Name	Comment	Reply
Lisa Jonsson, student Gothenburg University	Det vore mycket intressant att få området "anti-inflammatorisk kost" och tarmflora utvärderat. Det finns ett stort allmänt intresse inom området. Böcker inom området toppar "fack-litteratur" listorna och har gjort i flera år. https://www.boktugg.se/2018/02/09/topplista-20-mest-salda-bockerna-januari-2018-fackbocker/ Vissa rekommendationer inom detta område går stick i stäv med NNRs nuvarande rekommendationer. T.ex. lyfts kokosolja fram som ett mycket hälsosamt livsmedel. Gluten och mjölkprodukter utesluts. Eftersom det finns ett så stort allmänt intresse inom området och många följer dessa "dieter" så vore det av stort intresse att få en genomlysning av ämnet. Vidare anser jag det vara ett problem att förtroendet för Livsmedelsverket i Sverige inte har högre förtroende hos konsumenterna. Experterna gör ett mycket omfattande arbete med NNR men om sedan Livsmedelsverket skall förmedla detta till allmänheten och allmänheten inte har ett högt förtroende för myndigheten blir det bekymmersamt. Då får modedieter och andra "tyckare" och "egenutnämnda experter" lättare att övertyga allmänheten om vad som är hälsosam kost. Livsmedelsverket skriver 2017 att "Förtroendet för Livsmedelsverket fortsätter uppåt! 60 procent av konsumenterna känner ganska eller mycket stort förtroende...." Jag anser att 60 % är en alldeles för låg siffra i detta sammanhang. Ser mycket fram emot kommande NNR. Allt gott, Lisa Jonsson	Dear Lisa Jonsson, Thank you for your comment. Inflammation and microbiota will be covered under "mechanisms" in chapters if relevant. The NNR2022 project reviews the food based dietary guidelines on an overarching level. Communication of the dietary guidelines is done by national authorities in each Nordic country, based on the NNR and may include additional considerations. To ensure high confidence in the recommendations, NNR2022 will be performed in a scientific rigorous way with a high degree of transparency. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Bjørn Sigurd	The world’s climate crisis is of outmost importance. Transition to a nutrition with less (red) meat and more fruits and	Dear Bjørn Sigurd Benestad Johansen,

Benestad Johansen, NutriOpt	vegetables is considered as a major factor for earth health. In order to provide a healthy vegetarian or semi-vegetarian nutrition, recommended amino acids levels should be given. Great carefulness is needed in a vegetarian nutrition in order to properly comply with the needs of all amino acids in order to get rich enough protein. Note: I think most people will agree on the importunateness of this. However, for this to be practically usable, nutrition tables for ingredients also need to contain amino acid levels for each ingredient. Currently, 'Matvaretabellen' in Norway does not hold this information. (I have unconfirmed information that corresponding food table in Denmark does hold this information). But, anyway, getting the recommended amino acid levels is both necessary and a good starting pint.	Thank you for your comment. Sustainability aspects and sustainable diet will be covered in NNR2022. You can read more about this at our website. The content of the national food composition tables is out of scope of the NNR2022 project. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Karin Beronius	All our schools, hospitals and institutions within the municipalities, use this guidance to decide the diet served there. Therefore, It's of a great importance that the food served, is also the food that makes us the healthiest. It's also of the greatest importance that these recommendations are evidence based and also updated with the latest research within the field of nutrition. My suggestion is that you look deeper into the recommended division between carbohydrates, protein and fat. Todays recommendations suggest that the majority of your daily nutrition intake should be carbohydrates, which has led to a huge intake of bread, pasta, starchy food, fruits and sugar. I think that you should more thoroughly look into how carbohydrates transform into sugars in our bodies and by that making it more clear to the public how intake of carbohydrates correlate to sugars. In order for the upcoming generations to become more healthy, I suggest that a more balanced picture of the division of a plate is drawn. Where a greater part of the plate consist of natural, healthy, fats (such as avocado, olive oil, butter, lard an other unprocessed fats), one part is	Dear Karin Beronius, Thank you for your comment. New significant evidence generated after the publication of NNR2012 relevant for dietary reference values and food based dietary guidelines will be dealt with in a systematic and transparent way be accounted for in NNR2022. The degree of processing of foods may be considered in NNR2022 for certain food groups, if data are available and it is relevant for setting food based dietary guidelines. The NNR2022 project reviews the dietary reference values and food based dietary guidelines on an overarching level. Communication of the dietary guidelines, for example to

	natural, unprocessed protein and the final part is natural, again unprocessed carbohydrates, such as green leafy vegetables. Recent studies (for example: http://www.phri.ca/pure/) and reviews of previous research (for example: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6053258/), show that the guidelines promoting high carb and low fat diets, are badly motivated and has a low evidence base. I suggest that in the material presented to the public, all pictures of processed foods are removed and replaced with natural foods. This will make it easier for people to make healthy choices and reduce the amount of processed odds in their diets. I also believe that the fear of fat needs to be transformed into a love of natural, healthy, fats. The public needs to be more aware of the health benefits of natural fats. Ultimately, the food pyramid picture would be flipped upside down and be completely filled with only natural choices in all parts. This allowing the base to be filled with nutrient dense foods as avocado, olive oil, butter, lard, tallow and eggs. The midsection filled with nutrient dense proteins such as salmon, fatty meats, chicken and preferably a “nose to tail”-picture that encourage us to use all parts of the animal. And the top should be represented by the natural healthy carbs found in green leafy vegetables and at the top, some berries for more nutrient dense sweets. My belief is that this pyramid would increase public health and quality of life dramatically, and reduce medical cost enormously.	schools and individuals is to a large extent not covered by NNR2022 because it is done nationally. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Minna Vanhala, The Association on Finnish Home	The responsibility of environmentally friendly food and consuming should be stated out more clearly. Long distance imports should be avoided and instead every nationality should prefer their own natural resources. NNR should speak out more for the vegetarian food, and the use of naturally grown/ living materials in meals. Today our eating habits is based on the supply, not on the needs. That is	Dear Minna Vanhala, Thank you for your comment. Sustainability aspects and sustainable diet will be covered in NNR2022. You can read more about this process at our website.

Economics Teachers	one reason why there is more heart and vascular diseases than there should be with the knowledge today. We eat more than we actually consume, buying food is easier than consuming the energy it gives us. Also we are saturated with different chemicals hidden in food products. We don't know how they interact to each other, nor do we know how the chemicals change our bodies in long tearm. This is why NNR should state out the importance of pure, non-toxic ingredients. The knowledge for food-consumption in families has changed. When before everything was home-made, nowadays more and more of meals is ready-made, so called micro-wave meals. Food has become more stressfull for families, than a pleasure that gives families an opportunity to spend time together. Therefore major campaigns should be taken into consideration- to teach families how to prepare well-balanced meals that do not cost a lot and don't take too much time in this busy time. Children do not recognize the basic ingredients as well as know what to do with them. In Finland milk is too much emphasised. Instead, there should be more options for calcium-intake. Vitamins are not explained well enough. If there would be better charts on different consequences on the lack of vitamins, would it be more easy to build vitamin-rich meals. As we home economics teachers see young people (in Finland 12-16 year olds) weekly on daily, we get the direct knowledge on their understanding. We can also influence directly to homes by giving home work to our students. But that is not enough. Families need more guidance and advices, they need actual help.	The degree of processing of foods may be considered in NNR2022 for certain food groups, if data are available and it is relevant for setting food based dietary guidelines. The NNR2022 project reviews the dietary reference values and food based dietary guidelines on an overarching level. Food safety, for example long term effects of contaminants on health, is reviewed by the national authorities in each Nordic country and incorporated into national advice on food safety. Communication of the dietary guidelines is also done nationally. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Monika Thoresen,	Our suggestion is to: In addition to recommending different nutrients to have a good health, we believe it's important to talk about the concrete health benefits of	Dear Monika Thoresen,

Barilla Norge AS	consuming whole grain, fiber, protein etc.. WHY should the consumer have focus on these nutrients in their food. F.ex. helps digestion, prevent cardiovascular disease, cognitive processes ++	Thank you for your comment. Health effects/mechanisms will be described in chapters. The NNR2022 project reviews the dietary reference values and food based dietary guidelines on an overarching level. Communication of the dietary guidelines is to a large extent not covered by NNR2022 because it is done nationally. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Axel Lilliestråle	On page 149, there is a statement that reads: "Microalgae oil with DHA and EPA could be an alternative to consuming fish, but supplements have not been shown to preform as well as the naturally occurring nutrients in fish" This claim is controversial, particularly because there is no reference to this claim. To the contrary, there are studies published post 2012 showing that vegans reach optimum levels of DHA & EPA through a modest supplement of algae derived DHA and EPA oil. Se reference below: Sarter, B., Kelsey, K. S., Schwartz, T. A. & Harris, William. (2014). Blood docosahexaenoic acid and eicosapentaenoic acid in vegans: Associations with age and gender and effects of an algal-derived omega-3 fatty acid supplement. Clinical Nutrition, 32(2). 212 - 218. doi: 10.1016/j.clnu.2014.03.003 Also, taking algae derived DHA and EPA oil is probably to prefer to fish, because the algae oil is free from toxins and pollutants.	Dear Axel Lilliestråle, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. The NNR2022 project reviews the food based dietary guidelines on an overarching level. Communication of the dietary guidelines for specific groups is done by national authorities in each Nordic country, based on the NNR and may include additional considerations.

		Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Rosa Maria Alonso i Terme	Dear Nordic friends, It would be interesting to also have: 1. Age and gender-based nutrition recommendations. 2. Recommendations for meat-fish ¨reducitarians¨ so we would know how to eat a healthy diet with less animal meat intake. Tak!	Dear Rosa Maria Alonso i Terme, Thank you for your comment. Health effects and nutritional requirements will form the basis for nutrient recommendations in age and gender-based groups just as in previous editions of the NNR. Possible health effects of plant-based diet/vegetarian diet/vegan diet will be considered in NNR2022 where relevant. Sustainability aspects and sustainable diet will also be covered in NNR2022. You can read more about this process at our website. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Marta Velgan, family doctor	I am a Family Doctor in Estonia. Considering the big influence of our diet on our health and therefore impact on health care sustainability, it would be game changing to see in NNR 2022 a increased focus on plant-based diets (including veganism). The possible effects of plant-based diet on obesity, diabetes, several widespread cancer and heart decease rates can be dramatic. Considering that medical professionals do not normally get to focus on preventative medicine during their studies, the	Dear Marta Velgan, Thank you for your comment. Possible health effects of plant-based diet/vegetarian diet/vegan diet will be considered in NNR2022 where relevant.

	new guidelines could provide essential information for both professionals and a great number of people currently suffering due to dietary choices. If no guidelines are given for a healthy plant-based diet, it will be rather likely that the countries using NNR 2022 as guidelines for their own nutritional recommendations, will find it easier not to compile their own recommendations. Currently in Estonia there are no complete guidelines on healthy plant-based diet and plant-based diet is for children and pregnant women no recommended. Due to that, it will continue to be a challenge to provide healthy vegan meals in public institutions such as kindergartens, schools, hospitals, prisons, the army. For the medical and educational sector professionals it will be difficult to get adequate information on plant-based diet to support people who choose to change their diets, and people will not know where to find trustworthy information on their dietary choices. NNR 2022 are hugely influential guidelines and how you choose to communicate current and future challenges and opportunities in diets will have an effect on the entire Nordic and Baltic region. Lastly, it cannot be underestimated what shifting to whole foods plant based diets can do for public health and environment. Thank you for the opportunity to suggest topics for systematic reviews in NNR. I hope the new guidelines will make a strong scientific statement about the current state of public health, the environment and challenges ahead.	Sustainability aspects, sustainable diet and obesity will be covered in NNR2022. You can read more about this process at our website. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Annika Dahlqvist pensionerad allmänläkare	Jag hoppas att ni är medvetna om att de enda studier som är acceptabla är RCT-studier. Inte epidemiologiska studier, om de inte visar en riskökning på minst 10-20 ggr jämfört med annan kost.	Dear Annika Dahlqvist, Thank you for your comments. For a description and rational for the methodology used in NNR2022 please read the following articles: **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al **Food & Nutrition Research**

		The Nordic Nutrition Recommendations 2022 – Structure and rationale of qualified systematic reviews. Arnesen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Kätrin Karu, nutritionist	Hello! I was going through the topics that you are looking for expertise and couldn't find fibers in the list. On the other hand nutritional fibers and their importance to the microbiome are constantly gaining attention and if not jet, then should be added to the topics covered in the recommendations. I hope that I could help with that :-) Thank you!	Dear Kätrin Karu, Thank you for your comment. The health effects of dietary fibre will be included, for example in the chapters on carbohydrates, cereals and vegetable/fruits. Microbiota will be covered under "mechanisms" in chapters if relevant. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Christina Søndergaard	No comment is received.	

Hans Jartoft, private.	Cholesterol is a poor health marker and nutrional advise must focus on keeping triglycerides low, not cholesterol. Grains are cheap "rocket fuel" with very little nutritional value. Should only be eaten as "emergeny food". Artificial fertilizers is one of the biggest problems on the planet, not cows if they live in a natural habitat. Measure how polyunsaturated fats like soja, corn, sun flower seed an similar oils affect our bodies before recommending them, after that, you wont. Fat from animals (that have been eating what they should) is the best possible source of energy for a human being. Just check it, do your research, honest research, far away from big money. Obesity is a food induced hormonal imbalance. Study and you will learn. Study the difference between easily digestible starch and resistant starch. Salt is essential. Sugar is toxic. Good luck.	Dear Hans Jartoft, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. For further information about our methodology and evaluation of new science, please read the following articles: **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al,. **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure and rationale of qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** Sustainability aspects and sustainable diet will also be covered

		in NNR2022. You can read more about this process at our website. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Wimanx	- Concluded that only “low- or very low-certainty” evidence existed to show that this meat causes any kind of disease — not cancer, not heart disease, not Type 2 diabetes. Eating red meat isn’t killing us. https://www.latimes.com/opinion/story/2019-10-09/red-meat-diet-nutrition-guidelines	Dear Winmanx, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. For further information on our principles and methodology and how we consider new evidence, please read the following articles: **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure and rationale of qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews.**

		Arnesen et al, **Food & Nutrition Research** Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Sandra Owe, SOW Consulting	Hello, I would like to have your definition and main activities for the roles you are describing as experts. Would also be happy to get information on how the selection of experts are carried out. What are the criterias and methods for selection of experts?	Dear Sandra Owe, Thank you for your comment. The chapter experts will be responsible for writing the chapters designated to them. Each chapter is also reviewed by another expert. All applications will be evaluated by the NNR2022 committee based on previous research experience and competence related to the different topics. In addition, we aim for an equal distribution of authors from the different Nordic countries. A number of younger experts will also be recruited to encourage skills transfer. For further information about the process, please review the updated information on our website and the following article: **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**.

