

The socio-economic impacts of alternative protein sources in the context of “greening” policies



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The EU Green Deal



The European agriculture and food system, supported by the Common Agricultural Policy, is already a global standard in terms of safety, security of supply, nutrition and quality.

Now, it must also become the global standard for sustainability. A shift to a sustainable food system can bring environmental, health and social benefits, as well as offer fairer economic gains. The recovery from the pandemic will put us onto a sustainable path.

- The EU's goals are
 - to ensure food security in the face of climate change and biodiversity loss
 - reduce the environmental and climate footprint of the EU food system
 - strengthen the EU food system's resilience
 - lead a global transition towards competitive sustainability from farm to fork

https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/agriculture-and-green-deal_en

Policy conflicts

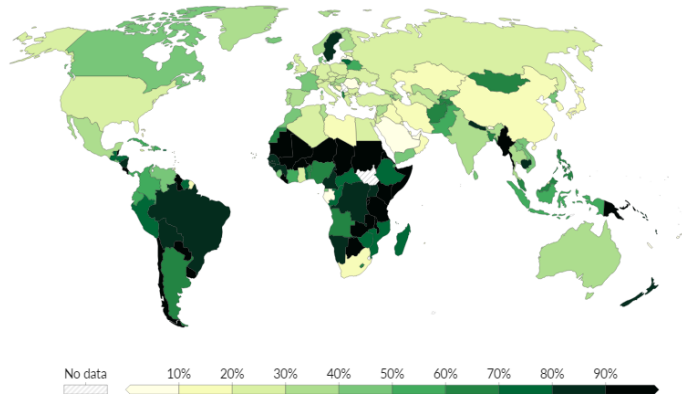
- Environmental conservation *versus* food availability
- Food preferences *versus* environmental impacts

Can Alternative Proteins align with both sets of policy requirements?

Share of national greenhouse gas emissions that come from food, 2015

Food system emissions include agriculture, land use change, and supply chain emissions (transport, packaging, food processing, retail, cooking, and waste). Emissions are quantified based on food production, not consumption. This means they do not account for international trade.

Our World in Data



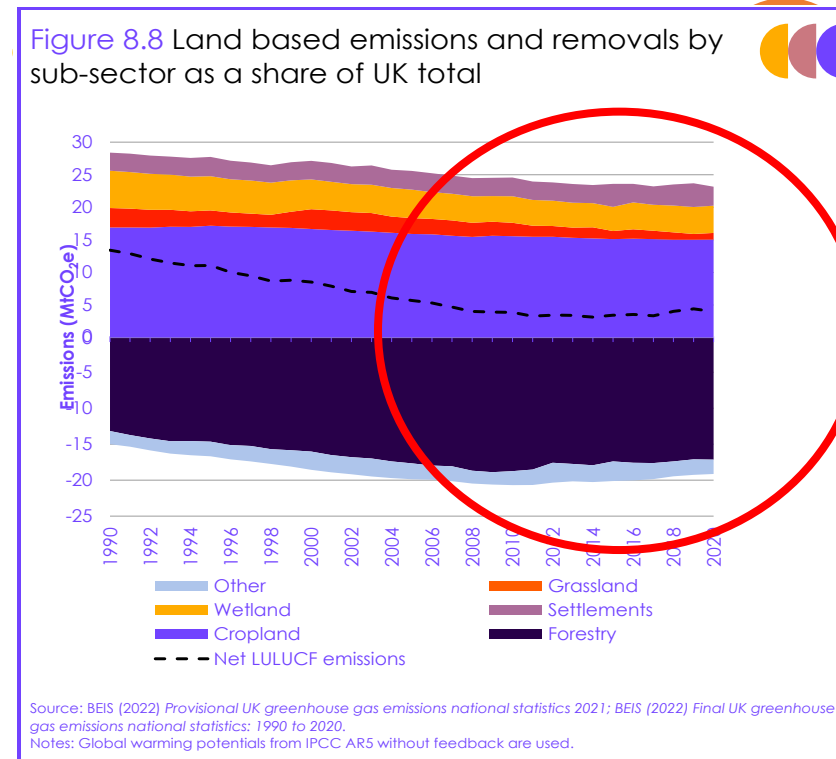
Source: Crippa et al. (2021).

OurWorldInData.org/environmental-impacts-of-food • CC BY

<https://ourworldindata.org/environmental-impacts-of-food> 2015

What is the Challenge for Land Use Policy towards Net Zero?

