

The beef landscape in Switzerland*

Policy recommendations for its consumption reduction

Lucca Zachmann

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Abstract

Beef meat consumption is high in Switzerland and has been growing in the last years. International trade has contributed to this unfavourable trend. A high beef consumption is having severe adverse effects on human and planetary health. This paper argues that the price of beef needs to be increased through import tariffs on beef imports and taxation on domestically produced beef. Only a higher price of beef will more likely trigger a shift to animal-based proteins. Direct consumption of animal-based proteins needs to be advertised and incentivised and technological advancements that aim at producing alternative meat forms should be subsidised.

*. This research paper acts as the final assessment of the course *Food and Sustainability* taught by Prof. Colin Sage in April 2019 at the University of Gastronomic Sciences in Pollenzo, Italy.

1 Introduction

Contemporaneous dietary preferences and production practices are challenging ecosystems and are propelling climate change. A high meat consumption, particularly in the industrialised world, and its resulting large-scale and intensive production are major drivers of the environmental degradation. The availability of cheap products through international and market dominated trade are making imports attractive, which – in most cases – strain the environment more than local production due to transportation emissions and energy consumption from refrigeration. This short research paper therefore looks at imports of beef meat in Switzerland and advances three policy adjustments to guide beef consumption into a more sustainable (and healthy) direction.

Assessing the impact of meat production on the environment is complex. Grass-fed cattle lives longer and therefore releases more methane compared to animal-protein fed cattle. Yet, a wide range of scientific studies agree that animal husbandry is an inefficient protein and energy source that comes at high environmental costs. It is highly inefficient to feed animals with plant-based proteins and consume their meat instead of consuming the plant-based proteins in the first place. Poore et al. (2018) find that animal husbandry uses approximately 83% of the world's farmland while only providing 37% of our protein and 18% of our calories. Particularly beef takes an alarming position: 50 kg CO₂eq are on average expelled to produce 100g of protein. Beef meat is by far the worst animal protein in terms of environmental degradation. This is not only due to greenhouse gas (GHG) emissions but also due to acidification, eutrophication and land use.¹ Sage (2011) notes that livestock contributes principally through methane and nitrous oxide emissions to around 18% of the global warming effect.² Additionally, carbon dioxide emissions from energy requirements of farms and feed production as well as carbon storage potential foregone on land appropriated for raising livestock harm the environment.³ The adverse effect of beef consumption on the planet is further amplified if the meat is imported from far away. The net trade balance, i.e the subtraction of exports from imported foods, is the second largest contributor to GHG emissions after primary food production in the UK.⁴ Although the majority of meat is eaten from domestic production, meat exports haven been growing globally over the last years. Caro et al. (2014) assessed 237 countries and found that GHG emissions from meat traded across borders have risen on average by 19% in the past 20 years.⁵

1. J. Poore and T. Nemecek, "Reducing food's environmental impacts through producers and consumers," *Science* 360, no. 6392 (2018).

