



Healthy Nutrition and Sustainable Food Production
National Research Programme NRP 69

Sustainable and healthy diets: Trade-offs and synergies

FiBL: Matthias Stolze (PI), Christian Schader, Adrian Müller, Anita Frehner

Flury & Giuliani: Birgit Kopainsky

Rütter Soceco: Carsten Nathani, Julia Brandes

Uni Zürich: Sabine Rohrmann, Jean-Philippe Krieger, Giulia Pestoni

ZHAW: Christine Brombach, Stefan Flückiger, Matthias Stucki

Treeze: Rolf Frischknecht, Martina Alig

22 October 2020

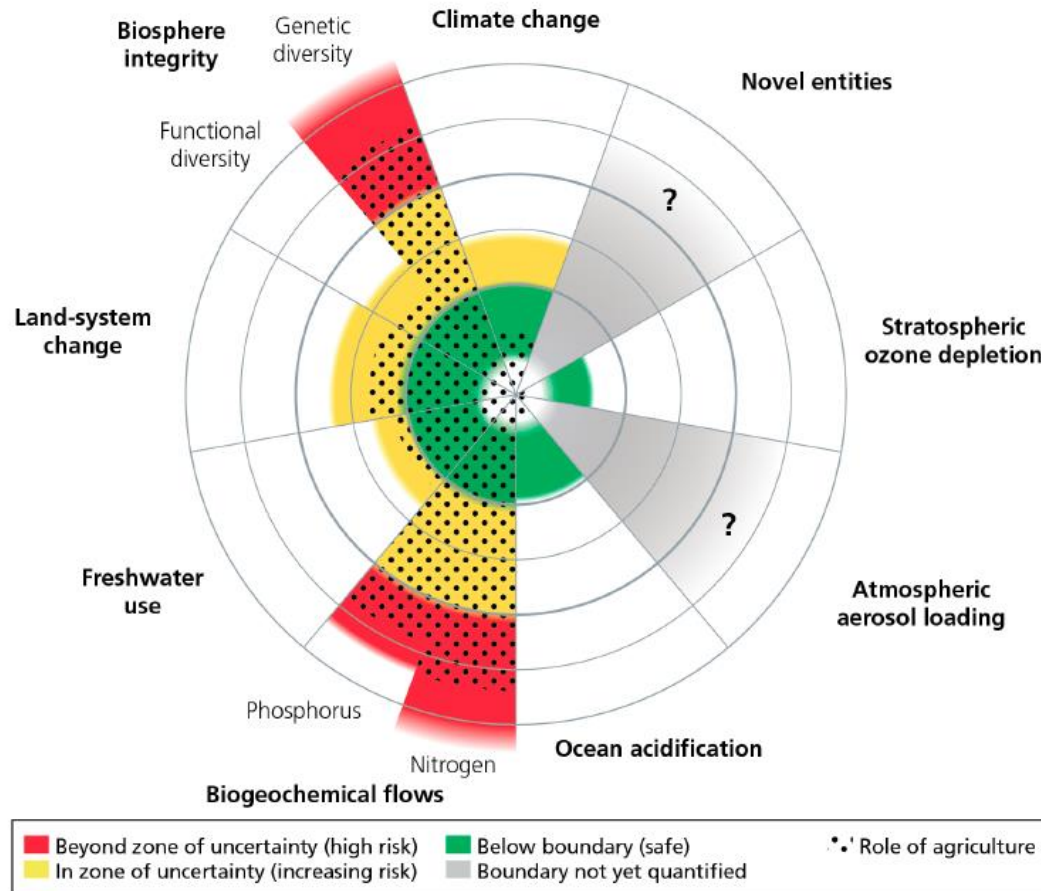
Elements of sustainable diets



Source: Johnston et al., 2014, *Advances in Nutrition*



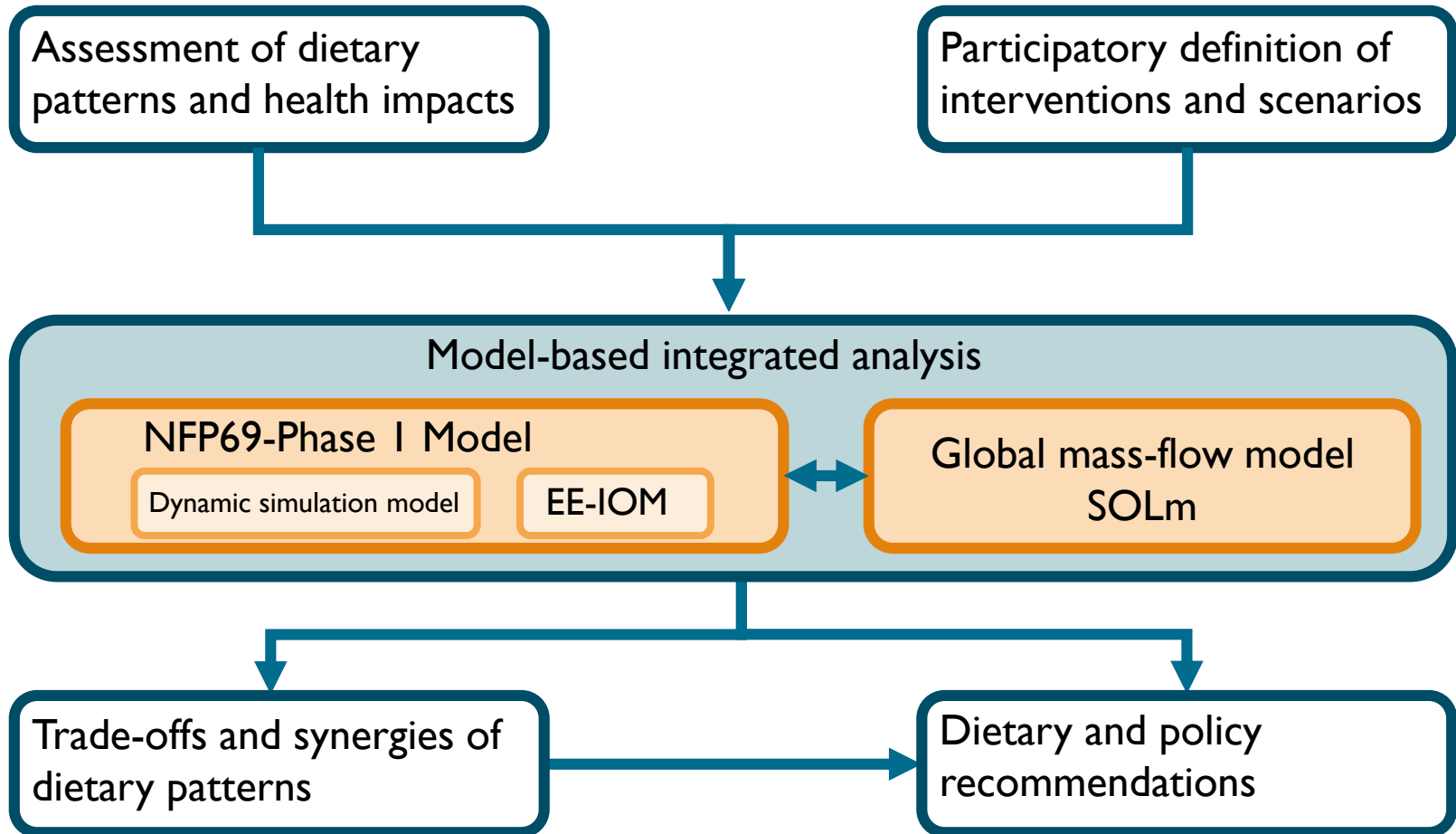
Contribution of agriculture to the planetary boundaries



Source: Campbell et al., 2017, *Ecology and Society*



Project approach



Scenarios (1/2)

Reference scenario 2050

- Consumption per person as in base year 2008 (menuCH-data)
- Share organic: doubling the share from base year



