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Development of a grain-milk food supplement and determination of physico-chemical properties

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Food supplements are popular in worldwide due to their health-related functional properties. The objective of this study was to develop a nutritious grain-milk food supplement using locally available whole grains. Food supplements were prepared using 35 % and 40 % grain mixtures of pre-determined ratios (Red rice 45 %, Red cowpea 25 %, Barley 20 %, Sesame 10 %) with UHT milk and sugar followed by wet blending and pasteurizing (at 90 − 95 ℃, 30 $mmmmiiiinnnn$). The two best formulas of food supplements containing 35 % and 40 % grain mixture with different milk ratios (57 % and 52 % respectively) were selected based on sensory evaluation. In

35 % and 40 % food supplements, the physical properties of pH, titratable acidity, water activity, total solids, and solid non-fat were (6.63 ± 0.02 %, 6.66 ± 0.01 %), (0.01 ± 0.001 %, 0.02 ± 0.001 %), (0.99 ± 0.001 %, 0.99 ± 0.001 %), (32.28 ± 0.21 %, 34.01 ± 0.43 %) and (28.89 ± 0.23 %, 29.88 ± 0.44 %) respectively. The supplements with 35 % and 40 % grain mixture had ash, fat, crude fiber, protein, total carbohydrate, caloric value and total sugar contents of (0.73 ± 0.001 %, 0.77 ± 0.00 %) (3.31 ± 0.05 %, 3.99 ± 0.06 %), (0.689 ± 0.001 %, 0.78 ± 0.001 %), (8.15 ± 0 .015 %, 8.39 ± 0.001 %), (20.01 ± 0.45 %, 21.78 ± 0.55 %), (142.45 ± 2.15 kcal, 156.55 ± 1.72 kcal) and (12.12 ± 0.09 %, 11.99 ± 0.03 %) respectively. Zinc, iron, sodium, magnesium, calcium, and potassium content (mg/kg) in supplements with 35 % and 40 % grain mixture were (1.04 ± 0.05, 4.78 ± 0.35), (3.04 ± 0.05, 3.44 ± 0.23), (159.00 ± 2.83, 86.16 ± 2.31), (84.97 ± 1.41, 191.21 ± 6.12), (173.71 ± 2.61, 386.6 ± 15.30) and (367.28 ± 6.29, 386.6 ± 15.3) respectively. Among vitamin B components, only B5 was detected (0.7 mg and 0.5 mg per 100 g) respectively. The self-life of the products was found to be up to 10 days. Although both samples were highly acceptable, overall analysis showed that the 40 % grain mixture supplement had slightly higher nutritional values and sensorial characteristics.

Keywords: Food supplement, Multigrain, Pachchaperumal, Red cowpea, Barley.