

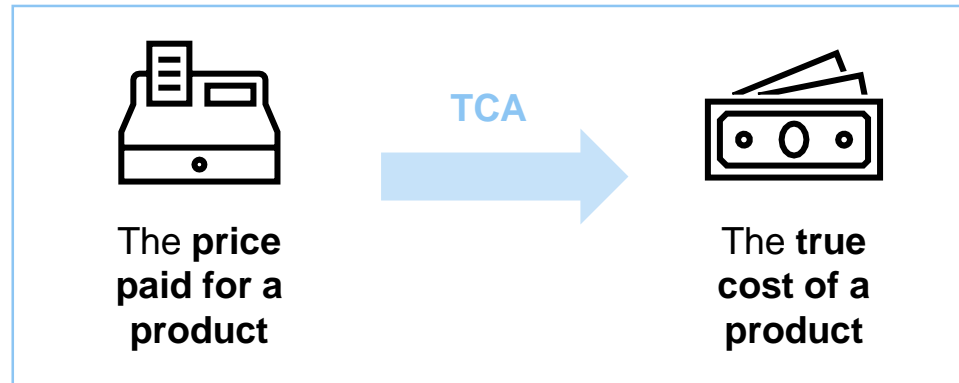


# Moving Towards a Sustainable Swiss Food System: An Estimation of the True Cost of Food in Switzerland and Implications for Stakeholders

**Master Thesis Presentation** February 5<sup>th</sup>, 2021  
Future Food Symposium

# What is the true cost of food?

- **All costs** generated by a product over its life cycle
- Derived by accounting “**for all external costs – including environmental, social and economic – generated by the creation of a product**”<sup>1</sup> (true cost accounting (TCA))
  - External costs (externalities) are currently not included in food prices, e.g. GHG emissions, pollution (air, water, soil), human health impacts, social externalities



<sup>1</sup> Food Tank

# Four main questions to be answered today

- 1) **Why is it important** to understand the true cost of food?
- 2) **How can you approximate** the true cost of food?
- 3) **In which magnitude** do first results lie?
- 4) What can we conclude from these numbers and **how should we proceed?**

1) Why is it important to understand the true cost of food?

# The current food system is not sustainable



It is one of the major contributors to climate change, and also one of the sectors to be most affected by it



Agriculture is one of the main drivers of biodiversity and ecosystem service loss



Unhealthy diets cause rising public health costs worldwide, especially due to the increase of NCDs<sup>1</sup>



Farmers and food system workers are often those most affected by poverty and food insecurity



Tax payers support food systems that do not enable sustainable development



Intensive animal production systems significantly affect animal welfare



- Externalities of the current food system are **not accounted for in food prices**, despite significantly stalling sustainable development
- Growing demand for resource-intense and unhealthy diets will **further increase these impacts and the costs they cause (leading to decreased food system resilience)**

<sup>1</sup> Non-communicable diseases (cardiovascular diseases, cancer, diabetes etc.)

