Original Research

Studies on the Performance of Poultry Farming Enterprises in Nadia District of West Bengal

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Abstract

The study focused on the economics of poultry farms in Nadia district of West Bengal state. Both primary and secondary data were used. The present study has been conducted based on primary and secondary data. The primary data was collected from 120 poultry farms and 20 market intermediaries selected randomly using pre-tested questionnaires. The broiler as well as the layer farming in poultry enterprise has been found profitable in Nadia district of West Bengal. However, there is still enough scope in reducing the cost of production and increasing the profitability in poultry farming. The study is based on primary and secondary data collected from 120 poultry farmers by adopting purposive sampling. The total fixed cost in layer farming was estimated to be 0.66 per cent of the total cost for 1000 birds per batch. The return structure of layer farms indicates the total returns from the sale of eggs, sale of culled birds and manure from 1000 birds as Rs. 424590. Among the overall total returns, the sale of eggs accounted for about 86.39 per cent followed by sale of culled birds (9.1 per cent). As regards marketing of egg, there was only two channels of marketing. Thus, producers' share in consumer's rupee was observed 79.23% and 56.50 % respectively. Garrett's ranking technique was used to identify the constraints in the poultry farming and marketing in the study area. The study recommends feed subsidies by the government, provision of adequate incentives and supporting services to broiler producers as well as organizing training workshops to increase profitability of broiler production.

Key words: Broiler, Enterprise, Purposive Sampling, Profitability, Poultry

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Introduction

Animal husbandry is an integral part of agriculture in India. It provides gainful employment particularly to small and marginal farmers and agricultural labourers. Livestock also provides a variety of raw materials for industrial use. As the production of agricultural crops has been rising at a rate of 1.5 to 2% per annum, the production of eggs and broilers has been rising at a rate of 8 to 10% per annum and poultry had evolved

from a backyard venture to a full-fledged commercial agribusiness (Kumar and Rai, 2006). The poultry sector accounts for about two per cent of the gross domestic product (GDP) in India and about 10 per cent of the total gross national product (GNP) attributable to livestock sector.

The poultry industry has made great progress after independence. Each operation in the poultry business has become a huge business by itself. Some farms specialize in producing eggs for market consumption, or for hatching chicks. Many large farms specialize in raising broilers for meat production. Other businesses are focused on feed preparation or on using the wastes of poultry farms for compost production and fertilizing farmlands (Aggarwal *et al.*, 1981). If managed and marketed well, all segments of the poultry business can be profitable. The present per capita availability of poultry meat is 2.2 kg against the requirement of 11 kg, as per the National Committee on Human Nutrition in India (Indiastat, 2014). Therefore, to meet the domestic requirement, there is a need of about six-time increase in meat production. Hence, poultry enterprise offers both incentives for investors and at the same time pose a risk of losses to the farmers. It may be taken up both as main enterprise as well as a subsidiary occupation (Chikara and Singh, 1989). Poultry farming assumes special significance in the state of West Bengal due to integration of poultry sector and available land area. The productivity and production of food grains, particularly of cereals in West Bengal have already reached a point of saturation with little scope to increase, resulting in looking for subsidiary occupations like poultry farming. The specific objectives of the investigation are-

1. To analyze financial feasibility of investment in layer and broiler farms in Belgaum district;
2. To estimate the cost and returns in layer and broiler farming;
3. To study the price spread in the existing marketing system for broilers; and
4. To study the constraints in management of layer and broiler farms and to suggest suitable measures for improving both farms.

Materials and Methods

The present study is based on both primary and secondary data. For evaluating the specific objectives designed for the study, required primary data were collected from the 120 sample farmers through personal interview method with the help of pre-tested schedule. The primary data collected from the sample farmers included the data on general information, poultry farm size, the capital invested, the quantity of inputs used and their value, number of eggs and broilers produced and other items through carefully structured and presented questionnaires. The data on the marketing aspects were collected from the wholesalers and retailers located in West Bengal. Data on inputs such as chick, feed, labour, medicine and vaccine, electricity and other miscellaneous items along with cost incurred on them and output such as eggs, live broilers of marketable age, culled birds and manure along with returns obtained from them in both broiler and layer farming were obtained separately. The tabular presentation method was followed to study the

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general characteristics of sample poultry farmers, determine the resource structure, returns and profits. Simple statistical tools like averages and percentages were used to arrive at meaningful results.

