

SENSORY PERCEPTION, HEALTH, AND SUSTAINABILITY: A MULTIDISCIPLINARY APPROACH TO FUTURE DIETS

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CONTEXT

Reducing the consumption of animal products in favor of plant-based alternatives has been identified as a key strategy for achieving environmental and public health goals (Willett et al., 2019).

Nevertheless, numerous studies show plant-based products struggle with consumer acceptance due to sensory limitations, especially texture and flavor, compared to meat and dairy analogues (Curtain & Grafenauer, 2019; Fiorentini et al., 2020). While consumers may express willingness to adopt more sustainable diets, this intention often fails to translate into behavior when sensory expectations are not met (Siegrist & Hartmann, 2019).

This discrepancy underlines the importance of aligning sensory appeal with health and sustainability goals.

RESEARCH GAP

Current research on sustainable food systems often treats sensory science, nutrition, and environmental science as separate domains, while few researchers fully integrate these dimensions into a coherent framework.
→ need for an integrated approach

OBJECTIVES AND RESEARCH QUESTIONS

- Improving the acceptability of plant-based products
→ how can we make sustainable diets more appealing and healthy without compromising on taste?
- Combining life cycle assessment (LCA), nutritional profiling, and sensory evaluation through interdisciplinary frameworks
→ how do sensory qualities—like flavor and texture—relate to nutrition and environmental impact?
- Guiding consumers towards foods that are both healthy, enjoyable and sustainable
→ what drives people's food choices when it comes to innovative plant-based foods as alternatives to meat and dairy?

METHODS

Literature

- Systematic review and meta-analysis
- Extracting of standardized values for sensory attributes, environmental indicators, and nutritional data for a broad range of plant-based alternatives
- Identification of potential sensory phenotypes conducive to more or less sustainable dietary patterns

Data collection, compilation and integration of sensory, nutritional and LCA datasets

Experimental studies

- Consumer tests
- Sensory panels across Italy and Denmark

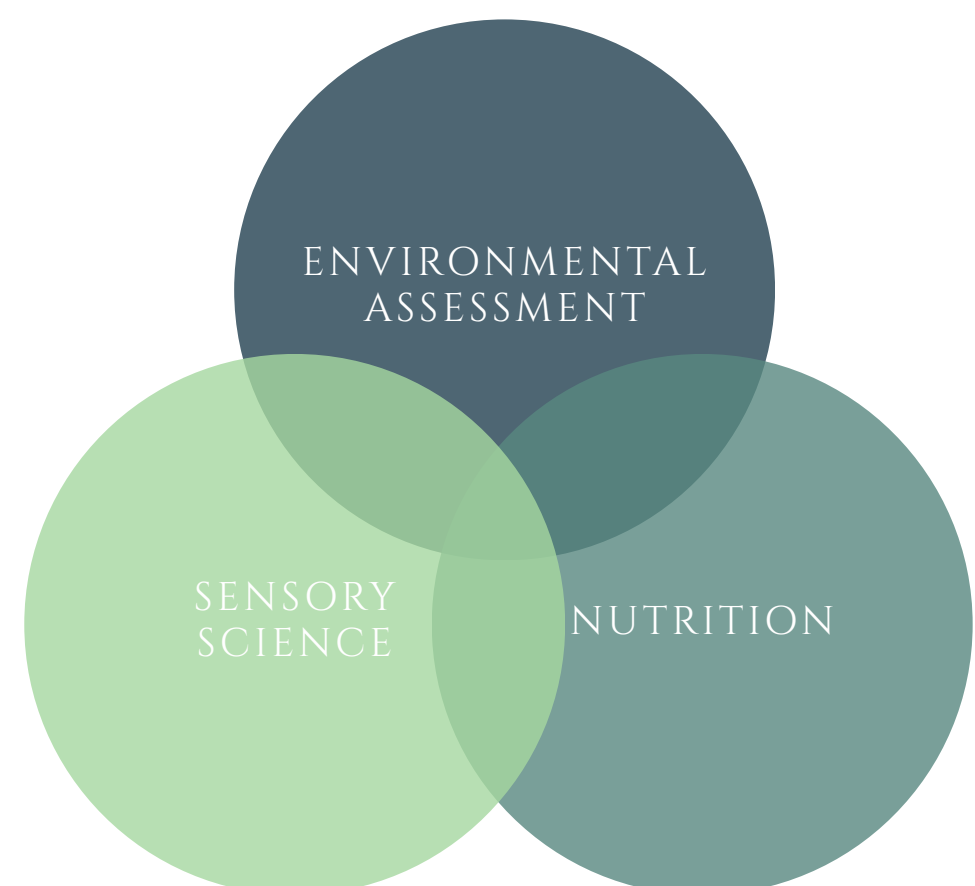
Evaluations

- GHG, land use, water footprint
- Healthiness index

Data analysis

- Correlation and multivariate analysis to identify key sensory-nutrition-environmental associations
- Analysis of cultural, demographic and dietary factors

Development of a framework linking sensory quality, health index, and sustainability score



EXPECTED OUTPUT AND IMPACT

- ✓ Evidence-based guidelines to optimize plant-based products
- ✓ Industry insights
- ✓ Support to public policy
- ✓ Promotion of sustainable diets

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