

ABSTRACT

Predominance of lactose intolerance in about 33 % of world population and increased reported incidence of milk allergy has resulted into demand of dairy alternatives. Also, the popularity of functional foods has led to the development of beverages with functional benefits. Taking these facts into consideration, the aim of this work was to optimize the process technology for production of oat milk and oat milk based frozen dessert with good nutritional profile and consumer acceptability. Oat milk was produced with the liquefaction process using α -amylase. The optimum conditions for making oat milk were found to be 27.0 % (w/w) slurry concentration, 2.1 % (w/w) enzyme concentration and 49.0 min liquefaction time. One kg of rolled oats resulted in 2.85 kg of oat milk having 25.98 ± 0.15 % total solids, 6.7 ± 0.11 pH, 20 °Brix total soluble solids, and 1.01 ± 0.08 Pa·sⁿ consistency index. Oat milk was found to contain 2.89 % protein, 2.31 % fat, 0.56 % ash, 18.11 % carbohydrate, 0.58 % β -glucan and 32.94 mg GAE/ 100g total phenol content with good antioxidant activity and mineral composition. Developed oat milk contained all the nine essential amino acids in adequate amounts and had 18.81 % saturated fatty acids, 46.6 % MUFA and 34.51 % PUFA. An exponential model describing the combined effect of TSS and temperature of processing on rheological properties of oat milk was developed. Optimized formulation for inulin enriched flavoured oat-milk beverage contained 6.77 % w/w inulin and 6.40 % w/w sugar. The optimized oat milk frozen dessert formulation consisted of 52.61 % oat milk, 33.14 % milk cream (25 % fat), 4.26 % inulin and 10 % sugar. It was found that citri-fi and inulin can be used as fat replacers in oat milk frozen dessert formulation to replace more than 50 % of milk fat/ palmolein oil to obtain a sensory acceptable product. Electronic nose classified the oat milk into “unspoiled” (microbial counts < 6 log₁₀ cfu/ g) and “spoiled” (microbial counts \geq 6 log₁₀ cfu/ g) categories. The shelf-life of oat milk was 4 hours and 9 days at room temperature (24 ± 2 °C) and refrigerated conditions (4 ± 0.5 °C), respectively.

Keywords: Enzyme, liquefaction, oat milk, rheology, β -glucan, inulin, citri-fi, frozen dessert, fat replacers, electronic nose
