

## *Research Article*

# **ECONOMIC ANALYSIS OF POULTRY ENTERPRISE IN JAIPUR DISTRICT OF RAJASTHAN STATE OF INDIA**

Vikash Pawariya\*, S S Jheeba

**ABSTRACT:** The cost and return analysis of different sizes of poultry farms in Jaipur district of Rajasthan state has been carried out based on primary data collected from twenty poultry farms for the period of July, 2010 to June, 2013. The study has shown that the variable cost per bird has been reported very high while the total fixed cost per bird was reported less in both broiler and layer farms. The feed cost covered the most part of variable cost both in layer and broiler farms. The maximum revenue received from the broilers in the broiler farms and from the eggs in layer farms. The return on per bird was productive as the benefit-cost ratio and the layer farms showed more profit than broiler farms. All the results obtained showed solvency of farms for investment committed on them as calculated cost-benefit ratio were more than unity, NPV values were positive, profit rates were more than 100. So the present study computed the cost and return and capital productivity of investment in poultry industry of Rajasthan, India.

**Key Words:** Poultry enterprise, Jaipur, Rajasthan, Cost and return analysis.

## **INTRODUCTION**

The Indian poultry sector with 7.3% growth in poultry population, has witnessed one of the fastest annual growth of about 6% in eggs, 10% in meat production and 8.35% in broiler production over the last decade amongst all animal based sectors. In India, Poultry growth rate during 2003-07 was 7.33 per cent though total livestock annual growth was 2.23 per cent only (Livestock Census 2007). Total poultry population in Rajasthan was 49.94 lakh. Jaipur district ranked second in organized poultry farms in Rajasthan (Livestock Census 2007).

In spite of a spectacular growth in the poultry sector during the past two decades, a huge gap exists between availability and need of poultry products. Therefore, to meet the domestic need, it is required to increase meat and egg production. Increase in population growth, changing life-style, shifting of food habits, rapid urbanization, increased per capita income, awareness about health care, etc. are contributing towards rising demand of poultry products. Thus, the growth potential of this sector is bright due to regular flow of income throughout the year in the rural economy of the

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*Department of Agriculture Economics Sri Karan Narendra Agriculture University, Jobner,  
Jaipur- 303329, Rajasthan, India.*

*\*Corresponding author. e-mail: vikashpawariya@gmail.com*

Rajasthan state. Diversification of agriculture through allied activities like poultry farming has acquired added significance for solving the agrarian crisis of the state. Adoption of poultry farming will meet the growing demand of poultry products and nutrition (Singh *et al.*, 2010). Despite the nutritive value of poultry meat and rapid growth in this industry, its production in the country is grossly inadequate as reflected in the wide gap between demand and supply of the product. Rajasthan state is still one of the low egg producing states in India. The state produces only 1.09 per cent of the total National egg production and the per capita availability of egg is as low as 10 eggs as compared to 53 eggs at all India level. Concerning broiler production, Rajasthan State contributes about 0.06 per cent of the national broiler production (Livestock Census 2007). The production capacity of poultry farms has to increase rapidly to be able to meet up with the increasing demand, and for this to be achieved, the present level of technical and economic efficiency must be improved. Keeping all above points of poultry farming in view, the present study has been conducted to know and analyze the different economic aspects in poultry farms in the district. The present study has been under taken as a little attempt to fill the research gap in the areas of economic aspects of poultry industry.

## **MATERIALS AND METHODS**

The study was conducted in Jaipur district of Rajasthan state. The data used in the study related to the period from first July 2010 to thirtieth June, 2013. There were 200 organized poultry farms in Jaipur district. A 10 per cent sample, *i.e.*, 20 poultry farms were selected randomly. Both primary and secondary data

were used for the study. The relevant primary data were collected by interviewing the farmers personally and from the records maintained by them with the help of pre- prepared schedules for the year 2010-11 to 2012-13. The secondary data with respect to the list of organized farms, egg prices were collected from Directorate of Animal Husbandry, Jaipur.

