

Abstract

Optimizing the Dutch Adult Diet for 2030 and 2050 for Health and Sustainability, Based on EAT-Lancet Environmental Planetary Boundaries [†]

Corné van Dooren ^{1,*} , Judith Groen ², Carolina Carrillo Diaz ², Lisanne de Weert ², Alessandra C. Grasso ² and Lana Liem ²

¹ WWF-NL, 3708 JB Zeist, The Netherlands

² Blonk Sustainability, 2805 TD Gouda, The Netherlands; carolina@blonksustainability.nl (C.C.D.); lisanne@blonksustainability.nl (L.d.W.); alessandra@blonksustainability.nl (A.C.G.); lana@blonksustainability.nl (L.L.)

* Correspondence: cdooren@wwf.nl

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Abstract: The current Dutch diet fails to meet existing nutritional guidelines, and exceeds the environmental boundaries set for a sustainable food system. We demonstrated that, if there are no changes to the current diet, the Earth system's boundaries will be further exhausted. Therefore, it is of importance to decrease the environmental impact of the Dutch diet while meeting relevant nutritional recommendations. A future planet-based diet for the Netherlands was created using Optimeal[®], a diet optimization software, the most recent food consumption survey, and environmental impact data for the Netherlands (Agri-footprint 6 database) for males and females (18–50 years). The environmental data was adjusted to incorporate forecasted improvements in 2030 and 2050 and to align with the scope of the planetary boundaries defined by the EAT-Lancet commission. The planetary boundaries translated into optimization constraints with a system boundary from cradle-to-processing for five environmental indicators (GHG emissions, blue water use, cropland use, phosphorus application, and surplus nitrogen), and the nutritional constraints were based on the Dutch food-based dietary guidelines. Furthermore, acceptability constraints were placed on food group consumption: 33–150% of current intake. The results show the optimized diets that meet the environmental and nutritional constraints for Dutch males and females in 2030 and 2050. The required changes in intake point towards a reduction in meat, eggs, fats and oils, potatoes and tubers, and sugar and confectionery, and an increase in legumes, nuts and seeds, vegetables, fish, and meat replacers. In the optimized diets, the main source of protein is 64–74% derived from plant-based products, instead of animal-based products, which is the case for the current diet. The optimal diets reduce the impacts on biodiversity loss by 55–84%. Although it contains a substantial change in protein source, the diet remains acceptable for the majority of consumers in this study, and fits within the planetary boundaries. These results contribute to the development of future planet-based dietary guidelines for the Netherlands.

Keywords: healthy diet; planetary boundaries; optimization; food-based dietary guidelines; biodiversity



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