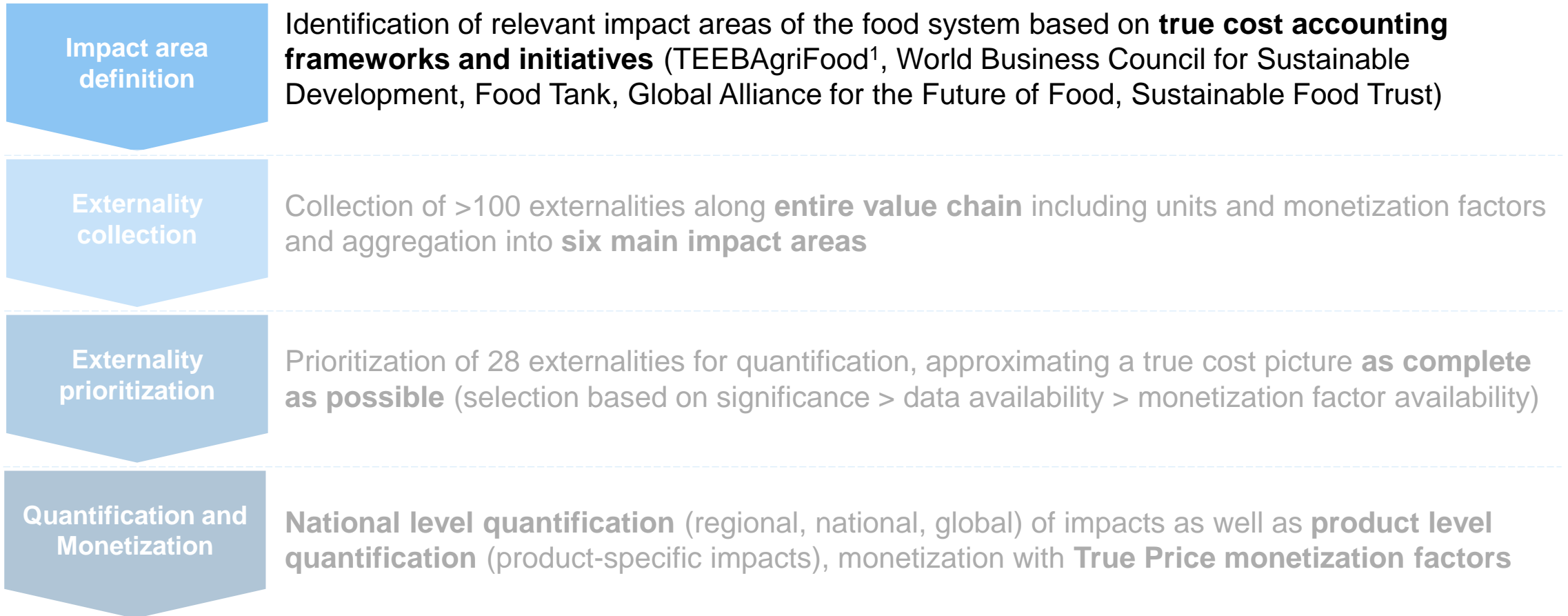
# Building a standard for the true cost of food

**What we know today:** in-depth quantification of selected externalities (mostly environmental), only rarely in CHF

**What is missing:** a holistic methodology and overview of relevant impacts across the entire value chain, also in CHF

2) How can you approximate the true cost of food?

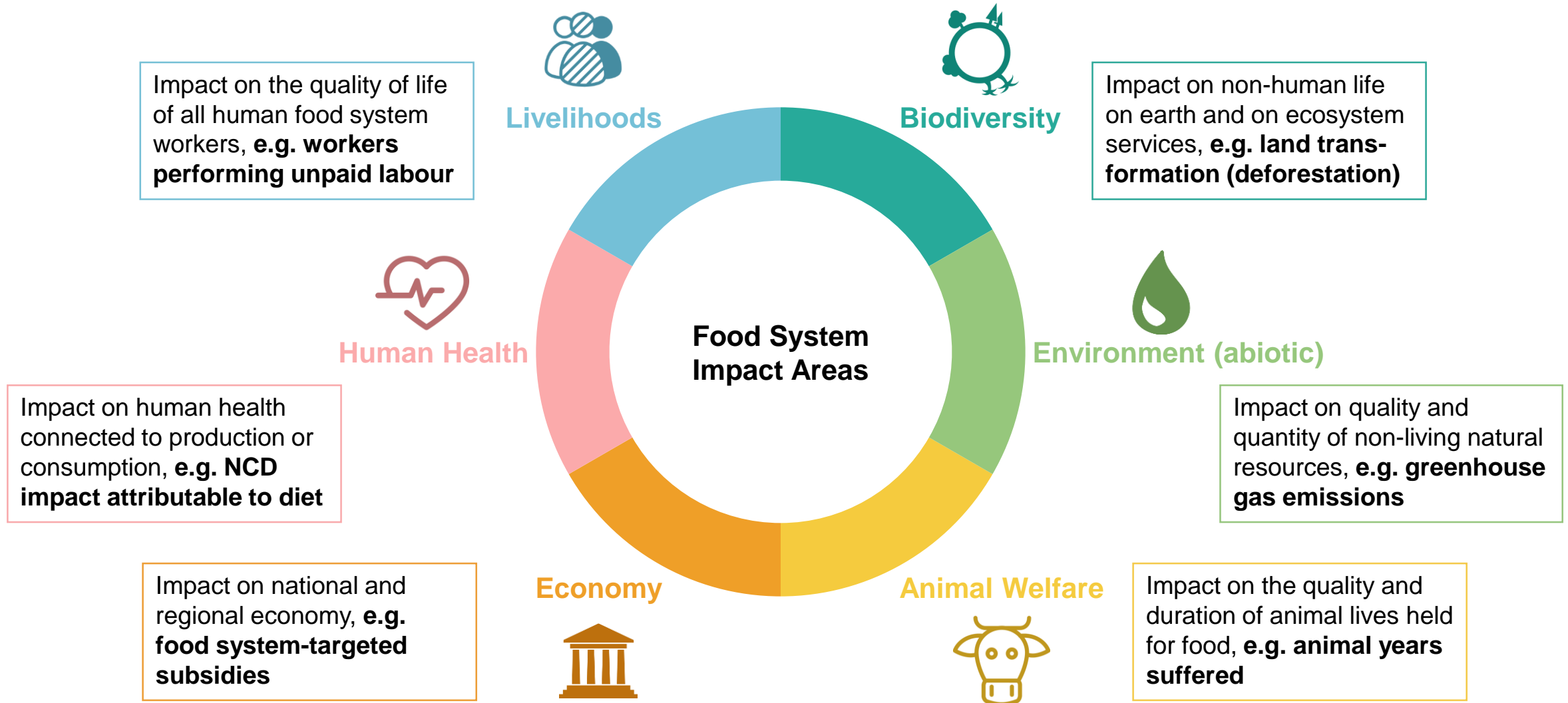
# Methodology defined for true cost approximation



