MARKETING SYSTEM OF EGG IN SOME SELECTED AREAS OF TANGAIL DISTRICT

BY

FARJANA JAHAN

DEPARTMENT OF AGRIBUSINESS AND MARKETING

SHER-E-BANGLA AGRICULTURAL UNIVERSITY

SHER-E-BANGLA NAGAR,

DHAKA-1207

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By

FARJANA JAHAN

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Approved by:

Dr. Md. Mizanur Rahman Sarker Professor Dept. of Agricultural Statistics Sher-e-Bangla Agricultural University Supervisor	Sauda Afrin Anny Assistant Professor Dept.of Agribusiness and Marketing Sher-e-Bangla Agricultural University Co-supervisor

Sharmin Afrin

Chairman

Examination Committee
Department of Agribusiness and Marketing
Sher-e-Bangla Agricultural University

DEPARTMENT OF AGRIBUSINESS AND MARKETING

Sher-e-Bangla Agricultural University

CIRTIFICATE

This is to Certify that the thesisentitled **"Marketing System of egg in some selected areas of Tangail district"**submitted to the Faculty of Agribusiness management, Sher-e-Bangla Agricultural University, Dhaka in the partial fulfilment of the requirements for the degree of Master of Science (MS)in**AGRIBUSINESS AND MARKETING,** embodies the result of a piece of bona fide research work carried out by **FARJANA JAHAN**, Registration Number: **19-10280**under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

I further certify that any help or source of information received during thecourse of this investigation has duly been acknowledged.

Dated:

Dhaka, Bangladesh

Department of Agricultural Statistics

Sher-e-Bangla Agricultural University

Dr. Md. Mizanur Rahman Sarker

Professor

Supervisor

ABSTRACT

The present study was conducted to estimate the profitability of egg production and marketing in Tangail district of Bangladesh. Three villages from Gopalpur Upazila and two villages from Ghatail Upazila were selected for this study. In total, 52 egg producers were selected purposively for the study. Out of 52 samples, 32 were from Gopalpur Upazila and 20 were from Ghatail Upazila. Primary data were collected during March to June, 2022 through field visits. The required data were collected through structured interview schedule from the 52 egg producers. The secondary information sources were DLS reports, BLRI reports, Bangladesh economic review, BBS, different journals, newspaper, relevant websites etc. Descriptive statistics and Profit equation were used to address the main objectives of the study. The results of the study showed that, per 100 layers, average total cost for egg production was Tk. 1,98,966.98. Per 100 layers gross return from egg production was estimated Tk. 2,85,165.8 and per 100 layers average net return of egg production was Tk. 86198.82. The study considered land use cost, housing cost, equipment cost, feed cost, day old chick cost, transportation cost, maintenance cost, veterinary cost, electricity cost and miscellaneous cost. The study identified the exiting marketing channels in the study area. The study also identified that egg producers were facing some problems such as: price of poultry feed and feed materials, high price of veterinary drugs, lack of government support, lack of information in layer farming system etc. If these problems could be solved within the shortest possible time, all the egg producers could be able to earn a much higher profit than the existing level. On the basis of findings, some recommendations were made for the development of egg production and marketing in Bangladesh.

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ACRONYMS AND ABBREVIATIONS

BBS: Bangladesh Bureau of Statistics

BER: Bangladesh Economic Review

BCR: Benefit Cost Ratio

BLRI: Bangladesh Livestock Research Institute

DOCs: Day Old Chicks

DLS: Department of Livestock Services

et al: et alia (and others)

etc.: Etcetra, (and others)

eg.: Exempli gratia; for example (in English)

FAO: Food and Agriculture Organization

Fig.: Figure

GDP: Gross Domestic Product

Tk.: Taka (Bangladeshi Currency)