### **Cost and return analysis**

In estimation of costs and returns of poultry farms, following Data were collected:

Variable costs (VC) considered:

1. Cost of feed
2. Cost of chicks
3. Cost of casual labor
4. Cost of water and electricity
5. Cost of litter
6. Cost of repair and maintenance
7. Cost of stationery, post and telephone
8. Cost of transport
9. Interest on working capital

### **Fixed costs (FC) considered**

1. Salary of permanent labour
2. Depreciation on fixed assets
3. Interest on fixed capital
4. Land rent

### **Production**

1. Eggs
2. Broilers
3. Cocks
4. Manure (Guano)

### **Revenues**

1. Receipts from sales of eggs
2. Receipts from sales of birds
3. Receipts from sales of poultry manure
4. Receipts from sales of empty gunny bags

Total variable costs (TVC)  
 Total Fixed Costs (TFC)  
 Total Costs (TC) = TVC + TFC  
 Total Revenues (TR)  
 Net Revenues (NR) = TR - TC.

**Productivity of Investment**

For assessing the productivity of investment made on the poultry farms, various economic parameters were used.

**Benefit cost ratio (BC-Ratio)**

The benefit-cost ratio is the ratio of discounted total benefits to discounted total costs. It implies weighting of the return against the costs involved in a project. In benefit-cost analysis, we are concerned more with primary or direct cost and real benefits rather than the nominal benefits flowing from a project. The benefit-cost ratio is used for determining the viability of a particular project. The project is economically viable when it has a benefit-cost ratio greater than unity. To serve the purpose following formula was used.

$$BCR = \frac{\sum_{t=1 \text{ to } 3} B_t/(1+r)^t}{\sum_{t=1 \text{ to } 3} C_t/(1+r)^t}$$

Where,

BCR = Benefit-cost ratio

B<sub>t</sub> = Total benefit from poultry farm in time “t”.

C<sub>t</sub> = Total cost of poultry farm in time “t”.  
 t = 1, 2 and 3

r = Rate of interest used for discounting (in present study the rates of discounting used were 14 per cent).

**Net-Present value (NPV)**

It is the present value (worth) of the incremental net benefit or incremental cash flow stream and usually, abbreviated as NPV. It was calculated by using following formula.

$$NPV = \sum_{t=1 \text{ to } 3} B_t/(1+r)^t - \sum_{t=1 \text{ to } 3} C_t/(1+r)^t$$

Where,

NPV = Net-present value

**Internal Rate of Return (IRR)**

Another method of calculating profitability or viability of a project is the assessment of internal rate of return, *i.e.*, yield of the project. This is defined as rate of discount at which net present value (NPV) of capital expenditure equals to further cash proceeds *i.e.*, it is the rate of interest at which net present value equals to zero. It is expected that internal rate of return is greater than the prevailing rate of interest for an economically viable project. Thus, IRR is the rate of interest (r), which satisfies:

$$NPV = \sum_{t=1} B_t/(1+r)^t - \sum_{t=1} C_t/(1+r)^t = 0,$$

It is the maximum interest rate the project could pay for the resources used if the project is to recover its investment and operating costs. “An internal rate of return of a series of values such as a cash flow can exist only when at least one value is negative in the cash flow series. If all the values are positive, no discount rate can make the net present value of the stream equals to zero”.

**Profit rate**

The average income during the period of lifetime of the project is equated to the depreciation of capital investment. The income

over and above depreciation expressed as percentage is known as profit rate. It is calculated by the following formula:

$$R = \frac{TR - DP}{TC} \times 100$$

Where,

R = Profit rate

TR = Total revenue

DP = Depreciation

### **Cost and Return Structure of Broiler and Layer Farms**

#### **Costs structure of broiler farms**

In the present study, total cost of raising broilers was Rs.10.11 lakh per farm and Rs 185.08 per bird. The total cost was Rs. 8.52 lakh in year 2010-11, Rs. 10.20 lakh in year 2011-12 and Rs. 11.35 lakh in year 2012-13. The total variable cost covered 79.14 per cent of the total cost. The results were in the line of findings of Jebarani *et al.* (2005), Kumar *et al.* (2006) and Farooq *et al.* (2013) who found various cost included in broiler production. The fixed cost covered remaining 20.86 per cent of the total cost. Feed cost was major expense for broiler farm. It accounted 46.84 per cent of the total cost of production (Table 1). In absolute terms, the cost of feed increased with increase in the year. Percentage was variable over the years. In absolute terms, per bird the overall average feed cost was Rs.86.57. The cost of casual labour was 0.29 per cent of total cost and permanent labour accounted for 11.11 per cent of total cost. In absolute terms, per bird the overall average casual labour cost was Rs. 0.53. The veterinary expenses accounted for 3.71 per cent of the total cost. The trend from year 2010-

11 to year 2012-13 is in increasing with respect to medicine and doctors help. In year 2011-12 there was abrupt increase in veterinary expenses due to the poultry disease at that time. Interest on working capital accounted 1.02 per cent of the total cost. The proportion of interest is decreasing with respect to total cost which shows lower share of loan amount in total investment. Interest on working capital for broiler farms per bird was conspicuous increasing in absolute amount with Rs.1.84 in year 2010-11 and Rs. 1.95 in year 2012-13. Depreciation on building, vehicle and equipment accounted 1.72, 0.88, and 1.49 per cent of total cost, respectively. In the absolute amount, it was Rs.3.24, Rs. 1.65, and Rs. 2.80 per bird, respectively. The depreciation on building, vehicle and equipment was decreasing over time. Interest on fixed capital was 3.87 per cent of the total cost. Interest on fixed capital was decreasing with respect to the total cost from year 2010-11 to year 2012-13 annually. Land rent was Rs.3.17 per bird and was increasing overtime as land property is being dearer. In the broiler production, the maximum portion of cost structure was covered by variable costs which accounted 79.14 per cent of the total cost with absolute amount Rs 146.19 per bird. Similar findings were observed by Adewunmi (2008). The total variable cost was increasing over time with 77.83 per cent, 79.22 per cent and 80.50 per cent of the total cost in year 2010-11, 2011-12 and 2012-13, respectively. Total fixed cost accounted 20.86 per cent of the total cost i.e., in absolute amount Rs. 38.89 per bird. It was decreasing over time comprising 23.17 per cent, 20.80 per cent and 19.50 per cent of the total cost in year 2010-11, year 2011-12 and year 2012-13, respectively. The overall average total cost per farm incurred

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**Table 1. Per bird total cost incurred in broiler farm during 2010-11 to 2012-13 in Jaipur district of Rajasthan (in Rs.)**

