Do Swiss food trends lead to healthier, more nutritious and environmentally friendly diets?

Alba Reguant-Closa[1], Daria Loginova[2], Stefan Mann[2] and Thomas Nemecek[1]

[1]*Agroscope, Life Cycle Assessment Research Group, 8046, Zürich, Switzerland*
[2] *Agroscope, Department of Socioeconomics, 8356, Ettenhausen, Switzerland*

E-mail contact address: alba.reguantclosa@agroscope.admin.ch

1. INTRODUCTION

Production and consumption of food have a considerable environmental impact (Poore & Nemecek, 2018). In addition, dietary consumption influences the health and nutritional status but can change over time due to various socioeconomic factors. The aim of this study was to: 1) evaluate the nutritional, health and environmental (NHE) dimensions of 64 foods commonly consumed by the Swiss population; and 2) assess consumption trends in combination with the NHE dimensions from 1990 since 2017 at food and diet level.

2. METHODS

The nutritional dimension of sixty-four commonly consumed foods was analysed by the Nutrient Rich Food Index 10.3 (NRF10.3), based on the NRF9.3 developed by Fulgoni et al. (2009). To evaluate the health effects of dietary intake, the Health Nutritional Index (HENI) was used (Stylianou et al., 2021). The Swiss food composition database was used to obtain the nutritional composition of the selected foods. The environmental dimension of foods was assessed by LCA using the SALCA method v2.1 (Douziech et al., 2024), and seven impact categories were considered for evaluation: GWP (IPCC 100 years), water scarcity (AWARE), land use (agricultural), eutrophication freshwater, eutrophication marine and ecotoxicity freshwater. To evaluate consumption trends, we used disaggregated agent-based data on Swiss household purchases provided by Swiss Federal Statistical Office for the years 1990, 2000, 2010, 2017 for 6–12 thousand randomly selected participants of the survey (households of Switzerland) each year. The fraction of food wasted (avoidable and unavoidable, was estimated and subtracted (Beretta et al., 2017). Data analysis was performed at food and diet level. For the diet level analysis, a portion of out of home food intake was estimated (Beretta & Hellweg, 2019).

The decreased consumption of all meats except for poultry had a positive nutritional and health impact while decreasing the overall environmental impact due to meat consumption. The increased consumption of pulses increased the nutritional density and health of the Swiss population while having a low to moderate overall environmental impact. Nutritional and health dimensions behave differently for some products, highlighting the importance of reporting both dimensions. Figure 1 shows the NHE dimensions of four selected foods. At diet level, an increase in nutritional density and a decrease in health was observed (see Table 1). A significant different HENI value at year 2000, lead mainly by an increased consumption of nuts, fruits, vegetables and omega-3 fatty acids content of the diet was observed. The environmental dimension varies depending on the impact category considered and clear trends were more difficult to be determined. In general, ecotoxicity freshwater, climate change (GWP) and water scarcity increased, while eutrophication marine, land use agricultural, eutrophication freshwater and acidification terrestrial decreased (Table 1).

4. CONCLUSIONS

A better understanding of the dynamics of the nutritional, health and environmental dimensions as well as consumption trends of foods will help optimize dietary recommendations and identify synergies and trade-offs between dimensions. The next steps of this study are to analyse food groups at product and diet level based on dietary recommendations, and better align production and consumption recommendations with sustainable goals.

