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Development of pasteurized grain-milk beverage and evaluation of physico–chemical and sensory properties

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Consumer demand for nutritious and healthy foods has been steadily increasing over the last two decades. The aim of this study was to create a low fat, gluten-free functional grain-milk beverage with enhanced nutritional and taste characteristics. Grain mixtures were prepared by mixing selected grains of sorghum: horse gram: red rice 'kuruluthuda' at three grain ratios. Grain extract made by streamlining the processing steps of overnight soaking, pressure cooking, blending with water (1:3), and filtering. The best grain mixture ratio was chosen based on a primary sensory assessment. The formulation of grain-milk beverages was done to three different grain extract ratios with cow's milk, sesame milk, sweetener (Kithul treacle and sugar), and carrageenan. Final beverage mixture was homogenized (6000 rpm) and preserved by heat treatment to reduce the microbial load of the final product. The 70% multi-grain extract beverages with sugar and treacle were chosen as the best formulations based on sensorial characteristics in terms of appearance, color, mouth feel, sweetness, overall taste, and acceptability. The total soluble solid content and total acidity of treacle and sugar-containing beverage samples differed only slightly and the pH of sugar-containing beverages is higher than that of treacle-containing beverages. Sugar containing beverage had lower fat, crude fiber, and total ash content than treacle containing beverage, but treacle containing beverage had slightly lower protein and carbohydrate content than sugar containing beverage. The caloric value of both beverages was strikingly similar. The Trypsin inhibitory activity of treacle grain - milk beverages was slightly higher than other sample. After adding potassium sorbate as a preservative, the shelf life of heat-treated sugar incorporated grain-milk beverage is 14 days while that of kithul treacle incorporated grain-milk beverage is 11 days according to the microbiological results of total plate count, yeast and mould microbial and sensory properties. The findings of this study showed that it is possible to combine grain extracts and cow's milk to produce value-added beverages. Furthermore, the developed beverages had a high potential for introduction into the local market as healthy beverages.

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