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Comparative analysis of the economics of conventional and non-conventional feed use by poultry enterprises in Owerri, Nigeria

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Abstract
Economic crisis impacts negatively on the profitability of poultry enterprises in Nigeria. As a result, poultry farms resort to using non-conventional bye-products. Eighty (80) poultry farms in Owerri in Southeast Nigeria were surveyed. Results show that the use of non-conventional feeds increased profitability while reducing production cost. This is recommended for wider dissemination by extension services, as well as further research on their nutritive and health consequences.

1 Introduction

The livestock sub-sector, contributed about 5.9% of the GDP in Nigeria (CBN, 1995). Poultry in particular occupies an important position in the supply of animal protein to Nigeria's teeming and growing population. The problem of inadequate protein intake in Nigeria and most developing countries is well known. Poultry has the advantage of quick growth and can therefore be a quick means for addressing deficit protein supply.

However, the poultry industry is hamstrung by a number of problems traced to the economic crisis and decline in Nigeria, particularly since the mid - 1980's. This situation manifested in fiscal crises, foreign exchange shortage, balance of payment and external debt crisis, high level of unemployment, negative growth and low consumption. This led to most establishments either producing below installed capacity or grounded (OKONKWO, 1990). Economic depression has had adverse effects on the livestock sub-sector including scarcity and high cost of feeds, labour, drugs and vaccines, and weak consumer purchasing power.

The poultry industry in Nigeria is therefore at a critical cross road. The enthusiasm with which farmers at both commercial and subsistence levels embraced poultry business is now dampened by poor returns (ILOEJE, 1997). In the last decade poultry businesses have been liquidated. There has been substantial reduction in production and some producers left the business as they are unable to sustain losses incurred due to huge increases in input costs, particularly feed (ALAWA and BALOGUN, 1989).

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Many poultry enterprises now seek alterative non-conventional feed sources as a form of adjustment strategy. This paper compares the economics of conventional and unconventional feed use in poultry enterprises with the intention to recommend them to extension for dissemination to other poultry farmers.

2 Methodology

The study was conducted in Owerri agricultural zone in Imo State in Southeast Nigeria. Nigeria is made up of 36 states, and Imo is one of them. Four local government areas within the Owerri agricultural zone were selected. These are: Owerri municipal, Owerri-West, Owerri-North and Ahiazu-Mbaise. These were purposely selected after a reconnaissance survey which indicated a concentration of poultry enterprises in those areas. Imo state is central within the humid Southeast Nigeria and has a population of 2,485,499 and a population density of 499/km^2 in 1991 (FEDERAL OFFICE OF STATISTICS, 1993).

A list of registered poultry farms in the selected area was obtained from the livestock unit of the Imo State Ministry of Agriculture, Owerri. About 120 farmers were registered and 80 farmers whose farm size were four hundred (400) birds and above were purposely selected. All were interviewed and data collected by questionnaire and interview as well as by obtaining their farm records.

3 Results

3.1 Types of Poultry Enterprises

About12.5% of the poultry farms engage in breeding and hatchery operations, 28.75% in commercial egg production, 43.75% in broiler production, while 15% in marketing of poultry products (Table 1). None of the farms engaged in feed milling and processing of poultry products. The major enterprise therefore is broiler production. The main reason proffered by farmers for preference for broiler production is the shorter production cycle, which means farmers begin to obtain some earnings in a shorter time than for egg production. Insufficient investment fund is often a problem for these farms.

Table 1: Distribution of Poultry Enterprises in Owerri, 1999 (%) n = 80

Type of Enterprise	Number of Farmers	% of Farmers
Breeding and Hatchery	10	12.0
Commercial Egg Production	23	28.75
Broiler Production	35	43.75
Marketing of Poultry Products	12	15.0
Total	80	100

3.2 Problems of Poultry Production

The problems identified relate to feed and day-old chicks procurement. About 75% of the farmers stated that high cost is their major problem in feed procurement, while 25%

identified high transport cost (Table 2). None of the farmers indicated insufficiency of feed.

Table 2: Problems of Feed Procurement by Poultry Farmers in Owerri, 1998 (%) n = 80

Option	Number of Farmers	% of farmers
High cost of feed	60	75
High transport cost	20	25
Total	80	100

As a result of the high cost of feed, some poultry farmers have resorted to the use of non- conventional feeds. About 18.75% of the farmers accepted using non-conventional feeds in their farms, while 81.75% of them used conventional feeds. Non-conventional feeds are formulated using locally sourced raw materials or wastes from cereal crops. The by-products, which are used as substitutes to the conventional components of feeds, are considered cheaper and readily available. However, most of the farmers using conventional feeds stated that non-conventional feeds are unscientific and could be a source of infection to the birds. This could be an area for further research by animal scientists especially on the nutritive value of these substitute calorie sources and the possibility or otherwise of there being a source of infection.