UN: United Nation

%: Percentage

CHAPTER-1

INTRODUCTION

1.1 Prelude

Bangladesh is a densely populated developing country and its economy is very much dependent on agriculture. Poultry is a part of agricultural farming system in Bangladesh. Even though raising poultry birds is mostly a subsistence practice in Bangladesh. The agricultural sector contributes 12.91% of the GDP whereas the livestock contributes 1.90% (BER, 2021). Furthermore, it is pivotal for the rural economic system as maximum households in Bangladesh are directly or indirectly involved in livestock farming. Among the livestock sub-sector, the poultry industry as a fundamental part of animal production is committed to supplying the nation with a cheap source of good quality nutritious animal protein in terms of meat and eggs (Akter and Uddin, 2009). Specifically the egg industry is an integral part of agriculture. It has completed its industrialization, produces high-quality outputs, provides employment opportunities and export facilities (Dogan et al.2018). Egg production, fertility and hatchability are important reproductive traits that determine the success of any poultry industry (Islam et al., 2002). According to the UN, an average human being must consume 104 eggs annually to remain healthy. Bangladesh got closest to achieve this target in 2018, with a per capita annual consumption of 103 eggs (DLS, 2018). On this note, layer chicken farming has its importance which is mainly used for egg purposes, also generates cash income through the sale of live birds, eggs, by-products. Countries' 20% peoples are directly engaged in livestock sector and 50% peoples are associated in livestock production (DLS, 2018).

Table-1: Contribution of livestock and poultry on national economy:

Item	Percentage
Contribution of livestock sector in GDP	1.90%
Role of livestock in agricultural production	16.52%
Cultivation of land	50%
Employment directly	20%
Employment partly	50%
Foreign exchange earnings	4.31%
Fuel supply	25%

Source: BBS (2021-2022)

However, the chicken layer is the prospective but moderately developed sector in Bangladesh that produces both egg and meat for human consumption. The chicken layer business, often known as the egg industry has grown rapidly owing to increase per capita egg consumption. Table-2 shows that poultry population for the year 2012-13, the number was 2962.64 lac. In 2021-22 the population of poultry has raised to 3756.45 lac. Poultry population is increasing day by day. Poultry production and poultry related industry contributes much more of total livestock sector in Bangladesh.

Table 2:- Poultry population in Bangladesh

Type	Year									
Poultry	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Chicken	2490.11	2553.11	2617.70	2683.93	2751.83	2821.45	2892.83	2966.02	3041.06	3118.00
Duck	472.54	488.61	505.22	522.40	540.16	558.53	577.52	597.16	617.46	638.45
Total poultry	2962.64	3041.72	3122.93	3206.33	3292.00	3379.98	3470.35	3563.18	3658.52	3756.45

Source: BBS, 2021-2022

Poultry industry creates various job opportunities through the establishment of hatchery, feed mill, pharmaceutical company and marketing of poultry birds. Poultry excrement is used as fertilizer for growing crops. It is also used as fish feed. That is, additional income may be obtained from the sale of poultry excrement.

The figure of economic contribution of the poultry industry to the economy is given below : -

