Nutritional composition and consumer acceptability of complementary meal blended from pearl millet, sorghum, chickpea, sesame and moringa oleifera

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ABSTRACT

Childhood malnutrition caused by the consumption of low nutrient density foods is continues to be a major problem in Ethiopia. Complementary foods play a crucial role in facilitating consumption of important nutrients. Therefore, it is better to focus on development of complementary food aimed to reduce such malnutrition. This study was designed to formulate complementary food from the blend of malted sorghum and pearl millet, roasted chickpea and sesame, moringa oleifera flours for the vulnerable infants. All samples were cleaned from any impurities. Pearl millet and sorghum samples were malted and dried; chickpea and sesame samples were roasted; and moringa oleifera sample was dried. Then all samples were milled, sieved and packed for further analysis. The proximate composition and anti-nutritional factors and sensory analysis were conducted by standard methods. The result of this study revealed that proximate and anti-nutritional factors composition are significantly affected (P<0.05) by the blend ratio. Moisture, protein, fat, carbohydrate, and energy value content ranged from 4.35 (T4) to 4.77% (T1), 13.51 (T5) to 15.91% (T4), 8.05 (T2) to 12.40% (T4), 61.40 (T4) to 66.79% (T2) and 394.66 (T2) to 420.83 kcal/100g (T4) respectively. Tannin, phytic acid and oxalate content ranged from 4.37(T1) to 11.16% (T5), 0.02(T2) to 0.04% (T1) and 41(T5) to 69.12mg/100g (T1) respectively. The overall sensorial acceptability of complementary food (porridge) ranged from 4.75 (T3) to 5.17 (T4). Therefore, based on the proximate composition and sensory evaluation data, treatment four (T4) of the proportion, 20% sorghum + 40% pearl millet + 20% chickpea + 10% sesame + 10% moringa oleifera complied with codex standards set for complementary food. Therefore, this proportion can be taken as an appropriate complementary food to fulfill the nutritional demand of children either by manufacturing in complementary food processing factories or preparing at household level if ingredients are easily accessible.

Keywords:

INTRODUCTION

MATERIALS AND METHODS

Sampling and sample preparation

Pearl millet sample preparation

Sorghum sample preparation

Chickpea sample preparation

Sesame sample preparation

Moringa oleifera sample preparation

Weaning blend formulation

Experimental design

Proximate composition determination

Anti-nutritional content determination
Tannin content determination

Determination of phytate content

Determination of oxalate content

Porridge preparation

Sensory properties

Analysis of the data

RESULTS AND DISCUSSION

Chemical composition of the blended flour

**Means with the same alphabet as superscript within same columns are not significantly different at 5% significance level. RV: indicates reference value*

**Means with the same alphabet as superscript within same columns are not significantly different at 5% significance level.*

Sensory evaluation

Overall acceptability

[*] *Means with the same letter within the same column are not significantly different*

CONCLUSION

DATA AVAILABILITY

CONFLICT OF INTEREST

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REFERENCES

Agricultural Sciences 11

Frontiers in nutrition 3

Nig Fd J 13

Food and Nutrition Bulletin 27

The lancet 371

Journal of Microbiology Biotechnology and Food Science

International Journal of Scientific and Engineering Research 7

Codex Stan 72

Rome, Italy: Codex Alimentarius Commission

International Journal of Food Science and Nutrition Engineering 5

Food science & nutrition 3

International Food Research Journal 24

Food science & nutrition 5

Feeding and nutrition of infants and young children: guidelines for the WHO European Region, with emphasis on the former Soviet countries

British Journal of Nutrition 85

Journal of food quality 2019
Global nutrition report 2017: Nourishing the SDGs

Official methods of analysis of AOAC international

Pakistan journal of Nutrition 7

Food Science and Quality Management 72

Heliyon 7
Methods for sensory evaluation of food
Quantification of tannins: a laboratory manual

International Journal of Nutrition and Food Sciences 3

International Journal of TROPICAL DISEASE & Health 4

Int J Eng Sci 3

Journal of food agriculture and environment 5

Journal of Natural Sciences Engineering and Technology 8

Pakistan Journal of Nutrition 16

Food and nutrition sciences 6

Geneva: World Health Organization

Research Journal of Chemical and Environmental Sciences 5