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# Study of Production Performance and Economic of Broiler Farms in Parwan Afghanistan

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**ABSTRACT**

**Poultry industry is one of the main source of income in Afghanistan, where about 1.5 million people are engaged in this sector. In recent years, from 476 poultry farms only 165 farms are continuing their activities in Parwan province of Afghanistan, which means that most of previous farms are broken down. In this research, 30 broiler chicken farms were selected by random sampling method and to evaluate the production performance and economical status of broiler farms in Parwan, Afghanistan. Data were collected by using questionaries' and personal interviews. Based on the results, it was found that the production performance of the chickens was such as the feed conversion ratio was 1.83, the livability percentage was 90.23%, the average market weight was 1.9 kg, and the mortality rate was 9.77%. The fixed costs included 5.64% worker's salary, 0.79% farm rent and 0.32% electricity bill which are totally (6.75%). Variable costs include the cost of a day-old chicken 6.98%, feed cost 70.45%, veterinary service cost 3.44%, litter cost 1.41%, worker food cost 2.11%, fuel cost 7.05% and miscellaneous cost were 1.47%, which totally reached (93.25%). The total income which were earned 97.93% from live chickens as main product and 2.07% from manure as by product and the benefit cost ratio was 1.07%. To conclude this, as the broiler production is profitable, but the proportion of income is less than the investment. In order to improve the income, it is recommended to provide high-quality feed, prevent diseases, providing high-quality vaccines and medicines, and hiring experts in broiler farms.**

***Keywords-*** broiler farms, benefit cost ratio, income, livability, economic.

## I. INTRODUCTION

Afghanistan is an agricultural country where more than 80% of its people depend on agriculture for their livelihood. Livestock sector contributes greatly to the livelihood of the rural population and is the main source of income and food. The livestock sector helps to improve food security and livelihood, create employment and increase the national economy in Afghanistan. Agriculture is consisting of: cultivation, herding, livestock and forestry. It is vital for the livelihood of a large percentage of men and women in Afghanistan (FAO, 2023).

One of the active sectors of Afghanistan's agriculture industry is the poultry sector. About 1.5 million individuals are employed and receive money from this sector. It makes for 6.4% of the growth in agriculture and 11.5% of the growth in livestock. 25.8% of the total meat production comes from poultry in Afghanistan. Over 200 billion Af are currently invested in the poultry sector. Annually, the poultry industry has had a strong growth at the rate of 8–10%, which is indicative of its inherent potential. The poultry meat which is producing in commercial poultry farms and rural bases is the main part in mutton and beef. It expects poultry sector growth between 15 and 20 percent yearly (KHATAMI, AZIMI, & HEWADMAL, 2022).

Afghanistan's poultry industry is expanding day by day with more investment in this sector and with the better use of current technologies. There are 11 thousand

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(mostly small) poultry farms, 233 egg farms, 20 poultry feed mills, 28 incubators and 9 poultry processing centers in Afghanistan. Afghanistan imports an average of 19 million live chickens and 43 thousand tons of chicken meat annually.

In terms of Afghanistan's poultry demand, 270 thousand tons of Poultry meat demanded annually. Despite the increase in domestic chicken production, this production cannot meet the current market demand. Recently, Afghan government is looking for investors to invest in this sector, the current demand/supply deficit is an opportunity for investors that guarantees profitability (Moore, Afghanistan).

Poultry meat is a good source of protein that plays a major role in eliminating malnutrition. Poultry meat is consumed more by people in Parwan Afghanistan than other animal meat based on its cheapness and lack of transmission of animal diseases. According to (Rahman, Khan, Islam, & Ferdous, 2003) mentioned that poultry meat, especially broiler meat, is superior to other types of meat available for human consumption due to its tenderness, palatability and digestibility. The meat of broilers can effectively and quickly meet the required protein deficiency because it can be produced in the shortest possible time compared to other meat-producing animals.

The production of poultry meat in Afghanistan is done in a small amount, which cannot satisfy the needs of the people. The Benefit cost ratio is very low, therefore, the farmers receive less benefits. The net income is also less, thus causing a lack of capital investments have been made in this industry and the active farmers are also in the process of abandoning this industry. According to the head of the Poultry Farmers Union of Parwan Afghanistan, there were 476 poultry farms, of which only 165 poultry farms continue to operate and the remaining has stopped itself. The reasons might be the high price of feed, poor quality of feed, poor quality of vaccines and medicines, lack of knowledge about disease control, and the fluctuations in the price of poultry meat.

In this research, the productive and economic performance of broiler farms in Parwan Afghanistan has been studied and the factors that affect the production performance have been identified and the suggestions have been made for its improvement.