- **Socio-economic, financial, cultural, historical, and legal** factors represent the greatest challenges and opportunities for climate action
- **Integration** of natural science solutions with other disciplinary perspectives key for success
- Stakeholder **adoption** and **implementation**



UK Committee for Climate Change (2022),

Alternative Proteins within the Food System

The food system, from food production to consumption, is driven by, and impacts upon, an interacting set of

- Environmental
- Societal,
- Cultural
- Political
- Economic influences.

Various issues need to be considered *simultaneously* as they exert both **push** and **pull** within the food system

Feedback mechanisms

“**Lock-in**” to specific practices which may be reinforced by policy or cultural tradition

Animal Production systems

- Contribute (to differing extents) to GHG emissions,
- Reducing reliance on animal production systems is central to policies focused on GHG emission reduction and achieving net zero
- Alternative proteins, are important part of the transition to net zero under greening policy transition.
 - culturally and organoleptically acceptable,

In addition to consumer preferences and choices, it is important to consider:

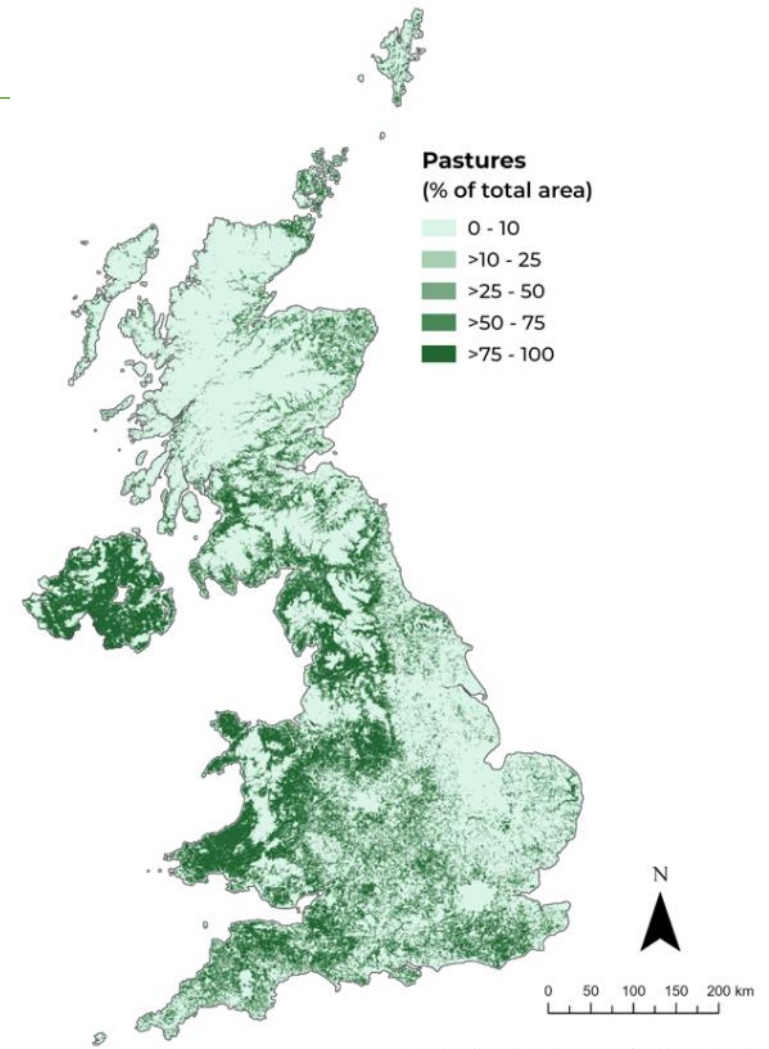
- Impact on rural economies and reskilling (including adoption of environmentally friendly practices such as land sharing and sparing (as opposed to land abandonment).
- Impacts on biodiversity in relation to pastureland (and ensuring the “sweet spot” between delivery of different ecosystem services, which militates against increased intensification).
- Alternative protein production might capitalise on the “circular bioeconomy” in relation to (e.g.) on farm biomass and reuse of waste in relation to bioreactors and farm diversification
- Consumer decision-making in relation to combined sustainability and health indices (e.g. comparing meat and Alternative Proteins in relation to label information on supermarket shelves,

