

The Proof is Not in the EATing

Der Beweis liegt nicht im Essen

La preuve n'est pas dans le rapport sur l'alimentation



point de
vue

by
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Ensuring a sustainable future for global society has become a policy priority, and the need for solutions is urgent. Food production and consumption play important roles both as *part of* and *solutions to* this challenge. However, good intentions are not sufficient. Solutions must be evidence based and fit reality if they are to be acceptable.

Food and sustainability

Sustainability is a complex issue often covering three pillars: social, economic and environmental. Scientists warn that several of the planet's environmental boundaries are close to being or are already transgressed. The United Nations' Intergovernmental Panel on Climate Change (IPCC) has warned about the implications of global warming, and the Paris Agreement in 2016 has speeded up work – or at least intentions – on cutting greenhouse gas (GHG) emissions.

Several reports addressing agriculture and food production's impact on climate and the environment have been released in recent years – some of which also address diet and health. One of the most widely reported is *Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems*, published in the *Lancet* (Hereafter EAT-Lancet), launched in January 2019 (Willett *et al.*, 2019). EAT-Lancet is referred to by many as the ultimate solution for food production and

consumption. Unfortunately, there are several uncertainties and flaws throughout the report. Furthermore, its very restrictive dietary recommendations prescribed for the whole world's population are not sustainable – or affordable for many people with low incomes. This article comments on some of the issues forming the basis of the report, its methodology and interpretation of its findings.

Lack of transparency

EAT-Lancet's 'Planetary Health Diet' (PH diet) is stated as providing healthy diets within an environmentally safe operating space for a population of 10 billion people by 2050. According to EAT-Lancet they have quantified intake levels for

different food groups for optimal health based on 'best available science'. The authors then assessed the nutritional adequacy of the diet and estimated its effect on premature deaths from non-communicable diseases (NCDs).

Unfortunately, the methodology applied in determining the diet is neither sufficiently described, nor in alignment with scientific standards normally required for peer-reviewed publications of this nature. These are the findings of an independent review of EAT-Lancet undertaken by EpiX Analytics funded by MatPrat (Zagmutt *et al.*, 2019a, 2019b, 2020). The authors of EAT-Lancet do not describe the methodology used for selecting



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literature to quantify specific intake levels of different foods; neither how this literature was used to arrive at the specific intake levels, nor an assessment of mortality prevention potential. There is inconsistent use of the literature for associations between food groups and diseases. For example, the authors have included the protective effect of nuts against Type II Diabetes Mellitus but they excluded the effect of low dairy consumption on increasing colorectal cancer risk reported in the literature they are citing. Consequently it is not possible to assess whether the best and most up-to-date evidence was selected, or even searched for, and thus what the potential bias in the methodology and outcomes might be.

Transparency is a key element for ensuring the validity of science. Without an adequate description of the methodology, it is difficult, if not impossible, for others to evaluate the quality of the conclusions and recommendations in the report.

Diet based solely on health

The name of the report implies the diet is optimal for both human and

planetary health. However, it appears that environmental perspectives have been evaluated *a posteriori*, i.e. after identifying a healthy diet, which means the specific diet is based on human health considerations alone. After determining dietary composition, certain parameters related to environmental boundaries were evaluated: GHG emissions, cropland use, water use, nitrogen application, phosphorus application and biodiversity loss. This was done without accounting for uncertainties related to the environmental impact of each food produced.

Animal sourced foods are not villains

EAT-Lancet is proposing a very detailed and restrictive diet, especially for animal sourced foods. However, multiple systematic literature reviews show that animal sourced foods can be part of dietary patterns that promote health and reduce disease risk. As an example, the Norwegian nutritional guidelines for prevention of NCDs and ensuring good health, advise a plant-based diet with moderate amounts of red meat and fish (2–3 dinner portions per week of each) and daily intake

of dairy products. Several other countries also have similar guidelines including animal sourced foods as part of balanced healthy diets. The World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) third expert report on cancer prevention states that moderate amounts of red meat (350 to 500 grams per week cooked weight) can be included in a healthy diet, preventing both cancer as well as other NCDs (WCRF/AICR, 2018a). Furthermore WCRF/AICR emphasises a more holistic focus: 'it appears increasingly unlikely that specific foods, nutrients or other components of foods are themselves important singular factors in causing or protecting against cancer' (WCRF/AICR, 2018b, p. 80).