Total cost (TC) =	Fixed Cost + Variable cost
Gross returns (GR) =	Quantity produced × price per unit of respective product
Net returns (NR) =	GR – TC Returns over variable cost
Input-output ratio =	Gross returns / Total cost

The primary data were supplemented by secondary sources of data gathered from the records published by various poultry manufacturers, internet web resources and standard texts on poultry production. The assessments used for the financial analysis were:

1. Pay Back Period: Payback period represents the length of time required for the stream of cash proceeds produced by the investment to be equal to the original cash outlay i.e. the time required for the project to pay for itself. In the present study, payback period was calculated by following formula-

Payback period = Initial investment / Net annual cash inflows

2. Net Present Value: The present value represents the discounted value of the net cash inflows to the project. In the present study, a discount factor of 12 per cent was used to discount the net cash inflows representing the opportunity cost of capital. It can be represented by-

$$NPW = \frac{B_t - C_t}{(1+d)^t}$$

B_t = Gross returns in year t
C_t = Costs in year t
t = No. of years/ Economic life period of the project
d = Discount rate

3. Benefit-Cost Ratio: The benefit cost ratio (BCR) was worked out by using following formula-

$$B{:}C\ ratio = \frac{B_t/(1+d)^t}{C_t/(1+d)^t}$$

4. Internal rate of return: The rate at which the net present value of project is equal to zero is internal rate of return (IRR) to the project. The net cash inflows were discounted to determine the present worth by the following interpolation technique.

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$$IRR = \text{Lower Discount rate} + \text{Difference between the Two discount rates} \left[\frac{\text{Present worth of cash flows at lower discount rate}}{\text{Absolute difference between present worth of cash flows stream at the two discount rates}} \right]$$

Garrett's Ranking Technique

To find out the most significant problems faced by the respondent, Garrett's ranking technique was used. As per this method, respondents have been asked to assign the rank for all problems and the outcome of such ranking have been converted into score value with the help of the following formula-

$$\text{Percent position} = 100\ (R_{ij} - 0.5)/\ N_j$$

Where

R_{ij} = Rank given for the i-th variable by j-th respondents

N_j = Number of variables ranked by j-th respondents

With the help of Garrett's Table, the percent position estimated is converted into scores. The factors having highest mean value is considered to be the most important factor.

Terms and Concepts used in the Study

The terms and concepts used in the study and the procedure used to calculate the cost of different items are given below.

Human labour	:	Human labour was estimated in terms of eight hours of work per day. The women labour days were converted into man days on the criteria that one-woman day is equal to 0.60-man days on the basis of wage rate equivalent.
Broiler	:	A young chicken that is usually less than 10 weeks of age and has been breed specifically for meat production.
Layer	:	A female in lay. Usually used to refer to female birds kept solely for egg production for human consumption.
Variable costs	:	The variable costs include cost of chicks, bedding material, feed charges, vaccination, electricity charges
Debeaking	:	Remove the upper part of the beak (of (a bird) to prevent it injuring other birds
Labour wages	:	This was calculated on the entire working cost of the enterprise at the prevailing rate of interest by financial institutions in the study area.
Depreciation charges	:	Depreciation on each capital equipment was calculated based on the purchase value using the straight-line method.

Results and Discussion

Socio-Economic Profile of the Poultry Farmers

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An understanding of general characteristics of the sample farmers is expected to provide a bird's eye view of the general features prevailing in the study area. Therefore, an attempt has been made in this study to analyze some of the important characteristics of the sample farmers. The general information relating to the age, education, family size, average land holdings, experience in poultry business and flock size according to different farm size groups are presented in Table 1.

Table 1: Socio-economic profile of the respondents

Socio-Economic Status	Characteristics	Frequency of farm	Percent
Age	Below – 30 Years	12	9.2
	30 Years – 50 Years	48	38.3
	Above 50 Years	60	50
Educational Qualification	Primary & Secondary	30	25
	Higher Secondary	31	25.83
	Graduate	56	46.67
	Post Graduate	3	2.5
Occupation	Businessmen	47	39.17
	Agriculturist	54	45
	Private	10	8.33
	Professionals	9	7.5
Monthly Income	Rs.1000 – Rs.15,000	72	60
	Rs.150,00 – Rs.20,000	43	35.83
	Rs.2,0,001 – Rs.40,000	4	3.33
	Above 40,000	1	0.83
Experience	Less than 5 years	12	10
	5-10 years	9	7.5
	10-15 years	54	45
	15-20 years	42	35
	Above 20 years	3	2.5
Total		**120**	**100**

Source: Estimation based on Field survey

The result shows that majority of farmers were within the age group of between 30 -50 years and above 46 years and more adoptive to new techniques. Information about educational qualification of selected poultry farmers were analysed and found that all (100 percent) the farmers were educated. The implication is that younger farmers are likely to adopt modern techniques faster. The findings are in agreement with Sani *et al*. (2007) that majority of farmers within the age group of 36 years and 46 years are more adoptive to new techniques.

