

Nutritional Status of Female Farmers on Agricultural Intensification in Selected Communities of Gombe State, Nigeria

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ABSTRACT The study determined female farmers' nutritional status in selected communities in Gombe State, Nigeria with respect to energy, protein, calcium; iron, thiamine and vitamin C. Using relevant indices such as investment capital, land, income and nutritional status farmers were in poor rating. Also, farmers identified inadequate access to credit and extension as constraints. Farmers consumed energy, calcium, iron and thiamine far below the recommended daily allowance (RDA) or recommended nutrient intake (RNI), derived from bread/cereals; legumes/nuts; roots/tubers; vegetables/products; meat/fish/eggs; dairy products; fruits; sweets and sugars. Age, income, education, and parity showed significant influence on nutrient intake. In view of the malnutrition status of female farmers as evident in the study, it is recommended that sound approaches to meet the nation's goal of raising the productivity of small-scale farmers need to address factors leading to malnutrition with attendant consequences for decline in productivity and low nutritional status. This will have far reaching implications for the nations march towards food security on sustainable basis.

INTRODUCTION

Women constitute about 70% of the agricultural labour force in the rural sector, producing much of the country's food. In addition to child bearing and rearing women and girls expend several hours per day fetching water, fuel wood and cooking for the family. Yet due recognition is not given to their vital role in the development of agricultural policy and programmes (UNDP, 1998).

Despite the fact that women are predominantly the food producers for the nation, the majority of them are still food insecure, being small-scale farmers whose farm sizes fall below the threshold level for adequate food production. Most affected are usually pregnant and lactating women whose protein and energy intake falls below the recommended daily allowance (RDA) or recommended nutrient intake (RNI). This contributes to the high incidences of differential feeding practices, which results in malnutrition and invariably low productivity. Women have often been blamed for failure of attempts to raise levels of agricultural production and empirical evidences abound asserting their subsistence status characterized with vicious cycles of poverty (CBN 1998, FOS, 1999 and CBN/World Bank 1999). Yet studies with respect to female farmers' nutrition status, which is one of the major links to their health and level of productivity is being neglected.

Events of the recent past have given rise to new era in which true position of women in the productive and reproductive cycle has begun to be realized. In the last decade of international development, women have been recognized as vital human resources. Any agricultural expansion programme that proceeds without women's participation is self-defeating because of the loss of their contribution (James and Trail 1995). Hence, the issues of nutritional concerns and role of women have emerged as global concerns. This study therefore seeks to investigate and highlight female farmers' nutrition status in the study area. Particularly it seeks to assess nutrient intake of the six major nutrients needed by female farmers to enhance their reproductive and productive roles and to identify their socio-economic characteristics

MATERIALS AND METHODS

The data for this study were obtained from a random sample of three hundred female farmers from selected communities of Kaltungo in Gombe State. It is situated in the northern guinea savannah at longitude 11°30' to 11°40' East and latitude 9°30' 10°30' North. It has short rainy season starting from June to October and dry season of more than six months. The rainfall averages 1600mm. Agriculture is the main occupation in community.

A total of 300 farmers were randomly selected from sampling frame of 1300 registered female farmers provided by the Women In Agriculture (WIA) unit of Kaltungo local Government Area extension divisional office. A structured questionnaire was administered to the respondents to elicit responses to items contained in the research instrument designed in line with study objectives.

The analytical procedures used for presenting the result of the study were descriptive and inferential statistics involving frequency distribution, percentages and t-test analysis.

