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SENSORY ANALYSIS OF THE DEHYDRATED PRODUCT OBTAINED FROM APPLES HARVESTED FROM THE TRADITIONAL ORCHARDS OF THE BRAN - ZĂRNEȘTI AREA

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Abstract

Having a scientific foundation of more than two decades, sensory analysis is an easy method for assessing the quality of a food product by bringing its characteristic features to the public consumers' attention. As a complementary method in food control and expertise, sensory analysis mirrors the outcome of certain physiological and psychological aspects of the tasters, which involve such actions as reception, recognition, ordering, description, and appreciation. Relying on the consumer's first contact with the product, the analysis measures its sensory properties that affect the subjects' choice power as well as their purchase decision. By describing the results obtained from the sensory analysis of apple chips, the present paper seeks to emphasize the importance of tasting in the presentation, refinement and promotion of the product. This objective was accomplished at the INDAGRA International Fair, which took place at Romexpo Bucharest on 4th November 2016. The apple chips and other food products were featured by the stand of the University of Agronomic Sciences and Veterinary Medicine of Bucharest. 191 people, 21-60 years old, were invited to visit the stand of the University of Agronomic Sciences and Veterinary Medicine Bucharest and taste the products. The apple chips were evaluated for different organoleptic features like appearance, taste and aroma as well as for the general impression to simulate a possible authentication of the product as a preferred registered trademark. At the same time, the experiment aimed to emphasize the importance of nutraceutical fruit consumption by attracting the consumer's attention with the present analysis and through raising awareness of healthy food and eating. The paper presents the results, being an important step to follow with the serial production of the tested products.

Key words*: apple chips, taste, appearance, aroma.*

INTRODUCTION

Having a scientific foundation of more than two decades, sensory analysis is an easy method for assessing the quality of a food product by bringing its characteristic features to the public consumers' attention.

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By describing the results obtained from the sensory analysis of apple chips, the present paper seeks to emphasize the importance of tasting in the presentation, refinement and promotion of the product.

This objective was accomplished at the INDAGRA International Fair, which took place at Romexpo Bucharest on 4th November 2016. The apple chips and other food products were featured by the stand of the University of Agronomic Sciences and Veterinary Medicine of Bucharest.

To attain the objective, we planned on questioning the visitors open to taste the products and participate in the survey that highlights the sensory properties of these products.

MATERIALS AND METHODS

Apples chips

Drying has been used in the United States for more than a century (Downing, 1989) and

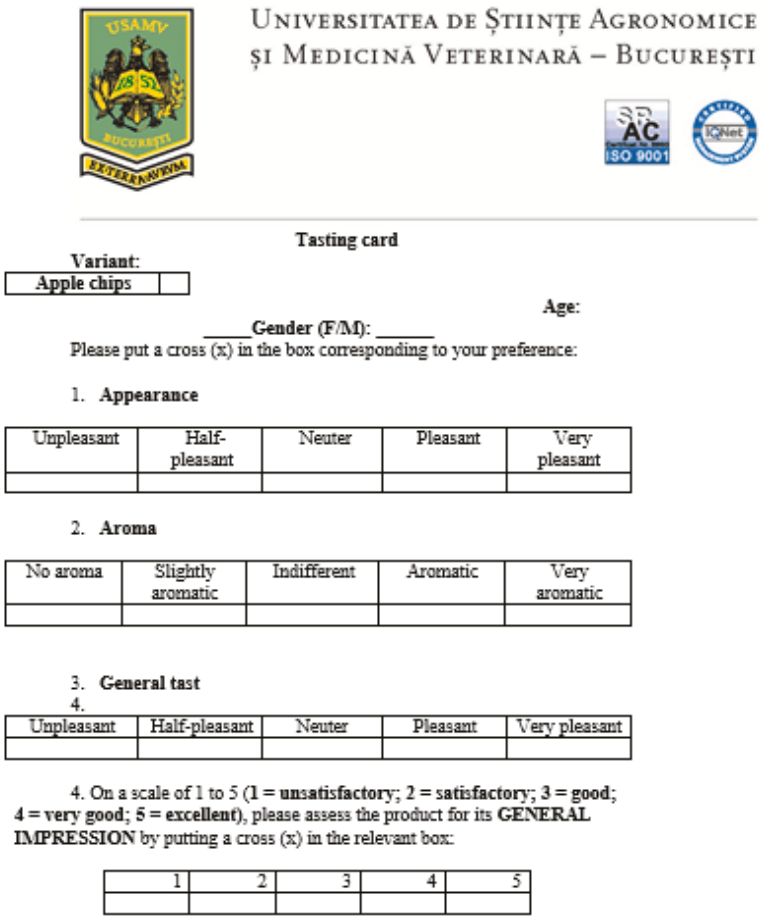
represents the process that underlies the obtaining of different food products like apple chips. Researcher S. Gould reported that at the turn of the 19th century fruit dehydration had been common for several years in the western part of the New York state.
Shaped as rings or slices, apple chips are the result of drying healthy, ripened fruit.
Their thickness and shape are often irregular, dehydration being a procedure that transforms the fresh apple pieces in a particular way.
The drying proper implies the vaporization of water within the fruit and its removal from the used drying system.
As important as dehydration is product packaging, which must ensure long-term storage.
At the same time, packaging must meet the requirements of regular handling during transportation and storage as well as of keeping product integrity by removing moisture, oxygen, light and foreign odour. Observance of packaging standards and norms guarantees product quality.