SFP 2050

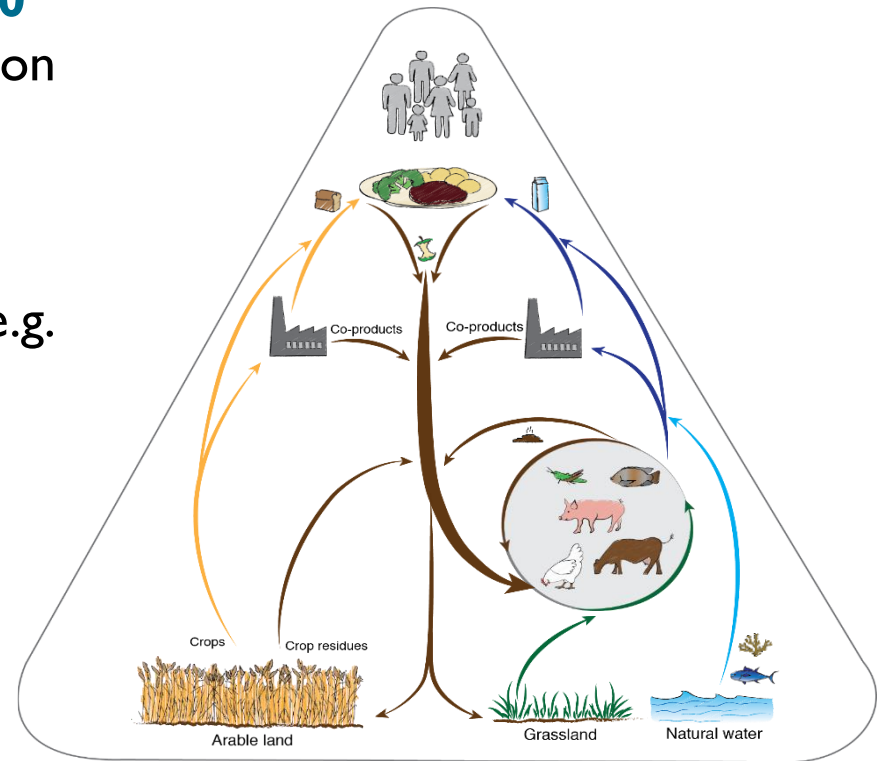
- 100% of the population follow the Swiss Food Pyramid recommendations
- Share organic: doubling the share from base year



Scenarios (2/2)

Sustainability / Feed No Food 2050

- Feed no food, closed cycles, reduction in nitrogen surplus
- Remaining feed:
 - Grass resources
 - By-products of the production (e.g. milling industry, brewery, oil production, sugar manufacture, dairy processing)
- Share organic: fourfold the share from base year
- Pulses are increased until protein supply of SFP scenario is reached



Source: Van Zanten et al., 2019, *Global Food Security*



Impact assessment of dietary scenarios

Environmental impact assessment: EE-IOM, SOLm

Indicators: land use, GHG emissions, biodiversity loss potential, eutrophication, nitrogen surplus, phosphorus surplus, non-renewable energy demand, ...

