Short communication

Economics of some modules of poultry production in Kaduna State, Nigeria

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Abstract

Poultry production plays a very important role in providing Nigerians with one of the cheapest sources of animal protein. In spite of this great nutritional contribution, some degree of discrepancies exist between its demand and supply vis a vis other economic expectations. This paper evaluates and compares the profitability of four layer production modules using input-output data from secondary sources (research reports and field experiences) and primary sources (2002 /2003 input and output prices in Zaria). The modules covered by this paper are: started pullets (0 – 8 weeks), point of lay pullets (9 – 20 weeks), commercial egg production (21 – 72 weeks) and full cycle layer production (0- 72 weeks). Fixed and variable costs were estimated for 500 birds and deducted from gross returns to give the net cash returns. The major investments in the started pullets and point of lay modules were the cost of pullets, accounting for about 61% and 50% of the total cost of production respectively. Feed constituted about 71% and 86% of the total cost of production in the commercial egg and full cycle layer production modules respectively. The analysis also indicate that sales of started and point of lay pullets accounted for over 90% of the gross income from started and point of lay modules while sales of eggs accounted for about 86% of the gross return from the other two modules. Net cash returns were positive for all the modules considered. The returns to Naira invested per year were 0.75, 0.69, 0.14 and 0.16, for started pullets, point of lay, egg production and full cycle layer modules respectively. It is evident from these results that modules with shorter production cycle tends to generate higher returns to investment, as more batches are turnout per year depending on the length of production cycle.

Keywords: Poultry, Modules, Income, profitability, Investment.

Introduction

Poultry production forms an important component of the livestock sub-sector in Nigeria. Winrock International Institute for Agricultural Development (1992) asserted that in terms of poultry production in Africa, Nigeria rates highest with a total of 190 million chickens. The contribution of poultry production to total

livestock output increased from 26% in 1995 to 27% in 1999 while increase in the production of table egg accounted for about 13% during the same period (CBN, 1999). The two most important factors responsible for the phenomenal increase in poultry production in Nigeria were identified as its profitability and the quick return to

invested capital (Dafwang *et al* 1993; Ogundipe *et al* 2002).

Poultry is considered to be a means of livelihood and a way of achieving a certain level of economic independence in Nigeria. The primary purpose for keeping poultry in all parts of the country is for both dietary and economic reasons. Today, poultry keeping has developed from a backyard business to a commercially oriented industry (Yusuf *et al*, 1993). In fact, poultry production is unique in that it offers the highest turnover rate and the quickest returns to investment outlay in the livestock enterprises. Funds invested in poultry production are recovered faster than in any other livestock enterprise. A study conducted (Ojo, 2002) indicated that poultry has the highest feed conversion rates and produces the cheapest, commonest and the best source of animal protein. The production cycle could be as short as 2 months for started pullet production and 18 months for the full cycle layer production. Ogundipe and Sanni (2002) affirmed that returns to investment can be improved by turning out more batches in a year depending on the length of the production cycle.

Although some level of commercialization of the local breed of poultry is evident, the development of commercial egg production in Nigeria is mainly with the exotic chicken. This breed of highly prolific birds has been found to be adaptable to the prevailing conditions in the country and is therefore the basis for medium to large-scale investment in the poultry industry (Barau and Ogundipe 1992).

The major problem area in poultry production in Nigeria according to Dafwang *et al* (1993); Adepoju and Alamu (1999); Ogundipe *et al* (2002); and Umeh and Odo, (2002) is the high and rising costs of production inputs, particularly feed, day old chicks and medications. An

understanding of areas of intervention for costs reduction scheme and selection of poultry enterprise with higher index of profitability, taking into consideration supply – demand constraint, would enable poultry farmers to obtain optimum economic benefit from their investment into this industry. Analysis of cost-returns structure in the different modules of poultry production would also facilitate appropriate knowledge of costs implications and the accruable benefits for new entrepreneur into poultry business. This paper focussed on the commercialization of exotic breed of layers with the aim of identifying the cost-return structure and the relative profitability of the different modules of poultry layer business.

