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Sustainable diets

What does it mean?

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How their environmental footprints is measured?

Adam Drewnowski *(USA)*

Director of the Center for Public Health Nutrition at the University of Washington.

What are the impacts on main food categories?

Frans Kok *(The Netherlands)*

Emeritus Professor in Nutrition & Health and former Head of the Division of Human Nutrition at Wageningen University.

YOGURT IN NUTRITION
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#SustainableDiets

Dr. Elin Röös

Dr. Elin Röös is a Researcher at the Swedish University of Agricultural Sciences in Uppsala, Sweden. She works for the Centre for Organic Food and Farming (EPOK) and she is also associated to the Food Climate Research Network at Oxford University.

She holds a MSc in Engineering Physics from Uppsala University. In 2013 she defended the thesis on Analysing the carbon footprint of food – Insight for consumer communication.

She is co- supervising several PHD & master students. She does research on and teach about sustainable food production and sustainable land use from many different angles. These include assessing the environmental impact of different foods using life cycle assessment (LCA), to calculate the climate impact and land use associated with different types of diets and comparing environmental impacts of different farming and food systems.
She also works in many interdisciplinary projects where we look at the economic and information policy instruments for more sustainable dietary patterns and how more sustainable and healthy food ingredients can be produced and processed.

What does it mean?
Sustainable diets : myth or reality?

Current food systems is a main contributor to climate change, responsible for about 25% of greenhouse gas emissions. In addition, food production is a leading cause of deforestation, biodiversity loss, freshwater use and water pollution. Despite this immense negative impact, food systems fail to feed people adequately; one-third of the world's population suffer from some form of malnutrition, either hunger, obesity and/or micronutrient deficiency. Power imbalances leading to a range of social problems are also inherent in current food systems and the treatment of farm animals reared for food raises serious ethical concerns.

In other for diets to be sustainable action is hence needed on many fronts, taking the multifaceted aspects of social, economic and environmental aspects into account. As one of the most cited definitions of sustainable reads: "*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/ Biodiversity International, 2010). Other definitions add the issues of animal welfare, feasibility of diets and the aspect of good quality food.

In high-income settings, access to healthy foods is usually good but the Western diets, high in animal sourced foods, cause environmental impacts that are several times higher those in low-income countries. A shift towards more plant-based diets has therefore been highlighted as an important mitigation option in these settings, as has reduction in food waste and improvements in production. The type and amount of meat and dairy in diets in order to reach sustainability is difficult to exactly pin down as it depends on many aspects including the access to alternative foods and which sustainability aspects that are prioritised. One approach is to limit livestock production to feed resources not consumed by humans i.e. grass from pastures, and agricultural and food industry by-products. This reduces the amount of animal products in the diet while utilising livestock to recycle biomass into the food system thus positively contributing to food security.

Prof. Adam Drewnowski

Prof. Adam Drewnowski is the Director of the Center for Public Health Nutrition at the University of Washington. He obtained his MA degree in biochemistry at Balliol College, Oxford University, and PhD in psychology at The Rockefeller University in New York. Author of the Nutrient Rich Foods Index (NRF), a nutrient profiling model that measures nutrient density of individual foods, meals and composite food patterns.

Recently Dr. Drewnowski has worked on Future 50 foods for healthier people and a healthier planet and he is also the PI of the Seattle Obesity Study (SOS), funded by the National Institutes of Health. The SOS has explored the socioeconomic determinants of health, focusing on access to healthy foods. Using geographic information systems data and geopositioning tracking devices, the SOS has explored where people shop, what they buy, and how their food purchases affect their health and well being.
Dr. Drewnowski has authored over 300 research publications and advises governments, foundations, and the private sector on issues related to diets and health.

How their environmental footprint is measured?

Healthy Diets from Sustainable Food Systems: What Does New Research Show?

The four domains of sustainability have been defined as health, economics, society and the environment. The food supply needs to produce foods that are nutrient rich, affordable, socially acceptable and appealing – and with low impact on the environment. Each of the sustainability domains has its own metrics and measures. Nutrient density of individual foods and food patterns has been measured using nutrient profiling (NP) tools. Affordability can be measured in terms or energy or nutrients per unit cost, often in relation to consumers' purchasing power. Measuring the social value of foods is a more complex issue, and can include attitudes and beliefs not to mention perceived pleasure and social context of eating. Finally, environmental impact of diets has been measured in terms of land, water and energy use associated with food production, distribution and retail.

The current research has focused on protein as a resource-intensive nutrient. Protein quality is being integrated, for the first time, into NP models. Whereas animal-source proteins account for 66% of total protein in high income countries, that may change with the advent of plant-forward diets. In order to optimize diet quality at a given price point while minimizing its environmental impact, some tradeoffs will need to be made. The creation of new metric measures and models critically depend on high quality data.

Prof. Frans Kok

Prof. Frans Kok is emeritus professor in Nutrition & Health and former head of the Division of Human Nutrition at Wageningen University, The Netherlands. He was trained in human nutrition in Wageningen and epidemiology at Harvard University, Boston USA.

Kok's scientific research covers topics such as diet in disease prevention, dietary behaviour, and overweight. In emerging economies in Asia and Africa attention is on diet and deficiency disorders. He is author of around 350 original scientific publications and supervised 70 PhD graduates. Frans Kok is editor of three nutrition textbooks '*Personalized Nutrition – Principles and Applications*', '*Introduction to Human Nutrition*' and '*Biomarkers of Dietary Exposure*'.