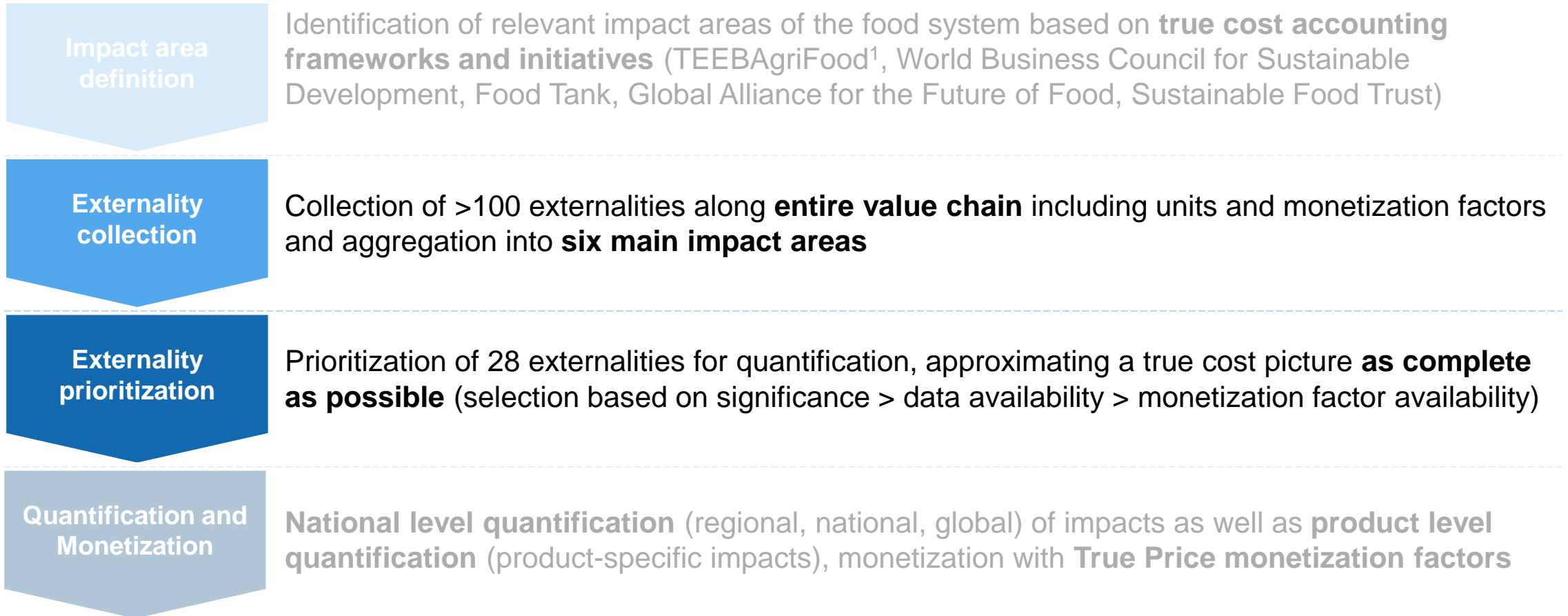
<sup>1</sup> The Economics of Ecosystems & Biodiversity for Agriculture and Food