		Christensen et al. **Food & Nutrition Research** Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Jonas Drott	Hello, I would like the committee to further look into the correlation between grain (in particular gluten), as well as refined vegetable oil (canola oil etc) consumption, and gut health (leaky gut syndrome, IBS etc) as well as the long-term development of auto-immune conditions. Also, studies on organic grass-fed and pasture raised cattle in regards to both human health from consumption of such foods, and environmental impact, in comparison to conventional raised animals from concentrated animal feeding operations and the like. Kind regards, Jonas Drott Health coach and physical fitness instructor CrossFit Njord Stenungsund, Sweden.	Dear Jonas Drott, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. Different biological mechanisms for health effects of foods, for example microbiota will be covered in chapters if relevant. Sustainability aspects and sustainable diet will be covered in NNR2022. You can read more about this process at our website. For further information about our methodology, please read the following article: **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al. **Food & Nutrition Research** Yours sincerely,

		Rune Blomhoff, Head of the NNR2022 Committee
Richard Nyström, Swedish citizen	As a person, father and Swedish citizen, I would like to share my main opinions about the NNR food recommendations. My point of view is not based on formal research, but rather on a genuine interest for what is new in food- and health research. I myself can choose diet and lifestyle based on my own beliefs, but many people around me, like my children in school, rely of your recommendations for a large part of their diet. I am therefor happy to get this opportunity to express my opinions. I hope you will read them, consider them, and find them useful. 1. In general, please be more clear on if a specific recommendation is based impact on human health or impact on the environment. I want to know if, by selecting a certain diet, I "save" my health or the environment (or both/neither). 2. Since recent evidence shows that saturated fat is not as unhealthy as it has been depicted before, and I expect an increased tolerance on saturated fats in the new recommendations. If so, please be extra clear that this is an area where recommendations have changed so that those using these recommendations feel comfortable in changing their behavior accordingly. For example, I do not want my kids to be served low fat milk or low fat margarine or low fat anything. 3. Meat in general, and red meat in particular, has been the "bad guy" for long, and it is easy to get the impression that the less meat we eat, the better it is for our health. Even though meat everyday might not be necessary, we should still acknowledge that it is an extremely nutrient dense food source which cannot easily be replaced by plant based food. 4. "Plant based oils" are often expressed as the fat source to be used in all cases. I think the recommendations needs to state more clearly that a mix of fats in the diet is healthy for various reasons: - Polyunsaturated fats are unstable and does not tolerate heat well. - Omega-3 vs omega-6 levels vary greatly in different seed oils so we	Dear Richard Nyström, Thank you for your comments. 1) A rationale will be given for all dietary reference values and dietary recommendations in the NNR2022 New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. Please read more in the following articles: **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure and rationale of qualified systematic reviews.** Arnesen et al **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews.**

	cannot just say they are all equally good for the health (or good in the same way). - Eating more fish and seafood is often how we are recommended to balance omega-3 and omega-6 levels. But reducing intake of omega-6 rich oils can be more effective. 5. In the current recommendations there is very little (if any) mentioning of inflammatory food and the linked health states (metabolic syndrome etc.). Including this would be a welcome addition. Please feel welcome to contact me, should you have any questions about my comments above. KR Richard	Arnesen, et al **Food & Nutrition Research** 1 Same as 1) 2) Same as 1 and 2) 3) Inflammation in relation to health outcomes will be covered under "mechanisms" in chapters if relevant. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Milla löfstedt	Hej! Jag vill se en förändring i den kost som ges i förskola/skola. Vad är syftet med att servera livsmedel med socker i? Ex kanelbulle på kanelbullens dag, glass vid förskolans dag, pepparkakor etc. Även livsmedel såsom ketchup och sylt. Bort med allt detta, kan förskola/skola vara en god förebild och ge barnen en kost som gör att de tar till sig information och lärande? Jag förstår inte syftet och hur man kan välja att ge saker som är direkt skadliga för oss utan minsta näring. Det blir svårt för oss som vill ge barnen en bra grund när det sedan serveras på förskola och personalen inte kan neka barnen i och med barnkonventionen blir lag.	Dear Milla Löfstedt, Thank you for your comment. NNR should be used as a guideline for dietary planning for groups, including kindergartens and schools. NNR is also a basis for nutrition policies and national dietary guidelines in the Nordic countries. Each Nordic country is responsible for the guidelines provided to municipalities or regions. In these guidelines other relevant factors may be incorporated besides the science basis from NNR. Yours sincerely,

		Rune Blomhoff, Head of the NNR2022 Committee

Sandra Owe, SOW Consulting	Hello, I would like to have your definition and main activities for the roles you are describing as experts. Would also be happy to get information on how the selection of experts are carried out. What are the criterias and methods for selection of experts?	Dear Sandra Owe, Please see the answer above. The comment is received twice. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Sofia Eklund	- Kost för IBS och övriga magproblem då detta är otroligt vanligt idag. Fullkornsbröd, spannmål etc. är oftast inte gynnsamt för denna grupp, som många gånger mår bättre av de lösliga fiber som finns i t.ex. rotfrukter. Förekomst av känslighet/veteallergi även utan celiaki. - kost för att minska inflammation: autoimmuna sjukdomar ökar enormt och många märker att de kan bli hjälpta av livsmedel som minskar inflammation. Ökat fokus på vilka livsmedel som kan vara gynnsamma vid dessa tillstånd samt vilka livsmedel som kan trigga inflammation. - Biotillgänglighet, specifikt skillnad på kroppens upptag av vegetabiliska källor till t.ex. järn, d-vitamin och omega 3. Ökad kunskap om hur man som vegetarian /vegan kan sätta ihop sin kost för att inte riskera näringsbrister. Jag själv föreläser om kost och upplever stor okunskap inom dessa områden, att väldigt många som äter plantbaserat saknar grundläggande kunskaper i näringslära vilket blir ett problem. Större fokus på järnbrist hos framförallt unga kvinnor och hur råden kan utformas för att minska risken för detta. - Skillnad på näringstäthet i ekologiska livsmedel / gräsbeteskött gällande ex. Omega 3/6, d-vitamin och fettsyraprofil. - Nyansera rekommendationerna om rött kött till att gälla minskat intag av importerat kött och charkprodukter, inte nödvändigtvis minskat intag av svenskt (ekologiskt/gräsbetes) rött kött. Granska de studier som gjorts på rött kött och se mer på övrig livsstil/andra kostfaktorer hos de	Dear Sofia Eklund, Thank you for your comments. The DRVs are intended for healthy individuals. Generally, the DRVs cover increased requirements such as during short-term mild infections or certain medical treatments. The DRVs are usually not suited for long-term infections, malabsorption, and various metabolic disturbances or for treatment of persons with a sub-optimal nutritional status. They are meant to be used for prevention purposes. For individuals with disease and for other groups with special needs, the dietary composition might have to be adjusted accordingly. Sustainability aspects, sustainable diet and chronic diseases such as obesity and type 2 diabetes will be covered in NNR2022. The degree of processing of foods may be considered in NNR2022 for

	som haft ett högt intag av rött kött. Finns studier på personer som ätit mycket grönsaker, lite socker och snabba kolhydrater, som är hälsosamma i övrigt OCH äter rött kött? - Större fokus på balansen mellan omega 3 och omega 6. Problematisera omega 6-innehåller i alla vegetabiliska oljor och risken/förekomsten av transfetter i dessa. Starkt ifrågasätta den odlade norska laxen och undvika att bidra till marknadsföringen av denna som hälsosam. - Ifrågasätt rekommenderadet av lightprodukter och gå tillbaka till rekommendationer för mer naturlig, ren mat. Granska mättnad kopplat till högt intag av lightprodukter och hur det kan trigga ett ökat intag av socker. - Större fokus på vad alla processade produkter med tillsatser, sötningsmedel m.m. gör med kroppen. Idag väldigt vanligt med proteinbars m.m. - Starkare än idag avråda unga människor från energidryck och skriva mer om hur det påverkar sömn, samt hur de ofta ersätter mer näringsrik mat eller ”botar” blodsockerdippar och sömnbrist hos befolkningen.	certain food groups, if data are available and it is relevant for setting food based dietary guidelines. NNR2022 will account for significant new evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines. This may include for example bioavailability from different foods. The NNR2022 project reviews the food based dietary guidelines on an overarching level. Communication of the dietary guidelines, for example types of foods to increase or avoid in certain population groups is to a large extent not covered by NNR2022. It is done by national authorities in each Nordic country, based on the NNR. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Anna Ståhlberg	Hej! Jag skulle önska att man omvärderar nyttan av hårt raffinerade och omestrade margariner. Bör de verkligen nyckelhålsmärkas och klassas som nyttiga? Kunskapen om omestring och dess hälsoeffekter är mycket begränsad. Livsmedelsverket skriver att studier gällande effekter på spädbarn och vuxna är alldeles för få och resultaten för motstridiga för att kunna dra slutsatser om dessa fetters påverkan på hälsan hos barn. Mer kunskap behövs om långtidseffekter och interaktioner med övriga	Dear Anna Ståhlberg, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022.

	fettsyror i maten. Djurstudier visar varierande resultat av omestrat fett- en del visar tex negativa effekter på lever och hjärna. Likaså är kunskapen om de värmeinducerade ämnena; 2- och 3-MCPD-estrar och glycidylestrar mycket begränsad. 3-MCPD betraktas som cancerogent och toxiskt, och EFSA efterfrågar bättre data från humanstudier och anser att osäkerheten kring riskbedömningen är stor. Långtidseffekterna är osäkra för både 2-och 3-MCPD. SLV:s egen riskrapport visar att de högsta värdena av dessa oönskade ämnen finns i raffinerade oljor samt i flera flytande och fasta margariner. Margariner med palmolja hade oftast högst nivåer. Mvh Anna Leg dietist EFSA riskrapport Risks for human health related to the presence of 3- and 2-monochloropropanediol (MCPD), and their fatty acid esters, and glycidyl fatty acid esters in food. 2016 doi: 10.2903/j.efsa.2016.4426. https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2016.4426 JEFCA:s riskrapport Joint FAO/WHO expert commitee on food additives. Eighty-third meeting Rome, 8–17. 2016 summary and conclusions. JEFCA/83/S https://www.who.int/foodsafety/publications/JECFA83-Summary.pdf D'avila LF, et al.Toxicological aspects of interesterified fat: Brain damages in rats.Toxicol Lett. 2017.https://www.ncbi.nlm.nih.gov/m/pubmed/28528080/ Lavrador MSF, Afonso MS, Cintra DE, et al. Interesterified Fats Induce Deleterious Effects on Adipose Tissue and Liver in LDLr-KO Mice. Nutrients. 2019 Feb 22;11(2). doi: 10.3390/nu11020466. https://www.ncbi.nlm.nih.gov/pubmed/30813339	The Keyhole label is based on the NNR, but the process of setting criteria for labelling is not within the NNR2022 scope. The NNR2022 project reviews the dietary reference values and food based dietary guidelines on an overarching level. Food safety, for example heat-induced components, is reviewed by the national authorities in each Nordic country and incorporated into national dietary advice. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	Afonso MS, Lavrador MS, Koike MK, et al. Dietary interesterified fat enriched with palmitic acid induces atherosclerosis by impairing macrophage cholesterol efflux and eliciting inflammation. J Nutr Biochem. Epub 2016 Mar 4. doi: 10.1016/j.jnutbio.2016.01.005 https://www.ncbi.nlm.nih.gov/pubmed/27142741 Livsmedelsverkets riskrapport. Rapport 35. 2017. 2-MCPD, 3-MCPD och glycidylfettsyraester i livsmedel på den svenska marknaden Riskhantering, riskvärdering och haltdata. [Citerad september 2019] https://www.livsmedelsverket.se/globalassets/publikationsdatabas/rapporter/2017/2-mcpd-3-mcpd-och-glycidylfettsyraester-i-livsmedel-pa-den-svenska-marknaden-livsmedelsverkets-rapport-23-2017.pdf	

Martin Norum	Hi, I have submitted an application to be considered a contributor/expert regarding protein. Additionally I would like to add a comment here. I would advise som modifications and updates during the protein chapter. More specifically, I may be of help in the "Protein and physical exercise" section, wheras there has been scientific progress since the present version of NNR. Kind regards, Martin Norum, MSc Sport & Exercise Nutrition	Dear Martin Norum, Thank you for your application as an expert and your comment. All applications will be evaluated based on previous research experience and competence related to the different topics. In addition, we aim for an equal distribution of authors between the Nordic countries. All chapter experts will be recruited during the spring 2020. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Daniel	I would like you to look into latest research that shows the inflammatory effect on our bodies from grains(including corn,rice,oats). Dr.Osbourne at Gluten Free Society has some very valuable information with valid sources. Celiac disease is only one of hundreds of autoimmune disease that can be caused by these gluten proteins that leaks through our intestal barrier and makes our immune system go berserk and attack your own tissue/organs. This can lead to diseases(depending on your genetic predisposition) like arthritis, lupus, hashimotos, diabetes type1 the list goes on. No grain no pain! Thanks	Dear Daniel, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. The recommendations consider not only the avoidance of clinical or subclinical deficiencies but also a reduction in the risk of development of overweight and obesity and major lifestyle diseases such as cardiovascular diseases, type-2 diabetes, cancer, and osteoporosis.

		Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Gunnar Rundgren	If the revision should include issues of sustainability and environment, it is needed to include those also for the production of fruit and vegetables. They incur considerable environmental damages. For instance: -research in Sweden show that half of all use of pesticides for the production of the food of Swedes are used in the production of fruit and vegetables, https://www.sciencedirect.com/science/article/pii/S0959652618340447?via%3Dihub -research in China, the biggest producer of vegetables in the world show that they cause around one fifth of the total greeenhouse gas emissions from Chinese crop production, despite using less than one tenth of the area. https://onlinelibrary.wiley.com/doi/abs/10.1111/gcb.14425 -recent research in the UK show that the annual consumption of 10.8 Mt of vegetables, despite being far from the recommended quantity, generates 20.3 Mt CO2 eq., consumes 260.7 PJ of primary energy and depletes 253 Mt eq. of water. Many vegetables have a higher footprint than that of chicken or milk. https://www.sciencedirect.com/science/article/pii/S0048969719319758 Considering the rather limited contribution nutrition the environmental impact of many vegetables is far too high. The recommendations should take this into account and guide consumers to those kinds of vegetables and production methods which reduce the environmental damage, such as locally produced, in season and organic vegetables. And to reduce those vegetables that have a high environmental footprint, in particular those which are transported far and by air those which are grown in places with water stress, those that are produced with a lot of fertilizers and pesticides and those which	Dear Gunnar Rundgren, Thank you for your comments. Sustainability aspects and sustainable diet will be covered in NNR2022. The NNR2022 Committee will arrange a seminar and a workshop within sustainability to define the areas and topics that are most relevant and pressing for NNR2022. You can read more about this process at our website as it proceeds. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	are produced with a lot of fossil energy (such as greenhouse crops from many countries).	
Juliana Gjessing	I worked as a clinical dietitian in Canada and now in Norway. In the updated NNR 2022, I hope the committee can address the issue on how to supplement deficiencies. Many countries have written on daily requirement of vitamin/min, but I can't seem to find good data on how to supplement an individual when there is a deficiency, aside from Vitamin D.	Dear Juliana Gjessing, Thank you for your comment. For most nutrients, a hierarchy of criteria for nutrient adequacy can be established ranging from prevention of clinical deficiency to optimal levels of body stores and functionality. However, clinical guidelines on dietary supplementation is the responsibility of the national health administration and is not within the scope of NNR. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Marie Henriksen Bogstad, NOAH - for dyrs rettigheter	NOAH – for animal rights Dronningens gate 13 0152 Oslo 22nd October 2019 Comments for the NNR 2022 Committee with regards to the work on updating the nordic nutrition recommendations NOAH – for animal rights is a member organization working for a society where consideration for animals are a given. Animal rights are based on recognizing animals as fellow creatures with equal ability to experience and demand respect and consideration. This is the basis for everything that NOAH does. We work with topics such as wildlife, domesticated animals, agriculture, as well as environment and health. We encourage a plant-based diet and promote a shift away from animal agriculture.	Dear Marie Henriksen Bogstad, Thank you for your comments. Sustainability aspects and sustainable diet will be covered in NNR2022. You can read more about this process at our website as it proceeds. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted

	In our comments, we want to emphasize the need for an increased focus on plant-based consumption in the nordic nutrition recommendations. Since 2012 several research papers and reports have been published, underlining the need for a dietary shift away from animal products in order to improve health, wildlife and the environment. For example reports from the IPCC and IPBES, Union of Concerned Scientists and Food and Land Use Coalition. In fact, a change towards plant-based foods will be crucial if we want to save our planet from the ongoing climate and nature crisis. In the Nordic countries, the consumption of meat and dairy is particularly high and the cause of many non-communicable diseases and obesity. Therefore, a plant-based diet can help improve the health and lifestyle of the nordic population. The Nordic council of ministers published an assessment of "Future Nordic Diets" in 2017. They concluded that the Nordic countries could feed 37 million people - 10 million more than today - if the population decreased their consumption of meat with 81-90%, and increased the production of plants for human consumption. Similarly, the EAT-Lancet report focused on the need for a large reduction in the consumption of animal products, limited to 14 g of red meat per day. The Norwegian university, Nord, has calculated that with a reduction of meat consumption of 30-60% Norwegian self-sufficiency could increase up to 80%. The IPCC assessed that a dietary shift towards plant-based foods will directly benefit 12 out of 17 sustainable development goals. Researchers from Oxford University have stated that the single biggest way to reduce one's impact on the planet is by avoiding animal products. Hence, a plant-based diet is healthy for both people and the planet. We would like to encourage the working group behind the reassessment of the Nordic Nutrition Recommendations to bring more of these new reports into their work. The Nordic recommendations should not only focus on what is healthy for the population, but also what is beneficial for the environment, nature and people. A holistic	for in NNR2022. This includes dietary patterns such as plant-based diets. The NNR2022 project reviews the food based dietary guidelines on an overarching level. Communication of the dietary guidelines, and how a healthy diet can be achieved is done by national authorities in each Nordic country, based on the NNR and may include additional considerations. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	approach to nutrition is necessary in terms of the large crises we are facing. We would also like to address the importance of focusing not only on increased consumption of fruit and vegetables, but explicitly on how to reduce the consumption of animal products by exchanging them with legumes like beans, peas and lentils, plant-based meat substitutes and plant milk products. Going forward we hope the NNR 2022 will include a significant focus on a dietary shift towards plant-based foods, and hence contributing not only to increased consumption of these foods, but also production. Thank you. Best regards, Marie Henriksen Bogstad, agroecologist at NOAH Kaisa Sogge-Hautala, project leader for sustainability at NOAH Siri Martinsen, leader and veterinary at NOAH	
Suvi Virtanen (Finnish Institute for Health anf Welfare)	Comments on behalf of Finnish expert group for early nutrition • More emphasis should be paid on the type of protein (balanced amino acid composition) in the Protein section. • In NNR2022, recommended maximum amounts of infant formulas should be considered alongside supplemental intakes. It seems that the tolerable upper intake level (UL) for vitamin A and/or D can exceed in infants who consume high amounts of highly enriched formulas. Would national supplementation be a more safe treatment. • Toxicological risk assessment (toxins, heavy metals, other contaminants) should be linked to nutritional assessment. Particularly, young children are vulnerable group due to their higher intake of energy per kg of body weight.	Dear Suvi Virtanen, Thank you for your comment. New significant evidence generated after the publication of NNR2012 relevant for dietary reference values and food based dietary guidelines will in a systematic and transparent way be accounted for in NNR2022. This includes different foods as sources of essential amino acids. Upper intake levels (UL) will also be reviewed in NNR2022. However, decisions on fortification and

		supplementation programs are taken of nationally. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Ann Fernholm, Kostfonden	Kommentar till Kommittén för NNR 2022 (referenser kommer i en andra kommentar) För trovärdighetens skull behöver de nordiska näringsrekommendationerna vila på en stabil vetenskaplig grund. Kostfonden vetenskapliga råd föreslår därför att kommittén för NNR 2022 ska använda GRADE, the Grading of Recommendations Assessment, Development and Evaluation för att evidensgradera NNR 2022. Vidare föreslår Kostfondens en stor försiktighet i användningen av surrogatmått för hälsa, som blodtryck och LDL-kolesterol, i utvärderingen av kostråden. GRADE har utvecklats för att underlätta en kritisk bedömning av resultat från systematiska genomgångar av vetenskapen och undvika felaktiga eller vinklade slutsatser. Det är internationellt erkänd metod som används av exempelvis Cochrane, Socialstyrelsen och Statens beredning för medicinsk och social utvärdering, SBU. En viktig del av GRADE är att på ett systematiskt och transparent vis redovisa hur tillförlitliga evidensen är. För att evidensstyrkan ska graderas som stark krävs vanligtvis randomiserade och kontrollerade studier av hög kvalitet. En hög kvalitet innebär att observerade effekter och noterade biverkningar har säkerställts vetenskapligt. Få av dagens kostrekommendationer vilar på en sådan stark grund. Enligt NNR 2012 ska exempelvis mängden rött kött begränsas till 500 gram i veckan, med motiveringen att ett högre intag kan leda till ökad risk för tjock- och ändtarmscancer. I oktober 2019 publicerade dock ett	Dear Ann Fernholm, Thank you for your comment. To ensure high confidence in the recommendations, NNR2022 will be performed in a scientific rigorous way with a high degree of transparency. For a description and rational for the methodology used in NNR2022, please read the following articles; **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure and rationale of qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research**

	konsortium av oberoende forskare flera systematiska genomgångar av hälsoeffekterna av att äta mycket rött kött. [1-5] Utvärderingarna, som genomfördes i enlighet med GRADE, visade på en låg eller mycket låg styrka i evidensen att rött kött kan ge cancer. Resultaten från genomgångarna fick stor spridning, både internationell och i Sverige och ledde till artiklar som var kritiska mot kostråden. Det har också varit blåsväder kring rekommendationen att mängden salt i maten ska begränsas till 2,4 gram natrium per dag. Rådet baseras främst på att ett minskat saltintag sänker blodtrycket, vilket har antagits vara bra för hälsan. En Cochranegenomgång från 2014 visade dock på svag evidensen för rekommendationen[6] och analyser av Prospective Urband and Rural Epidemiological Study visar att en natriumkonsumtion om 2,4 g/dag (uppskattad genom mätningar av mängden salt i morgonurinen) visserligen kopplas till ett lägre blodtryck, men samtidigt till en förhöjd risk för hjärt-kärlsjukdom.[7, 8] Flera epidemiologiska studier tyder på att majoriteten av befolkningen äter en mängd salt som är neutral för hälsan. Genom användningen av ett surrogatmått för hälsa – blodtrycket – har alltså ett kostråd utfärdats som nu tycks vara effektlöst för majoriteten. Nivåerna av LDL-kolesterol i blodet används också som ett surrogatmått för risken för hjärt-kärlsjukdom och har lett till en rekommendation att begränsa mängden mättat fett i maten. Utvärderingar av effekten av en sådan begränsning på hjärt-kärlsjukdom ger dock ett splittrat resultat[9-11] och användbarheten av LDL som ett enskilt surrogatmått ifrågasätts nu.[12] Kosten påverkar många olika faktorer i kroppen. Ett ensidigt fokus på en riskfaktor för sjukdom kan leda till att man missar en negativ inverkan på ett annan riskfaktor, som kanske har större betydelse för hälsan. Därför bör ingen riskfaktor isolerat användas som surrogatmått för hälsa. Problem med övervikt och fetma fortsätter att öka. För att inte fler år	Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	ska gå förlorade i folkhälsoarbetet är det viktigt att de kostrekommendationer som utfärdas har en bevisad positiv effekt på hälsan. I de fall där det finns osäkerheter kring effekten behöver detta redovisas. Kerstin Brismar, senior professor, Karolinska Institutet. Nina Rehnqvist, senior professor i kardiologi, tidigare ordf. i SBU:s nämnd Ledamot Magnus Simrén	
Ann Fernholm, Kostfonden	Här är referenser till kommentaren vi nyligen skickade in om att använda GRADE i utvärderingen av NNR 2022, och undvika att använda isolerade surrogatmått på hälsa. 1. Han, M.A., et al., Reduction of Red and Processed Meat Intake and Cancer Mortality and Incidence: A Systematic Review and Meta-analysis of Cohort Studies. Ann Intern Med, 2019. 2. Johnston, B.C., et al., Unprocessed Red Meat and Processed Meat Consumption: Dietary Guideline Recommendations From the Nutritional Recommendations (NutriRECS) Consortium. Ann Intern Med, 2019. 3. Vernooij, R.W.M., et al., Patterns of Red and Processed Meat Consumption and Risk for Cardiometabolic and Cancer Outcomes: A Systematic Review and Meta-analysis of Cohort Studies. Ann Intern Med, 2019. 4. Zeraatkar, D., et al., Red and Processed Meat Consumption and Risk for All-Cause Mortality and Cardiometabolic Outcomes: A Systematic Review and Meta-analysis of Cohort Studies. Ann Intern Med, 2019. 5. Zeraatkar, D., et al., Effect of Lower Versus Higher Red Meat Intake on Cardiometabolic and Cancer Outcomes: A Systematic Review of Randomized Trials. Ann Intern Med, 2019. 6. Taylor, R.S., et al., Reduced dietary salt for the prevention of cardiovascular disease: a meta-analysis of randomized controlled trials (Cochrane review). Am J Hypertens, 2011. 24(8): p. 843-53. 7. O'Donnell, M., et al., Urinary sodium and potassium excretion,	Please see the reply above.

	mortality, and cardiovascular events. N Engl J Med, 2014. 371(7): p. 612-23. 8. Mente, A., et al., Association of urinary sodium and potassium excretion with blood pressure. N Engl J Med, 2014. 371(7): p. 601-11. 9. Ramsden, C.E., et al., Re-evaluation of the traditional diet-heart hypothesis: analysis of recovered data from Minnesota Coronary Experiment (1968-73). BMJ, 2016. 353: p. i1246. 10. Hamley, S., The effect of replacing saturated fat with mostly n-6 polyunsaturated fat on coronary heart disease: a meta-analysis of randomised controlled trials. Nutr J, 2017. 16(1): p. 30. 11. Hooper, L., et al., Reduction in saturated fat intake for cardiovascular disease. Cochrane Database Syst Rev, 2015(6): p. CD011737. 12. Astrup, A., et al., WHO draft guidelines on dietary saturated and trans fatty acids: time for a new approach? BMJ, 2019. 366: p. l4137.	
Johanna Holm	För att behålla förtroendet för kostråden bör de vetenskapliga kraven för råden höjas avsevärt i enlighet med skrivelse från Kostfonden. Nivå på evidens och effektfaktor för enskilda råd bör också redovisas så att allmänhet förstår grunden.	Dear Johanna Holm, Thank you for your comment. To ensure high confidence in the recommendations, NNR2022 will be performed in a scientific rigorous way with a high degree of transparency. For a description and rational for the methodology used in NNR2022 please read the following articles; **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure**

		and rationale of qualified systematic reviews. Arnesen et al **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews.** Arnesen, et al **Food & Nutrition Research** The NNR2022 project reviews the food based dietary guidelines on an overarching level. Communication of the dietary guidelines is done by national authorities in each Nordic country, based on the NNR and may include additional considerations. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Johanna Holm	För att behålla förtroendet för kostråden bör de vetenskapliga kraven för råden höjas avsevärt i enlighet med skrivelse från Kostfonden. Nivå på evidens och effektfaktor för enskilda råd bör också redovisas så att allmänhet förstår grunden.	Please see the reply above.
Kreftforeningen/The Norwegian Cancer Society	Increasingly more and more people are surviving cancer – which is good news. Studies of people that have been through cancer treatment can provide vital information that will help us understand how the diet impact survival and cancer recurrence. Ultimately, we need good evidence-based dietary guidance for cancer survivors. According to ESPEN guidelines from 2017 (1) cancer survivors are recommended to maintain a healthy weight and a healthy lifestyle, which includes being	Dear Norwegian Cancer Society, Thank you for your comment. The recommendations in NNR are intended for healthy individuals. Generally, the recommendations cover increased requirements such

	physically active and a diet based on vegetables, fruits and whole grains and low in saturated fat, red meat and alcohol. Furthermore, these guidelines for adult patients with cancer raise awareness by drawing attention to the high prevalence of malnutrition and its adverse impacts on response to treatment, prognosis, and survival. The ESPEN guidelines are supported by Schwedhelm et al (2016) (2). The authors conclude that adherence to a high-quality diet and a prudent/healthy dietary pattern is inversely associated with overall mortality among cancer survivors, whereas a Western dietary pattern is positively associated with overall mortality in this population. Breast cancer is the most frequently diagnosed cancer (excluding non-melanoma skin cancers) among women in 140 of 180 countries worldwide. According to Jochems et al (2018) (3) the reduction of dietary fat after breast cancer diagnosis could increase relapse-free survival among breast cancer survivors, adherence to a high quality diet may protect against overall mortality and death from other causes among breast cancer survivors, and adherence to a prudent diet may protect against death from other causes among breast cancer survivors. Moreover, a Western diet is detrimental for breast cancer survivors. The World Cancer Research Fund report "Diet, nutrition, physical activity and breast cancer survivors" (2014, revised in 2018) (4) concludes that there is some evidence of links between better survival after breast cancer and: • being a healthy body weight • being physically active • eating foods containing fibre • eating foods containing soy • a lower intake of total fat and, in particular, saturated fat Additional large and well-conducted studies, preferably RCTs, are needed to clarify whether dietary patterns/indices and food intake could influence health outcomes in other cancer survivors than breast cancer survivors. To summarize: More research is warranted to assess	as during short term mild infections or certain medical treatments. National health authorities are responsible for dietary recommendations for individuals with disease and for other groups with special needs, where the dietary composition might have to be adjusted accordingly. In this, NNR2022 is complemented by clinical guidelines from other societies, for example ESPEN. NNR puts the whole diet in focus and the role that dietary patterns and food groups play in the prevention of diet-related chronic diseases is emphasized. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	the role of postdiagnosis diet in cancer survival and site-specific cancer recurrence. The Norwegian Cancer Society recommends including food-based dietary guidelines for (breast) cancer survivors, based on current evidence, in the new edition of the Nordic Nutrition Recommendations. References: 1. Arends et al. ESPEN guidelines on nutrition in cancer patients. Clin Nutr. 2017 Feb;36(1):11-48. 2. Schwedhelm et al. Effect of diet on mortality and cancer recurrence among cancer survivors: a systematic review and meta-analysis of cohort studies. Nutr Rev. 2016 Dec;74(12):737-748. 3. Jochems et al. Impact of dietary patterns and the main food groups on mortality and recurrence in cancer survivors: a systematic review of current epidemiological literature. BMJ Open. 2018 Feb 19;8(2):e014530 4. World Cancer Research Fund: Diet, nutrition, physical activity and breast cancer survivors (2014, revised in 2018) https://www.wcrf.org/sites/default/files/Breast-cancer-survivors-report.pdf	
Bård E Viko, Managing Director, Nàdarra AS	Nàdarra is new in the Norwegian market. We deliver Algae oil with Omega-3 (Ovega-3). Considerable fatty acids - 1000 mg on 2,5 ml oil. Algae should be considered as new plant-based nutrient - sustainable and eco friendly. Our oil has been processed - fermented and cold-pressed - but also interesetd in topics to eat algae - mostly macroalgae. What do you think?	Dear Bård E Viko, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. This may include different foods as sources for essential fatty acids. Yours sincerely,

		Rune Blomhoff, Head of the NNR2022 Committee
Rebekka Helén Kristiansen, advisor Sustainability and food production, MatPrat, and Katrine Andersen Nesse, Head of Sustainability, environment and climate, Animalia	The climate effect of methane The NNR2022 will integrate sustainability and environmental issues when developing evidence-based platforms for the national dietary guidelines. Greenhouse gas (GHG) emissions are one of many aspects of sustainability. The different GHGs have different global warming potential (GWP). The GHG methane receives a lot of attention. The methodology to estimate its climate effect, however, is currently in progress. To compare GHGs, the climate effect of the different GHGs is estimated. In the process of measuring the climate effect of e.g., methane the gas is calculated 'as if' it was CO2 – that is, translated into CO2-equivalents using the gas' GWP in a 100-year perspective (GWP100 – weighing factors). GWP is a measure of how much heat a GHG traps in the atmosphere up to a specific time horizon, relative to CO2. The CO2-equivalents indicate the estimated climate effect of x amount emissions of y gas. Methane is estimated to be up to 30 times stronger than CO2 using this method. The methane emissions from enteric fermentation in ruminant animals (sheep and cattle) and animal fertilizer is estimated to account for 60% of the annual CO2-equivalents from Norwegian agriculture. The methodology behind GWP100 has been questioned by several researchers, as this methodology does not consider that different GHGs have different atmospheric lifetimes. CO2 is a long-lived GHG (hundreds of years), whereas methane is comparatively short-lived (approximately 12 years). GWP does not consider that if the number of ruminants is kept constant, there will be no accumulation of methane from ruminants in the atmosphere. A constant emission of the long-lived gas CO2, on the other hand, results in an accumulation of CO2 molecules in	Dear Rebekka Helén Kristiansen, Thank you for your comment. We are aware of this issue, and our sustainability experts will account for new significant literature on this topic. The NNR2022 Committee will arrange a seminar and a workshop within sustainability to define the areas and topics that are most relevant and pressing for NNR2022. Please follow the continuously updated information on our website to follow the process. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	the atmosphere. The recognition of the long-term importance of CO2 has prompted renewed interest in the question of whether methane emissions may be over-valued in GWP100. This is resolved with the suggested GWP* - a methodology that better account for the differences between short- and long-lived gases. GWP* is addressed in IPCC´s special report on global warming of 1.5oC. A modification, which incorporates a term for different climate responses to radiative forcing at different scales, was published in September this year. The fact that the climate effect of methane is still under examination, and the current misinterpretations of CO2-equvalent emissions of short-lived climate pollutants, should be considered when discussing the climate effect of methane emissions from agriculture and taken into account when developing guidelines for sustainable food consumption. References Allen, M.R., Shine, K.P., Fuglestvedt, J.S. et al. (2018). A solution to the misrepresentations of CO2-equivalent emissions of short-lived climate pollutants under ambitious mitigation. Cain, M., Lynch, J., Allen, M., Fuglestvedt, J., Frame, D., Macey, A. (2019). Improved calculation of warming-equivalent emissions for short-lived climate pollutants. CICERO (2018, 11. April). Kunsskapsstatus på metan. David Archer, et al (2009). Atmospheric Lifetime of Fossil Fuel Carbon Dioxide. IPCC (2018, 8. October). Global warming of 1.5oC.	
Rebekka Helén Kristiansen, advisor Sustainability and food production,	Greenhouse gases from agriculture is part of a biological cycle The NNR2022 will incorporate sustainability and environmental issues when developing evidence-based platforms for national dietary guidelines. The emission of greenhouse gases (GHG) is one of many environmental issues that needs to be tackled to halt global warming and achieve a sustainable development. When addressing GHG	Dear Rebekka Helén Kristiansen, Thank you for your comment. We are aware of the issue you are highlighting, and our sustainability experts will account for new significant literature on this topic.

