



BI-01

## Influence of particle size of rice flour in manufacturing rice incorporated wheat bread

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Bread is an important food product across the whole cross profile of the Sri Lankan society. Incorporation of rice flour in bread manufacturing process is a viable option, as rice is the staple food crop in Sri Lanka. Rice flour, obtained from heat treated and raw rice grains were subjected to three grinding techniques; pin mill, turbo rotor mill and cyclone separator. Thereafter, leavening index of rice flour incorporated bread dough was determined along with cold and hot water treatment, as well as with different proportions of wheat flour. The best treatment in terms of leavening index was subjected for microbial fermentation and subjected for leavening index test again. All samples were replicated thrice. Bulk density, moisture content and pH of the bread prepared with the best treatment were determined, to measure the influence of post gelatinization process of rice flour. Results revealed that, best soaking method and best rice flour in manufacturing of rice bread were cold soaking and raw rice flour, due to rapid accomplishment of leavening index two. On the other hand, if the manufacturer is equipped with a pin mill (300  $\mu\text{m}$ ), turbo rotor mill (250  $\mu\text{m}$ ) or cyclone separator (75  $\mu\text{m}$ ) the desirable rice flour to wheat flour ratios are 30:70, 40:60 and 50: 50 respectively. Because, all above levels with regard to grinding methods were failed to achieve leavening index two within the stipulated time of 2 ½ hours. Hence, productive treatment was cyclone separation, because it was capable to replace 50% of wheat flour. Even though microbial treatment was capable to increase rice flour by 10%, it was not suitable in bread manufacturing process due to poor organoleptic properties. pH , moisture content and bulk density of bread manufactured from the treatment of cyclone separation were 5.4, 40.9% and 0.121g  $\text{cm}^{-3}$  respectively and those values were within the range of regulatory requirements of bread. When considering the appearance, texture and mouth feel, there was no contrast between bread made with best treatment and 100% wheat flour. Hence, 50% of wheat flour can be replaced by adopting of cyclone separation process in manufacturing of bread, along with cold soaking process.

*Keywords:* bread, rice flour, wheat flour, leavening index, cyclone separator