

SENSORY PROFILE OF GLUTEN-FREE BREADS BASED ON ALTERNATIVE COMMERCIAL FLOURS

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OBJETIVE

The objective of the study was to evaluate the global differences and similarities, and the overall acceptability of gluten-free breads (GFB) formulated with alternative flours in regular consumers, with and without gluten-related disorders.

INTRODUCTION

GFB have become a growing trend in the food industry, mainly because consumers with gluten-related disorders are looking for healthier options. Over the last years the supply of gluten-free products has significantly increase. However, these products are often associated with lower-quality compared to wheat-containing counterparts, mainly explained due to a lower sensorial acceptability, less flavour, lower nutritional profile, and a shorter shelf-life [1]. In this context, sensory analysis by regular consumers plays a critical role in GFB characterization for to ensure that GFB are as flavourful and attractive as their gluten-containing counterparts. In this work, the use of Napping® in the description of the sensory characteristics of GFB formulated with novel flours would provide the opportunity to identify the descriptors related to the most important attributes commonly recognized by the consumers of these products.

MATERIALS AND METHODS

Were mixed in stand mixer (100 g d.b) [2]

- Rice flour (22.5%)
- Sorn starch (57.5%)
- Alternative gluten-free flours (20%): brown rice, rice bran, lupine, millet, carob, quinoa, sorghum, teff and buckwheat
- Sunflower oil (6%)
- Sugar (5%)
- HPMC (2%)
- Salt 2%
- Dry yeast (3%)
- Water (80 - 110 mL)

The optimal fermentation time of dough (OFID) and the optimal hydration level were previously determined

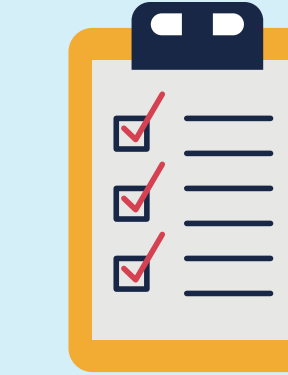
A. GFB FORMULATION AND PREPARATION B. SENSORIA ANALYSIS

Fermented in a proofing chamber at 30°C, 90% relative moisture (Memmert-HPP 108, Schwabach, Germany) according to the OFID of each GFB. The breads were baked in an electric convector oven (Beta 21L, Pauna, Argentina) at 180°C for 30 minutes and cooled at room temperature for 1 h

Projective Mapping (Napping®), Ultra-Flash Profiling, and Affective Test

34 untrained panelists and regular GFB consumers, with or without gluten-related disorders, participated.

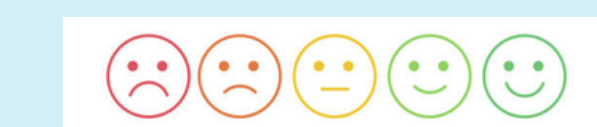
A. Ultra-Flash Profiling: described attributes for each GFB



B. Napping®: the samples were placed on a sheet (map with dimensions of 40cm x 60cm) so that the distance between them was perceived as similar or different.



C. Affective Test: completed a general acceptance test (9-point structured hedonic scale).



RESULTS AND DISCUSSION

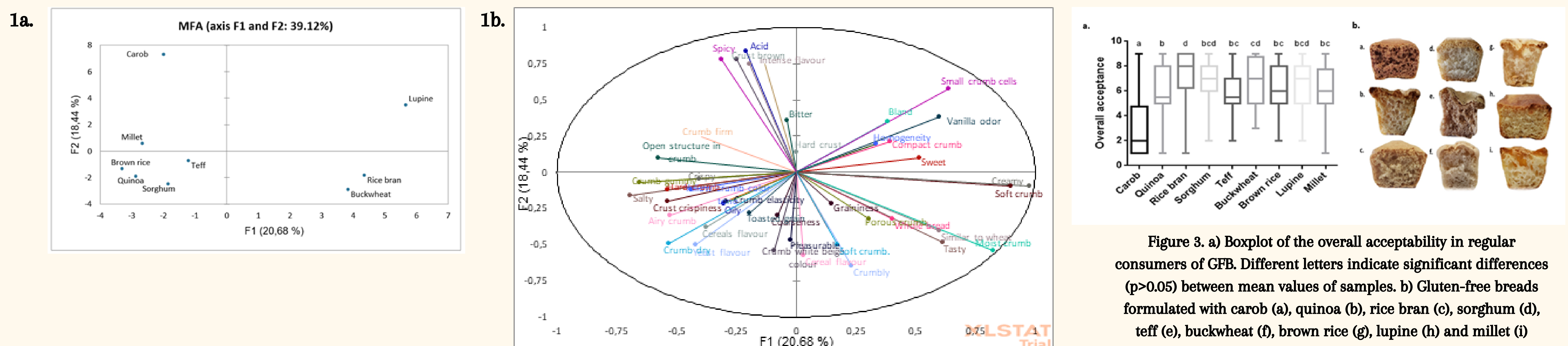


Figure 1a. Biplot representation of the GFB formulated with different alternative flours (n=9), in the first two dimensions of the MFA of data from projective mapping. 1b. Biplot representation of the nine samples of GFB formulated with different alternative flours, in the first two di-dimensions of the MFA of data from projective mapping.

CONCLUSIONS

- Fourth defined groups according to their inherent characteristics along the vertical and horizontal coordinates, 1) carob and millet; 2) lupine; 3) rice bran and buckwheat; and 4) rice brown, teff, sorghum and quinoa.
- The biplot obtained from the MFA explained the 39.12% of the total data variability with the two first axis, where the first dimension (F1) represented the 20.68% and the second dimension (F2) the 18.44% of variability.
- The GFB formulated with alternative flours such as the proposed in the present study received a punctuation >6, except for the GFB with carob flour.
- The main descriptors obtained for each alternative flour are based on the opinions and expectations of this consumers and have been related to attributes as texture, odour, flavour, colour, alveolar structure and humidity of crumb.
- The sensorial profile obtained could serve as guide in the successful design of GFBG with good technological and nutritional properties to satisfy the consumer's expectations.