During his career, he acted as Dean of Science of Wageningen University being responsible for the quality of academic research and postdoctoral training. Kok has been member of several national and international scientific committees, including director of the European Nutrition Leadership Platform and European Nutrition Leadership Program" in Luxembourg.

What are the impacts on main food categories?

Can Dairy & Yogurt be part of Sustainable Diets? What do we know?

The food system is a major driver of greenhouse gas (GHG) emissions, water and land use. Dietary changes i.e., more plant-based foods and less animal-based foods will provide benefits for both the environment and our health. However, we need to know more about the environmental impacts and health consequences of reducing and/or replacing specific foods or adopting dietary regimens (vegetarian, vegan, flexitarian).

Animal products such as meat, especially beef, and dairy have a higher carbon footprint than most plant products. For estimating the environmental burden, however, it is important to differentiate in the type of meat (beef, pork, chicken) and dairy (milk, cheese, yogurt). Moreover, dietary change towards less GHG intensive diets, should fulfil nutritional requirements, be cultural and social acceptable, and affordable.

To evaluate to what extent food categories can be part of sustainable diets, observational and scenario-based approaches, and modeling/optimization strategies have been used. For the dairy food category, most studies focused on total dairy, rather than milk and cheese (hard and soft), or yogurt per se. Although the evidence base is still scarce, results indicate that dairy plays a moderate role in the contribution to GHG emission: an emerging rank order in global warming potential is beef, other meat (chicken, pork), (hard) cheese, milk, plant products. Daily intake of 1-2 servings of dairy (up to 500 grams of milk or derivative equivalents, e.g. cheese) may fit in sustainable and healthy diets. Yogurt and milk are of special interest, because of their nutrient richness and low fat content, but more studies are necessary to quantify their impact.

Sustainable diets can be composed in different ways. Ideally, current local dietary habits and eating cultures should be the basis for change. In future analyses, we need to increase the evidence base beyond summaries of national case studies by using optimization approaches with individual data on dietary intake. Most probably, convergence guidelines which recommend a reduction and substitution rather than elimination approach may be more effective in increasing dietary transition rates for planetary health.

4 QUESTIONS/ANSWERS

EATING
to protect our health – and our planet

The Yogurt in Nutrition Initiative is looking forward to exploring the links between our diet, our health and our environment. We're bringing you an overview of the scientific debate surrounding these topics.
For the full version of these Questions & Answers visit **www.yogurtinnutrition.com**

What is a sustainable diet and why do we need it?

The most accepted definitions describe a sustainable diet as one that has a low impact on the environment while contributing to a healthy life, with safe and affordable access to food, for everyone both today and in future generations.[1,2] The FAO definition is: "*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.*"[1]

As our global population grows, the pressure on our planet's resources increases. The number of people on Earth is predicted to reach almost 10 billion by 2050[3] – more than our planet can cope with if we persist with our current system. We still have an opportunity to turn the tide towards better health for us and our planet.

What would a more sustainable diet mean for you?

We don't know the whole answer yet. Switching to a sustainable diet is not as straight-forward as it might seem. But several pioneering studies are working towards identifying the diets that meet all the demands of sustainability. For now, scientists have already identified several steps you can take straight away to help both your health and the planet.[4]

1. If you eat too much or waste food – eat less and waste less
2. Eat more fruit, nuts, seeds and vegetables
3. Eat limited amounts of red meat
4. Eat less processed food especially processed meat
5. Limit foods with added sugar and avoid empty calorie foods
6. Eat more locally-produced and seasonal foods

Can yogurt and other dairy products be part of a sustainable diet?

Dairy can play an important role in sustainable diets. Although animal-based foods are associated with higher greenhouse gas emissions than plant-based foods; ruminant animals have the ability to convert non-human edible resources such as grass into nutritious foods for humans.[5,6]

Many studies on sustainable diets include dairy products[7,8,9,10,11], because of their nutrient density, the role that ruminants can play in making use of grass biomass and the role that dairy products play in many current diets.[5,6] Furthermore, on average the production of milk protein releases 5 times less greenhouse gas and uses 6 times less land than the production of protein from a pure beef production unit.[12,13]

Even if dairy protein causes greater emissions than a combination of legumes and cereals, modelling studies find that by retaining dairy products in the diet it's easier to meet nutritional needs of the population than through plant-based foods alone.

What is a flexitarian diet?

Flexitarian diets range from omnivore diets with reduced amounts of meat (e.g. through reduced portion sizes or having meat free days) to vegetarian diets including meat occasionally. Flexitarian diets don't eliminate any food groups, are generally plant-rich (fruits, vegetables, grain, legumes, nuts and seeds) and include modest amounts of meat and various amounts of fish and dairy foods.

Scientists view the flexitarian diet as a flagship of sustainable diets for people all over the world.[8,14]

In flexitarian diets, the high amount of plant-based foods balanced with a moderate intake of dairy products and low amount of meat generally provides an all-round healthy mix of protein, fibre, vitamins, minerals and fatty acids. At the same time, the flexitarian dish tends to contain less fatty or sugary foods, from more environmentally-friendly sources than the average diet in westernised countries.

Recent studies suggest that switching to flexitarian diets could also shrink the carbon footprint and put us well on course for reaching the goals set for 2050 by the Paris climate Agreement, to which 195 countries signed up in 2016.

TO KNOW MORE:
- In the next page we provide you a selection of the different reports and scientific papers that are part of this debate and that we used for this material
- Visit **www.yogurtinnutrition.com** for the full version of these Questions & Answers
- Enjoy the talks and later you will find the video of this symposium in our website

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Want to know more?

Here is our selection of the different reports and scientific papers that are part of this debate.

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