

Dough rheology and physicochemical properties of steamed buns fortified with cross-linked rice starch

ABSTRACT

Although fibre is associated with numerous health effects, daily fibre consumption is less than recommended. Fibre-enriched food is desirable to overcome this problem and resistant starch (RS) has potential as fibre ingredient. The objective of the research was to study the effect of cross-linked (CL) rice starch (RS type 4) at different levels (0%, 15% and 30%) on dough rheology, physicochemical and sensory acceptance of steamed bun. CL rice starch was produced by cross-linking rice starch with combination of 12% sodium trimetaphosphate and sodium tripolyphosphate for 3h at 45°C under alkaline condition. The dough of steamed bun was characterized by Farinograph and Extensograph, whereas cooked steamed bun was characterized by total dietary fibre, protein, moisture, textural properties, colour and sensory acceptance. Incorporation of CL rice starch in wheat flour lowered the strength, extensibility and quality of dough. The quality of dough was positively correlated with the protein content, indicating lower gluten formation in fortified SB. Total dietary fibre of steamed bun increased significantly with increasing CL starch in the order: 30CL (2.44%) > 15CL (1.33%) > 0CL (0.75%). Hardness and yellowness of steamed bun incorporated with CL rice starch reduced significantly. SB with 15% CL rice starch showed similar sensory acceptability with control SB. The study suggests that CL rice starch at 15% is suitable to increase fibre in steamed bun with little effects on the appearance and sensory attributes.

Keyword: Cross-linked rice starch; Steamed bun; Dough rheology; Physicochemical properties