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## DETERMINANTS OF FOOD EXPENDITURE AND HOUSEHOLD FOOD SECURITY STATUS OF FARMING HOUSEHOLDS IN OGBOMOSO ADP ZONE OF OYO STATE.

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### ABSTRACT

This study examined the determinants of food expenditure and assessed the food security status of farming households in Ogbomoso ADP Zone, Oyo State, Nigeria. Primary data were collected from 150 farming households through a multistage sampling technique and analyzed using descriptive statistics, multiple regression, and the Foster–Greer–Thorbecke (FGT) food security index. The average age of household heads was 49 years, with 78% male respondents, while mean household size was five persons. About 37% had tertiary education, and average farming experience was 13 years. The mean monthly household income was ₦67,890, while average monthly food expenditure was ₦57,493, accounting for more than 75% of income. Regression results showed that household size (Coeff. = 0.07427) significantly increased food expenditure ( $p < 0.01$ ), farming experience (Coeff. = -0.02311) reduced it ( $p < 0.10$ ), and household income (Coeff. = 3.09e-08) positively influenced it ( $p < 0.05$ ). The FGT analysis revealed that 62.9% of households were food insecure, with a depth of 21.9% and severity of 14.8%, showing the paradox of farming households being food producers yet facing high vulnerability to food insecurity. These findings align with previous studies in Nigeria that highlight the central role of household size, experience, and income in shaping food security outcomes. The study concludes that household size, farming experience, and income are key determinants of food expenditure and food security among farming households in the study area. It recommends family planning, integrated interventions such as productivity-enhancing technologies, off-farm income diversification, nutrition education, and targeted social protection programs to reduce food insecurity and improve household welfare.

**Keywords:** food expenditure, food security, farming households

### Introduction

Global efforts to ensure food security continue to confront significant challenges, especially in

regions with high poverty, unstable incomes, and agricultural dependence. According to the Food and Agriculture Organization (FAO) and

other international agencies, food security means that all people at all times have access to sufficient, safe, and nutritious food to meet their dietary needs and preferences for an active, healthy life (FAO *et al.*, 2020). Despite aggregate gains in food production, Sub-Saharan Africa remains particularly vulnerable: rising food prices, poor infrastructure, climate variability, and population pressures exacerbate food insecurity (Erokhin & Gao, 2020; Otekunrin, *et al.*, 2021).

In Nigeria, smallholder farming households often face the paradox of producing food while remaining food insecure. Studies in various states have shown that household food security is strongly linked to socioeconomic variables including household size, farm size, income levels, education, and farming experience (Kabir *et al.*, 2020; Onasanya & Obayelu, 2022). For example, Otekunrin *et al.*, (2021) in rural Oyo State found that income, farm size, non-farm income, and extension service access significantly shaped food insecurity measured via HFIAS. Meanwhile, Salman & Akinbosoye (2023) reported that cooperative membership, household size, and income were among the key determinants of food security in Akinyele LGA, Oyo State. On the other hand, studies such as “Determinants of Household Expenditure on Some Major Food Items in Uyo Metropolis” reveal that expenditure patterns on food are influenced primarily by household size, income, and the education of the household head (Frank *et al.*, 2019).

Engel’s law provides theoretical grounding: as household income increases, the proportion of income spent on food tends to decrease, even as absolute food expenditure rises (Engel, 1857; 1895). But in contexts of low or uncertain income, high dependency, and rising food costs, households may still allocate large shares of their income to food, leaving little for other essentials (Olayemi, 2004). This leads to

vulnerability: when food expenditure takes up too much of income, households become less resilient to shocks like price hikes or crop failures.

Ogbomoso ADP Zones, typifies many of these challenges: predominantly smallholder agriculture, variable income flows, limited access to market infrastructure, and high cost of living. Moreover, recent work in Oyo State has focused on food security generally (Otekunrin *et al.*, 2021; Onasanya & Obayelu, 2022) or on nutritional measures, but less so on explicitly modeling how socio-economic variables determine food expenditure and how that expenditure ties to formally measured food insecurity outcomes (e.g., via incidence, depth, severity).

