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Economic evaluation of skimmed milk powder supplementation in Sonali poultry birds

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Abstract

The present study was conducted to evaluate the effect of skimmed milk powder supplementation on the performance and economics of Sonali poultry birds. A total of 120 day-old Sonali chicks were randomly divided into four treatment groups, each having 30 birds with three replications of 10 birds. The dietary treatments consisted of T1 (basal diet), T2 (basal diet + 0.5% skimmed milk powder), T3 (basal diet + 1.0% skimmed milk powder) and T4 (basal diet + 1.5% skimmed milk powder). The economics of production was assessed based on feed cost, supplementation cost, total production cost, cost of production per kg live weight, net profit and B:C ratio. The total cost of production increased with increasing levels of skimmed milk powder, being highest in T4 (₹158.85/bird). The cost of production per kg live weight ranged from ₹171.63 to ₹174.45. The results indicated that skimmed milk powder supplementation influenced the economics of Sonali poultry production.

Keywords: Sonali poultry, skimmed milk powder, economics, production cost, net profit, b:c ratio

Introduction

Poultry farming plays an important role in providing animal protein and generating income for rural and small-scale farmers. Feed constitutes a major proportion of the total cost of poultry production; therefore, efficient feed utilization and economical feeding practices are essential for profitable production.

Skimmed milk powder is a concentrated dairy product containing protein and lactose and may serve as a supplementary nutrient source in poultry diets. However, limited information is available on its use in Sonali poultry birds. Therefore, the present study was undertaken to evaluate the effect of different levels of skimmed milk powder supplementation on the economics of production in Sonali poultry birds.

2. Materials and Methods

2.1 Experimental birds and design

The experiment was conducted for 56 days (8 weeks) at the Poultry Unit of the Section of Animal Husbandry and Dairy Science, College of Agriculture, Nagpur. A total of 120 day-old Sonali chicks were procured and randomly allotted to four dietary treatments. Each treatment consisted of three replications with 10 birds per replication.

The treatment groups were

Table 1: Treatment details and number of chicks allotted to each experimental group

Treatment details		Total no. of chicks in each groups
T1	Basal diet without skimmed milk powder	30
T2	Basal diet + 0.5 skimmed milk powder	30
T3	Basal diet + 1.0 skimmed milk powder	30
T4	Basal diet + 1.5 skimmed milk powder	30
Total chicks		120

Commercial pre-starter, starter and finisher feeds were used as basal diets, and skimmed milk powder was incorporated into the feed according to the respective treatment levels.

Estimation of cost of production

The economics of production were estimated by considering the expenditure incurred on:

1. Day-old chicks
2. Feed consumed
3. Skimmed milk powder
4. Electricity
5. Labour
6. Vaccines, medicines and other expenditure

The thesis methodology states that feed cost was calculated using the prevailing market price of the feed ingredients and skimmed milk powder.

The following economic parameters were considered

Total cost of production (₹/bird)

= Cost of chick + feed cost + supplement cost + electricity + labour + other expenditure
Cost of production per kg live weight

= Total cost of production ÷ live body weight (kg)

Net profit per bird

= Sale value per bird – total cost of production per bird

Benefit-cost ratio (B:C ratio)

= Gross return ÷ total cost of production

The experimental observations were analyzed statistically using a Completely Randomized Design (CRD), with treatment differences evaluated through analysis of variance.

Results and Discussion

Cost of production

The economics of production of Sonali poultry birds under different dietary treatments are presented in Table 1. The cost of day-old chicks was constant at ₹25.00 per bird in all treatments. Feed consumption increased with increasing levels of skimmed milk powder, resulting in an increase in feed expenditure. The total production cost was ₹143.20, ₹149.06, ₹153.38 and ₹158.85 per bird in T₁, T₂, T₃ and T₄, respectively.

Table 2: Economics of production of Sonali poultry birds under different dietary treatments

Sr. No	Particulars	T ₁	T ₂	T ₃	T ₄
1	Cost of day old chicks (Rs)	25	25	25	25
2	Average total feed consumed (kg)/bird	2.28	2.30	2.34	2.37
3	Cost of feed	37.50	37.50	37.50	37.50
4	Cost of feed consumed per bird (Rs)	85.52	86.27	87.77	88.89
5	Total skimmed milk powder consumption per bird (g)	0	7.17	14.35	21.52
6	Cost of skimmed milk powder (Rs 500/kg)	0	3.59	7.18	10.76
7	Total cost of feed consumption with skimmed milk powder per bird in Rs	84	89.86	94.18	99.65
8	Electricity charges	6.44	6.44	6.44	6.44
9	Labour charges	19.25	19.25	19.25	19.25
10	Other expenditure (vaccine, medicine, etc) per bird	8.51	8.51	8.51	8.51
11	Total cost of production (Rs) per bird	143.2	149.06	153.38	158.85
12	Average body weight gain at the end of 8 th week per bird (g)	833.35	868.46	890.61	910.53
13	Average market rate rs 300 per kg weight	300	300	300	300
14	Cost of production per kg	171.83	171.63	172.21	174.45
15	Net profit per bird (13-12)	128.17	128.37	127.79	125.55
16	Cost benefit ratio (B:C ratio)	1.74	1.74	1.74	1.71

Source: Data obtained from the present investigation.

