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Production and marketing of poultry eggs in Rajnandgaon district, Chhattisgarh

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Abstract

A field experiment was conducted at the Rajnandgaon district, College of Agriculture Raipur, Indira Gandhi Krishi Vishwavidyalaya, Raipur (Chhattisgarh). During season of 2020-21 with a view to study the "Production and marketing of poultry eggs in Rajnandgaon district, Chhattisgarh". The data were collected from selected poultry farms and from selected marketing intermediaries. The study was obtaining correct and perfect information from the respondents, it was decided to collect information through personal interview using interview schedule. The data collected during the period of inquiry were compiled and analyzed systematically keeping in view the objectives of the study, the major analytical tools employed for the study was Simple arithmetic averages and percentages were worked out to arrive at costs, returns and production efficiency measures. Functional analysis was used to estimate resource productivity. Seasonal price index was carried out to see the variation of prices according to the seasons. Garrett's ranking technique was used to identify the constraints in the poultry farming and marketing. Generally in any economic study, total costs are discussed under two heads viz., variable costs and fixed costs. On the basis of the above finding, the average total variable cost and total fixed cost was found highest at per farm. The gross return, net returns per layer and benefit: cost ratio was observed highest for large farms.

Keywords: Poultry farms, marketing intermediaries, analytical tools, production efficiency, resource productivity, break-even analysis, Garrett's ranking, egg production, large farms

Introduction

Poultry farming is the form of animal husbandry which raises domesticated birds such as chickens, ducks, turkeys and geese to produce meat or eggs for food. It has originated from the agricultural era. Poultry mostly chickens are farmed in great numbers. More than 60 billion chickens are killed for consumption annually. Chickens raised for eggs are known as layers, while chickens raised for meat are called broilers. During the past four decades, the annual output of eggs has gone up by over eight times, and hence the marketing of poultry is the fast-growing industry. The development of farming has been given priority to help small rural farmers in the unorganized sector. It is also planned to ensure easy access to all necessary facilities, including inputs, credit and marketing. Hence, a study of the poultry industry and its commercial viability is of particular importance. Poultry farming is initiated by thousands of rural as well as semi-urban masses. Poultry farming with low capital investment produces employment opportunities for rural and semi urban people. (Wikipedia.com).

Augmenting the production of laying chickens and improving farmers' returns by effective production planning and marketing will improve farm incomes. Laying chickens are prolific, easy to raise and adaptable to various climates and altitudes and are an excellent diversification activity for small farmers. (www.researchgate.net, Martin Hilmi, 2019) [13]

India ranks third in production of eggs and eight in meat production in the world, said The Economic Survey 2021-22. Egg production in the country has increased from 78.48 billion in 2014-15 to 122.11 billion in 2020-21) taking the per capita availability of eggs to 91 eggs per annum in 2020-21. (<https://m.economicstimes.com>) In Chhattisgarh 8.0 million poultry are contributing 0.9 billion eggs per annum. (icar.org.in)

Egg is the cheapest source of high-quality human food. It is an important source of unsaturated fatty acids, minerals especially iron and phosphorus and almost all the vitamins except vitamin C, thus forming well balanced source of nutrients. Egg is not only superb in nutritive value, but also it is very palatable, easily digestible and can be served in different ways.

Materials and Methods

The field experiment was conducted at the Rajnandgaon district, College of Agriculture Raipur, Indira Gandhi Krishi Vishwavidyalaya, Raipur (Chhattisgarh). The total poultry population in Chhattisgarh was 1, 10, 64,700 out of these, 32.68 per cent poultry population were found in Rajnandgaon district, 21.92 per cent in Dongargarh, Mohla, Chhuikhadan, Khairagarh, Dongargaon, Chhuriya, Ambagarh Chowki, Manpur districts and 45.4 per cent of poultry population is found in remaining districts of Chhattisgarh. Rajnandgaon district covers highest number of poultry population. Hence, Rajnandgaon district was selected for this study. For the study of marketing channels and price spread of egg marketing, concerned intermediaries, viz., traders, wholesalers and retailers were interviewed.

Considering the nature of the study and for obtaining correct and perfect information from the respondents, it was decided to collect information through personal interview using interview schedule. A well-structured schedule was prepared and questions were posed to each layer farmer in order to obtain required information on production and marketing of eggs. Data regarding capital investment, costs and returns and various distribution channels used for marketing of eggs were collected from the selected layer farmers through survey method. On the basis of the above finding, the gross return, net returns per layer and benefit: cost ratio was observed highest for large farms. The break-even analysis revealed that the producers had to maintain minimum of eggs in large farms, and Egg production per farm was found highest in large farms.

