Mineral Composition of Locally Formulated Breakfast Meal for Nursery School Pupils in Anambra State

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Abstract

The objectives of the study were to determine the mineral composition of locally formulated breakfast meals for nursery school pupils. Inadequate breakfast can lead to deficiencies that impact overall health and developmental outcomes. An adequate breakfast meal includes a mix of macronutrients such as carbohydrates, proteins, fats and essential vitamins and minerals. Mineral composition in a nutritional context pertains to the minerals found in food and their relative concentrations. The mineral composition of a food item can influence its nutritional value and health benefits. Thus, knowing the mineral composition of the formulated breakfast meal is vital. The breakfast meal formulated in this study combined several ingredients, each contributing unique nutritional benefits. The study adopted experimental research design. Composite flours were produced from the various local food items used for the study which included corn, date, sweet potato and bonga fish. Six samples of the breakfast meal were formulated at different ratios. Standard laboratory analytical method of Association of Official Analytical Chemists (AOAC) procedure was used to determine the mineral composition of the samples. The mineral elements analyzed were potassium (K), phosphorus (P), zinc (Zn), iron (Fe), magnesium (Mg) and calcium (Ca). The results on the mineral composition showed the samples contained a reasonable and recommendable good amount of potassium (250.16-385.31), phosphorus (235.81-276.85), zinc (2.57-3.64), iron (3.84-6.41), magnesium (134.66-148.36) and calcium (198.62-290.57). The result obtained showed that the formulated breakfast meal samples contained appreciable amount of minerals and the formulations are suitable to be used as meal for nursery school pupils. These findings support the use of local ingredients in child nutrition, may better support the nutritional needs of school-aged children, particularly for cognitive development, energy metabolism, and immune function. The study recommends that 40% corn, 10% sweet potato, 20% dates, 0.4% bonga fish and 27.6% oat be used for the formulation of this product as it gives product with highest mineral content also, the samples should be further characterized to determine their suitability for various applications, such as food formulation, nutritional supplementation, and pharmaceutical development. Further studies are recommended to examine these breakfast formulations' shelf-life.

Keywords: **Breakfast Meal Formulation, Mineral Composition, Local food items.**

Introduction

Breakfast is the first meal of the day, usually consumed in the early morning hours. It plays a vital role in nutrition by providing essential nutrients, supporting energy needs, and influencing various aspects of physical and mental well-being. It is considered the most important meal of the day, contributing substantially to daily nutrient intake and energy needs (Adelekan, 2020). Breakfast impacts both short-term and long-term health by boosting metabolism, improving cognitive functions, replenishing energy and managing weight. Furthermore,