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Development and Assessment of Breadfruit and Groundnut Diet as Complementary Weaning Dietin Umuahia Environment

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Abstract **– This study examines the development of breadfruit (*Artocarpus altilis*) and groundnut (*Arachis hypogeal*) mix as complementary weaning diet (CWD) for babies in Umuahia environment. The global strategy for infant feeding states that, babies should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health, and thereafter, receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years or beyond. Protein-energy malnutrition generally occurs during the crucial transitional phase when children are weaned from liquid to semi-solid or fully adult foods. During this period, children need nutritionally balanced, calorie-dense supplementary foods in addition to mother's breast milk because of the increasing nutritional demands of the growing body. Thus, weaning food plays a great role on child growth and development. It is on the note that this study sought to the development of complementary diet with the commonly available food crops to the Umuahia environment. Breadfruits and groundnut were used to produce complementary meal under a hygienic condition and the organoleptic properties of the CWD were assessed by panellists in comparison with commercial complementary diet (CCD). Percentage and mean were used to analyse the assessments of the panellists. It was found out that the generally acceptability of CWD was higher than that of CCD by the panellists. In essences, recommended was made that the Umuahia people should be trained on the hygienic production of CWD in other to improved the nutritional status of the babies and infants; and also to help them save money for other things.**

Keywords **– Assessment, Breadfruit, Complementary, Groundnut.**

I. INTRODUCTION

Weaning is the process of gradually introducing a mammalinfant to what will be its adult diet and withdrawing the supply of its mother's milk. The process takes place only in mammals, as only mammals produce milk. The infant is considered to be fully weaned once it no longer receives any breast milk (or bottled substitute). At this point, the mother tries to force the infant to cease nursing, while the infant attempts to force the mother to continue. This process may lead to weaning conflict; this may be considered the result of the cost of continued nursing to the mother, perhaps in terms of reduced ability to raise future offspring, exceeding the benefits to the mother in terms of increased survival of the current infant(Salmon and Shackelford, 2008).

Potential weaning diets are developed from locally available least expensive food items and crops, using local processing methods. WHO (2000) in Adepeju, et. al. (2014) reported thatthe addition of food other than breast milk in developing countries had had a marked increase in the danger of gastroenteritis as a potentially fatal disease. Poor feeding practices as well as lack of suitable complementary foods are responsible for under nutrition with poverty exacerbating the whole issue. The complementary foods are often of low quality and given in insufficient amounts, thereby such complementary foods need to be fortified. Fortified complementary foods are unavailable especially in the rural areas and where available, they are often too expensive and beyond the reach of average mothers.

African bread fruits (Treculia africana) is from the mubery family of moraceace. It is an important food crop in Nigeria.

African breadfruit (Treculia africana) is readily available throughout the year (Onyekwelu and Fayose, 2007). It has high protein content (21.44%) and nutritive qualities which is good for the infant especially when processed in form cereal as a complimentary weaning diet. Also, Groundnut(Arachies hypogea) is a root seed and a usuful source of thiamine, niacin, vitamine E and folic acid. It contains some anti nutritional factor including trypsin inhibitors, haemagglutinnis, goitrogems, saponims & phytic acid which could be destroy or reduced to minimum levels through traditional cocaine and processing techniques such as soaking in water and roosting (Fries & Miranda, 2004). Although legumes are deficient in sulphur-containing amino acid, it can be used to enhance to protein content or cereal base diet and improve the nutritional status by supplying lysima. Combination of commonly used cereal with inexpensive plant protein sources like legumes can be used. (Plahar, Nti &Annan, 1997) explained that cereals are deficient in lysima but have sufficient sulphur containing Amino acid which are limited in legumes whereas legumes are reach in lysima.

Commonly used complementary foods among the mothers are locally produced and based on local staple foods, usually cereals that are processed into porridges (Adepeju, Gbadamosi, Omobuwajo, & Abiodun, 2014). Complementary foods according to WHO (2001) and Lutter (2001) are products intended to supplement or replace breast milk during the early years of life. It is expected that complementary foods should supply certain essential nutrients that cannot be sufficiently supplied by breast milk after six months while also providing additional calories for staying quality.WHO (2001) pointed out that apart from their bulkiness reported as a probable factor in the cause of malnutrition, cereals-based

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gruels are generally low in protein and are limiting in some essential amino acids, particularly lysine and tryptophan. In addition, the demand for the carbohydrate sources (cereals-maize and sorghum) is ever increasing owning to their increased utilization. Furthermore, the population is increasing and the requirement for cereals and cereal-based foods is equally on the increase. Based on the aforementioned, coupled with the high price of commercial and industrially made baby foods and low protein, vitamin and minerals nutrients level of locally made complementary foods, the need for locally available, cheap, easy to prepare and high nutritious complementary food development therefore becomes important in order to curb malnutrition among the young for better growth and development.