The 24-Hour Recall Technique provided information on six major nutrients needed by female farmers to enhance their reproductive and productive roles. These major nutrients are:

- Energy in kilo-calories
- Protein in grams
- Calcium in milligrams
- Iron in milligrams
- Thiamine in milligrams
- Vitamin C in milligrams

Using the 24-Hour Recall Technique, details of all foods and drinks consumed with full description of each and the amounts were obtained. Female farmers were asked to recall all foods and drinks consumed in the preceding 24 Hours. Under reliance was not placed on farmers' memory recall ability (Young et al., 1952). Each quantity said to have been consumed by each was estimated using common household measures of varying sizes in the study area, like peak milk tins, and weighed with a Salter Scale previously calibrated. Quantities of leftovers were also estimated and deduced from the initially estimated quantities to obtain the actual consumed portion of the food. Farmers who ate in same containers with others were asked to give the number and ages of those they ate together and such quantities were estimated in respect to the number and age of individuals (FAO 1984). Finally the values of the nutrients consumed both raw and cooked were obtained and calculated from the following food composition tables (FAO, 1968; Widows, 1978; Keshinro, 1986) and comparisons of various values of the nutrients derived were made with those of WHO /FAO (1987) recommendations for female farmers, termed, the recommended nutrient intake (RNI) or the recommended daily allowance (RDA). Therefore RNI/RDA is defined as the amount sufficient or more than sufficient for the nutritional needs of

practically all healthy individuals in a population. The Following RNI values were used in computing the nutrient intake of the female farmers to determine adequacy of their intake.

RNI/RDA		
Energy (Kcal)	=	2,435
Protein (g)	=	47
Calcium (mg)	=	1,200
Iron (mg)	=	28
Thiamine (mg)	=	1.5
Vitamin C (mg)	=	30

The nutrient intake were then expressed as mean, standard deviation and the percentage of the recommended daily amounts (RNI). Differences were assessed through T-test. Data from the qualitative analysis (Food Frequency) complimented the 24 -Hour Recall Technique (Quantitative technique).

RESULTS AND DISCUSSIONS

(a) Age: Age was measured by the actual number of years indicated by farmers as corresponding to their last birthday age. The age of the respondents range from 18-60 years. Female farmers aged 18-40 years constituted the majority (51.5%). For all age brackets, vitamin C was well supplied and exceeded the RDA/RNI value. The supply of thiamin was also good for all age groups as its requirement though not met, was supplied in reasonable proportion. Similarly, protein, in contrast to what obtain in calcium and iron was considerably better especially in age category of between 31-above 51 years. The age categories of 21-30 years age had mean intake of energy and protein lower than their RDA/RNI. Similarly, age bracket of 21-30 years (13.3%) had low energy and protein in contrast with what obtain in age brackets 31-40 years, 41-50 years and 51 and above that exceeded their RDA/RNI values for energy and protein. On the whole, female farmers in age bracket of between less than 20 and 30 were deficient in energy, calcium, and iron. The probable explanation for this might be their demand for these nutrients is higher than of older farmers. Expectedly, the younger an individual, the greater his/her nutrient requirements. Also, because of the higher nutrients requirements for this group, their intake in terms of energy and protein was the poorest.

(b) Parity: The pattern of consumption of nutrient according to parity showed no variation.

Comparison of the mean intake of nutrients of parity showed that the mean energy, calcium and iron for all categories were inadequate and parity 11, and 11 and above (?11) study groups showed the lowest consumption (82%, 50% and 50%) of RDA/RNI for energy, calcium and iron respectively. In contrast, vitamins C mean intakes for all farmers were adequate even exceeding RDA/RNI. Also thiamine mean intake was almost adequate.

The number of pregnancy (parity) of female farmers ranged from 2-12. Parity 12 constituted the majority. Female farmers were found to be deficient in calcium and iron especially those of higher parity (8, 9, 10, 11 and 12). This is because majority of women enter into pregnancy with inadequate intake of these nutrients and with the rapid succession of each pregnancy makes it more difficult for women to attain optimal requirements.

(c) **Education:** In the same vein, the pattern of consumption of nutrients according to education showed little or no variation. Those with and without formal education were deficient in calcium and iron but had good intake of thiamine and vitamin C above RDA/RNI.

On the other hand, the non-literate, adult literacy and primary uncompleted categories were most unable to meet their energy and protein requirements. Minimal knowledge, especially in

nutrition (Nutritional Knowledge) could be a contributory factor for the observed deficiencies in these categories.