<b>Cost Item</b>	<b>Year 2010-11</b>	<b>Year 2011-12</b>	<b>Year 2012-13</b>	<b>Overall average</b>
<b>Variable costs</b>				
Cost of chicks	37.39 (21.94)	39.68 (21.38)	44.38 (22.29)	40.48 (21.87)
Feed	78.04 (45.78)	88.28 (47.57)	93.38 (46.89)	86.57 (46.84)
Veterinary expenses	5.52 (3.27)	7.48 (4.03)	7.40 (3.72)	6.80 (3.71)
Casual Labour	0.38 (0.28)	0.40 (0.22)	0.79 (0.40)	0.53 (0.29)
Miscellaneous	3.81 (2.25)	4.20 (2.27)	5.95 (2.99)	4.66 (2.55)
Transportation	4.29 (2.23)	5.05 (2.72)	6.44 (3.23)	5.26 (2.86)
Interest on working capital	1.84 (1.08)	1.91 (1.03)	1.95 (0.98)	1.90 (1.02)
<b>Total Variable Costs</b>	<b>131.27</b> <b>(77.83)</b>	<b>147.00</b> <b>(79.22)</b>	<b>160.29</b> <b>(80.50)</b>	<b>146.19</b> <b>(79.14)</b>
<b>Fixed costs</b>				
Salary of permanent labour	21.12 (12.40)	20.25 (10.91)	20.84 (10.46)	20.74 (11.11)
Depreciation on buildings	3.63 (2.14)	3.30 (1.78)	2.80 (1.40)	3.24 (1.72)
Depreciation on vehicle	1.77 (1.05)	1.61 (0.87)	1.55 (0.78)	1.65 (0.88)
]Depreciation on equipment	3.07 (1.9)	2.79 (1.51)	2.54 (1.28)	2.80 (1.49)
Interest on fixed capital	8.14 (4.78)	7.40 (3.99)	6.35 (3.19)	7.30 (3.87)
Land rent	1.52 (0.90)	3.22 (1.74)	4.76 (2.39)	3.17 (1.79)
<b>Total Fixed Costs</b>	<b>39.26</b> <b>(23.17)</b>	<b>38.58</b> <b>(20.80)</b>	<b>38.84</b> <b>(19.50)</b>	<b>38.89</b> <b>(20.86)</b>
<b>Total Costs</b>	<b>170.52</b> <b>(100.00)</b>	<b>185.59</b> <b>(100.00)</b>	<b>199.13</b> <b>(100.00)</b>	<b>185.08</b> <b>(100)</b>

Figures in parentheses are percentage to total costs.

**Table 2. Per bird overall gross and net returns in broiler poultry farms in Jaipur district of Rajasthan (in Rs.)**

Sources of receipts	Gross and net returns			Overall avg.
	2010-11	2011-12	2012-13	
<b>Sale of birds (Broilers)</b>	191.72 (95.87)	224.39 (96.38)	252.15 (96.57)	222.75 (96.34)
<b>Sales of manures</b>	8.15 (4.07)	8.28 (3.56)	8.80 (3.37)	8.41 (3.60)
<b>Sale of empty gunnies</b>	0.12 (0.06)	0.13 (0.06)	0.16 (0.06)	0.14 (0.06)
<b>Gross returns (TR)</b>	199.99 (100.00)	232.80 (100.00)	261.11 (100.00)	231.30 (100.00)
<b>Total costs</b>	170.52	185.59	199.13	185.08
<b>Net returns (NR)</b>	29.47	47.21	61.98	46.22

in raising of broilers per bird was Rs.185.08. The total cost per bird incurred in broiler farms was increased in absolute amount Rs.170.52, Rs.185.59 and Rs.199.13 in year 2010-11, 2011-12 and 2012-13, respectively. The total cost as analyzed (Table 1), showed a definite and distinct increasing pattern overtime.

#### **Revenue structure of broiler farms**

Different components of the revenue in the broiler farms were sale of birds (broilers), sale of manures, and sale of empty gunny bags. Table 2 shows the overall weighted average gross returns. Per bird average gross returns were Rs.231.30. The average gross return was increasing over time in year 2010-11, 2011-12 and 2012-13, respectively. The average gross returns were Rs.199.99 per bird for year 2010-11 and Rs.232.80 per bird for year 2011-12 and Rs.261.11 per bird for year 2012-13. This shows the profitability of the broiler enterprise. The overall average net return for layer farms was Rs.46.22 per bird. The overall average net return

was increasing overtime *i.e.* Rs.29.47 per bird in 2010-11, Rs.47.21 per bird in 2011-12 and Rs.61.98 per bird in 2012-13.

The major source of revenue in the broiler farm was found to be sale of birds (broilers) *i.e.* Rs.222.75 per bird comprising 96.34 per cent of the gross returns. The returns from birds were increasing over time. The second major source of the broiler poultry farm was poultry manure (guano). On the average, sale of this byproduct added Rs.8.41 per bird with 3.60 per cent share in the gross return. From the sale of manure Rs.8.15 per bird with 4.04 per cent, Rs.8.28 per bird with 3.56 per cent and Rs. 8.80 per bird with 3.37 per cent of the gross return in year 2010-11, year 2011-12 and year 2012-13, respectively. It was increasing in the absolute amount over time. Sale of empty gunny bags was the last source of revenue in broiler production. The return from the empty gunny bag consisting 0.06 per cent of the gross return amounted Rs.0.14 per bird in absolute amount.

