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Sustainable consumer-driven process applied to food product innovations: an empiric study

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INTRODUCTION

In the fast-moving food sector, companies lack operational methods to develop their products to meet consumer expectations, while addressing the challenge of universal sustainability. Flexible consumer-driven methodologies are expected to increase the chances of product success in the marketplace. These methods are underdeveloped in most food companies. Means of integrating environmental aspects into innovation processes are still very vague.

OBJECTIVE

The present study aimed to develop an iterative consumer-driven process for sustainable food product innovations. The process was empirically tested on spirulina-based food innovations.

METHODS

Innovation process:

Agile Stage-gate® [1]

Ideation, **Concept, Development, Validation** and Launch

Consumer-driven + environment-oriented methods

→ concurrently managed along the stages of the innovation process.

→ iterations allowed.

Consumer-driven methods: [2]

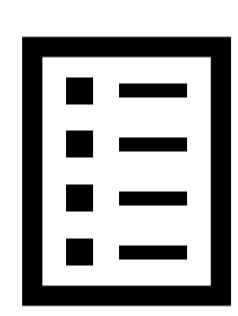
Focus groups:



Group discussions with animator
 n=10 target consumers

→ Qualitative thematic results (from verbatims)

Quantitative consumer test:

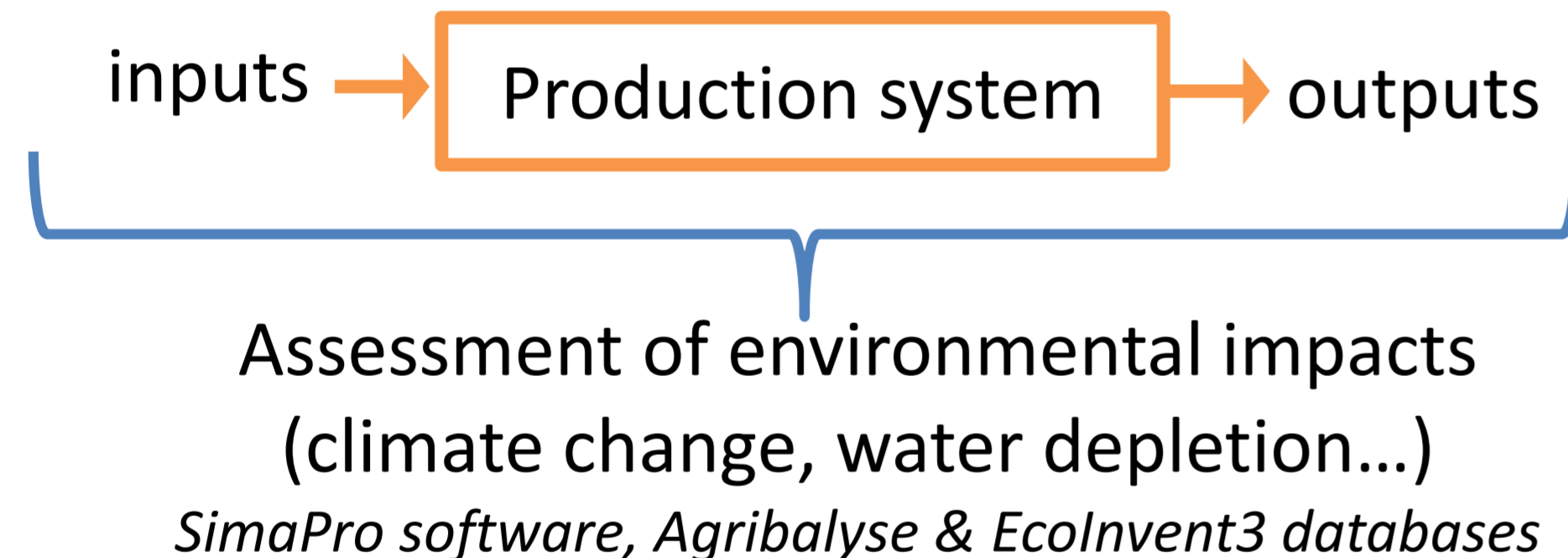


Hedonic test in controlled lab environment
 n=180 target consumers

→ Hedonic scores and purchase intentions

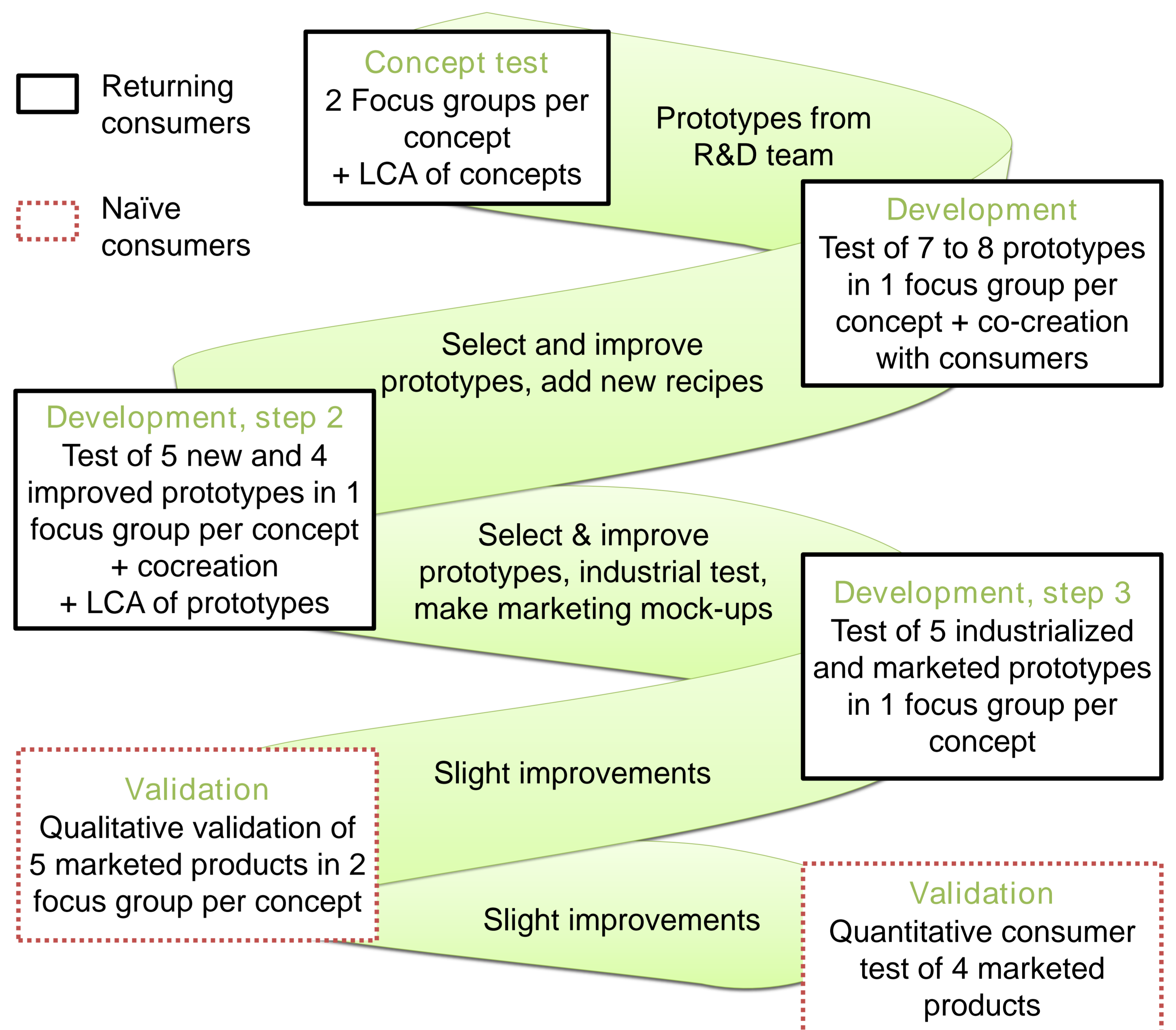
Environment oriented method: [3]

Life Cycle Analysis (LCA):



RESULTS

Stages from concept to validation were developed with an iterative approach in a case study of spirulina-based food innovations



Iterative development :

