



disproquima

LIFE SCIENCE PRODUCTS

nutrasal®

**NutraSal 50% Less
Sodium Sensory
Analysis - Cheeses**

Nutramax a Disproquima company

1. INTRODUCTION

1.1. Cheese production in pilot plant

In order to check the sensory quality of **Nutrasal® 50% Less Sodium** in the application of cheeses, two tests were carried out with the following types of cheese:

- a. **Fresh cheese made from pasteurized cow's** milk with curd salting until 1.3% salt is obtained in the final product. In the case of the cheese where Nutrasal® 50% less sodium is used, the sodium chloride content is 0.65%.

Two different cheeses were prepared:

- **Cheese A:** Addition of common table salt (NaCl).
- **Cheese B:** Addition of Nutrasal® 50% less sodium (50% reduction in sodium content).

- b. **Pressed paste cheese (75% cow's milk + 25% sheep's milk)** salted by immersion in brine prepared with common salt (NaCl) or Nutrasal® 50% less sodium.

Two different cheeses were prepared:

- **Cheese A:** Immersion in 16% density brine prepared with table salt (NaCl).
- **Cheese B:** Immersion in 16% density brine prepared with Nutrasal® 50% less sodium.

2. ORGANOLEPTIC AND SENSORY ANALYSIS

2.1. Study protocol

The organoleptic analysis was carried out at **IGH Flavours & Technology** facilities (Murcia, Spain). The chosen place was a tasting room, with separate, individual spaces, under white light and with controlled climatic conditions (23°C / RH 65%).

Descriptive and affective tests were carried out on the **Nutrasal® 50% Less Sodium** product on the cheeses described above.

2.2 Statistical analysis

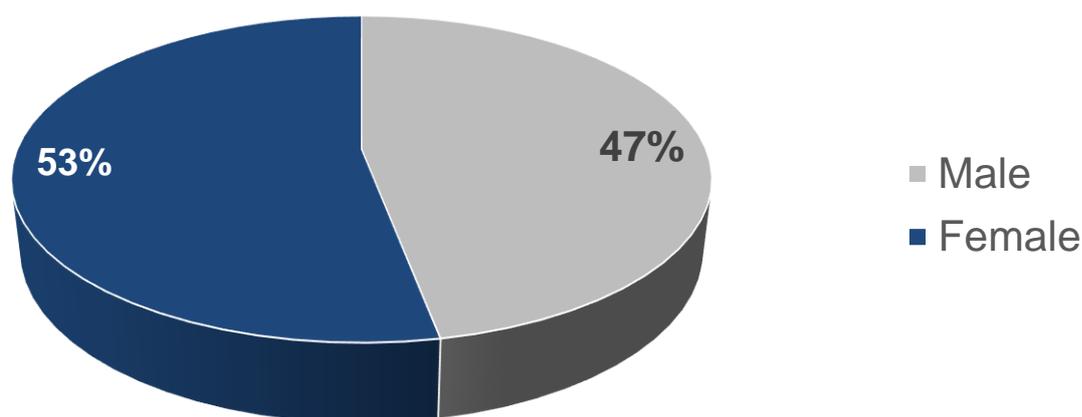
The data obtained were subjected to analysis of variance with a significance level of 5%, through t-test (arithmetic mean, standard deviation, variance and F test to finally perform a T-test with a

confidence level of 95% and assess the significant differences between the cheeses). Excel program was then used to obtain the results (Disproquima S.A, Terrassa, Spain).

