

# INNOVATION IN TRADITIONAL TRÁS-OS-MONTES PRODUCTS: CONSUMER PERCEPTION ON EXTRA LONG MATURATION SHEEP CHEESE

Álvaro Mendonça<sup>1</sup>; António Fernandes<sup>2</sup>; Fernando Sousa<sup>3</sup>; Sandra Gomes<sup>4</sup>

<sup>1,2,3,4</sup> Institute Polytechnic of Bragança, Agriculture School. Sensory Analysis Laboratory of the Department of Animal Science, School of Agriculture.

<sup>1,2</sup> Mountain Research Center, Campus de Santa Apolónia - 5300-253 Bragança.

<sup>1</sup>alme@ipb.pt; <sup>2</sup>toze@ipb.pt; <sup>3</sup>fsousa@ipb.pt; <sup>4</sup>sgomes@ipb.pt

## 1. Introduction

Cheese is an important food for a healthy diet. Portugal is a country with a huge tradition in the manufacture of cheese from the use of small ruminants. Herds managed in production systems based on pastoralism, with cycles of production according to animal physiology, shaped by the time and the expertise of the shepherd. The production of traditional cheeses is a very strong habit in rural communities and the study of consumer acceptance of matured cheese is an important factor for the valorization/competitiveness strategy. This work is based on data from a survey on the consumption preferences of Extra Long Maturation (ELM) sheep's cheese. The objective of the study was to identify the consumer profile, cheese consumption habits and to compare consumers' perception about the characteristics of cheeses with different maturation periods (6, 11 and 12 months).

## 2. Material and Methods

To achieve these objectives, a study was developed based on a sample of 107 consumers who went to a supermarket in Bragança on May 29, 2015 and the National Agricultural Fair 2015, in Santarém on June 11. To collect the data, it was used a questionnaire with questions about socioeconomic characteristics of the consumer, frequency of general cheese consumption and the sensorial perceptions of consumers about appearance, aroma and taste, in a scale 1 to 9; and, hardness and perceived fat and salt content, in a scale 1 to 5. Data analysis was done using SPSS 23.0 and involved the use of descriptive statistics to identify the consumers' profile and cheese consumption habits; and, the Friedman test to verify if there were statistically significant differences between cheeses with different maturation periods. The three cheeses were presented to consumers in a plastic dessert plate with the cheese code inscribed on the plate next to the slice of cheese with 6, 11 and 12 months. Each slice was about 5 millimeters thick. There was also a plate with three toasts, a napkin and a glass of water. Consumers were informed that they should clean the palate between tasting each of the three cheese slices since the slices were supplied at the same time

To cleanse the palate, consumers could turn to water and/or toasts.

## 3. Results

The majority of the participants (76.6%) consumed cheese more than once a week, were male (57.9%), aged between 25 and 64 years old (77.6%), married or in a stable relationship (48.1%), lived in households with 3 or 4 people (52.5%) with a net monthly household income between € 1,001 and € 3,000 (44.9%) and had a higher education degree (63.6%) (Table 1).

**Table 1. Consumers' profile and cheese consumption frequency**

Variable	Group	Percent	Number
<b>Gender (n = 107)</b>	Male	57.9	62
	Female	42.1	45
<b>Age (n = 107)</b>	17 to 24 years old	18.7	20
	25 to 64 years old	77.6	83
	More than 64 years old	3.7	4
<b>Educational level (n = 107)</b>	2nd cycle	2.8	3
	3rd cycle	6.5	7
	Secondary	27.1	29
	Higher	63.6	68
<b>Civil status (n = 106)</b>	Married/stable relationship	48.1	51
	Single	37.7	40
	Divorced	11.3	12
	Widow	2.8	3
<b>Household members (n = 101)</b>	1 person	12.9	13
	2 people	14.9	15
	3 people	20.8	21
	4 people	31.7	32
	5 or more people	19.8	20
<b>Net monthly household income (n = 100)</b>	Less than € 500	6.0	6
	€ 500 to 1,000	10.0	10
	€ 1,001 to 3,000	48.0	48
	€ 3,001 to 5,000	32.0	32
	More than € 5,000	4.0	4
<b>Cheese consumption frequency (n = 107)</b>	Once a month	4.7	5
	One to four times a month	18.7	20
	More than once a week	76.6	82

It was possible to identify significant differences, at a significance level of 1%, in all the sensorial characteristics considered (p-value < 0.01) with the exception of perception of salt and fat content (p-value > 0.01). Regarding the appearance,

aroma and flavor, cheese 1 (6 months of maturation) was preferred because it has the highest mean rank. Regarding the overall evaluation and purchase intention, there were also significant differences (p-value < 0.01), with the lowest matured cheese having the best evaluation and intention to purchase. Regarding hardness, it was possible to identify statistically significant differences (p-value < 0.01), with cheese 2 and 3, with 11 and 12 months of maturation respectively, considered by consumers as being the hardest ones (Table 2).

**Table 2. Sensorial characteristics, purchase intention and overall assessment**

	Mean rank			P-value
	Cheese 1 (6 months)	Cheese 2 (11 months)	Cheese 3 (12 months)	
<b>Appearance</b>	2,64	1,62	1,84	0,000*
<b>Aroma</b>	2,38	1,68	1,94	0,000*
<b>Flavor</b>	2,42	1,63	1,95	0,000*
<b>Hardness</b>	1,74	2,13	2,13	0,000*
<b>Perception of salt content</b>	2,03	1,88	2,09	0,124
<b>Perception of fat content</b>	1,95	2,04	2,01	0,616
<b>Intention to purchase</b>	2,50	1,64	1,86	0,000*
<b>Overall assessment</b>	2,52	1,64	1,85	0,001*

\* There are significant differences at the significance level of 0.01.

## 4. Conclusion

The majority of consumers were male, aged between 25 and 64 years old, married or in a stable relationship, living in households of 3 or 4 people with a net monthly household income between € 1,001 and 3,000, had a higher education degree and consumed cheese more than once a week. Cheese 1 (6 months maturation) was preferred over the appearance, aroma and flavor, having also recorded a better overall evaluation and purchase intention. Cheeses 2 and 3 (11 and 12 months maturation, respectively) were considered the hardest ones. Thus, in conclusion, Cheese 1 should be produced and marketed by the company.

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