# Six main impact areas of the food system and their definition



# Methodology defined for true cost approximation



<sup>1</sup> The Economics of Ecosystems & Biodiversity for Agriculture and Food

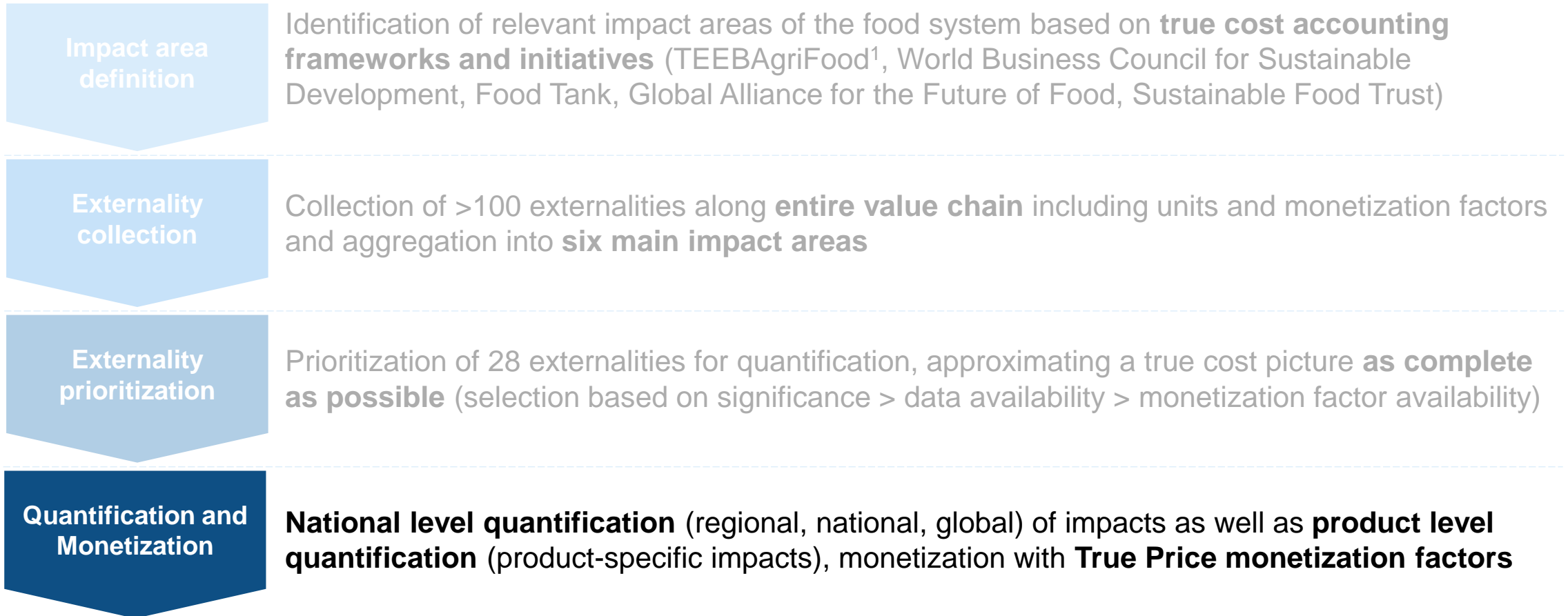
# Thesis prioritizes 28 of >100 collected externalities for national and product level true cost of food estimate