The findings from Table 2 showed that the total variable cost constitute the highest proportion (Rs.347142) of the total cost of production. Permanent labour and Cost of feeding accounted for highest in the total cost of production. This agrees with Intisar (1995); Sharabeen (1996); Yusuf and Malomo (2007) and Adepoju

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(2008) that feed cost comprises the highest share in the total cost of poultry production. The findings also support the result of Intisar (1995); Sharabeen (1996); Yusuf and Malomo (2007) and Adepoju (2008) that sale of egg contributed highest share to total revenue. The result further showed that the average gross margin per bird was 361.06 and net revenue was 256.83.

Table 2: Average cost and revenue of poultry farmers per bird

Cost items	**Percent**
Fixed Cost (1)	
Labour	**15.8**
Total Fixed Cost	**15.8**
Variable Cost (2)	
1. Price of day-old chicks	**15**
2. Cost of feed	**18.5**
3. Cost of Electricity/ Diesel	**10.36**
4. Cost of Vaccination / Medicines	**16.5**
5. Interest on Working Capital	**11.4**
6. Interest on Investment on Birds	**13.85**
7. Cost of Water	**1.83**
8. Health Cover	**1.35**
Total Variable Cost	**-**
Marketing cost (3)	
Transportation Cost	**0.57**
Advertisement Cost	**0.46**
Total Marketing Cost	**-**
Total Cost (1+2+3)	**100**
Revenue items	
i. Sale of Egg	**86.39**
ii. Sale of Gunny Bags	**1.86**
iii. Sale of Manure	**2.64**
iv. Sale of culled Birds	**9.1**
Total Revenue	**99.99**
Gross Margin	**-**
Net Revenue	**-**

Source: Field Survey in West Bengal (2015)

Table 2: Calculation of NPV, BCR & IRR

NPW at 15% DF	6032
BC Ratio	1.12
IRR	49.77

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To compute the net present value and Internal rate of return for integrated broiler farming, present value of cost and returns at 15 per cent discount factor were calculated and the results are presented in Table 2. On the basis of NPV, BCR and IRR, investment in broiler farming was found to be most profitable in large sized farms, then smaller farms. This was due to the fact that the benefits per bird were highest and cost of production per bird was lowest on large farms.

The structure and level of fixed and variable costs incurred in the broiler production on different size groups of layer farms are presented in Table 3.

Table 3: Economics of layer farming in West Bengal

Particulars	**Average (Rs.)**
Shed including egg and feed store Equipments	124500
i. 2 Brooders @ Rs. 476/ each	875
ii. 35 Chick feeders @ Rs. 15/each	575
iii. 32 Groove feeders @ Rs. 55/each	1460
iv. 40 Layer feeders @ Rs. 100/each	4200
v. 32 Chick waters @ Rs. 25/each	820
vi. 12 Nest units (Three Tier) @ Rs. 120/each	1420
Miscellaneous equipment's i.e. craters, egg trays, hurdles, etc.	1340
Electric connection meter etc.	10355
Total	136172
Fixed cost	
Apportioned cost of shed and feed store	500
Interest on capital investment @ 11% P.A.	966.85
Depreciation on equipments and building for 22 weeks @ 8% P.A.	703.17
A. Total fixed cost	2170.01
Variable cost	
Cost of 1000 chicks @ Rs. 15.50/chick	15500
Chick mash @ Rs. 5/kg of 3 kg/chick	15000
Grower mash @ Rs. 3/kg of 5 kg/bird	15000
Electricity, litter, water, medicine and other charges	11200
Labour @ Rs. 1500/month (for 2000 birds- requirement of one man)	10200
Feed (Layer mash)	277095
Interest on variable cost for one month @ 11% P.A	3147
B. Total variable cost	347142
Total cost (A+B)	349142
Total cost/bird	339.14
Cost of production/egg	1.75
Returns	
Sale of eggs at an average price of Rs. 1.50/ egg with an average of 260 eggs/hen/year	392600

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Sale of culled birds @ Rs. 31/bird	30752
Sale of manure	8238
Gross returns	424590
Net returns	8494
Net returns/bird	84.94
Net returns/month	6859

It is seen from the table that the total cost incurred in layer production amounted to Rs. `368644. The total fixed cost in layer farming was estimated to be Rs. 2170.01 (0.67 per cent of the total cost) for 1000 birds per batch. The return structure of layer farms indicates the total returns from the sale of eggs, sale of culled birds and manure from 1000 birds as Rs. 425590. Among the overall total returns, the sale of eggs accounted for about 91 per cent followed by sale of culled birds (7.83 per cent) and manure (1.91 per cent). The net returns were Rs.84946 per annum of 1000 birds. Net returns per month were found to be Rs. 6859 per 1000 birds. Rajendran and Samarendu (2003) found that the feed cost to be a major problem faced by the poultry farmers (89.94%), followed by high cost of medicine and vaccine (78.17%), poor quality of feed and feed ingredients (66.20%). Pant *et al*. (2004) revealed that total cost per bird was Rs. 43.65 and fixed and variable cost accounted for 3.34 and 96.95 per cent, respectively.

