



Chemical and Sensorial Evaluation of a Newly Developed Bean Jam

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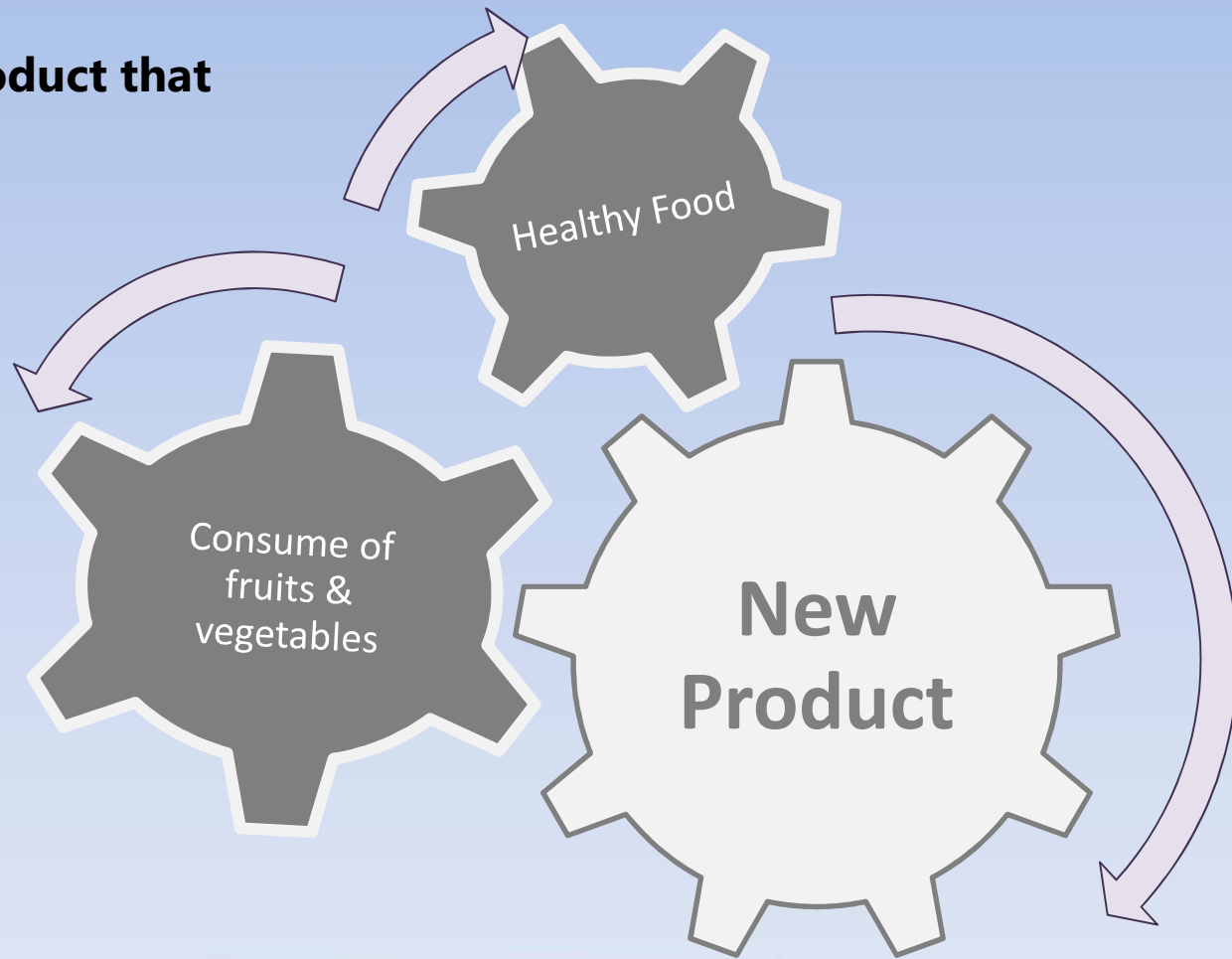




Objective

Develop a new food product that brings together:

- **Innovation**
- **Pleasure**
- **Healthy food**





Plant foods



! 1.7 Million deaths → Due to

Low consumption of fruits and vegetables

400 g



Assure benefits and protecting effect



Obesity
Diabetes type 2
Cancer
Cardiovascular diseases
Constipation Among others



It is important to increase plant food consumption in every possible form





Raw materials

Beans

Is one of the most important sources of protein in human diets. It offers health benefits in the prevention and reduction of diabetes, obesity, heart disease and chronic disorders.