(d) **Income:** The pattern of consumption of nutrients by income was similar to all. All categories were deficient in calcium and iron but had adequate intake of Vitamin C and thiamine above 100%. However, result showed that low – income group farmers (₦5,000 per annum) had low mean intake of all nutrients in comparison to high- income earners (₦ 5,000). High prices of food items may affect the ability of low-income groups to buy food, therefore may not feed adequately.

t-test Values

(a) **Age (Null Hypothesis (Ho):** There is no significant difference in nutrient intake between young (18-30 years) and old (31-60 years) farmers. The t-test analysis for difference between young and old female farmers reveals that there is significance difference between these categories of age group (t = -287; p<0.05).

The finding suggests that there is variation in the pattern of nutrient intake among young and old female farmers. This implies that the level of protein intake by respondents in this study is greatly influenced by age. Therefore as one

Table 1: Socio-economic characteristic of farmers and nutrient intake

Characteristics	Nutrients					
	Energy	Protein	Calcium	Iron	Thiamin	Vitamin C-
(a) Age Under						
21 29 (9.6)	48	-14	-370	-14	+0.2	+22
21-30 40 (13.3)	-21	-4	-170	-12	+0.1	+29
31-40 86 (28.6)	+18	+7	-420	-8	+1.0	+20
41-50 100 (33.3)	+32	+3	-610	-17	+1.0	+19
51 and Above 45 (15.0)	+40	+6	-500	-18	+0.2	+15
(b) Parity Under 5						
5-7	-38	+10	-480	-8	+0.5	+20
8-10	-185	+3	-490	-9	+0.3	+16
11 and Above	-315	-3	-585	-11	+0.4	+14
	-434	-8	-600	-14	+0.6	+11
(c) Education						
Non- literate 64 (21.3)	-60	-2	-300	-8	+0.5	+6
Adult literacy 50 (16.6)	-70	-4	-312	-5	+1.0	+14
Primary uncompleted 43 (14.3)	-98	+4	-320	-4	+0.4	+10
Primary completed 60 (20.4)	+30	+4	-310	-5	+0.3	+8
Secondary uncompleted 35 (11.6)	+20	+5	-300	-6	+0.3	+7
Secondary completed 16(5.3)	+40	+10	-300	-2	+0.6	+5
Teachers college 32(10.7)	+60	+18	-222	-4	+0.1	+8
(d) Income (N)						
Under 1000 110(36.6)	-98	-6	-500	-6	+0.2	+5
1000-2999 100(33.3)	-87	+7	-180	-4	+0.4	+15
3000-4999 50(16.7)	+60	+11	-98	-6	+1.0	+19
5000 and Above 40(30.4)	+183	+13	-60	-3	+0.2	+24

advances in age, so also his/her nutrient requirements diminish. The older the individual the better the chances of meeting up with nutritional needs. Perhaps, this explains why older farmers met their nutritional needs than young farmers who have higher needs and demand for most nutrients. This findings is in line with Ferro-Luzzi et al (1992) who studied aid and maternal under nutrition among females. According to the report under nutrition was highest in mothers below 31 years. The influence of age on requirements is obvious in that the needs of a young rapidly growing mother would no doubt be different from those of an elderly. The younger an individual, the chances are that the greater the nutrient demand and vice-versa.

Table 2: t-test values showing differences in nutrient intake

	Nutrient Intake	T-test value (df = 16)	Remarks
(1)	Young farmers 18- 30yrs and old farmers 31-60yrs	-2.87	SD
(2)	Low income (?N5000) and high income (? N 5000)	-2.33	SD
(3)	No formal education and formal education	-2.70	SD
(4)	Low parity (?5 Children) and High parity (?5 Children)	4.41	SD
(5)	Head of household and non-head of household	0.86	NSD

**NSD – No Significant difference
SD – Significant difference at 0.05 levels

(b) Income: The t-test analysis of difference between low and high income was positive and significant ($t = 2.33, p < 0.05$). This result suggests that differences exist in pattern of nutrient intake among various income groups, thus income has significant influence. The higher the income of an individual, the greater the chances to buy needed food items. Therefore as income increases so also the ability to buy food items for adequate consumption. This study conforms to earlier one by Engle (1995) who reported that the low-income class shows high risk of nutritional deficiencies than high-income class.

