

Amporn Sae-Eaew 2008: Effects of Jasmine Rice Flour Characteristics on Quality of Cake Mixed Flour. Doctor of Philosophy (Agro-Industrial Product Development), Major Filed: Agro-Industrial Product Development, Department of Product Development. Thesis Advisor: Associate Professor Penkwan Chompreeda, Ph.D. 254 pages.

The aim of this study was to utilize broken Jasmine rice by substituting it for wheat product. Jasmine rice flours with varying particle sizes (-80,100,120 and 150 mesh) were prepared and used in cake preparation. It was found that particle size may be associated with higher water absorption, set back, pasting temperature, starch damage and storage modulus as particle size becomes finer, whereas it may be associated with lower resistance force (compressibility of flour), peak viscosity, breakdown, gel and cake hardness as particle size becomes finer. The DDA and LRA results from Thai consumer acceptance test data of four Jasmine rice butter cakes indicated that, products were differentiated by appearance attributes. Liking for Flavor and overall liking were identified as the critical attributes influencing acceptability and purchase intent. From the study of Jasmine rice flour storage during 6 months, it was found that the significant change include color, starch damage and gel hardness but not cake hardness for each flour particle size during storage. Cakes prepared from flour with <120 or <150 mesh size were not significantly different and were similarly accepted by consumers. Flour with <120 mesh was then selected as an ingredient in rice butter cake formula, and powdered emulsifier mix was used. The DDA and PCA results from American consumer acceptance test data indicated that liking for texture attributes and overall liking could separate wheat flour butter cake from Jasmine rice flour cake. Taste and overall liking were identified as the critical attributes influencing acceptability and purchase intent. Cake mixed product formulated after storage for 6 months had stable quality and can be used to prepare the rice butter cake with similar acceptability. Replacing butter with 70% rice bran oil by butter weight in cake formula yielded acceptable cake. Cake mixed product consisted of rice bran oil mixed, sugar mixed and Jasmine rice flour mixed. Additional ingredients for household use formula were 1/6 cup evaporated milk and 1 egg yolk and 4 eggs for egg white. The optimum product making process required mixing for 7 min and baking in an oven at 170°C for 35 min. Rice bran oil cake and cake mixed were microbiologically safe. Energy and cholesterol of cake prepared from rice bran oil cake mixed product were 399 kcal/100g and 30 mg/100 g, respectively. Consumers acceptability on cake mixed by the laboratory use test method indicated that consumer moderately liked this product (7.92 of 9 score). All of them (100%) accepted product and 96% would purchase this product at a price similar to the commercial ones. No significant difference in purchase intent was observed, when consumer were asked if they would purchase or if purchase after the influence of family members. In conclusion, this study confirmed the importance of flour particle sizes that affect their properties and end product quality, revealed the storage extension of Jasmine rice flour to supply a year-round utilization, and demonstrated feasibility of completely substituting wheat flour with Jasmine rice flour for production of rice cake products that are acceptable to the consumer.

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Thesis Advisor's signature

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