“ Les décideurs de l'action publique ne devraient pas tirer de conclusions fondées sur des hypothèses irréalistes et une méthodologie peu claire. ”

Animal sourced foods are nutrient-dense, while sugar provides no essential nutrients to the human body. However, the PH diet allows for more sugar than meat. The authors do not provide any reasoning as to how they have reached the dietary recommendation for meat or any other foods listed: for example, grains 232g, eggs 13g and fish 28g per day, to name but a few.

A global food system is the wrong prescription

According to the IPCC, a food system should cover nutritional needs, as well as consider differences in people's cultural backgrounds, preferences, knowledge and economies (IPCC, 2019). Therefore, it makes no sense to talk about a 'global food system'. The

IPCC advises every country to evaluate how its natural resources and land are best used for food production, and stress that site-specific natural, socio-economic and cultural conditions should be considered (IPCC, 2014).

EAT-Lancet claims that its recommendations have high potential for local adaptation and scalability. However, it fails to account for regional and national differences in natural resources available for food production. What is considered sustainable production in one country, does not necessarily mean sustainable elsewhere. Percentage of arable land is one marker. Even within Europe there are great variations. In Denmark, 62 per cent of the land area is arable, while Germany has 58 per cent, Spain 53 per cent and France 52 per cent. Finland (7 per cent), Sweden (6 per cent) and Norway (3 per cent) in contrast have very low shares of arable land according to The World Bank.

Food insecurity

Food production in alignment with the recommendations of EAT-Lancet will make many countries more reliant on imports. Natural resources available for food production in a country might make it impossible and/or challenging to produce certain foods. This contrasts with recommendations by the Food and Agriculture

Organization (FAO) and IPCC, which stress that each country should use available natural resources to produce food to contribute to national food security (IPCC, 2014). Livestock production, which in many regions is key in ensuring national food security will be heavily reduced if the recommendations by EAT-Lancet are followed.

Furthermore, EAT-Lancet concludes that applying the framework would keep the planet within a safe operating space; this is inconsistent with their own reporting of environmental effects. Implementing the PH diet globally would still cause environmental effects above planetary boundaries as described by the authors for cropland use, nitrogen application, phosphorus application and natural biodiversity loss. Even with implementation of additional actions like halving food waste and greatly improved production practices, the authors report that it would still not be within safe operating boundaries for four out of nine indicators.

Norway: a case study

One third of arable land globally is best suited for grass production. In Europe, grasslands cover more than one-third of agricultural land. Grasslands provide important ecosystem services, including water manage-

ment, water purification, erosion control and carbon storage. Animals grazing in these areas help to maintain biodiversity and increase albedo (the diffuse reflection of solar radiation back into the atmosphere).

“ Politische Entscheidungsträgerinnen und Entscheidungsträger sollten keine Schlussfolgerungen auf der Basis von unrealistischen Annahmen und unklaren Methoden ziehen. ”

Furthermore, researchers at the FAO have estimated that 86 per cent of feed for livestock globally is based on materials currently not eaten by humans (Mottet *et al.*, 2017). These are, in other words, resources for food production that would mostly be lost with transition to a production system in line with the EAT-Lancet PH diet.

Take Norway as an example: a country with very little arable land (3 per cent) and with natural limits for production of plant-based foods. Only one-third of the arable land is suitable for cultivation of grains and other crops, while two-thirds are considered best used for grass production. In addition, 45 per cent of Norway is classified as good pastureland. Due to climate and weather conditions, a large proportion of grains produced in Norway is not considered suitable for human consumption but is instead used for feed.

Agriculture accounts for 8.6 per cent of national GHG emissions, of which half comes from ruminants' digestive systems. Some of the environmental concerns globally, such as water scarcity and emissions from land use change, are not issues of concern in countries such as Norway.



Animals grazing in grassland areas help to maintain biodiversity and increase albedo (the diffuse reflection of solar radiation back into the atmosphere).

For these reasons, livestock is a cornerstone of sustainable Norwegian land-based food production and important for national food security. Norway is close to being self-sufficient in meat, poultry, milk and eggs. The degree of self-sufficiency on plant-products varies with weather conditions. Normally, about 95 per cent of fruits and berries, 50 per cent of vegetables, and 60 per cent of food grains are imported. Livestock production helps to keep self-sufficiency rates of land-based foods in Norway between 40 and 50 per cent.

“ Policy makers should not jump to conclusions based on unrealistic assumptions and unclear methodology. ”

A Norwegian report evaluating the consequences to Norwegian agriculture of implementing the PH diet estimated that 43 per cent of Norway’s agricultural land would go out of production if consumption of beef was reduced to the maximum level allowed for by EAT-Lancet, of 14g per person per day (Aas, 2019). Reducing agricultural land is the opposite of the recommendations in the IPCC Special Report on Climate Change and Land, which stress that agricultural land must remain productive to maintain food security as the population increases and the negative impacts of climate change on vegetation increase (IPCC,2019).