MatPrat, and Katrine Andersen Nesse, Head of Sustainability, environment and climate, Animalia	emissions and the potential to reduce emissions of each of the GHGs, it is important to keep in mind that emissions from agricultural processes is part of a biological cycle. Hence, it is not possible to cut the emissions to zero. IPCC distinguishes between the slow carbon cycle (fossil), where turnover times exceed 10 000 years, and the fast carbon cycle (biological), where vegetation and soil carbon have turnover times in the magnitude of 1-100 and 10-500 years, respectively. Burning of fossil fuel transfers carbon from the slow cycle to the fast cycle, while agricultural production operates within the fast cycle. Agriculture depends upon biological processes where nutrients and gases move between the atmosphere, land, water and living organisms. Through the photosynthesis, plants utilize CO2 from the atmosphere to produce biomass to grow. When plants decay and die, the CO2 is returned to the atmosphere. This biological carbon-cycle is not part of any carbon accounting, as it is considered balanced. Carbon that passes through ruminants and is emitted as methane is part of the biological cycle. These emissions, however, are carbon accounted. Methane has as strong warming potential, but due to being short-lived, it does not accumulate in the atmosphere. CO2, on the other hand, stays in the atmosphere for hundreds of years. Today we emit in a relatively short period of time large amounts of fossil carbon as CO2. Every single emission of CO2 will accumulate in the atmosphere and increase global warming, because CO2 is long-lived. The emissions of CO2 from burning fossil carbon create imbalance in the biological carbon cycle and result to a large extent in the rapid climate change we observe today. The short-lived greenhouse gases, such as methane from agriculture, and the long-lived greenhouse gases, such as CO2 from burning of fossil fuel, have different effects on the climate as they take part in two different cycles. This should be considered when addressing emissions	The NNR2022 Committee will arrange a seminar and a workshop within sustainability to define the areas and topics that are most relevant and pressing for NNR2022. Please follow the continuously updated information on our website to follow the process. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	from agriculture and food and taken into account when developing guidelines for sustainable food consumption. References Ciais, P., et al (2013). Carbon and Other Biogeochemical Cycles. (IPCC) CICERO (2018, 11. April). Kunsskapsstatus på metan. David Archer, et al (2009). Atmospheric Lifetime of Fossil Fuel Carbon Dioxide. IPCC (2018, 8. October). Global warming of 1.5oC.	
Karianne Spetaas Henriksen, fagsjef ernæring Animalia AS, Eilin Lundekvam Bye, ernæringsfaglig rådgiver MatPrat, Torill Emblem Nysted, spesialrådgiver ernæring og bærekraft Animalia AS, Trine Thorkildsen, fagsjef ernæring,	Meat consumption in Norway Meat consumption is reported in different forms, including food supply data, ready-to-cook consumption, consumer surveys and dietary surveys (1). These data cannot be compared directly, and thus, it is important to be accurate regarding the use of the different types of statistics. Otherwise, information extracted from these data may be wrong and misleading. For instance dietary guidelines for red meat consumption is given in cooked weight, but there are no updated data on cooked meat consumption in Norway. Food supply data for meat are based on whole animals, encompassing muscle, fat, bones, and other non-edible and edible by-products, where changes in storage and import/export are accounted for. The Norwegian Directorate of Health (Helsedirektoratet) reports food supply data on an annual basis based on data from The Norwegian Institute of Bioeconomy Research (NIBIO). NIBIO also produces annual estimates for the ready-to-cook consumption of meat in Norway, based on the food supply data. To make the calculations as accurate as possible, non-edible parts of the animal are excluded (e.g. bones and some fat), and waste is considered. What is left is an estimate of the raw meat available, prior to processing, cooking and heat treating. The Norwegian Directorate of Health recommends no more than 500 g of red and processed red meat per week as part of a healthy and varied diet. This is stated to be equivalent to 700-750 g of raw meat per week	Dear Karianne Spetaas Henriksen, Thank you for your comment. For meat and meat products there are uncertainties in the reporting of consumption as for all the other food groups. This is accounted for when developing the guidelines. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

bærekraft og dyrevelferd MatPrat	(i.e. prior to any heat treatment or cooking). No recommendations are made in Norway regarding the amount of poultry, and game meat is not included in the definition of red meat. Misunderstandings can arise when the food supply data and ready-to-cook consumption are used interchangeably, and unfortunately, this is all too frequently the case. In addition, the distinction between raw and cooked meat and/or red meat and poultry, is important when comparing consumption against dietary recommendations. However, this is often not taken into consideration. To compare meat consumption using food supply data against the dietary recommendations, would not be correct. Instead, using dietary surveys would allow for the closest estimate to what people eat. Whereas the ready-to-cook consumption would provide the most accurate estimate of raw meat available for consumption. In Norkost 3, the most recent Norwegian dietary survey carried out in 2010-11, the mean consumption of red and processed meat was 820 g per week (including processed poultry). In comparison, the ready-to-cook red meat consumption from 2010-11 estimated by NIBIO was approximately 780 g per week. Even though the methods used to estimate the ready-to-cook and Norkost 3 data are different, the findings are within the same range and allows for a more frequent estimate of the actual meat consumption. According to the latest statistics, the ready-to-cook consumption does not seem to have increased. Norwegian meat consumption in 2018 (raw weight): - Food supply data of total meat was 68.3 kg per capita - Ready-to-cook meat consumption was 51.9 kg per capita, of which 40.1 kg was red meat. 40.1 kg equals approximately 770 g of red meat (ready-to-cook) per week, i.e. slightly higher than the current dietary recommendation of 700-750 g of raw red meat.	

	As the most recent dietary survey in Norway is close to 10 years old, ready-to-cook consumption data from 2018 should be considered when assessing the consumption of red and processed meat in Norway. References: 1. Animalia. Kjøttets tilstand 2019. Status i norsk kjøtt – og eggproduksjon. Oslo: Animalia; 2019.	
Katrine Andersen Nesse, Head of Sustainability, environment and climate, Animalia, and Rebekka Helén Kristiansen, advisor Sustainability and food production, MatPrat	Sustainability is about food security. NNR 2022 will develop evidence-based platforms for the integration of sustainability and environmental issues into the national food-based dietary guidelines (https://www.helsedirektoratet.no/english/nordic-nutrition-recommendations-2022#get-involved) The essential question is how sustainability is going to be defined within this work. Sustainability in food production and consumption is fundamentally about food security for present and future generations. In Norway, with 3% arable land, it is about utilising the national natural resources to produce the food we can, in the most sustainable way. The development of evidence-based platforms for the integration of sustainability and environmental issues in food-based dietary guidelines need to emphasize food security as a main issue. If the integration of environmental sustainability is not using the natural resources and possibilities for food production in Norway and the other respective Nordic countries as a basis, the recommendations will affect the national food security if implemented and thus not represent sustainable development. FAO`s definitions underlines that sustainability in this matter is about food security: “A sustainable food system (SFS) is a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised.” FAO, 2018, Sustainable food	Dear Katrine Andersen Nesse, Thank you for your comment. The NNR2022 Committee will arrange a seminar and a workshop within sustainability to define the areas and topics that are most relevant and pressing for NNR2022. Please follow the continuously updated information on our website to follow the process. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	systems, Concept and framework “Sustainable diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.” FAO, 2010, Sustainable Diets and Biodiversity. The FAO definition of sustainable agricultural development is "the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such development... conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable." www.fao.org, Sustainable agriculture and rural development The Intergovernmental Panel on Climate Change (IPCC) has stated that all countries must utilise their available resources for food production because global warming will reduce the availability of arable land globally. The conditions and possibilities for food production are different in each of the Nordic countries. The quantity of arable land is the least in Norway. The climate and weather conditions put limitations to Norwegian food crops, whilst the conditions are most suitable for feed crops and livestock. The last two years, with too much rain in 2017 and drought in 2018, has shown the vulnerability of the food crops in Norway and the robustness of livestock. It is documented that a reduction of livestock production in Norway will reduce the utilisation of arable land and at the same time increase the need for import of plant foods. Both aspects reduce Norwegian self sufficiency and short- and	

	long- term food security. The development of evidence-based platforms for the integration of sustainability and environmental issues into the national food-based dietary guidelines, must see food security as the main issue. With this as a starting point, it will be convenient to guide both the producers and the consumers in a sustainable direction.	
Trine Thorkildsen , Head of nutrition, sustainability and animal welfare, Norwegian Centre for Consumer Information |Egg and Meat & Karianne Spetaas Henriksen, Head of Nutrition, Animalia AS Norwegian Meat and Poultry Research Centre	Egg and Heart Disease The potential effect that eggs have on heart health has remained elusive in the literature, with some studies showing eggs have a protective effect on heart disease and other studies showing an adverse association. Interpretation of evidence from these studies has been complicated by the methodological challenges in nutritional epidemiology. For example, it has been difficult to separate any potential independent associations between egg consumption and heart disease risk from the innumerable demographic, clinical, dietary, and lifestyle factors that may mediate or confound the results. This level of uncertainty has resulted in variable dietary recommendations, particularly among subgroups of patients with, or at high risk for, heart disease. Early epidemiologic studies reported relatively strong correlations between cholesterol intake and heart disease, however, some recently published studies have shown that dietary cholesterol has a minimal impact on cardiac outcomes or markers of CVD risk. In 2015, the Dietary Guidelines for Americans scientific advisory committee indicated that, “available evidence shows no appreciable relationship between consumption of dietary cholesterol and serum cholesterol” and that “cholesterol is not a nutrient of concern for overconsumption.” However, they also suggested that individuals should consume little dietary cholesterol while following a healthy eating pattern. Eggs are a common source of dietary cholesterol, but eggs also contain an abundance of vital nutrients, such as protein, essential fatty acids, antioxidants, choline, iodine, vitamins, and minerals. Because of this, eggs should be evaluated as a whole food in terms of total	Dear Trine Thorkildsen, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. This includes potential health effects of egg consumption. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	consumption, rather than on the basis of specific constituents, such as cholesterol. Several large prospective observational studies have been published recently on this topic, and null findings or even decreased risks for major cardiovascular disease endpoints based on egg intake have been reported. In a recently published study of egg consumption, Key et al. (2019) evaluated ischemic heart disease (IHD) risk among 410,000 men and women across Europe. Egg intake was associated with a 7% decreased risk of IHD. Relatively similar findings were reported in a recent prospective cohort study in China (Xu et al. 2019). Specifically, consuming 7 or more eggs per day was associated with a non-significant 3% decreased risk of IHD, and a significant 9% decreased risk of stroke. In another recently published analysis of 460,000 Chinese participants, daily egg consumption was associated with an 11% reduction in CVD risk, as well as 12%, 14%, 26%, and 10% reductions in risk of IHD, major coronary events, haemorrhagic stroke, and ischaemic stroke, respectively (Qin et al. 2018). These findings have been supported by prior meta-analyses on this topic (Alexander et al. 2016). The state of the science appears to favor a conclusion that egg intake does not adversely affect heart health among the general population, and may provide some cardiovascular and cerebrovascular benefits. Some studies, however, have reported an increased risk of CVD among persons with type 2 diabetes. Interpretation of the evidence from these studies is challenging because changes in dietary and lifestyle habits before and after diabetes diagnosis need to be considered and addressed analytically. In summary, the weight of the analytical epidemiologic evidence supports a conclusion that egg intake does not adversely impact heart health among healthy populations. In fact, several large-scale epidemiologic studies have shown decreased risks of heart disease and stroke among study populations who regularly consume eggs. Eggs are a	

	nutrient dense food, providing a good and affordable source of protein, essential fatty acids, antioxidants, choline, iodine, vitamins, and minerals. Thus, recommendations regarding the consumption of eggs should consider them as a whole food.	
Ola Thomsson, Swedish University of Agricultural Sciences	My name is Ola Thomsson and I work as research officer at Swedish University of Agricultural Science at the faculty of veterinary medicine and animal science. Much of the faculty's research is focused on sustainability and primarily on sustainable food production. I have been in contact with Eva Werensjö Lemming at the Swedish national food agency about that we have several researchers and a lot of knowledge regarding sustainability and food production to contribute with to the update of the NNR. Eva told me that there will be a workshop on sustainability in Oslo on the 23rd of January, however she was not part of the ws arrangement. I therefore turn to you to ask if you any more information about it? Or when more information will be available? Eva also mentioned that we were put on the Stakeholder list for this workshop by her. With hopes of a nice Wednesday! Best wishes Dr. Ola Thomsson	Dear Ola Thomsson, Thank you for your comment. The seminar was postponed to March 11. Unfortunately, due to the COVID-19 situation, the seminar was cancelled. We will arrange a new webinar September 24. Please follow our webpage for continuously updated information. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Mats Toftenes	THE IMPORTANCE OF LOW CARB, ZERO SUGAR AND INTERMITTING FASTING More and more studies show the great effects that fasting have on human health. Autophagy (cell cleansing), DNA-repair, reduction of inflammation, reversion of insulin resistance, mitochondria production increase, weight loss - in general reduction of diseases and better health!	Dear Mats Toftenes, Thank you for your comment. NNR puts the whole diet in focus and the role that dietary patterns and food groups play in the prevention of diet-related chronic diseases is emphasized.