Apples

Is the most consumed fruit in Europe. It presents health benefits by being rich in phenolic compounds including flavonoids and fiber.

Carrots

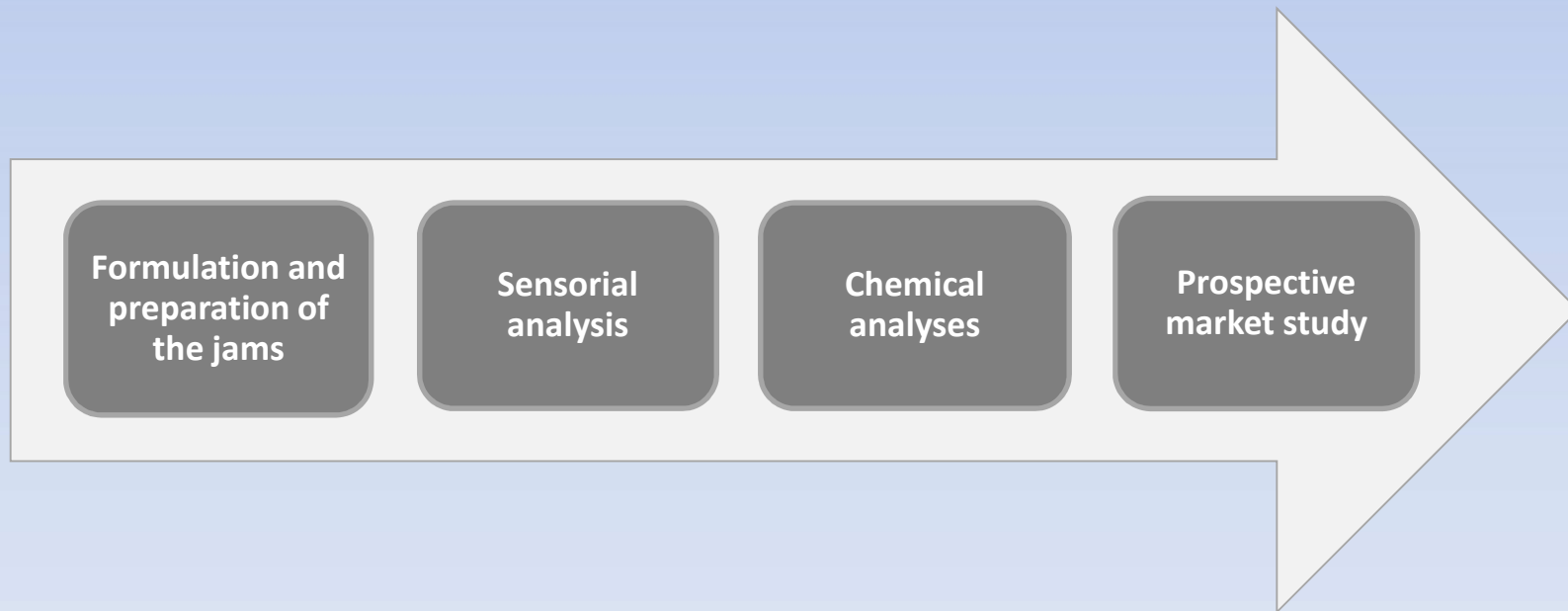
It is among the most consumed plant foods for having a nice color and flavor. It is rich in fiber, carotenes, vitamins, minerals and other bioactive compounds.



Methodology

The product, bean jam, aimed to associate the benefits of beans with the consumption of fruit and vegetables.

In this work three jam formulations have been developed, from a base constituted on apple and carrot , to which was added bean cooking water.