ID	Impact Area	Impact Category	Topic	Externality	Unit	# of externalities selected for prioritization <sup>1</sup>
Env1	Environment (abiotic)	Contribution to climate change	Energy and non-energy sources (GHGs)	Greenhouse gas emissions	kg CO2 eq	7/13
Env2	Environment (abiotic)	Pollution of the living environment	Air pollution	Acidification	kg SO2 eq	
Env3	Environment (abiotic)	Degradation of land	Soil degradation	Soil loss from water erosion	kg soil lost	
Env4	Environment (abiotic)	Degradation of land	Soil degradation	Soil organic carbon loss	kg SOC	
Env5	Environment (abiotic)	Depletion of scarce abiotic resources	Fossil fuel depletion	Fossil fuel depletion	kg oil-eq	
Env6	Environment (abiotic)	Depletion of scarce abiotic resources	(Other) non-renewable material depletion	(Other) non-renewable material depletion	kg Cu-eq	
Env7	Environment (abiotic)	Depletion of scarce abiotic resources	Scarce water use	Scarce water use (blue water)	m3	
Bio8	Biodiversity	Pollution of the living environment	Air, water and soil pollution	Terrestrial ecotoxicity	kg 1,4-DB eq	7/13
Bio9	Biodiversity	Pollution of the living environment	Air, water and soil pollution	Freshwater ecotoxicity	kg 1,4-DB eq	
Bio10	Biodiversity	Pollution of the living environment	Air, water and soil pollution	Marine ecotoxicity	kg 1,4-DB eq	
Bio11	Biodiversity	Pollution of the living environment	Water pollution	Freshwater eutrophication	kg P-eq to freshwater	
Bio12	Biodiversity	Pollution of the living environment	Water pollution	Marine eutrophication	kg N-eq to marine water	
Bio13	Biodiversity	Degradation of biodiversity and ecosystems	Land occupation (part of land-use change)	Land occupation	MSA ha*yr	
Bio14	Biodiversity	Degradation of biodiversity and ecosystems	Land transformation (part of land-use change)	Land transformation	ha	
Liv15	Livelihoods	Labour	Free labour	Unpaid labour (work-related)	FTE	3/53
Liv16	Livelihoods	Non-guarantee of a decent living standard	Lack of social security	Workers with insufficient social security	\$	
Liv17	Livelihoods	Occupational health and safety risks	Negative effects of employee health & safety	Exposure to pesticides	DALYs	
Hum18	Human Health	Environmental human health impacts	Air pollution	Human toxicity (air pollution)	DALYs	8/18
Hum19	Human Health	Personal health impact attributable to diet	Malnutrition due to insufficient food diversity	Health impact of malnutrition	DALYs	
Hum20	Human Health	Personal health impact attributable to diet	Overweight and obesity attributable to diet	Health impact of overweight and obesity	DALYs	
Hum21	Human Health	Personal health impact attributable to diet	Hypertension attributable to diet	Health impact of hypertension	DALYs	
Hum22	Human Health	Personal health impact attributable to diet	Non-communicable diseases attributable to diet	Health impact of non-communicable diseases	DALYs	
Hum23	Human Health	Personal health impact attributable to diet	Food poisoning	Health impact of food poisoning	DALYs	
Hum24	Human Health	Personal health impact attributable to diet	Pesticide exposure (consumer)	Health impact of pesticide exposure	DALYs	
Hum25	Human Health	Public health threats from livestock production	Public health threats	Health impact of antibiotic use	DALYs	
Eco26	Economy	Additional spending through taxes	Subsidies	Taxes for food system-targeted subsidies	\$	2/6
Eco27	Economy	Additional spending through taxes	Regulation and research	Taxes for regulation and research	\$	
Ani28	Animal welfare	Animal welfare	Animal suffering	Animal years suffered	ALYS	1/1

<sup>1</sup> Externalities prioritised based on significance, data availability and data accessibility