	A brand new study published in The New England Journal of Medicine 26th of Dec 2019, gathers and concludes from a total of 80 studies on intermitting fasting. Read it here: https://www.nejm.org/doi/full/10.1056/NEJMra1905136?query=featured_home The study concludes that humans are not meant to eat 3+ meals per day. After 14-16 hours of feast, a lot of positive cellular processes starts. The body is starting to resetting, cleaning and unclogging the whole system. Pretty much in all cultures people are eating 3-4 meals a day + snacks in between. The reason is carbohydrates (glucose) - they send our blood sugar levels up and down, making us super hungry after just a few hours after the previous meal. The consequence is regular meals, no fasting, and that our body never reaches the resetting/cleaning mode. Long term we are building up cellular toxic waste and eventually becomes insulin resistant, and all kinds of lifestyle diseases occur. In order to be able to provide daily intermitting fasting, the carbs need to be reduced so that hunger is controlled. (Keto/low carb diet is the solution) My recommendation: Please review the recommendation on meal frequency and carbohydrate intake, as well as recommending zero sugar and other refined products (starch, flour etc). As per today the Norwegian advice is 3-4 meals per day + 1-2 mid-meals, no more than 11 hours without food, and a nutrition based on 45-60 % carbohydrate. This CAUSES diseases. Thank you for reading, and thank you for the opportunity to participation through comment submission.	New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. The NNR2022 project reviews the dietary reference values and food based dietary guidelines on an overarching level. Communication of the dietary guidelines, for example to schools and individuals is to a large extent not covered by NNR2022 because it is done nationally. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

Torwald Åberg, farmaceut, näringsfysiolog, Receptum	Ökningen av de metabola sjukdomarna är att likna vid en dödlig viruspandemi. Nu måste alla insatser sättas in som kan få de uppåtgående kurvorna att brytas och gå nedåt. Den enda effektiva behandlingen är en sänkning av fettintaget under 25 E% vilket har klart visats hos folket på Okinawa och Kitava. I Ragnar Tegelmans avhandling visade vi att med kostdataprogram fick vi ett genombrott där ett fettintag lägre än 25 E% fett sjönk insulinresistensen hos friska idrottare och på Sabbatsbergs Kostcentrum fick vi samma resultat hos patienter verifierat med stor blodprofil och kroppsmätning. En vidareutveckling av kostdataprogrammen har nu lett fram till en märkning av livsmedlen som har resulterat i ett lågt fettintag, under 20 E% kombinerat med ett högt intag av de essentiella näringsämnena. Bakgrunden är ett funnet samband mellan energiämnena som skapat en algoritm för implementering i en livsmedelsdatabas där fyra olika grupper av livsmedel faller ut. Tester på brandmän i Stockholm har visat på god effekt med sänkning av insulinresistensen till normal nivå. Genom denna lösning som kan appliceras på produkterna i butik och restaurang kan man nå även de grupper i samhället som normalt är svåra att nå. Märkningen skiljer sig helt från de försök man gjort med Traffic Light Food i andra länder. Bäst vore om jag kunde komma och informera om den forskning och utveckling som började på Stockholms Universitet och vidareutvecklades på Karolinska Institutet och Sabbatsbergs sjukhus.	Dear Torwald Åberg, Thank you for your comment. The NNR2022 project reviews the dietary reference values and food based dietary guidelines on an overarching level. Communication of the dietary guidelines, national food databases and labelling of products are not in the scope of NNR 2022. On that basis we kindly reject your suggestion to present your results. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
stine sem, landbruks- og matdepartementet	Hei, Jeg vil gjerne få listen over hvilke eksperter som er med i arbeidet videre. vennlig hilsen Stine	Dear Stine Sem, Thank you for your comment. All chapter experts will be established during the next months. The chapter experts will be announced at our web page when all chapter experts are established. Yours sincerely,

		Rune Blomhoff, Head of the NNR2022 Committee
nanashi	. No comment received	
Tanja Kalchenko, MD, leader at NGO Health Practitioners for plant based nutrition, hepla.no	Thank you for choosing an open process for NNR 2022. Hepla (Helsepersonell for plantebasert kosthold) is a Norwegian organization that works to provide safe, evidence-based scientific information on how to live on a plant-based diet. Additionally, the organization promotes the health advantages associated with a plant-based diet. Individuals on a plant-based diet rely on accurate and correct information about nutrition. While there are good documents and guides from the Norwegian (and other) governments, we hear from organizations and individuals in Norway that experience that health professionals are commonly unable to advice on safe plant-based nutrition, and in some cases give nutritional advice that is unsafe. NNR, which serves as a basis for creating guidelines and other documents on nutrition in the Nordic countries, Hepla believes has the potential to improve the quality and availability of evidence-based nutritional information relating to plant-based diets. This makes NNR a key piece in providing high quality and reliable information to health professionals in the Nordic countries on the topic of plant-based diets. While Hepla will comment on drafts of individual chapters, as they are made available, the end result may be improved if we are also able to add to the topics (or sub-topics) covered. Our focus is safe and adequate nutrition for individuals living on plant-based diets. Based on NNR 2012, these are the main additional topics we believe should be included in NNR 2022: Pregnancy, lactation, and infancy on a plant-based diet, including recommendations for long-chained omega-3 fatty acid intake (from microalgae sources) Intake recommendations for essential nutrients where the uptake differs from animal-based foods, i.e. zinc, (non-heme) iron, selenium, and possibly protein and other nutrients The main plant sources for each of the essential nutrients should be specified. Alternatively, the main sources for those essential nutrients that require extra attention on a plant based diet, i.e. vitamin B12, B2, B6, iodine, vitamin D, long-chained omega-3 fatty acids, and calcium, should be	Dear Tanja Kalchenko, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. This means that the nutrient requirements are discussed for each population group such as children and pregnant women. This also includes taking into account dietary patterns, for example a plant-based diet. The NNR2022 project reviews the dietary reference values and food based dietary guidelines on an overarching level. Communication of the dietary guidelines and national programs for fortification and supplementation are out of scope of the NNR 2022. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	listed. For cases where no reliable and practical plant-based source exists for the nutrient, e.g. vitamin B12, it should be clearly stated that supplementation or fortified food intake is necessary. This category includes vitamin D and iodine for the Nordic countries.	
Lars-Åke Wiman	“There is no strong scientific evidence that the current population-wide upper limits on commonly consumed saturated fats in the U.S. will prevent cardiovascular disease or reduce mortality. A continued limit on these fats is therefore not justified.” https://www.nutritioncoalition.us/news/saturated-fat-limit-not-justified	Dear Lars-Åke Wiman, Thank you for your comment. New significant evidence generated after the publication of NNR2012 relevant for dietary reference values and food based dietary guidelines will in a systematic and transparent way be accounted for in NNR2022. This includes a review of the health effects of fatty acids. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Tom Andersen	I read this statement: "3. Conflict of interest forms All member in the Working Group have submitted the forms for declaration of interest." Where can I se those filled forms?	Dear Tom Andersen, Thank you for your comment. The conflict of interest forms of all involved experts will be available on request. There will be more information about this at our web-page soon. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

Trine Thorkildsen , MatPrat & Karianne Spetaas Henriksen, Animalia AS	The EAT -Lancet Commission (hereafter EAT-Lancet) has received recognition and is used as basis for achieving sustainable diets. An example is a food policy lab project led by Stockholm Resilience Centre contributing to the Nordic Council of Ministers' (NCM) work to reach the UN's SDGs. Furthermore, the NCM requests sustainability aspects of diets to be incorporated in the NNR. Considering this, it should be noted that EAT-Lancet has several flaws. Recent publications cast doubt on its methodology (1,2,3). Environmental perspectives have been evaluated a posteriori, meaning the diet is based on health considerations only. Several countries, including the Nordics, have health promoting dietary guidelines including moderate amounts of animal sourced foods, which are very different from EAT-Lancet, especially for meat. As required by Lancet4, EAT-Lancet should follow the GATHER standards. In contrast, EAT-Lancet did not use required systematic review methodology, and its documentation does not describe details necessary to understand how data inputs and outcomes were selected, or their respective impact on the study's findings. E.g., although more recent meta-analyses on red meat consumption and colorectal cancer (CRC) exist, the older Chan et al. (2011) study (5) was selected without justification. EAT-Lancet argues that similar prevented mortality projections from 3 independent studies corroborate their mortality prevention calculations. Yet, the 3 studies included dissimilar health impacts. I.e., almost 1/3 of total 11M mortalities in the Global Burden of Disease (GBD) project were attributed to high sodium (6), while sodium was not restricted in EAT-Lancet and no sodium-related mortalities were included in the Springmann et al. study (7). Moreover, the Springmann et al. methodology chosen to report prevented mortalities in EAT-Lancet have multiple methodological issues. First, protective health effects were included for fish, nuts, fruits and vegetables, but ignored for other animal-sourced foods such as dairy and poultry (protective effect for CRC (8,9,10)). Cardiovascular health benefits attributable to grain consumption (11) were also excluded, while those for legumes were included, despite both low dairy and low grain intake being included in	Dear Trine Thorkildsen, Thank you for your comment. We are aware of the limitations and the criticism against the EAT-Lancet commission report. Sustainability aspects and sustainable diet will be covered in NNR2022. You can read more about this at our website. To ensure high confidence in the recommendations, NNR2022 will be performed in a scientific rigorous way with a high degree of transparency. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	the GBD calculations. Also, the mortality calculations ignored key statistical uncertainties: in the prevalence of food group consumers in a population, amounts consumed, total population, and mortality rates. In a re-analysis for the USA, Zagmutt et al. found after correcting some calculation errors and correctly accounting for uncertainty, the effect of the EAT-Lancet diet is no greater than the impact of energy consumption changes preventing under-/overweight and obesity alone (3). This caloric reduction was responsible for 63% to 94% of prevented mortalities. EAT-Lancet fails to demonstrate that its diet will provide any additional benefit than any other diet regulating caloric intake. Finally, the sustainability assessment also ignores uncertainty and statistical significance, and fails to highlight that with drastic improvements in food systems required by EAT-Lancet, other diets are also sustainable. Before EAT-Lancet can be used to inform dietary guidelines, it needs to be replicated and validated by multiple independent researchers. The only replication attempt so far points to a failure to follow a systematic and transparent method and several errors in the methods that compromise its reliability. References: 1. doi.org/10.1016/S0140-6736(19)31903-8 2. www.epixanalytics.com/eat-lancet-criticism-correspondence.html 3. doi.org/10.1093/jn/nxaa020 4. Lancet information for authors 2019 5. doi.org/10.1371/journal.pone.0020456 6. doi.org/10.1016/S0140-6736(19)30041-8 7. doi.org/10.1016/S2542-5196(18)30206-7 8. doi.org/10.1016/S2542-5196(18)30206-7 9. doi.org/10.1093/annonc/mdr269 10. doi.org/10.1007/s00394-014-0705-0 11. doi.org/10.1016/j.amjcard.201	
Trine Thorkildsen , MatPrat & Karianne Spetaas Henriksen, Animalia AS	Epidemiology of Processed Meat Intake and Cancer in Perspective The topic of processed meat consumption and cancer risk, namely colorectal cancer (CRC), is a subject of scientific debate. Discussion continues on whether high processed meat consumption is an independent cause of CRC in the general population or specific sub-groups or whether the weak associations observed across the literature are due to methodological challenges and limitations. Furthermore, it has been shown repeatedly across varying worldwide study populations that, on average, those who consume most processed meat also have demographic, lifestyle, dietary, and clinical factors that are associated	Dear Trine Thorkildsen, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. For a description and

	with risk of chronic disease. Ascertaining and measuring individual dietary factors is a well-known challenge in observational epidemiology. Indeed, there may be even more inherent challenges when attempting to accurately and reliably measure processed meat intake. Processed meat has been defined by its preservation methods, and studies commonly include various items in their analyses. Exposure assessment is made even more difficult by inconsistent definitions of processed meat across studies and consumption patterns that vary widely by culture and geographic region. The difficulty of interpreting complex nutritional epidemiologic evidence involves numerous methodological considerations, including clearly defining food variables and outcomes, accurately measuring intake, accounting for dietary pattern differences, understanding the role of bias and confounding within and across studies, isolating the effects of a single food/food group from the countless foods and dietary constituents that individuals consume, assessing potential (and relevant) biological mechanisms and genetic variation in metabolizing enzymes, and interpreting results based on varying analytical metrics and statistical testing parameters. Interpretation of findings is also challenging, as prospective cohort studies generate associations between foods and cancer that are very weak, with most RRs between 0.8 and 1.25. If there is strong exposure effect (e.g.RR>2.0), sources of uncertainty such as confounding, exposure misclassification, and other biases may not be sufficient to obscure a valid, strong association. However, in the case of weak associations, even modest confounding, moderate exposure and confounder measurement error, and other biases can have a large influence on effect estimates. Given the considerable degree of exposure misclassification from self-reported dietary intake, correlation of certain foods with other dietary and lifestyle factors, and the impact of bias and confounding, there is significant uncertainty surrounding epidemiologic evidence for foods and cancer. The difficulty of interpreting nutrition epidemiology, may be even more pronounced when evaluating processed meat consumption because of high collinearity with other dietary and lifestyle factors. Additionally, there is no scientific consensus on biological mechanisms possibly explaining the	rational for the methodology used in NNR2022 please read the following articles; **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure and rationale of qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	weak observed associations between processed meat and CRC. Recently, the Annals of Internal Medicine, one of the highest rated medical journals, published a series of systematic reviews in which the totality of evidence on red and processed meat and major health outcomes was examined, including cancer and total mortality. The researchers cited several study limitations, including residual confounding, dietary assessment issues, recall bias, and insufficient data for sub-group analyses. The conclusion was that certainty of currently available evidence is low to very low, and the effects of red and processed meat on cancer are very small. Thousands of studies conducted over many years continue to tell us that no one food is proven to cause or prevent cancer. What science does continue to tell us is that the best way to prevent cancer is to follow an overall balanced diet, maintain a healthy weight, be active, and don't smok	
Trine Thorkildsen , MatPrat & Karianne Spetaas Henriksen, Animalia AS	Epidemiology of Red Meat and Cancer in Perspective In 2015/2016, IARC classified consumption of unprocessed red meat as probably carcinogenic based on limited evidence that intake of red meat causes cancer in humans. In 2017/2018 the WCRF/AICR downgraded unprocessed red meat intake from a convincing to a probable cause of colorectal cancer (CRC). These conclusions are based on findings from nutritional epidemiology, with several well-known methodological challenges and limitations. Importantly, such studies generate associations, which should not be conflated with causation. Causal conclusions must be drawn on the totality of scientific evidence after a rigorous and critical appraisal of the studies have been performed using systematic weight-of-the-evidence methodology. Although weak positive associations between high red meat intake and CRC have been reported in the literature the current epidemiologic evidence is not sufficient to make causal inference: • Strength of association is one of the hallmarks of causality (most established causal relationships for cancer are RR >2.0). Weak non-significant associations (close to the null value) are observed in most studies of red meat and CRC. Thus, it is difficult to distinguish observed CRC risk from an association influenced by chance, bias and/or confounding in many studies. • A well-defined pattern of dose-response is indicative of a causal relationship. However,	Dear Trine Thorkildsen, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. For a description and rational for the methodology used in NNR2022 please read the following articles; **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure**

	there is no clear dose-response relationship for red meat and CRC risk. • Consistency of an exposure-disease association in various populations can lend credibility to a causal interpretation. Although the majority of RRs for red meat and CRC are slightly elevated, associations are relatively inconsistent by gender, study country, tumor site and study population characteristics. • Studies use different definitions of red meat, making it problematic to interpret data across studies. • Self-reported dietary intake, correlation of certain foods with other dietary and lifestyle factors and impact of bias, bring great significant uncertainty to the evidence for foods and cancer. Numerous studies show that individuals who consume most red meat have a clustering of adverse health risk factors, such as smoking, overweight, and physical inactivity. Even when confounding factors are controlled for, the impact of confounding may remain. Both IARC and WCRF/AICR stated that residual confounding is a limitation when reviewing the evidence on red meat and cancer. • Cancer commonly takes years to progress. Many studies of red meat consumption are too short to account for the time it takes for cancer to develop. This also makes it difficult to account for possible changes over the life course in food intake, behavioral characteristics, socioeconomic factors, and comorbidities. • Additionally, there is no scientific consensus on possible biological mechanisms explaining the observed associations between red meat and CRC. Recently, one of the highest rated medical journals, the Annals of Internal Medicine, published a series of systematic reviews in which the totality of evidence on red meat and major health outcomes was examined. The researchers cited several study limitations, including residual confounding, dietary assessment issues, recall bias, and insufficient data for sub-group analyses. The conclusion was that certainty of currently available evidence is low to very low, and the absolute effects of red meat on cancer are very small. Thousands of studies conducted over many years continue to tell us that no one food cause or prevent cancer. What science does continue to tell us is that the best way to prevent cancer is to follow an overall balanced diet, maintain a healthy weight, be active, and don't smoke. Red meat is a significant source of protein and essential nutrients in the Nordic diet.	**and rationale of qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews** Arnesen et al, **Food & Nutrition Research** Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	Based on current epidemiologic evidence, red meat can be a part of a healthy diet and lifestyle.	
Magnhild Kolsgaard, The Norwegian Dairy Council (Melk.no)	Often sustainability of food is simply put as the CO2eq released per kg, per g protein or per kcal. The nutrient content of different foods vary greatly. Milk is nutrient dense, contributing to the daily intake of B-vitamins, proteins and minerals such as calcium and iodine. Nutrient density is a factor that is often neglected when talking about the sustainability of food. Some initiatives have, however, been taken to include nutrient density when calculating the sustainability of different foods. One of these, the Optimeal® optimization program, has been used to analyse the effect of reducing dairy intake on different sustainability parameters such as GHG-emissions and land use. The results are summarized in the Fact Sheet "Environmental impact of dairy substitution" from Blonk Consultants. By using the Optimeal® optimisation program they showed that when taking nutrients into consideration, dairy products are just as environmentally efficient as the package of products needed to replace them. This shows the importance of including nutrient density when considering the environmental impact of the food. Link to Fact Sheet: https://www.blonkconsultants.nl/wp-content/uploads/2016/06/FactSheet-OptiMeal-10-2015-Final.pdf	Dear Magnhild Kolsgaard, Thank you for your important comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. Sustainability aspects and sustainable diet will be covered in NNR2022. You can read more about this at our website. To ensure high confidence in the recommendations, NNR2022 will be performed in a scientific rigorous way with a high degree of transparency. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Gyrd Omholt Gjevestad, TINE SA	Thank you for the opportunity to submit comments in conjunction with the revision of the Nordic Nutrition Recommendations. TINE would like to draw the Committee's attention to a newly published study that adds knowledge to the research area on dairy products and health. The study shows that an intake of 57 g Jarlsberg cheese/day has positive effects of markers related to bone- and heart health, and substantiates the importance of evaluating foods, not only nutrients, when investigating possible health effects of foods. We ask the committee to consider this article in the work of revising several chapters in the NNR, among them the chapter of fats, food matrix (food, food patterns and health	Dear Gyrd Omholt Gjevestad, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. For a description and