Three main problems were identified with respect to the procurement of day-old chicks. These are transportation (16.25 %), high cost of chicks (67.5%), and irregular supply of chicks from breeders (16.25%) (Table 3). These limit the number of chicks a farmer can stock.

Table 3: Problems of Day-Old Chick Procurement in Owerri, 1998 (%) n = 80

Option	Number of Farmers	% of Farmers
Transportation Problems	13	16.25
Irregular supply of chicks	13	16.25
High cost of chicks	54	67.5
Total	80	100.00

3.3 Cost and Returns in Broiler Production

Feeding, housing, equipment, day-old chicks, drugs and vaccines are the major cost items in poultry production. Of these, feed (67.3%) was the most pronounced cost item. Day-old chicks accounted for 15%, labour (5.4%), drugs and vaccines (4.0%), and other miscellaneous items (5.6%) (Table 4). In effect variable cost items sum to 97.3% of total cost. Fixed cost items such as housing and equipment contributed only 2.7% of total cost.

The high cost of feeds and feeding is traced to the scarcity and high cost of maize, the major raw material for feed stuff formulation. High cost of feed is therefore the most important factor affecting profit margin. Other cost factors like equipment, building materials, drugs and vaccines though of lower consequence than feed are rising due to the economy-wide high rate inflation. The result of all these is low output levels, consumer resistance and lower profit.

Total variable cost was N324,000 with total revenue of N380,000. This meant a gross margin of N56,000. Total cost was N332,900 (average cost of N332.9 per unit) and total revenue of N380,000 meant a profit of N47,100 was recorded for the production of 1000 broilers (Table 4). Note that a mortality rate of 5% was allowed. Returns per Naira invested is 6 Kobo, (that is 6%). This implies that though poultry is a profitable investment, profit was poor. Better results would be obtained if production costs were lower.

Table 4: Expenditure and Income for Broiler Production of 1000 Birds in Owerri, 1998

Items	Quantity	Price/Unit	Amount	
Revenue				
Sales of birds	950	400	380,000	
Variable Cost of Production				Contribution to Total Cost
a) Stocks				
(Day-old chicks)	1000	50	50,000	15.0%
b) Feeds	350	640	224,000	67.3%
c) Drugs & Vaccines			13,500	4.0%
d) Labour			18,000	5.4%
e) Miscellaneous			18,500	5.6%
Total Variable Cost			324,000	97.3%
Gross Margin			56,000	
Fixed Cost (FC)				
(Depreciated Assets)			8,900	2.7%
Total Cost (TC) = (FC+TVC)			332,900	100.0%
Average cost				
of production per unit			332.9	
Profit			47,100	
Return per *Naira* invested			0.141	

This result further shows that close to 70% of the cost in broiler production went into feeding the birds. This means that the success of broiler business rest largely on the availability, cost and quality of feeds. High cost of feed is attributed to high cost of the major raw material (maize), used in feed formulation. This problem could be ameliorated if government liberalizes the maize market. This would encourage domestic production of poultry products by reducing production cost and increasing profit margin. Presently the importation of maize is banned while its export is

permitted. This has led to rising cost of maize in the domestic market. Maize is the major energy source in poultry feeds in Nigeria.

3.4 Cost and Returns in Egg Production

Total variable cost was N682,700 while total revenue was N720,000. This meant a gross margin of N37,300 (Table 5). Total expenditure was N692,300 and with total income of N720,000, profit was N27,000. Average cost was N144 per crate of 30 units of eggs. Feeding accounted for 69.3% of total cost, drugs and vaccines (2.2%), cost of day-old pullets (7.2%), labour cost (5.7%), while other costs and contingencies accounted for 8.2% of total cost. This also shows that close to 70% of total cost went to feeding, as was with broiler production. The attraction of producers to egg production seems to be that as the pullets reach the point-of-lay, the process becomes fairly simple (OJEWOLE and LONGE, 1998; OLAYIDE and AKINWUMI 1977). Some cash earnings are made which lift the burden on farmers. However, in regions where farm capital and funds for investment is scarce, the funding requirement over a longer period may be a critical hindrance to egg production. This cash stress is an advantage in broiler production when compared to egg production. Further, with return per Naira invested as 0.04 or 4%, broiler production is more profitable than egg production at the common farm size in the study area.