**Total 28 / 104**

# Methodology defined for true cost approximation

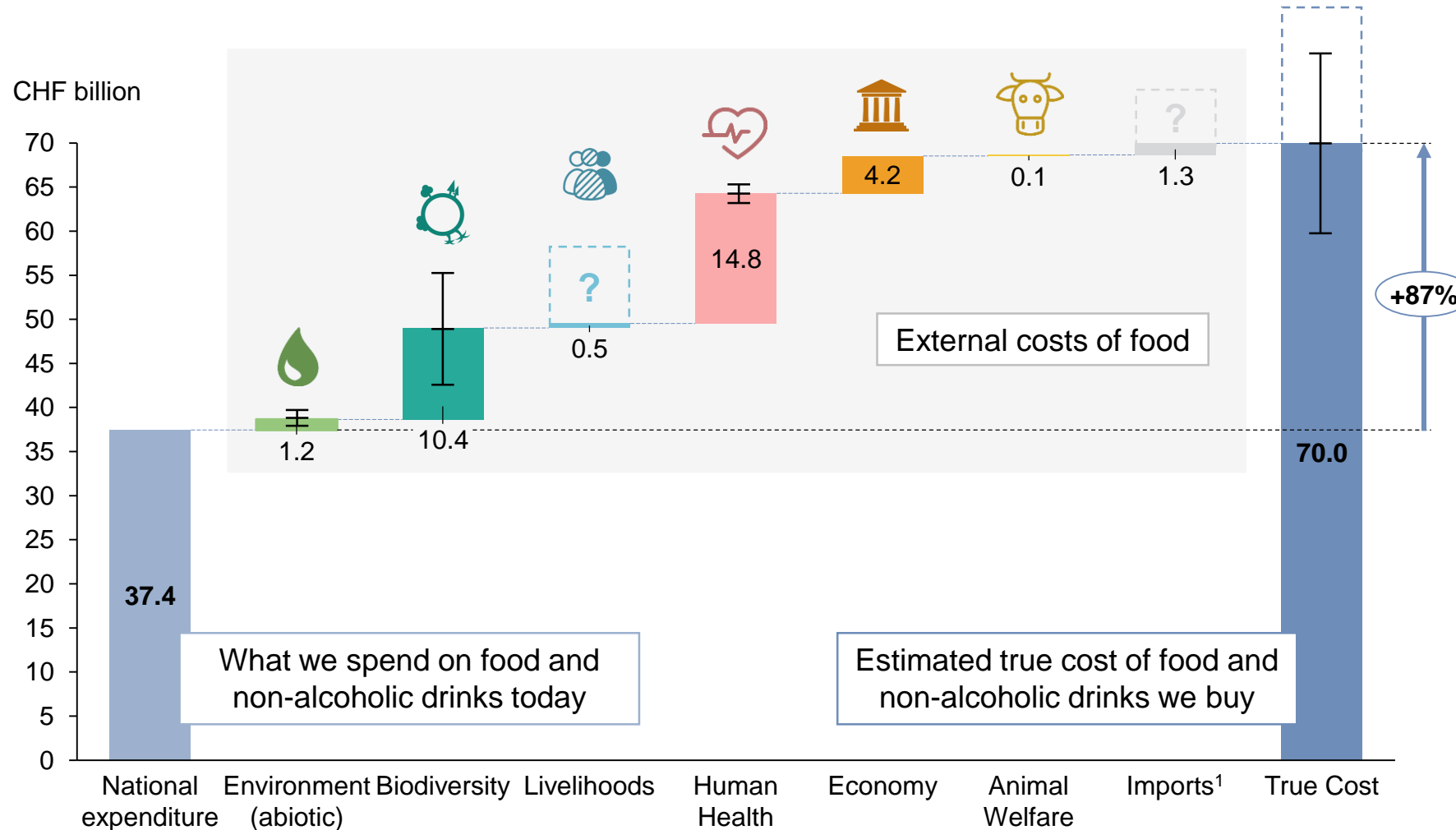


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3) In which magnitude do first results lie?

# National level true cost estimate at 1.87 (1.61-2.12) CHF per CHF spent (2018), showing Swiss food system is not sustainable

