706). Furthermore, the RCT by Hall et al. demonstrated biological mechanisms related to increased energy intake, including higher eating rate and lower levels of appetite suppressing hormones when consuming an ultra-processed diet, compared to a minimally processed diet. There is also extensive evidence that commonly used additives in UPFs may have pro-inflammatory properties and promote dysbiosis of the gut microbiome, which is associated with low-grade inflammation and metabolic dysregulation. As mentioned above, research consistently supports that associations between UPF and health outcomes persist after adjusting for energy intake and diet nutrient profile, supporting the role of pathways that are independent of dietary energy and nutrient content.
11. The committee does not identify any risk groups. This section should be changed to: “High consumers of UPFs have an increased risk of weight gain, obesity, type 2 diabetes, CVD, and all-cause mortality. Consumption of UPF should be minimized by choosing for less processed versions of foods, when possible”. This statement is consistent with the advice given for red meat, which is associated with health outcomes in a less consistent manner than UPF are.
12. The committee states that “UPF is however a heterogenous group of foods and a mix of foods with various nutrient quality and it has not been possible to assess causality on the type of processed foods and health outcomes”. This argument is invalid. We do not have proof that red meet causes colorectal cancer, CVD and type 2 diabetes but the NNR2022 still recommends limiting consumption. While further research is warranted, it is not justified to investigate every individual type of UPFs and their health effects before taking action. A high intake of UPF is associated with several health outcomes contributing significantly to the burden of disease in the nordic countries, and diets lower in UPF are associated with less risk. This fact alone justifies recommendations to limit consumption, even in the absence of causal evidence.
13. The committee states that ”A guideline on UPF would introduce conflicting messages about some foods, for example some ready-made foods, wholegrain bread, and granola. The concept is difficult for the consumers to understand, for example why pasta with or without filling is classified differently.” First, as mentioned above, not all ready-made foods, breads, and granolas are UPF. Second, we should not underestimate the consumers. Giving clear advice to choose the less processed versions of foods, e.g. those containing mostly whole foods over those containing less, is easily captured, and would encourage the food industry to improve products. Emphasizing the importance of mainly choosing whole foods aligns with most dietary recommendations but must be explicitly stated. In contrast, suggested recommendations from other chapters are not easily understood by consumers. For example, recommendations regarding specific E% from added sugar or specific fatty acids in the diet are difficult for most consumers to put into practice.
14. The committee states that “Time to prepare foods, and the accessibility to foods does not make it easy to leave out highly processed foods from the diet”. This argument is invalid. The current evidence supports diets that are *high* in UPF are detrimental to health, and that eating less is beneficial to health. However, there is no need to completely avoid all UPF. Furthermore, people in the Nordic countries have a high accessibility to non-UPF and eating mostly non-UPF is highly realistic for most people. Finally, this argument implies that we should not make time for cooking. Cooking for ourselves and our family is a positive behavior that is associated with better health and helps to preserve culinary traditions. Why should we not make time for it? We never question taking time to care for ourselves in other ways, such as exercising or spending time in nature***.***

In summary, we believe that the arguments provided for not including recommendations regardingUPF are invalid and not justified by the current evidence base. Furthermore, the text in the NNR report does not reflect the systematic evaluation of the current literature which we conducted. We strongly recommend the Committee to reconsider their decision to omit recommendations regarding UPF. The current evidence supports that limiting UPF and replacing UPF with whole and minimally processed foods would lead to reduced risk of weight gain, obesity, type 2 diabetes, CVD, and all-cause mortality. There are no risks associated with this type of advice. Also, focusing on increasing whole and minimally processed foods is in line with current evidence regarding food groups and dietary patterns independent of the NOVA framework.

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