

CONFERENCE PAPERS

15. Effect of gum arabic from *Acacia Senegal* var. *kerensis* as an improver on the rheological properties of wheat flour dough

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Abstract

Dough improvers are substances with functional characteristics used in baking industry to enhance dough properties. Currently, the baking industry is faced with increasing demand for natural ingredients owing to increasing consumer awareness. Thus, the rising demand for natural hydrocolloids. Gum Arabic from *Acacia senegal* var. *kerensis* is a natural gum exhibiting excellent water binding and emulsification capacity. However, very little is reported on how it affects the rheological properties of wheat dough. The aim of this study was therefore, to determine the rheological properties of wheat dough with partial additions of gum Arabic as an improver. Six treatments were analyzed comprising of: flour-gum blends prepared by adding gum Arabic to wheat flour at different levels (1%, 2% and 3%), plain wheat flour (negative control), commercial bread flour and commercial chapati flour (positive controls). The rheological properties were determined using Brabender Farinograph, Brabender Extensograph and Brabender Viscograph. Results showed that addition of gum Arabic significantly ($p < 0.05$) increased dough development time (1.44-6.45 minutes), water absorption capacity (59.34-59.96%), stability (6.34-10.75 minutes), mixing tolerance index (12.00-35.80), Farinograph quality number (48.60-122.20) and time to breakdown (4.33-12.05 minutes). However, there was no significant effect of gum Arabic addition on dough consistency (490-505 BU). In extensograph properties, energy was significantly ($p < 0.05$) higher in wheat flour containing 2% gum Arabic (108.44 cm²), while extensibility was significantly higher in wheat flour containing 3% gum Arabic (153.11mm). Gum Arabic significantly ($p < 0.05$) decreased all the Viscograph parameters apart from the pasting temperature (69.82-71.68° C). The findings of this study show that gum Arabic significantly ($p < 0.05$) enhanced the rheological properties of the dough. An optimal gum Arabic concentration of 2% in wheat flour dough is recommended for pan bread and 3% for chapati. These findings support the need to utilize gum Arabic from *Acacia senegal* var. *kerensis* as a dough improver.

Keywords: Dough improvers, Gum Arabic, *Acacia Senegal* var. *kerensis*, Rheological properties, Wheat dough