Economics of Layer Poultry Production in West Godavari District of Andhra Pradesh

ABSTRACT

The present study aims to analyze the economics and profitability of layer poultry farming in West Godavari district of Andhra Pradesh. The data was collected from three small, eleven medium and sixteen large layer poultry units using purposive random sampling. A pretested questionnaire was used to collect data from poultry farmers. The economic analysis reveals a positive net present value and benefit- cost ratio greater than one for small, medium and large layer poultry units, indicating economic viability. The internal rate of return for small firms is 39.15 per cent, while medium firms exhibit 72.07 per cent and large firms exhibit 78.03 per cent indicating substantial profitability in layer poultry units. Based on NPV, BCR and IRR, large layer farms were most profitable followed by medium and small layer farms. The layer had to produce a minimum of 22, 21 and 20 eggs in small, medium and large farms, respectively. The margin of safety stood at 277.51, 279.80 and 283.19 for small, medium and large farms, respectively. The higher margin of safety is on large farms over medium and small farms. The study revealed that poultry layer farming is a profitable business in West Godavari district. However, challenges such as adverse climatic conditions affecting birds with attack of viral diseases and high cost of inputs are major production constraints. High price fluctuations and lack of co-operating marketing facilities are major marketing constraints.

Keywords: Poultry; layer farms; NPV; BCR; IRR

1. INTRODUCTION

Poultry sector is now playing a significant role and contributing to the overall wellbeing of people especially creating employment opportunities, improving food security, livelihood and nutrition. India ranks 3rd in egg production. During the year 2022-23, the total egg production in the country is 138.38 billion numbers. The per-capita availability of egg is 101 eggs per annum. The total egg production from commercial poultry is 118.16 billion numbers and backyard poultry are 20.20 billion numbers contributing 85.40 per cent and 14.60 per cent of total production of egg respectively. The India poultry market size reached INR 2,099.2 billion in 2023. The animal husbandry enterprise with the fastest pace of expansion in India is layer farming.

Layer poultry farming means raising egg-laying poultry birds for the purpose of commercial egg production. Layer chickens are such a special species of hens, which need to be raised from when they are one day old. They start laying eggs commercially from 18-19 weeks of age. They continue laying eggs continuously till their 72-78 weeks of age. They can produce about one kg of eggs by consuming about 2.25 kg of food during their egg laying period (Poultry India, 2024).

Andhra Pradesh is the top egg-producing state in India, contributing around 20 per cent of the country's total egg production. Andhra Pradesh's dominance in egg production is due to its favourable climate and well-developed poultry infrastructure. The state's four districts of East Godavari, West Godavari, Krishna and Guntur produce 75 per cent of the state's eggs. The research study on "Economic Analysis of Layer Poultry Units in West Godavari District of Andhra Pradesh" is opt at the moment. The different breeds of poultry birds that lay brown and white coloured eggs are BV-300 and Island-300. The present study is aims to study the economic analysis of layer poultry units of different sizes in this district.

2. LITERATURE REVIEW

Kumar (2017) studied the economics of large scale poultry production in Sehore district of Madhya Pradesh, revealed that the investment on chick feed was found to be on an average Rs. 2,13,333 per farm, which accounted Rs. 24.49 per bird. On the other hand, the investment on grower feed was found to be on an average Rs. 9,53,467 per farm, which accounted Rs. 117.71 per bird. The study also revealed that, investment

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on layer feed was found to be on an average of Rs. 24,88,800 per farm, which accounted Rs. 341.40 per bird. The first rank confronted by 100.00 per cent of poultry growers was high cost of establishment and non-availability of proper market followed by the problems confronted by 80.00 per cent of poultry growers (rank second) were high cost of variable inputs and lack of storage facilities respectively. The next important but nominal constraints ranked third confronted by 60.00 per cent of poultry growers was lack of capital, non-availability of resources and physical and natural hazards followed by the problems confronted by 40.00 per cent of poultry growers (rank fourth) were unavailability of skilled labour, lack of knowledge and lack of risk bearing ability respectively.

