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Stabilization of rice bran to be used as a human food ingredient

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Rice is the staple food of Sri Lanka and the country is almost self sufficient in rice with the paddy harvest recorded as 3 million t in 2003. It is milled raw and parboiled form and the potential rice bran production is around 250,000 t using both primitive and modern mills, scattered throughout the country. Only the modern mills are equipped with Rubber Roll sellers and Cone Polishers with the ability to separate good quality rice bran free from other impurities. At present this valuable raw material with high protein fat and dietary fibre is given to the animal feed industry. This study was initiated to look into the possibility of stabilizing the rice bran which has the tendency to deteriorate due to the activity of lipase enzymes, which comes into contact with the lipids as soon as it is milled. The Bran (raw and parboiled) obtained from rice varieties BG 300, BG 352, BG 358, BG 1/94, BG 450 and AT 353 were evaluated for their nutritional composition. The percentage protein, fat and ash (minerals) values of parboiled bran was higher than raw bran, whereas the reverse is true for the percentage starch content.

A low cost extruder was designed and fabricated at Industrial Technology Institute so that rice bran can be stabilized as it is removed from the mill. The extruder consists of two stainless steel barrels ie outer and inner. The extruder is connected to an electric steam boiler and the steam is sent into the gap between the inner and outer tubes. A rotating screw is fitted to the inner tube which takes the rice bran from the hopper to the other end of the extruder while getting steamed. The screw is operated with a motor fitted to it. The optimum process conditions were worked out for the low cost extruder ie. the three variables tested were feed rate (20, 30, 52, 80 g/min) steam pressure (2, 2.5, 3, 3.5 bras) and retention time. {1 min (10 rpm) 2 min (8 rpm) 3 min (6 rpm) and 5 min (4 rpm)}. The rice bran obtained form above treatments were stored for one month and increase in free fatty acid levels were determined. A fee rate of 80g / min, a steam pressure of 2 bars and a retention time of 5 min. was selected as best for rice bran stabilization. The final temperature of rice bran coming out of the extruder is 75 - 80 °C. The stabilized rice bran in the above method was used in the preparation of a puffed, rice based breakfast cereal using a Berstoff twin screw extruder and in the preparation of baked products.

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