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NUTRITIONAL ANALYSIS AND SENSORY EVALUATION OF FORMULATED INFANT CEREAL FROM GUINEA CORN, CRAYFISH AND CAROT

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INTRODUCTION & AIM

- Infant nutrition stands at the forefront of public health priorities, and the nutritional choices made during transition from exclusive breastfeeding to complementary feeding is central to shaping their overall health and resilience to diseases (1).
- Consequently, there is a growing emphasis on formulating complementary foods that not only meet the energy requirements of infants but also provide a spectrum of essential nutrients such as protein, vitamins and minerals crucial for their optimal growth and development.
- This study aimed at formulating infant cereals from a blend of cereal, crayfish, and vegetable at different proportions and determining its nutritional profile and sensory acceptability.

METHOD

Infant cereal was formulated using guinea corn (energy), crayfish (protein source) and carrot (vitamins) at different proportions of samples.

Sample A (Guinea corn 75%Crayfish 5%Carrot 20%), B(Guinea corn 75%Crayfish 10%Carrot 15%), C(Guinea corn 75%Crayfish 15%Carrot 10%).

The guinea corn was milled into flour, the crayfish was ground into powder, and carrots were finely grated. These ingredients were combined at different proportions and milled together in a food processor

Nutrient analysis (proximate and micronutrient) of samples was carried out using standard AOAC procedure. Sensory evaluation was carried out among mothers using a 9-point Likert scale.

Statistical analysis was carried out using SPSS v26 and means were separated using Duncan's Multiple Range Test at $p<0.05$.

Pictures of formulation process

RESULTS & DISCUSSION

1. Proximate analysis revealed that, Sample C had significantly ($p<0.05$) higher protein content (27.67±0.04%) and fat content (6.67±0.58%) than other samples. The fat content ranged from to (4.33±0.58% to 6.67±0.58%).
2. There was a significant difference in the carbohydrate content of samples ($p<0.05$). A had the highest carbohydrate content (67.64±1.10%) while C had the lowest carbohydrate content (57.87±0.28%) (Table 1).
3. Beta-carotene content of sample A (10.55±0.06mg/100g) and B (10.72±0.16mg/100g) were not significantly different ($p>0.05$) while sample C had the lowest beta-carotene content (9.06±0.14mg/100g).
4. Sample A was most preferred by the mothers in colour, aroma and taste while sample C was most disliked.
5. The nutritional profile of the sample C formulation had the best nutrition profile and can be a source of high quality protein and nutrient dense meal (2) which can be suitable for infants.

Table 1: Proximate composition of Infant Cereal Formulations

SAMPLES	MOISTURE (%) Mean±SD	PROTEIN (%) Mean±SD	FAT (%) Mean±SD	FIBRE (%) Mean±SD	ASH (%) Mean±SD	CHO (%) Mean±SD
A	3.17±0.29^{a}	21.58±0.04^{a}	4.33±0.58^{a}	0.24±0.01^{a}	3.03±0.50^{a}	67.64±1.10^{c}
B	3.67±0.58^{a}	23.25±0.04^{b}	4.67±0.58^{a}	0.28±0.00^{b}	3.50±0.00^{a}	64.64±0.54^{b}
C	3.83±0.29^{a}	27.67±0.04^{c}	6.67±0.58^{b}	0.30±0.02^{b}	3.67±0.29^{a}	57.87±0.28^{a}

A- 75% guinea corn, 5% crayfish, and 20% carrot, B- 75% guinea corn, 10% crayfish, and 15% carrot, C- 75% guinea corn, 15% crayfish, and 10% carrot; Mean values with the same superscript within the same column are not significantly different ($p>0.05$).

Table 2: Micro-nutrient composition of Infant Cereal Formulations

SAMPLES	POTASSIUM (mg/100g) Mean±SD	CALCIUM (mg/100g) Mean±SD	SODIUM (mg/100g) Mean±SD	BETA-CAROTENE (mg/100g) Mean±SD
A	83.3±0.00^{a}	88.48±0.00^{a}	235.74±0.00^{a}	10.55±0.06^{b}
B	104.43±5.27^{b}	193.89±0.00^{b}	270.60±0.00^{b}	10.72±0.16^{b}
C	125.53±0.00^{c}	352.02±0.00^{c}	340.33±0.00^{c}	9.06±0.14^{a}

A- 75% guinea corn, 5% crayfish, and 20% carrot, B- 75% guinea corn, 10% crayfish, and 15% carrot, C- 75% guinea corn, 15% crayfish, and 10% carrot; Mean values with the same superscript within the same column are not significantly different ($p>0.05$).

CONCLUSION

- Although all samples were nutrient dense, sample C had the highest nutrient density but was the least preferred formulation by mothers. This is mot likely due to increase crayfish content.
- Further study with slightly reduced crayfish content is recommended

FUTURE WORK / REFERENCES

1. Martín-Rodríguez, A., Bustamante-Sánchez, Á., Martínez-Guardado, I., Navarro-Jiménez, E., Plata-SanJuan, E., Tornero-Aguilera, J. F., & Clemente-Suárez, V. J. (2022). Infancy dietary patterns, development, and health: an extensive narrative review. *Children*, *9*(7), 1072.
2. Ilemobayo, M. A., & Kone, K. J. (2024). Nutritional Compositions and Sensory Evaluation of Fermented Maize and Millet Fortified with Crayfish and Soybeans for the Production of Infant Food. *AgriHealth: Journal of Agri-food, Nutrition and Public Health*, *5*(1), 10-20.