

## Study concerning the quality of jam products based on banana and ginger

Crina Muresan, Anamaria Pop<sup>\*</sup>, Sevastița Muste, Stancuta Scrob, Andreea Rat

<sup>1</sup>University of Agricultural Sciences and Veterinary Medicine, Faculty of Food Science and Technology,  
3-5 Mănăștur street, 3400, Cluj-Napoca, Romania

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### Abstract

In order to diversification of fruit jam products and increasing segment of consumers it was intended to valorification bananas and ginger in obtaining a new product. The products obtained at the Canning Laboratory of Faculty of Food Science and Technology was the result of original recipe and the goal of the study was to investigate the quality of jam by physico chemical analyses and general consumer's acceptance. The analyses were conducted on three prototypes of jam, first banana jam without addition of ginger (VI Control sample BJ), then banana jam with 2% ginger (V2 BGJ 2 %) and banana jam with 4% ginger (V3 BGJ 4 %). By sensory analysis was determined acceptability, preference and product differentiation by consumers. Present study indicated that banana jam with 2% ginger (V2 BGJ 2 %) was the most preferred by consumers by combining intense flavor and slightly spicy lime flavor of ginger and creamy consistency of banana.

**Keywords:** jam, banana, ginger, chemical analysis, sensory analysis

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### 1. Introduction

Banana is probably the most important fruit crop in the world with annual production of more than 80 million tones. In many of the 120 banana producing countries which are mainly located in the Third World, banana is locally consumed either fresh, prepared by cooking or processed as beer, chips and other food products. In addition to being the major source of carbohydrates, banana fruits contain high levels of potassium, and the vitamins B and C. It is (after rice, milk and wheat) the fourth major food source for the developing world and also ranks fourth (after rice, wheat and maize) in terms of gross value of production. [1]

Jams are gelatinized products obtained from fresh fruits that are boiled with sugar, with or without added pectin and acid.

The final concentration of jams is determined by the current standards. The products presented in containers sealed and stability is ensured by heat treatment. [2]

The purpose of this study started from a market research regarding the need of a new product, banana and ginger jam, and it turned to be a study searched because bananas are a favorite food for everyone from infants to alders, since is known that is creamy, rich, sweet, sources of potassium, fiber, vitamins, manganese, no fat and cholesterol. Ginger has been used for flavoring.

Ginger is an important commercial crop grown for its aromatic rhizomes, which are used both as a spice and as a medicine. This ingredient has become very popular in Romania among the consumers.

## 2. Material and methods

**Materials:** The raw materials taken in the study (banana) were purchased from supermarkets in Cluj-Napoca and were selected based on consumer preferences statistic dates on the type of fruit consumed most often both the elderly and children. Ginger has been used for flavoring.

**Method:** To determine physico chemical components has been taken medium sample to be representative for analysis. [3]

According to EU Council Directive 2001/113/EC, the new jam product was obtained as a mixture, brought to a suitable gelled consistency of sugars, the pulp of banana and ginger like an flavor ingredient.

A small amount of jam was made by boiling quantities of banana pulp and sugar together, pectin and citric acid, until setting point it was reached. More specifically, 600 g of sugar for 1 kg of bananas was added and boiled and then 20 gm of citric acid was added and stirred continuously till it boiled and reaches the consistency of jam, until the solution has a concentration of minimum 61°Bx. Jam texture depends on the type of pectin, sugar, and citric acid added. Then the jam was filled in the bottles and heat treatment have been done. [4-9]

The experimental variants was physico-chemical analyzed (both for bananas and banana ginger jam): moisture, asch content, acidity viatmin C, total sugar,IR (refraction index).

The sensory attributes, were evaluated by a group of trained panelists, using a 5-point Hedonic scale.