Permanent grasslands ecosystem services

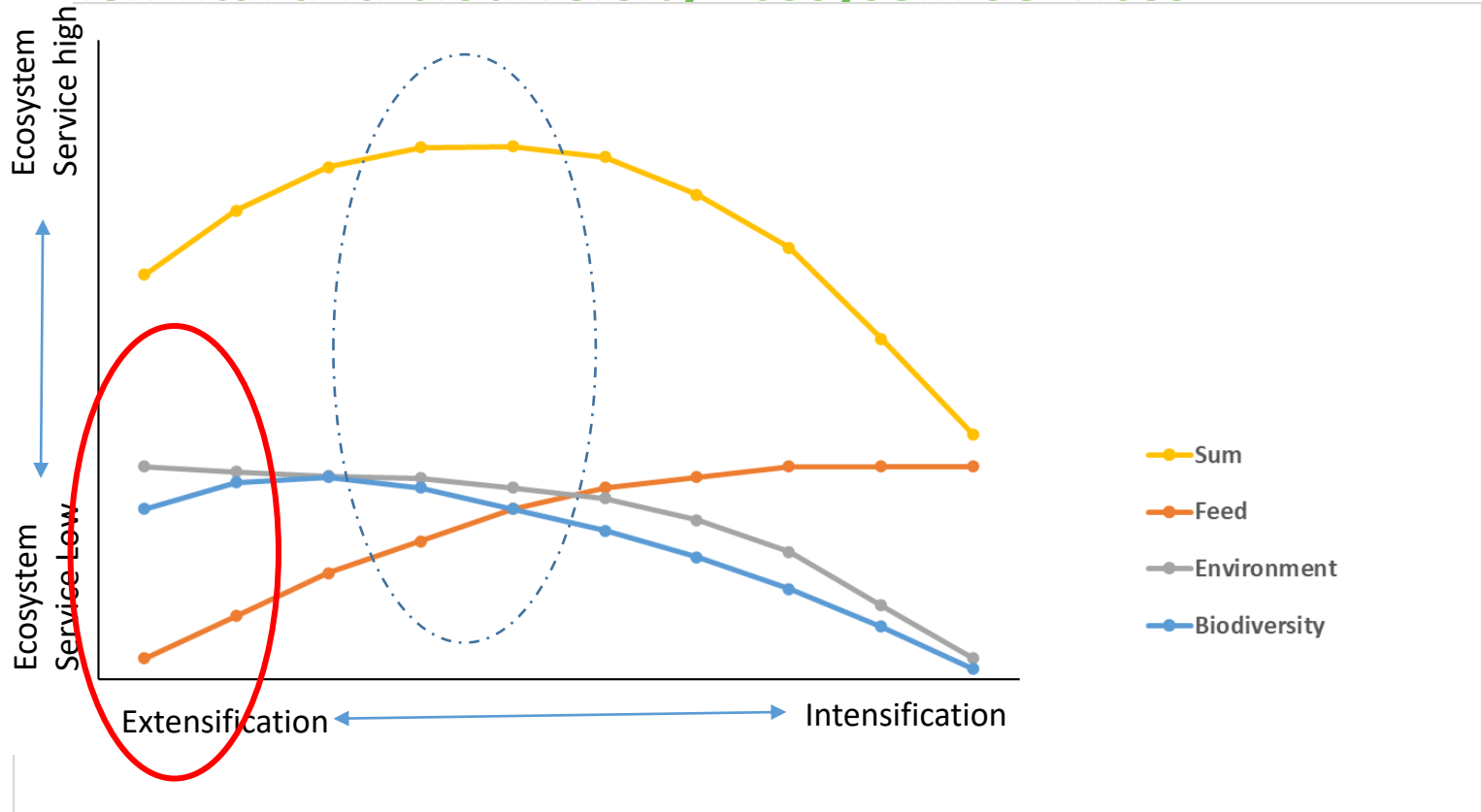


General trend towards intensification

- Improved and semi-natural grasslands cover around 40% of the UK (Marston *et al.*, 2022)
 - Improved grasslands: c. 30%
 - Semi-natural grasslands: c. 10%
- 1930s – 1980s: England & Wales lost around 97% of lowland wildflower meadows (Fuller, 1987)
- Species-rich grasslands cover less than 1% of UK land area (Trenbith, 2022)

