UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE BUCHAREST

FACULTY OF BIOTECHNOLOGY

PHD THESIS

RESEARCHE REGARDING THE CORRELATION BETWEEN PHYSICO – CHEMICAL CHARACTERISTICS, SENSORY ANALYSIS OF SMOOTHIE TYPE PRODUCTS AND THE CONSUMERS' PREFERENCES

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SUMMARY

Key words: fruits, new products, smoothie, quality, term of validity, storage in freezing state, consumer behavior

The doctoral thesis entitled “Research regarding the correlation between physico-chemical characteristics, sensory analysis of smoothie type products and the consumers’ preferences”, elaborated by the post-graduate STAN Andreea, under the scientific guidance of Mrs. Prof. Univ. Dr. Mona Elena POPA, at the doctoral school of the Univrsity of Agronomical Science and Veterinary Medecine in Bucharest, is structured in 3 parts, with 9 chapters and 85 figures and charts, 27 tables, 3 annexes and a bibliography with 179 titles of recent data.

The first part of the thesis is named “Literature review regarding food products and related consumer behavior”, the second part is named “Experimental research regarding the new smoothie products development in correlation to consumer perception” and the third part is entitled “General conclusions, author’s contributions and result dissemination obtained after the conducted research”.

In order to attain the main objective of the following doctoral thesis, and the establishment of the research plan, the first part was structured on three chapters and a study regarding the factors which influence the fruits preservation of the smoothie type products was realized as well as the actual analysis of production, commercialization and consumption of these products.

Based on the documentary studies and the conclusions drawn after every chapter of the first part, the research plan was established. It contains 4 big experimental categories which are:

- Experimental research on the development of new alimentary smoothie type products based on mixtures obtained from fruits without any additional preservative substance and chemical stabilizers or other chemical substances for pH or acidity.
- Experimental research on determining the nutritive and active compound composition of smoothie type products.
- Sensory analysis of the newly developed products by means of the people answering to the sensory evaluation tests (single and pair)
- The study of the consumer’s behavior towards the smoothie type products by using research and marketing methods to determine the factors that influence fruit based alimentary products consumption.

In the research plan, the second part of the thesis contains four chapters, in which the materials, the methods and the equipment used for the experiments, the experimental research regarding the fruits used for the smoothies, the experimental research regarding the nutrient and active compound composition in the new products and the consumer's behavior towards them are presented.

The raw materials analyzed in order to obtain the new smoothie type products have been: strawberries, sour cherries, peaches, plumes, apples, pears, blueberries, grapes and vine shoots. For every type of fruit 4 different types of samples have been realized (P1 – fresh fruits; P2 – fruit puree; P3 – fruit puree dipped in ascorbic acid 1% for 5 minutes; P4- fruit puree thermally treated at 95°C for 5 minutes),and that have been later on frozen at -18°C. The results obtained contain the physicochemical microbiological nutritive and sensory characterisation of both fresh fruits and the ones exposed to different pretreatments and frozen storage.

After the physico-chemical nutritive and sensory characterization of raw materials such as: plumes, apples, blueberries, apricots, peaches and apple juice as well as grape and vine shoot juice, it was noticed that the purees thermally treated at 95°C for 5 minutes have not registered significant differences from the initial samples, ensuring in the same time maximum stability in frozen storage, being thus chosen for the new smoothie mixtures.

Due to a new ingredient (vine shoot puree thermally treated at 95°C), for product number 1, 2 types of mixtures have been realized, having as a purpose the observation of the nutritive and sensory differences as well as the degree of acceptability, as follows:

Product 1: - mixture 1, noted PMA, contained a puree combination of plums, apples, blueberries and grape and apple juice;

- mixture 2, noted PML, contained the same combination of fruit purees as mentioned in mixture 1, to which it was added a 5% of vine shoot puree instead of the blueberry one.

Product 2, noted PCS, contained a mixture of apricot, apples, and peaches puree and apple and grape juice.

By determining the physicochemical characteristics of the new mixtures, it was observed that the initial thermal treatments and the frozen raw material storage have both led to obtaining high quality products.

The sensory objectives of the analysis have been: the evaluation of the degree of acceptability of 3 products obtained through the mixture of some selected fruit purees and the preference evaluation and the degree of perception between the mixtures PMA and PML.

By evaluating the products in terms of color, taste and mouthfeel sensation, all the samples have registered over 70% acceptance grades.

After the sensory analysis using the preference method, both the smoothie PMA and the smoothie PML obtained 40-60 scores, showing a similar level of preference.

After the reasearch regarding the knowledge level identification and consumer's preferences to smoothie type products resulted the fact that 65.6% of the persons that joined the study, consume fruits daily, 28.3% of them consume fruits only 1-2 times a week, and a percentage of 6% only a few times a month; 95.3% of the subjects consume fresh fruits, 35.3% drink fruit juice, 24.6% consume them as jam or marmalade and 14.1% as smoothies and 18.8% as dry fruits or in any other form. Only 46.6% know the nutritional value of the smoothie products and know about these products while a percentage of 22% have never even heard of it.

A percentage of 52.3% of the participants answered that the reason for which they consume smoothies is that it contains fresh and natural fruits and 55.4% of them answered that they buy for the good taste. 16.7% of the interviewed people answered that they use smoothie type products for the reason that they can be easily carried and consumed anywhere (at work, in the park, etc.), or even due to the fact that it can replace a snack meal (34.1%), while another part of them (24.8%) consumes smoothies for the rich fiber content and the nutritive value (37.2%).More than 37.4% of these people consume homemade smoothies, 28.5% only order them in restaurants or coffee shops, only 14.1% buy them from specialized stores and 0.8% buy the smoothies online.

Having in mind that the level of fruit consumption is still very low, both at national and international level, and the smoothie type products are less known through the Romanian consumers, placing them on the market as an alternative to fresh fruits may facilitate their acceptance and preference.

It is important that the smoothie type products availability to be varied and extended in order to facilitate the consumer's access to a larger variety. At present, the smoothie type products available on the market are only presented as permanent products or temporary actions (coffee shop presence) and unveil to the consumer a new concept, with clear tint of high quality products (premium).