2. Colin Sage, *Environment and Food* (Routledge, 2011).

3. Susan Subak, "Global environmental costs of beef production," *Ecological Economics* 30, no. 1 (1999).

4. Sage, *Environment and Food*.

5. Dario Caro et al., "CH₄ and N₂O emissions embodied in international trade of meat," *Environmental*

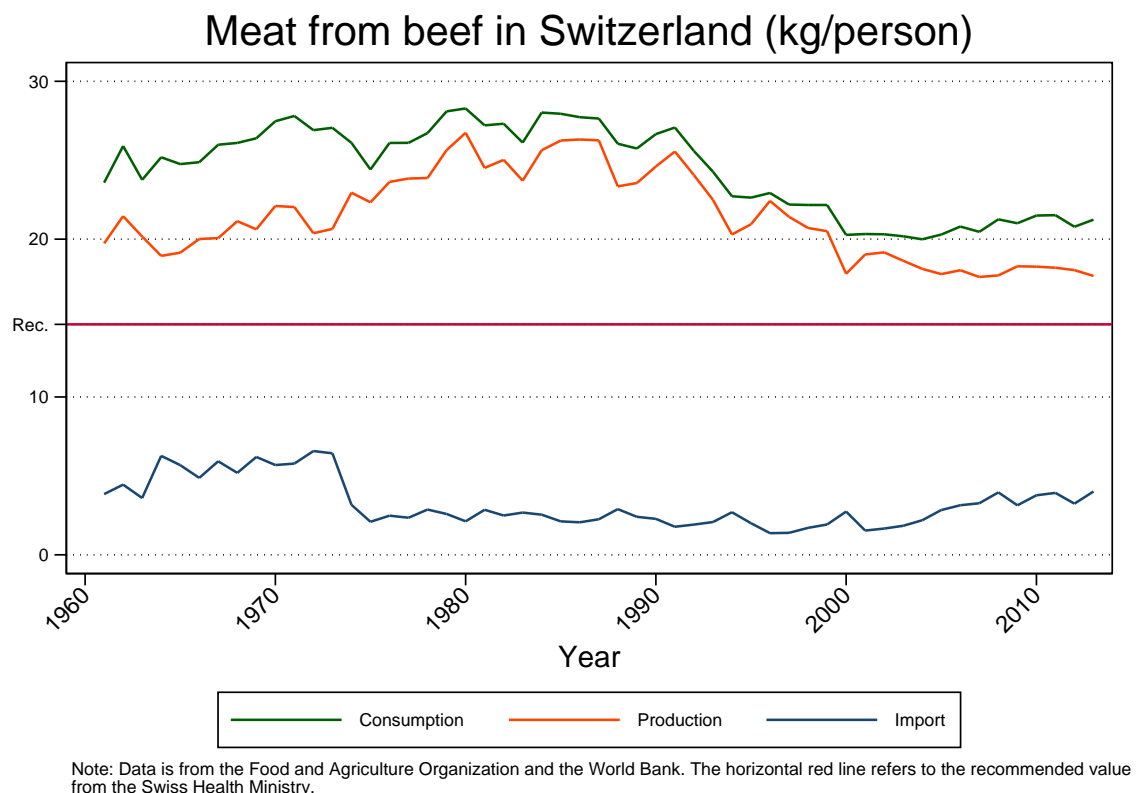


Figure 1: Swiss beef consumption, production and import

Alongside the environmental costs of beef production stand adverse health effects of excessive red meat consumption. Nutritional research has generated a body of scientific evidence that demonstrates susceptibility of cardiovascular diseases due to high animal fat consumption and an increased likelihood of cancer due to disproportionate animal protein consumption.⁶ As a result, health ministries around the world have proclaimed recommended consumption values.

2 Beef landscape in Switzerland

Despite negative health and environmental effects, beef consumption per capita⁷ remains high in Switzerland, as shown in Figure 1. It stands well above the recommended per capita value of 14.6 kg per year from the Swiss Health Ministry.⁸ While the consumption (and production) per capita in Switzerland increased from 23.5 to 27.0 kg from 1960 to 1991, it thereafter decreased steadily to 19.9 kg in 2004. Since 2004, beef consumption per capita has slightly increased – due to increased imports since domestic production has marginally decreased since 2000 – and stands at 21.2 kg in 2013. Switzerland’s self-sufficiency rate of

Research Letters 9, no. 11 (2014).

6. Evelyn Battaglia Richi et al., “Health Risks Associated with Meat Consumption: A Review of Epidemiological Studies,” *International Journal for Vitamin and Nutrition Research* 85, nos. 1-2 (2015).

7. Consumption per capita is calculated as the total domestic production per capita minus exports per capita plus imports per capita.

8. Bundesamt für Lebensmittelsicherheit und Veterinärwesen BLV, *Fleischkonsum in der Schweiz 2014/15*, technical report (2017).

producing beef is high and stands at 83.0% in 2013. The rising imports since 2000, although relatively small in magnitude, call for further investigation.

