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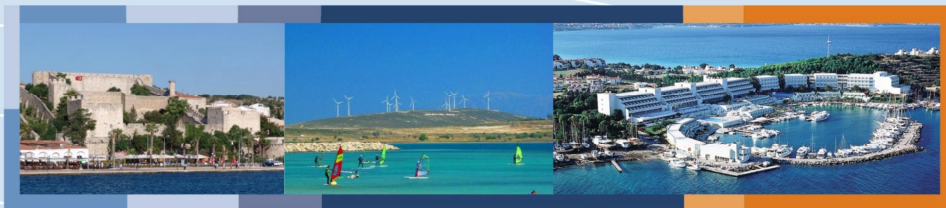


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Food product development: whey cheese with pumpkin jam

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Abstract

In Portugal a popular desert is whey cheese with pumpkin jam. However, these two products are only sold separately. Having in mind that the production of a combination of these two would be potentially interesting for new food commercializing, studies were conducted on the development of this new food product. A sensorial evaluation and a consumer study were conducted to perceive how consumers accepted this new product. The sensorial evaluation consisted of a descriptive analysis, with a panel of 17 tasters. The parameters evaluated using five points hedonic scales were: homogeneity in colour, homogeneity of the product, milk aroma, intensity of aroma, intensity of taste, salty taste, milk taste, sweetness, consistency and presence of granules. The results of the classification given to the different parameters evaluated in the sensorial analysis showed that only the salty taste received a classification of 2 (in a scale of 1 to 4), whereas all the others had 4 or 5, indicating that the panellists appreciated the product. Regarding the consumer study, this was performed by applying questionnaires to 100 persons. The results showed that almost 60 % of the enquired referred liking whey cheese with pumpkin jam. As to the frequency of consumption, the majority does it monthly, but there is still a good deal of people who do it daily. From the results obtained, it can be inferred that this product can be a successful innovation in the Portuguese dairy industry.

Keywords: whey cheese, pumpkin jam, Food development, sensorial analysis, consumer study.

Introduction

Whey is a dairy product that contains lactose, proteins, minerals, and traces of fat and organic acids, as well as calcium. It contains 7% (w/v) of total solids, being 75% lactose and 10% whey protein (1). Traditionally, this whey is used in whey cheese production, such as *Requeijão* in Portugal, especially after whey from ovine animals (2, 3). The traditional method of production of Portuguese Requeijão consists in heating the starting material, so that the curd rises spontaneously to the surface and is scooped into plastic moulds, where it drains and cools (2). Portuguese whey cheese (requeijão) has been reported as a food vector for environmental conditions prevailing in the gastrointestinal tract (4).

Pumpkin is a vegetable from tropical and subtropical zones (5), which can be used to obtain different food products, such as syrups, jams, jellies or purees. It is a good source of carotenoids, potassium, vitamins (B2, C and E), and it has a large quantity of fibre (6). Furthermore it has a low energetic content, being a good food from the nutritional point of view. Pumpkin jam is obtained using thermal treatment, one of the most important methods of preservation of vegetables (7).

Product innovation is commonly regarded as a major success factor in aggressive and competitive food markets (8,9). This is so because consumer demands change and becomes more differentiated. The main objective, when a new food product is developed, is to ensure that it will be accepted by consumers, and that acceptance is based on the relationship between the attributes of the product and the human perception. Sensory evaluation is often described like a scientific method used to evoke, measure, analyse and interpret those responses to foods as perceived through the senses of sight, smell, touch, taste and hearing (10). Descriptive sensory analysis can be considered as the first step in the characterization of a food product, providing a pre-defined terminology for describing sensory perceptions as objectively as possible (11). Apart from the sensory analysis, more new products would succeed in food industry if processors changed the way they approach new product development, such

as more careful adaptation to the market and consumers (9). In other words, food producers must have a market orientation, they must understand consumers, their needs and expectations.

In Portugal the combination of whey cheese with pumpkin jam is very frequently used, either at home or in restaurants as a desert. However, these two products are sold only separately, and the joining happens only at the time of consumption. Therefore, the selling of a combined product, whey cheese plus pumpkin jam together in the same package, could offer consumers the possibility of acquiring a more convenient food, and therefore could increase its consumption, due to the easiness in use. This opportunity was explored in the present work, with the development of such a combination. The work included the development of the product, a sensorial evaluation and a consumer study.

Materials and Methods

To perform the sensorial evaluation, a panel of 17 untrained tasters was used, being 12 female and 5 male, aged between 19 and 35 years old. International protocols (ISO 6658:1985) (28) were used to perform the descriptive analyses. The parameters evaluated using five points hedonic scales were: homogeneity in colour, homogeneity of the product, milk aroma, intensity of aroma, intensity of taste, salty taste, milk taste, sweetness, consistency, granules and as an overall perspective the global appreciation. The market study was performed by applying questionnaires to 100 persons, of which 57 were women and 43 were men.