Lack of additionality

EAT-Lancet evaluates the healthiness of the PH diet by assessment of nutrient adequacy and prediction of changes in mortality rates resulting from a transition in the world population to the PH diet. The authors’ conclusion is that the PH diet could prevent more than 10 million annual premature mortalities from NCDs. However, they are comparing apples to oranges.

The PH diet has an optimal energy (caloric) content, and the authors assume perfect adherence to the diet. As a comparison, they use today’s actual food intake where some get too few and many get too many calories. Adherence to the PH diet would therefore, in theory, eliminate the issues of under- and overconsumption. Globally 820 million people do not get the food they need. Overconsumption of food leads to overweight and obesity, which is one of the leading risk factors of premature deaths today. Close to 2 billion, or 39 per cent, of the world’s population is overweight or obese – mainly due to overconsumption (FAO, IFAD, UNICEF, WFP and WHO, 2019).

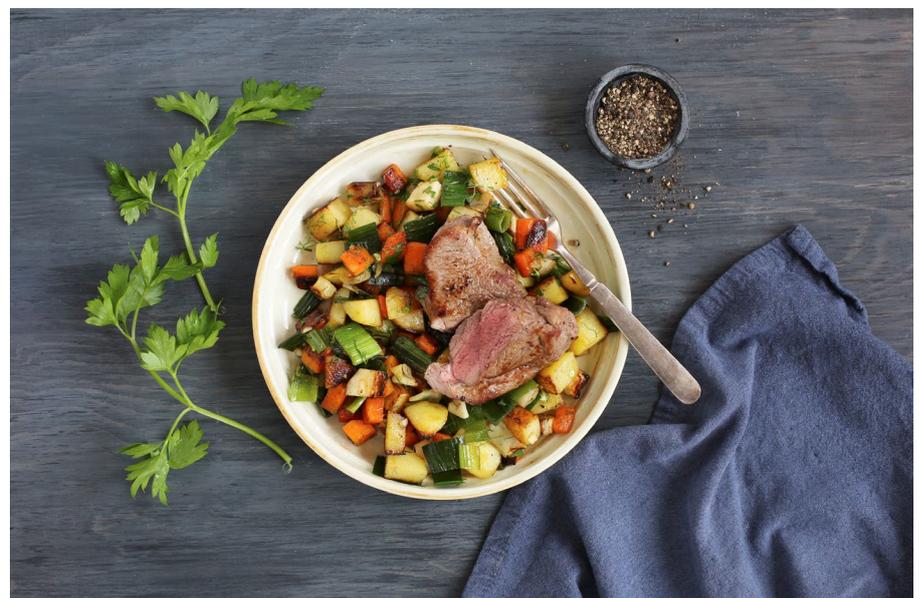
A recent publication in *The Journal of Nutrition* revealed that the change in caloric content of the PH diet could explain 63–94 per cent of the calculated mortalities prevented in the United States, after addressing methodological issues (Zagmutt *et al.*, 2020). This means that if underweight, overweight and obesity were to be eliminated from the US population, then the PH diet would not significantly give any *additional* effect in prevention of premature mortalities from NCDs.

One size does not fit all

In theory, providing diets with optimal caloric content can eradicate different

forms of malnutrition (overweight, obesity and under-nutrition). However complex issues are behind malnutrition that will need a multitude of measures to be handled properly and effectively. The stunning figures of overweight and obesity can be explained by the presence of an obesity-promoting environment that includes access to fast food meals high in fats, sugar and calories, dependence on vehicles and technologies leading to sedentary behaviour and reducing physical activity. Lack of access to nutrition education and healthy options (e.g. food deserts) are other explanations. Under-nutrition on the other hand may be caused by underlying factors such as food insecurity due to climatic extremes, conflicts and population growth, or lack of access to safe drinking water and adequate sanitation, leading to higher risk of infectious diseases (FAO, IFAD, UNICEF, WFP and WHO, 2019). In addition, according to the World Health Organization, poverty amplifies the risk of, and risks from, malnutrition in all forms (WHO, 2018). It is questionable whether a prescription of a universal diet can solve these complex and multi-factorial issues.