Results and Discussion

Data pertaining to cost analysis of egg production, egg production, cost-price relationship, gross returns, net return and benefit : cost ratio influenced by various treatment has been given in table 1, 2, 3, 4, 5, 6, 7 & 8 and fig 1(a) & (b), 2(a) & (b), 3(a) & (b), 4, 5(a) & (b), 6(a) & (b) and 7.

The profitability of any enterprise depends upon income generating capacity and cost structure. The average total cost was ₹ 21217318.55 per farm and ₹ 953.07 per layer for the sample as a whole. It can be also observed that on an average variable cost formed 97.55 and 97.55 per cent of total cost per farm and per layer, respectively, whereas, fixed cost accounted for 2.45 and 2.45 per cent of total cost per farm and per layer respectively. This finding is similar with the earlier findings of Verma and Singh (2008) [22] and Bhullar *et al.* (2012) [2].

Total average cost per layer can be noticed that it was highest, ₹ 952.95 on large farms, followed by ₹ 952.57 on medium farms and ₹ 953.70 on small farms. The average total variable cost was ₹ 20697500.85 and ₹ 929.72 per farm and per layer, respectively and the average total fixed cost was ₹ 519817.70 and ₹ 23.35 per farm and per layer, respectively. This findings validate our earlier formed hypothesis two *i.e.*, cost of production per layer is lower in large farms as compared to small and medium farms. This finding is similar with the earlier findings of Bhullar *et al.* (2012) [2], Dileshwar (2012) [5] and Dadore (2015) [3].

Egg production per farm and per layer could be recorded from the present investigation that egg production per farm was 2121136 numbers, 4334410 numbers and 13522800 numbers in small, medium and large farms, respectively, with an overall egg production of 6659449 numbers for the sample as a whole and egg production per layer was 296 numbers, 298 numbers and 300 numbers in small, medium and large farms, respectively, with an overall egg production per layer was 298 numbers for the sample as a whole.

It is the cost-price relationship that generally decides the economic prosperity and the degree of commercialization on these farms. The cost of production per egg was ₹ 3.22, ₹ 3.20 and ₹ 3.18 in small, medium and large farms, respectively; with an overall cost of production per egg was ₹ 3.20 for the sample as a whole.

An average gross return obtained from the sale of eggs was ₹ 1341 (93.58 %) per layer and the gross return was worked out as ₹ 1424, ₹ 1432 and ₹ 1442 per layer in small, medium and large farms, respectively, with overall ₹ 1433 per layer for the sample as a whole.

The net profit per farm was ₹ 3370169.8, ₹ 6973309.35 and ₹ 22044417.8 in small, medium and large farms, respectively, with an overall ₹ 10684127.45 per farm for the sample as a whole. Similarly, the net return per layer was also worked out as ₹ 470.30, ₹ 479.43 and ₹ 489.05 in small, medium and large farms, respectively, with an overall ₹ 479.93 per layer for the sample as a whole. As the farm size increases, the net return per farm as well as per layer also increases which might be due to reduced production cost in large farms followed by medium and small farms. The above observations are in agreement with the earlier observation of Bhullar *et al.* (2012) [2], Dileshwar (2012) [5] and Dadore (2015) [3].

The benefit: cost ratio was 1.49, 1.50, and 1.51 for small, medium and large farms, respectively, with an overall 1.50 for the sample as a whole. The benefit: cost ratio increased with increase in farm size which indicated that as the size increase, the net margin over the rupee invested on layers also increased.

