

PROFITABILITY OF BROILER FARMS IN FOUR SOUTHERN DISTRICTS IN BHUTAN

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ABSTRACT: The study was designed to assess the profitability of broiler farms in four southern districts of Bhutan. From these sites, those broiler farms having more than 200 birds were included in the study. The data were gathered through face-face interview using semi-structured questionnaires from 61 respondents. The data collected were subjected to descriptive analysis. The finding indicated that majority of the respondents are either into semi-commercial or commercial farming business. A total depreciated fixed costs, variable costs and net farm income were estimated to determine the profitability of broiler farming. The study revealed that 96 % of the total cost was incurred on variable costs and only 4 % were accounted as fixed costs. Amongst the variable costs, highest expenditure (76%) was incurred on the purchase of commercial broiler feed. Of the total fixed costs, 45 % of the investment was incurred for the construction of broiler sheds. The average net profit to farmer through broiler farming of 1083 birds flock accounts to Nu. 86,607/- which correspond to 24% profitability ratio.

Keywords: Broiler; fixed and variable cost; respondents; semi and commercial farm.

1. INTRODUCTION

Poultry industry is leading agricultural industries in many parts of the world and a major supplier of animal protein for human population (Balogun et al. 2013). Poultry farming is one of the easiest means with low gestation period to generate cash income. This is mainly due to the quick return from investments in comparison to other livestock farming (Sanusi et al. 2015). Egg and chicken have been recognized as a major source of protein accessible to human in short period of time (Osti et al. 2017).

Broiler farming is popular as chicken meat contains high quality of essential nutrients such as proteins, minerals, and vitamins that are required for improving human nutrition (Food and Agriculture Organization [FAO] 2013). In many developing countries, broiler production is considered as an important foundation for the livelihood as it provides family income and employment opportunity (Guèye 2005).

In broiler production, feed accounts about 60-70% of its cost of production (Amao et al. 2015). The unit cost of production is also increasing over the years due to increase in price for feed. The broiler birds need a steady supply of quality nutrients for better growth and health (Ravindran 2009). With constant supply of quality feed, the broiler farming gives fast returns from the investment with better Feed Conversion Ratio (FCR), converting feed into meat (Mbuza et al. 2016). The feed quality is the most important factor that affects the broiler performance. The broiler bird should be fed balanced feed for proper growth and performance.

In Bhutan, broiler production was not introduced although poultry development started since 1961. This was mainly owing to strong religious belief and other social stigmas (Nidup and Penjor 2005). Therefore, the demand for chicken meat was met through import from neighboring states of India (Dahal 2007).

However, with the increase in consumption, the broiler production has slowly gained its momentum especially in southern Bhutan. Broiler farming in Bhutan was initially started from Tsirang Dzongkhag (District) in 2004, and was followed by Samtse Dzongkhag in 2006 (Tashi 2009). The domestic chicken production has drastically increased from 943 MT in 2014 to 1926 MT in 2019 (Department of Livestock [DoL] 2019). The highest (456.67 MT) chicken meat was produced by Samtse Dzongkhag and was followed by Chukha and Tsirang Dzongkhag with 444.43 MT and 352 MT, respectively (DoL 2019). In spite of increase in domestic chicken meat production, there is still a huge import to meet the rising demand of the consumers. Thus, the market competition between imported and domestic products is still quite predominant. The imported chickens are sold comparatively at lower price than the domestic chicken. Of late, owing to the price difference, Bhutanese broiler farmers are facing difficulties in marketing the chicken meat. This has posed a risk to the broiler farmers and there is possibility of shifting to other types of farming. Such practices if it prevails will result in the import of huge quantity of chicken meat from neighboring countries. Until date, no study has been conducted to determine the profitability of broiler farms in the country. Such study is crucial to establish science-based evidences for guiding the broiler farmers. Thus, the study was conducted with an aim to evaluate the profitability of broiler farms in southern Dzongkhags of Bhutan. The findings of the study may provide baseline to augment the broiler production and expected to encourage farmers to take broiler farming in long run.

2. MATERIALS AND METHODS

2.1 Study Sites and Data collection

For the study, Norbugang and Samste gewogs (sub-district) under Samtse district, Gelephu, Dekiling, Samtenling, Chusergang and Gakidling in Sarpang district; Donglangang and Gosarling under Tsirang and Samphelling in Chukha district were selected. From these sites, those broiler farms having more than 200 birds were included in the study. The data were collected from identified broiler farmers through

face-face interview using semi structured questionnaire from October to December 2019. In total, 61 respondents were interviewed.