Table 4: Marketing cost, margin, price spread & marketing efficiency in marketing of broiler in channel I

Particulars	Amount (Rs. per100 Kg)	Percentage share in consumer's price
Net price received by producers/ Wholesalers purchase price	6500	79.23
Rent for shop	55	0.65
License fees	5.42	0.05
Transportation charges	650	8.54
Labour charges	177	1.58
Electricity charges	180	3.12
Total marketing cost incurred by Wholesalers	45	0.55
Producers share in consumer's rupee (%)		79.23
Price spread (Rs)	1550	

Table 5: Marketing cost, margin, price spread &marketing efficiency in marketing of broiler in channel-II

Particulars	Amount (Rs. per100 Kg)	Percentage share in consumer's price
Net price received by producers/ Wholesalers purchase price	7100	56.5
Rent for shop	75	0.65
License fees	7.42	0.05
Transportation charges	650	8.54
Electricity charges	190	3.25
Total marketing cost incurred by Wholesalers	45	0.55
Wholesalers margin	850	10.45
Producers share in consumer's rupee (%)		56.5

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Price spread (Rs)	2270	

The marketing costs and margins for marketing of broilers through channel I are presented in Table 4.

Marketing Channel-I:

Marketing Channel -II:

In this channel the wholesalers sold the broilers through retailers to the consumer. The wholesalers transported the broiler birds from the producers to his shop and sold them to the retailers after keeping a margin of Rs. 167.08 per 100 kg broilers (1.27 per cent of consumer's price). The major costs incurred by the wholesalers were, rent for his shop accounting for 0.65 per cent of consumer's price, license fees accounting for 0.05 per cent of consumer's price, transportation charges (8.54%), labour charges (1.58%), electricity charges (3.12%) and the value of weight loss (2.40%). The marketing costs and margins for marketing of broilers through channel II are presented in Table 5. The retailers took care of collecting the broiler birds from the producer production unit and also transporting to their shop. On the other hand, the consumers paid price of Rs. 12,722.5 per 100 kg of broiler weight which formed the consumer's price.

Problems Faced by the Poultry Farmers

Poultry farmers in the Nadia district were asked to rank the problems faced by them while doing their farming. The problems were listed and the farmers were asked to rank these problems in their order of priority. The ranks were then converted into percent position and from the percent position, the individual scores were determined on a scale of 100 points by using Garrett's Rating Scale. In short, the poultry

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farmers wanted to get lower feed cost and marketing high price for eggs, solution for labour problems, to encourage investment and continuous power supply for their industry production. This ranking is supported by the constraints observed by Bhattu *et al*., 1999 like high feed cost poor quality of inputs and marketing structure.

Table 6: Problems of the poultry farmers

S. No.	Problems	Rank
1.	Availability of Raw Materials	9
2.	Control Measures	7
3.	Feed and Marketing	2
4.	Health Coverage	10
5.	High Feed Cost and Low Egg Prices	1
6.	Improved Technology	8
7.	Investment	3
8.	Labour Problem	4
9.	Lack of Transport/Storage Facilities	11
10.	Managerial Problems	6
11.	Power Supply	5

Conclusion

This study shows that the broiler business in Nadia district of West Bengal is profitable assuming variation in prices of chicks, feed, and price/kg of meat. The broiler as well as the layer farming in poultry enterprise has been found profitable in West Bengal. Even when the cost of feed is high, the price/kg of meat could be above the average, compensating for the high costs of the operation. Also, when the cost/chick is high, the feed cost could be low, compensating for the initial high cost per flock. The impact of sold value of egg of wholesale traders significant, this is on account of price spread which they taken up also increases the profit of the farmer. Cost incurred by traders is not influencing positively to increase their net profits. The fluctuating prices tend to compensate for each other for a positive net profit. The major problems faced by the broiler and layer farmers were categorized under two heads viz., feed cost, insufficient credit for investment production and marketing problems. Among the production problems high feed cost, labour supply, broken eggs, lack of government subsidy, lack of loan facility were the major problems in the study area. To overcome the problems of labour scarcity during peak period, poultry farmers may adopt labour saving techniques such as use of automatic watering and feeding system. In order to improve the marketing efficiency, the producer should sell their produce directly to the wholesalers or have tie up with retailers where-ever feasible.

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