Results and Discussion

The members of the panel used for the sensorial evaluation of this product were mostly female (71 %) and aged between 19 and 24 years old (65 %). Almost all panelist admitted liking each product separately: 'whey cheese' and 'pumpkin jam', which is an important base to serve as taster for the product under development (Figure 1).

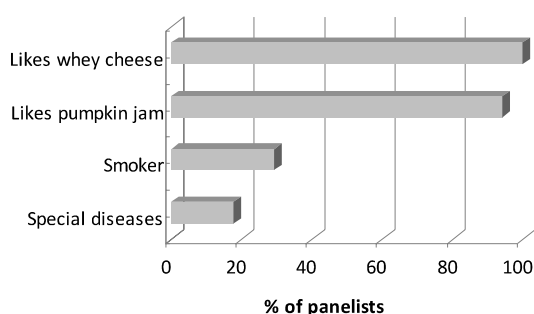


Figure 1. Some characteristics of the panelists.

The first stage of the product development involved the testing of two different types of product, which corresponded to two different presentations: (a) a layer of pumpkin jam between two layers of whey cheese; and (b) pumpkin jam on top of whey cheese. As it can be seen from Figure 2, the first option was the one preferred, being elected by more than 70% of the panelists.

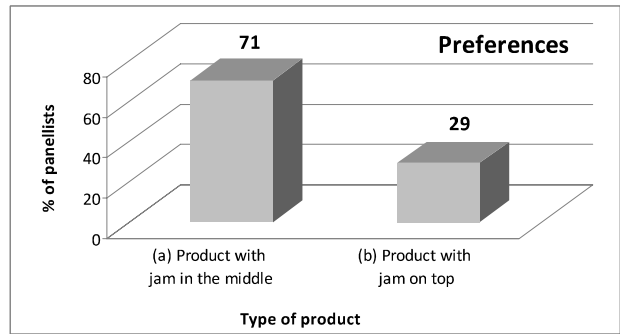


Figure 2. Preferences for the two types of product developed.

After this result, the sensory profile of the chosen product (product (a)) was established considering the following attributes: homogeneity in colour, homogeneity of the product, milk aroma, intensity of aroma, intensity of taste, salty taste, milk taste, sweetness, consistency, and presence of granules. The results obtained are presented in Figure 3 and they allowed concluding that the product was considered consistent, very sweet, with some granules and homogen in colour. Aspects that were appreciated were the milk aroma, the intensity of aroma and the intensity of taste.

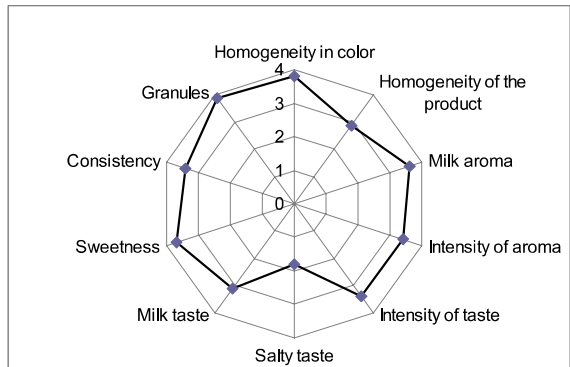


Figure 3. Sensorial profile of the product in the presentation chosen.

In contrast, the attributes less valued by the tasters were the “homogeneity of the product”, as a consequence of the unstable layer of pumpkin jam in the middle of whey cheese, and “salty taste” because of the sweetness of the jam. However, the “global appreciation” was considered good (Figure 4).

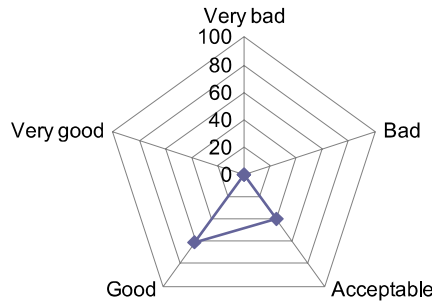


Figure 4. Global appreciation of the product developed.

As noted above, the sample used for the market research was composed by 100 persons: 57 women and 43 men. The first two questions asked were about the tastes of the enquired (Figure 5). They were asked, with closed-end questions if they liked “whey cheese” and “pumpkin jam”. Their answers allow some leeway since almost half of the people liked whey cheese and three quarters liked jam.

