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Ethanollic extract of rice bran: a thermally stable preservative for edible oils and cake

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Abstract

The purpose of this study was to evaluate the thermal stability of the rice bran extract (RBE) and analyze the effect of RBE on the shelf-life of sunflower oil and the quality characteristics and shelf-life of baked cake. The thermal stability of RBE was evaluated by a Rancimat test using sunflower oil. Properties such as moisture content, porosity, crumb density and pore area of cakes baked with RBE and the synthetic antioxidant butylated hydroxytoluene (BHT) were compared. Sensory properties such as taste, aroma, texture, color and overall acceptability of the cake samples were compared using a sensory panel test. The shelf-life of the cakes was evaluated by microbial counts and chemical methods. Thermally treated RBE and BHT for 2 h at 180 °C retained 75% of their initial capacity in protecting sunflower oil while RBE had a significantly higher protection factor ($p < 0.05$). Cakes baked with RBE received higher scores for taste, color and overall acceptability compared to control or BHT-added cake. BHT-added cake and RBE-added cake exceeded the aerobic plate count (APC) and yeast and mold count (YMC) on days 11 and 13 respectively, while the control cakes without added antioxidants exceeded the APC and YMC on day 7. Both BHT- and RBE-added cakes maintained hexanal levels below 5 mg/kg over 28 days while the control cake exceeded this level on day 21. The results suggest that RBE can be used as a natural food additive to improve the quality and shelf-life of baked foods and edible oils.

Keywords: Phenolic antioxidants, Food preservatives, Sensory properties, Shelf-life, Rice bran, Baked cake, Sunflower oil

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