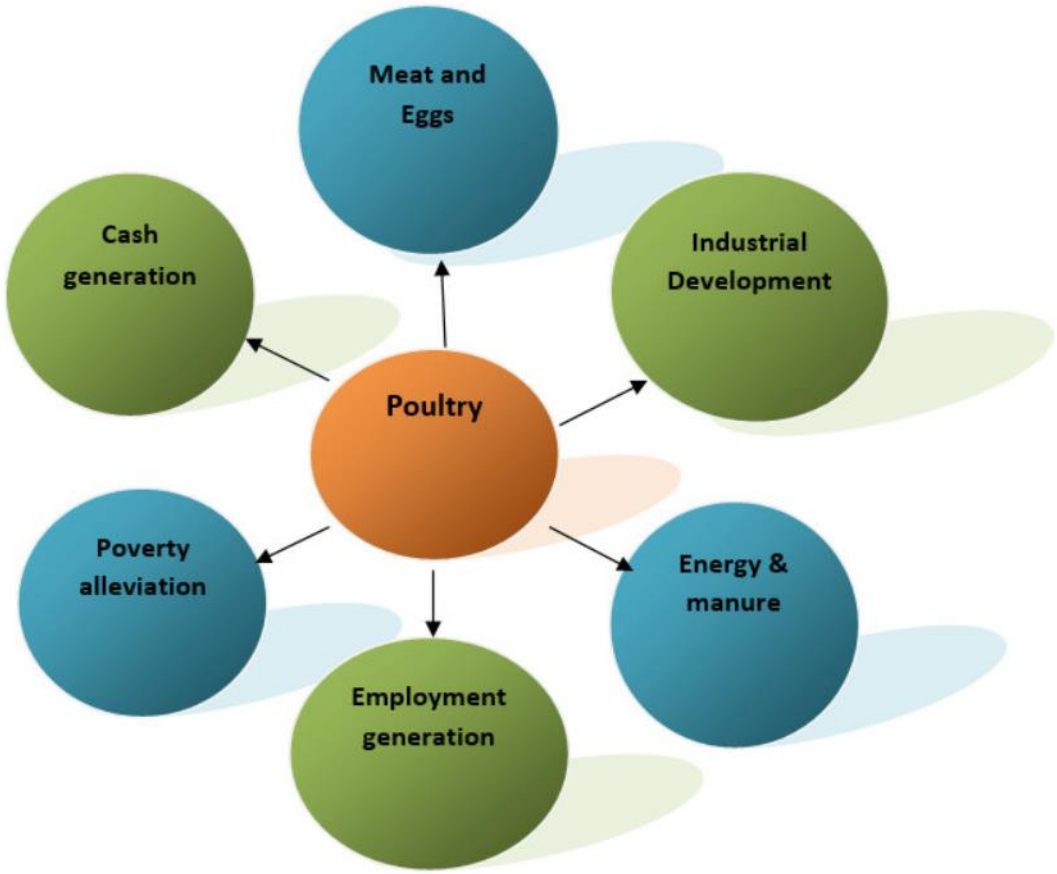

Figure-1: Economic contributions of the poultry industry to the economy

Source: Islam (1995)

Layer farming means raising egg-laying poultry birds for commercial egg production which needs to be raised from day one of their life. They start laying eggs commercially from 18-19 weeks of age. They can produce about one kg of eggs by consuming about 2.2 kg of food during their egg-laying period (BLRI,2016). However, layer chicken farming plays an important role in the national economy by creating employment and also by generating income in Bangladesh. The poultry industry is very important to the economy because it provides a good source of animal protein in meat and eggs. The poultry industry is not only meeting local needs very substantially rather it has found newer opportunities from value addition food industries which have grown up based on chicken and eggs that produce soup, nuggets, sausages and other products in accordance with the changing preferences of the customers. Some of these local poultry-based and value -added products have found some export markets as well (newsroom-meattradnewsdaily.co.uk). The egg is also an inexpensive source of protein among all animal products and also a delicious food item. The egg is a complete protein with

excellent quality, one egg will give 6g of protein and egg-white protein has a biological value of 100, the highest biological value of a single protein (Food and Agriculture Organization 2005). About 31 percent of the population in Bangladesh lives below the absolute poverty line and the number of landless people has been increasing by 3.4 percent per annum (BBS, 2009). About 50% children are born under-weight and 52% mothers suffer from nutrition deficiency (BBS, 2014). Poultry eggs and meat are used as human food. Egg has more nutritional value than any other food. They are good sources of proteins, minerals and vitamins. To supply animal protein poultry plays significant role. In Bangladesh about 22 to 27% of total animal proteins are supplied by poultry industries (Haque, 1996). In spite of this, 60% families of Bangladesh cannot meet their protein need in their daily food consumption (BBS-2007). This malnutrition has an adverse effect on health. As a result, the livelihood is seriously affected. These effects are given in following figure-