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Table 3. Per bird total cost incurred in layer farms during 2010-11 to 2012-13 in Jaipur district of Rajasthan (In Rs.)

Cost Item	Total cost		Overall* everage
	July'10 - Dec'11	Jan'12- June'13	
<b>Variable Costs</b>			
Cost of chicks	23.27 (4.12)	28.68 (4.47)	25.97 (4.33)
Feed	384.78 (68.15)	441.63 (68.96)	413.21 (68.64)
Veterinary expenses	47.35 (8.39)	56.80 (8.86)	52.08 (8.68)
Casual Labour	2.23 (0.39)	2.41 (0.37)	2.32 (0.38)
Miscellaneous	8.14 (1.45)	9.39 (1.46)	8.77 (1.45)
Transportation	29.24 (5.17)	33.94 (5.30)	31.59 (5.25)
Interest on working capital	6.93 (1.22)	8.14 (1.27)	7.53 (1.25)
Total Variable Costs	501.94 (88.89)	581.00 (90.72)	541.47 (90.01)
<b>Fixed Costs</b>			
Salary of permanent labour	20.25 (3.56)	21.20 (3.31)	20.73 (3.41)
Depreciation on buildings	8.50 (1.40)	7.56 (1.17)	8.03 (1.30)
Depreciation on vehicle	9.54 (1.68)	8.48 (1.33)	9.01 (1.46)
Depreciation on equipment	6.93 (1.12)	6.16 (0.94)	6.54 (1.05)
Interest on fixed capital	17.39 (3.07)	15.40 (2.04)	16.39 (2.66)
Land rent	1.62 (0.28)	2.52 (0.39)	2.07 (0.35)
Total Fixed Costs	62.71 (11.11)	59.38 (9.28)	61.04 (9.99)
Total Costs	564.65 (100.00)	640.38 (100.00)	602.51 (100.00)

Figures in parentheses are percentage to total costs.

\*layer production cycle is of 18 months.

**Table 4. Per bird overall gross and net returns in layer poultry farms in Jaipur district of Rajasthan (In Rs.)**

Sources of receipts	Overall gross and net returns*		Overall average*
	July'10- Dec'11	Jan'12-June'13	
Sale of the Eggs	669.74 (91.83)	766.30 (92.70)	718.03 (92.35)
Sale of birds	38.10 (5.22)	37.60 (4.54)	37.84 (4.81)
Sales of manures	19.31 (2.64)	20.59 (2.49)	19.95 (2.55)
Sale of empty gunnies	2.28 (0.31)	2.28 (0.27)	2.28 (0.29)
Gross Returns (TR)	729.43 (100.00)	826.77 (100.00)	778.10 (100.00)
Total Costs	564.65	640.38	602.51
Net Returns (NR)	164.79	186.39	175.59

Figures in parentheses are percentage to total return.

#### **Cost structure of raising layer farms**

In the present study, for the analysis of data, eighteen months of study period was considered to cover the maintenance of chicks and growing period of initial four months and fourteen months of production period of one batch of layer birds. The costs incurred for the mentioned period are presented in accordance with the two batches per bird and over all weighted averages of the farms in Table 3. The analysis revealed that feed cost was the major item of expenditure and it alone accounted 68.64 per cent of the total cost. Veterinary expenses were second most important expenses with 8.68 per cent followed by transportation cost constituting 5.25 per cent of the total cost. Feed cost was the major expense for layer farm. It accounted 68.64 per cent and in absolute amount Rs. 413.21 per bird of the total cost of production