Product formulation



Maceration (6 to 12h)



Water from boiling the beans
Rich in nutrients

Boiling



Code	PRODUCT DESCRIPTION	FORMULATION
BJA	Bean jam with apple	1.9 kg raw apple 0.9 kg sugar 1.5 L bean boiling water
BJAC	Bean jam with apple and cinnamon	1.9 kg raw apple 0.9 kg sugar 1.5 L bean boiling water 10 cinnamon sticks
BJC	Bean jam with carrot	1.5 kg raw carrot 0.9 kg sugar 1.5 L bean boiling water





Chemical analyses

- Determination of lipids – Method Soxhlet
- Determination sugars (°Brix) – Refractometry
- Determination antioxidant activity – Method ABTS
- Determination of crude fibre – Method Weende
- Determination of protein – Method Kjeldahl





Sensorial analysis

Product acceptability

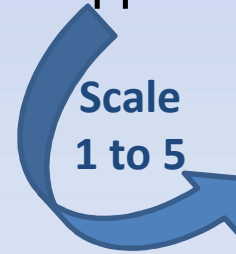
2 tests

Ordering Proof

Sensorial profile

- Bean jam with carrot
- Bean jam with apple and cinnamon
- Bean jam with apple
- Carrot jam
- Apple jam

- Bean jam with carrot
- Bean jam with apple and cinnamon
- Bean jam with apple



Scale
1 to 5

- Colour
- Aroma
- Consistency
- Sweetness
- Taste
- Global appreciation



Prospective market study

Study the preferences and choices of potential consumers

On-line questionnaire

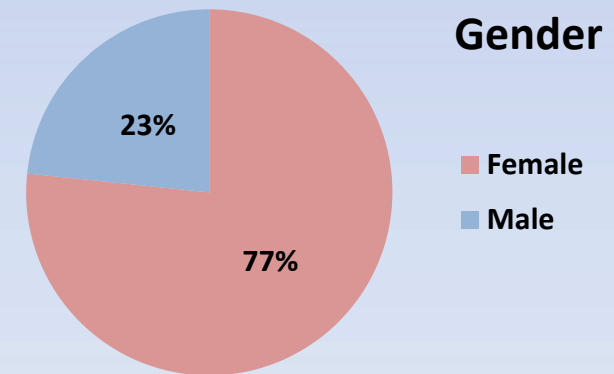
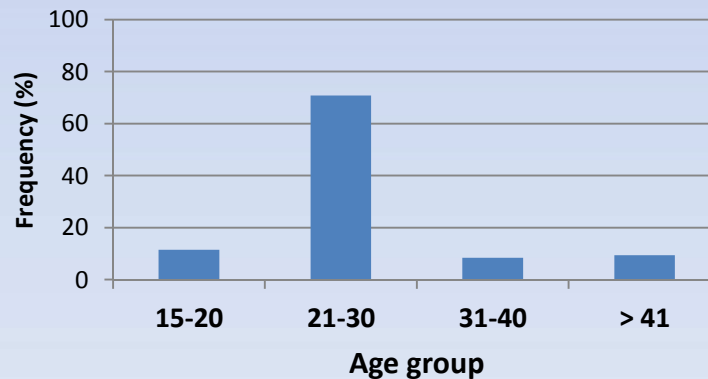


