Optimisation of nutritional composition of traditional porridges produced from blended pearl millet, cowpeas, and wild loquat and velvet wild medlar fruits

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Abstract

Traditional cereal based porridges have an important role to play in the fight against food insecurity. However, the cereal based porridges are high in energy and are usually deficient in some essential amino acids as well as micronutrients. The objective of the study was to optimise blending ratios of porridges formulated from pearl millet, cowpeas, wild loquat and velvet wild medlar fruit powders to improve the nutritional composition. Twelve formulations of the composite flours were determined using D-optimal mixture design. The ingredients were considered in the ranges of 58 %–66 %, 20 %–30 %, 8 %–15 % for pearl millet flour, cowpeas flour, and fruit powders, respectively. The porridges were analysed for nutritional composition, functional properties, anti- nutritional factors, and sensory acceptability. The results showed significant difference ($P < 0.05$) in proximate, water absorption capacity, viscosity, reconstitution time, bulk density, mineral, phytate, total phenolic content as well as overall acceptability with changes in ingredient composition. The overall optimum point was in the range of pearl millet (58.82 %), cowpea (26.17 %), fruit powders (15 %) at a desirability of 0.581. In conclusion, optimisation of cereal based porridges with legumes and indigenous fruits enhanced nutrient composition. The porridges can help contribute in improving food insecurity, especially in resource poor communities.

Keywords: Pearl millet, Cowpea, Food security, D-optimal mixture design, Wild fruit powder, Porridge