Social and health impact assessment: EE-IOM, SOLm

Indicator: Social Hotspot Index, AHEI, production-related DALYs

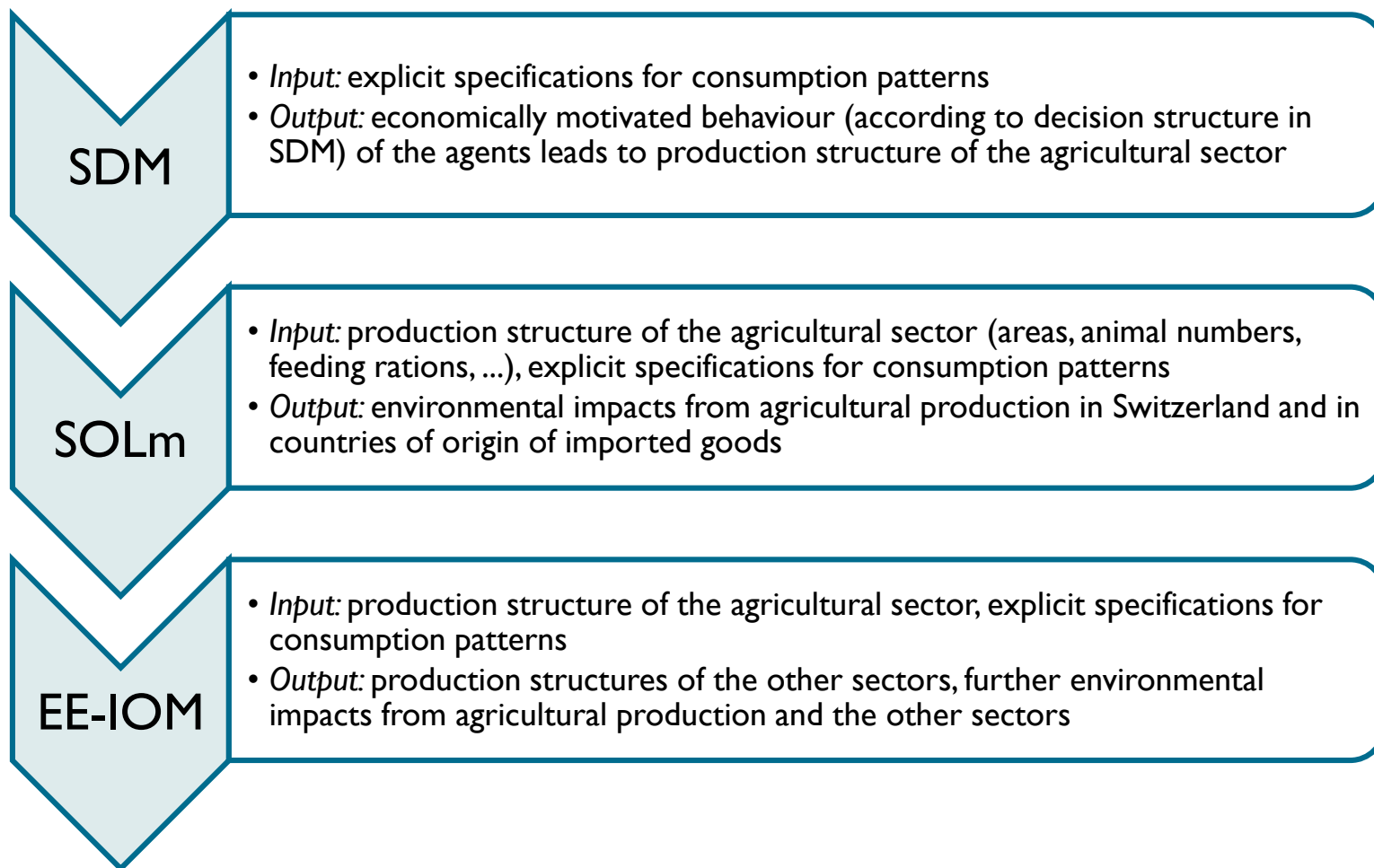
Economic impact assessment: EE-IOM

Indicators: gross value added, employment, household expenditure