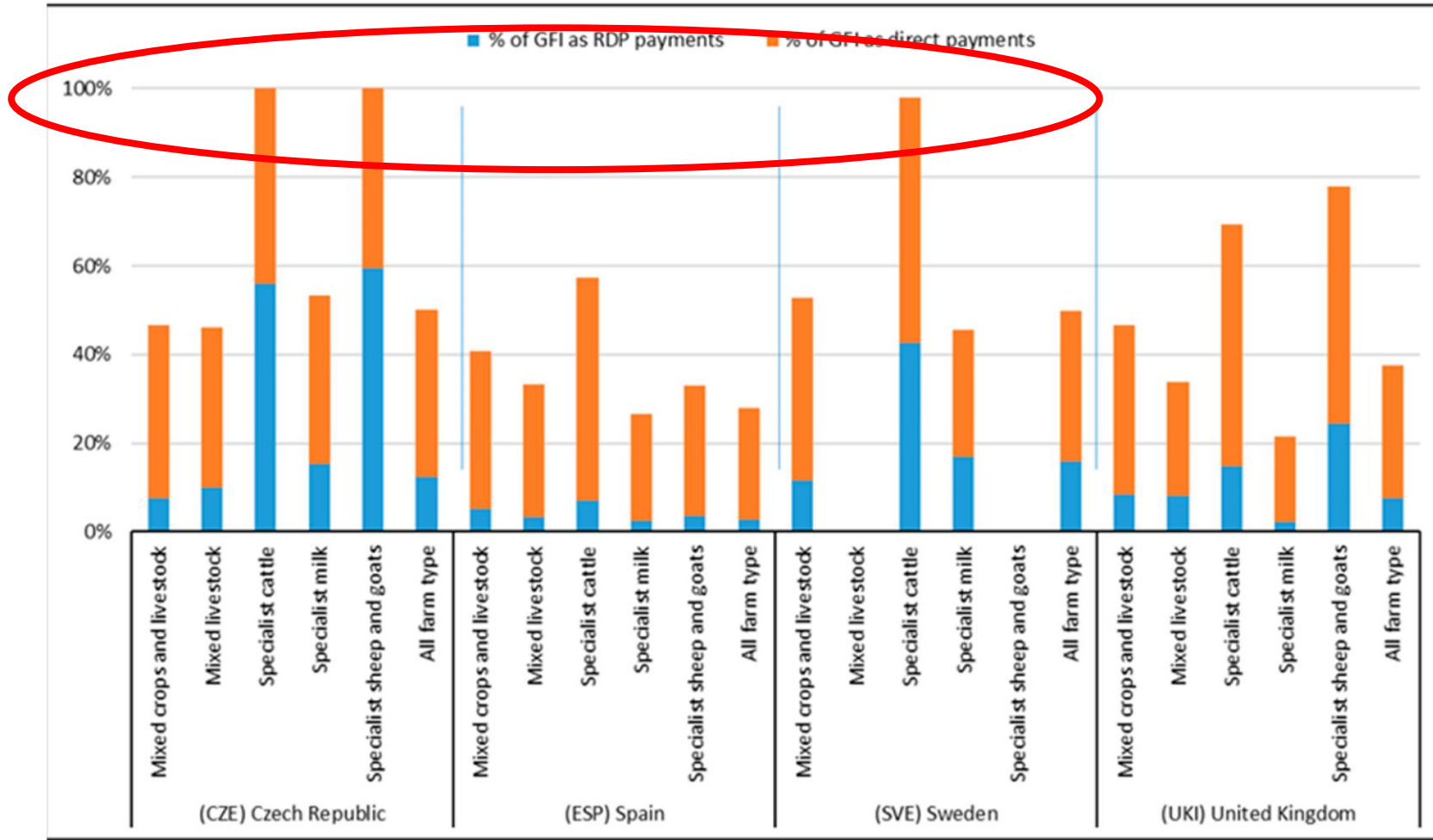


Multifunctionality Sweet-Spot or optimisation of environmental and biodiversity Ecosystem Services



Schils, R. L., Bufer, C., Rhymer, C. M., Francksen, R. M., Klaus, V. H., Abdalla, M., ... & Price, J. P. N. (2022). Permanent grasslands in Europe: Land use change and intensification decrease their multifunctionality. *Agriculture, Ecosystems & Environment*, 330, 107891.

Percentage of gross farm income as CAP payments for the Czech Republic, Spain, Sweden, and UK grazing livestock farms (average 2008–2017). GFI = Gross Farm Income. RDP = rural development programme. Source: FADN



Shift from Basic Payments to AES may be financially problematic

- Problems with application EU-wide instruments to very heterogeneous biogeographic zones and socio-cultural contexts.
- More targeted CAP agri-environment schemes may be more effective in encouraging a balance between food production and other ESs,
 - uptake is voluntary and farmers are likely to adopt the most economically viable options, which may not deliver necessary environmental outcomes.
- In practice, some targeted actions are moved under Pillar 1 in future CAP developments such as eco-schemes.
- There is a need for farmer involvement and peer support in shaping policy and economic support to deliver change,
 - Transition away from livestock production?