2.2 Data analysis

Simple descriptive analysis was done on data such as fixed, variable costs and revenue generated by each farm using Statistical Package for Social Science (SPSS) version 23 (IBM n.d.).

Simple descriptive statistics (means and percentages) were used to determine the inferences of the study. The depreciation costs for drinkers and feeders were calculated based on the number of batches reared in a year. However, for shed construction and processing equipment depreciation were calculated at 10 years salvage life.

The revenues generated were calculated to infer the profitability of the broiler farms. The following formulae were used to determine the relationships.

$$TC = TFC + TVC$$

$$NFI = TR - TC$$

Where;

TC = Total Cost, TFC = Total Fixed Cost, TVC = Total Variable Cost, NFI = Net Farm Income, TR = Total Revenue.

3. RESULTS AND DISCUSSIONS

3.1 Socio-Demography of respondents

Table 1 describes the socio-demography of the study areas. The study recorded majorities (32.8 %) of the broiler farmers in the age range of 31-40 years, and 24.6 % falls between 41-50 age range. This finding is supported by Mamman et al. (2016) where majority of the broiler farmers were of 31-40 age groups in Nasarawa State, Nigeria. In contrast, Ike et al. (2011) in Anambra state, Nigeria revealed that the majority of the respondents were between 45-55 age groups. In the current study, majority (37.7 %) of the respondents have primary education level, followed by secondary education (27.9 %) and uneducated farmers with 27.9 % each. Similar results was also observed by (Ike et al. 2011) and (Mamman et al. 2016) in Nigeria.

Table 1: Socio-demography of respondents (n = 61)

Variable	Category	% Respondents
Age	20-30	23.00
	31-40	32.80
	41-50	24.60
	51-60	18.00
	> 60	1.60
Education Level	Uneducated	27.90
	Non-Formal Education	3.30
	Primary	37.70
	Secondary	27.90
	Bachelor's Degree & Above	3.30
Credits	Yes	52.50
	No	47.50

3.2 Broiler farming type

Table 2 presents the broiler farming type in the study areas. The broiler farm with flock size of 500-1000 birds (39.3 %) were the most common enterprise, followed by 1001-5000 (34.4 %), less than 499 (24.6 %) and only single broiler farmer has flock size of 5001-10,000. The findings indicated that majority of the respondents are either into semi-commercial or commercial broiler farming business. In Bhutanese context, poultry farm with bird size between 500-1000 numbers and above 1001 birds are considered as semi-commercial and commercial farm, respectively. All the respondents in this study had constructed an open-sided house of deep litter system. In terms of Broiler Day old Chicks

Table 2: Broiler farming type (n = 61) in the study area

Variables	Category	% Respondents
Farm Type	< 500	24.6
	501-1000	39.3
	1001-5000	34.4
	5001-10000	1.6
Source of DoC	Government farm	23
	Import	77

(DoCs), majority (77 %) of inputs were imported by private entrepreneur from neighboring states of India. The government farm also produces and supply small numbers of broiler DoCs.

3.3 Total Fixed Costs

Fixed cost is defined as the costs that remain constant irrespective of change in the level of activities. The fixed costs such as depreciation on poultry shed, processing equipment and biological pit were computed at the salvage life of 10 years by number of batches reared in a year. However, for poultry equipment such as drinkers and feeders, the depreciations were computed at one year salvage life.

The study revealed that irrespective of flock size, an average amount of Nu. 11,324/- was incurred as total fixed cost (Table 3) which constituted 4 % of the total cost. This finding is in concurrence with Abdurofi et al. (2017) and (Olorunwa 2018) in Malaysia and Nigeria who reported comparatively low fixed cost. The highest fixed cost (45 %) was observed in broiler shed construction, followed by cost in broiler feeders and drinkers purchase with 24 % and 17 %, respectively. Similar results were also obtained by (Maikasuwa 2014) in economic analysis of small-layer farm in Nigeria.

3.4 Variable costs

The variable costs change depending upon the expenditure made in the broiler farming business. The variable costs increase with the increase in the flock size and vice versa. In this study, the variable costs include purchase of DoC, feed, bedding materials, minerals/vitamins supplements, labor and electricity costs. An average amount of Nu. 268,830/- was incurred as variable costs in the study areas (Table 3).