Despite rich literature on food security in Nigeria, there is a lack of studies that simultaneously analyse food expenditure determinants and their link to quantitatively measured food insecurity (incidence, depth, severity) in specific farming communities like Ogbomoso ADP. Most prior research (Babarinde *et al.*, 2024; Fasakin *et al.*, 2024; Shaibu *et al.*, 2023) examines either expenditure patterns or food security separately, or uses proxy measures like dietary diversity or access scales without integrating expenditure models. This limits the ability of policy makers to target interventions that address not just food insecurity per se, but the underlying economic behaviour (food spending) that drives vulnerability. Based on these gaps, this study investigates the determinants of food expenditure and the food security status of farming households in Ogbomoso ADP Zone, Oyo State, Nigeria, using regression modeling and FGT-index measures. To address these challenges, this study focuses on three objectives:

1. Describe the socioeconomic characteristics of farming households in the study area.

2. Analyse the determinants of food expenditure among farming households.
3. Assess the food security status of farming households.

## Methodology

### Study Area

The study was carried out in Ogbomoso Agricultural Zone of Oyo State. Ogbomoso Agricultural Zone is made up of five Local Government Areas (L.G.A), namely Ogbomoso North L.G.A., Ogbomoso South L.G.A, Ogo-Oluwa L.G.A, Oriire L.G.A and Surulere L.G.A. respectively. The geographical location of Ogbomoso is on latitude 8.1° N and longitude 3.29 E (Map of Ogbomoso 1998). The land area is about 3547.89 square metres which is bounded in the North by Irepodun L.G.A, in the West by Oyo L.G.A, in the South by Ejigbo L.G.A of Osun State and in the East by Asa L.G.A of Kwara State. The climatic and soil conditions of the study area favour the extensive production of food crops like cassava, yam, maize, vegetables, banana, plantain, tomatoes, mango and cash crops like cocoa, oil palm, cashew etc.

### Sampling Technique and Sample Size

Multistage sampling method was adopted for this study. The firstly stage involved a purposive selection of three blocks from Ogbomoso Agricultural zone, that is, Ogo-Oluwa, Oriire and Surulere L.G.A's respectively due to their prominence in agricultural practices. The second stage involved the random selection of one (1) percent of villages from the list of registered villages in the selected three (3) agricultural blocks. Hence, this resulted in the selection of five (5) Villages from Oriire block, three (3) villages from Surulere block and two (2) villages from Ogo-Oluwa block respectively which amounted to a total of ten (10) villages

used for this research work. The third stage involved the random selection of twenty percent (20%) of the registered farming households from each block were considered for this study. Therefore, a total of one-hundred and fifty (150) farming households were sampled for this study, ensuring adequate representation of the farming population in the study area.

### Source of Data

Primary data were collected through a thorough, pretested and well-structured questionnaire which was administered to household heads. The questionnaire captured information on socioeconomic characteristics, farm production details, household income and expenditure, and food consumption patterns. Data collection was complemented with interviews and field observations.

### Measurement of Variables

Food expenditure was defined as the total value of food consumed (purchased and home-produced) over a 30-day recall period. Household income comprised all farm and non-farm earnings within a month, measured in Nigerian Naira. Food security status was measured using the Foster–Greer–Thorbecke (FGT) index, with the food security line set at two-thirds of mean per capita food expenditure; households below the line were classified as food insecure, and those above as food secure. Socioeconomic characteristics were measured as follows: age (years), sex (male = 1; female = 0), marital status (married = 1; otherwise = 0), education (years of schooling), household size (number of members), farm size (hectares), and farming experience (years).

### Method of Data Analysis

Both descriptive and inferential statistical tools were employed. Descriptive Statistics

(frequencies, percentages, means) were used to summarize household socioeconomic characteristics. Multiple Regression Analysis was applied to identify the determinants of household food expenditure. The Foster–Greer–Thorbecke (FGT) Index was used to measure food security status, focusing on the incidence, depth, and severity of food insecurity. The FGT index is specified as:

$$P_{\alpha} = \frac{1}{N} \sum_{i=1}^q \left(\frac{z-y_i}{z}\right)^{\alpha}$$
$$\alpha = 0, 1, 2$$

where:

$P_{\alpha}$  = food insecurity measure,

$N$  = total number of households,

$q$  = number of food-insecure households,

$z$  = food security line,

$y_i$  = food expenditure (or per capita food expenditure) of the  $i^{\text{th}}$  household,

$\alpha = 0, 1, 2$  represent incidence, depth, and severity of food insecurity respectively.

