

How to develop a food product

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In modern lifestyle meals away from home are no longer an option for leisure, but a requirement. Thus, the quality of the meals is largely conditioned by the options offered by the market. The food industry technology has evolved significantly with the introduction of new methodologies in order to keep up with the changes imposed by new patterns of life. However healthy food supply has still to be improved around the globe in view of consumers demand.

The aim of this project was to establish a process for the development of a tasty and nutritionally balanced cereal snack taking into consideration the existing industrial equipment in order to decrease investment costs and speed up time to market of the product. Several stages were identified: product concept; product formulation and processing; packaging development; storage tests; manufacture and marketing development. The first two stages were covered throughout the entire project and will be presented here.

The product concept. The cereal snack was to be nutritional balanced and aligned with the Portuguese food based dietary guidelines. Because cereals combine perfectly with dairies and fruits, a dairy or a fruit filling will be included in a cereal envelope by coextrusion to produce small cereal bars that can be packed together in variable number in order to target different ages (and different energy requirements). Dairy and fruit fillings should be pumpable at low temperature (20-40 °C), with a viscosity between 10-20 Pa.s at a shear rate between 1-100 s⁻¹, and should also have low water activity (a_w) < 0.55, to increase product shelf-life.

Dairy and fruit fillings formulation and processing. To miniaturize the production process, formulations were prepared in a Thermomix TM31 kitchen appliance (Vorwerk) with temperature and shear rate control. Viscosity was measured using a Carri-Med CSL 500K rheometer; a_w was evaluated with AquaLab Series 3 (Decagon); and nutritional facts were evaluated using the Food Composition Table of the National Institute of Health Dr. Ricardo Jorge. For sensory analysis, an affective test made by a convenient untrained panel was performed. Several simple ingredients were tested when combined with strawberry or milk powder to produce a fruit based or a dairy based filling, respectively. Potential formulations for dairy and fruit fillings were selected if having a_w < 0.55 and a good sensory evaluation. When measured, at different shear rates and at different temperatures (20, 40 and 60 °C), the viscosity was between 10 and 20 Pa.s, at typical coextrusion shear rate, when fillings were heated at temperatures higher than 40 °C or 20 °C for dairy or fruit filling, respectively.

The formulated dairy and fruit fillings showed sensorial and technological features that make them able to pursue the outlined product development process.

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