Materials and methods

Data collection

The database for this study was obtained mainly from secondary sources while input and output prices were collected from the open market. The secondary database was sourced from National Animal Production Research Institute (NAPRI), poultry research programme records and reports. Information collected from this source includes; types and quantities of production inputs per bird – feed, vaccines, medications, brooding materials, equipments and housing. The 2002–2003 input and output prices were collected from the open market and the average rates from five prominent poultry input dealers in Zaria were used in the analysis. The poultry layer enterprise was divided into four modules of varying production cycles. The modules covered were: started pullets (0 – 8 weeks), point of lay pullets (9 – 20 weeks), commercial egg production (21 – 72 weeks) and full cycle layer production (0–72 weeks). The categorization of these modules was based on the fact that an entrepreneur could specialize in any of them depending on the production motives, availability of resources and managerial ability.

Analytical techniques

Farm budgeting technique was applied in analyzing the economics of the different modules under consideration. A farm budget, as defined by Olukosi and Erhabor (1987), is a detailed physical and financial plan for the operation of a farm for a certain period. The aim of a farm budget is to consider resources to be used, estimate expected receipts, expenditures and consequently, the net farm income. Fixed and variable costs were estimated for 500 birds in each module for ease of computation and comparison and the total divided by 500 to obtain the unit cost (cost / bird). Total expenditure includes both the fixed and variable costs. The variable or recurrent costs in poultry production includes the costs of pullets / day old chicks, feed, litter materials, heating, vaccination, medication, debeaking, and wages for labour while the fixed costs considered were the depreciation on housing and equipments. The depreciation on housing and equipment were estimated using the straight-line method. The straight-line method, according to Olukosi and Erhabor (1987), is the difference between the market price and the salvage value of an asset divided by its expected life span. It was assumed that the poultry house would be of economic value for at least 10 years while the equipment were assumed to last for 6 years after purchase.

The model for estimating net farm income can be represented by the equation:

$$NFI = \sum_{i=1}^n P y_i Y_i - \sum_{j=1}^m P x_j X_j - \sum_{k=1}^k F_k$$

Where:

NFI = Net farm income

Y_i = Quantity of product(s)
(where $i = 1, 2, 3, \dots, n$, products)

$P y_i$ = Unit price of the product (s)

X_j = Quantity of the variable input
(where $j = 1, 2, 3, \dots, m$,

variable inputs)

$P x_j$ = price /unit of variable input

F_k = Cost of fixed inputs

(where $k = 1, 2, 3, \dots, k$
fixed inputs)

Σ = Summation (addition) sign.

Profitability index (return to Naira invested) was employed to explain the extent to which a Naira invested into the different modules of poultry production contributes to the net farm income. The annual return to investment was obtained by turning out 5 batches of started pullet production (0–8 weeks) per year leaving enough time for cleaning and getting the next batch ready, while 3 batches of point of lay production (9–20 week) were estimated per year. The annual return to invested capital is the contribution of a Naira invested into poultry business to the annual net farm income.

Results and Discussion

The estimated investments per bird on fixed and variable inputs and the returns from a flock size of 500 birds for the different modules of poultry production are presented in tables 1. The analysis shows that the cost incurred on pullets was the highest constituting about 61% and 50% of the total expenditure in the started and point of lay pullet modules respectively. This was followed by the investment on feed, which accounted for about 24% and 39% of the total expenditure in the respective modules. However, feed constituted about 71% and 86% of the total cost of production in the commercial egg and full cycle layer production modules respectively. This agrees with earlier observations by Barau and Ogundipe (1992); Adepoju and Alamu (1999) that feed constitutes over 70% of the total cost of production in the full cycle commercial egg production. The cost of pullet accounted for about 22% and 5% of the total investment in the respective modules. About 5% mortality was

Economics of layer strain production enterprises

Table 1: Costs and returns of four modules of layer enterprise (Naira/Bird)

