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Production of Pregelatized Legume Flour From Sortex Rejected Chickpea and White Kidney Bean

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Abstract

The undersized grains in the Sortex rejected part of the legume processing plants have similar nutritional properties with the commercial seeds. Processing these waste legumes and offering them to domestic and foreign markets has the potential to contribute to the country's economy. Therefore, this study was designed to examine the potential of producing relatively higher value-added natural food components from waste legumes with low commercial value. In this study, soaking, boiling and dehulling processes were applied in order to produce flour with different properties from Sortex rejected white kidney beans and chickpeas. Flour samples were obtained from both soaked and boiled (pregelatinized) samples of each legume. The effect of seed coat on the flour quality were also determined. Color, ash, protein, dietary fiber, water absorption capacity and trypsin inhibitor activity were analyzed in these flour samples. According to the total dietary fiber analysis, it was determined that the dietary fiber content of the seed, without seed coat removal, was higher. Pregelatinization process significantly increased the water absorption capacity of flour samples in both legume varieties. While negligible decreases were observed in trypsin inhibitory activity of soaked samples, a significant decrease was detected with pregelatinization process. In general, L* values of flours obtained from white kidney beans and chickpeas increased with soaking process and decreased after pregelatinization. In a* value, decrease was observed with soaking and increase with boiling, and finally, in b* value, decrease was observed with soaking and increase with boiling. High dietary fiber content, low trypsin inhibitory activity and high water absorption capacity were determined as the selection critea of the flours. Therefore, only the samples with the seed coat removed were taken as a potential ingredient for bread production. In bread production experiments, soaked and pregelatinized legume flours were added to wheat flour according to the principle of replacing 20% of the wheat flour. In all bread samples obtained, it was observed that the moisture level of the bread was suitable for the % moisture value requested in the Turkish Food Codex. Volume and baking loss values in breads containing 20% legume flour were found to be similar to the control bread. Although no statistically significant difference was observed, a decrease in the rapidly digestible starch fraction and an increase in the resistant starch fraction were observed in breads containing legume flour. Although it was observed that the sensory scores of the breads produced by mixing legume flours with cereal flours decreased ($p<0.05$) in some parameters, they were still acceptable. As a result, it was determined with this study that innovative food product components with high added value can be produced from legume residues with low commercial value. Turkey is one of the leading countries in legume production. Therefore, the utilization of these wastes has the potential to contribute to the economy.

Key Words: *Legume Flour, Chickpea Flour, Bean Flour, Pregelatinized Flour, Bread*

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