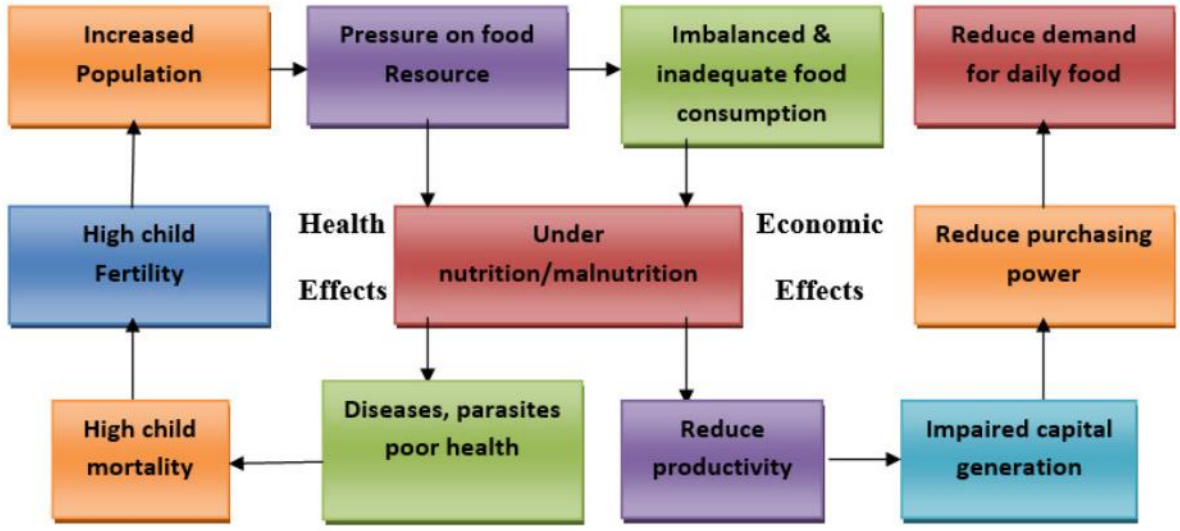

Figure-2: Flow chart of nutrition; some implications of under nutrition or malnutrition.

Increased population creates pressure on food resources. It leads to inadequate food consumption. For that malnutrition is created. This malnutrition has two effects, such as- health and economic effect. In case of health effect people suffer from various diseases. For that child mortality rises. In case of economic effect malnutrition reduces productivity. It leads to low capital generation. So, people's purchasing power reduces and it reduces demand for daily food. Anyway, poultry can solve these problems. It provides various nutrients, which is very essential for building of our body. When body is fit everything (Islam, 1995). The climate of Bangladesh is suitable for layer farming, so the layer birds can be raised easily to fulfil daily requirements of nutrient value. Layer production requires less capital compared to other meat

producing animals. The demand of layer egg and meat has been increasing day by day. The majority of the people, irrespective of caste and religion, prefer chicken. Egg production has been acting as an important tool for reducing the migration from rural poor people to the urban areas. Millions of rural women are involved in poultry rearing under the poverty alleviation program of direct Non-Government Organizations (NGOs) and Department of Livestock Service (DLS) under its packages program. The importance of the layer as a source of income for the landless and marginal farmers, particularly women, has become increasingly recognized (Ogunlade and Adebayo, 2009). For these reasons, the development of this layer of farming may be considered as an important strategy for poverty reduction which is one of the pivotal objectives of the government of Bangladesh. The contribution of egg production is vital to the national economy in case of generating employment opportunity, additional income for households and improving the nutritional level of the people. The poultry sector registered a per holding increase of 38.8 percent and per capita increase of 64.8 percent for the period between 1983/84 and 2005 (Planning Commission 2011). In fact, there has been a silent revolution in the poultry sector during the last decade. During the 2000/01-2008/09decadepoultry population registered a growth of over 5 per cent (ibid.). It is one of the fastest growing sectors with bright future and plays a crucial role in supplying nutritious food and employment generating.

Table-3: Production of egg

Year	**12-13**	**13-14**	**14-15**	**15-16**	**16-17**	**17-18**	**18-19**	**19-20**	**20-21**	**21-22**
Egg (Unit-core number)	761.74	1016.80	1099.52	1191.24	1493.31	1552.00	1711.00	1736.00	2057.64	2335.35

Source: BBS, 2021-22

Table-3 shows that egg production is increasing day by day. The production of egg was increasing on a regular basis with a lower increasing rate which has reached to a higher rate in the year 2022-22. The increase in production of egg was significant in recent years.