Technical Parameters	Started pullet (0-8 wks)	Point of lay pullet (9-20wks)	Egg production (21-72wks)	Full cycle layer prod. (0-72wks)
Costs:				
Day old pullets	114.40	-	-	121.00
Started pullets	-	221.45	-	-
Point of lay pullets	-	-	572.00	-
Brooding / rearing	03.58	0.78	02.34	06.70
Feed (0 – 8 weeks)	45.23	-	-	45.23
Feed (9 – 20 weeks)	-	173.04	-	173.04
Feed (21 – 72 weeks)	-	-	1809.99	1809.99
Medications	5.00	6.18	10.08	21.26
Vaccinations	6.00	4.00	4.12	14.12
Debeaking	-	5.00	-	5.00
Labour (N800/ month)	3.20	4.80	19.20	28.80
Depreciation on housing	1.00	2.26	10.67	11.67
Deprec. on equipment	0.70	1.68	10.06	10.76
Miscellaneous exp.(5%)	8.96	20.96	121.92	112.38
Total Cost (a)	188.07	440.15	2560.38	2359.95
Returns:				
Birds	215.60	539.00	427.50	427.50
Eggs	-	-	2466.16	2466.16
Manure	0.45	2.25	18.95	21.65
Empty feedbags	0.34	1.73	14.55	16.62
Total revenue (b)	216.39	542.98	2927.16	2931.93
Net Income (b – a)	28.32	102.83	366.78	571.98
Return to Naira Invested per batch = (c / a)	0.15	0.23	0.14	0.24
Annual Return to Investment = (c / a) x no. of batches per year.	0.75	0.69	0.14	0.16

considered for each batch, thus the initial number of pullets was increased by 5% and the total cost divided by 500 birds to obtain the unit cost per bird.

Based on these estimates, any management intervention towards cutting down on the cost

of production in any of these enterprises will need to lay emphasis on pullet and feed costs. Other major cost components in these enterprises are costs of medication, vaccination and labour. These costs vary with the length of the production cycle. It is assumed in this analysis that farmer's equity capital was invested

into the business. Where a farmer will depend on borrowed fund, the total cost will increase by the interest paid on the capital.

The analysis also indicate that sales of started and point of lay pullets accounted for over 90% of the gross income from started and point of lay modules while sales of eggs accounted for about 86% of the gross return from the other two modules. About 65% hen housed egg production was assumed in estimating the return from eggs. It was also estimated that, of the total egg production, 5% were graded small, 10% medium and 81% large while 3% were cracked. Other sources of income in the layer enterprise are sales of manure and empty feedbags. It was estimated that, about 25% of total feed intake would come out as manure while about 90% of the total number of feedbags were sold. Net cash returns from investing in these poultry production enterprises were positive for all the modules considered. The returns to Naira invested per year were 0.75, 0.69, 0.14 and 0.16, for started pullets, point of lay, egg production and full cycle layer modules respectively. These values are lower than that reported by Umeh and Odo (2002), who reported a return to Naira invested of 1.21 per year for full cycle layer production. Returns to investment tend to be higher for modules with shorter production cycles and least for commercial egg production module. However, availability of consistent market may be a major obstacle in the production of started and point of lay pullets throughout the year.

Where egg production is the target of the farmer, a vertical integration (full cycle layer production) involving the first three modules will increase economic returns. The major change in the input structure resulting from this vertical integration is that total feed cost now makes up about 86% of the total cost of production. Also, raising point of lay pullets directly on the farm ensures that

farmers have greater control of the management and hence, on the quality of point of lay pullets used in the laying phase. In the laying phase, cash flow problem is low as the return from eggs is able to cater for other recurring expenses.

The implication of these estimates is that poultry industry is capital intensive with the costs of feed and pullets constituting the major sources of investment. Therefore, for any poultry enterprise to survive under the present economic climate, the farmer should pay more attention to these major cost components by seeking for ways to maximize effectiveness in qualities, methods of acquisition and utilization. The study indicated that annual return to investment was highest for started pullet module and least for the egg production module. However, the choice of any production module should also take into consideration financial requirements and availability of supply channels for the products.

Conclusion

This paper has helped to highlight the major cost-return components in four poultry layer production modules under the prevailing economic condition. It is evident through these analyses that the layer strain poultry production enterprise is a viable venture. Efficiency of resource allocation in this enterprise will depend to a large extent on the identification of the various alternative production strategies, the various costs and return elements that could be employed to obtain the highest possible return to investment outlay.

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