2.1 Beef imports

Based on data⁹ from the Swiss Customs Agency, Table 1 reports for the years 2012/13 that the majority of the increased imports are due to fresh or chilled products. 38'468.5 tons of fresh or chilled meat – that is 86.2% of total beef imports – were imported in 2012/13. Live cattle intended for slaughtering is with 2'631.4 tons the second largest (5.9% from total) and frozen meat with 2'349.6 tons the third largest import category (5.3% from total). Salted and preserved meats from beef depict small import volumes.

Beef type		Overall imports		Regional shares (%)				
		Tons	%	EU	UK	Americas	Oceania	Others
1	Fresh or chilled meat	38468.5	86.2	62.3	10.6	20.1	3.5	3.5
2	Live cattle for slaughtering	2631.4	5.9	100.0	0.0	0.0	0.0	0.0
3	Frozen meat	2349.6	5.3	4.0	10.9	77.0	2.1	5.9
4	Salted meat	811.9	1.8	76.9	2.1	21.0	0.0	0.0
5	Preserved meat	374.4	0.8	4.2	0.0	95.8	0.0	0.0

Notes: Data is for 2012 and 2013 from the Swiss Customs Agency. *EU* refers to the countries of the European Union as per 2013, *UK* to the United Kingdom and Ireland, *Americas* to countries from North, Central and South America, *Oceania* to Australia and New Zealand and *Others* to the remainder.

Table 1: Import volumes, shares and regions of origin per product type

Most fresh or chilled beef comes from the European Union (62.3%), the Americas (20.1%) and the UK (10.6%; particularly from Ireland). Live cattle is exclusively imported from the EU. The majority of frozen and preserved meat comes from the Americas.

Due to the dominance of fresh and chilled beef imports, Table 2 concentrates only on these and shows region of origin, import price and import mode. The EU, with 62.3% the largest fresh or chilled beef importer as seen in Table 1, features with 4.2 CHF/kg the lowest median

Region		Import price (CHF/kg)	Transportation shares (%)			
			Truck	Plane	Train	Boat
1	EU	4.2	100.0	0.0	0.0	0.0
2	Americas	17.2	78.1	20.6	1.1	0.1
3	UK	10.6	100.0	0.0	0.0	0.0
4	Other	4.3	100.0	0.0	0.0	0.0
5	Oceania	23.6	21.9	78.1	0.0	0.0

Notes: Data is for 2012 and 2013 from the Swiss Customs Agency. Import price is the median price in CHF per kg of imported fresh or chilled beef. Truck, plane, train and boat are divisions of the import volume by the respective transportation mode.

Table 2: Fresh beef import origins, modes and prices

9. The confidential import data come from the Swiss Customs Agency for the years 2012/13, i.e. the last two years in Figure 1. The dataset records for every shipping that enters Switzerland the country of origin, volume and value of the shipping, HS 8-digit product classification and the transportation mode, amongst other things.

import price. Import prices are not retail prices but customs values. EU imports are exclusively undertaken by road. Fresh or chilled beef that comes from far away, i.e. the Americas or Oceania is considerably more expensive (17.2 CHF/kg or 23.6 CHF/kg, respectively) and comes by plane (20.6% or 78.1%) or by boat to a major European port and enters Switzerland via road (78.1% or 21.9%). These long-haul imports strain the environment additionally due to nautic or aerial transportation. Beef from the UK comes by truck and is medium priced (10.6 CHF/kg).

2.2 Animal feed

According to the Federal Statistical Office, more than three quarters of domestically produced beef is fed by grass, hay, green maize and root crops.¹⁰ Yet, a large volume of protein rich leguminous vegetables are imported to feed animals. Table 3 lists import volumes and shares as well as shares per region of origin for five important plant-based proteins. It becomes apparent that imports of beans, lentils and chickpeas are exclusively used for human consumption. This stands in contrast with peas and soya beans of which 88.7% and 85.7% are respectively imported to feed animals.