## 3. Results and Discussion

The commercial value of the fruit is defined by current standards through quality indices: sort, size, appearance and sectional maturity. All these criteria have been met for bananas taken under study. Technological process for obtaining Banana Ginger Jam final product includes several steps as it follows: Quantitative reception was done by weighing; Mechanical treatment consists of sorting, cleaning and cutting: bananas were sliced crosswise as thin to form a paste quickly; Ginger has been used finely divided, in order to properly blend with banana paste; Syrup preparation

consisted of dissolving the citric acid, pectin and sugar in boiling water and for about 10 minutes; After the obtained syrup was added bananas; The thermal treatment consisted of boiling and concentrating the product in normal atmospheric pressure for obtaining a gelled mass without separation of liquid; The ginger was added towards the end of the gelling time; Cooling jam was made to 8°C, to avoid caramelization of sugar, to obtain a homogeneous product and avoid increasing viscosity; Dosing was done manually in glass bottle with 167 g weight with hermetic closing; To ensure longer storage of the finished product was subjected to the heat treatment.

Regarding the aspect of banana jam was observed to be gelled mass without separation syrup, with no signs of fermentation or mold without foreign bodies. Regarding the colour was observed in banana jam a shade of light brown colored because of light-colored fruit. Regarding the taste and flavor they are pleasant, characteristic of banana fruit variety flavored with ginger which increases progressively with the addition of spice;

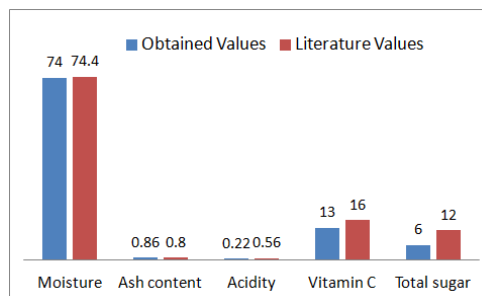


Figure 1. Comparative analysis of bananas quality indices

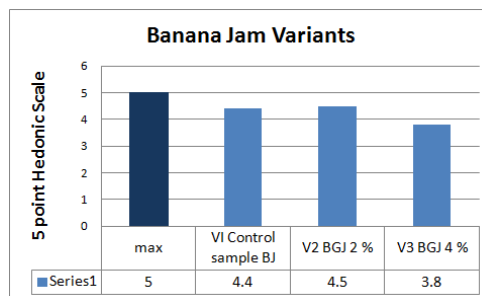


Figure 2. Sensory analysis in 5 point Hedonic Scale

Regarding raw material in terms of physico-chemical indices, it can be concluded that it

comply with quality criteria on humidity (74%), ash content (0.861%), acidity (0.228% malic acid), vitamin C (13mg%) , total sugars (6%).

The 5 Point Hedonic Scale Test was conducted on 20 consumers of different age and sex, a group of trained panelists. After centralizing their answers, variant V2 BGJ 2 % showed the highest hedonic score of 4.5, compared to variant VIBJ (4.4) and variant 3 V3BGJ (3.8), where it appears that banana jam with ginger 2% is most preferred by consumers.

**Table 1.** Comparative analysis of Bananas Ginger Jam quality indices

Banana Ginger Jam Variants			
Variants	VI Control sample BJ	V2 BGJ 2 %	V3 BGJ 4 %
° Brix	66	68.3	69.3
IR	5,7	6,1	6,5
Moisture (%)	33.4	32.2	29.9
Ash content (%)	0.583	0.578	0.633
Acidity (g%malic acid)	0.268	0.282	0.456

In this case, under the conditions of admissibility in jams, soluble substances respects the stipulations of Stas as at least 61 °Bx. All three prototypes obtaining values of more than 61 °Bx, especially in samples with the addition of ginger, as can be seen in Table 1.

The highest value of ash content was found in the banana jam with added 4% ginger.

Banana jam with added ginger 4% present acidity value nearest the value of STAS 3183-90-Jam, as the other two prototypes.

#### 4. Conclusion

Concerning the quality of finished products obtained was observed that total sugar content were higher values in the banana jam with ginger.

Observing consumer preference after applying 5-point hedonic test was recorded as between the three prototypes (banana jam, banana jam with ginger 2%, banana jam with ginger 4%), after analyzing sensory banana jam with ginger 2% is best appreciated by consumers.

As shown in the study conducted, bananas and ginger lend themselves to obtain gelled products and physico-chemical parameters corresponding to quality standards. By combining intense flavor and slightly spicy lime flavor of ginger and creamy consistency of banana, appreciated by consumers, we recommend in Romania manufacture of banana jam with added 2% ginger.

**Compliance with Ethics Requirements.** Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human / or animal subjects (if exist) respect the specific regulation and standards.

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