Tipping points and farmer decision-making

- Farmers require **financial incentives** and **technical guidance** to trigger positive tipping points
- Changes to agri-environmental schemes and subsidy programmes are needed to deliver **more ES from PG**
- **Land use/ management change** should be appropriate, context-specific and align with farming values.
- **Flexibility in (e.g.) payments, including payments stacking and assessment metrics**
 - Land abandonment
 - Stocking density

- Tindale et al, (2024) Tipping points and farmer decision-making European permanent grassland agricultural systems; Elliot et al., (2024) European Permanent Grasslands: A Systematic Review of Economic Drivers of Change



Farmer values explain decisions to intensify or extensify on PG

- **“Productivist”** (focus on food security)
 - Predicted future management decisions resulting in **increased intensification**
 - *How does this relate to AE schemes in terms of payments?*
- Farmers prioritising current land management practice and **taking good care of the land on the farm**
- **“Good livestock management”**
- **Both the financial and non-financial impacts of policies and interventions on farmers need be considered (consultation) before policy-based interventions are enacted in relation to rural transitions**



Jin S, Cao Y, Burd M, Tindale S, Feng Z, Green O, Newell-Price P, Vicario-Modroño V, Mack G, Sánchez-Zamora P, Gallardo-Cobos R. Farmer identities and permanent grassland management: evidence from five European biogeographic zones. People and Nature. 2024 Sep 30.

Consumers, Sustainability and Animal Welfare

- online survey (n=approx 600 per country) was conducted in five European countries
 - Czech Republic, Spain, Sweden, Switzerland, and the UK.
- Consumers valued similar attributes when buying meat and dairy products across all countries.
- Attribute importance
 - Freshness, quality/taste and animal welfare emerged as the most important Environmental attributes
 - Food miles, carbon footprint, and organic production were the least important

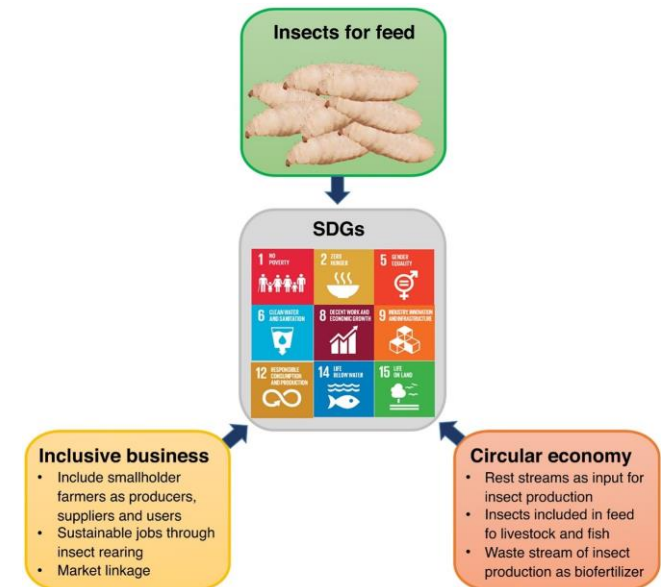
Should Alternative Proteins be positioned as *fresh, pro-animal welfare products* rather than as *sustainable products*?

Ammann, J., Mack, G., El Benni, N., Jin, S., Newell-Price, P., Tindale, S., Hunter, E., Vicario-Modrono, V., Gallardo-Cobos, R., Sánchez-Zamora, P. and Miškolci, S., and Frewer, L.J. 2024. Consumers across five European countries prioritise animal welfare above environmental sustainability when buying meat and dairy products. *Food Quality and Preference*, 117, p.105179.

Insect proteins and consumers

Insects as livestock feed are more acceptable than insects as human food ingredient.

- Partial solution to Alternative Protein acceptance
- To what extent does this solve the GHG problem?
 - **Increase animal production?**
 - **Climate change adaption versus mitigation?**