⊖ Min, mean, max estimate  
 [?] Lack of data

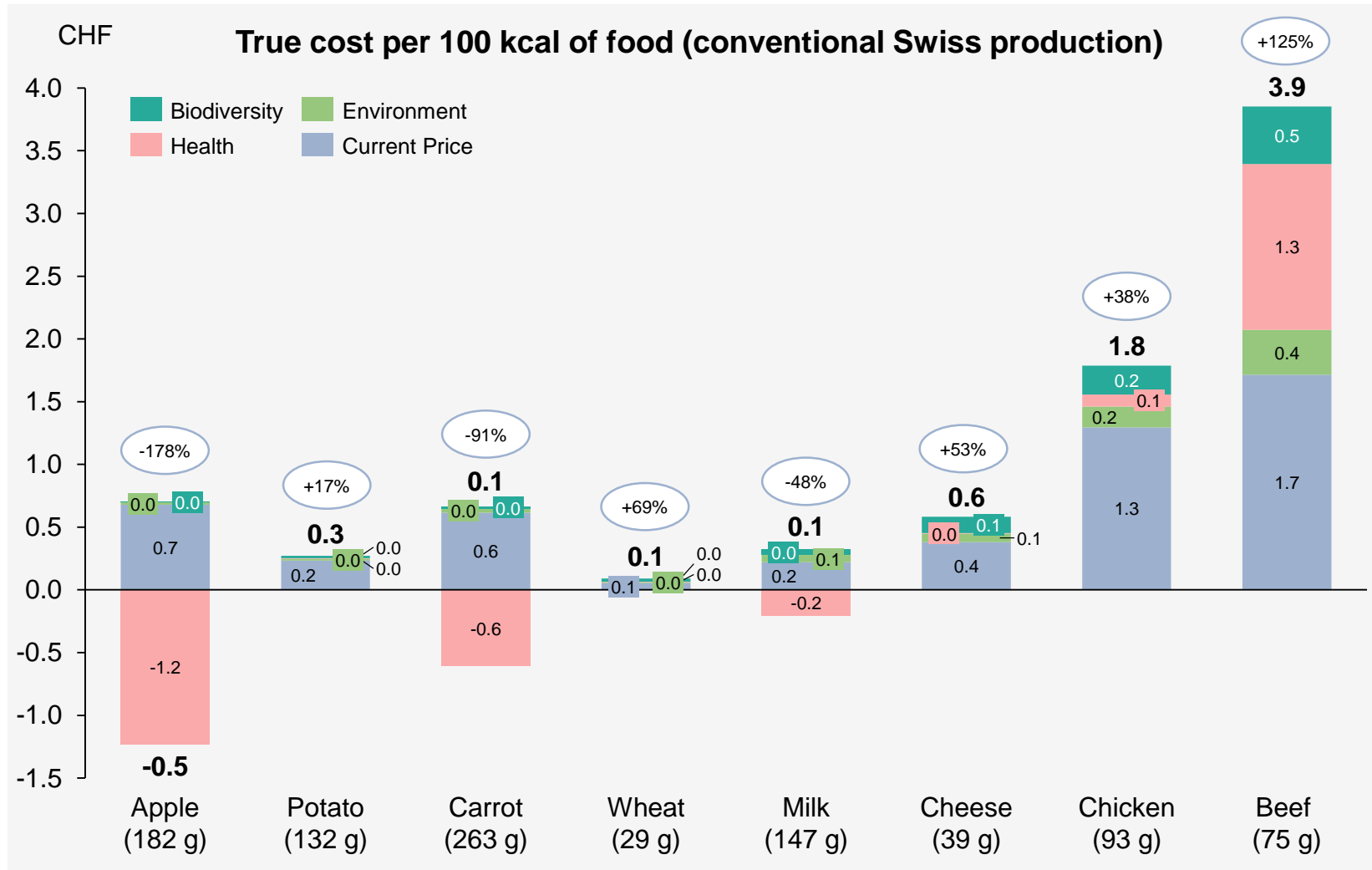


- **20 of 28** prioritized externalities quantified
- External costs estimated at **32 billion CHF in 2018**
- Current food system causes high external costs, **driven by biodiversity and human health costs**
- Real true costs likely higher due to **limited data availability and accessibility** (especially in terms of livelihood costs)
- External costs of **imports also likely to be underestimated**

<sup>1</sup> Approximated by applying Swiss production-related external costs per CHF of locally produced food (0.39 CHF/CHF) to difference between the 2018 import (12.8 billion CHF) and export value (9.4 billion CHF), 3.4 billion CHF

# Product level true cost estimates indicate need for reconsideration of current production and consumption practices, particularly beef

Difference between true cost and retail price (x%)



- **12 of 28** prioritized externalities quantified
- External costs of Swiss food system likely partially **driven by the high intake of red meat** (exceeds recommended intake for health by factor 3)
- Some products have a **lower or negative true cost due to their health benefit**
- **More data is needed** on other impact areas, other products such as fish, legumes and on differences within products (different production practices)

4) What can we conclude from these numbers and how should we proceed?





**ETH** zürich

**THANK YOU FOR YOUR ATTENTION**

Alessa Perotti

[alessa.d.perotti@gmail.com](mailto:alessa.d.perotti@gmail.com)

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