EAT-Lancet’s approach to determining the healthiest diet assumes a causal relationship between foods and NCDs. However, the evidence applied for assessing the healthiness of the PH



The Norwegian nutritional guidelines for prevention of NCDs and ensuring good health, advise a plant-based diet with moderate amounts of red meat and fish.

diet is largely based on observational studies with well-known weaknesses, such as small effect sizes, bias from dietary assessment methods and confounding variables such as smoking, alcohol intake, physical activity among others. Observational studies with weak associations alone cannot establish causal links between a certain food and development of disease (Ioannidis, 2018).

When making evidence based dietary recommendations aiming to prevent NCDs, the scientific practice is to perform a systematic and transparent literature search for different types of studies to assess the causality between foods and a certain NCD. Then the quality of the studies should be rigorously and critically evaluated

before ranking the findings depending on their scientific robustness. Lastly the totality of the evidence base and strength of the evidence should be judged. The methodology applied by EAT-Lancet does not conform with these standards.

Making an impact

All the above mentioned issues mean that EAT-Lancet should be discussed soberly and evidence from other reports should be included in the accumulated relevant knowledge. This will be particularly important when it comes to making political decisions about food production and consumption – especially when these policies differ greatly from the

existing consensus. However, in October 2019 mayors from 14 cities worldwide including London, Tokyo, Los Angeles, Paris and Oslo, signed the C40 Good Food Cities Declaration, committing cities to align public procurement to the EAT-Lancet diet by 2030.

To secure a sustainable world with enough, nutritious and safely produced food made available for everyone, with lowest possible environmental impact, production must be adjusted to each country and region. Policymakers should not jump to conclusions based on unrealistic assumptions and unclear methodology.

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Further Reading

- Aas, L. (2019). *EAT-Lancet rapporten og «The Global Reference Diet» –konsekvenser for norsk landbasert matproduksjon, matsikkerhet og bærekraft* (Ås: Norges miljø- og biovitenskapelige universitet). Available online at: <https://www.nmbu.no/fakultet/biovit/aktuelit/node/39046> (Last accessed: 23 February 2020).
- FAO, IFAD, UNICEF, WFP and WHO (2019). *The State of Food Security and Nutrition in the World 2019. Safeguarding against Economic Slowdowns and Downturns* (Rome: FAO). Available online at: https://docs.wfp.org/api/documents/WFP-0000106760/download/?_ga=2.259788362.1741549626.1582654289-1572131586.1582654289 (Last accessed: 24 February 2020).
- Ioannidis, J.P.A. (2018). The challenge of reforming nutritional epidemiologic research. *Journal of the American Medical Association*, **320**(10): 969-970.
- IPCC (2014). Agriculture, Forestry and Other Land Use (AFOLU). In: *Climate Change 2014: Mitigation of Climate Change*. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press. Available online at: https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf (Last accessed: 16 January 2020).
- IPCC (2019). *Climate Change and Land: an IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes In Terrestrial Ecosystems*. (Geneva: IPCC). Available online at: <https://www.ipcc.ch/site/assets/uploads/2019/11/SRCCL-Full-Report-Compiled-191128.pdf> (Last accessed: 16 January 2020).
- Mottet, A. *et al.* (2017). Livestock: On our plates or eating at our table? A new analysis of the feed/food debate. *Global Food Security*, **14**: 1-8.
- Willett, W. *et al.* (2019). Food in the Anthropocene: the EAT Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, **393**(10170): 447-492.
- World Health Organization (2018). *Malnutrition* (WHO: Geneva). Available online at: <https://www.who.int/news-room/fact-sheets/detail/malnutrition> (Last accessed: 20 February 2020).
- World Cancer Research Fund/American Institute for Cancer Research (2018a). *Continuous Update Project Expert Report 2018. Recommendations and public health and policy implications* (London: WCRF/AICR). Available online at: <https://www.wcrf.org/sites/default/files/Recommendations.pdf> (Last accessed: 24 February 2020).
- World Cancer Research Fund/American Institute for Cancer Research (2018b). *Diet, Nutrition, Physical Activity and Cancer: a Global Perspective. A summary of the Third Expert Report*. Available online at: <https://www.wcrf.org/sites/default/files/Summary-of-Third-Expert-Report-2018.pdf> (Last accessed: 24 February 2020).
- Zgmutt, F.J., Pouzou, J.G. and Costard, S. (2019a). December 13, 2019 – Continuing the dialogue on EAT-Lancet. Available online at: <https://www.epixanalytics.com/eat-lancet-criticism-correspondence.html> (Last accessed: 13 January 2020).
- Zgmutt, F.J., Pouzou, J.G. and Costard, S. (2019b). The EAT Lancet Commission: a flawed approach? *The Lancet*, **394**(10204): 1140-1141.
- Zgmutt, F.J., Pouzou, J.G. and Costard, S. (2020). The EAT-Lancet Commission's dietary composition may not prevent noncommunicable disease mortality. *The Journal of Nutrition*. <https://doi.org/10.1093/jn/nxaa020>.

