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Stabilization of rice bran using saturated steam and development of rice bran incorporated cracker

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This study was focused on stabilizing rice bran obtained from BG-352 (white rice) and AT-362 (brown rice) varieties. Rice bran of these two varieties was exposed to saturated steam for 5, 10, 20 and 30 minutes and subsequently dried at 70 °C to get the safe moisture content 8 - 10% before storing under ambient conditions in sealed polypropylene bags. Crackers were developed by incorporating stabilized rice bran for identifying the most appropriate incorporation levels with acceptable sensory attributes. Development of free fatty acid (FFA) and peroxides of stabilized rice bran were evaluated for 90 days in order to determine storage stability. Crackers developed by substitution of wheat flour with stabilized AT-362 rice bran at 15%, 20%, 25% and 30% were evaluated for sensory characteristics; appearance, color, texture and overall acceptability. Proximate composition of both rice bran and bran incorporated crackers was estimated. FFA and peroxide values revealed that the best stabilization methods for BG-352 and AT-362 bran were achieved by steaming for 30 and 20 minutes respectively. There was no significant difference between steaming of AT-362 bran for 20 and 30 minutes in terms of FFA and peroxide development ($P \geq 0.05$). According to the proximate analysis, bran from BG-352 rice variety contained 31.44% carbohydrates, 22.18% fat, 13.18% moisture, 12.01% fiber, 11.89% protein and 8.69% ash. Values obtained for bran from AT-362 were 37.04%, 22.14%, 10.56%, 9.23%, 11.91% and 9.12% respectively. Sensory evaluation revealed that crackers with acceptable sensory properties can be obtained by substituting wheat flour with 25% of stabilized rice bran. Proximate composition of the crackers prepared with 25% of bran was 60.15% carbohydrate, 14.31% fat, 11.09% protein, 6.18% moisture, 4.34% fiber and 3.93% ash. Finally, these results suggest that rice bran can be stabilized effectively by saturated steam for longer shelf life and also, there is a potential for incorporating stabilized rice bran in the cracker making process.

Keywords: Rice bran, stabilization, saturated steam, storage stability, bran crackers