Table 1: Cost of production per farm and per layer

Particulars	Farm size			
	Small	Medium	Large	Overall
Different cost (Rs. /farm)				
Variable cost	6667246.40 (97.56)	13514050.40 (97.54)	41904903.40 (97.55)	20697500.85 (97.55)
Fixed cost	166967.80 (2.44)	341080.25 (2.46)	1050270.80 (2.45)	519817.70 (2.45)
Total cost	6834214.20 (100.00)	13855130.65 (100.00)	42955174.20 (100.00)	21217318.55 (100.00)
Different cost (Rs./layer)				
Variable cost	930.40 (97.56)	929.12 (97.54)	929.65 (97.55)	929.72 (97.55)
Fixed cost	23.30 (2.44)	23.45 (2.46)	23.30 (2.45)	23.35 (2.45)
Total cost	953.70 (100.00)	952.57 (100.00)	952.95 (100.00)	953.07 (100.00)

Table 2: Breakup of the total cost of production per layer farm (₹/ farm)

Sr. No	Particulars	Farm size			
		Small	Medium	Large	Overall
I.	Variable cost				
1.	Chick cost	218563.00 (3.20)	442168.00 (3.19)	1356787.60 (3.16)	675280.67 (3.18)
2.	Feed cost	6091100.00 (89.13)	12334160.00 (89.02)	38179372.00 (88.88)	18885596.67 (89.01)
3.	Labour cost	74526.40 (1.09)	161740.40 (1.17)	567957.60 (1.32)	253193.15 (1.19)
4.	Health cover	53745.00 (0.79)	113451.00 (0.82)	358354.20 (0.83)	172530.50 (0.81)
5.	Electricity charges	128988.00 (1.89)	270537.00 (1.95)	829398.40 (1.93)	408136.67 (1.92)
6.	Miscellaneous cost	25081.00 (0.37)	52362.00 (0.38)	171288.80 (0.40)	80885.27 (0.38)
7.	Interest on working capital	75243.00 (1.10)	139632.00 (1.01)	441744.80 (1.03)	221877.93 (1.05)
	Total Variable cost	6667246.40 (97.56)	13514050.40 (97.54)	41904903.40 (97.55)	20697500.85 (97.55)
II.	Fixed cost				
1.	Depreciation on building	144036.60 (2.11)	294536.25 (2.13)	892504.80 (2.08)	446353.10 (2.10)
2.	Depreciation on equipment's	15048.60 (0.22)	31999.00 (0.23)	117197.60 (0.27)	51202.60 (0.24)
3.	Miscellaneous fixed cost	7882.60 (0.12)	14545.00 (0.10)	40568.40 (0.09)	22262.00 (0.10)
4.	Total fixed cost	166967.80 (2.44)	341080.25 (2.46)	1050270.80 (2.45)	519817.70 (2.45)
III.	Total cost (variable + fixed)	6834214.20 (100.00)	13855130.65 (100.00)	42955174.20 (100.00)	21217318.55 (100.00)

Table 3: Breakup of the total cost of production per layer (₹/ layer)

Sr. No	Particulars	Farm size			
		Small	Medium	Large	Overall
I.	Variable cost				
1.	Chick cost	30.50 (3.20)	30.40 (3.19)	30.10 (3.16)	30.33 (3.18)
2.	Feed cost	850.00 (89.13)	848.00 (89.02)	847.00 (88.88)	848.33 (89.01)
3.	Labour cost	10.40 (1.09)	11.12 (1.17)	12.60 (1.32)	11.37 (1.19)
4.	Health cover	7.50 (0.79)	7.80 (0.82)	7.95 (0.83)	7.75 (0.81)
5.	Electricity charges	18.00 (1.89)	18.60 (1.95)	18.40 (1.93)	18.33 (1.92)
6.	Miscellaneous cost	3.50 (0.37)	3.60 (0.38)	3.80 (0.40)	3.63 (0.38)
7.	Interest on working capital	10.50 (1.10)	9.60 (1.01)	9.80 (1.03)	9.97 (1.05)
	Total Variable cost	930.40 (97.56)	929.12 (97.54)	929.65 (97.55)	929.72 (97.55)
II.	Fixed cost				
1.	Depreciation on building	20.10 (2.11)	20.25 (2.13)	19.80 (2.08)	20.05 (2.10)
2.	Depreciation on equipment's	2.10 (0.22)	2.20 (0.23)	2.60 (0.27)	2.30 (0.24)
3.	Miscellaneous fixed cost	1.10 (0.12)	1.00 (0.10)	0.90 (0.09)	1.00 (0.10)
4.	Total fixed cost	23.30 (2.44)	23.45 (2.46)	23.30 (2.45)	23.35 (2.45)
III.	Total cost (variable + fixed)	953.70 (100.00)	952.57 (100.00)	952.95 (100.00)	953.07 (100.00)

Table 4: Egg production according to farm size

Category of farms	No. of egg produced	
	Per farm	Per layer
Small	2121136	296
Medium	4334410	298
Large	13522800	300
Overall	6659449	298