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Summary

The Proof is Not in the EATing

 One of the most widely discussed reports addressing sustainable food production and healthy diets is *Food in the Anthropocene: the EAT-Lancet Commission on Healthy Diets from Sustainable Food Systems* (EAT-Lancet) launched in January 2019. The report is stated to be based on best available science but unfortunately the methodology applied is not transparent or in alignment with certain scientific standards. The diet prescribed by EAT-Lancet is based on health considerations alone, before looking at certain environmental aspects, but no description is given as to how the very specific intake levels for each food were set. The diet is especially restrictive for animal sourced foods, even though evidence-based dietary guidelines in many countries have concluded that these foods can be part of a health-promoting diet. Furthermore, an independent review has found several flaws and weaknesses in the report. EAT-Lancet also fails to account for national differences in natural opportunities for food production. Implementation of their recommendations will make many countries more reliant on imports which contrast with the recommendations by the FAO and the IPCC. Taking these issues into account warrants caution before taking on trust the recommendations by EAT-Lancet into business and policy.

La preuve n'est pas dans le rapport sur l'alimentation

 L'un des rapports les plus largement examinés sur la production alimentaire durable et les régimes alimentaires sains est *Notre nourriture dans l'Anthropocène: la Commission EAT-Lancet pour une alimentation saine et durable* (EAT-Lancet) publié en janvier 2019. Le rapport annonce faire appel à la meilleure science disponible, mais malheureusement, la méthodologie appliquée n'est pas transparente ou conforme à certaines normes scientifiques. Le régime alimentaire prescrit par EAT-Lancet est basé uniquement sur des considérations de santé, avant d'examiner certains aspects environnementaux, mais la façon dont les niveaux d'apport très spécifiques pour chaque aliment ont été fixés n'est pas indiquée. Le régime alimentaire est particulièrement restrictif pour les aliments d'origine animale, même si les directives diététiques fondées sur des preuves dans de nombreux pays ont conclu que ces aliments peuvent faire partie d'un régime alimentaire favorable à la santé. En outre, un examen indépendant a révélé plusieurs lacunes et faiblesses dans le rapport. EAT-Lancet ne tient pas non plus compte des différences nationales dans les opportunités naturelles de production alimentaire. La mise en œuvre de leurs recommandations rendra de nombreux pays plus dépendants des importations, ce qui contraste avec les recommandations de la FAO et du GIEC. La prise en compte de ces questions mérite de considérer avec prudence les recommandations d'EAT-Lancet dans l'industrie et l'action publique.

Der Beweis liegt nicht im Essen

 Einer der meistdiskutierten Berichte, der sich mit nachhaltiger Nahrungsmittelproduktion und gesunder Ernährung beschäftigt, ist *Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems* (EAT-Lancet), erschienen im Januar 2019. Der Bericht soll – so heißt es – die besten zur Verfügung stehenden wissenschaftlichen Erkenntnisse heranziehen. Leider ist aber die angewandte Methodik nicht transparent oder sie entspricht nicht bestimmten wissenschaftlichen Standards. Die von EAT-Lancet empfohlene Ernährungsweise basiert allein auf gesundheitlichen Erwägungen, noch bevor auf bestimmte Umweltaspekte eingegangen wird. Es wird aber nicht beschrieben, wie die sehr spezifischen Aufnahmemengen für jedes Lebensmittel festgelegt wurden. Besonders einschränkend ist die Ernährungsweise in Bezug auf Lebensmittel tierischen Ursprungs, obwohl in vielen Ländern wissenschaftlich fundierte Ernährungsrichtlinien zu dem Schluss gekommen sind, dass diese Lebensmittel Teil einer gesundheitsfördernden Ernährung sein können. Darüber hinaus hat eine unabhängige Überprüfung mehrere Mängel und Schwächen in dem Bericht festgestellt. EAT-Lancet berücksichtigt auch keine nationalen Unterschiede in Bezug auf die naturbedingten Produktionsmöglichkeiten für Lebensmittel. Die Umsetzung der EAT-Lancet Empfehlungen wird viele Länder stärker von Importen abhängig machen, was im Gegensatz zu den Empfehlungen der FAO und des IPCC steht. Es ist daher Vorsicht angebracht, bevor man den Empfehlungen von EAT-Lancet in Wirtschaft und Politik vertraut.