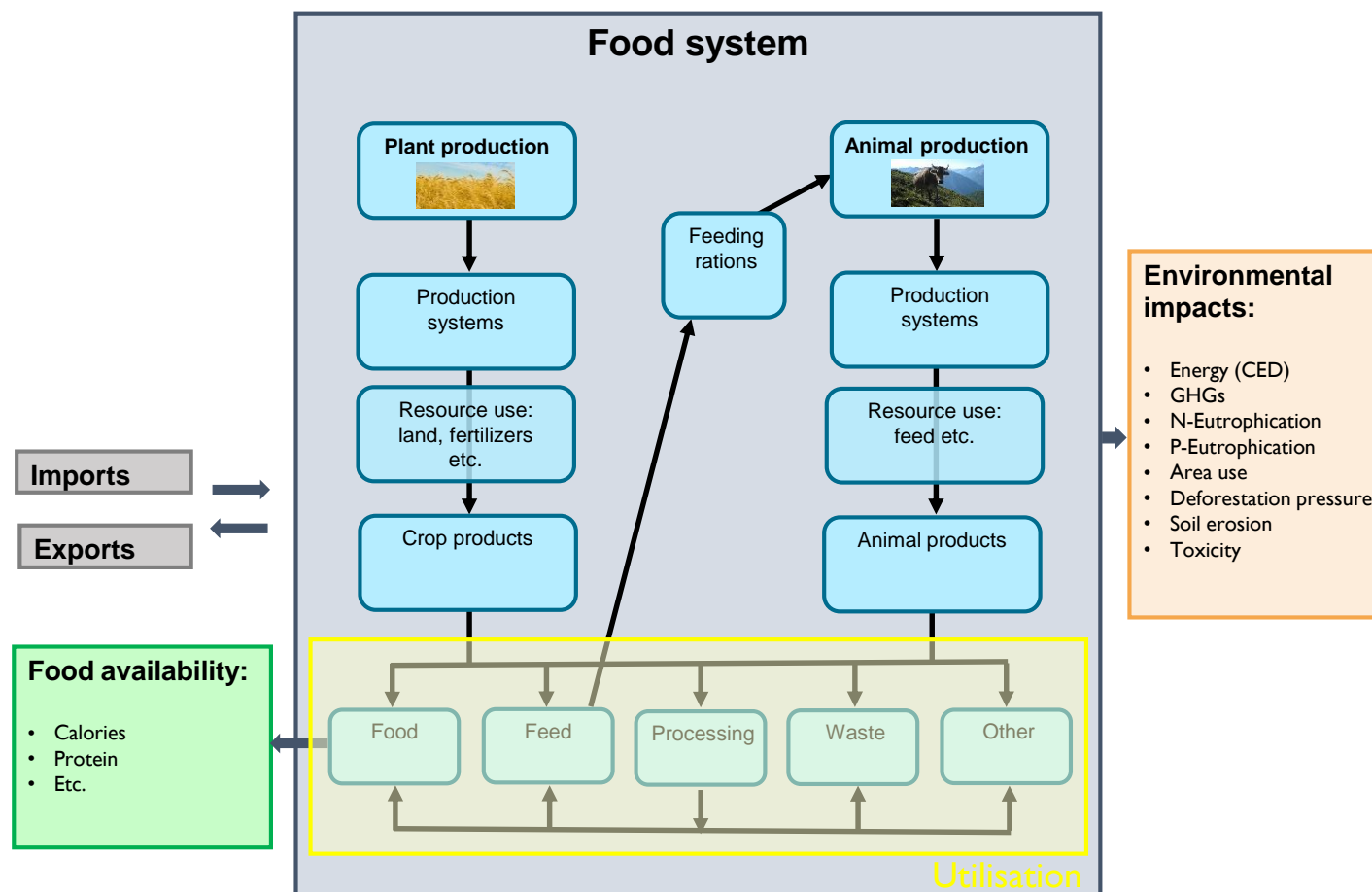


Integrated Modelling Approach: Linking the three models

Predefined scenarios



SOLm model structure: food systems view



Human health impacts: Alternate Healthy Eating Index (AHEI-2010)