## II. MATERIALS AND METHODS

Choosing the study area is an important step for conducting any research. For conducting this research, Parwan province was chosen because it has more broiler farms. Owners of commercial broiler farms were considered as the population for this study. Random sampling method was used to collect data and select farmers. The selected samples included 30 broiler farms. The total sample size of this research was 30 farmers. Research data has been collected from primary sources using questionnaires, observations and interviews with farm owners.

***Analytical method used**:* After data collection, it was edited and coded. All the collected data were summarized and carefully checked and recorded in the main pages. Finally, the relevant tables were prepared according to the objectives of the research.

***Simple analysis of profitability:*** The profitability of broiler farms is analyzed based on the analysis of gross profit and net return.

To calculate Gross cost, we have used the following formula:

$$\mathbf{GC=TFC+TVC}$$

TFC=Total fixed cost, TVC=Total variable cost

***Net return analysis:*** Net return was obtained by deducting gross costs (variable and fixed cost) from gross return. Interpretation and discussion of the findings are presented in a simple way such as average, percentage, ratio, etc.

To calculate net return we have used following formula-

$$\mathbf{Net\ return= GR\text{-}GC}$$

Where, GR=Gross return, GC=Gross cost

***Cost-Benefit Ratio and Feed Conversion rate:***

Benefit cost ratio is a relative measure which is used to compare benefit per cost. It helps to analyze the financial efficiency of the farms.

To calculate benefit-cost ratio and Feed conversion rate, we use following formula:

$$\mathbf{Benefit-Cost\ ratio} = \frac{\mathbf{Gross\ return(GR)}}{\mathbf{Gross\ cost(GC)}}$$

$$\mathbf{FCR} = \frac{\boldsymbol{Total\ quantity\ of\ feed\ consumed}}{\mathbf{Mean\ body\ weight\ gain}}$$

$$\mathbf{Livability}\ \% = \frac{\mathbf{Number\ of\ live\ briolers \times 100}}{\mathbf{Number\ of\ broilers\ at\ the\ beginning}}$$

## III. RESULTS

***Socioeconomic and Demographic information of broiler farmers in Parwan, Afghanistan***

Information on socioeconomic and demographic factors (Table 1) is important for describing the ownership and operations of broiler farms in Parwan, Afghanistan. Gender and age of farmers, educational background, and work experience are among the categories. The data showed that all respondents were male, 40% of farmers were between the ages of 40 - 50, while 30% were between the ages of 30 - 40, and 13.3% were above 50 years' age and just 16.7% were young farmers (those between the ages of 20 - 30). The capital intensive nature of broiler production discourages newcomers from entering the sector. This may be the

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cause of the shortage of young farmers in the sector. Regarding education, nearly half (46.7%) of farmers are illiterate, 26.7% had bachelor's degrees, and 13.3% had only received their primary education, 3.3% of respondents had a secondary education, while 10.0% received a middle education. Regarding farming experience, about 73.3% of farmers had less than five years of experience in producing broilers, about 20.0% had between five and ten years, and another 6.7% had more than eleven years' experience.

***Production Performance***

Table 2 provides information on average feed conversion ratio, liveability %, mortality rate and body weight in marketing.

**Feed Conversion Ratio:** Table 2 makes it obvious that the overall feed conversion ratio was 1.83.

**Liveability percentage**: Broiler chicken in the research area had a liveability percentage of 90.23%.

**Average Body Weight at Marketing**: 1.9 kg was the average body weight of broiler chicken at marketing.

**Mortality Rate**: The mortality rate of broiler chickens in the research area was 9.77%.

**Table 1: Socioeconomic and Demographic information of broiler farmers**

| Age of farmers | Frequency | Percent |
|---|---|---|
| 20-30 | 5 | 16.7 |
| 30-40 | 9 | 30.0 |
| 40-50 | 12 | 40.0 |
| above 50 | 4 | 13.3 |
| Total | 30 | 100.0 |
| **Farmers' Education Level** | | |
| Illiterate | 14 | 46.7 |
| Primary | 4 | 13.3 |
| Middle | 3 | 10.0 |
| Secondary | 1 | 3.3 |
| Bachler | 8 | 26.7 |
| Total | 30 | 100.0 |
| **Farming Experience** | | |
| 5 year or less | 22 | 73.3 |
| 5-10 year | 6 | 20.0 |
| 11 year or above | 2 | 6.7 |
| Total | 30 | 100.0 |

**Table 2: Performance parameters of broilers farms in Parwan, Afghanistan**

| S. No | Variables | Mean |
|---|---|---|
| 1 | Body weight in marketing (Kg) | 1.9 |
| 2 | Feed Conversion Ratio (FCR) | 1.83 |
| 3 | Livability(%) | 90.23 |
| 4 | Mortality Rate(%) | 9.77 |

***Profitability Analysis:***

Profit maximization is the main goal of a producer. To earn profit, producer wants to maximize profit through minimizing cost. The focus of our study is to estimate the costs returns and finally the profitability of the broiler farms.