Table 5: Expenditure and Income for Commercial Egg Production in Owerri, 1998 (1000 Pullets)

Items	Quantity	Price/Unit	Amount	
Revenue				
Sales of eggs	4800 crates	150/crate	720,000	
Variable Cost of Production				Contribution to Total Cost
a) Stocks (Day-old-pullets)	1000	50	50,000	7.2%
b) Feeds	750 bags	640	480,000	69.3%
c) Drug & Vaccines			56,800	8.2%
d) Labour			39,400	5.7%
e) Miscellaneous			56,500	8.2%
Total Variable Cost (TVC)			682,700	98.6%
Gross Margin			37,300	
Fixed Cost (FC)				
(Depreciated Assets)			9,600	1.4%
Total Cost (TC)			692,300	100.0%
Average cost of production per crate			144	
Net profit			27,700	
Return to *Naira* Invested			0.040	

3.5 Use of Non-Conventional Feed

To overcome the high cost of production with low profit margin in the poultry industry, farmers resorted to the use of non-conventional feeds formulated by substituting or supplementing industrial organic by-products for maize as the prime calorie source in poultry feed. Because these materials are not consumed as human food, they are expected to reduce competition between man and the poultry industry over the use of maize (ADEGBOLA, 1988; UDEDIBIE and EMENALOM, 1993). 18.75% of the farmers use non-conventional feeds although only 12.5% of the fanners produce these non-conventional feeds. This means that more farmers than produce non-conventional feeds use them. In effect they obtain them from the formulators. This means an emerging market for non-conventional feeds.

A typical non-conventional feed formulated by poultry farmers for their own use is shown in Table 6. The materials are sourced from households, farms, markets and industries. Market for these materials therefore emerges and users have to pay for them. This feed was found to be cheaper by farmers when compared with the cost of conventional feed. It is however expected that if farmers increased the scale of production, the unit cost of feed production will drastically decrease. Conventional feeds cost N640 per bag while the non-conventional feeds are N512 per bag. A price difference of at least N125/bag less the cost of conventional feed implies a reduction of 20%.

Table 6: Production of a Tonne of Typical Non-Conventional Feed in Owerri, 1998

Inputs	Quantity (kg)	Cost (*Naira*)
Soya bean meal	40	1080
Groundnut cake	20	380
Maize offal (Grit)[1]	350	10,500
Palm kernel cake (Pkc)	150	900
Wheat offal	160	1,250
Spent Grain[1]	150	1500
Rice Bran[2]	30	300
Salt	5	50
Blood meal[3]	30	1800
Bone meal[3]	35	1050
Fish meal	5	350
Premix	7	840
Vegetables[4]	5	200
Make-up	20	350
Total	1012kg	20,500

Note: 1 tonne = 40 bags of 25kg ca. Therefore average cost/bag = N512 ca.

[1] materials from breweries

[2] materials from rice farms and mills

[3] materials from livestock farms and markets

[4] materials from households, farms and markets.

This shows that the use of non-conventional feeds by farmers would help reduce cost and increase profit margin. It is already known that the use of by-product as substitutes for maize in rations reduced production cost without adverse effects on carcass quality and economy of feed conversion by birds (LONGE, 1978; UDEDIBIE and EMENALOM, 1993).

A simulated analysis of the consequences of the use of non-conventional feeds is shown in Table 7. It is assumed that complete use of non-conventional feed may reduce production by about 10%. However, other variables are assumed unchanged. This shows an increase in gross margin of 12.1% and 64.3% for broiler and egg production respectively.

Table 7: Simulated Effects on Gross Margin of Substitution of Conventional with Non- Conventional Feed *

	Broiler		Layer	
	Conventional	Non-Conventional	Conventional	Non-Conventional
Feed Cost (N)	640	512	640	512
Total Variable Cost (N)	324,000	279,200	682,700	586,700
Total Revenue (N)*	380,000	342,000	720,000	648,000
Gross Margin (N)	56,000	62,000	37,300	61,000
Change (%)		-12.1	-	64.3

*Assume a 10% reduction in production.

4 Conclusion

Adjustment strategies became inevitable due to the continued increase n input cost especially feed. Maize, the primary raw material for feed formulation has continually increased in price as a result of low output, macro-economic policies and competition for use between feed manufactures, other industries and for human consumption. The use of non-conventional feeds, formulated by farmers is therefore recommended. Extension effort should promote this, while further research on these alternative to maize as energy source is suggested. Specifically, there is need for further research on the nutritive and health implications of the use of non-conventional feeds.

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