Analysis of poultry egg production, distribution and consumption in parts of Nasarawa State, Nigeria.

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ABSTRACT

Poultry egg has assumed industrial, commercial and nutritional importance in Nigeria. Despite the importance, poultry farmers still face several problems. This study was conducted in Nasarawa South geo-political zone of Nasarawa State to examine the status of poultry egg production, distribution and consumption. The egg production and distribution in the study area were profitable statistically at 1 per cent level of probability. Egg consumption per household was estimated at 1.83 crates per month. This implies that in a household of more than one person, individual consumed less than one egg per day; which is inadequate.

INTRODUCTION

One of the challenges of Nigerian agriculture is, its ability to feed the ever-increasing population with adequate calorie and protein (Williams and Williams, 1991). The federal government of Nigeria had tried in the past to offset the huge deficit in animal protein consumption by embarking on massive importation of chilled beef and chickens (Adichie et al., 1985). For many reasons, this policy was counter-productive, hence, the recent ban on importation of frozen poultry products.

Livestock farming is part of a dynamic development process. Cattle and sheep herds have been reported to grow at a rate slower than the human population growth (FAO, 1997). Chickens and pigs, raised in intensive farming are becoming more important in developing countries with high annual growth rates (Kurt, 1999). It is now very well known that very rapid increase in poultry products can be achieved in a short time compared to beef production.

Poultry products (meat and eggs) have assumed the role of providing much needed animal protein to mankind (Aihonsu and Sunmola, 1999). Poultry eggs contribute to the palatability of many dishes by adding about the same amount of animal protein as pork and poultry meat (Alabi and Isah, 2002). Poultry production contributes also to the national gross domestic product (GDP), in the provision of gainful employment and income to a sizeable proportion of the population. The high demand for poultry products, the success of exotic breeds and the ease of mastering the techniques of poultry production, among other factors, make poultry business a very attractive venture (Sani et al., 2000). Poultry egg has also attained industrial importance as a major ingredient in the baking of confect- ioneries and the use of the egg albumen in the making of shampoo and in book binding (Mayhew and Penny, 1988).

In spite of the significance of the poultry industry to the national economy, poultry farms have been facing various problems. Poultry production in general is facing low capital base, inefficient management, disease and parasite, housing and marketing problems, e.t.c. (Alabi et al., 2000). For poultry birds to express their full genetic potential, certain basic requirements must be provided. These include environment, good management, balanced rations, and adequate housing (Akinwumi et al., 1979). High cost of feeds, poor quality of Day Old Chicks (DOC), inadequate extension and training facilities have been the bane to poultry production in Nigeria (Ogunfowora, 1980; Bamgbose et al., 1998).

Considering poultry egg as a very important poultry product, this study seeks to examine the status of poultry egg production, distribution and consumption in Nasarawa South geo-political zone of Nasarawa State, Nigeria.

METHODOLOGY

A survey was conducted in April and May, 2004 in Nasarawa South geo-political zone of Nasarawa State. The Zone comprises five Local Government Areas (Awe, Doma, Keana, Lafia and Obi). A pre-survey was initially carried out to identify poultry farmers and

egg traders in the zone, with the assistance of three staff of Nasarawa State Agricultural Development Programme (NADP). The number of poultry farmers and egg traders identified varied among the LGAs in the zone. Of all the poultry farmers and egg traders identified, a sample of fifty (50) poultry farmers, thirty-eight (38) egg traders and seventy five (75) households that consume eggs were used for the study. The distribution pattern of the questionnaire is as presented in Table 1.

The study used mainly primary data which were collected using three sets of interview schedule administered to the sampled poultry farmers, egg traders and household heads by two research scientists and three research assistants. The information gathered include detailed modules on input and output in poultry egg production, egg marketing system and facilities and households characteristics.

Table 1. Sample size by Local Government.Area

L.G.A.	Poultry farmers	Egg marketers	Households consuming eggs
Awe	8	6	15
Doma	11	8	15
Keana	9	7	15
Lafia	15	11	15
Obi	7	6	15
Total	50	38	75

The analysis of the data was done using descriptive and inferential statistics. The descriptive statistics used include mean and percentage; while inferential statistics used is the student t. Multiple regression model (Mirer, 1990) was also used to identify factors determining egg production, distribution and consumption in the study area.