Table 3 makes clear that peas for animal feeding come from the EU, particularly from France and Germany. Roughly half of the imported soya for animal feeding (56.5%) comes from the EU, the Americas and Others (mostly China) are responsible for the remainder of soya imports for animal feeding. France is an interesting case as it imports 40.8% of soya for animal feeding. However, France does not export soya for human consumption. Instead, soya for human consumption comes from China, Austria and Canada.

3 Policy implications

The many numbers presented in the previous section provide a sound basis for policy adjustment recommendations. The objective of Swiss food policy should be a reduction of beef consumption overall due to adverse environmental and health effects. Figure 2 displays the proposed policy adjustments by means of a systems diagram. Different actors are identified through different colours: State, private companies, trading partner, households and the society. The state can influence with its food policy (1) production technologies (4) and production volumes (5) and through its import policy (3) the availability of beef and animal feed (8). Furthermore, the state can influence consumption or buying decisions through education

10. Federal Statistical Office, *Swiss Agriculture: Pocket Statistics 2015*, technical report (2015).

Legume type	Overall imports		Regional shares (%)			
	Tons	%	EU	Oceania	Others	Americas
Beans						
Animal feeding	6.1	0.1	0.8	57.9	41.3	0.0
Human consumption	8585.1	99.9	19.8	0.0	80.1	0.0
Chickpeas						
Animal feeding	0.0	0.0	0.0	0.0	0.0	0.0
Human consumption	1587.4	100.0	38.6	0.1	37.7	23.6
Lentils						
Animal feeding	0.0	0.0	0.0	0.0	0.0	0.0
Human consumption	3666.8	100.0	20.9	0.0	31.4	47.7
Peas						
Animal feeding	22830.8	88.7	97.6	0.0	2.4	0.0
Human consumption	2900.9	11.3	70.4	0.4	26.7	2.5
Soya						
Animal feeding	25337.1	85.7	56.5	0.0	33.8	9.7
Human consumption	4220.8	14.3	48.7	0.0	28.6	22.8

Notes: Data is for 2012 and 2013 from the Swiss Customs Agency. There are no imports recorded from the UK.

Table 3: Leguminous vegetable imports per usage type

(2). Most R&D companies¹¹ (4), all production facilities (5), domestic (8) and foreign (9) feed providers, foreign producers (10) and corporate buyers¹² (7) are profit driven and therefore sensitive to price changes. Trends (9) such as alternative diets and the eating culture (10), i.e. a proper meal needs a piece of meat, are embedded in society and influence the buying decision.

The following subsections discuss three policies that the state should undertake to reduce beef consumption.