Osti et al. (2016) conducted study on economic analysis of poultry egg production in Nepal and revealed that variable and fixed cost in small, medium & large farm were Rs. 161.659, Rs. 190.58, Rs. 142.58 and Rs. 13.53, Rs. 3.21, Rs. 0.48 per 100 birds, respectively, and net return were Rs. 316.22, Rs. 163.65, Rs. 640.20 per 100 birds, respectively.

Dadore (2015) ascertained the problems of production and marketing of eggs in Indore district of Madhya Pradesh. He reported that rising prices of feed, seasonal fluctuation in demand, high transportation cost, lack of producers organization and lack of marketing infrastructures were the constraints faced by the producers.

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Ghasura (2013) identified the constraints in poultry farming by collecting data from 110 poultry farm entrepreneurs in Banaskantha district of Gujarat. The constraints faced were non-availability of chicks. Most poultry entrepreneurs faced low egg prices during summer, high cost of feed and medicine, lack of adequate credit facilities, fluctuating prices for the poultry products, increased risks and uncertainty of the poultry enterprise, high mortality of chicks and non-availability of veterinary aids.

Soumya (2012) studied the economic analysis of poultry farming (layers) in Chittoor district of Andhra Pradesh and revealed that the B:C ratio was highest in large farms (1.22) followed by medium (1.18) and small farms (1.14). The internal rate of return also highest in large farms (88.45) followed by medium (73.93) and small farms (59.42) showed an increasing trend with increase in farm-size. The margin of safety is highest on large farms over medium and small farms in her research on the break-even analysis of layer poultry units.

Halkatti et al. (2010) studied economics of broiler production by trained and untrained farmers. The study conducted at Haveri district of Karnataka revealed that feed cost was the major expenditure in broiler production, which accounted for nearly 60 per cent of the total cost. The total cost of production per bird for the trained and untrained farmers was Rs. 46.57 and Rs. 54.25, respectively. The cost of feed, total variable cost and total cost was less in case of trained farmers. The total net returns was more than double in case of trained farmers compared to untrained farmers. B: C ratio was also more in case of trained farmers.

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Abdul et al. (2008) studied the profitability analysis of broiler production in Rawalpindi district. He revealed that the B:C ratio was highest in large farms (1.34) followed by medium (1.10) and small farms (0.95). The net present worth also highest in large farms (Rs. 239424) followed by medium (Rs. 115988) and small farms (Rs. 126932), showed an increasing trend with the increase in farm-size. However, the investment on all farm-sizes turned out to be an economically viable as the net present worth was positive in all the farms.

Khamdev (2006) studied that total cost of production, consist the fixed and variable cost, of poultry production in Bhopal division of Madhya Pradesh. The cost of production of a bird was Rs. 398.57 for its total life span. It also shows that the highest total cost per bird was incurred in commercial scale i.e. Rs. 411.24 per bird followed by Rs. 385.90 per bird for non-commercial unit. It was also found that the net return per bird was Rs. 47.63 in their life span, which comes to Rs. 31.75 yearly income per bird. The net return per bird varied to on an average of Rs. 40.93 for commercial and Rs. 54.34 for non-commercial unit.

Varma (2004) made an attempt to analyze the economics of layer farms in Indore district of Madhya Pradesh. He examined the costs and returns per year, the net return, cost of production per egg and benefit-cost ratio on small, medium and large size-groups of layer farms. The results of the study revealed the total cost of maintenance per layer per cycle on an average worked out to be Rs. 443.32. It was higher in small farms at Rs. 455.50 than in large farms Rs. 431.05 indicating decreased trend with the increase in the size of layer farms.