5. ACKNOWLEDGEMENTS

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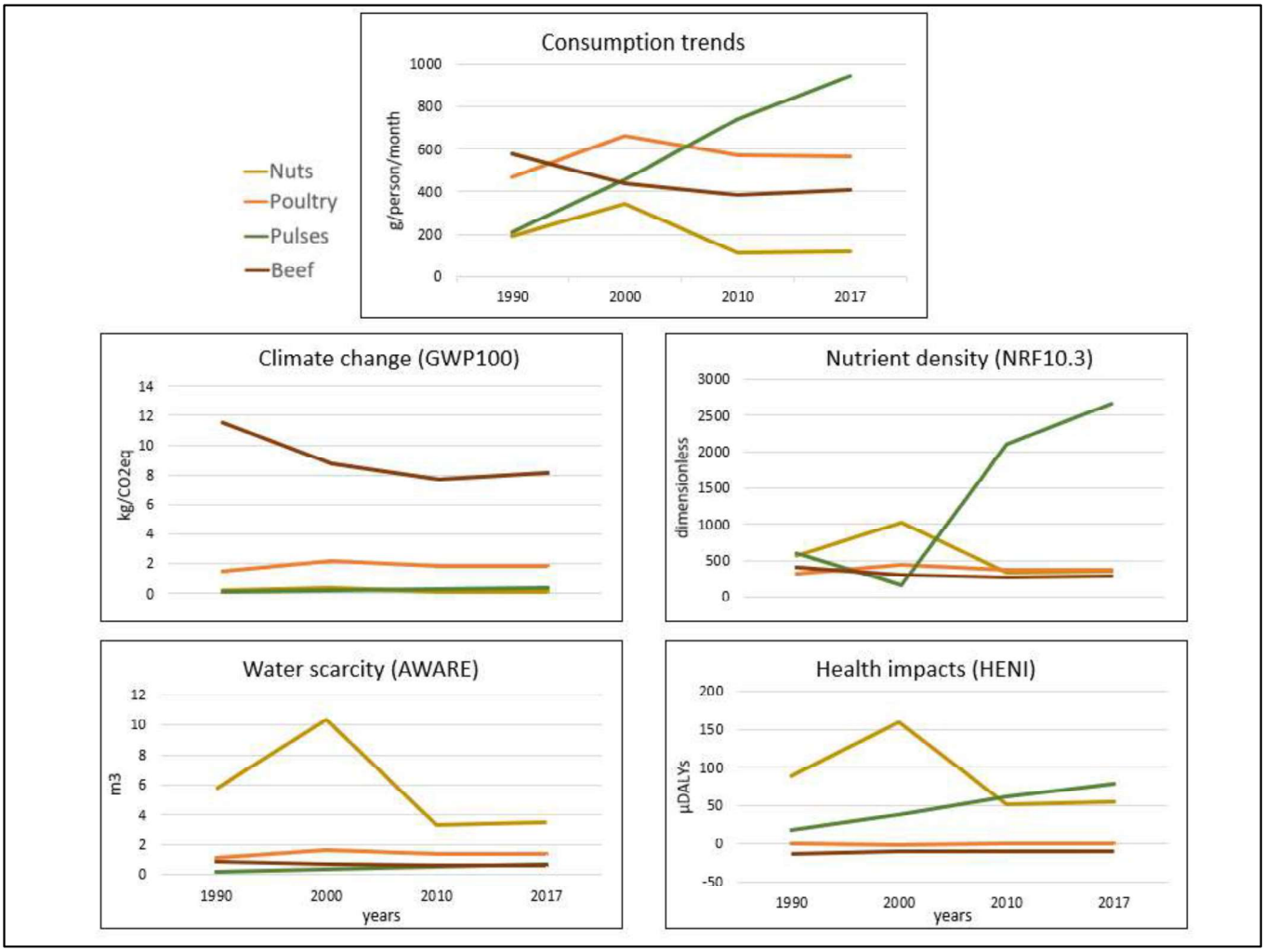

Figure 1. NHE dimensions of selected foods per consumption trends.

Footnote: NRF10.3: Nutrient Rich Food index 10.3; GWP100: Global warming potential 100 years; HENI: Healthy nutritional index; AWARE: available water remaining.

Table 1. *Trends in Nutritional, health and environmental (NHE) scores in 1990 – 2017 at diet level*

year	NR10.3	HENI	AWARE	LO	GWP	EM	EFW	AT	ECFW
1990	7.80	2.11	3.79	4.19	3.50	0.0046	0.0006	0.0370	3538.76
2000	8.20	14.19	4.93	4.56	3.52	0.0050	0.0007	0.0357	1762.69
2010	8.48	1.57	5.05	3.84	4.07	0.0043	0.0007	0.0374	5269.06
2017	8.54	3.25	4.58	3.90	3.94	0.0042	0.0006	0.0353	4487.39

Footnote : Red colour shows worst values; green colour shows better effect. Abbreviations: 1) Ecotoxicity.wP.-.USEtox.-.Freshwater (ECFW); 2) Acidification.-.Terrestrial (AT); 3) Eutrophication.-.Freshwater (EFW); Eutrophication.-.Marine (EM); 4) IPCC.2021.-.GWP100.(fossil.&.LULUC) (GWP); 5) Land.occupation.-.Agricultural (LO); 6) Water.scarcity.-.AWARE (AWARE); 7) Heath Nutritional Index (HENI); 8) Nutrient Rich Food Index 10.3 (NRF10.3).