Table 5: Production cost per egg

Sr. No	Particulars	Farm size			
		Small	Medium	Large	Overall
1.	Cost of production (Rs. / layer)	953.70	952.57	952.95	953.07
2.	Receipts other than eggs (Rs.)	92.00	91.00	92.00	92.00
3.	Total no of eggs produced/ layer	296.00	298.00	300.00	298.00
4.	Production cost per egg (Rs.)	3.22	3.20	3.18	3.20

Table 6: Gross returns from different sources (In ₹)

Particulars	Farms size groups			
	Small	Medium	Large	Overall
1. Sale of eggs				
Per farm	9545112	19504845	60852600	29853342
Per layer	1332 (93.54)	1341 (93.65)	1350 (93.62)	1341 (93.58)
2. Sale of culled birds				
Per farm	573280	1163600	3606080	1780960
Per layer	80 (5.62)	80 (5.59)	80 (5.55)	80 (5.58)
3. Sale of manures				
Per farm	71660	145450	450760	222620
Per layer	10 (0.70)	10 (0.70)	10 (0.69)	10 (0.70)
4. Sale of gunny bags				
Per farm	14332	14545	90152	44524
Per layer	2 (0.14)	1 (0.07)	2 (0.14)	2 (0.14)
Total				
Per farm	10204384	20828440	64999592	31901446
Per layer	1424 (100.00)	1432 (100.00)	1442 (100.00)	1433 (100.00)

Table 7: Net return per farm and per layer (In ₹)

Particulars	Farms size			
	Small	Medium	Large	Overall
Production cost				
Per farm	6834214.20	13855130.65	42955174.20	21217318.55
Per layer	953.70	952.57	952.95	953.07
Per egg	3.22	3.20	3.18	3.20
Gross return				
Per farm	10204384	20828440	64999592	31901446
Per layer	1424	1432	1442	1433
Per egg	4.50	4.50	4.50	4.50
Net return				
Per farm	3370169.8	6973309.35	22044417.8	10684127.45
Per layer	470.30	479.43	489.05	479.93
Per egg	1.28	1.3	1.32	1.30

Table 8: Benefit: Cost ratio in different Farm size

Sr. No.	Particulars	Farm size			
		Small	Medium	Large	Overall
1.	Total return per layer (Rs.)	1424	1432	1442	1433
2.	Total cost of production per layer (Rs.)	953.70	952.57	952.95	953.07
3.	Benefit: Cost Ratio	1.49	1.50	1.51	1.50

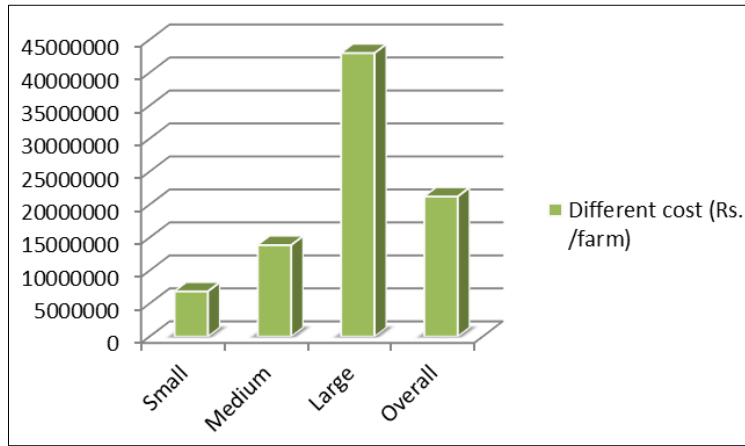


Fig 1(a): Different cost (Rs./farm)

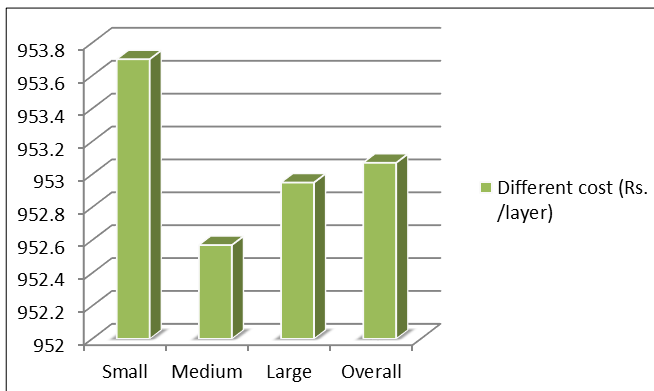


Fig 1(b): Different cost (Rs./layer)