Table-4: Demands of egg in 2021-2022

Items	Value
Demand (core number)	1785.68 core number (104 number/year/head)
Production (core number)	2335.35 core number
Availability	136.01 (number/year/head)

Source: BBS, 2021-22

Table-4 shows that the demand of egg is 1785.68 core number where an average human being can consume 104 eggs annually to remain healthy. According to the UN, an average human being must consume 104 eggs annually to remain healthy. Bangladesh achieves this target in 2021-22, with a per capita annual consumption of 104 eggs (DLS, 2021-22). Much of increased egg production has come from commercial poultry sector. Since the last decade it is observed that poultry was one of the major activities where a large number of employments could generate a greater portion of local value addition. Coping with the domestic demand by the layer for the egg plays vital role and cannot be ignored (Anas, 2015). Government has declared poultry as a thrust sector and classified it as agro-based industry.

1.2 Background of the study

Bangladesh has a long historical background of poultry raising under traditional backyard farming. Almost all eggs and poultry are produced by villagers in this country since domestication mainly for their domestic consumption with very little commercial motives. In 935 improved varieties of birds (while leg horn) were first imported in India form foreign countries. Rising of improved type of birds was first started in government poultry farm.

In 1947, six poultry farms were first established in different places in this country for supplying eggs and chicks to the villages. In 1964 commercial poultry farm named eggs and hens ltd. was established at Gazipur near Dhaka city by late Mr. Ekramul Hossain, which was recognized as a mother commercial poultry farm in the private poultry sector (Akter, 2013). Poultry farming on commercial and scientific line was started in 1970 in Bangladesh . After the liberation of Bangladesh ,BIMAN Bangladesh Airlines, started a commercial poultry farm in the name of Biman poultry Complex Ltd. at Savar very close to Dhaka city, mainly to

furnish for flight catering needs of the Biman Bangladesh Airlines but it also fulfilled the demand for eggs and day-old chicks of private poultry farms to some extent .Since then commercial poultry started to gain popularity and during 1990 the poultry production stated taking the shape of and industry with the establishment of a large number of small and broiler and layer hatcheries.

Commercial egg production has become a specialized and speedy business at present time for the people of Bangladesh. Now-a-day's layer farming is being accepted as a profitable business. As a result, a good number of small, medium and large farms have already been established all over the country.

1.3 Statement of the problem

Risk and uncertainty are quite common factors of agricultural business. One of the major problems in the development of the layer subsector in Bangladesh is the lack of sufficient and appropriate feed**.** Diseases are a major problem for the layer industry in Bangladesh. Also the mortality rate of layer is high (35-40%) because of diseases. Layer farm owners usually carry out vaccination and medication for common layer diseases. All the sample farm owners (100%) opined that it is essential to increase the government financial support and supervision to improve the layer sector to ensure the adequate supply of feed and vaccine at cheaper price. A layer farm owner should have technical knowledge to run a layer farm but most of the layer farm owners started this business without being properly trained. All most of the farm owners faced the problem of load-shading and irregular electricity supply which hamper egg production. The price of day-old chicks is set by hatchery owners which vary from month to month. Most of the time, eggs and chickens are being marketed through middle men. As a result, the farm owners do not get actual share of price. In some cases, the farm owners do not have own transports to carry eggs to Arod/near market. Therefore, they have to pay more cost for transportation. Mostly the farm owners with lower investment hardly get loans. Actually govt. has no proper policy to provide loans for this sector. Moreover, though some NGOs provide loans, their interest rate is high.

1.4 Scope of the study

The study focuses on estimating profitability of egg production. The study also focuses on the socio-economic structure of egg producers where their demographic characters as gender, age, educational background, family size and income are explored. The research identifies the

problems that they face every business hour. This research will be conducted at Gopalpur and Ghatail Upazila, Tangail, Dhaka. Informal economic sectors are unauthorized and our government gives little focus on this sector. So there is a need to study profitability, marketing channel and problems of the egg producers in producing egg.

