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## **A Comparative Study of Micronutrients Content of Complementary Foods Used by Igbo and Hausa Mothers in Umuahia, Abia State, Nigeria**

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**Abstract:** This study compared the micronutrients content of complementary foods used by Igbo and Hausa mothers in Umuahia urban. Data were collected using a pre-tested standard questionnaires administered on 100 mothers randomly selected from the study area and biochemical analysis of the identified complementary foods for proximate and micronutrients content. Results showed that maize pap (akamu), marshed yam + red oil and jollof rice + beans were the common complementary foods used by Igbo mothers; while Dawa gruel(guinea corn), tuwoshinkafa and acha porridge was used by Hausa mothers. Biochemical analysis of the samples revealed that the moisture content ranged from 37.6% in tuwoshinkafa to 81.62% in akamu. The ash content of jollof rice + beans was the highest (8.72%). Fat (15.59%), protein (35.04%) and energy (468.3 kcal) were highest in acha porridge; while akamu (89.84%) had the highest carbohydrate content. Jollof rice + beans had the highest iron (5.83 mg/100 g) content while acha porridge had the highest calcium contents (23.02 mg/100 g). The phosphorus content was more in tuwoshinkafa (555.2 mg/100 g). Marshed yam + red oil had the highest content of vitamin A (10.76 µg/d) and C (1904IU). The micronutrient content of the food samples when compared with industrially processed cereal (cerealac) showed that although some could supply appreciable amount of energy and nutrients, they were deficient in calcium and vitamin C which are of paramount importance for the growing child. This paper proposes nutrition education programmes with emphasis on adequate home fortification of complementary foods which will benefit the infants.

**Key words:** Micronutrient content of the food, industrially processed cereal, diet of infant

### **INTRODUCTION**

Complementary foods are foods other than breast milk or infant formula introduced to an infant to provide nutrients (Kleinman, 2004). WHO/UNICEF (1998) refer to this feeding stage as the period when the breast milk alone is no longer sufficient to meet nutritional requirement of infants. Anderson (1997) and WHO (2000) states that the period starts from 6 months with continued breast feeding and gradual introduction of family foods in semi-solid forms to babies until 2 years. In Nigeria, a country with multiple ethnicities, the period is fraught with a lot of problem considering the arrays of complementary foods available. Tanda (2008) revealed that hidden hunger-the lack of essential micronutrients in a presumably adequate diet is increasingly prevalent in developing world. There is a global record that billions of people suffer negative health consequences from micronutrient malnutrition due to lack of sufficiency in the diet (McClafferty, 2007; Kraemer, 2010). Several documents have already recognized that elements can become limiting not only because of environmental deficiencies but because of imbalances in the diet that have in the past been accepted as adequate (WHO/FAO, 1996; Smith and Haddad, 2000). Information on the nutrients composition especially the micronutrients contents of complementary foods used by the ethnic groups is necessary. This study compared the complementary foods used by Igbo and Hausa mothers in Umuahia Abia state.

**Objectives of the study:** The broad objective of the study was to compare the micronutrient content of the complementary foods used by Igbo and Hausa mothers in Umuahia.

#### **Specific objectives:**

- To identify the common complementary foods used by the study population
- To determine the micronutrient content of the identified complementary foods.
- To identify problems associated with complementary feeding in the study area
- To evaluate the method of formulating complementary foods by the study population.

### **MATERIALS AND METHODS**

The study was conducted in Umuahia the capital city of Abia state which was selected because it consists the two ethnic groups needed for the study. The sub-areas include the Igbo and Hausa mothers. Information on the type of complementary foods, method of formulating the foods and problems associated with the complementary foods of 100 mothers randomly selected from the sub-areas were obtained by means of questionnaire. The nutrients composition of the identified complementary foods was determined by biochemical analysis. Adequacy of diets was determined using recommended intakes of nutrients and the responses to questionnaires were subjected to statistical analysis and presented.