(c) Education: The t-test of significance for differences between formal education and non-formal education was significant ($t = 2; p > 0.05$). The higher the educational level, the more respondents are prone to appropriate eating habits and vice-versa. This further confirms the study's report that more educated farmers consume more nutrients according to RDA/RNI

than the less educated. This report tallies with UNICEF 1998 that reported significant influence of education on food consumption. This suggests that little or lack of knowledge of nutrition predisposes a farmer to inadequate nutrition.

(d) Parity: There is a significant difference between female farmers in low and high parity status ($t = 4.4; p > 0.05$). This means that the higher the parity the more difficult for a mother to attain optimum nutritional requirements. This agrees with Baksh et al (1994.)

(e) Gender of Head of Households: There is no significant difference in terms of nutrient consumption intake between household heads and non-house hold heads. ($t = 0.8, p > 0.05$).

This finding suggests that leadership status has no significant influence on nutrient intake. There is no difference in the pattern of nutrient consumption for both heads and non – heads of households. The general poverty situation in majority of households in rural settings in Nigeria could be a probable explanation for this trend.

This study is similar to the position of Brown and Hadad (1999) who reported that insignificant relationship exists between leadership and nutrient intake but contrary to findings of FGN/UNICEF (1994) that reported significant relationship.

CONCLUSIONS AND RECOMMENDATIONS

The study attempted examining female farmers' nutrient intake. The study showed that farmers were above the national mean age for marriage either lactating or pregnant with high child dependency ratio, fertility rates and large household sizes. Farmers were poor from all indices: investment capital, land, income and nutritional status. Also, farmers identified inadequate access to credit, and extension as constraints. The study indicated farmers consumed energy, protein, calcium, iron, thiamine, and vitamin C nutrients derived from food sources in the study area. Age, education, parity, and income of farmers did influence their nutrient intake, hence play obvious influence on requirements therefore are crucial factors to be considered in terms of adequate nutrition among peasant farmers especially the high risk female farmers.

Furthermore, it could be concluded that age, income, education and parity of female farmers influence their nutrient intake which plays obvious influence on requirement. Therefore they are crucial factors to be considered in terms of

adequate nutrition among peasant farmers especially the most vulnerable lactating and pregnant female farmers.

From the result, it could be asserted that female farmers' nutritional status in the study area is poor. The implication of this is that the sap of the muscles needed for arduous task in farming, pregnancy and lactation becomes undernourished resulting in its atrophy. The consequence is that farmers' capacity to work is greatly reduced. Therefore, this otherwise active, pregnant and lactating female farmers rendered inefficient through lack of nutrients are unable to contribute adequately to agricultural intensification, home management and socio-economic growth.

In view of the above findings the following recommendations are hereby suggested to enhance adequacy of nutrient intake, health and high productivity and consequently agricultural production.

1. As indicated in the study, food and nutrient intake of farmers significantly affect farmers' productivity. It is recommended that studies of this nature be conducted in rural and urban areas on wider scope in order to identify problems associated with food intake and its effect on the high-risk groups (active female farmers) and their productivity.
2. Focusing on under nutrition of farmers and factors influencing their food consumption patterns can make policy makers; research and extension agencies to create awareness and understanding on the impact of nutritional deficiencies on farmers health, as well as productivity. It is only based on these that sound programmes to improve the nutritional and productivity of farmers especially in rural areas, can be designed.
3. Education of female farmers (predominant food producers of the nation) is a major strategy for poverty eradication. It ensures production of skills that combines land and resources for efficient productive activities. Thus the development of human capital influences effective and efficient use of other resources to achieve agricultural expansion growth and development desired.

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