EFFECT OF USING SOME SUBSTITUTE MATERIALS ON THE QUALITY OF THE PRODUCED BISCUIT

BY

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B.Sc. (Food Science and Technology), Faculty of Agriculture,
Ain Shams University, 1989

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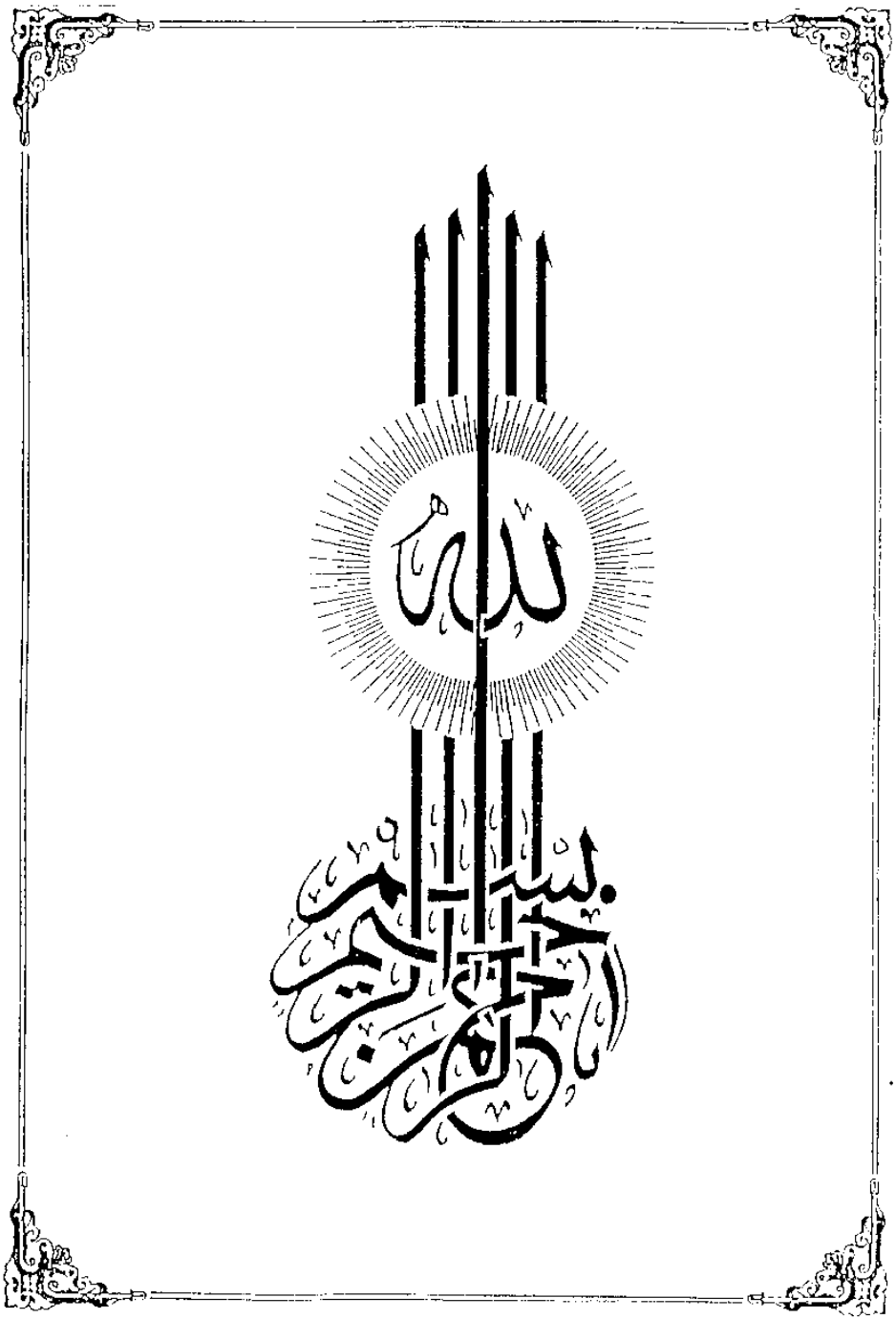

Approval Sheet

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ABSTRACT

Said Ahmed Ahmed Saleh. Effect of using some substitute materials on the quality of the produced biscuit. Unpupblished Master of Science, Ain Shams University, Faculty of Agriculture, Department of Food Science, 1997.

To study the effect of some substitute materials on biscuit quality, soft biscuit Soiree was manufactured using corn flour at levels of 5, 10 and 15%; rice flour + soy flour mixtures (45% + 5%, 40% + 10%, respectively) as a partial replacement for soft wheat flour. High fructose corn syrup was used to replace sugar in the basic recipe at different levels of 20, 40 and 60%. Corn and sunflower oils were also used to substitute 50% of palm oil in cookie dough. In addition, each of lecithin and glycerol monostearate (GMS) was used to replace 50, 75 and 100% of whole egg in the production of "Ramsis" soft biscuit.

The farinogram data indicated that the use of rice flour + soy flour mixtures; 20 and 40% HFCS as substitute materials improved dough development and dough stability. While, replacement of whole egg with 50, 75 and 100% lecithin or GMS improved water absorption but adversely affected the dough development and dough stability.

The addition of corn flour or HFCS replacers raised the moisture content in biscuits. Replacement of wheat flour with rice flour + soy flour mixtures increased crude protein, ash contents and decreased nitrogen free extract.

During storage, the moisture content of biscuit samples increased by different rates due to the used substitute materials till reached its maximum at 10 months of storage. Replacement

50% of shortening with sunflower oil or 15% wheat flour with corn flour obtained the highest acid value of biscuit extracted lipidS during storage. The use of 50% corn or sunflower oils as palm oil replacers caused a substintial increasing in the peroxide value of biscuit lipids. However, the replacement of lecithin showed a favorable effect by inhibiting the autoxidation of biscuit lipids during storage.

The highest breaking force and breaking strength obtained for Soiree biscuits was for the control one. These characteristics were in positive relationship with increasing percentage of corn flour substitutes, while it was in negative relationship with increasing HFCS percentage. Replacement of 50% whole egg with lecithin markedly reduced the breaking force and strength, while the full replacement with GMS gave biscuit with the highest values. The breaking force increased tremendouely versus storage period reaching their maximum then declined.

The sensory evaluations of biscuits during storage indicated generally that no appreciable difference in mean score values of quality attributes using the studied substitutes, except the replacement of 50% palm oil with corn or sunflower oils, and the use of 50% GMS as whole egg replacer which adversed biscuit quality.

Key words: Flour substitutes, emulsifiers, lecithin, glycerol mono-stearate, whole egg, high-fructose corn syrup, breaking force, breaking strength, rheological properties, organoleptic evaluation.

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