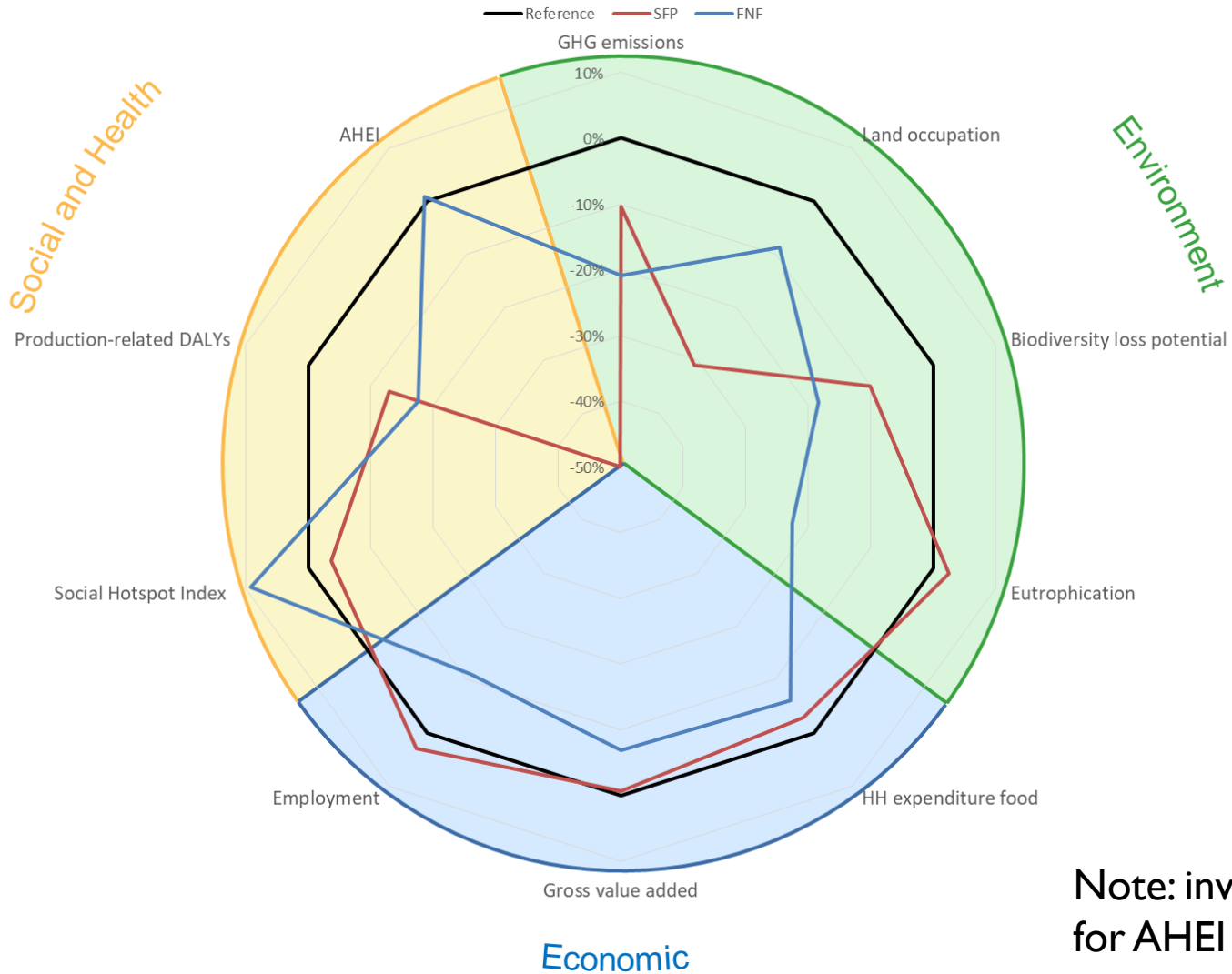
- Score from 0 to 110 points
- 11 groups à 10 points

Component	Criteria for minimum score (0)	Criteria for maximum score (10)	AHEI-2010 in women	AHEI-2010 in men
Vegetables, ² <i>servings/d</i>	0	≥5	5.4 ± 2.4	5.6 ± 2.6
Fruit, ³ <i>servings/d</i>	0	≥4	3.4 ± 2.4	3.7 ± 2.6
Whole grains, ⁴ <i>g/d</i>	0		1.8 ± 1.7	2.4 ± 2.0
Women		75		
Men		90		
Sugar-sweetened beverages and fruit juice, ⁵ <i>servings/d</i>	≥1	0	3.0 ± 3.6	2.6 ± 3.5
Nuts and legumes, ⁶ <i>servings/d</i>	0	≥1	2.7 ± 2.5	4.1 ± 3.2
Red/processed meat, ⁷ <i>servings/d</i>	≥1.5	0	3.5 ± 3.1	3.1 ± 3.0
<i>trans</i> Fat, ⁸ % of energy	≥4	≤0.5	6.0 ± 1.7	7.8 ± 1.4
Long-chain (n-3) fats (EPA + DHA), ⁹ <i>mg/d</i>	0	250	6.2 ± 3.2	7.6 ± 3.1
PUFA, ¹⁰ % of energy	≤2	≥10	5.6 ± 2.0	4.7 ± 1.8
Sodium, ¹¹ <i>mg/d</i>	Highest decile	Lowest decile	5.0 ± 3.2	5.0 ± 3.2
Alcohol, ¹² <i>drinks/d</i>			5.1 ± 3.1	5.8 ± 3.3
Women	≥2.5	0.5–1.5		
Men	≥3.5	0.5–2.0		
Total	0	110	47.6 ± 10.8	52.4 ± 11.5