The sensory analysis
As mentioned in the introduction, the quality measurement of the dehydrated products was achieved through the sensory analysis method, which recorded a wide range of customers' preferences.
The apple chips were evaluated for different organoleptic features like appearance, taste and aroma as well as for the general impression to simulate a possible authentication of the product as a preferred registered trademark.
At the same time, the experiment aimed to emphasize the importance of nutraceutical fruit consumption by attracting the consumer's attention with the present analysis and through raising awareness of healthy food and eating.

The target consumers
Intending to achieve a highly objective and complex result, the sensory analysis targeted subjects of different age, gender and class. Consequently, the realization of this selection was sought within the INDAGRA International Fair.
191 people, 21-60 years old, were invited to visit the stand of the University of Agronomic Sciences and Veterinary Medicine of Bucharest and taste the products. Most of them, mainly males, gladly answered the invitation, some of them showing an interest in forming or enriching their healthy diet culture.
As expected, the subjects 40-60 years old were present in the highest number, 70%, the younger people being responsive in a lower percentage, 30%. As already mentioned, the male subjects outnumbered the female ones by 68.06%.

Tasting the chips
In key with the particularity of the Bran - Zărneşti area, the apple chips obtained from the Jonathan and Scortos cultivars were manually packed in small plastic bags decked with strips featuring traditional folk themes. Likewise, the products were exhibited in wattle baskets made by local craftsmen. The apple chips were offered in servings of four, as half-round slices.
The tasters were free to choose their preferred products, which they did by picking one or more food samples.
To measure and record the analysis results, the tasting was required to occur on the spot.

The tasting card
The research method of the present experiment was the hedonic analysis, or the preference test represented by the tasting card (Figure 1).



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Tasting card

Variant:

Apple chips	

Age:

____Gender (F/M): _____

Please put a cross (x) in the box corresponding to your preference:

1. **Appearance**

Unpleasant	Half-pleasant	Neuter	Pleasant	Very pleasant

2. **Aroma**

No aroma	Slightly aromatic	Indifferent	Aromatic	Very aromatic

3. **General tast**
4.

Unpleasant	Half-pleasant	Neuter	Pleasant	Very pleasant

4. On a scale of 1 to 5 (**1 = unsatisfactory**; **2 = satisfactory**; **3 = good**; **4 = very good**; **5 = excellent**), please assess the product for its **GENERAL IMPRESSION** by putting a cross (x) in the relevant box:

1	2	3	4	5

Figure 1. Tasting card - research method

Figure 1 shows that the tasting card was conceived by following certain parameters. By putting a cross in a certain box, each taster expressed their opinion about the appearance, aroma, taste and general impression of the product.

While the first three characteristics were associated with parameters like unpleasant, half-pleasant, neuter, pleasant, very pleasant, or no aroma, slightly aromatic, indifferent, aromatic, very aromatic, the general impression was measured in figures on a 1 to 5 scale.

For a correct assessment, the figures were associated with the following ratings: unsatisfactory, satisfactory, good, very good and excellent.

Aiming at a highly objective result, the tasting card did not require the subject's name, except their age and gender.

RESULTS AND DISCUSSIONS

The results were measured via a questionnaire, whose attitude scale interpreted the obtained information statistically.

The survey recorded relative and absolute frequencies, which were associated with percentage and numerical results (Clinciu, 2013).

Accordingly, organoleptic dimensions like aroma and taste recorded the results shown in the following tables (Tables 1, 2).

On the strength of Table 1, one can analyse the tested consumers' opinion about the aroma of the prepared and presented chips.
It is noticeable that the female respondents accept these chips more easily as they might become new and healthy prepared food for both adults and children.

Table 1. Aroma determination

Respondents	No aroma	Slightly aromatic	Indifferent	Aromatic	Very aromatic
Male %	0.76	5.38	0.76	49.24	43.84
Female %	-	1.63	-	47.54	50.82

In Figure 2, one can statistically notice that females become more attracted by these natural products as compared to males.

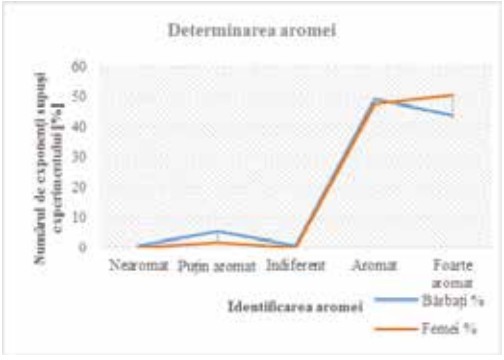

Figure 2. Determination of apple chip aroma by the male and female respondents

Chip taste determination leads to the observation that there is only a slight difference between the male and female respondents. As a conclusion, the respondents' taste does not vary too much.
Figure 3 is a graphical representation, according to male and female respondents, of the individual taste of the analysed chips.
One can therefore say that both genders have close taste regarding the apple chips prepared in the laboratory. As more than 50% of the respondents described the taste as being very pleasant and more than 40% as pleasant, one can gather that these apple chips are appreciated by the consumers and their market production might be successful.