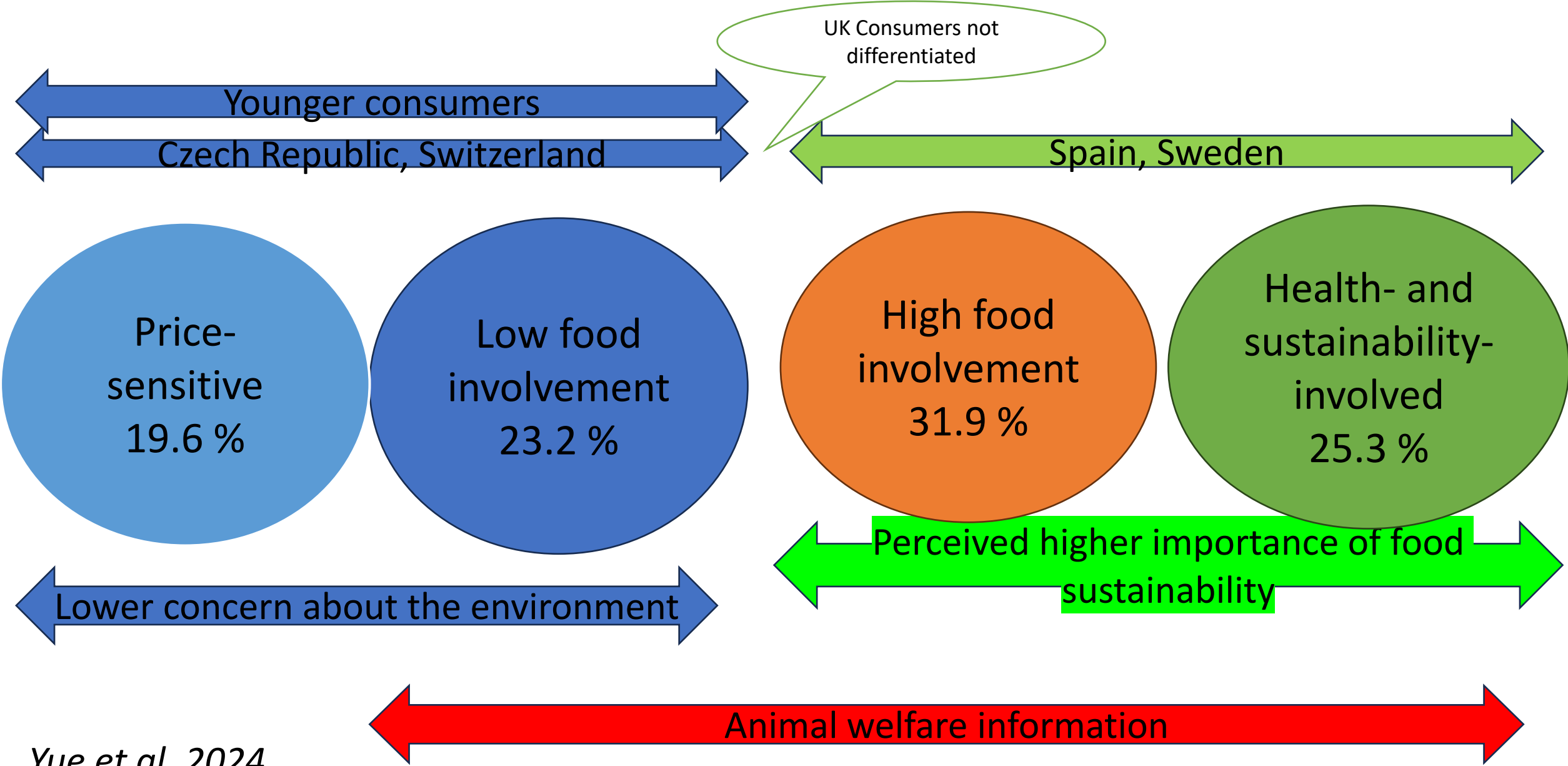


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Pakseresht, A. Vidakovic, A. and Frewer, L.J., 2023. Factors affecting consumers' evaluation of food derived from animals fed insect meal: A systematic review. Trends in Food Science & Technology, 138, pp.310-322.

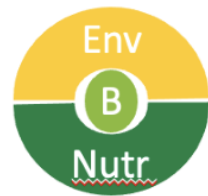
Image: www.food.gov.uk/research/the-future-of-animal-feed-animal-by-products-and-insects

Cluster analysis – Segmenting consumers of meat and dairy products

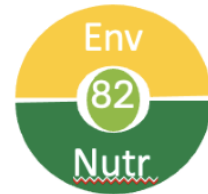


Combine Sustainability and Health labelling- the Sus-Health Project

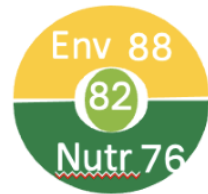
Figure 2:



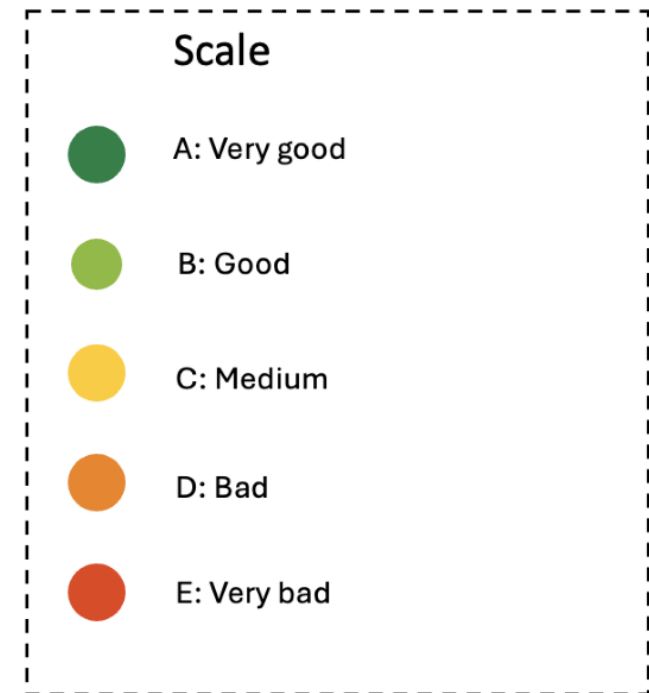
Example 1



Example 2



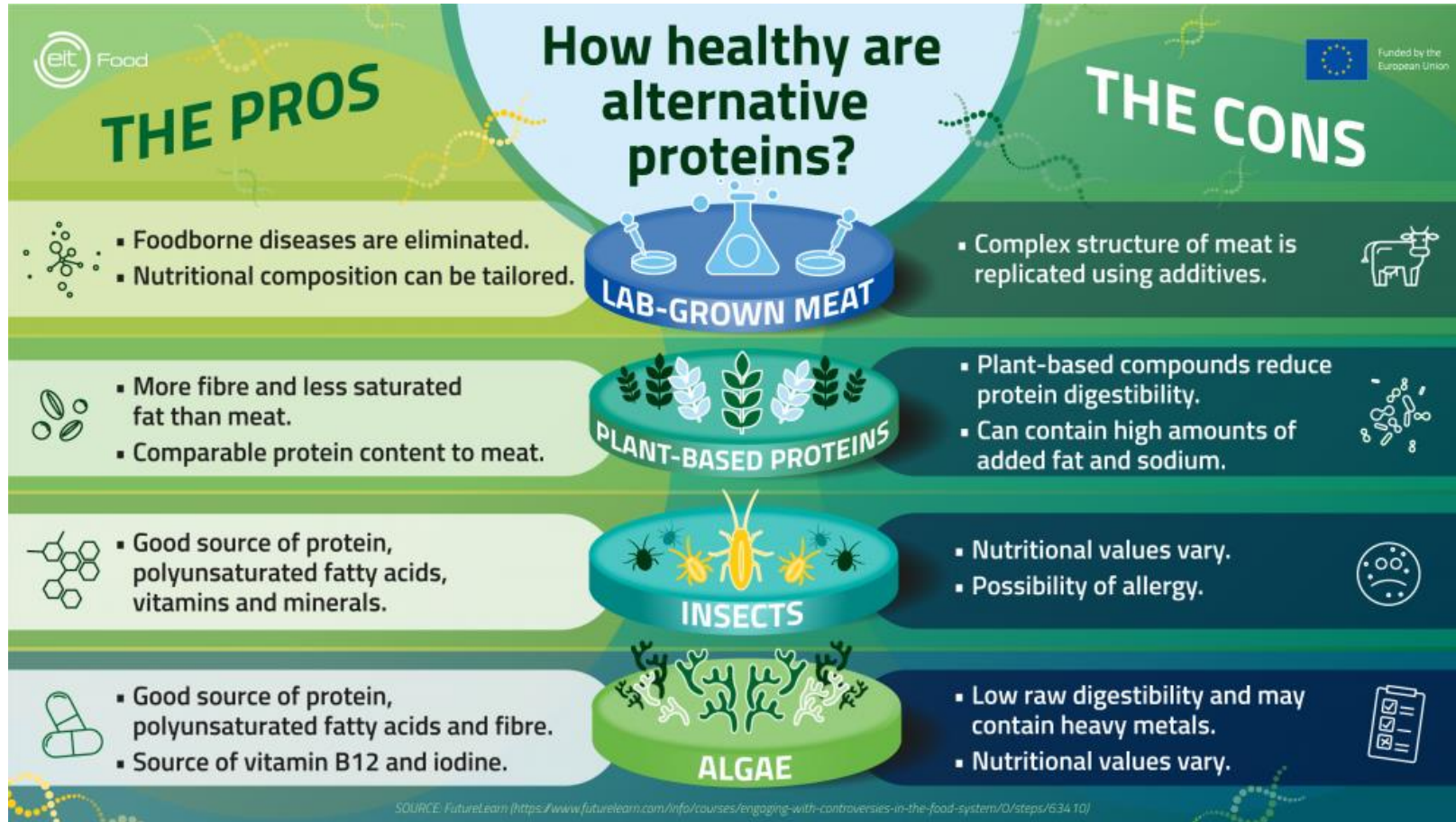
Example 3



Should targeted communication strategies directed towards different groups of consumers be adopted?