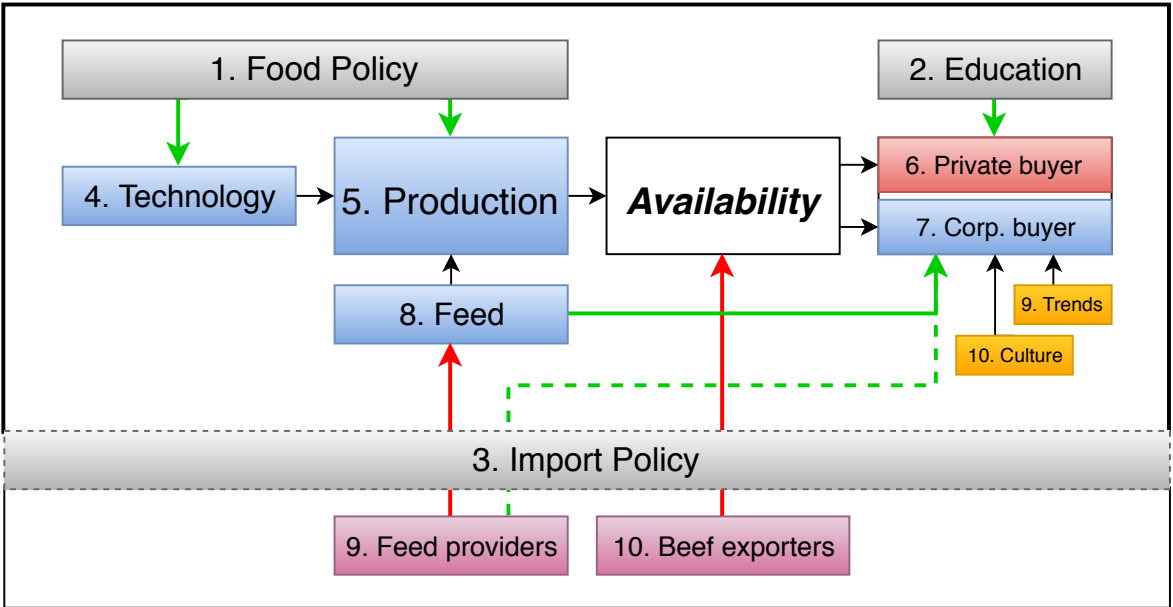


Figure 2: Systems diagram of policy adjustments

11. There are non-profit organisation that research on alternative beef forms such as The Good Food Institute or Universities but also profit driven enterprises such as Memphis Meats or MosaMeat.

12. Corporate buyers are hospitals, schools, canteens, etc.

3.1 Import tariffs

The state should increase through its import policy (3) tariff barriers and non-tariff barriers on imported beef products to increase their retail price and ultimately reduce their availability. Beef imports are attractive because of their cheap import price (4.2 CHF/kg). Beef imports that are not produced under Swiss regulations are harder to monitor and strain the environment even more due to longer transportation (i.e air freight that releases CO₂ directly into the atmosphere or the release of refrigerator gases¹³). Additionally, longer transportation exposes fresh or chilled meat to a greater risk of spoilage. To increase the price of beef in Switzerland in general, the state should impose a tax on domestic beef production that is particularly high for plant-protein fed beef. Additionally, tariffs should be increased on imported and edible animal feed such as peas and soya. Tariffs on these leguminous vegetable proteins should be reduced if they are intended for direct consumption and domestic production is infeasible. In such cases, neighbouring trading partners should be favoured.

3.2 Direct consumption

It is highly inefficient to feed methane releasing animals with proteins that humans could eat in the first place. Table 3 demonstrated that imported peas and soya are more used as animal feed than as human food. This should be changed. Therefore, the domestic production of leguminous vegetable proteins, within productive capabilities, should be subsidised by the state if they are intended for direct consumption. This shift, from animal proteins to vegetable proteins, needs to be supported by educative practices by the state (2), changes in the eating culture (10) and trends in society¹⁴ (9).

3.3 Technological advancements

Ultimately, the state should incentivise alternative meat production through subsidies targeted at R&D companies that work in the promising field of cultured meat. Cultured meat or in vitro meat is in an early stage and aims at "deliver[ing] products traditionally made through livestock rearing in novel forms that require no, or significantly reduced, animal involvement."¹⁵ Through reduced animal involvement, the ecological footprint of beef production could drastically be downsized. At question remains how ethical 'beef' produced in a laboratory is and how it will be received by consumers. Additionally, health concerns are not addressed with this policy adjustment.

13. Sage, *Environment and Food*.

14. For instance through food influencer in social media or celebrity chefs.

15. Neil Stephens et al., "Bringing cultured meat to market: Technical, socio-political, and regulatory challenges in cellular agriculture," *Trends in Food Science & Technology* 78 (2018): p. 1.

4 Conclusions

Beef consumption is high in Switzerland and this is having severe adverse effects on human and planetary health. It is a no-brainer that meat consumption needs to be reduced. A sound starting point is to cut down imports, that have recently increased, because the state has direct control over the import policy. Beef imports strain the environment additionally due to long transportation and are produced under non-controllable foreign agricultural policies. By eliminating cheap beef imports and increasing the price of domestically produced beef through taxation, consumers might start to question the need of beef products in their diets. In a next step, alternative protein sources, plant-based or cultured meat, should be incentivised by the state through education and subsidies. By making a statement as the first country to impose clear measures to reduce conventional beef meat consumption, Switzerland can shine as a role model and usher a global post-meat era.