Table 2. General taste determination

Respondents	Taste determination				
	Unpleasant	Half-pleasant	Neuter	Pleasant	Very pleasant
Male (%)	-	0.76	1.54	40.78	56.92
Female (%)	-	-	1.63	44.17	54.10

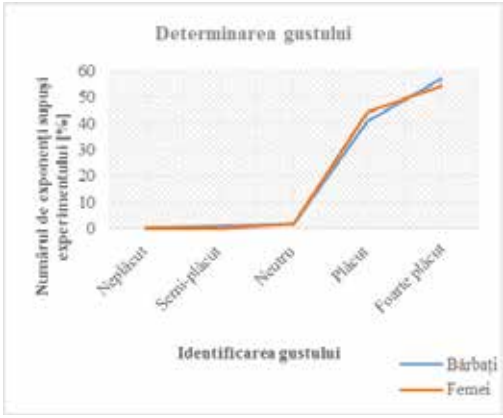

Figure 3. Chip taste determination by male and female respondents

Except for one taster, who thought that the product had no aroma, the others appreciated its quality. The vast majority considered that its features were pleasant and very pleasant.
According to gender and age, the opinions varied from one subject to another, as the above tables clearly show.
It was a welcome surprise to find that the appearance and general impression of the product recorded no parameters for unpleasant and half-pleasant. Almost 100 percent of the subjects opted for the pleasant and very pleasant appearance and general impression of the product.
It is worth remarking that more than 50% of the female subjects had a positive attitude, classifying the product as very pleasant and excellent (Tables 3, 4).

Table 3 recorded the data regarding the appearance of the chips obtained through dehydration and drying.
Following the data obtained from the examined respondents, one can notice that the majority are satisfied with the appearance of the consumed chips, which are very similar to the classic chips such as those made from potatoes.

Table 3. Appearance determination

Respondents	Chip appearance determination				
	Unpleasant	Half-pleasant	Neuter	Pleasant	Very pleasant
Male (%)	-	-	3.08	43.84	53.08
Female (%)	-	-	-	42.62	57.38

Statistically, as shown in the Figure 4 below, both the male and female consumers share a common opinion about the appearance of apple chips.

Figure 4. Determination of the chips exterior appearance by the male and female respondents

Feedback

The feedback obtained from the subjects of our experiments shows that the females are more pleased with the new apple chips even as compared to the ones made from potatoes, while the males, at close quarters, are also pleasantly impressed by the new apple products, which might be produced soon and are healthy to boot. Likewise, the male and female subjects appreciate all the quality characteristics of these chips as well as the aroma and the pleasant taste of the traditional Romanian apples which, compared to the imported ones, are usually tasteless and have no aroma, except for a pleasant appearance.

Table 4 statistically indicates that about 60% of the subjects are very impressed by the new food products, while about 40% of them are only pleasantly impressed.

Table 4. General impression

Respondents	Unpleasant	Half-pleasant	Neuter	Pleasant	Very pleasant
	1	2	3	4	5
Male (%)	-	-	2,30	39.24	58.46
Female (%)	-	-	-	37.71	62.29

Figure 5 graphically demonstrates the same tendency towards the appreciation of the remarkable quality of these Romanian apple chips.

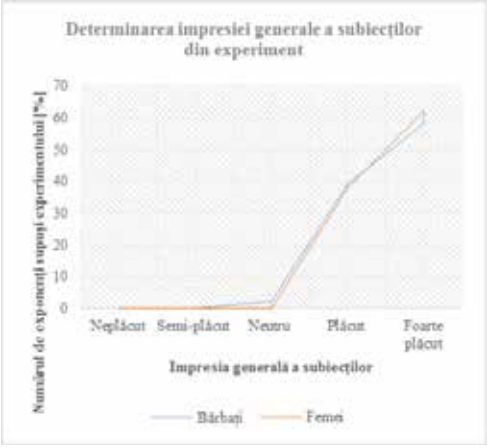

Figure 5. Determination of the subjects' general impression regarding the chips obtained from apples specific to the Bran - Zărnești area

CONCLUSIONS

The Bran - Zărnești area is traditionally appropriate for the growth of apple cultivars that have aromatic fruit and are resistant to the cold climate of the region.
The aim of this research was to test the consumer's preferences on dried apples in order to promote locally new possibilities of valorisation of apple fruits.
The results showed that more than 62% of the women and 58% of men appreciated this product with the highest scores.

Both women and men evaluated the taste of the product with „pleasant" and „very pleasant" scores, being a very important parameter of the sensorial analysis.
For the dried apples it was chosen a package with national traditional aspects. The consumers liked the theme, this parameter being noted with the highest score also.
For the aroma parameter, the women showed more interest than men, most of them appreciated it.
The positive results of this study are an important step for continuing the research in the valorisation of the local products in the Bran - Zărnești area.

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