**Total cost:** The cost items are classified into two broad categories, i.e. (i) Fixed cost and (ii) variable costs.

Day-old chicks, feed, litter, labour, veterinary services, electricity, fuel (Coal) costs, etc. were the main variable costs for farmers raising broilers, whereas depreciation of fixed assets, rent of farm, and Labour salary were the main fixed costs. For 1000 broilers, the average total cost per batch (45 days) and per farm was calculated to be 314865.05 Af. Table 3, displays the summarized average costs for farms that raise broilers.

**Cost of a day-old chick:** This cost is the initial cost for the broiler farms. This cost varies from farm to farm according to size and number. In the studied area, we found that the price of a day old chicken varies from 11 to 35 Af. Therefore, a farm that buys a day-old chick for 35, its cost is higher than a farm that buys 11 Af per chick.

Each day-old chick cost an average of 22 Af. For 1000 day-old chicks, the total cost per batch, per farm, was 22000 Af. 6.98% of the total cost was this.

**Feed cost:** Feed cost is the most important cost item for poultry farming. In our study area, only one poultry feed mill that produced feed for its own farm but, the remaining farms buy feed from the market at an average of 53.6 Af per kg. Therefore, a part of the capital is invested to feed the broiler every day. For 1000 broilers, the average feed cost per batch, per farm was 221845.04 Af. It is contributed 70.45% of the overall expenses.

**Veterinary services cost:** Veterinary expenses are another important cost of broiler production. Veterinary services included the cost of vaccines, medicines and doctors' fees. For 1000 broilers, the average veterinary services cost per batch, per farm was 10860 Af. It is contributed (3.44%) of the overall expenses.

**Cost of labour:** In general, there are two types of workers for poultry farming. such as hired labour and family workers. Here, we have considered only hired labour. In the hired labor force, two people work in each farm, one is called an expert and the second is called a regular worker. For 1000 broilers, the estimated average labour cost per batch and farm was 17777.8, Af or 0.79% of the overall cost.

**Electricity charges:** Electricity is considered as fixed cost. If the electricity is connected for once so, its bill is paid by month. The average electricity cost per farm (1000 broilers) was 1000 Af, or 0.31% of the overall cost.

**Litter cost:** The average cost of litter for a farm with 1000 broilers was 4440 Af, or 1.41% of the total cost.

**Cost of fuel (Coal)**: For 1000 broilers, the estimated average fuel cost per batch and farm was 22220, Af or 7.05%: of the overall cost.

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**Cost of labour food:** The cost of food for the workers in the broiler farms was 6666.66 Af or 2.11% for keeping 1000 broiler for one period.

**Miscellaneous cost:** The miscellaneous cost includes transportation, repair of equipment and farm, etc., which was 5555.55Af or 1.74% for keeping one thousand broilers for one period.

***Revenue from broiler Enterprises:***

**Gross Revenue:** In the current study, the income realized from two sources, presented in table 4, revealed that on an average return from sale of per kg of live broilers was estimated to be 140 Af, and the next source of income was sale of manure, the average return from sale of per bag manure was calculated to be 150 Af. The total income from selling of live broilers was 330066 or 97.93% of overall income and the total income of manure was calculated 6944.44 Af or 2.07% of overall income. For 1000 chicks (2357.6 kg), the gross return per farm per batch (45 days) was 337010.44 Af.

**Net Returns and Benefit- cost Ratio:** The net return (profit) per batch per farm for 1000 broilers was 22145.39 Af (Table 4). demonstrates the relative gross and net return in relation to costs.

**Table 4. Income of 1000 broilers for a 45-day production period**

| S. No | Gross return | Income (Af) | Percentage |
|---|---|---|---|
| 1 | Sale of Broilers | 330066 | 97.93 |
| 2 | Sale of manure | 6944.44 | 2.07 |
| Total gross return | | 337010.44 | 100 |
| Net return= GR-GC | | 22145.39 | |
| Benefit-Cost ratio | | 1.07 | |

## IV. DISCUSSION

Based on the results of this research, the overall feed conversion ratio was 1.83. Broiler chickens in the research area had a liveability rate of 90.23%, while the average marketing age was 45 days, the average body weight of broiler chickens at the time of marketing was 1.9 kg and broiler chicks' mortality rate was 9.77%. According to (Badubi, Ravindran, & Reid, 2004) indicated that the average marketing age was 48.3 days at a live weight of 1.79 kg. The average conversion ratio was estimated to be 2.72 and the average mortality rate was 9.15%. (Balamurugan & Manoharan, 2014) also mentioned that the average weight of broiler birds 2.19 kilograms in overall. The reason for this difference can be the quality of feed or the efficiency of feed consumption by different strains of broiler chickens.