The total cost of production increased progressively from ₹143.20/bird in T₁ to ₹158.85/bird in T₄. This increase was primarily associated with higher feed consumption and the additional expenditure on skimmed milk powder. The cost of skimmed milk powder increased from ₹0.00/bird in T₁ to ₹10.76/bird in T₄.

The increase in production cost was accompanied by an improvement in final body weight. Birds in T₄ attained the highest final body weight of 910.53 g, compared with 833.35 g in the control group. Thus, although T₄ required greater expenditure, the additional cost was associated with higher live weight production.

Cost of production per kilogram of live weight

The cost of production per kilogram of live weight was ₹171.83, ₹171.63, ₹172.21 and ₹174.45 in T₁, T₂, T₃ and T₄, respectively.

Interestingly, T₂ recorded the lowest cost of production per kilogram (₹171.63/kg), despite having a higher total production cost than T₁. This was due to the greater final body weight obtained in T₂. T₄ recorded the highest cost per kilogram (₹174.45/kg), which may be attributed to the comparatively higher feed consumption and supplementation cost.

This indicates that total cost alone should not be used to judge economic efficiency; production cost relative to the quantity of live weight produced is also important.

Net profit

The net profit per bird was

₹128.17,

₹128.37,

₹127.79 and

₹125.55 in T₁, T₂, T₃ and T₄, respectively.

Numerically, the highest net profit was observed in T₂ (₹128.37/bird), followed by T₁ (₹128.17), T₃ (₹127.79) and T₄ (₹125.55). Therefore, from the net-profit-per-bird figure in Table alone, T₂-not T₄-has the highest net profit.

This point is important because the thesis abstract states that T₄ had the highest net profit, whereas the actual Table values show T₂ = ₹128.37, which is the highest. For a research paper, I recommend reporting the Table values and avoiding the contradictory statement.

Benefit-cost ratio

The benefit-cost ratio was 1.74, 1.74, 1.74 and 1.71 in T₁, T₂, T₃ and T₄, respectively.

The B:C ratio indicates that all treatments generated returns greater than the expenditure incurred. T₁, T₂ and T₃ showed the same numerical B:C ratio of 1.74, whereas T₄ showed a comparatively lower ratio of 1.71. The lower B:C ratio in T₄ can be attributed to its greater expenditure on feed and skimmed milk powder.

Therefore, T₄ was not the most economical treatment when B:C ratio alone was considered, although it produced the highest final body weight.

Overall economic response

The economic results demonstrate a clear relationship between dietary supplementation, production expenditure and live-weight production. Increasing skimmed milk powder supplementation from 0 to 1.5% increased feed and supplementation costs and consequently increased total production cost. At the same time, final body weight increased from 833.35 g in T₁ to 910.53 g in T₄.

The findings suggest that the economic advantage of skimmed milk powder supplementation should be evaluated not only from the standpoint of total production cost but also in relation to live weight produced, sale value and return per unit of expenditure.

The present findings are consistent with the general observation reported in the thesis that dietary feed additives can improve production performance and economic returns. Pandey *et al.* (2013) ^[2], as cited in the thesis, reported improved production performance, meat quality and economic returns with dietary supplementation in broilers.

Conclusion

The present study demonstrated that supplementation of skimmed milk powder influenced the economics of Sonali poultry production. The total cost of production increased progressively with increasing supplementation level, from ₹143.20/bird in T₁ to ₹158.85/bird in T₄. The highest final body weight was recorded in T₄ (910.53 g/bird), indicating improved growth with 1.5% skimmed milk powder supplementation.

However, the economic parameters showed a slightly different trend. T₂ recorded the highest net profit per bird

(₹128.37), while T₁, T₂ and T₃ showed the highest B:C ratio of 1.74. T₄ had a B:C ratio of 1.71. Therefore, considering production cost, net profit and B:C ratio together, lower supplementation levels, particularly 0.5% skimmed milk powder, appeared economically competitive, whereas 1.5% supplementation produced the highest live body weight.

Under the conditions of the present experiment, skimmed milk powder supplementation can therefore be considered a potential dietary intervention for improving the productive performance of Sonali poultry birds, but the optimum level should be selected by balancing additional feed/supplementation cost against the additional live-weight gain and market return.

References

1. Pandey, *et al.* Effect of dietary feed additives on production performance, meat quality and economic returns in broilers. 2013.

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