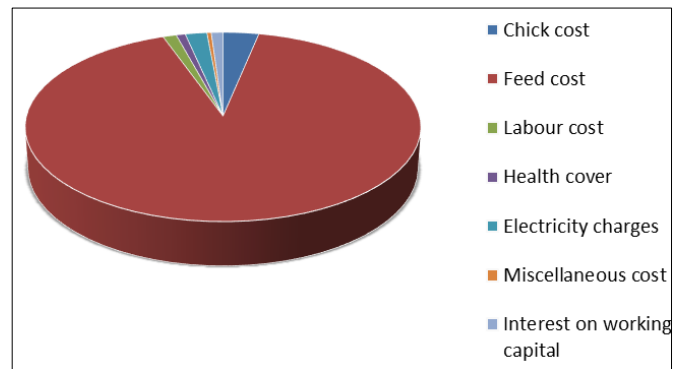


Fig 3(a): Total cost of production per layer Variable cost

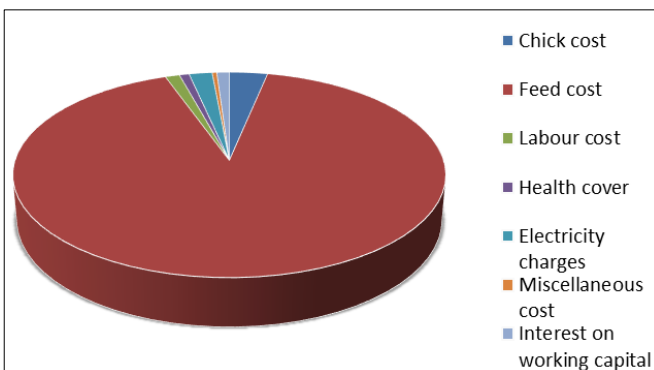


Fig 2(a): Total cost of production per farm Variable cost

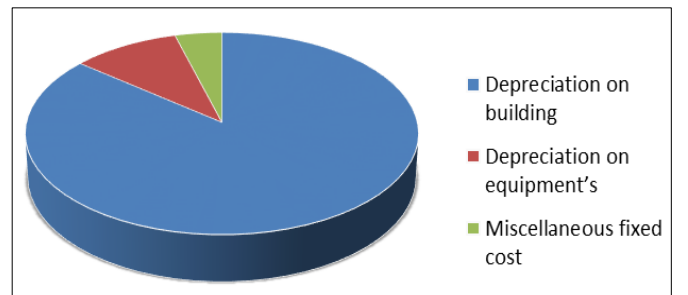


Fig 3(b): Total cost of production per layer fixed cost

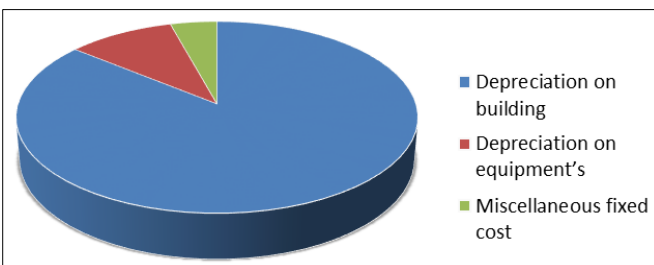


Fig 2(b): Total cost of production per farm fixed cost

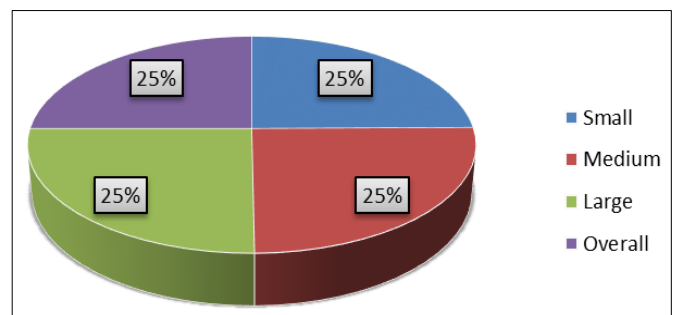


Fig 4: No. of egg produced per layer

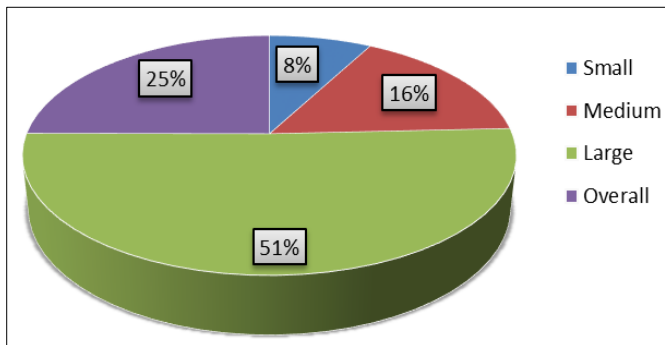


Fig 5(a): Gross returns from different sources per farm

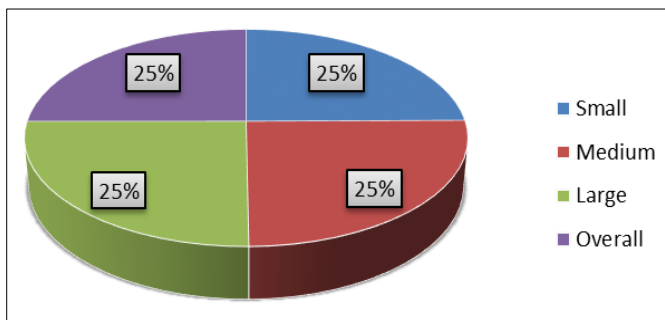


Fig 5(b): Gross returns from different sources per layer

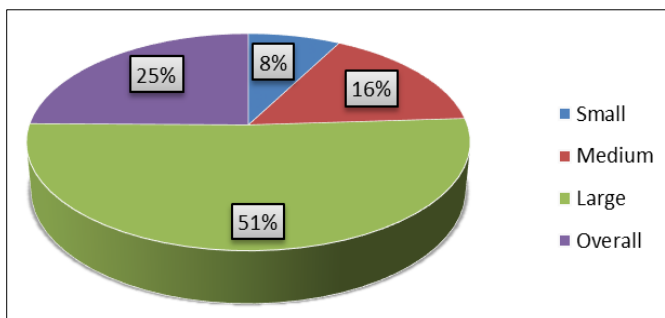


Fig 6(a): Net returns from different sources per farm

