Formulation of Economically Viable, Energy-Dense, Low-Glycaemic, Blenderized Tube Feeding Formula for Malnourished Adults Requiring Nutritional Support in Sri Lankan Hospitals

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The high cost of commercially available enteral nutrition formulas has driven the increased use of blenderized tube feeding (BTF) in Sri Lankan hospitals, particularly for managing adult malnutrition. This study aimed to develop cost-effective, energy-dense, and macronutrient-balanced BTF formulas suitable for clinical use. The target was to achieve approximately 1 kcal/ml energy density while aligning with the World Health Organization (WHO) guidelines for macronutrient distribution: carbohydrates (55– 75%), fats (15–30%), and proteins (10–15%). Following preliminary trials with different rice forms (cooked raw rice, overnight cooked rice, and cooked roasted rice) to minimize viscosity, roasted white Nadu rice was selected as the carbohydrate base. Three natural, soup-based BTF formulations (F1, F2, F3) were developed using locally available ingredients, including roasted white Nadu rice, dhal, peanuts, milk powder, dates, coconut milk, and cow's milk, guided by the Sri Lanka Food Composition Tables. To assess the suitability of one selected formulation for patients with diabetes glycaemic index (GI) was measured. All formulas were evaluated for physicochemical, microbiological, rheological, and osmolar properties to assess clinical safety and suitability. Energy density values of the three formulations were 0.82 (F1), 0.71 (F2), and 0.68 (F3) kcal/ml, which were lower than the required value of the standard formula (1 kcal/ml). All three formulations adhered to the recommended macronutrient distribution (carbohydrate: fat: protein), 51:30:19, 50:36:14, 52:30:18 for F1, F2. F3 formulations, respectively. F1 was chosen for the GI study, and the GI of the formulation was measured to be 37 ± 8.6 (low GI), which can be recommended for patients with diabetes. The findings highlight the feasibility of using locally sourced ingredients to meet hospital nutrition needs in resource-constrained settings. However, further clinical trials are recommended to validate their effectiveness in patient care.

Keywords: Blenderized tube feeding formulas, energy density, macronutrients

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