(Table 3). It was constituting 384.78 per bird with 68.15 per cent in first batch (July, 2010-Dec, 2011) and Rs.441.63 per bird with 68.96 per cent in second batch (Jan, 2012- June 2013) of the total cost. The reason behind the high feed cost was regular consumption of feed by birds and longer gestation period. Veterinary expenses were accounted 8.68 per cent of the total costs that is in absolute amount were Rs. 52.08 per bird. It has increased over time with respect to absolute amount as well as proportion of total cost likewise 47.35 per bird (2010-11) with 8.39 per cent and Rs. 56.80 per bird (2012-13) with 8.86 per cent of the total cost. The casual labour constituted 0.38 per cent of the total cost with absolute amount Rs.2.32 per bird and permanent labour salary constituted 3.41 per cent with an absolute amount Rs.20.73 per bird of the total cost of production.



Transportation cost was amounted Rs.31.59 per bird comprising 5.25 per cent of the total cost. Due to remoteness and lacuna of local mandi (market) and regular requirement of transportation the cost indulged was higher. Interest on working capital was Rs.7.53 per bird with 1.25 per cent of total cost incurred in production process of layers. Due to return cycle after four months the interest on working capital was comparatively less. Depreciation on building, vehicle and equipment accounted 1.30 per cent, 1.47 per cent and 1.05 per cent of the total cost respectively. In the absolute amount Rs.8.03, Rs.9.01, Rs.6.54 per bird incurred in the depreciation on building, vehicle and equipment respectively. The depreciation was decreasing over time. Interest on fixed capital accounted Rs.16.39 per bird with 2.66 per cent of the total cost. Interest on fixed capital constituted 3.07 per cent and 2.04 per cent of the total cost for year 2010-11 and year 2012-13, respectively. Land rent accounted 0.35 per cent of the total cost amount Rs.2.07 per bird in absolute. In the layer production, the maximum proportion covered by variable costs which accounted 90.01 per cent that was Rs 541.47 per bird in absolute amount of the total cost. In the first batch the total variable cost was accounted Rs.501.94 per bird with 88.89 per cent and in second batch Rs.581.00 per bird with 90.72 per cent of the total cost. Total fixed cost accounted 9.99 per cent of the total cost. In absolute amount it was Rs.61.04 per bird. The total fixed cost incurred in first batch was Rs.62.71 per bird with 11.11 per cent of the total cost and in the second batch it was Rs.59.38 per bird with 9.28 per cent of the total cost. Total cost in the production of layer in absolute amount was Rs.602.51 per bird. It was Rs. 564.65 per bird in first batch and in second batch

Rs. Rs.640.38 per bird. The total cost showed a definite trend as scale of production and operation takes place. Emam and Hassan (2010) were studied that the other factors of production such as price of day-old chicks, price of (4 - 5 months) hens, mortality cost, vaccines and drugs and labour cost included in raising egg poultry production.

### **Revenue structure of layer poultry farms**

The source of revenue of the layer farm have been identified as sale of eggs, sale of birds (cock), sale of poultry manure and sale of empty gunny bags and were worked out in the following manner. Table 4 shows the overall weighted average gross returns were Rs 778.10 per bird for layer farms. The average gross return showed an increasing trend over time in two batches year 2010-11 and 2012-13 respectively. The average gross returns were Rs. 729.43 per bird for first batch July, 2010-Dec, 2011 and the average gross returns were Rs 826.77 per bird for second batch Jan 2012-June 2013. This showed the profitability of the layer enterprise over time. The overall average net return for layer farms was Rs.175.59 per bird. The overall average net return was increasing overtime *i.e.* Rs.164.79 per bird in first batch and Rs.186.39 per bird in second batch. The major source of revenue in broiler farms was found to be from scale of operations and size of farm. The returns from sale of eggs were Rs. 718.03 per bird comprising 92.35 per cent of gross return. The returns from sale of eggs were Rs.669.74 per bird with 91.83 per cent and Rs. 766.30 per bird with 92.70 per cent of the gross return in year 2010-11 and 2012-13, respectively. Similarly, Jadhav and Kashar (1990) has found that egg production is the largest source to returns in the layer farms.

