ABSTRACT

Complementary feeding becomes a necessity for the optimum development of an infant after completion of six months of age. Sorghum is rich in mineral but considerable amounts of anti-nutrients are present making their elimination necessary to improve the nutritional quality and effectively utilize its full potential as human food, by using simple household technologies. Its use for infant foods needs to be popularized by applying several processing techniques and improving its nutritive value and thus formulating a home-based complementary food mix. Present study was conducted to design complementary food mixes based on sorghum using different processing methods and evaluate their organoleptic properties, nutritional profile, physico-chemical properties and shelf-life (three months). White sorghum grains (CSV-23), were processed by roasting, popping, germination & drying and malting & drying and analyzed for anti-nutrients and *in-vitro* protein digestibility on dry weight basis. Significantly low anti-nutrients viz., 0.61mg tannin and 147.61mg phytate and higher *in-vitro* protein digestibility were recorded in malted & dried sample (96.18%) per 100g, thus, was selected for formulation of complementary food mixes. Four complementary food mixes, R1 (MSF:MCF:RF:MP:S-30:10:10:30:10), R2 (MSF: MGF:RF:PF:MP:S-25:10:5:20:30:10), R3 (MSF:MGF:BMF:PF:MP:S-25:10:5:20:30:10) and R4 (MSF: MCF: BMF:PF:MP:S-25:10:5:20:30:10), were formulated and subjected to evaluation of organoleptic, nutritional and physico-chemical characteristics. Formulated mixes were well-accepted organoleptically. Nutrients of the formulated mixes ranged from 2.21-3.16g moisture; 11.95-14.0g protein; 2.34-3.74 g fat; 2.26-3.25g total ash; 0.35-0.47g crude fibre; 77.99-78.49g carbohydrate and 385.98- 401.03kCal energy per 100g on dry weight basis. Lowest tannin and phytate were in R1 (0.36mg and 56.0 mg) and R4 had highest *in-vitro* protein digestibility (78.49%). Regarding minerals, maximum values recorded were: 2.97mg iron (R1); 39.54mg calcium (R3); 13.18mg magnesium (R4) and 1.91mg zinc (R4) per 100g. Highest amount for beta carotene was in R2 and ascorbic acid in R3. Regarding physico-chemical properties, lowest bulk density (0.64g/ml); water absorption capacity (166.26%); swelling index (1.38); viscosity (9.82cps) and wettability (14.73sec.) were recorded in formulated mix R1. Lowest water solubility index was in R3 (44.91%). Shelf-life study of complementary food mixes, stored at ambient temperature for three months revealed that variation in moisture and energy was significant; while in crude protein, crude fat, total ash, crude fibre and carbohydrate was non-significant. There was significant decrease in mineral and vitamin content. Tannin showed non-significant differences while phytate decreased significantly over the storage period along with *in-vitro* protein digestibility. The overall acceptability scores remained in the range of being “liked very much” only for R1, while decreased to “liked moderately” for R2, R3 and R4 after ninety days. Peroxide value, free fatty acids, total bacterial count and yeast and mold count were detected but these were much lower than the safe limit in the formulated mixes. Thus, it can be concluded that the formulated mixes are safe for consumption and can be stored up to 90 days at ambient temperature and are recommended as complementary food for children of 6-24 months age.

**Keywords:** Sorghum, complementary food mixes, processing, formulation, storage, ambient temperature

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