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► To cite this version:

Adeline Cortesi, Gwenola Yannou-Le Bris, Anne Saint-Eve, Caroline Pénicaud. Multicriteria assessment tool to support design of food products integrating environmental, nutritional and sensorial dimensions. EFFoST International Conference 2022, Nov 2022, Dublin, Ireland. hal-03866694

HAL Id: hal-03866694

<https://hal.inrae.fr/hal-03866694v1>

Submitted on 22 Nov 2022

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Multicriteria assessment tool to support design of food products integrating environmental, nutritional and sensorial dimensions

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Aim

Food companies need to better include the environmental performance in their food product design process. However, improving the environmental performance can reduce the product performance on other important quality dimensions. Therefore, our goal was to develop a multicriteria assessment tool able to simultaneously assess food product performance on several quality dimensions, including environment. This tool could help food designers developing more sustainable products without neglecting other quality dimensions.

Method

Pizza was selected as a study model because pizzas are widely consumed worldwide and because it exists a wide variety of different pizzas recipes. Four main steps were followed for the multicriteria assessment tool development:

- (1) Identifying the main quality criteria that pizza companies include when defining their product specifications and the associated indicators (semi-structured telephone interviews);
- (2) Developing a multicriteria assessment tool (based on DEXi software) to integrate the indicators mentioned by the pizza companies;
- (3) Calibrating the tool. This was done by assessing the performance of a large number (n=60) of pizzas on the different quantitative indicators mentioned by the companies in order to establish different levels of performance for each of them;
- (4) Validating the multicriteria tool on 16 others pizzas to confirm the ability of the tool to discriminate the pizzas.

Results

Interviews with pizza companies highlighted that sensory and nutritional properties were the main quality dimensions included. The multicriteria tool was therefore developed including three dimensions: environmental, nutritional and sensorial, resulting in integrating 39 indicators. The validation on the 16 pizzas showed that the pizzas were well discriminated using the multicriteria tool, either through an overall score or by comparing each of the dimensions independently. The tool also makes it easy to identify the indicators to improve which provides design axis to explore.

Conclusion

The tool could help food product designers in several ways: (i) finding the best compromise between several food design options as it integrates environmental, nutritional and sensory performances, (ii) identifying the dimension that needs improvements and/or (iii) positioning the relative performance of a product within its product category. Future research could generalize such an approach to other food products.

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