Source: Chiuve et al. 2012



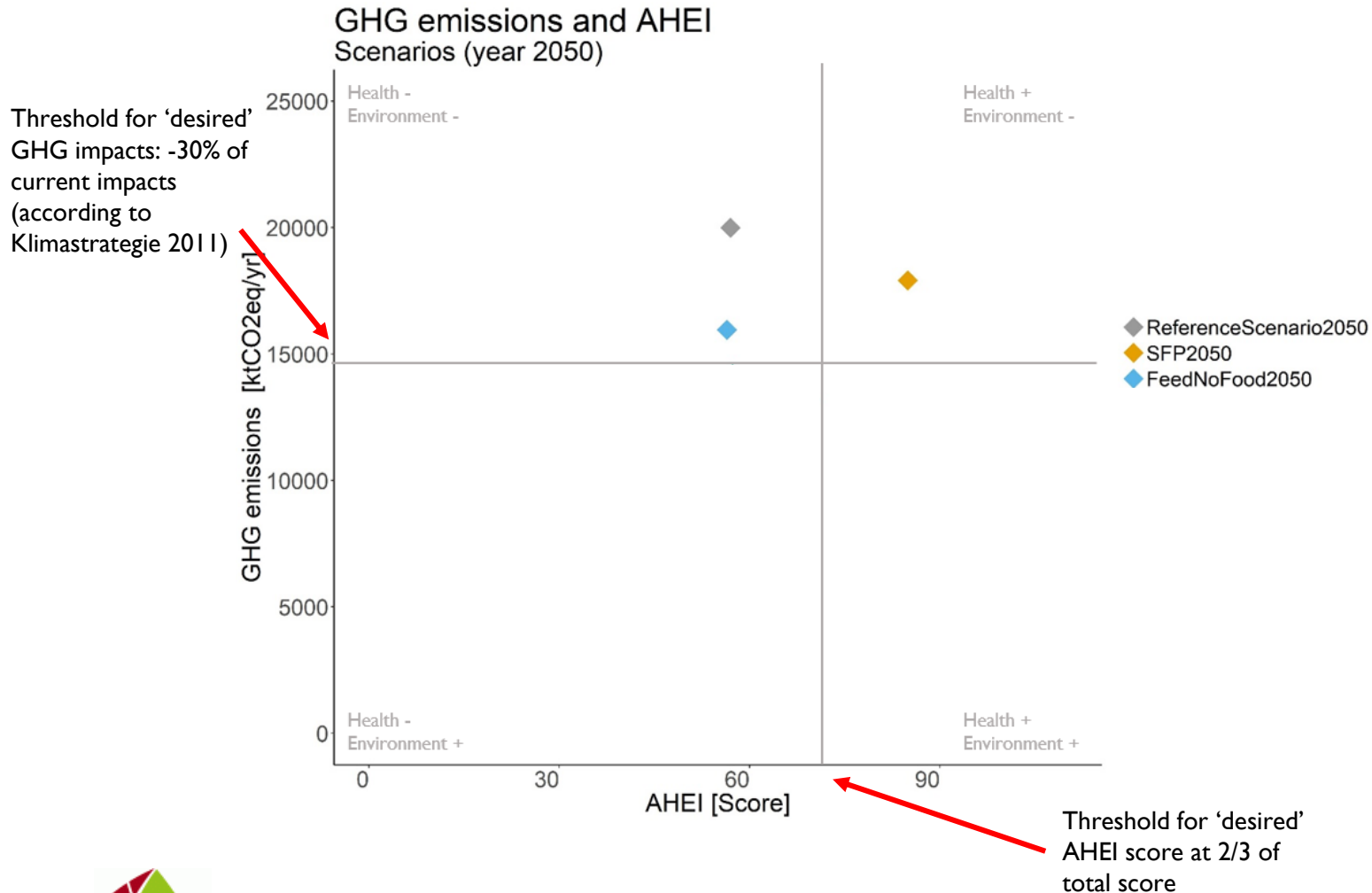
Overview of trade-offs and synergies of the SwissFoodPyramid and the FeedNoFood scenario



Note: inverse scale for AHEI



Human health and environmental impacts of scenarios



Improvement options and potential trade-offs

Improvement options

- Partly substitute animal-source foods with pulses or other potential adequate protein sources
- Reduce sugar consumption
- Increase vegetables and fruits consumption
- Consistent proportions between coupled products from a production perspective (e.g. cattle meat and milk)
- Reduce food waste

Potential trade-offs

- Type of meat (e.g. chicken vs. cattle meat)
- Nose-to-tail
- Fatty fish



SGE Comicstrips

Nachhaltiger geniessen – So kann's gehen!