Table 1: Proximate composition of complementary foods used

Comp. food	Moisture (%)	Ash (%)	Fat (%)	Protein (%)	CHO (%)	Energy (kcal)
TS	37.60	1.10	0.60	8.20	64.01	259.65
DG	79.50	1.39	0.45	10.10	86.99	392.62
AP	4.92	2.10	15.59	35.04	21.05	468.30
AK	81.62	1.10	0.42	5.30	89.84	397.67
MYR	64.87	4.34	6.04	6.84	80.44	407.90
JRB	71.90	8.72	6.94	16.96	59.45	399.01

TS = Tuwo Shinkafa, DG = Dawa Gruel, AP = Acha Porridge, AK = Akamu (maize pap), MYR = Mashed Yam and Red Oil, JRB = Jollof Rice and Beans

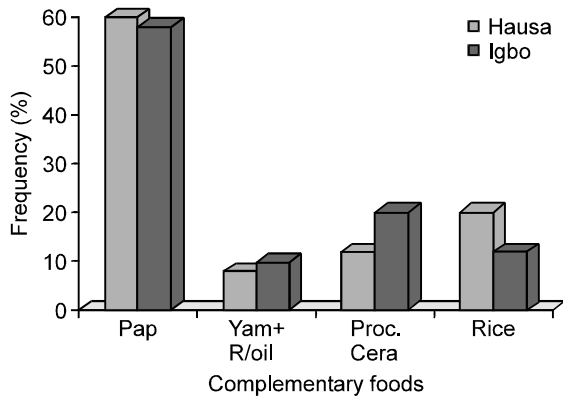


Fig. 1: First complementary foods given

## RESULTS

**Socioeconomic characteristics of respondents:** Age, educational qualification, occupation and income were considered to be the symbol of socioeconomic status. Majority (60%) of the Hausa mothers were within the age range of 18-30 yrs while the Igbo mothers were more (76%) within the age of 25-35. Very few (2% each) Hausa mothers attained B.Sc and HND level of education respectively; whereas more Igbo mothers (5% and 7%) had B.Sc and HND respectively, majority (60%) were secondary school certificate holders. Their occupation ranged from civil servant, farming, self-employed and housewife. Most of the respondents were self-employed (47.6% Hausa, 64% Igbo). Their monthly income was mainly between 2000-10,000 Naira (43% Hausa, 47% Igbo).

**Complementary feeding practices:** The reasons for introducing complementary foods ranged from breast milk not enough (6% Hausa, 36% Igbo), advice from people (14%), traditionally accepted age (46% Hausa, 30% Igbo), baby stopped by itself (3% Hausa, Igbo 4%), expectant mother (27% Hausa, 10% Igbo) and baby not strong enough (4% Hausa, 6% Igbo). The introduction of complementary foods was mainly between 5-8 months for Igbo mothers (38) and 9-11 months for Hausas (42%). The first complementary foods given to babies includes pap (60%, 58%), mashed yam and red oil (8%, 10%), processed cereals (12% 20%) and rice (20%, 12%).

Table 2: Mineral composition of complementary foods used

Comp. foods	Fe Ca P		
	(mg/100 g)		
TS	5.16	2.09	555.20
DG	5.00	23.02	349.78
AP	2.63	191.80	254.10
AK	2.49	27.51	12.66
MYR	5.01	24.26	17.17
JRB	5.83	20.75	212.59

TS = Tuwo Shinkafa, DG = Dawa Gruel, AP = Acha Porridge, AK = Akamu (maize pap), MYR = Mashed Yam and Red Oil, JRB = Jollof Rice and Beans

Table 3: Vitamin composition of complementary foods used

Comp. foods	Vitamin C (µg/dl)	Vitamin A (iu)
TS	1.63	510.00
DG	1.11	390.50
AP	1.31	994.00
AK	1.61	450.50
MYR	10.76	1904.00
JRB	2.92	1817.50

TS = Tuwo Shinkafa, DG = Dawa Gruel, AP = Acha Porridge, AK = Akamu (maize pap), MYR = Mashed Yam and Red Oil, JRB = Jollof Rice and Beans