To examine the determinants of food expenditure, a multiple regression model was used, expressed as:

$$FE_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_n + \mu_i$$

where:

$FE_i$  = monthly food expenditure of the  $i^{\text{th}}$  household,

$X_1 \dots X_n$  = vector of socioeconomic variables (age, gender, education, household size, income, farm size, farming experience),

$\beta_0$  = constant term,

$\beta_n$  = regression coefficients,

$\mu_i$  = error term.

The regression results provide insights into the factors that significantly influence household food expenditure, while the FGT index reveals the extent of food insecurity in the study area.

## Results and Discussion

### Socioeconomic Characteristics of Farming Households

Table 1a and 1b summarizes the socioeconomic profile of farming households

in Ogbomoso ADP. The results show that 78% of respondents were male, while only 22% were female, reflecting the male dominance in household headship and farming decisions. This aligns with Ogunniyi *et al.*, (2020), who observed that men in rural Nigeria often have greater access to land and production resources. Nonetheless, the 22% female representation highlights the growing role of women in agricultural livelihoods and household food provisioning. The average age of respondents was 49 years, with a majority (51%) aged between 51–60 years. This indicates that farming households are largely headed by middle-aged to older individuals, suggesting both experience and potential challenges related to aging in the agricultural workforce. Compared to findings from Wudil *et al.*, (2023), where the mean farmer age was 40 years, Ogbomoso ADP zone appears to have relatively older household heads, raising concerns about youth participation in agriculture.

Marital status analysis shows that 76% were married, which is typical of rural farming communities where marriage provides labor support and household stability. Household size averaged five members, with 54.7% of households having 4–6 members. Larger household sizes are double-edged: they provide family labor but also increase food expenditure needs. This supports the observation of Amao *et al.*, (2023), who reported that household size is strongly correlated with higher food expenditure and vulnerability to food insecurity in Nigerian households.

Educational status revealed that 36.7% of the respondents attained tertiary education, while 40% had secondary education, and only 10% reported no formal education. This relatively high literacy level is encouraging, as education is a critical determinant of agricultural decision-making, market participation, and

nutrition awareness. However, the persistence of households with little or no education highlights the need for inclusive rural extension and capacity-building programmes. Farm characteristics showed an average farm size of 1.03 hectares, with 63.3% cultivating  $\leq 1$  hectare. This points to the dominance of smallholder farming, consistent with the national profile of Nigerian agriculture. Farming experience averaged 13 years, with 41.3% having 11–15 years of experience. This indicates that households in the study area are relatively experienced, though experience did

not always translate into commercial-scale farming due to limited land access.

In terms of income and food expenditure, respondents reported an average monthly income of ₦67,890, while average food expenditure was ₦57,493, accounting for more than 75% of household income. The distribution further reveals that 55% of households earn below ₦50,000 monthly, while 37% spend between ₦51,000–₦75,000 on food, demonstrating a heavy expenditure burden relative to earnings.

Table 1: Distribution of respondents by socioeconomic characteristics

Characteristics	Frequency (n =150)	Percentage	Mean
<b>Sex</b>			
Male	117	78.00	
Female	33	22.00	
<b>Age (Years)</b>			49
$\leq 30$	20	13.33	
31 – 40	21	14.00	
41 – 50	10	6.67	
51 – 60	77	51.33	
Above 60	22	14.67	
<b>Marital Status</b>			
Single	17	11.33	
Married	114	76.00	
Widowed	15	10.00	
Divorced	4	2.67	
<b>Household Size</b>			5
$\leq 3$	23	15.33	
4 – 6	82	54.67	
Above 6	45	30.00	
<b>Educational Status</b>			
No Formal Education	15	10.00	
Primary Education	20	13.33	
Secondary Education	60	40.00	
Tertiary Education	55	36.67	
<b>Farm Size (hectare)</b>			1.03
$\leq 1$	95	63.33	
1.1 – 2	32	21.33	
Above 2	23	15.33	

