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Quality assessment of brioche bread produced from rice flour, teff flour and carob powder blends

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Since the enrichment of gluten-free cereal products is not mandatory there is a need for improving nutritional content of gluten-free diets by incorporating alternative gluten-free grains that are naturally abundant in nutrients. The rising incidence of nutrition diseases and the increasing costs of treating them, has alarmed nutritionists and the authorities. Rediscovering the influence of diet on health, has led to the emergence of functional foods, as foods with preventive and ameliorative effects of various non-communicable chronic conditions [1-3]. Referring to these observations, the purpose of this paper was to optimize high nutritional brioche bread assortments and to improve their sensory, nutritional and technological attributes. In the context of obtaining such products, this study sought alternatives for the partial substitution of rice flour (RF) with teff flour (TF) and carob powder (CP). Four samples of brioche bread were obtained using different proportions of RF and TF and the same proportion of CP and corn starch (CS), as follows: 69:10:1:20%, 59:20:1:20%, 49:30:1:20% and 79:0:1:20% respectively.

• Introduction

Consumers demand of new food products not only to satisfy a physiological need but also to have healthy food with necessary nutrients to prevent nutrition-related diseases and to improve physical and mental health. In this regard, a close relation between nutrition and health has been established and functional foods containing ingredients with a specific health benefit were technologically developed. TF are a good source of crude fiber, has relatively higher protein content with an excellent balance and a complete set of essential amino acids, minerals (such as Fe, P, K, Ca, Zn and Mg) and significant source of bioactive compounds including polyphenols, especially very rich in flavonoid derivatives. CP contained high levels of carbohydrates (45%), appreciable amounts of protein (3%), and low levels of fat (0.6%).

Material and method

Teff flour (TF) and carob powder (CP) and the other ingredients used in this study were purchased from local market in Timisoara town, Romania.

Production of the composite brioche breads: Brioche bread bread samples (control and with different substitution levels of RF with TF and CP) were prepared according to the AACC International Method 10-50.05 with minor modifications.

Sensory evaluation of brioche breads with TF and CP. A panel of 25 panelists have evaluated breads using a 9-point hedonic scale. The appearance, texture, taste, flavor and general acceptability, were evaluated.

The proximate composition and physical the brioche bread samples using standard laboratory procedures, were evaluated.

• Results and discussions:

Following the sensory analysis of the brioche bread samples, it was observed that the brioche bread sample obtained from 59% RF, 20% TF, 1% CP and 20% SC had been given the highest scores on the Hedonic scale (appearance – 8.5; texture – 8.0; taste – 8.6; flavor – 8.5; general acceptability – 8.4).



Figure 1. Bread with tamarind flour and elderflowers powder

The results obtained regarding the proximate composition of the studied brioche bread samples show the superior nutritional profile of all three brioche bread samples with added TF (B10TF, B20TF and B30TF) compared to control sample. Thus, the brioche bread sample with 20% TF presented amounts of 15.53% fat, 5.21% protein, 4.44% ash and 2.95% fiber compared to 17.25% fat, 3.42 % protein, 2.21% ash and 1.87% fiber present in the control sample. In terms of the physical characteristics of brioche bread it can be observed that with the percentage of TF increased, the batter became more viscous and dense, had low line spreads because of less fluidity, and had low specific gravity.

• Conclusions

Our study aims to strengthen the attempt to widen the range of flours and other raw materials used in bakery and pastry making to find alternatives to cereal flour.