Feed cost contributed 70.45% of the overall expenses which represents the highest cost among variable costs. The next one is the cost of fuel (coal), which is estimated 7.05% of the overall cost. The total cost of day-old chicks, per batch, per farm is 6.98% of the total cost. According to the finding of (Singh, Sharma, Sidhu, & Kingra, 2010), feed accounted for the majority of variable expenditures (56.23%), followed by day-old chicks (20.56%) and other expenses (7.13%). (Balamurugan & Manoharan, 2014) are also found that feed accounted for the majority of the variable expenses (72.03%), followed by day-old chicks (17.04%) and other expenses (10.93%). ( Zimunya & Dube, 2021) were determined that the largest production expenses were feed and chick costs, which accounted for 62.06% and 26.36% of all variable costs. Due to the cold climate in Afghanistan, fuel costs are greater than those of day-old chicks, placing a day-old chick prices is third overall cost. (Chawke, Kahate, Sul, Nage, & Shelke, 2021) declared that the cost of feeding constitutes is a major problem to most of the poultry farmers as it accounts for a larger percentage of total cost of production, poultry cannot live without feed .According to the research results, the income from the sale of live broilers was 97.93% of the total income and the income from the sale of manure was 2.07% of the total income. According to (Singh, Sharma, Sidhu, & Kingra, 2010) stated that per broiler, the average return on sales was 98.13 percent. The selling of empty gunny bags (1.02%) and the sale of manure (0.85) were the sources of income. In Afghanistan, manure is sold in bags, because the income from the bags is considered together with manure.

The benefit-cost ratio is an indicator for evaluating the income on investment and evaluating the efficiency of the farm business. This ratio is mainly calculated by dividing the Gross return as revenue by the Gross cost or total cost. The results showed that the ratio of the broiler industry in Parwan, Afghanistan was 1.07. Based on (Sunarno, Purnomo, & Rahayu, 2017) results, the calculated R/C ratio was 1.06, which means that the broiler business is currently profitable. It is less than the proportion that the results of the present research have obtained, while the results of ( AZEEZ & AKBAY, 2021) among all farm groups, the ratio of benefit to cost was 1.28 and (Shaikh & Zala, 2011) benefit-cost ratio for the entire sample was found to be 1.11, which is more than the proportion obtained in this research, which shows that raising broilers in Parwan, Afghanistan is profitable, but the profitability is less in proportion to the cost.

## V. CONCLUSION

In this study the current situation of broiler chicken production was economically analyzed. Based on the results, all respondents were male and most of the people who engaged in broiler production industry are middle-aged, illiterates were with less than five years' experience. In addition, the profitability is relatively lower in terms of net return and return compare to investment. Apart from this, the industry of broiler chicken production broke down in Parwan, Afghanistan due to low quality of production factors such as feed, day-old chicks, medicines and vaccines. Also, feed price is high, low attention focused on the hygiene and the broiler

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chicken meat price in the market tends to be fluctuating. Taking this into account, it is suggested to raise the quality of feed, using cheaper feed ingredients, importing high-quality medicines and vaccines, providing hygiene management and diseases control trainings to broiler chicken keepers. Moreover, the establishing of hatcheries and breeding farms are needed to provide high quality of low price day-old chicken in the Parwan province of Afghanistan.

**Table 3: The cost of 1000 broilers for a 45-day production period**

| S. No | **Inputs of Production** | **Quantity** | **Unit cost(Af)** | **Total cost(Af)** | **percentage** |
|---|---|---|---|---|---|
| **A** | **Fixed cost** | | | | |
| 1 | Labour salary | 2 | 8888.9 | 17777.8 | 5.64 |
| 2 | Farm rent cost | 1 | 2500 | 2500 | 0.79 |
| 3 | Electricity cost(monthly) | | 1000 | 1000 | 0.31 |
| | **Total Fixed cost(TFC)** | | | **21277.8** | |
| **B** | **Variable cost** | | | | |
| 4 | Day old chicks cost | 1000 | 22 | 22000 | 6.98 |
| 5 | Feed cost (KG) | 4138.9 | 53.6 | 221845.04 | 70.45 |
| 6 | Veterinary services cost | 1000 | 10.86 | 10860 | 3.44 |
| 7 | Cost of litter(Kg) | 300 | 14.8 | 4440 | 1.41 |
| 8 | Cost of labor food | 2 | 3333.3 | 6666.66 | 2.11 |
| 9 | Cost of Coal(Kg) | 2222 | 10 | 22220 | 7.05 |
| 10 | Other miscellaneous cost | | | 5555.55 | 1.74 |
| | **Total Variable cost(TVC)** | | | **293587.25** | |
| | **Total cos(TFC + TVC)** | | | **314865.05** | **100** |

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