



Nutritional Quality and Sensory Evaluation of Wheat-Lupine Bread

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ABOUT THE STUDY

Bread is one of the most popular and widespread baked products in the world. It is an important staple food made of wheat flour, salt, and yeast. However, wheat protein is lower than that of proteins from pulses. White lupine is a good source of protein, fiber, minerals, and vitamins. It has some anti-nutritional factors which inhibit its consumption. The use of lupine as human food, specifically in baked products has been limited. Wheat bread represents the main source of carbohydrates, minerals, and vitamins for most people. However, wheat protein is lower than that of proteins from pulses and oilseeds due to its lower levels of lysine, methionine, and threonine. It is a good source of nutrients, not only proteins but lipids, dietary fiber, minerals and vitamins, phytochemicals with antioxidant capacities, such as polyphenols, mainly tannins and flavonoids which are responsible for the health benefits.

Therefore, the potential of lupine in human nutrition has generally been underestimated worldwide. So there is a need for designing studies to develop lupine-based convenient food products. To make *Lupinus albus* edible various modern and traditional processing methods like soaking after roasting, germination, fermentation, alkaline, and thermal treatments are some of the processing methods. When lupine flour and wheat flour are used together in food formulations, a supplemented and complementary effect is achieved due to the low lysine and high sulfur-containing amino content of wheat flour proteins. The study was done factorial design comprising white lupine bean from 2 soaking conditions, 3 roasting temperatures, and blended with 3 categories of supplementation

of wheat flour. All white lupine bean was prepared in duplicate/triplicate following a randomized completely block design (RCBD).

However, white lupine flour is deficient in sulfur-containing amino acids, methionine, and cysteine, which are present in significant quantities in wheat flour. Therefore, a mixture of wheat and lupine flour should have a higher nutritional value than the individual ingredients. The substitution of 10% of wheat flour with processed (roasted at 140°C and soaked for 15 days) lupine resulted in a significant increase in the total protein content of the flour mixture. These are almost to the literature reported values. The effects of blending ratio and processing of lupine bean on nutritional quality and sensory evaluation of wheat-lupine bread prepared by different methods were investigated. Finally, we conclude that the use of white lupine flour from thermally-treated and soaked beans in bread is feasible and that the functional tolerance is good.

Results of processing and blending ratio show that the combination of roasting temperature, soaking condition, and blending ratio had a positive effect on the nutritional (protein, fat, fiber, and minerals) content of bread. However, the combination of roasting temperature and soaking condition play a negative role on alkaloid content was very low than raw lupine flour. In addition, processing and supplementation had good color, taste, flavor, appearance, and overall acceptability of bread. Wheat lupine bread had good quality after roasting temperature (140°C) and soaking condition (10th day), which was more conducive to the formation of blending-processed products.

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