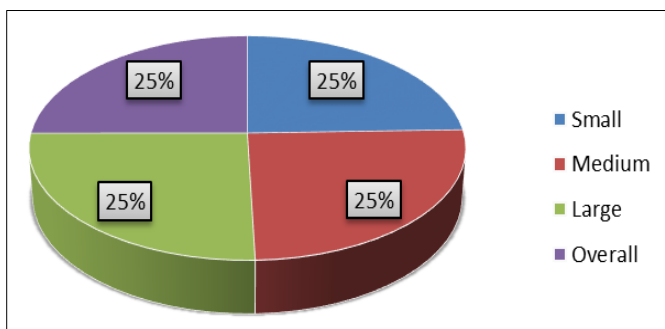


Fig 6(b): Net returns from different sources per layer

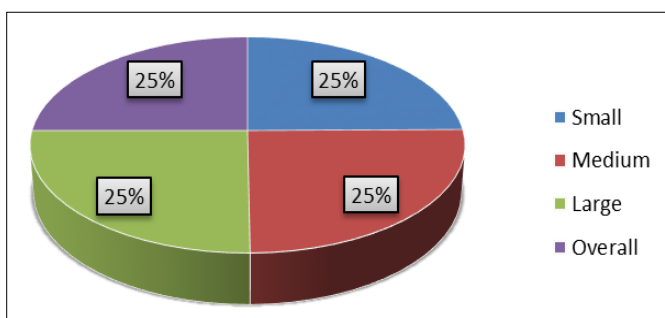


Fig 7: Benefit: Cost Ratio

4. Conclusion

The cost analysis of egg production, egg production, cost-price relationship, gross returns, net return and benefit: cost ratio was significant in the large farm.

Generally in any economic study, total costs are discussed under two heads viz., variable costs and fixed costs. On the basis of the above finding, the average total variable cost and total fixed cost was found highest at per farm. The gross return, net returns per layer and benefit: cost ratio was observed highest for large farms.

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