- Number of steps was not planned: 3 steps of focus groups about recipes and packaging prototypes were necessary.
- 6-months-development: food product prototyping constraints.
- New consumers are needed for the validation of products because returning consumers get used to them (effect of mere exposure).
- An ingredient toolkit adapted to the products in development enables co-creation activities with consumers.

SWOT analysis of the use of LCA during the innovation process

Strengths Comparative analyses of products and industrial/transport practices.	Weaknesses Limited data on ingredients (organic). The need for precise inputs : difficulty to assess impacts of concepts.
Opportunities The need of companies for guidelines for sustainable innovation	Threats Companies disinterest or mistrust. Difficulties to take into account companies strategies about products.

- To be innovative, the company must produce innovative prototypes to counterbalance consumers' tendency to refer to existing products.
- Final products met the expectations of future consumers: good hedonic scores
- The assessment of environmental impacts allows a broader approach to sustainable practices and can help with design of products and organizational decisions.

CONCLUSION

This study highlighted the value of

- consumer voice,
- close collaboration between R&D and consumer scientists,
- environment-friendly thinking, in a successful development.

This methodology is flexible enough to apply to any new food product, including innovations.

[1] Cooper R.G., Sommer A.F. *Ind Market Manag* 2016, 59: 167–180.

[2] Costa A.I.A., Jongen W.M.F. *Trends Food Sci Techn* 2006, 17: 457–465.

[3] European Commission, Joint Research Centre, Institute for Environment and Sustainability, 2010. ILCD Handbook, First edition. ed. Publications Office of the European Union, Luxembourg.