ABSTRACT

Aim of this study was to optimize the fermentation of sorghum and its effects on bread properties. The optimization of fermentation was conducted by three factors; microorganism, sorghum flour concentrations, and the duration of fermentation using the Response Surface Methodology (RSM). The optimum conditions of fermentation that was predicted by RSM are fermentation by the mix of dry baker yeasts and pure *Lactobacillus plantarum* with 37% sorghum flour (w/w) concentration for 24 hrs. The fermented sorghum flour was compared to non-fermented sorghum flour and wheat flour. The fermented sorghum flour provided higher protein (23% w/w), total phenolic contents (TPC; 1.8% w/w), amylopectin (55% w/w) and total starch (61% w/w) as well as the physical properties such as pasting temperature (91°C) and redness (3.1) than non-fermented sorghum flour. In contrast, fermented sorghum flour has lower moisture (3.3% w/w), total and reducing sugar (2.3% and 3.2% w/w), amylose content (5.51% w/w), viscosity (109.53RVU), and L* (lightness; 80). The application of fermented sorghum flour to the bread dough could improve nutritional and functional values and also increase the volume expansion (0.9 mL/min). This modified bread has a flat surface, natural dark color, a little sour odor, and hard texture.