Kumar and Rai (2004) studied the economic status of poultry farming enterprises in Andaman and Nicobar Islands. The study compared the investment patterns, labour utilization pattern, cost and returns and

14 efficiency measures of small (300 birds), medium (900 birds) and large (1500) farms. The total cost per bird was found to be Rs. 68.84, Rs. 65.85 & Rs. 63.07, respectively. The net return per bird was Rs 8.36 for small farms, Rs. 11.35 and Rs. 14.13 for medium and large farms, respectively. The study revealed that the BC ratio of all three categories was even and was 1.13, 1.19 and 1.24, respectively. The study concluded that the broiler farming was a profitable enterprise and a main source of income to a sizable number of farmers.

Farooq et al. (2003) concluded in his study on poultry farming in Chakwal, Pakistan, that the total cost of production, gross return and net profit per layer was Rs. 393.88, Rs. 432.01 and Rs. 38.26, respectively. Mean feed cost per layer was Rs. 302.23 which included Rs. 10.27, Rs. 29.19 and Rs. 262.77 for starter, grower and layer ration, respectively. Feed cost was the major component contributing 76.73 per cent to the total cost of production. Gross return from the sale of marketable eggs, culled eggs, culled birds, empty bags and manure were Rs. 388.84, Rs. 3.85, Rs. 35.80, Rs. 2.20 and Rs. 1.45, respectively, forming 89.98, 0.89, 8.28, 0.51 and 0.34 per cent of the total returns, respectively.

3. METHODOLOGY

The study was conducted in Tadepalligudem and Attili mandals of West Godavari district of Andhra Pradesh. The layer farms are grouped into 3 categories based on number of birds, small (below 10000 birds), medium farms (10000-20000 birds) and large farms (20000 and above birds). 3 farms are selected from small size, 11 farms are selected from medium size and 16 farms are selected from large size. Total 30 layer poultry farms are considered for the study.

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3.1 Net Present Value

It is also sometimes referred as net present worth (NPW). It is the present worth of the incremental net benefits or incremental cash flow stream. Net present value (NPV) of a project is estimated using the following formula.

$$NPW = \sum_{j=1}^{n} \frac{B_j - C_j}{(1+i)^j}$$

Where B_j = Benefits in jth year

C_j = Costs in jth year

i = Discount rate

n = Number of years

The net present value (NPV) should be positive to indicate that the project investment is economically viable.

3.2 Benefit-Cost ratio (BCR)

It is the ratio of present value of costs and present value of benefits. For any project to be viable, Benefit-Cost ratio should be more than one. The project with highest Benefit-Cost ratio must be opted for implementation among the alternative projects. Benefit-Cost ratio is calculated using the following formula.

$$BCR = \sum_{j=1}^{n} \frac{B_{j/(1+i)^j}}{C_{j/(1+i)^j}}$$

Where B_j = Benefits in rupees in jth year

C_j = Costs in rupees in jth year

I = Discount rate

n = Number of years

In the present investigation, the net present value (NPV) and benefit-cost ratio (BCR) were calculated at 15, 20 and 25 per cent discount rates.

3.3 Internal Rate of Return (IRR)

It represents the average earning capacity of an investment over the economic life period of the project. It is the discount rate at which the present values of cash flows are just equal to zero i.e., NPW = 0. In other words, the benefit cost ratio calculated at IRR is unity. Mathematically, it can be represented as

$$\text{IRR} = \sum_{j=1}^{n} \frac{B_j - C_j}{(1+i)^2} - \text{I}$$

Where B_j = Benefits in rupees in jth year

C_j = Costs in rupees in jth year

i = Discount rate

n = Number of years

I = Initial investment

When the calculated IRR is greater than the market rate of interest, then the investment in the project is considered viable and worthy.

