



Interventions in the food system can lead to surprising effects

The agri-food system is responsible for 30% of all environmental impacts in Switzerland. Two-thirds of the footprint of food consumption occurs abroad, in line with the high proportion of food imported into Switzerland. These are the findings of an NRP 69 research group which described and analysed the Swiss food system using environmental-economic models. To structure the food supply in a sustainable manner, they recommend integrated strategies that cover producers and consumers alike.

Continuing population growth, progressive climate change and ever scarcer resources – a range of trends at home and abroad are challenging the Swiss agri-food system. The interconnections depend on numerous actors who influence the economic and environmental conditions for the Swiss food supply chain. To be able to supply the population with food in a more sustainable manner, it is essential to coordinate agricultural production, the food processing industry, distribution and food consumption with each other.

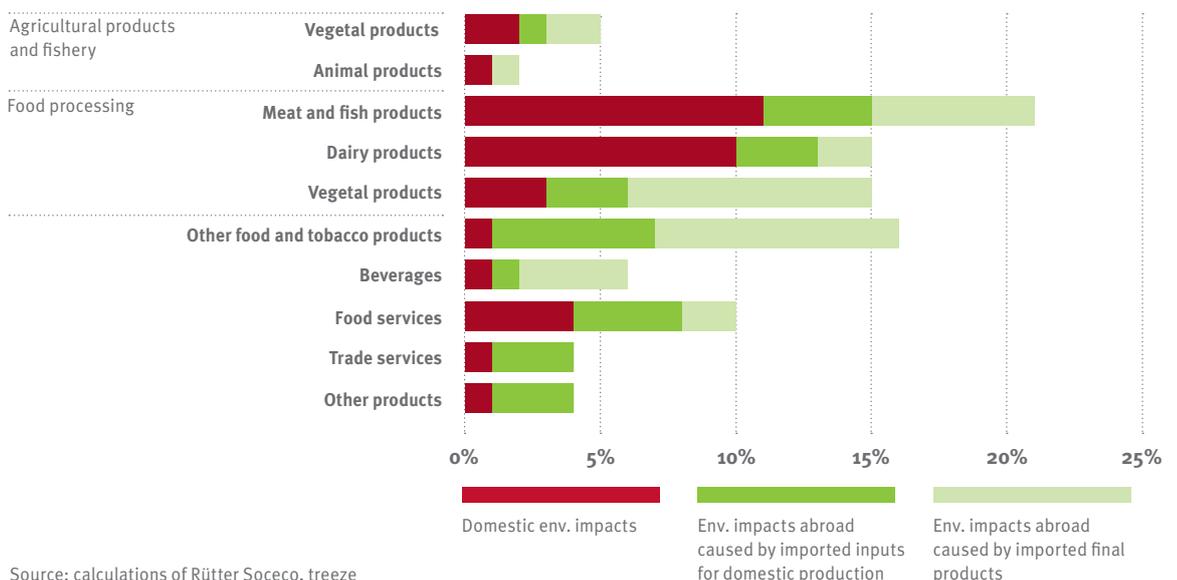
As part of NRP 69, a research group simulated possible trends in the Swiss agri-food system with the aim of creating decision criteria for a more sustainable food system. They applied two

environmental-economic models and looked for synergy and conflicting aims between environmental sustainability and cost-effectiveness. In the first model, the scientists analysed the economic output of the food sector and its consequences for the environment. Using a second model, they tested the long-term effects of possible trends and strategies for modifying the food system.

The analyses in the first model showed that the Swiss agri-food system is placing an above-average burden on the environment. The sector, which includes agricultural production, the food processing industry, trading, sales and consumption, accounts for just under 7% of gross value

Environmental impact of food consumption by product group

Animal products are responsible for at least 40% of the environmental impact of food consumption. Producing and processing plant-based foods accounts for at least a quarter of the harmful environmental consequences. Around two thirds of the footprint resulting from Swiss food consumption occurs abroad, the last third occurring domestically.



added, and employs around 12% of economically active people in Switzerland. In total, the agri-food system accounts for 30% of the environmental impact and 17% of greenhouse gas emissions in Switzerland. A comparison of sub-sectors shows that the added value of agriculture is low, while this sector accounts for the majority of the environmental impact. Manufacturing meat and dairy products places a heavy burden on the environment, in part because these areas emit the most greenhouse gases. Crop cultivation affects the environment mainly through its considerable usage of soil and water. In contrast, the environmental impact of the food processing industry, trade and distribution is relatively low, although these sectors generate the majority of the economic value added. The researchers also showed that around two-thirds of the environmental footprint of Swiss food consumption accrues abroad. This is primarily because a lot of food, feedstuffs and raw materials are produced in other countries and then imported into Switzerland.

In the second model, the researchers investigated the susceptibility of the Swiss food system to possible trends between now and 2050. They analysed the impact of rapid climate change with drastic falls in domestic harvests, pronounced population growth (11.3 million inhabitants in 2050), the consequences of limited food and resource imports as well as of high oil and energy prices. The model showed that crop cultivation in Switzerland is more susceptible to climate change than to pronounced population growth. Import restrictions would also place crop cultivation under severe pressure. If the quantities of raw materials from abroad were limited, animal production in Switzerland would become more profitable than crop production, with the latter losing its competitive edge. However, higher energy prices

Further information:
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Findings form basis for second research phase

The findings of the “Sustainable agri-food system” project are being used as basis for research in the second phase of NRP 69. The follow-on project “Diets of the future” intends to provide concrete recommendations for players in the Swiss food system. The research group is collaborating with the Swiss Society for Nutrition in this work.

would have the opposite effect – animal production would become less profitable than cultivating crops.

Finally, the research group modelled the consequences of various strategies for modifying the current food system. Amongst other things, they investigated the consequences of significantly lower meat consumption, replacing meat in one scenario with more dairy products, and in another scenario with exclusively vegan foodstuffs. In the vegan model, the number of animals fell in parallel with meat consumption. However, replacing meat with dairy products based on the same form of livestock rearing leads to a greater number of cows overall. This effect stems from the biological link between dairy and meat production, because more calves have to be reared to cover the additional demand for milk. This example and the overall work of the researchers show that certain interventions in the food system can lead to unexpected and even surprising effects.

Recommendation

Holistic perspective needed

Certain political interventions relating to livestock farming or to the imports of intermediate products, such as animal feed, could reduce the environmental impact that results from food consumption most efficiently. However, the environmental-economic modelling carried out in the project has shown that certain interventions may produce surprising effects. The researchers recommend that strategies to promote more sustainable food supply systems should be

applied in an integrated manner. This means that interventions must involve a number of different areas, particularly farming, food consumption and public health. Moreover, these measures should be coordinated. Strategies dealing with food consumption, for example, should be accompanied by production-level measures and vice versa. Only in this way will it be possible to accommodate both the environmental and the economic dimensions of the agri-food system.