II. Purpose of the Study

The general purpose of the study was to developed complementary diet for infants using groundnut and breadfruit blend. The specific objectives of the study were to:

- Process flour from groundnut and breadfruit.
- Develop a complementary diet processed from groundnut and breadfruit.
- Comparatively evaluate the organoleptic attributes of the developed complementary weaning diet (CWD) and commercial complementary diet (CCD) for general acceptability.

III. Research Questions

- Will it be possible to process flour from groundnut and breadfruit?
- Can groundnut and breadfruit be used to develop a complementary diet?

What will be the outcome of the organoleptic comparative assessment and general acceptability of the two diets?

IV. Materials and Methods

Breadfruit and groundnut were gotten from the main market in Umuahia, Abia state, Nigeria. A commercial complementary diet, (CCD) was purchased from a supermarket in Umuahia, Abia state.

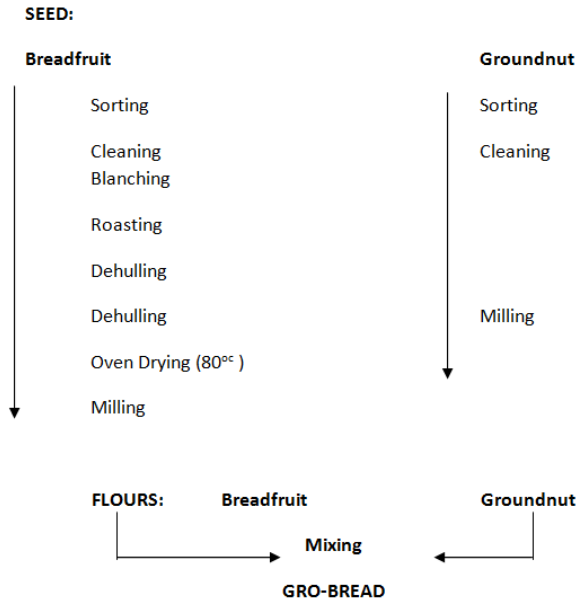

Fig.1. Flow Chart of the processing of bread fruit and groundnut as a complimentary weaning diet.

Table 1: Average Value of Duplicate Composition of Breadfruit and Groundnut(100%)

Sample		Protein	Fat	Moisture	Ash
A	GN	26.25	6.89	2.40	2.65
B	BF	21.44	23.00	8.24	1.94

Preparation of the samples:

CWD: Boil water to 100ºC, measure 10cl into a bowl, add 5 tablespoon of GROBREAD flour stir and fold in firmly to avoid lumps.

CCD: Boil water to 100ºC, measure 10cl into a bowl, add 5 tablespoon of CCD stir and fold in firmly to avoid lumps.

Table 2: Orgagoleptic assessment of CWD and CCD

Sample	Colour	flavour	Texture	Taste	General acceptability
CWD	65.7%	52%	56%	66%	61%
CCD	34.3%	48%	44%	34%	39%
Total	100%	100%	100%	100%	100%

Table 2 presents the organoleptic assessment of the sample CWD and CCD in percentages. It reveals that the sample CWD has higher percentages over sample CCD in the colour, flavour, texture, taste and general acceptability attributes as shown on the table.

Table 3: Mean scores of sample CWD and CCD by the panellists

Sample	Colour	Flavour	Texture	Taste	General acceptability
CWD	3.66	3.54	3.06	2.66	3.72
CCD	2.34	2.23	2.67	2.37	1.48

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Table 2 reveals the mean scores of the samples attributes. The mean point set as yardstick for judgement is 3.00. From the Table it is revealed that the sample CWD had mean scores higher than the mean point (3.0) for colour, flavour, texture and general acceptability and had a mean score of 2.66 lower than the mean point for taste. The mean scores for sample CCD were all below the mean point.

V. Conclusion and Recommendations

The study was able to process flour out of groundnut and breadfruit as illustrated in Figure 1. The flour, GROBREAD was used to develop a complementary diet and was presented to the panellists for assessment.

The developed complementary weaning diet of blends of groundnut and breadfruit provides an acceptable weaning diet as it contains adequate carbohydrate, protein and other essential nutrients as shown in the body of this work. The colour and flavour of the CWD was improved by the groundnut based on its peculiar characteristics. This sample canbe easily developed and prepare among the mother to use as complementary diet for their children and wards. This will make up for the nutrients that are not sufficient in the breast milk and equally help to supply them withessential nutrients for proper and total growth.

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