

Effect of Soaking and Malting on Some Chemical and Antioxidants Properties of Finger Millet (*Eleusine coracana L. Gaertn*) Flour Using Response Surface Methodology

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Abstract

The effects of soaking (0 -18 h) and malting (24 - 72 h) time on certain chemicals, colour, total phenolic content (TPC), total flavonoid content (TFC) and antioxidants characteristics of two finger millet (*Eleusine coracana L. Gaertn*) (FM) cultivars and sorghum (*Sorghum bicolor*) were examined using a central composite rotatable design. The data of the chemical, colour, TPC, TFC and antioxidant capacities of the treated flour were subjected to ANOVA and regression analysis. When compared to light-brown and dark-brown FM flour, sorghum had greater moisture (12.87%), ash (3.53%), and fat (3.63%) content. Both light-brown and dark-brown FM cultivars, as well as the sorghum cultivar, were significantly different ($p < 0.05$) L^* , a^* , b^* , C^* , and H° values. Higher a^* , b^* , C^* , and H° values were also detected in sorghum flour, as well as a high L^* value in light-brown FM flour. Light-brown FM had higher TPC, TFC, ferric reducing antioxidant power (FRAP), and % inhibition (DPPH), with values ranging from 15.25-38.26 mg GAE/100 g, 10.79-24.68 mg QE/100 g, 0.26-1.25, and 33.81-64.43%. The fitness of the models developed was good, since the lack of fit for any model was not significant. The coefficients of determination R^2 in the models were relatively high, with TPC in sorghum flour being 0.91, which was high when compared to the FM flours; light-brown FM flour had a high TFC of 0.95 when compared to dark-brown FM and sorghum flour. Dark-brown FM flour attained 0.83, which was higher than light-brown FM and sorghum flour. In dark-brown FM, DPPH was 0.98, which was considered acceptable. The optimal soaking and malting conditions for light-brown FM were 11.78 and 65.47 h; dark-brown FM was 15.65 and 70.25 h; and sorghum flour was 16.27 and 42.63 h, with a desirability of 1.00. The findings serve as a reference for food processors looking to boost bioactive substances in cereal and related products.