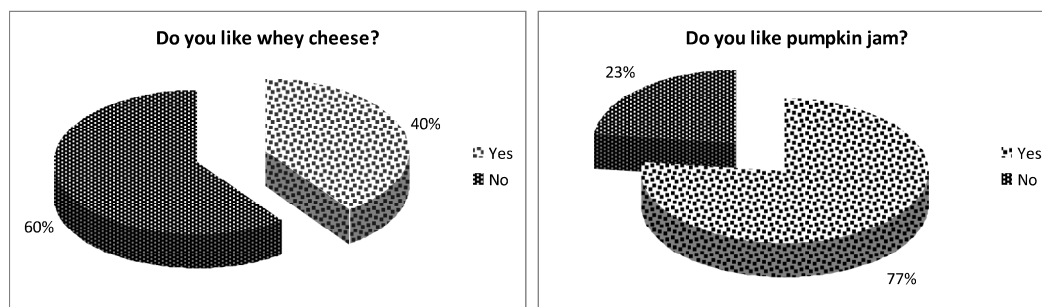


Figure 5. Liking for whey cheese and pumpkin jam.

The third question was also a closed-end question and was about the liking and disliking of the combination of whey cheese with pumpkin jam (Figure 6). More than half of the enquired answered positively to this question. So, once again, there is some indication that the product development could proceed.

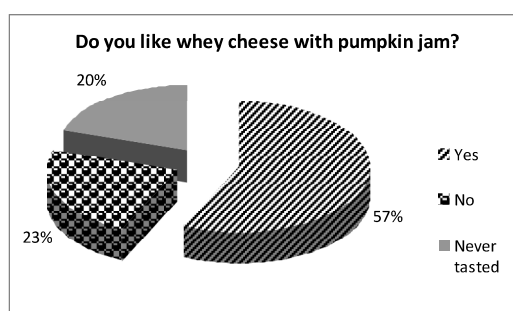


Figure 6. Liking for the combination of whey cheese with pumpkin jam.

The next question was about the frequency of consumption of the products in question: whey cheese or pumpkin jam (Figure 7). To measure the frequency of consumption, the possible answers were provided – daily, weekly, monthly, seldom, never. Unfortunately, these results were not very encouraging, because almost half of the enquired said that they did not consume any of the products. However, more than one quarter of the enquired said that they consume these products (whey cheese or pumpkin jam) monthly and 10% even weekly.

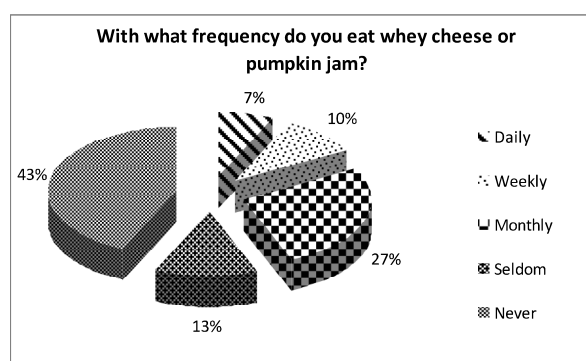


Figure 7. Frequency of consumption.

According to the questionnaire it was still possible to know that half the people of the sample consume whey cheese or pumpkin jam at tea and almost on fourth at lunch (Figure 8). Finally, 90% of the sample agrees that pumpkin goes well with whey cheese, which is an encouraging result. These results give an idea of the acceptance by the consumers of the product at stake. Consequently, this should be designed, primarily, to meet the food needs regarding a snack food. However, it can still be explored in other market segments - the people who consume it on other occasions, particularly at lunch as a desert.

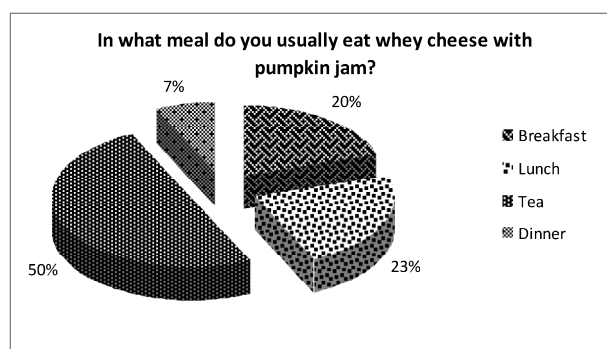


Figure 8. Moment of consumption.

Conclusions

The sensory quantitative profile analysis to the final form of the product developed (a layer of pumpkin jam between two layers of whey cheese) emphasised a good global appreciation. However more studies could still be performed.

With respect to its acceptability by consumers, the preliminary results are encouraging, since the majority of the enquired liked this combination of products (whey cheese and pumpkin jam), and therefore would appreciate the product developed. However, a more detailed study should be conducted with a bigger sample and with other types of questions, namely to access the buying intentions.

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