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Effect of β -glucan molecular weight on rice flour dough rheology, quality parameters of breads and *in vitro* starch digestibility



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ABSTRACT

The study aimed at investigating the effects of molecular weight (peak molecular weight, Mp, 83, 192 and 650 kDa) and level (1.3, 2.6 and 3.9 g/100 g flour basis) of enriched in β -glucan (BG) concentrates (from oat and barley) added into rice flour gluten-free (GF) doughs on their viscoelastic and pasting properties, as well as the quality parameters of bread and the *in vitro* starch digestibility. A purification process of a commercial BG concentrate, followed by an acid hydrolysis step were employed to reduce the content of interfering excipients (e.g. maltodextrins) and obtain preparations with a range of molecular weights. BG-enriched GF breads of improved quality, that can fulfil the EFSA claims (ingest of 3 g of BG per day with a daily bread intake of ~200 g), were obtained, exhibiting slower starch digestibility (*in vitro* assay) dependent on the molecular weight and concentration of BG. With the higher Mp BG used, showing the largest impact on dough rheology characteristics and having a greater potential for health benefits, higher specific volume and lower bread crumb hardness were noted among the GF breads. The medium and lowest Mp BG also had an influence on dough rheological behavior and bread quality attributes. The rapidly available glucose of the bread decreased from 81 g/100 g to 72 g/100 g as result of the 3.9 g/100 g addition of the highest Mp BG in the GF formulations.

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