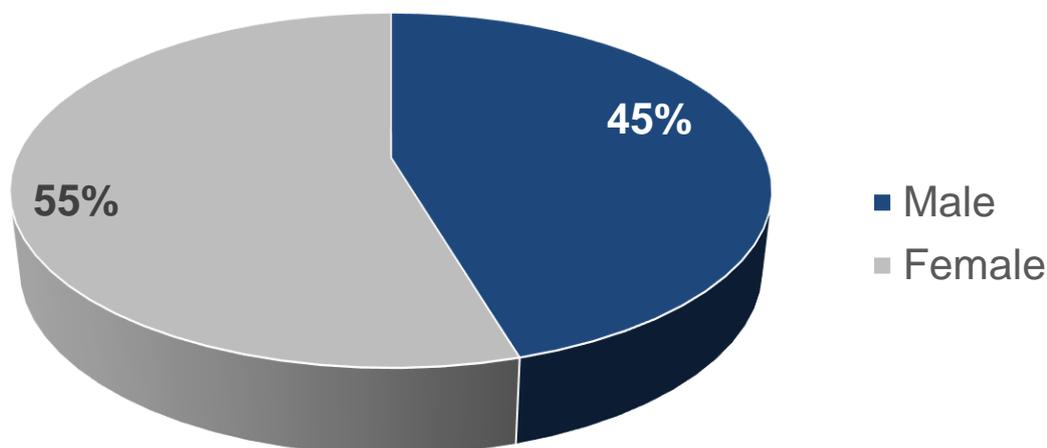
2.3 Participants

The participants were all over 18 years and also regular consumers of cheeses. We will call them **Consumer Judges**. There were 15 people in the fresh cheese sensory analysis and 11 in the pressed paste cheese analysis.

The profile of the consumer judges is shown in the following figures.



Graph 1. Percentage separation of consumer judges according to their gender in the sensory analysis of fresh cheese.



Graph 2. Percentage separation of consumer judges according to their gender in the sensory analysis of pressed paste cheese.

3. METHODOLOGY

The sensory analysis carried out on the cheeses containing Nutrasal® 50% Less Sodium or common salt (NaCl) was of 2 types: **affective (consumer-oriented)** and **descriptive (product-oriented)**.

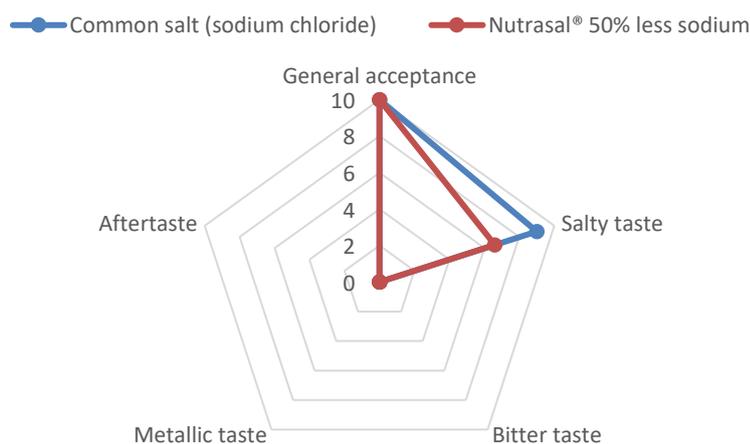
The **affective test** consists of a determination of the acceptability by consumers towards the taste of the product, which is measured on a 6-point hedonic scale to determine the degree of acceptability. The **descriptive test** consists of a description of intensity with the consumer judges, using a 6-point analytical scale to determine the organoleptic characteristics (taste).

4. RESULTS AND CONCLUSIONS

4.1 Fresh cheese

In the **overall taste acceptability analysis**, the results were identical between cheese A (NaCl) and cheese B (Nutrasal® 50% less sodium), with no difference between the two. Subsequently, in the **flavour intensity analysis**, the 15 participants determined a zero on the intensity scale for the flavours: bitter, metallic and aftertaste in both **cheese A** and **cheese B**, that is, the consumer judges did not perceive these flavours in any of the cheeses.