Quantitative study



1110 respondents

Between
18 and 67
years



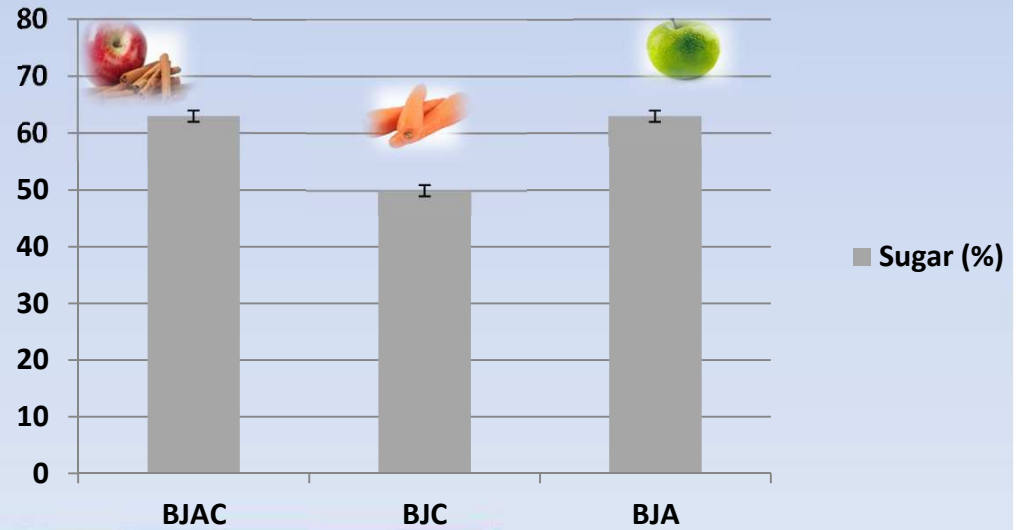
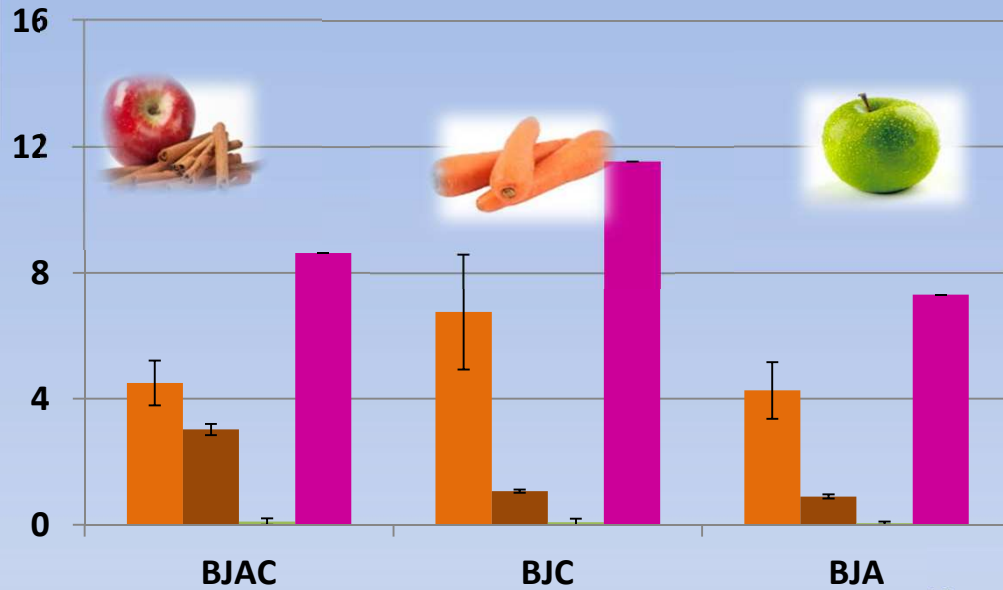