Second major source of revenue in layer poultry farm was sale of cocks after the end of production process. Return from the sale of birds was Rs.37.84 per bird consisting 4.81 per cent of the gross return. Sale of poultry manure from the layer farm was Rs.19.95 per bird consisting 2.55 per cent of the gross return. The last source of revenue in the layer poultry farm was sale of empty gunny bags. It constituted 0.29 per cent of gross return with Rs.2.28 per bird overall weighted average.

### **Capital productivity of investment**

For capital investment analysis, market value of the capital is taken. To estimate stream of constant benefits, three year data of cost and returns were taken from farmers and average of three year data were extended up to 20 years assuming that market conditions will remain same for 20 years and net benefits will remain same for the period. Payback period, NPV, BC ratios and IRR were calculated at the 14 per cent rate of interest. Results showed that payback period calculated with gross data in broilers was 8 years whereas in layer farms it was three years. NPV of broiler farms was estimated to be Rs.52242.36 per farm at the 14 per cent rate of interest. Results were same with the Ahmad *et al* (2010). Further, IRR at broiler farm was 15 per cent whereas same at layer farm was 66 per cent. The entire above estimate shows that layer farms were more profitable than broiler farms but initial investments and running expenses in layer farms were very high.

As per the Livestock Census, 2007, the organized sector of Indian poultry industry contributes nearly 70% of the total output whereas the rest emanates from the unorganized sector. The present study was confined in the organized sector only. In the present study,

benefit-cost ratios were employed for measuring the economic viability of committed investment on poultry enterprise with respect to the size category and overall averages. The rate of interest was 14 per cents. This rate was chosen since it reflected the general rate of bank interest during the study period in the country. As presented the benefit cost ratio of overall averages for sample farms of broilers was 1.007 at 14 per cent rate of interest. Evidently the benefit cost ratio was comparatively profitable as it is more than one. As it is computed from analysis the benefit cost ratio of overall averages for sample farms of layer was 1.211 at 14 per cent rate of interest. Evidently the benefit cost ratio was comparatively profitable as it is more than one. As it is depicted at 14 per cent of interest, the net present value of gross data in broiler farms was Rs.52242.36. As it is depicted at 14 per cent of interest, the net present value of gross data in layer farms was Rs.6646553.87. This indicates that farms were economically viable after three years. IRR at broiler farm was 15 per cent whereas same at layer farms was 66 per cent. (Mahama *et al.*, 2013 found the similar finding). The profit rates were 113.20 per cent, 121.47 per cent, and 129.33 per cent in year 2010-11, year 2011-12 and year 2012-13 respectively. The overall average profit rates occurred 122.51. Therefore, the profit rates for all categories were more than 100. This again strengthened the viability of poultry farms. The profit rates were 129.18 per cent, 129.10 per cent, in year 2010-11 and year 2012-13 respectively. The overall average profit rates occurred 129.13. Therefore, the profit rates for all categories were more than 100. This again strengthened the viability of poultry farms.

## CONCLUSION

Feed cost in broiler and layer production was the major item of expenditure and it alone accounted for 46.84 per cent and 68.64 per cent of the total cost, respectively. The total variable cost covered 79.14 per cent and 90.01 per cent of the total cost in broiler and layer production, respectively. The total variable and fixed costs were increasing and decreasing over time. The average gross return was increasing over time in years 2010-11, 2011-12 and 2012-13, respectively. The overall weighted average of gross returns was Rs.1270616.00 for broiler farms. The overall weighted average of net returns was Rs.29.96 lakh for layer farms. The average gross return was increasing over time in two batches year 2010-11 and 2012-13 respectively. All calculated benefit-cost ratios were more than unity, NPV values were positive, profit rates were more than 100 and year wise and Batch wise analysis showed more and more solvency of the farms as their scale of operations expanded.

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