- Emphasise health and sustainability in some countries
- Emphasis animal welfare benefits generally
- Try to keep costs low (especially compared to equivalent animal products)
- Complex debate about subsidies and taxation

<https://www.eitfood.eu/blog/are-alternative-proteins-good-for-you>



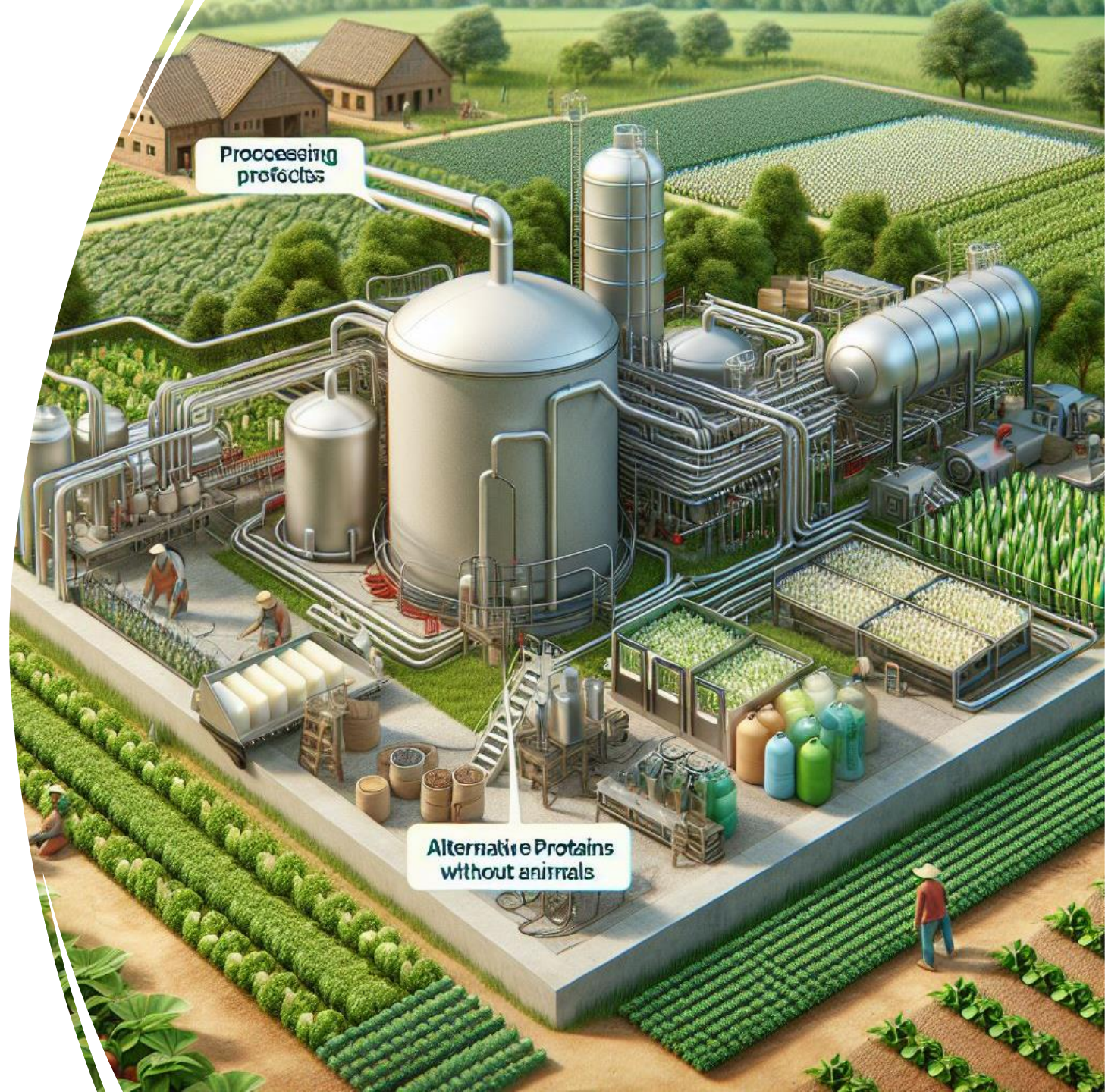
Consumer “barriers” to adoption

- Perceptions that
 - Alternative Proteins are **ultra-processed**
 - Unnatural
 - Expensive
 - “Disrupt” traditional landscapes through land use change



Future farms?

- AI generated image of Alternative Protein bioreactor on farm
- Powered by biomass
- The circular economy in action



Alternative Proteins in the food system

Lock-in to animal production

- Basic payments under the (unreformed) cap
- Citizen Preferences for farmed and tidy landscapes
- Farmer “productivist” identity

Policy “push”

- Acceptable/coproduced AES
- Subsidies for Alternative Protein production?
 - On-farm bioreactors powered by biomass

Consumer “Pull”

- Health, animal welfare and sustainability

Thank you for you attention