Results





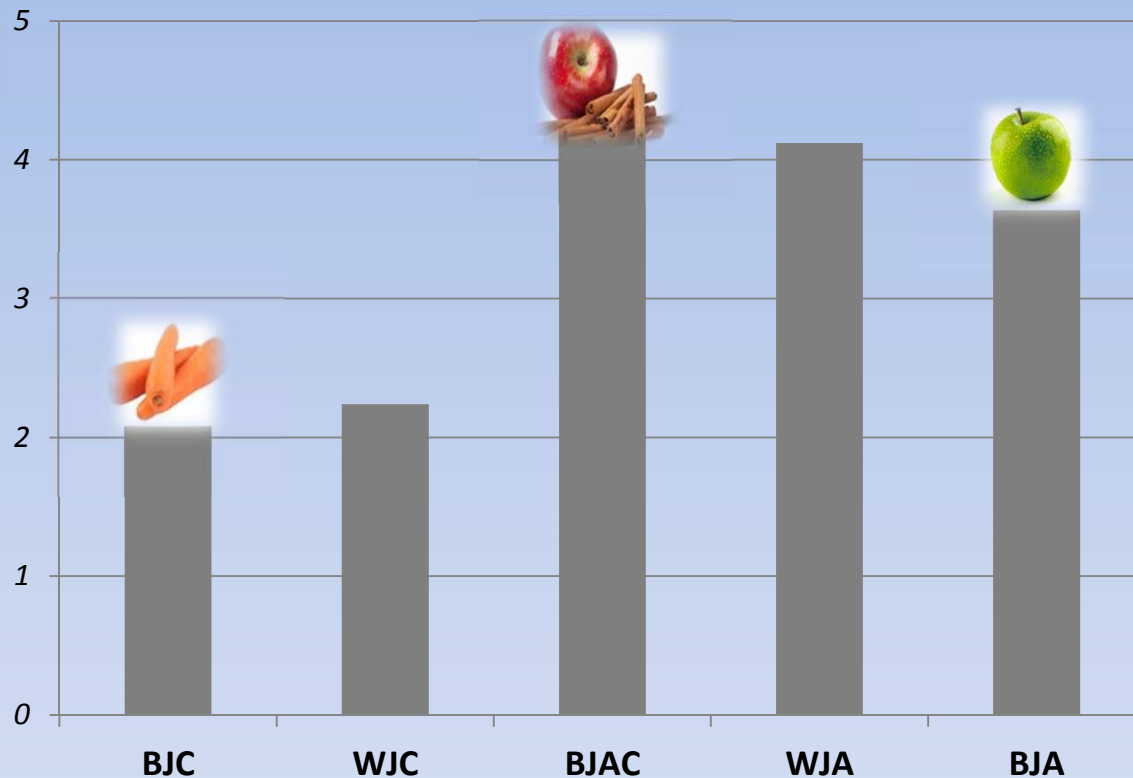
Chemical analyses





Sensorial analysis

Ordering proof

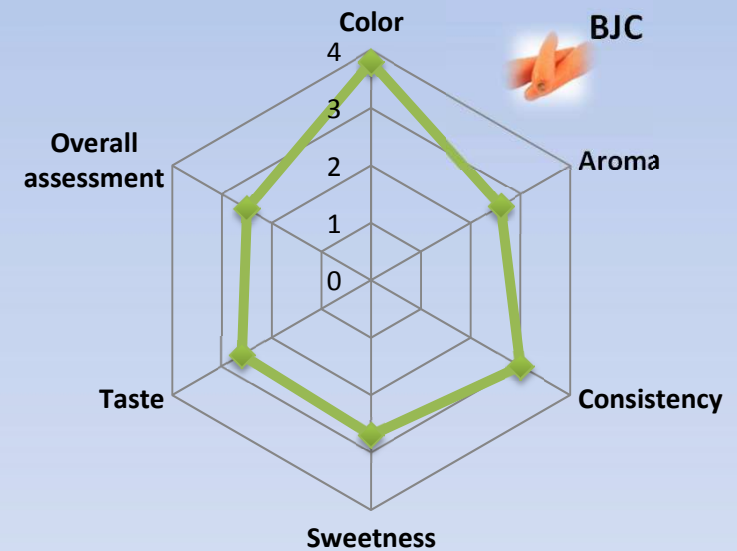
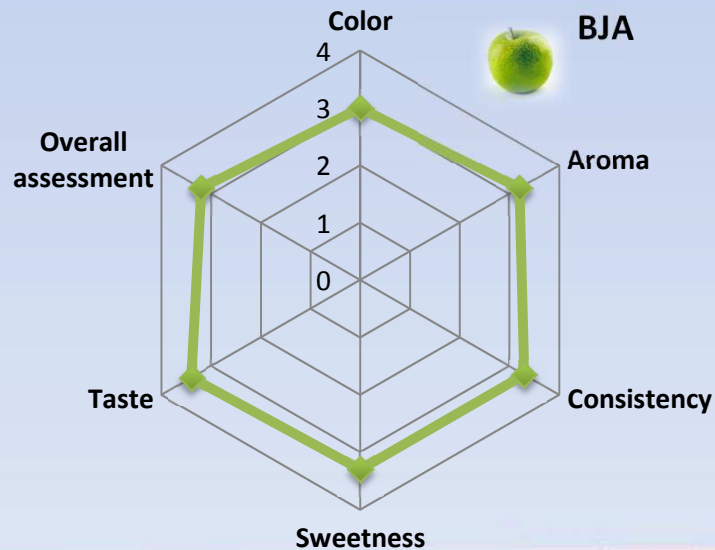
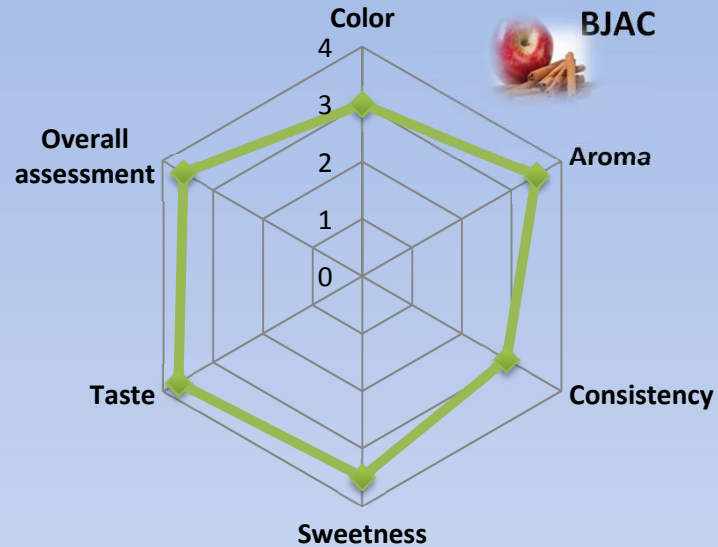