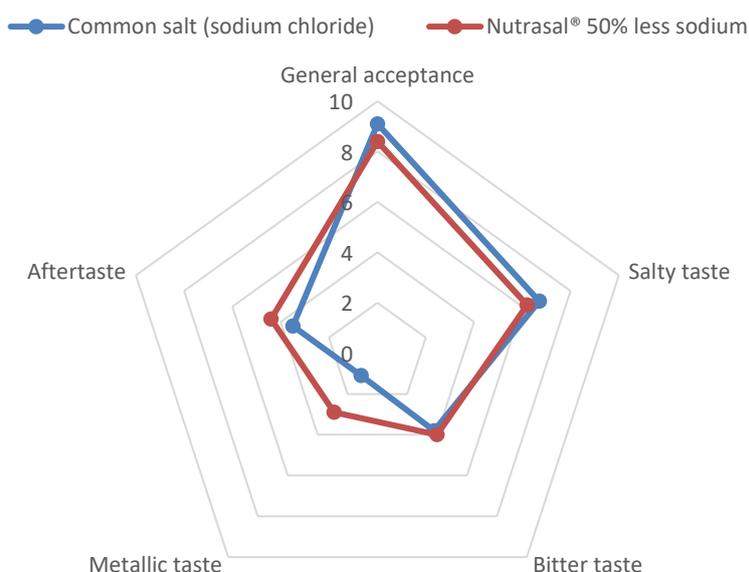
In the case of the intensity of the **salty flavour**, the consumer judges determined that **cheese B** was somewhat less salty than **cheese A**, but it was not a value that indicated a lower acceptance of the product. That is, when we use Nutrasal® 50% less sodium, a healthier cheese is obtained since it contains 50% less sodium and has organoleptic characteristics similar to a typical cheese. This lower intensity of the salty flavour is because cheese B contains 50% less NaCl than cheese A. This difference in NaCl content causes a decrease in the perception of the intensity of the salty flavour by the consumer, since the intensity of the salty taste of KCl in food is of the order of 30% compared to NaCl (Benet, 2016).



Graph 3. Organoleptic comparison between cheeses made with common salt or Nutrasal® 50% less sodium in fresh cheese.

4.2 Pressed paste cheese

In the overall taste acceptability analysis, there were no significant differences between cheese A (NaCl) and cheese B (Nutrasal® 50% less sodium). Later, in the **flavour intensity analysis**, the 11 participants did not find significant differences for the flavours: salty, bitter, metallic and aftertaste in both cheese A and cheese B. **Nutrasal® 50% less sodium is a good salt substitute that does not affect the fermentation or formation of the cheese, obtaining even creamier cheeses. Depending on the type of cheese, a non-significant difference can be detected in the metallic taste that can be masked by the formation of compounds during the curing of the cheese.**



Graph 4. Organoleptic comparison between cheeses made with common salt or Nutrasal® 50% less sodium in pressed paste cheese.

5 BIBLIOGRAPHY

- **Bonany, N (2017).** Sustitución de cloruro sódico por cloruro potásico en emulsiones cárnicas. Departamento de Ciencia Animal i de los Alimentos. Facultad de Veterinària. Universitat Autònoma de Barcelona.
- **Kamleh, R., Olabi, A., Toufeili, I., Daroub, H., Younis, T., & Ajib, R. (2014).** The effect of partial substitution of NaCl with KCl on the physicochemical, microbiological and sensory properties of Akkawi cheese. *Journal of the Science of Food and Agriculture*, 95(9), 1940–1948.
- **Reyna, M (2007).** Guía para la Evaluación Sensorial de Alimentos. Nutricionista Investigadora Instituto de Investigación Nutricional – IIN Consultora – AgroSalud.
- **Soares, C., Fernando, A.L., Alvarenga, N. et al. (2016).** Substitution of sodium chloride by potassium chloride in São João cheese of Pico Island. *Dairy Sci. & Technol.* 96, 637–655 (2016).
- **Tidona, F., Bernardi, M., Francolino, S., Ghiglietti, R., Hogenboom, J. A., Locci, F., Giraffa, G. (2019).** The impact of sodium chloride reduction on Grana-type cheese production and quality. *Journal of Dairy Research*, 1–7.