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Assessment of molecular weight distribution of wheat gluten proteins for chapatti quality

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ABSTRACT

Size Exclusion Chromatography (SEC) was used to characterize molecular weight distribution pattern of gluten proteins of four Indian commercial wheat varieties in order to elucidate their influence on flour physicochemical, dough rheology and quality characteristics of chapatti. SEC profile of a wheat variety was segregated into five domains: peak I (130-30 kDa; glutenins), peak II (55-20 kDa; gliadins), peak III (28-10 kDa; low molecular weight gliadins), peak IV and V (<10 kDa; albumins and globulins). SEC results indicated that R/E ratio ($r=0.745^{**}$ and $r=-0.869^{**}$), gluten index ($r=0.959^{**}$ and $r=-0.994^{**}$), dough development time ($r=0.830^{**}$ and $r=-0.930^{**}$) and dough stability ($r=0.901^{**}$ and $r=-0.979^{**}$) were positively and negatively altered by peak I and II, respectively. Peak I ($r=0.879^{**}$ and $r=-0.981^{**}$) and peak II ($r=-0.744^{**}$ and $r=0.995^{**}$) substantially influenced the chapatti hardness and overall score, respectively.

Keywords: Size exclusion chromatography, dough rheology, chapatti, molecular weight distribution, gliadins, glutenins.

1. Introduction