BJC – bean jam with carrot
WJC – water jam with carrot
BJAC – bean jam with apple and cinnamon
WJA – water jam with apple
BJA – bean jam with apple



Sensorial analysis

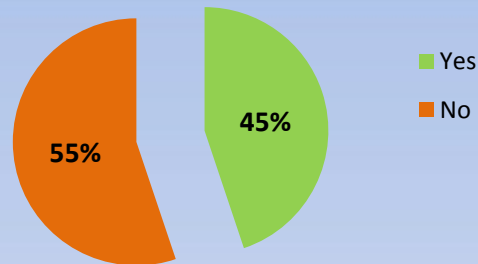
Sensorial profile



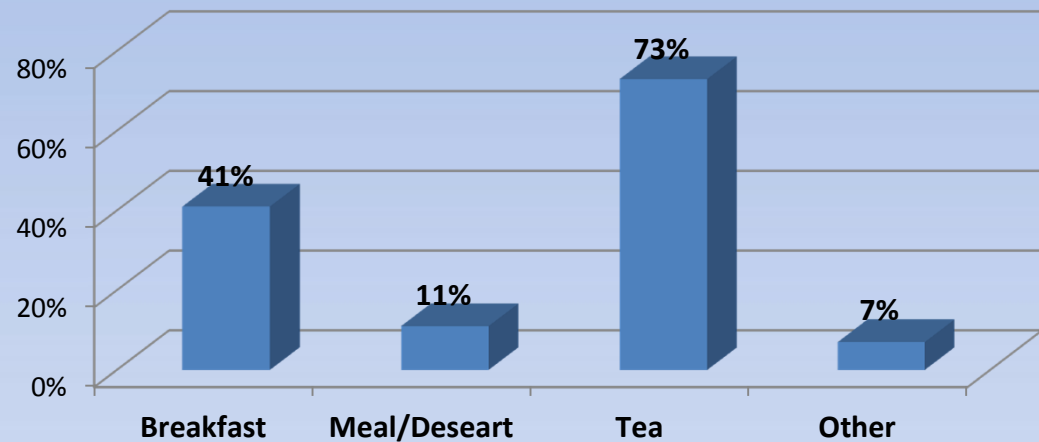


Prospective market study

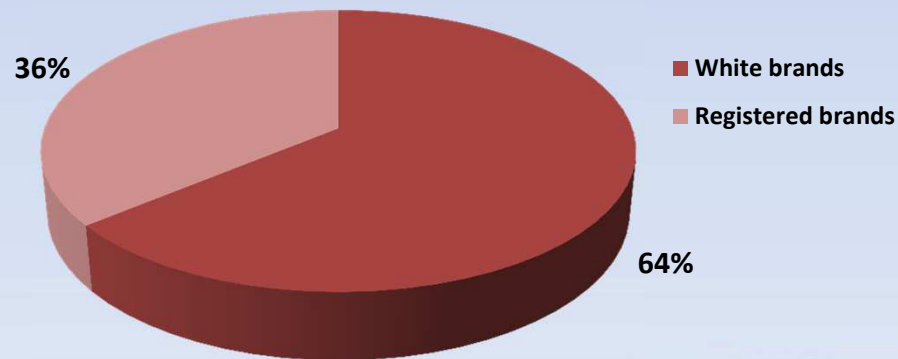
Do you regularly consume jams?



When do you eat jams?