The a priori model below was formulated for the regression analysis:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, ц).$$

where;

Y represents the quantity of eggs produced per 100 birds distributed and consumed (crates/month),

X_1 is the quantity of Feeds (Bags/month/100 birds),

X_2 is the cost of drugs (₦/month/100 birds),

X_3 is amount of labour (man-hours/month/100 birds),

X_4 is the cost of water (₦/month/100 birds),

X_5 is the experience (Years/individual),

X_6 is the cost of transportation (₦/month/trader),

X_7 is the cost of storage (₦/month/trader),

X_8 is the level of education attained (Years per individual producing, distributing and consuming eggs),

X_9 is the household size (Number of persons in a family),

X_{10} is the estimated Income level (₦/month) and

Ц is an error term

Note that X_1, X_2, X_3, X_4 are only applicable to production activity; while X_8, X_9 and X_{10} are applicable to all the three activities (production, distribution and consumption). Linear and double – log regression equations were fitted into the data; but double-log gave the best fit.

In the case of production, the poultry farmers possessed varying flock size which if used as one of the exogenous variables could cause problem of multi-collinearity with feed, labour and other variables. This could make the regression coefficient invalid and unreliable. In order to avoid this problem, flock size was fixed at 100 birds for every farmer. If one bird was used, the magnitude of variable like drugs would be insignificant.

The values of variables that changes in a short-run were converted to per month basis for uniform standard unit among the respondents. Each respondent specified his/her income level per annum, but this was converted to per monthly basis.

RESULT AND DISCUSSION

Egg production, distribution and consumption

The highest production, distribution and consumption of poultry eggs was observed in Lafia Local Government Area with average of 451 crates per farmer, 680 crates per trader and 2.5 crates per household per month respectively. The lowest production level was recorded in Keana (82.5 crates/farmer/month). The lowest distribution level was obtained in Obi (131.7 crates/trader/month). The lowest consumption level was observed in Awe (1.12 crates /household/month). The overall average eggs produced per farmer, distributed per trader and consumed per household were 207.8, 287.0 and 1.83 crates/month respectively (Table 2).

Table 2. Average quantity of eggs produced, distributed and consumed by Local Government Area.

L.G.A.	Quantity of eggs (crates/month)		
	Produced per farmer	Distributed per trader	Consumed per Household
Awe	177.50	182.67	1.12
Doma	196.50	266.67	2.05
Keana	82.50	174.00	2.00
Lafia	451.00	680.00	2.50
Obi	131.50	131.67	1.50
Average	207.80	287.00	1.83

Source: Field Survey data, 2004.

Variability in the level of egg production, distribution and consumption

The maximum quantity of eggs produced per farmer per month in the study area was 594 crates while the minimum was 29 crates. The production level varied greatly among the households with

coefficient of variation of 76 per cent. The study also revealed that a trader handled a maximum of 1200 crates of eggs per month while one with minimum quantity handled 8 crates of eggs per month.

The coefficient of variation for the egg distribution in the study area was 78 per cent. The level of egg consumption among the households in the study area was stable with coefficient of variation of 31 per cent (Table 3).

Table 3. Variability in the egg production, distribution and consumption in Nasarawa South Senatorial zone of Nasarawa State.

Estimate	Quantity of eggs (crates/month)		
	Produced per farmer	Distributed per trader	Consumed per Household
Maximu	594.00	1200.00	4.00
m	29.00	8.00	0.50
Minimum	207.80	287.00	1.83
Average			
St.andard deviation	157.00	225.08	0.57
Coef. of variation	0.76	0.78	0.31

Source: Field survey data, 2004.

Household income categories.

The distribution of households based on income category as presented in Table 4, revealed that 28 per cent of household producing poultry eggs had average monthly income of about ₦25,000.00. About 37 per cent of the households marketing poultry eggs had average monthly income below N10,000.00. Poultry egg was affordable to the households; this made it possible for even the households with less than ₦ 10,000.00 monthly income to consume poultry eggs. However, the quantity consumed per household was inadequate (1.87 crates/ household/month).

Status of households in egg production and distribution

Table 5 shows the distribution of households based on quantity of poultry eggs produced and marketed. Fifty per cent of the sampled households produced less than 200 crates of eggs per household per month. About 50 per cent also were engaged in marketing below 200 crates of eggs per household per month. Only 7.9 per cent of the households in egg marketing handled above 600 crates of the poultry eggs for sale per month.

