

Piyaporn Chueamchaitrakun 2011. Characterization of Physicochemical Properties of Glutinous Rice and Mixed Glutinous – Hom-mali Rice Flours and Theirs Utilization for Butter Cake. Doctor of Philosophy (Agro-Industrial Product Development), Major Field: Agro-Industrial Product Development, Department of Product Development. Thesis Advisor: Associate Professor Penkwan Chompreeda, Ph.D. 298 pages.

The aim of this research was to enhance the use of glutinous rice flour as a substitute to Hom-mali rice flour in order to reduce cost. Chemical composition of 9 Thai glutinous rice varieties were moisture content, ash, fat, fiber and protein in the range of 8.76-10.13, 0.22-0.41, 0.11-0.55, 1.42-2.63 and 6.88-9.53%, respectively. Swelling power and solubility of Thai glutinous rice flours were 8.72- 11.96 and 9.99- 4.22. The amylose content of RD6 was the lowest (2.8%) whereas Niew ubon was the highest (4.6%). The pasting temperature, trough, final viscosity, setback, onset temperature (T_o), peak temperature (T_p) and enthalpy (ΔH) of 4 mixed flours (glutinous rice flour (GRF): Hom-Mali rice flour (HMRF) = 80:20, 60:40, 40:60, and 20:80) were decreased as the content of GRF increased. The combination of NIRS technique and Partial Least Square (PLS) were able to formulate a reliable equation for the prediction of T_o , T_p , ΔH , pasting properties such as final viscosity, setback and pasting temperature of mixed flour samples ($R^2 = 0.82, 0.75, 0.739, 0.95, 0.97$ and 0.99 , respectively). Increasing the content of GRF resulted in a significant ($P < 0.05$) decrease in the specific volume, volume index and hardness value of the butter cake. Thirty-nine (39) lexicons of reduced egg yolk butter cakes prepared from mixed flour were identified by 7 trained panelists using generic descriptive analysis. Sixty percent (60%) of consumers accepted whole egg butter cakes prepared from 60% of GRF and reduced egg yolk butter cake prepared from 40% of GRF. The logistic regression analysis revealed that fluffiness, softness and moistness were critical attributes that influence overall acceptance and purchase intent for butter cake with whole and reduced egg yolk. The result of JAR and opportunity analysis of whole egg butter cake prepared from $>60\%$ of GRF should increase fluffiness. Reduced egg yolk butter cake prepared from $<40\%$ of GRF should increase moistness whereas one prepared from $>60\%$ of GRF should increase fluffiness.

Student's signature

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