

Chanidda Wongbasg 2010: Development of Steamed Snack from Germinated Glutinous Brown Rice Flour with Mung Bean-Strawberry Paste Filling. Master of Science (Agro-Industrial Product Development), Major Field: Agro-Industrial Product Development, Department of Product Development. Thesis Advisor: Associate Professor Kamolwan Jangchud, Ph.D. 142 pages.

The objective of this study was to develop steamed snack product from germinated glutinous brown rice (GGBR) flour with mung bean and strawberry paste filling to be acceptable to consumers. The experiment was conducted by 3x5 factorial arrangement in Completely Randomized Design (CRD) to study the effects of calcium chloride ( $\text{CaCl}_2$ ) concentrations (0, 0.5 and 1 mM in deionized water (DI)) and steeping times (12, 24, 36, 48 and 60 h) on the physical and chemical properties of germinated glutinous brown rice. The non-GGBR served as control. The result showed that GABA content and *alpha*-amylase activity of GGBR significantly increased ( $p \leq 0.05$ ) and peak viscosity and setback from trough considerably decreased when steeping time increased. The GGBR steeped in 0.5mM $\text{CaCl}_2$  for 36 hr was the optimal condition for steamed snack. The 3X3 full factorial arrangement in CRD was used to study the effect of ratios of GGBR and tapioca starch (100:0, 80:20 and 60:40) and ratios of mixed flour and water (100:0, 80:20 and 60:40) on properties of glutinous rice dough. The result showed that hardness significantly decreased and adhesiveness significantly increased ( $p \leq 0.05$ ) with increasing of GGBR flour and water content. From sensory evaluation by 9-point hedonic scale and using Response Surface Methodology (RSM), the result showed that the optimal ratio of GGBR and tapioca starch was in range of 60:40-65:35 and the ratio of mixed flour and water was in range 100:91-100:102. The 3X2 full factorial arrangement in CRD was used to develop strawberry paste filling. Three levels of modified starch (0, 3 and 6%) and two levels of wheat flour (5 and 10%) were studied. The result showed that the increase in modified starch and wheat flour caused the increase in hardness ( $p \leq 0.05$ ). The optimal strawberry paste formulation contained 3% modified starch and 5% wheat flour gave the optimal strawberry paste filling formulation. The optimal ratio of strawberry and mung bean paste for filling was 3:7. Hardness of final product was 2.32 N. The  $a_w$  of glutinous rice dough and mixed paste filling was 0.98 and 0.91, respectively. Consumer acceptance test showed that 96% of consumer accepted the developed product

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Student's signature

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Thesis Advisor's signature