Nachhaltiger geniessen – So kann's gehen!

Im Rahmen des NFP 69-Projektes «Sustainable and healthy diets: Trade-offs and synergies» hat die SGE sechs Comicstrips zu nachhaltiger und ausgewogener Ernährung veröffentlicht. Dabei werden unterschiedlichste Themen angesprochen wie Fleischkonsum, Food Waste, Herkunft und Produktionsbedingungen. Beleuchtet werden zudem auch die Gedanken der einzelnen Personen, deren Erfahrungen und Vorsätze für die Zukunft. Finanziert wurde dieses Projekt durch den Schweizer Nationalfonds.

Was wir essen und einkaufen, hat Einfluss auf unsere Gesundheit, auf die Umwelt, die Wirtschaft, auf Menschen und Tiere – in der Schweiz und in anderen Ländern. Wie können wir die Auswirkungen möglichst positiv beeinflussen? Wie können wir uns gesund und nachhaltig ernähren? Hier einige Anregungen ...



Der Teilzeit-Vegetarier - Remo, 39 Jahre

Seit drei Jahren esse ich bewusst weniger Fleisch als früher. Auslöser war damals ein Video auf Youtube. Natürlich wusste ich schon vorher, dass ein hoher Fleischkonsum schlecht für die Umwelt und das Klima ist. Aber mir war nicht klar, dass die Auswirkungen so krass sind ...

Deutsch

Französisch

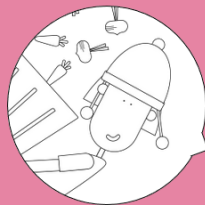
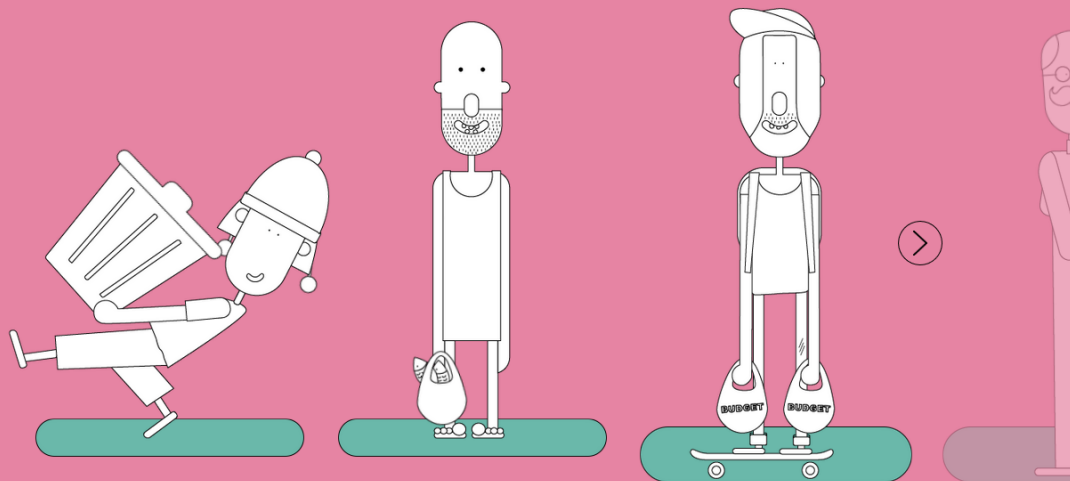
Englisch

<https://www.sge-ssn.ch/comic/>



Healthy and Sustainable Simulator

What type of consumer are you?



Sarah the food waste avoider

One third of global food production is either thrown away or wasted as it makes its way along the food chain. The resources used to produce it are therefore also wasted. This has made 51-year-old Sara sit up and think. Nowadays, she and her family take much greater care to ensure they don't leave food to rot or simply throw it away. As a result, Sara has been able to reduce household waste, and the family is saving money too.

<http://healthyandsustainable.ch/en/simulator>



Questions?

Thank you!



Anita Frehner

PhD Student

FiBL Research Institute of Organic Agriculture / Wageningen University & Research
Department of Socioeconomics / Animal Production Systems

anita.frehner@fibl.org

www.fibl.org / www.wur.nl