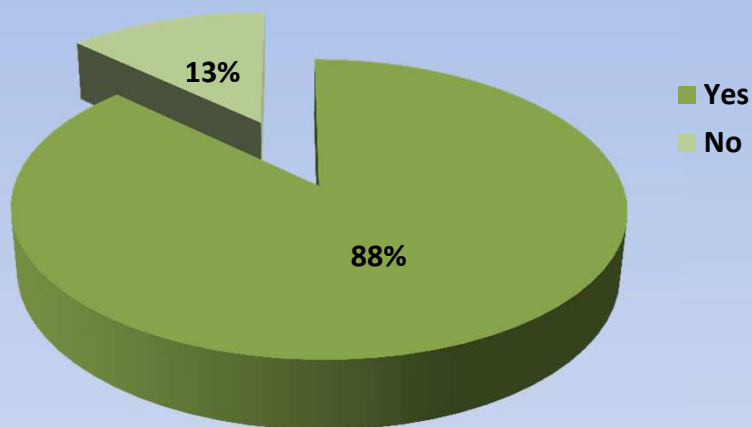
Brand preference



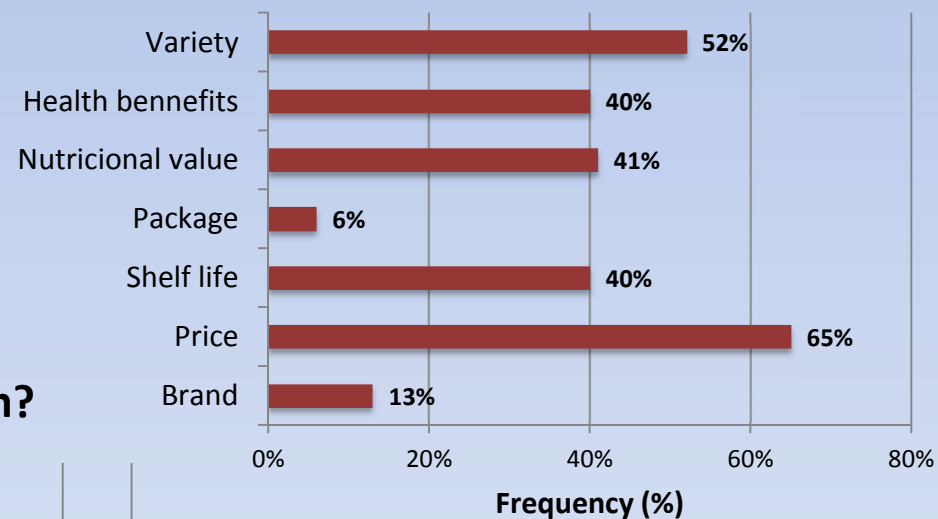


Prospective market study

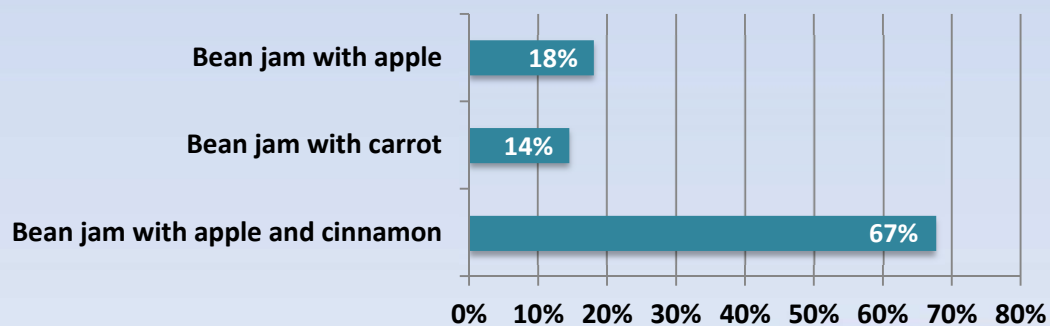
Importance for Quality/Price



Relevant characteristics



Would you be willing to try a new jam?





Conclusions

- ✓ The jams produced with the water from boiling beans are very rich in sugars, particularly the two variations with apple.
- ✓ As to fiber, the bean jam with apple and cinnamon was richer when compared to the other two.
- ✓ The fat content was similar on both samples made with apple and higher in the sample made with carrot.
- ✓ The antioxidant activity was found to be in the ranges reported in literature for similar products.



- ✓ The sensory analysis showed that the product preferred was the bean jam with apple and cinnamon (with generally higher scores, including overall assessment).
- ✓ Still, the color was better for the bean jam with carrot and the consistency for the bean jam with apple.
- ✓ Regarding the market study it was concluded about the possible interest of the potential consumers in experiencing these innovative products.
- ✓ Among the three possibilities, the inquired chose the bean jam with apple and cinnamon as the product they would most be willing to try.



Acknowledgment

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