	outcomes) and vitamin K. In the present study, which was performed at the Norwegian University of Life Sciences and supported by The Norwegian Research Council and TINE SA, the main aim was to establish a maximum efficacy dose (MED) after daily intake of vitamin K2-rich cheese (Jarlsberg®) based on the increase in ratio between carboxylated and undercarboxylated osteocalcin during a five-week diet. Total and LDL-cholesterol was also measured. 20 healthy volunteers were recruited. The daily intake of Jarlsberg® cheese in the study varied from 20 to 152 g. Clinical investigation was performed initially and after three, four and five weeks with measurement of vital signs, hematological and biochemical variables, carboxylated and undercarboxylated osteocalcin and vitamin K. The results showed that the MED decreased with treatment duration and was estimated to 57 g/day (95% CI: 47-67) after five weeks diet, resulting in a mean OR increase of 30% (95% CI: 23.8-36.8). Both OR and serum osteocalcin followed a quadratic dose response curve. For osteocalcin, a maximal increase of 46% was estimated at 59 g/day for five weeks. The serum content of long-chained vitamin K2 increased significantly with increasing cheese dose. The increase was mainly obtained the first three weeks and kept unchanged the following two weeks. The cheese doses close to the MED caused nearly significant reductions in total cholesterol, LDL-cholesterol, the LDL/HDL ratio and significant reduction in the blood pressures after five weeks diet ($p \leq 0.05$). Thus, the MED of Jarlsberg® cheese was estimated to 57 g/day. A daily intake of Jarlsberg® cheese increased the osteocalcin level, vitamin K2 and positively affected the blood pressure and lipid patterns despite the relatively high content of saturated fats. The results are published in Lundberg, H. E., et al. (2020). "Increased serum osteocalcin levels and vitamin K status by daily cheese intake." 2020 7(2): 11 and is available at https://www.ijclinicaltrials.com/index.php/ijct/article/view/394	rational for the methodology used in NNR2022 please read the following articles; **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure and rationale of qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews** Arnesen et al, **Food & Nutrition Research** Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

Anne Lise Brantsæter, Norwegian Institute of Public Health	I would like the NNR2022 Committee to take into consideration two recent papers that promote the use of Harmonized Nutrient Reference Values for Populations. The first is entitled: "Proposed Harmonized Nutrient Reference Values for Populations" (https://pubmed.ncbi.nlm.nih.gov/31701998/) and the second is entitled: "Why the Derivation of Nutrient Reference Values Should Be Harmonized and How It Can Be Accomplished" (https://pubmed.ncbi.nlm.nih.gov/32379857/). The scientists behind these papers highlight the need to harmonizing the derivation of NRVs, particularly the AR and UL in order to ensure inclusion of all countries, whether high-, middle-, or low-income, in the process and to improve access for all users to the tools and data needed to carry it out.	Dear Anne Lise Brantsæter, Thank you for your comment. We highly appreciate your comment and will consider your input carefully in the NNR2022 project. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. For a description and rational for the methodology used in NNR2022 please read the following articles; **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure and rationale of qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews** Arnesen et al, **Food & Nutrition Research**

		Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Magnhild Kolsgaard, The Norwegian Dairy Council (Melk.no)	NNR 2022 Committee. Thank you for the opportunity to submit comments in conjunction with the revision of the Nordic Nutrition Recommendations. We would like to draw the Committee's attention to a newly published Norwegian study that adds knowledge to the research area on vitamin K2 and health, and the importance of distinguishing between vitamin K1 and K2. In this study a higher intake of vitamin K2 was associated with lower risk of coronary heart disease during a median follow-up time of 11 years, while there was no association between intake of vitamin K1 and CHD. Dairy products are one of the main food groups that provide vitamin K2 in Europe, and also in this study (especially cheese). There is little knowledge of vitamin K status in the Norwegian population, but studies from other countries indicate a suboptimal intake (Liu, Y. P., et al. (2015). "Inactive matrix Gla protein is causally related to adverse health outcomes: a Mendelian randomization study in a Flemish population." Hypertension 65(2): 463-470). Dairy products may therefore be an important source of this vitamin in the Norwegian diet. We ask the committee to consider this article in the work of revising NNR, both the Vitamin K chapter but also the chapter on Food, food patterns and health outcomes, especially the part on dairy products. The results are published in BMJ Open: Haugsgjerd TR, Egeland GM, Nygård OK, et alAssociation of dietary vitamin K and risk of coronary heart disease in middle-age adults: the Hordaland Health Study CohortBMJ Open 2020;10:e035953. doi: 10.1136/bmjopen-2019-035953. The article is available at: https://bmjopen.bmj.com/content/10/5/e035953.long	Dear Magnhild Kolsgaard, Thank you for your important comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. For a description and rational for the methodology used in NNR2022 please read the following articles; **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure and rationale of qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews** Arnesen et al, **Food & Nutrition Research**

		Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Andreas Lindmark	Dear NNR members, I would like to contribute to the work on nutritional recommendations best i can. Why, there is a terrible trend in peoples health passing by as "normal". I argue that it's caused partly by the nutritional recommendations issued by you and Livsmedelsverket. I also fear it will take an even worse route in the upcoming NNR 2022, due to the strong climate agenda advocating the plant based diet. (which is to be seen in below research proven to destroy our health). That being said, I argue that this committee should not mix environmental aspects but strictly focus on diet and health for humans without the compromise of other parameters like climate or environment. That is for other agencies. Or, at least declare transparently how the calculations are done and how much of the other parameters were weighed in. Declaring the optimal diet for humans side by side with the other parameters taken in consideration. There might be issues like mercury in fish and other toxins. But still declared separately. I would like to point out some key points and issues raised the recent years. - The impact on environmet for production of specific food has nothing to do with impact on human health and longevity. - No research can prove that red meat causes cancer. In fact there are studies proving health benefits related to consumption of red meat. - No research can prove that intake of saturated fats causes illness, there is not even corellation. On the contrary, there is strong indications on the oposit.	Dear Andreas Lindmark, Thank you for your comment. We highly appreciate your comment and will consider your input carefully in the NNR2022 project. In general terms, the overall aim of NNR is to reduce burden of diseases and to improve public health in the Nordic countries by improving diet as well as reducing incidence and prevalence of diet-related NCDs and nutrient deficiencies. The project aims at providing updated scientific evidence and developing new updated NNR. In addition, the sub-goals are to: 1. Updated NNR for energy, macro- and micronutrients 2. Develop evidence-based platform for national FBDG

	- Since there is no danger in raised cholesterol levels, most of the scientific studies and reports on nutrition and health need to be reevaluated or scrapped, since they are based on this fallacy. - Vegetable oils seem to have a damaging effect on the human metabolism and our cells. (Cells built on fats not suited for the purpose which also easily oxidates are bad.) - Sadly there is very little research done on high fat/high animal based diet and the existing ones are designed by the industry to prove that sugar and carbs are better than fat. For example the latest one funded by World Surgar Research Organisation. (WSRO is representing the industry of surgar manufacturing and distribution) This study is scarily bad setup comparing a fast food diet calling it high fat with a slightly better one where they added some sugar. There are lots of weaknesses and delibereate demeaning setups in the method to achieve this result. it's 2020 and they did not even use a CGM. Purposuly measuring the blood sugar levels 2h after meals. The result is that sugar is handled by insulin(as your'e not diabetic or pre-diabetic), whilst the burger and pizza has a prolonged spike in BS... and much more. Start out by listening to this pod. And follow links to all research. Best regards// Andreas Lindmark https://podcasts.apple.com/se/podcast/fundamental-health-with-paul-saladino-md/id1461771083?i=1000479169842&fbclid=IwAR3v9i-ayYc4sBL4ScTbBrSKpL02vgcyC1J6wxWyYmnsGOBhwWjzSFTTd5A Scientific article from 20200807 https://www.onlinejacc.org/content/76/7/844?fbclid=IwAR3LupcdrVlB0RhYdJhUjEY0f96kl1CVAagJNklPy2_5FA9xzehDmHB_se4 Abstract The recommendation to limit dietary saturated fatty acid (SFA) intake has persisted despite mounting evidence to the contrary. Most recent	3. Develop evidence-based platform for integration of environmental sustainability into FBDG New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	meta-analyses of randomized trials and observational studies found no beneficial effects of reducing SFA intake on cardiovascular disease (CVD) and total mortality, and instead found protective effects against stroke. Although SFAs increase low-density lipoprotein (LDL) cholesterol, in most individuals, this is not due to increasing levels of small, dense LDL particles, but rather larger LDL particles, which are much less strongly related to CVD risk. It is also apparent that the health effects of foods cannot be predicted by their content in any nutrient group without considering the overall macronutrient distribution. Whole-fat dairy, unprocessed meat, and dark chocolate are SFA-rich f	
Andreas Lindmark	...SFA-rich foods with a complex matrix that are not associated with increased risk of CVD. The totality of available evidence does not support further limiting the intake of such foods. https://www.unc.edu/posts/2018/11/28/only-12-percent-of-american-adults-are-metabolically-healthy-carolina-study-finds/ https://www.jeffnobbs.com/posts/what-causes-chronic-disease https://www.nutritioncoalition.us/news/low-carb-strategy-for-fighting-the-pandemics-toll https://twitter.com/bigfatsurprise/status/1273618059421519872 https://www.nytimes.com/2020/06/17/health/diet-nutrition-guidelines.html?searchResultPosition=1 https://www.sciencedirect.com/science/article/pii/S073510972035687 4 https://paleofuture.gizmodo.com/a-brief-visual-history-of-people-waiting-in-line-for-st-1748536945 http://content.time.com/time/covers/0,16641,19610113,00.html	Dear Andreas Lindmark, Please see the answer to the comments above as these two comments belongs together.

	https://www.crisco.com/our-heritage https://www.sevencountriesstudy.com/ https://www.scientificamerican.com/article/records-found-in-dusty-basement-undermine-decades-of-dietary-advice/ https://www.bmj.com/content/353/bmj.i1246 https://grantome.com/grant/NIH/R01-HL044878-01A1 https://www.ahajournals.org/doi/10.1161/01.atv.0000118012.64932.f4 https://www.vintagepaperads.com/1976-Mazola-Corn-Oil-Ad--Take-This-To-Your-Doctor_p_21890.html https://pubmed.ncbi.nlm.nih.gov/30272088/ https://pubmed.ncbi.nlm.nih.gov/7488463/ https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(17)32252-3/fulltext https://pubmed.ncbi.nlm.nih.gov/15285507/ https://pubmed.ncbi.nlm.nih.gov/12389222/ https://www.google.com/search?q=carnitine,+acylcarnitine+beta+oxidation&safe=off&rlz=1CAEAQE_enUS891&sxsrf=ALeKk02Lt8-w27fU1JXNWKpqIxPcbawjCw:1592793509890&source=lnms&tbm=isch&sa=X&ved=2ahUKEwiD7-2aspTqAhXbRzABHfYTDwEQ_AUoAXoECA0QAw&biw=1366&bih=617#imgrc=LAaZoIO2g4a0lM	

	https://pubmed.ncbi.nlm.nih.gov/12524233/	
Andreas Lindmark	More information on vegetable fats being harmful to humans. 1966, research showed these fats caused more heart disease than animal fats. The study stayed in the basement since it showed the opposite result to the expected... 2013 it was dug out of the basement. https://pubmed.ncbi.nlm.nih.gov/23386268/ A more recent study with as much control as only the Chinese can do in the 21st century... Showing the problem with vegetable fats. https://pubmed.ncbi.nlm.nih.gov/28655596/ Also this on is interesting. https://pubmed.ncbi.nlm.nih.gov/9168460/ How much longer will you ignore these evidence? BR// Andreas	Dear Andreas Lindmark, Thank you for your comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Vibeke Telle-Hansen, OsloMet – storbyuniversitetet	Foreslår at pseudocerealer inkluderes i NNR2022. Det finnes mye kunnskap om helseeffekter av korn, men det er mindre forskning på helseeffetker av psudocerealer. Det blir mer og mer populært med et kosthold uten korn/gluten, i tillegg til at det er mange som ikke kan spise gluten grunnet allergi, og som dermed erstatter korn med pseudocerealer.	Dear Vibeke Telle-Hansen, Thank you for your comment. The topic you are highlighting is important and relevant. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. It is not within the scope of NNR to conduct new research.

		Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Jon-Magnus Restad	Hei. Ønsker å sette fokus på fett, og er av den oppfatning at det ikke finnes tilstrekkelig grunnlag for å anbefale å bytte ut mettet fett med umettet fett. En gruppe eksperter (mest amerikanske) utga nylig en konsensus-uttalelse der de skriver at det ikke lenger er tilstrekkelig vitenskapelig støtte til å anbefale folk å ikke innta mettet fett: https://www.nutritioncoalition.us/news/saturated-fat-limit-not-justified En annen meta-analyse konkluderer slik: «Available evidence from adequately controlled randomised controlled trials suggest replacing SFA with mostly n-6 PUFA is unlikely to reduce CHD events, CHD mortality or total mortality. The suggestion of benefits reported in earlier meta-analyses is due to the inclusion of inadequately controlled trials. These findings have implications for current dietary recommendations.» https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5437600/ En ny gjennomgang av «Sydney Diet Heart Study» (også en blindet, randomisert, kontrollert studie), konkluderer med at: «Advice to substitute polyunsaturated fats for saturated fats is a key component of worldwide dietary guidelines for coronary heart disease risk reduction. However, clinical benefits of the most abundant polyunsaturated fatty acid, omega 6 linoleic acid, have not been	Dear Jon-Magnus Restad, Thank you for your comment. We highly appreciate your comment and will consider your input carefully in the NNR2022 project. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. For a description and rational for the methodology used in NNR2022 please read the following articles; **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure and rationale of qualified systematic**

	established. In this cohort, substituting dietary linoleic acid in place of saturated fats increased the rates of death from all causes, coronary heart disease, and cardiovascular disease. An updated meta-analysis of linoleic acid intervention trials showed no evidence of cardiovascular benefit. These findings could have important implications for worldwide dietary advice to substitute omega 6 linoleic acid, or polyunsaturated fats in general, for saturated fats.» https://www.bmj.com/content/346/bmj.e8707 Dette er studier av høyeste evidens-nivå som stiller store spørsmålstegn ved anbefalingene som gis både av dere og helsemyndigheter i andre land. Mettet fett later ikke til å være skadelig. Og å erstatte mettet fett med umettet fett ser heller ikke ut til å gi noen gevinst. Med et litt annet perspektiv stiller jeg meg også tvilende til om vår beste kilde til fett kan være ultraprosesserte oljer som har vært fraværende nesten hele vår evolusjon. Disse planteoljene har også det problemet at de er veldig høye i Omega-6 PUFA, som gjør de generelt pro-inflammatoriske. Dersom man bruker disse oljene til matlaging, skapes det også skadelige stoffer da oljene er svært ustabile (i og med at de er flerumettede) under oppvarming. De oksiderer lett, og jeg mener derfor det er uansvarlig å anbefale inntak av disse oljene. Jeg nevner også "PURE" studien, som indikerer at høyere inntak av karbohydrater er assosiert med økt dødelighet. Økt fettinntak ser ut til å gi redusert risiko for slag: https://pubmed.ncbi.nlm.nih.gov/28864332/ Jeg kan heller ikke se at det er noen grunn til anbefalinger mot rødt kjøtt. WHO påstår at rødt kjøtt (særlig prosessert) er "probably carcinogenic to humans". Funnene deres er en bitteliten relativ risiko mot prosessert kjøtt, og ikke statistisk signifikant mot uprosessert rødt kjøtt. Størsteparten av studiene deres var også gjort på rotter som var injisert med kreftfremkallende stoffer. Intervensjonsstudier med	**reviews.** Arnesen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews** Arnesen et al, **Food & Nutrition Research** Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	negative resultater mot rødt kjøtt virker i det hele og det store å være fraværende. Man kan finne epidemiologi med svake relative risikoer begge veier, men da virker det meningsløst å anbefale noe som helst. Hong Kong er f.eks. det landet i verden med høyest forventet levealder, samtidig som de har høyest inntak av kjøtt per innbygger. Epidemiologi. Tror også vi bør ha i bakhodet at mennesker har spist rødt kjøtt i hundretusenvis av år. Kanskje man heller burde presentere mat etter hva som gir mest og best tilgjengelige næringsstoffer som er essensielle for oss mennesker? Hvor finner man de essensielle fett og aminosyrene, vitaminene og mineralene i sin mest bio	
Elaina Weber, Master's Student, NMBU, Ås	Hei hei! I just joined the public seminar, and it was run fabulously. Thank you, and thank you for making this open to the public. I asked a question there that went unanswered, so I will ask it here. It's a bit critical, if you'll allow! One question raised during the talks today was to the effect of "Is it good to decrease animal products if you're replacing them with soy?" The response was that this is complex, and no conclusion was made. This shows a major flaw in approaches that inherently do not enable comparisons. As we saw, there are a variety of ways to try to quantify environmental sustainability within diets. Many methods focus on improving environmental sustainability by chosen metrics. Notably, these approaches lack a framework that acknowledges limits to environmental resources (i.e. planetary boundaries). As such, they fail to allow for comparisons of improved sustainability: comparisons between indicators (GHGE versus land-use versus water use, etc.), comparisons between foods, comparisons between food groups, and, most importantly, comparisons with the targets of staying within a stable Earth system for humans. In light of the complexity that ensures there will always be a trade-off in dietary choices, does NNR 2022 plan	Dear Elaina Weber, Thank you for sending these important questions post-seminar, and sorry we did not manage to rise the questions while being online. You are totally correct that there will be many trade-offs to be made and using the planetary boundary model for this is one way of doing it. However, the final committee to work on the issues has not been established yet, but once it is up and running your question will have to be one of the first to resolve. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	to use a framework, such as planetary boundaries, that enables these essential comparisons? In other words, will NNR 2022 be satisfied with doing better, or is it willing to ask if we're doing enough? Thank you for your great work. I'm critical because I care (:	
Laila	I want environmental sustainability to be considered in all dietary recommendations from a planetary boundaries framework! Considering sustainability only in terms of land use and carbon footprint is simply not enough.	Dear Laila, Thank you for your comment. You are totally correct that we must integrate different dimensions of the sustainability term. Using the planetary boundary model is one way of doing it. However, the final committee to work on the issues has not been established yet, neither the framework. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Erik Tärk	Hi, Please consider the high relevance and importance of insulin resistance in majority of cases where obesity and inflammatory diseases are developed. Insulin awareness and monitoring should be prioritized higher than blood glucose monitoring, to stop the pandemic of metabolic syndrome. Insulin resistance due to excess carbohydrates, too frequent feeding and limiting essential nutrients, including fatty acids, along with poor physical activity can be the root cause of most diseases which have been widespread in the last 20-30 years.	Dear Erik Tärk, Thank you for your important comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022.

	Please refer to, and if at all possible, discuss with Dr. Benjamin Bikman, Dr Jason Fung regarding studies and practice to confirm this. Thank you and best regards, Erik Tärk	Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Anna Stubbendorff	Hej! Jag förstod att seminariet på Zoom den 24 september spelades in och skulle läggas på denna sida: https://www.helsedirektoratet.no/english/nordic-nutrition-recommendations-2022#webinarondietandsustainabilitynnr Jag kan dock inte hitta den någonstans, har den lagts någon annanstans? Hälsningar Anna Stubbendorff	Dear Anna Stubbendorff, Thank you for your comment. Minor editing must be done with the recording. Therefore, there is a delay in publishing the webinar and presentations. Thank you for your patience, everything will be published at our official webpage. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Magnhild Kolsgaard, The Norwegian Dairy Council (Melk.no)	NNR 2022 Committee In the Time schedule chart on your webpage https://www.helsedirektoratet.no/english/nordic-nutrition-recommendations-2022#timeschedule there is estimated a public hearing starting now in October 2020 and lasting until July 2021. Is this the correct dates? I also wonder what the deadline for summiting comments and nominations are. Best regards Magnhild Kolsgaard	Dear Magnhild, Thank you for your comment. The dates for public hearing of DRVs and FBDGs are incorrect. The public hearing for the final draft for chapters will start during the fall 2022. We will update the time schedule as soon as possible.

		The public call for comments is open throughout the whole project. The nomination of topic for systematic reviews will close December 31st 2020. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Margit Vea	Myndighetene omtaler kjemiske søtstoffer som et uskyldig og trygt alternativ, men baserer sine råd på gammel forskning. Lengre observasjonsstudier og erfaringer rundt bruken av kunstig søtstoff, bør få alarmklokkene til å ringe. På tross av at helsedirektoratet påpeker at kunstig søtstoff ikke bør gis til barn under 3 år, serveres lettprodukter også til barn. Hvordan kunstig søtstoff påvirker tidlig utvikling, er lite undersøkt, men en ny studie fra mai 2020, Nonnutritive sweetener consumption during pregnancy, adiposity, and adipocyte differentiation in offspring: evidence from humans, mice and cells, viser at inntak av lettbrus med kunstig søtstoff under svangerskapet, ser ut til å øke risikoen for at barnet blir overvektig. I tre år fulgte forskerne utviklingen til barn født av mødre som drakk lettbrus under graviditeten. De foretok samtidig studier på mus – vurderte kroppsvekt, fettvev, genuttrykk, glukose og insulintoleranse hos avkommet ved 12 ukers alder. Hos mus, særlig hannkjønn, så de forhøyet kroppsvekt, fett og insulinresistens. Det var det 47 % økning i kroppsfett ved inntak av apsartam, og 15 % økning i kroppsfett ved inntak av sukralose. Forskerne konkluderte med at studien var nytt bevis for at gravide som får i seg aspartam øker risikoen for at babyen for forstyrrelser i metabolismen og bli overvektig senere i livet. I en artikkel fra 2015, Artificial sweeteners are not the answer to childhood obesity, konkluderer forskerne med at kunstig søtstoff ikke er løsningen på overvektproblemet blant barn. Søtstoffene	Dear Margit Vea, Thank you for your comment on this important issue. We highly appreciate your input and will consider this carefully in the NNR2022 project. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	viser seg å gi de samme kroniske sykdommene som er forbundet med sukker. For å redusere overvekt og fedme blant barn, er det best å redusere inntaket av søtstoff fra både mat som inneholder sukker, mat med mange kalorier, og mat uten sukker men tilsatt kunstig søtstoff uten kalorier. Tarmfloraen er en sammensetning av mange bakterier, virus, sopp og andre mikrober som lever i tarmen vår. På The European Society of Cardiology Congress i august i år, presenterte forskerne en studie, Gut microbes could unlock the secret to healthy ageing, som avslører at mikrobiomet, tarmfloraen, i sterk grad påvirker sykdom og helse. Løsningen for å bygge god helse ligger i tarmfloraen. Først de senere årene er det forskning som viser at kunstige søtstoffer påvirker og endrer tarmfloraen. Når tarmfloraen endres, er det fare for at blant annet produksjonen av hormoner forstyrres. Bakteriene er viktige i produksjonen av hormoner som påvirker vekt, psyke, stoffskifte m.m. Forstyrrelser gir økt risiko for overvekt, kronisk sykdom, autoimmune sykdommer, økt betennelse i kroppen, angst og depresjon. IBS (irritabel tarm syndrom) og Crohns-lignende symptomer har økt i omfang de siste årene, også blant barn og unge. Det er nå mistanke om at symptomene kan forsterkes av søtstoffer som sukralose (Splenda) og maltodextrin. Hvordan kjemisk søtstoff påvirker tarmfloraen: 2014: https://www.eurekalert.org/pub_releases/2014-09/wios-gba091514.php 2014: https://www.sciencemediacentre.org/expert-reaction-to-non-caloric-artificial-sweeteners-nas-and-glucose-intolerance/ 2018: https://www.mdpi.com/1420-3049/23/10/2454 https://www.nature.com/articles/nature13752 2019 (spansk Review): https://academic.oup.com/advances/article/10/suppl_1/S31/5307224 2017: https://pubmed.ncbi.nlm.nih.gov/29159583/ Nylig forskning på tarmflora: https://www.escardio.org/The-ESC/Press-Office/Press-releases/Gut-microbes-could-unlock-the-secret-to-healthy-ageing Inflammatoriske tarmsykdommer hos barn: https://kirurgen.no/fagstoffSøtstoff og Chrons sykdom: https://www.newswise.com/articles/artificial-sweetener-splenda-could-intensify-symptoms-in-those-with-crohn%E2%80%99s-disease?sc=dwhn Om søtstoff til barn: https://www.tandfonline.com/doi/full/10.1080/02772248.2016.123475	

	4 https://pubmed.ncbi.nlm.nih.gov/25828597/Kunstig søtstoff og graviditet og amming: https://ammehjelpen.no/kunstige-sotstoffer-og-a	
Helena Westlund Friskskötens kan Sverige AB	Kan normala nivåer av D-vitamin och DHA, EPA förebygga risken att drabbas av typ 1 diabetes? Jag vill visa er studier som tyder på det. Men först till mig. Jag är specialistsjuksköterska, med 25 års erfarenhet av vården. De senaste 7 åren har jag utvecklat ett stort hälsointresse, med anledning av att ohälsan, hälsade på vår familj och min då 6 åriga dotter drabbas av diabetes typ1. Jag är i dag övertygad om att hon led av D-vitaminbrist när hon drabbades. Men jag kan inte bevisa det, då inga sådana prover var tagna innan hon insjuknade, eller ens efteråt. Jag är också övertygad om att hon ärvde den bristen från mig. Jag har ätit sparsamt med fisk hela mitt liv och när min glutendiagnos ställdes, hade jag grava brister. Inget prov på D-vitamin går att hitta i mina journaler. Jag fick tillskott av B-vitamin och järn, men inget D-vitamin. Jag påtalade på BVC att jag tyckte att mitt barn hade krokiga ben. Ingen åtgärd. Hennes tänder är fårade, så som vid D-vitaminbrist. Som diabetesförälder rannsakar man sig själv och tillbringar åtskilliga timmar med att försöka förstå vad som utlöste sjukdomen. I dag tror jag att det är många faktorer som behöver sammanfalla vid samma tidpunkt, för att barnet skall utveckla sjukdomen. Behöver vi verkligen identifiera alla dem eller räcker det att vi hittar några och avlägsnar dem, för att barnet/ungdomen skall få fortsätta vara frisk? Förutom allt lidande vi skulle kunna bespara, så är detta en väldigt kostsam sjukdom, för samhället. Livslång insulinbehandling, samt dyra tekniska hjälpmedel och i slutskedet ofta kopplad till dialys, amputationer, hjärtinfarkter mm. I dag kontrolleras inte D-vitamin regelbundet på barn med Diabetes, vilket jag anser att det borde göras efter att ha läst åtskilliga studier som visar på samband. Har ni kännedom om dessa studier? I så fall hoppas jag att ni lyfter upp vikten av att verkligen äta fet fisk 3 ggr i veckan, så behöver barnen inte ha dessa brister och kanske inte heller drabbas av diabetes. Se dessa studier och lyft upp fisken som den livsnödvändiga mat den faktiskt är! Vitamin D and Omega3 Supplementations in Mediterranean Diet During the 1st Year of Overt	Dear Helena Westlund, Thank you for your comment and sharing your story and experiences with us. We will consider you input and the studies you are referring to. In general, new significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	Type 1 Diabetes: ACohort Study Nutrients 2019,11 2158;doi:10.3390/nu11092158 Intake of D and risk of type 1 diabetes: a birth-cohort study The LANCET. Vol 358.November 3; 2001	
David Smith, Professor Emeritus of Pharmacology, University of Oxford	I have read the impressive document 'Principles and Methodologies' and was surprised to see in Table 1 on page 5 that none of the health outcomes listed include any outcomes related to mental health. I searched the last report (NNR2012) and found the following: three mentions of 'mental health' in the text, all of which related to physical activity; three text references to 'depression', two of which related to physical activity and one to potassium status; four text references to 'cognitive impairment' all of which related to micronutrients. I find this disturbing, since it is well established that nutrition plays an important role in mental health. I hope that the authors of the new NNR will give more detailed attention to this matter.	Dear David Smith, Thank you for this important comment. The table in the paper you are referring to are only suggestive. The respective authors for each chapter are required to do an appropriate literature search and evaluate witch outcomes that should be included. We can assure you that a number of outcomes related to mental health will be considered. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Henrik Stenwig, Sjømat Norge (Norwegian Seafood Federation)	Comments part 1, November 15th Comments to the Webinar on diet and sustainability: NNR2022 and that NNR2022 will develop evidence-based platforms for the national FBDG as well as the integration sustainability and environmental issues into FBDG. The webinar gave an interesting overview of the various aspects and of the complexity of the combination of nutritional recommendations and information on environmental performances. The major challenge in combining nutritional recommendations to the citizens with the aim to increase the proportion of healthy diets in the populations, is of course the complex nature of deciding on what is healthy across the population including dimensions as gender, age, education, traditions and cultural differences. Bringing in an obligation to combine nutritional	Dear Henrik Stenwig, Thank you for your comments. Reply to comment 1: The NNR2022 project will formulate health derived FBDGs based on an evidence based evaluation of the causal relationship between nutrient or food exposures and health outcomes. Further, we need to consider the implications of these FBDGs on sustainability. The

	recommendations with information/recommendations to the population on how to achieve/contribute to an environmentally sustainable development by choosing "greener" products, increases the complexity exponentially. As a representative of Sjømat Norge (the Norwegian Seafood Industry the Norwegian Seafood Federation represents the interests of approximately 680 member companies. Our member companies cover the entire value chain from fjord to dinner table in the fisheries and aquaculture sectors in Norway), I took notice of the differences between countries regarding national recommendations presented at the webinar, of the amount of fish in the diet. In Netherland it seems that the recommended intake of meat (in gram) is five times higher than for fish. This is significantly different from the recommendations from the Norwegian health authorities. Such differences in the recommendations will also have impact on the environmental footprints of the diets. The challenge of the current Nordic process includes the need of a kind of prioritization between a healthy versus an environmental ("green") diet. It might be seen as a typical "the hen or the chicken"-issue, and from the website of the NNR2022 it does not seem to be a clear subsequentially order in the terms of references of the current process regarding this kind of conflicting interest: "The new edition (NNR2022) will be published in 2022. In addition to include an update on NNR for energy, macro- and micronutrients, NNR2022 will develop evidence-based platforms for the national FBDG as well as the integration of overweight and obesity, and sustainability and environmental issues into FBDG." At what stage will the clarification be made of what the integration sustainability and environmental issues into FBDG means in relation to the "update on NNR for energy, macro- and micronutrients, NNR2022 will develop evidence-based platforms for the national FBDG"? End of Comments, part 1, November 15th 2020. Part 2 follows next. Comments part 2, November 15th In Norway, we have experienced that criteria and indicators used to assess sustainability have not been coherent across various food-categories such as vegetable products,	NNR2022 project will produce several background papers on various aspects of sustainability. Based on the conclusions from this report, we must consider whether we should put any restraints on these health derived FBDGs. We will describe very explicit in describing what are health derived FBDGs, and how sustainability is integrated into DRVs and FBDGs. Reply to comment 2: Thank you for this very important and relevant comment. We totally agree with you that the assessment of the environmental performance of diets and/or food products should be based on methods that can be used across various food categories. We are following the work by the European Commission and will of course consider this work in the NNR2022 project. We are also collaborating with several national and international front-line scientific mileus in order to base our guidelines on the best available and updated evidence. However, details about the exact way we will work has not been decided yet.

