# QUALITY PROPERTIES OF SOME BAKERY PRODUCTS FROM COMPOSITE FLOUR

By

**AHMED MOHAMED EL-SAYED ABOU-ELAZM**
B.Sc. Agric. Sc. (Food Science and Technology), Ain shams University, 2009

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# ABSTRACT

**Ahmed Mohamed El-Sayed Abou-Elazm: Quality Properties of Some Bakery Products from Composite Flour. Unpublished Master of Science Dissertation, Department of Food Science, Faculty of Agriculture, Ain Shams University, 2015**

This study was carried out to investigate the possibility of utilization of sorghum and chickpea flour in production of pan bread, sponge cake and biscuit. Strong wheat flour of (72% extraction) was replaced by 5, 10, 15 and 20% whole sorghum or chickpea flour. The effect of such replacement on physical and chemical characteristics of the resulted blends and baking properties, as well as, the acceptability of produced pan bread, sponge cake and biscuit were studied. The results indicated that addition of sorghum or chickpea flour to strong wheat flour (72% extraction) lead to increase lipids, fiber and ash contents. Also, crude protein was increased by added chickpea flour in the resulted blends, while wet or dry gluten and gluten index was reduced. Water absorption and mixing tolerance index increased by increasing the levels of chickpea flour, while water absorption was decreased by added sorghum flour. Dough stability, maximum resistance to extension, proportional number and energy were decreased by the increasing the levels of sorghum or chickpea flour compared to control (strong wheat flour 72%). Falling number values of all blends were decreased with increasing the replacement level with sorghum or chickpea flour. Meanwhile, liquefaction number was increased. The replacement of wheat flour with 10% sorghum or chickpea flour is successfully produced pan bread without any unfavorable change in the sensory characteristics of prepared bread. The results revealed that crude protein, lipids, ash and crude fiber contents of prepared pan bread had gradually increased with increasing the replacement level with sorghum or chickpea flour in comparison to control pan bread sample, except the crude protein decreased for bread produced by added sorghum flour. At 10% sorghum or chickpea flour replacement, the resulted pan bread was not

significantly different from control for crust color, summitry of form, texture and aroma. Generally, it could be concluded that, the pan bread produced by substitution with 10% sorghum or chickpea flour gave bread loaves more sensory acceptable rather than the bread produced by added 15% sorghum or chickpea flour. The partial replacement of wheat flour with sorghum or chickpea flour is not improving the rate of bread staling in comparison to control sample. Lipids, ash and crude fiber contents of cake samples were increased as increasing the replacement level of wheat flour by sorghum or chickpea flour. The replacement of weak wheat flour (72% extraction) with 10% chickpea flour improves the volume and specific volume of cake in comparison to control sample. No significant differences ($p>0.05$) in colour, flavor and texture could be observed between the control samples and cake produces from wheat flour substituted with 10% sorghum or chickpea flour, for cake produced with and without cake improver . Generally, it could be concluded that, chickpea flour successfully replace wheat flour with 10 or 15% in produced sponge cake without any unfavorable changes especially for the cake produced by added cake improver.

For biscuit, crude protein, fat, ash and crude fiber had significantly increased with increasing the replacement level with sorghum or chickpea flour in comprising to prepared biscuit contained 100% wheat flour (control). There is a significant decreased in both of biscuit volume and specific volume for biscuit samples which prepared by substitution of wheat flour with sorghum or chickpea flour except 10% chickpea flour compared to control sample. On the other hand, there were no significant differences between the thickness and spread ratio of 100% wheat flour biscuit (control) compared to sorghum or chickpea - wheat composite flour biscuit.

Generally, it could be concluded that replacement of wheat flour with chickpea flour gave biscuit more sensory acceptable rather than those of sorghum flour.

**Key words:** Sorghum flour, chickpea flour, wheat flour, Rheological properties, physical measurements, pan bread, cake, biscuit, staling and sensory evaluation.

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