

## WHOLE CHICKPEA FLOUR AS AN INGREDIENT FOR IMPROVING THE NUTRITIONAL QUALITY OF SANDWICH BREAD: EFFECTS ON SENSORY ACCEPTANCE AND TEXTURE PROFILE

Regina Teixeira da Costa<sup>1</sup>; Sinara Cristina da Silva<sup>2</sup>; Washington Azevêdo da Silva<sup>3</sup>; Aline Cristina Arruda Gonçalves<sup>3</sup>; Felipe Machado Trombete<sup>\*3</sup>

### Abstract

The classic sandwich bread is a traditional bakery product made with refined wheat flour and is widely accepted by different consumers. However, the search for a better life and the changing of the consumer's behavior about the nutritional quality of industrialized products have been increasing the demand for bakery products with whole ingredients, especially those with a higher content of dietary fiber. The inclusion of pulse flours in bakery products, such as chickpea (*Cicer arietinum* L) flour, has been exploited by the food industry due to its nutritional and sensory characteristics. This work aimed to develop a sandwich bread with a partial substitution (7.5%, 15%, and 30%) of refined wheat flour by whole chickpea flour (WCF) and also to evaluate the effects on sensory acceptance and texture profile during the shelf life. The WCF was obtained by immersion of the chickpea grains in water (5 °C; 3 parts of water: 1 part of grains) for 12 h and then drying at 180 °C for 1 h in an electric oven (G.PANIZ FTE 120) followed by sieving (10 mesh). Sensory evaluation was carried out with 65 consumers using a 9-point hedonic scale, ranging from 1 ("dislike extremely") to 9 ("like extremely"), for the attributes color, aroma, texture, flavor, and overall impression. A purchase intention scale ranging from 1 ("I would certainly not buy") to 5 ("I would certainly buy") was also applied. Firmness, elasticity, cohesiveness, chewability, and fracturability was evaluated by the Texture Profile Analysis (TPA), using a Texturometer (TA.XT plus, Stable Micro Systems). Data demonstrated that there was no difference ( $p > 0.05$ ) in sensory evaluation of the products elaborated with different concentrations of WCF, and all samples presented good acceptance. The overall impression for all attributes was located between 7 and 8, which corresponds to the terms "Like Moderately" and "Like Very Much." The addition of WCF did not cause negative effects on the texture of the bread. Firmness, springiness, cohesiveness, and chewiness did not differ ( $p > 0.05$ ) between WCF bread and control. The sample with 30% of WCF had adequate technological characteristics, and this formulation could be used by the food industry and also in domestic preparations, contributing to the diversification and nutritional enrichment of sandwich bread.

**Keywords:** pulse flour, bakery, sensory analysis, dietary fiber.

<sup>1</sup> Engenheira de Alimentos graduada pela Universidade Federal de São João del-Rei Campus Sete Lagoas;

<sup>2</sup> Técnica de Laboratório/Área: Alimentos, Departamento de Engenharia de Alimentos, UFSJ *Campus* Sete Lagoas;

<sup>3</sup> Docentes do Departamento de Engenharia de Alimentos, UFSJ *Campus* Sete Lagoas. \*Contato: Prof. Felipe Machado Trombete: [trombete@ufsj.edu.br](mailto:trombete@ufsj.edu.br)