3.4 Break- even point

The break-even quantity is that point of production where the farmers neither gain profit nor incurs loss. The break-even output in this study pertains to break- even sale number of eggs. The steps involved in finding out the break-even sale number of eggs are as follows:

1. Break-even sale value of eggs

$$= \frac{Fixed\ cost}{Percentage\ contribution\ of\ sale\ of\ eggs} \times 100$$

2. Break-even sale number of eggs

$$= \frac{Break\text{-}even\ sale\ value\ of\ eggs\ per\ layer \times egg\ production\ per\ layer}{Sale\ value\ of\ eggs\ per\ layer}$$

3.5 Garrett Ranking Technique

The constraints of layer poultry farms were measured by applying Garrett ranking procedure. The order of merit given by the respondents were converted into rank by using the formula. To find out the most significant factor that associated with the respondent, Garrett's ranking technique was used. As per this method, respondents have been asked to assign the rank for all factors and the outcomes of such ranking have been converted into score value with the help of the following formula:

$$\text{Per cent position} = \frac{100\left(R_{ij} - 0.5\right)}{N_j}$$

Where, R_{ij} = Rank given for the ith variable by jth respondents

N_j = Number of variables ranked by jth respondents

4. RESULTS AND DISCUSSION

4.1 Economic Viability of Layer Farms

The results for economic viability of different sized layer farms are presented in Table 1. The net present value of large farms at 15% discount rate is Rs. 422,158,735 whereas for medium and small farms is Rs. 78,433,039 and Rs. 3,018,893 respectively. The BCR for small, medium and large farms are 1.11, 1.26 and 1.38, respectively. The net present worth of small, medium and large layer farms at 20% discount rate are Rs. 1,959,311. Rs. 8,981,592 and Rs. 32,521,136 respectively and the corresponding BC-ratios are 1.08, 1.09 and 1.20 respectively. The net present worth of small, medium and large layer farms at 25% discount rate are Rs. 1,203,438. Rs. 176,068,105 and Rs. 968,157,350 respectively and the corresponding BC-ratios are 1.05, 1.06 and 1.17 respectively. The Net Present Worth is highest for large farms followed by medium and small farms at three discount rates. The net present values for all the farms are positive at both 15, 20 and 25% discount rates which in turn prove the economic viability of farms. The Benefit-Cost Ratio was positively related with farm-size and the large farms were economically more viable. The IRR is highest for large (78.03%) farms by

medium (72.07%) and small (39.15%) farms. The internal rate of return is higher than that of the discount rate for all sizes of followed farms which implies that investment is feasible.

Table 1. Economic viability of layer farms of different sizes **(In ₹)**

Particulars	Discount rates (%)		
	15	**20**	**25**
	Small farms		
NPV(Rs.)	3,018,893	1,959,311	1,203,438
B-C ratio	1.11	1.08	1.05
IRR (%)	39.15		
	Medium farms		
NPV(Rs.)	78,433,039	8,981,592	176,068,105
B-C Ratio	1.26	1.09	1.06
IRR (%)	72.07		
	Large farms		
NPV(Rs.)	422,158,735	32,521,136	968,157,350
B-C Ratio	1.38	1.20	1.17
IRR (%)	78.03		

Abdul et al. (2008) reported similar results that the net present worth also highest in large farms (Rs. 2,39,424) followed by medium (Rs. 1,15,988) and small farms (Rs. 1,26,932), showed an increasing trend with the increase in farm-size.

Soumya (2012) reported the similar results that the internal rate of return is highest for large farms (88.45) followed by medium (73.93) and small farms (59.42) in her research on layer poultry units in Chittoor district of Andhra Pradesh.