	agricultural animal products and aquatic animal products (farmed as well as captured). If the aim is to be able to combine nutritional recommendations with environmental sustainability issues, it must be a prerequisite that assessment of the environmental performance of the diets or food-products/-categories, must be based on methods that can be used across the various food categories. To avoid the inventing of the wheel-situation and to avoid developing methods that are based on assessments of environmental performances at the level of nutritional substances (proteins, carbohydrates, fatty acids), we will propose that the Product Environmental Footprint (PEF)- method developed by the European Commission, should become the method to be used to assess environmental performances, also in the current process to revise the NNR. (see https://ec.europa.eu/environment/eussd/smgp/dev_methods.htm and https://ec.europa.eu/environment/eussd/smgp/initiative_on_green_claims.htm). Concerning the question above on how to combine NNR to environmental issues, we would strongly suggest that this should be based on nutritional recommendations in combination with "continuously" updated information to the consumers on the environmental performances of the various food categories. With the PEF-method 16 impact categories of the food products will be assessed in parallel, and out of these only four are directly relevant to assess the climate-footprint. A merging of a nutritional values and environmental footprint into a combined index/indicator of sustainable nutritional recommendations will probably end up to be misleading of the consumers. The basis for this postulate is the fact that during the next few years there will be a significant change (hopefully reductions) of the environmental footprints of the food, but not evenly across the 16 impact areas (in addition to the effect on biodiversity) and not evenly across the food categories. A combined recommendation including nutrition and sustainability will probably not be robust due to unevenly distribution of changes of the environmental performances while the recommendations regarding healthy diets will not be subject to significant changes over the same period of a few years. In line with the above considerations, it is recommended to invite experts from the DG	Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	ENV of the European Commission and/ or representatives from the European Joint Research Centre (https://ec.europa.eu/info/departments/joint-research-centre_en#responsibilities) as experts regarding sustainability and environmental issues.	
Henriette Bastiansen, Kappa Bioscience	Recommendations of a systematic review of vitamin K2, separate from K1 Since NNR2012, there has been generated much data on vitamin K, both vitamin K1 and K2. Better analytical methods for detection of the two vitamins have provided more accurate and precise measures of both vitamin K1 and K2 in food, and more food has been analyzed. Correlation studies and prospective cohort studies have pointed on differences between intake of vitamin K1 and K2 on clinical important endpoints. Prospective clinical trials have shown beneficial and meaningful effects in diseased and healthy populations for both vitamins. Vitamin K1 and K2 has different lipophilic characteristics, therefore, the uptake, metabolism and distribution in the body is different. There are needs for a separate RDI (recommended daily intake) of vitamin K2, independent of K1. This was highlighted by Akbulut et al. 2020 (Cardiovascular Research Institute Maastricht, The Netherlands), https://doi.org/10.3390/nu12061852. As basis for their assessment they used a nine-criteria standard (published in 2014) to evaluate if there were enough evidence for vitamin K2 to be considered for an RDI, https://doi.org/10.1007/s00394-014-0666-3. The following criteria were looked into (a) an accepted definition; (b) a reliable analysis method; (c) a food database with known amounts of the bioactive; (d) cohort studies; (e) clinical trials on biologic processes; (f) clinical trials for dose-response and efficacy; (g) safety data; (h) systematic reviews and/or meta-analyses; (i) plausible biological rationale. The authors conclude that vitamin K2 meets all the criteria and should be considered for a specific RDI. Last years, important and relevant data have been published out of the Nordic counties. Below you find some examples. Rødbotten et al. (2014) investigated vitamin K2 content in different bovine muscles and breeds. They found vitamin	Dear Henriette Bastiansen, Thank you for your comment. These are very interesting and relevant findings. We will consider you input and the studies you are referring to. In general, new significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. Thanks for you input. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	K2 to be the most dominant form compared to vitamin K1, https://doi.org/10.1016/j.meatsci.2014.01.005. Vermeer et al. (2018) investigated the levels of vitamin K1 and K2 in European cheeses, including two Norwegian brands (Norvegia and Gamalost). They found the dominant form to be vitamin K2, https://doi.org/10.3390/nu10040446. Lundberg et al. (2020) investigated the uptake of vitamin K2 from the Norwegian cheese Jarlsberg in a prospective clinical trial. The levels of vitamin K1 and K2 in the tested cheese was 30 and 778 ng/g respectively. Daily intake of Jarlsberg cheese increased the osteocalcin level, vitamin K2 and positively affected the lipid patterns and blood pressure, https://dx.doi.org/10.18203/2349-3259.ijct20201712. Haugsgjerd et al. (2020) studied the association of dietary vitamin K and risk of coronary heart disease in middle-age adults (the Hordaland Health Study Cohort). Norwegian men and women (N=2987) with 46-49 years of age were included and the median follow-up time was 11 years. The authors concluded that a higher intake of vitamin K2 was associated with lower risk of coronary heart disease (CHD), while there was no association between intake of K1 and CHD, http://dx.doi.org/10.1136/bmjopen-2019-035953. Jespersen et al. (2020) studied a biomarker for vitamin K status (uncarboxylated matrix Gla-protein (dp-ucMGP)) and cardiovascular risk in a Danish general population study (229 males and 262 females, aged 19-71). The authors showed that the plasma levels of dp-ucMGP were positively associated with obesity, blood pressure, pulse wave velocity, and a history of cardiovascular disease. They concluded that the findings support dp-ucMGP as a biomarker of cardiovascular risk, and that vitamin K status could play a role in vascular calcification, https://doi.org/10.1016/j.clinbiochem.2020.05.005. Much data has been published since NNR2012, documenting content of vitamin K2 in Nordic food, biomarkers for vitamin K2 intake, and health benefits. We ask the NNR2020 Committee to consider vitamin K2 for a systematic review.	

Henriette Bastiansen, Kappa Bioscience	Recommendations of a systematic review of vitamin K2 in light of vitamin D intake Intake of sufficient amounts of vitamin D is important in the Nordic regions, especially during fall, winter and spring. It is shown that vitamin D induces the expressions of vitamin K dependent proteins. They are expressed in an inactive state, and vitamin K is needed for their activation. This is shown in several model systems, and also last year in a prospective double-blinded, placebo-controlled clinical trial (excluding vitamin K antagonist users and multivitamin users), https://doi.org/10.3390/nu11020231. The synergistic interplay between vitamin D and K was reviewed in 2017 where the authors conclude: "Taken together, animal and human studies suggest that optimal concentrations of both vitamin D and vitamin K are beneficial for bone and cardiovascular health as supported by genetic, molecular, cellular, and some human studies. However, vitamin D and calcium supplementation along with vitamin K deficiency might also induce long-term soft tissue calcification and CVD, particularly in vitamin K antagonist users and other high-risk populations", https://doi.org/10.1155/2017/7454376 Correlation, and prospective cohort studies have pointed on the importance of both vitamins together, on important clinical measures: Van Ballegooijen et al. (2020) studied the levels of both vitamin K and D in a prospective cohort study (N=4742) and mortality, with a median of 14.2 years follow-up. They concluded that combined vitamin D and K status are associated with increased all-cause mortality and possibly with cardiovascular mortality and cardiovascular events compared to adequate vitamin D and K status, https://doi.org/10.1007/s00394-020-02352-8. Van Ballegooijen et al. (2017) studied the levels of both vitamin K and D in a population-based cohort study (N=402) and blood pressure, with a median of 6.4 years follow-up. They concluded that the combination of low vitamin D and K status was associated with increased blood pressure and a trend for greater hypertension risk, https://doi.org/10.1161/hypertensionaha.116.08869. Mayer et al. (2017) studied the association of vitamin K and D status on arterial stiffness in a general population (N=1023). They concluded a substantial	Dear Henriette Bastiansen, Thank you for your comment. These are very interesting and relevant findings. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. Regarding the process for prioritizing topics for systematic reviews, the NNR2022 project will publish a scientific article describing the method and principles during Q1 of 2021. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee

	interaction of insufficient K and D vitamin in terms of increased aortic stiffness, https://doi.org/10.1016/j.jnutbio.2017.04.010 It is very common in the Nordic region to supplement with vitamin D, therefore it is important to balance that intake with enough vitamin K. Intake of vitamin K1 and K2 has different distributions in the body, and the vitamin K dependent proteins that are induced by vitamin D are located extrahepatically. This is also where vitamin K2 plays the most important role, https://doi.org/10.1016/S0304-4165(02)00147-2. Since NNR2012, much data has been published on the interactions between the two vitamins. It is important to assess a recommendation of vitamin D together with vitamin K2. In that respect, we ask the NNR2020 Committee to consider vitamin K2 for a systematic review, where one chapter should assess interactions to vitamin D.	
Eva Roos	In the presentation of the NNR 2022 at Nordic Nutrition Conference 2020 you listed meal-pattern and meals as one possible chapter in the coming NNR. In the "Call for chapter experts" this topic was not included in the list of topics that you could choose from being willing to contribute as an NNR expert.	Dear Eva Roos, Thank you for your comment. Some of the new chapters in NNR2022 was decided after the public call for experts was announced. When deciding on experts for these chapters, we have used everyone who has expressed their interest in the call as a starting point for selection of chapter authors. Selection is based on CV, competence and relevance, and experts have therefore in some cases been chosen regardless of the person's "tick" in the online application form. We have also

		emphasized the assessment of "Conflict of Interest". For some chapters we have had very few applicants, for others there were several. It is a complicated solitare and we must also take into account a geographical distribution between the Nordic countries. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Yelverton Tegner	It is important to address the dosage of vit-D. Todays recommendation is based more on beliefs than on science. Mony studies are of poor quality	Dear Yelverton Tegner, Thank you for your comment and thank you for pointing out an important issue. There are strict requirements for documentation that are required before formulating national dietary advices. Individual studies are not sufficient documentation to change or set dietary advices. Systematic reviews (SRs) are the preferred method to summarize the causal relationship between nutrient- or food group exposure and a health outcome. While several thousand

		SRs have been published in the field of diet and nutrition, only a limited number of the SRs have adhered to the principles and methodology required to qualify as main foundation for setting dietary reference values (DRVs) and food-based dietary guidelines (FBDGs) in the Nordic Nutrition Recommendations. For a description and rational for the methodology used in NNR2022 please read the following articles; **The Nordic Nutrition Recommendations 2022 – Principles and methodologies**. Christensen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 – Structure and rationale of qualified systematic reviews.** Arnesen et al, **Food & Nutrition Research** **The Nordic Nutrition Recommendations 2022 - Handbook for qualified systematic reviews** Arnesen et al, **Food & Nutrition Research**

		Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee
Per Bjønnes Kristiansen, Metabolsk Helse	Høringsuttalelse fra Metabolsk helse Metabolsk helse er en organisasjon som ble etablert 9. desember 2020 og registrert i Enhetsregisteret med org nr 926 300 636. Metabolsk Helse er en ideell og uavhengig helsepolitisk organisasjon for å bekjempe overvekt og fedme med tilhørende sykdommer som diabetes type 2 og hjerte- og karsykdommer. Målet er en halvering av livsstilsrelaterte sykdommer innen 2030! Vi vil adressere kost-relatert metabolsk sykdom som diabetes, høyt blodtrykk, ugunstige blodlipider (dyslipedemi), fedme, hjerte- og karsykdom, fettlever med flere, som alle er relatert til insulinresistens og som forventes å kreve økende ressurser fra helsevesenet. (Dall 2013). Metabolsk syndrom er i dag en vanlig tilstand, og forekomsten øker i takt med den generelle vektøkningen i befolkningen. Metabolsk syndrom eller insulinresistenssyndromet, som det også kalles, forsterkes av høyt karbohydratinntak og ledsagende hyperinsulinemi. (Ferrannini 1991, Reaven 1967) Sammenhengen mellom metabolsk syndrom og et høyt inntak av karbohydrater og lavt fettinntak anses som akseptert. Imidlertid er det en økende erkjennelse av at ultrabearbeidet mat fremmer overvekt, fedme og metabolsk sykdom (Costa 2018, Machado 2019). Vi vil derfor anbefale en gjennomgang av betydning av makronæringsstoffenes sammensetning for utvikling av metabolsk syndrom, og hvilken betydning ultraprosessert mat har for denne utviklingen. Anbefalingene om fettinntak må oppdateres Mange funn tyder på at fettkvalitet er mer avgjørende enn kvantitet, og studier som finner samsvar mellom fettinntak og sykdomsrisiko, er typisk ikke korrigert for transfett. Siden 1990 har en rekke studier demonstrert at industrielt transfett forårsaker hjerte- og karsykdom (Hyseni 2017). Små mengder transfett finnes naturlig i noe kjøtt og melkeprodukter, men hovedmengden skyldes	Dear Per Bjønnes Kristiansen and Metabolsk Helse, Thank you for your important comment. New significant evidence since NNR2012 that may inform dietary reference values and food based dietary guidelines will be accounted for in NNR2022. In addition to include an update on NNR for energy, macro- and micronutrients, NNR2022 will develop evidence-based platforms for the national food based dietary guidelines (FBDGs) as well as the integration of overweight and obesity (in addition to sustainability and environmental issues) into FBDGs. The principles for evaluating quality, bias as well as assessment of causality in nutritional sciences will be describes in several background papers in the NNR project. We have also a systematic, open and transparent methodology

	industriell prosessering og oppstår fra delvis herdet/hydrogenert fett av planteoljer. De siste årene er det gjennomført en rekke metaanalyser av sammenhengen mellom mettet fett og hjerte- og karsykdom, og konklusjonene har vist stort sprik. En analyse taler for at grunnen til spriket i konklusjoner er hvorvidt det er tatt hensyn til transfett og om transfett feilaktig er registrert som mettet fett. (Hamley 2017) Vi foreslår at ernæringsmyndighetene tar initiativ til å få utført en review / metaanalyse som tar for seg effekter av mettet fett, der studier med mulig transfett-konfunder utelates. Det er mye forvirring angående fettinntak og risiko for hjerte- og karsykdom, hvilket tilsier at nye review / metaanalyser må legge harde endepunkter til grunn. Individuelle kostråd basert på metabolsk helse Aktive friske personer nyttiggjør karbohydrater på en bedre og langt mer effektiv måte enn den store andelen av befolkningen som er overvektig og/eller insulinresistente. Passive og metabolsk syke personer tåler ikke karbohydrater særlig godt. Vi vil be om at kostholdsanbefalingene må differensiere mellom ulike befolkningsgrupper basert på metabolsk tilstand og øvrige ubalanser/plager som tilsier endret ernæringsbehov og økt forbruk av enkelte næringsstoffer. Metabolsk helse ser frem til nye nordiske kostanbefalinger med håp om at de i større grad enn tidligere tar hensyn til ny ernæringskunnskap og vektlegger individuelle forskjeller. Mvh Metabolsk Helse Org.nr. 926 300 636 Tonje R. Gulliksen, styreleder Per Bjønnes Kristiansen, daglig leder Dr. Vivian L. Veum, fagrådsmedlem Dr. Erik Hexeberg, fagrådsmedlem	for selecting topics for de novo systematic reviews, which also will be central when updating the DRVs and FDDGs. Yours sincerely, Rune Blomhoff, Head of the NNR2022 Committee