The highest proportion of variable cost (76 %) was attributed to purchase of commercial broiler feed, followed by cost of DoC (17 %) and payment for labour. The least variable costs were involved in payment for bedding materials, electricity and procuring of mineral and vitamin supplements. This result was supported by Demircan et al. (2010) where feed cost was the highest among other variable costs. Abdurofi et al. (2017) recorded 70 % for feed cost which is slightly less than the result from the current study.

Table 3: Cost-benefit analysis of broiler farm with average flock size of 1083 birds

Revenue	Mean Amount (Nu)	Percent
Sale of chicken	356736	97.3
Sale of Manure	2047	0.6
Gunny Bags	1053	0.3
Offal's	6925	1.9
Gross income	366,761	100.0
Variable cost		
Cost of Doc	45513	17
Payment of sawdust	3021	1
Electricity	1433	1
Labor payment	13221	5
Feed	203158	76
Minerals/Vitamins	2483	1
Total Variable cost	268830	100
Gross Margin (GR-TVC)	97,931	
Fixed cost		Percent
Shed construction	5146	45
Feeder	2673	24
Drinker	1945	17
De feathering machine	728	6
Weighing machine	225	2
Biological pit	607	5
Total Fixed cost	11,324	100
Total cost (TVC + TFC)	280,155	
Net Farm Income (GM-TFC)	86,607	

The variation of feed cost could be attributed to the scale of farm operation. In many studies, feed cost was reported to have attributed comparatively higher cost when compared to other variable costs. Wolde et al. (2016) reported that the feed cost represents 65–75 % of the total cost in intensive poultry farming. The cost of DoC was accounted to 17 % which is comparable to the result of Olorunwa (2018). The payment for labor in the current study was found comparatively cheaper than the results reported by Olorunwa (2018) and Uddin et al. (2011). In many studies on poultry production, other variable costs are comparatively less than the cost of feed and DoCs.

3.5 Total Cost

Total cost is the sum of total fixed costs and variable costs. In the current study, average total

cost of Nu. 280,155/- was incurred for a flock size of 1083 birds. Of the total costs, fixed costs and variable costs were attributed at 4 % and 96 %, respectively.

3.6 Total Revenue

Average total income was Nu. 366,761/- was earned by the broiler farmers irrespective of the flock size. The maximum income (97.2 %) was earned from the sale of chicken meat and about 1.9 % was generated from the sale of offal. However, the sale of gunny bags contributed minimal income to the farmer.

3.7 Cost-benefit analysis of Broiler farmers in the study areas

Table 3 represents simple cost benefit of broiler farms in the study areas. The result indicated that broiler production is a profitable

venture. The average net profit ratio of 0.24 was observed from 61 broiler farmers which imply to 24 % net profit. The current finding is not in agreement with the study of Olorunwa (2018) who reported 34 % net profit from broiler production in Nigeria.

3.8 Profitability ratio

The profitability ratio determined from the current study is as below;

a)

$$\begin{aligned} \text{Gross Ratio} &= \frac{\text{Total cost}}{\text{Gross income}} \\ &= \frac{280,155}{366,761} = 0.76 \end{aligned}$$

This ratio shows that the total farm cost was about 76 % of the gross income which measures the overall financial health of broiler production in the study areas.

b)

$$\begin{aligned} \text{Fixed Ratio} &= \frac{\text{Total Fixed cost}}{\text{Gross Income}} \\ &= \frac{11,324}{366,761} = 0.03 \end{aligned}$$

This fixed ratio indicates that 3 % of the gross income is used for fixed cost of the broiler production.

c)

$$\begin{aligned} \text{Operating Ratio} &= \frac{\text{Total Variable cost}}{\text{Gross Income}} \\ &= \frac{268,830}{366,761} = 0.73 \end{aligned}$$

This ratio shows that 73 % of the gross income is used for the payment of variable or operating costs of broiler production.

4. CONCLUSION

Based on the current findings, it is concluded that majority of the farmers are engaged either into semi-commercial and commercial farming.

The broiler production is a profitable venture with an average gross margin of Nu. 97,931/- and farm net income of Nu. 86,607/- with 24 % net profit. This could be mainly because of short gestation period when compared to other livestock farming. Thus, it is imperative to encourage interested farmers, entrepreneurs and unemployed youth to take up broiler farming to enhance domestic production of chicken meat and curb import.

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