Table 1b. Distribution of respondents by socioeconomic characteristics

Farming Experience (Years)			13.20
≤ 5	10	6.67	
6 – 10	34	22.67	
11 – 15	62	41.33	
16 – 20	25	16.67	
Above 20	19	12.66	
Monthly Income (₦)			67,890
≤ 50,000	83	55.33	
51,000 – 100,000	24	16.00	
101,000 – 150,000	25	16.67	
Above 150,000	18	12.00	
Food Expenditure (₦)			57,493.33
≤ 25,000	10	6.67	
26,000 – 50,000	42	28.00	
51,000 – 75,000	56	37.33	
76,000 – 100,000	27	18.00	
Above 100,000	15	10.00	

Source: Field Survey, 2025

Table 2: Determinants of household food expenditure in the study area

Variable	Coefficients	Std. Err	t-value	P > {t}
Age	-0.00039	0.0045	-0.12	0.902
Sex	-0.00547	0.325	-0.50	0.966
Marital Status	0.32495	0.2198	0.77	0.367
School years	0.01342	0.2143	0.29	0.744
Household size	0.07427***	0.0154	4.24	0.000
Farm experience	-0.02311*	0.0067	-1.78	0.079
Household income	3.09e-08**	7.35e-07	2.01	0.041
Constant	7.73263	0.3317	12.39	0.000
R <sup>2</sup> = 0.5161				

\*p < 0.10 = \*, p < 0.05 = \*\*, p < 0.01 = \*\*\*

Source: Field Survey, 2025

### Food Security Status of Farming Households

Table 3 shows the food security status of farming households using the Foster–Greer–Thorbecke (FGT) index. The result showed that 62.9% of farming households were food insecure, indicating that more than half of the sampled households in Ogbomoso ADP zone could not meet the minimum food security

threshold. The depth of food insecurity (21.9%) reflects the average shortfall in food expenditure relative to the food security line, meaning that food-insecure households would require about 21.9% of the food security line to escape food insecurity. The severity index (14.8%) indicates the inequality among food-insecure households, with a heavier burden

borne by the poorest and most vulnerable families.

The high incidence of food insecurity among farming households in Ogbomoso South indicates the paradox of food producers facing food deprivation. These results are consistent with earlier studies in Nigeria, such as Osabohien *et al.*, (2020), who reported that more than half of Nigerian households were

food insecure, and Otekunrin *et al.*, (2019), who highlighted worsening vulnerability due to rising population growth and income shocks. The depth and severity indices (21.9% and 14.8%, respectively) further suggest that food insecurity is not only widespread but also disproportionately severe among the poorest households, confirming the inequality of access to sufficient food.

Table 3. Food security status of farming households (FGT Index)

Food Security Measure	Value
Incidence of food insecurity (Headcount ratio, $P_0$ )	0.629 (62.9%)
Depth of food insecurity (Poverty gap, $P_1$ )	0.219 (21.9%)
Severity of food insecurity (Poverty severity, $P_2$ )	0.148 (14.8%)

Source: Field Survey, (2025)

### Conclusion

This study analyzed the determinants of food expenditure and assessed the food security status of farming households in Ogbomoso ADP, Oyo State. The results revealed that household size, farming experience, and income were the main determinants of food expenditure, with larger households spending significantly more on food, while more experienced farmers managed to reduce expenditure. Despite high food spending, 62.9% of households were food insecure, with considerable depth (21.9%) and severity (14.8%), showing the paradox of rural food producers facing deprivation.

This study examined the determinants of food expenditure and food security status of farming households in Ogbomoso South LGA, Oyo State. Results showed that household size, farming experience, and income significantly influenced food expenditure, with larger households spending more, while experienced farmers reduced reliance on purchased food. Despite high food spending, 62.9% of households were food insecure, with depth (21.9%) and severity (14.8%) indices highlighting the disproportionate burden on

the poorest. These findings underscore the paradox of rural food producers facing food deprivation and call for both household-level behavioral changes and broader policy interventions.

### Recommendations

Based on the findings of the study, the following recommendations are proposed:

#### Practical implications (household/farm-level):

1. **Family planning and resource management:** Awareness programs should promote family planning and efficient household resource use to reduce food insecurity pressures from large household sizes.

2. **Income diversification:** Farmers should be encouraged and supported to engage in non-farm and off-farm enterprises, thereby reducing vulnerability to farming risks and stabilizing food access.