Other foods introduced later include beans, mashed potatoes, agidi, garri, plantain, moimoi, tuwo shinkafa, acha, kunun-gieda, kunun-dawa and soya bean milk. The most common home made complementary foods include maize pap, mashed yam with red oil and jollof rice with beans for Igbo mothers and dawa gruel, acha porridge (gwate) and tuwo shinkafa. Frequency of complementary feeding showed that majority (56%, 40%) fed babies 3 times daily, while a good number (20%, 30%) fed 4 times daily. All the respondents (100%) claimed to have introduced fruits with complementary feeding because they know fruits are delicious. Oranges, paw paw, pineapple and banana were the fruits given because of availability. The problem associated with complementary foods included vomiting, fever, diarrhea/stooling and weight loss.

**Proximate composition and micronutrient content of complementary foods:** The moisture values ranged from 4.92% in Acha Porridge (AP) to 81.62% in maize pap (akamu AK). The protein content of AK was very low compared to that of AP (35.04%) while the carbohydrate content of AP was low (21.05%) when compared to that of AK (89.84%). Energy value ranged from 259.65 kcal in Tuwo Shinkafa (TS) to 468.3 in AP. The mineral

composition showed that jollof rice and beans had more iron content (5.83 mg/100 g), AP had the highest calcium (191.80 mg/100 g) and TS had the highest (555.20mg/100g) phosphorus content.

## DISCUSSION

The results showed that most of the respondents were in the low income group when their income and educational qualification was considered. This could explain the high use of home-made complementary foods. The fact that majority (60%) had secondary school certificate and were self-employed support the low income status.

The various reasons given for introduction of complementary foods equally support their level of knowledge. This is very sad because currently, a lot of information is being disseminated at both hospitals and health centers on child feeding and care. Therefore, it is either the mothers are not patronizing these facilities or they do not pay attention to the education activities. The age at which complementary foods were introduced for Igbo infants (5-8 months) and the Hausas (9-11 months) reflected the Hausas suckle their infants longer. This may be attributed to their culture and type of work which was mainly nomadic activity. This view had already been expressed by Uwaegbute (2008) that feeding patterns vary from country to country and even within countries, that ethnic differences exist. There was similarity in the type of complementary foods used by both tribes as in dawa gruel and maize pap; acha porridge and jollof rice and beans. This has also been documented by Uwaegbute (1991) that despite cultural differences, some complementary foods in Nigeria appear to be standard among all ethnic groups with pap assuming the role of super cultural weaning food. Furthermore, the result showed that most of the complementary foods used by the study population was from cereals, legumes and tubers. This is in line with Uwaegbute and Nnanyelugo (1989) which states that family diets were based on roots (such as cassava and yams), cereals (such as maize, sorghum) and starchy fruits (such as plantain). The frequency of feeding was encouraging because if the identified complementary foods were to be adequate, it means that babies fed with such intensity will be well nourished. Similarly, the fact that almost all mothers are aware that fruits are nourishing for babies is equally encouraging. The problems encountered in the home made complementary food was not surprising as the level of hygiene needed to exclude microbial contamination could hardly be reached if these mother fail to practice what they were taught at the hospitals and health centers. It is also important to note that for the mothers under study, there were no forbidden foods for the infants. This may be because cultures that stipulate such have been erased by civilization.

The micronutrient composition showed that although some of these complementary foods contain some

micronutrients, the levels were inadequate when compared with the recommended intakes. This is in line with the views of Uwaegbute (2008) which stated categorically that Nigeria traditional dishes are nutritionally poor because meat, egg and fish which have protein of high biological value were not used by mothers probably because of cost rather than taboos.

**Conclusion:** Igbo and Hausa mothers in Umuahia have similarities in the complementary foods used. Although these complementary foods contain some amounts of nutrients, there is need for nutrition education of mothers with emphasis on home fortification of these complementary foods to increase their nutrients as well as their micronutrients contents.

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