Costs and returns in egg production and distribution

The average estimated revenue and cost for the production of 100 crates of eggs were ₦38,078.71 and ₦29,891.10 respectively. The revenue and cost for marketing same quantity of the poultry eggs were ₦42,533.33 and ₦35,477.86 respectively. The profit of ₦8187.61 and ₦7055.47 in poultry egg production and marketing respectively, were confirmed to be statistically significant at 1 percent level of probability (Table 6). As the flock size varied among farmers, it is not

Table 4. Egg production, distribution and consumption units based on income category.

Level of Income (₦/month)	Proportion (%)		
	Production Units	Distribution Units	Consumption Units
Below 10,000	12.00	36.84	42.67
10,000– 19,999	16.00	21.05	14.67
20,000 – 29,999	28.00	13.16	22.67
30,000 – 39,999	24.00	15.79	10.67
40,000 – 49,999	10.00	7.89	5.33
50,000 – 59,999	-	5.26	2.67
60,000– above	10.00	-	1.33

Source: Field survey data, 2004.

Table 5. Distribution of farmers and traders by quantity of eggs produced and distributed respectively.

Quantity of Eggs (crates/month)	Percentage	
	Poultry Farmers	Egg Traders
Below 200	50.00	52.63
200-399	40.00	26.32
400-599	10.00	13.18
600 and above	-	7.90

Source: Field survey data, 2004.

possible to compare the performance of poultry farms at that variability status. Revenue and cost had to be converted to per 100 birds for every farm and average used as a general figure.

Table 6. Profitability of egg production and marketing per 100 crates of eggs.

Estimate	Production of 100 crates		Marketing of 100 crates	
	Revenue (₦)	Cost (₦)	Revenue (₦)	Cost (₦)
Average	38078.71	29891.10	42533.33	35477.86
Std. deviation	3067.00	3757.78	2642.15	1912.62
Profit	8187.61		7055.47	
t- value	11.94*		13.33*	

Source: Computed from field survey data, 2004
*Significant at 1 per cent level of probability
Note: The cost comprises costs of variable inputs and depreciations of fixed inputs.

Factors determining egg production, distribution and consumption

Table 7 presents the regression results showing the determinants of egg production, distribution and consumption. It was observed that the variables included in the regression model as applicable to each of the three activities on poultry eggs, explained 73, 61 and 54 per cent of variation in egg production, distribution and consumption respectively. The regression coefficients under the egg production were all positive. Feeds, labour, experience and income level were the significant factors determining egg production in the study area.

Transportation cost was negatively and significantly related to egg distribution. Household size and income level were positively and significantly related to egg consumption.

CONCLUSION

Egg as a poultry product has assumed both commercial and nutritional roles in Nasarawa South geo-political zone of Nasarawa State, Nigeria. In the zone, the per household egg consumption was estimated at 1.83 crates per month. The production and distribution of the poultry eggs were observed to be profitable statistically. Income level was a common determinant of egg production and consumption in the area. Egg distribution was negatively affected by cost of transportation. It was recommended that, for every household to consume adequate quantity of poultry eggs at affordable price, productivity in poultry egg production has to be improved through the use of quality feeds and chicks and efficient management practices. Poultry farmers and households consuming poultry eggs need to be enlightened on how to diversify their economic activities to boost their level of income for improving the production and consumption of poultry eggs. The egg traders should identify short distance markets for the distribution of their product, in order to cut down the transportation cost.

Table 7. Determinants of egg production, distribution and consumption.

Factors	Estimated Regression Coefficients		
	Production	Distribution	Consumption
Constant	0.385 (1.231)	0.534 (1.007)	0.691 (1.283)
Feeds	0.447* (3.024)	n.a	n.a
Drugs	0.026 (1.218)	n.a	n.a
Labour	0.163* (2.844)	n.a	n.a
Water	0.015 (1.222)	n.a	n.a
Experience	0.218* (2.985)	0.413* (3.003)	n.a
Transportation cost	n.a	-0.217* (2.768)	n.a
Storage cost	n.a	-0.113 (1.009)	n.a
Educational status	0.013 (1.003)	0.042 (1.134)	0.217 (1.062)
Household size	0.221 (1.420)	0.198 (1.094)	0.514* (3.099)
Income level	0.713* (3.164)	0.013 (1.118)	0.446* (3.172)
R^2	0.73	0.61	0.54

Source: Computed from field survey data, 2004.
*Significant at 1 per cent level of probability.
Figures in parentheses are t-values.
n.a = Not applicable.

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