#### Policy implications:

1. **Smallholder support:** Government and NGOs should provide affordable inputs, credit, and technical assistance to raise productivity and ensure stable food supplies.

## 2. Price stabilization mechanisms:

Policies aimed at stabilizing food prices and improving market efficiency will reduce the burden of seasonal fluctuations on vulnerable households.

## 3. Rural infrastructure investment:

Expanding rural roads, storage, and processing facilities will minimize post-harvest losses and improve both availability and affordability of food.

## References

- Amao, I. O., Ogunniyi, A. I., Mavrotas, G., & Omotayo, A. O. (2023). Factors affecting food security among households in Nigeria: the role of crop diversity. *Sustainability*, 15(11), 8534.
- Babarinde, T. O., Adepoju, A. A., Durojaye, G. B., Aremu, W. T., Ladoja, I. O., & Eleshin, M. A. (2024). Determinants of Food Insecurity and Household Coping Strategies among Cassava Farmers in Oyo State, Nigeria. *African Journal of Agricultural Science and Food Research*, 17(1), 29-41.
- Erokhin, V., & Gao, T. (2020). Impacts of COVID-19 on trade and economic aspects of food security: Evidence from 45 developing countries. *International journal of environmental research and public health*, 17(16), 5775.
- Engel, E. (1895). Die Productions- und Consumtionsverhältnisse des Königreichs Sachsen [The production and consumption relationships of the Kingdom of Saxony]. Reprinted in *International Statistical Institute Bulletin*, 9, 1–54.
- Fasakin, I. J., Fonsah, G., & Oni, O. A. (2024). Socio-Economic Drivers of Food Security Among Rural Households: Evidence from Smallholder Rice Farmers in Ebonyi State, Nigeria. *Qeios*, 1–19.
- FAO, IFAD, UNICEF, WFP, and WHO (2020). *The state of food security and nutrition in the world 2020*
- Frank, N. N., Bassey, N. E., & Nkeme, K. K. (2017). Determinants of Household Expenditure on Some Major Food Items in Uyo Metropolis, Akwa Ibom State, Nigeria. *Asian Journal of Agriculture and Food Sciences*, 5(6), 234 – 240
- Kabir, G. B., Azeez, F. A., Arowolo, O. V., & Nosiru, M. O. (2020). Determinants of food security among forest-based households in Oyo state, Nigeria. *Journal of Applied Sciences and Environmental Management*, 24(7), 1293-1298.
- Olayemi, J. K. (2004). Principles of microeconomics for applied economic analysis. *Mokola, Ibadan, Oyo State: SICO Publishers*, 67-92.
- Onasanya, O. A., & Obayelu, O. A. (2016). Determinants of Food Security Status of Maize-Based Farming Households in Southern Guinea Savannah Area of Oyo State, Nigeria. *Turkish Journal of Agriculture-Food Science and Technology*, 4(5), 411-417.
- Otekunrin, O. A., Otekunrin, O. A., Sawicka, B., & Pszczółkowski, P. (2021). Assessing food insecurity and its drivers among smallholder farming households in rural Oyo State, Nigeria: the HFIAS approach. *Agriculture*, 11(12), 1189.
- Salman, K. K., & Akinbosoye, O. O. (2013). Food Security Status Among Cooperative and Non Cooperative Farming Households in Rural Akinyele Local Government Area of Oyo State, Nigeria. *The Nigerian Journal of Rural Extension and Development*, 7(1), 35-45.

Salam, G., Alase, G., Lamidi, S., & Joseph, T. (2022). Determinants of Household Food Expenditure: Does Engel Law Hold in Nigeria?. *African Economic and Management Review*, 2(3), 11-17.

Shaibu, U. M., Shaibu, M. T., Adejoh, E., Ada, O. C., Odekina, O. F., & Balogun, S. T. (2023). Occupational dimension of food security: A rural household level assessment in Kogi State, Nigeria.

*World Journal of Advanced Research and Reviews*, 20(02), 891–899

Wudil, A. H., Ali, A., Aderinoye-Abdulwahab, S., Raza, H. A., Mehmood, H. Z., & Sannoh, A. B. (2023). Determinants of food security in Nigeria: Empirical evidence from beneficiaries and non-beneficiaries rice farmers of the Kano River Irrigation Project. *Frontiers in Sustainable Food Systems*, 7, 999932.

