

ACCST Research Journal

ISSN 0972-7779

Volume - XXI, No. 2, April 2023

Journal website: www.internationaljournalsiwan.com

ORCID Link: <https://orcid.org/0009-0008-6661-0289>

Google Scholar: <https://scholar.google.com/citations?user=KJ4eXesAAAAJ&hl=en>

Refereed and Peer-Reviewed Quarterly Journal

Nutritional Composition and Acceptability Evaluation of a Developed Supplementary Feed for Nutritional Enhancement

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(Received: March 17, 2023; Accepted: April 18, 2023;
Published Online: April 28, 2023)

Abstract :

Malnutrition remains a critical public health issue, especially in developing countries. This study aimed to develop a cost-effective, nutrient-dense supplementary feed using locally available ingredients and assess its nutritional composition and organoleptic acceptability. A blend of cereals, pulses, and micronutrient-rich additives was formulated and analyzed for proximate composition (energy, protein, fat, fiber, ash, and moisture) using standard AOAC methods. The product's acceptability was evaluated through sensory analysis with a panel of 30 semi-trained judges using a 9-point hedonic scale. The results revealed that the developed feed met the recommended dietary allowances (RDA) for key nutrients and was rated highly for taste, texture, color, aroma, and overall acceptability. The findings indicate the potential of this supplementary feed to improve dietary intake among vulnerable populations, particularly children and women. Further intervention trials are recommended.

Keywords : Supplementary feed, Nutritional composition, Sensory evaluation, Acceptability, Malnutrition, Food formulation

1. Introduction :

Malnutrition, particularly protein-energy malnutrition and micronutrient deficiencies, continues to impact millions globally. Developing a supplementary feed that is affordable, nutritionally rich, and acceptable in taste is essential in combating this issue. Supplementary foods play a pivotal role in bridging the nutrient gap among vulnerable groups such as children, pregnant and lactating women, and the elderly.

Recent efforts in home science have emphasized the importance of integrating traditional knowledge with modern food processing techniques to develop functional and fortified food products. This study seeks to formulate a supplementary feed using locally available cereals, pulses, and nutrient-dense ingredients, followed by an evaluation of its nutritional content and consumer acceptability.

2. Objectives :

- To develop a supplementary feed using nutrient-rich, locally available ingredients.
- To determine the proximate nutritional composition of the developed feed.
- To assess the sensory acceptability of the feed among the target population.
- To evaluate the feasibility of the feed as a dietary supplement for nutritionally vulnerable groups.

3. Methodology :

3.1 Formulation of Supplementary Feed :

The feed was developed using a standardized process involving ingredients such as wheat flour, roasted Bengal gram, groundnut powder, jaggery, skimmed milk powder, and green leafy vegetable powder. Proportions were optimized based on nutritional requirements and palatability.

3.2 Nutritional Analysis :

Standard AOAC (Association of Official Analytical Chemists) methods were used to determine :

- Moisture content
- Crude protein (Kjeldahl method)
- Crude fat (Soxhlet method)
- Crude fiber
- Ash content
- Total energy (calculated using Atwater factors)

3.3 Sensory Evaluation :

Sensory evaluation was conducted using a 9-point hedonic scale. Attributes assessed included appearance, aroma, taste, texture, and overall acceptability. A panel of 30 semi-trained evaluators (students and staff from the nutrition department) participated in the evaluation.

3.4 Statistical Analysis :

The data were analyzed using SPSS software. Mean, standard deviation, and ANOVA were applied to determine significant differences in sensory scores.

4. Results and Discussion :

4.1 Nutritional Composition :

The developed feed provided the following per 100g:

Nutrient	Value
Energy (kcal)	410
Protein (g)	14.2
Fat (g)	12.5
Fiber (g)	4.8
Ash (%)	2.1
Moisture (%)	8.3

The protein and energy values align with the requirements for supplementary feeding programs.

4.2 Sensory Evaluation :

Mean sensory scores (on a 9-point scale) :

Attribute	Mean Score
Appearance	8.1
Aroma	7.8
Taste	8.3
Texture	7.9
Overall	8.2

Scores indicated high acceptability with no significant negative feedback regarding flavor or texture. The addition of jaggery enhanced palatability.

4.3 Discussion :

The developed feed offers a balanced nutritional profile suitable for dietary supplementation. Its high acceptability further strengthens its utility in community nutrition programs. When compared with commercial products, this feed offers competitive nutrient density at a lower cost. Integration into mid-day meal schemes or Anganwadi services can be explored.

5. Conclusion :

The developed supplementary feed is a nutritionally rich and organoleptically acceptable product, ideal for addressing malnutrition in resource-limited settings. With its high acceptability and use of indigenous ingredients, it holds promise for wide-scale implementation. Further studies involving clinical trials and shelf-life analysis are recommended before large-scale deployment.

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