SENSORY ENGINEERING APPROACH: DRIVING PRODUCT FORMULATION THROUGH CONSUMER PERCEPTIONS AND PREFERENCES

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Aim: During food formulation products, consumer perception is essential to the development of optimal prototypes. Nielsen (2014) highlighted that 76 % of products developed are failures in the first year. Consumers' intervention often comes at the end of the development process, whereas it could be useful at all stages of formulation. The project aims to achieve a sensory engineering approach, based on experimental design, that integrates consumers perceptions and preferences at each stage of product development. To illustrate this approach, we chose to work on the formulation of a hybrid minced steak: mix of beef and soy proteins. The objective was to find the recipe that would get closer to perceptions of a pure beef steak while reducing meati proportion in the product. This objective was set in relation to current environmental issues.

Method: To integrate consumers' perception in the formulation process, a five steps methodology was proposed: (i) the choice of design factors with a consumers' approache to create a relevant product area/zone regarding consumers expectations for steak (ii) Desing of 10 steaks according to a design of experiments and a fast sensory characterisation of each steak to validate sensory differences between each steak developed (iii) Carrying out a sensory profile and a consumers' preferences test for the prototypes (iv) tChoice of the best receipe with a statistical approach (v) Validation of the optimal receipe found during the step (iv) with a consumers' evaluation.

Results: The method deployed allowed the definition of two key factors for the design of the optimal steak : the cooking time and the percent of soy protein. The results of the sensory characterisation highlights the differences between the products for 9 sensory dimensions. By combining sensory data with consumer preference, we identified a new optimum.

Conclusion: This study was a proof of concept to deploy a sensory engineeringmethodology. At each stage of the methodology, an approach to integrate consumers' perception was proposed and allowed us to identify levers to improve the methodology. The hybrid steak developed is optimal as its scores are close to the "classical beef steak in terms of appreciation and authenticity.