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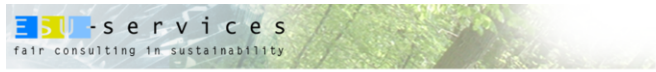

Environmental impacts of processed foods

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ESU

Food Day @ ETH Workshop
30.10.2024

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Environmental impacts of (ultra) processed foods (UPF)

Dr. Niels Jungbluth
ESU-services GmbH, Schaffhausen

Impact Forum
11.11.2024

We assist you

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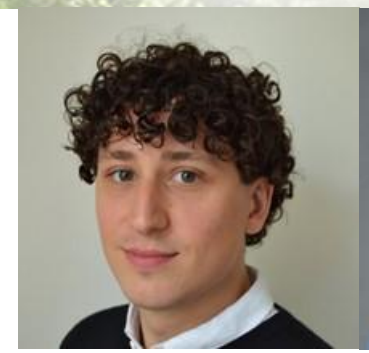

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Clients from industry, NGOs, administration, universities

25+ years and 400 projects experience in life cycle assessment

Company database with more than 10'000 datasets

All economic sectors covered

Overview Life Cycle Assessment

- Life cycle from cradle to grave
- Goal and Scope Definition to frame the research
- Balance of all in- and outputs according to the defined system boundaries & functional unit
- Assessment of different environmental impacts (e.g. climate change, eutrophication, summer smog, etc…)
- Analysis, improvement and comparison of products and services

➢ No absolute measurement

➢ No direct health effects

Key findings LCA of food consumption

- Main drivers of environmental impacts are animal products
- Most relevant is agricultural production (roughly 2/3 of impacts, 50% imported)
- Other aspects are transports, packaging, food waste, processing, cooling, and preparation

➢ Processing or UPF is not the major environmental issue in food consumption

Environmental impact of food processing

Pros - Cons

- Avoid food waste due to longer durability
- Alternative to heated greenhouses
- Eat more of basic food (chicken nuggets, sausages)
- Attractive replacements of animal products
- Reduced downstream impacts (cooling, cooking)

- Higher energy use and packaging
- More food waste if not the whole basic food is used (e.g. protein extracts instead of whole grain)
- Increased cooling and food waste (e.g. ready-made-meals)
- Unknown impacts of processed ingredients and supplements

➢ Pros and cons must be balanced out for the single product example

➢ Function needs to be considered

Plant products compared to their animal-based counterparts (Global warming potential)

Reduction potential of environmental impact (GWP)	64 g protein	4 µg vitamin B12	1.5 g omega-3 fatty acids	1 g of calcium	15 mg iron	150 µg iodine	14 mg zinc[4]	1.4 mg riboflavin (vitamin B2)	15 µg vitamin D	70 µg selenium
Drink instead of cow milk	42%	-8%	65%	-5%	na	-39%	40%	1315%	-92%	-96%
Instead of red meat …										
Legumes	-96%	na	-88%	-100%	-98%	-93%	-94%	-91%	na	na
Meat subsitutes, vegan, minimally processed	-91%	11520%	-84%	-99%	-91%	-92%	-61%	38%	na	-98%
Meat subsitutes, vegan, highly processed	-81%	19%	-93%	-97%	-88%	na	na	na	na	na
Egg-based meat alternatives	-65%	77%	-67%	-96%	-52%	na	-89%	na	na	na
Instead of poultry …										
Legumes	-89%	na	-74%	-99%	-99%	-62%	-96%	-91%	na	na
Meat subsitutes, vegan, minimally processed	-79%	2338%	-67%	-97%	-95%	-53%	-75%	49%	na	-87%
Meat subsitutes, vegan, highly processed	-54%	-75%	-85%	-94%	-93%	na	na	na	na	na
Egg-based meat alternatives	-18%	-63%	-29%	-92%	-72%	na	-93%	na	na	na
Instead of eggs …										
Legumes	-85%	na	-2%	-86%	-91%	540%	-89%	-51%	na	na
Meat subsitutes, vegan, minimally processed	-69%	17568%	24%	-55%	-56%	693%	-26%	690%	na	-63%
Meat subsitutes, vegan, highly processed	-34%	80%	-46%	-3%	-41%	na	na	na	na	na
Egg-based meat alternatives	18%	168%	163%	28%	140%	na	-80%	na	na	na
vegetable oil instead of fish										
omega 3 rich	na	na	-96%	1980%	na	na	556%	na	na	na
omega 3 poor/ other oils	2826%	na	-87%	452%	982%	na	na	na	na	na
omega 9 rich	na	na	-97%	na	1091%	52787%	na	na	na	na
Vegan cream instead cream	-59%	na	-79%	220%	-99%	na	na	na	na	na

➢ Meat and milk substitutes reduce environmental impacts

How many portions are needed?

Number of servings	64 g protein	4 µg vitamin B12	1.5 g omega-3 fatty acids	1 g of calcium	15 mg iron	150 µg iodine	14 mg zinc[4]	1.4 mg riboflavin (vitamin B2)	15 µg vitamin D	70 µg selenium
Milk for drinking, 200g	10	9	1	4	na	8	18	3	150	30
Red Meat - Beef, Veal, Lamb, Pork, horse, 110g	3	1	0	96	6	56	3	4	8	8
Poultry, 110g	2	8	1	120	24	22	12	8	14	3
Fish, omega-3 poor, 110g	3	1	2	35	16	2	19	16	6	3
Shellfish, 110g	4	2	6	24	8	1	7	13	na	na
Fish, omega-3 rich, 110g	3	1	0	71	16	4	28	11	2	na
Eggs, 110g	5	3	0	19	8	3	11	4	8	3
Legumes, 60g	4	na	2	15	4	133	7	12	na	na
Meat subsitutes, vegan, minimally processed, 110g	2	727	1	12	5	40	11	46	na	2
Meat subsitutes, vegan, highly processed, 110g	3	6	0	20	5	na	na	na	na	na
Egg-based meat alternatives, 110g	4	6	1	19	14	na	2	na	na	na
Milk alternatives, 200g	20	11	2	6	38	7	35	70	18	2
vegetable oils, omega 3 rich, 10g	na	na	0	33333	na	na	4200	na	na	na
vegetable oils, omega 3 poor/ other oils, 10g	1600	na	1	6897	3000	na	na	na	na	na
vegetable oils, omega 9 rich, 10g	na	na	0	na	3000	30000	na	na	na	na
Cream, 30g	94	48	1	43	1000	39	187	30	121	na
Cream alternatives, 30g	85	na	0	303	25	na	na	na	na	na

- Number of necessary portions a problem for some nutrients

Policy implications

- Processing used to make bad competing products (e.g. Swissmilk judging on plant-based drinks)
- The present policies of retailers to promote vegan or vegetarian products mainly/exclusively for the group of consumers with high environmental awareness and willingness to pay is questionable
- Products should be made available for fair prices
- Direct and indirect subsidies on animal-based products need to be reduced

Open questions about UPF

- Better description on the meaning and context of UPF
- Use a different wording for unhealthy food (not UPF)
- Which place can artificial nutrients play?
- How can we measure and discuss UPF?
- More transparency on energy use and food efficiencies in processing meat and milk replacements

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