4.2 Break even analysis

Break-even analysis was carried out with a view to find out the minimum number of eggs produced per layer so as to make the enterprise to run on no loss – no profit basis. From the Table 2, it is noticed that the layer had to produce a minimum of 22, 21 and 20 eggs in small, medium and large farms, respectively. The margin of safety stood at 277.51, 279.80 and 283.19 for small, medium and large farms, respectively. The higher margin of safety is on large farms over medium and small farms. The above analysis clearly indicated the profitable nature of layer farming

Table 2. Break-even analysis of layer farming (per layer)

	Farm Size		
Particulars	**Small**	**Medium**	**Large**
Sale value of eggs (Rs)	1142	1222	1183
Total variable cost (Rs)	923.6	961.8	844.89
Net variable cost (Rs)	859.28	906.57	787.68
Percentage of net variable cost to sale value of eggs	75.24	74.19	66.58
Fixed cost (Rs)	21.19	22.22	25.85
Break-even sale value of eggs (Rs)	85.59	86.08	77.35
Break-even number of eggs	22.49	21.20	19.81
Average egg production (in number)	300	301	303
Margin of safety	277.51	279.80	283.19

Soumya (2012) got similar results that margin of safety is highest on large farms over medium and small farms in her research on the break-even analysis of layer poultry units in Chittoor district of Andhra Pradesh.

4.3 Constraints faced by layer poultry farms

The layer poultry units were studied to determine constraints in the production of layer poultry farm. It was observed from the table 3, high cost of inputs was the first ranked constraint in layer poultry farming of mean score 60.77, followed by attack of viral diseases was ranked second constraint with a mean score 59.27, lack of insurance protection was ranked third constraint with a mean score 57.60, high cost of chicks was ranked fourth constraint with mean score 56.73, high electricity charges was ranked fifth constraint with mean score 55.07 and high cost of establishment, non-availability of timely chicks, labour shortage and lack of storage facility were ranked 6th, 7th, 8th and 9th constraints respectively in layer poultry farming. There were four marketing problems observed in the study area. High price fluctuations is the first ranked constraint in marketing of layer poultry units of mean score 63.93, followed by lack of co-operating marketing facilities was ranked second with a mean score 61.40, low wholesale price of egg was ranked third constraint with mean score 48.73 and lack of grading was ranked fourth constraint with mean score 37.33 in marketing of layer poultry units.

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There were four marketing problems observed in the study area. It was observed from the table 3, high price fluctuations was the first ranked constraint in marketing of layer poultry units of mean score 63.93, followed by lack of co-operating marketing facilities was ranked second with a mean score 61.40, low wholesale price of egg was ranked third constraint with mean score 48.73 and lack of grading was ranked fourth constraint with mean score 37.33 in marketing of layer poultry units.

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Table 3. Production and Marketing constraints

Constraints faced by the farmers in production

Constraints	Layer farms (n=30)	
	Per cent position	Rank
Production constraints		
High cost of inputs	60.76	I
Attack of viral diseases	59.26	II
Lack of insurance protection	57.60	III
High cost of chicks	56.73	IV
High electricity charges	55.06	V
High cost of establishment	51.26	VI
Non-availability of timely chicks	46.20	VII
Labour shortage	37.33	VIII
Marketing constraints		
High price fluctuation	63.93	I
Lack of co-operating marketing facilities	61.40	II
Wholesale price of egg is low	48.73	III
Lack of grading	37.33	IV

5. CONCLUSION

The net present worth is highest for large farms followed by medium and small farms at three discount rates which in turn prove the economic viability of farms. The Benefit-Cost Ratio was positively related with farm-size and the large farms were economically more viable. The internal rate of return is higher than that of

the discount rate for all sizes of farms which implies that investment is feasible. The small, medium and large poultry layer farms are economically feasible at 15%, 20% and 25% discount rates as NPV is positive and BCR is greater than 1. Based on NPV, BCR and IRR, large layer farms were most profitable followed by medium and small layer farms. The overall break- even output of the production, layer had to produce a minimum of 22, 21 and 20 eggs in small, medium and large farms, respectively. The higher margin of safety is on large farms over medium and small farms. Thus, the layer poultry farming clearly indicated the profitable nature of layer farming. The major problems faced by the layer poultry units are high cost of inputs, attack of viral diseases high price fluctuations and lack of co-operating marketing facilities.

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