1.5 Justification of the study

The contribution of egg sector to the economy of Bangladesh is enormous. Egg sector is vital for the poor rural community of the country and create direct employment for huge number of people. Poor communities have access to egg production which provides them a vital source of food and cash security. Egg sector has a good potential to earn a lots of foreign currencies for Bangladesh. The aim of the study is to focus on profitability socio-economic profile and marketing channel of the farmers. The study will offer a scope to estimate per unit cost and return from egg. It will provide valuable information for farmers, policy makers and related agencies. Individual farmers will get help for effective operation and farm management through pointing some drawbacks. The study will be helpful for the planners for proper planning and policy making. The policy makers will also get information about the profitability level and hindering the profitability of farmers. So, comprehensive plan is needed to make the egg production popular and sustainable. No recent study of this type was conducted in the study area, for this a good number of researchers are needed in this area. This study may bring socio-economic benefit to policy makers, individual farmer, egg traders. Besides it may be used as a basis for further study on egg.

1.5 Objectives

The following objectives are given below:

i. To illustrate Socio-economic characteristics of the egg producers;

ii. To examine the existing marketing channels of egg;

iii. To estimate the profitability of egg production;

iv. To identify the problems and constraints associated with egg production and marketing and to suggest possible solutions for those.

1.7 Organization of the Thesis

This study has been organized into several chapters. Chapter 1 provides an introduction to the study. Chapter 2 introduces a review of the literature. Chapter 3 provides research methodology. Chapter 4 provides results and discussion. Chapter 5 provides conclusion and recommendation.

CHAPTER-2

REVIEW OF LITERATURE

Generally, before conducting an experiment, it is essential to know the information about the previous research works. In this chapter, an attempt was taken to review the past research works which are relevant to the objectives of this study. This was mainly concerned with the review of the profitability of egg production and marketing channel.

2.1 Review of literature of the profitability of egg production

Shrivastava et al., (1994) studied on price spread in the marketing of eggs in Lucknow City. In this study the researchers estimated the distributive margins of different actors at various levels of the marketing chain to determine the producers share in the consumers rupee in egg marketing in Lucknow, Uttar prodesh, India.

Sharma et al., (1995) studied the marketable surplus of eggs in Panjub. The researchers Investigated in this study the marketable surplus of eggs in India according to farm size. They collected data for 1998/90 from a total sample of 191 poultry farms in Ludhina and Fariodkot districts, Panjub. In this study the farms were categorized into three groups according to size such as small (less than 3000 layers), medium (3000-10000 layers) and large (above 10000 layers). The result of this study showed that breakage and home consumption were the highest for large poultry farms and the lowest for the small farms. This report also presented that about 65 percent of total egg production took place in the period of October to March.

Ashutosh and Shrivastava (1999) carried out a study on economic analysis of poultry production and marketing in Jabalpur district of Mkadhya Pradesh. They studied 12 poultry farmers from the organized sector and twenty five poultry farms from unorganized sector. The results revealed the commercial layer and broiler units of particularly the large farmers were well managed and cost effective as compared to the small and medium farms. Among the four main marketing channels, two accounted for 75 percent share of egg marketing and one accounts for 90 percent share of broiler marketing. Poultry were considered to have good prospects.

Ali (1976) carried out an economic analysis of poultry farming in Dhaka city with particular emphasis on small scale commercial egg producing farms on the roofs of dwelling houses. The researcher found that both small and medium poultry farms were highly profitable. He also identified the problems of farmers.

Islam (1976) studied egg marketing in Mymensingh town. In this study the researcher identified the marketing system of egg, estimated the marketing cost and margin of egg in Mymensingh town and studies the marketing efficiency of eggs.

Miah (1992) studied poultry marketing in Mymensingh district. It is found that poultry birds were marketed through the channel: producer, Aratdar, Wholesaler, retailer and consumer. The intermediaries faced various problem in running their business. The study showed that marketing cost per 50 kg bird was Tk.23.36 on which transportation cost accounted for the highest share. The profit earned by the intermediaries was not encouraging. Since the marketing channel was long, the consumers had to pay high price and producers were deprived of fair returns.

Miah et al., (1992) conducted a study entitled "An economic analysis of poultry production in Mymensingh district: a micro level study'' they observed that poultry was produced in a backyard subsistence method and the existing poultry producing was in efficient.

Rahman (1993) conducted a study on marketing of egg in Bangladesh. In this study villages of Mymensingh and Tangail Districts were selected as supplying or producing centre Dhaka city was selected as consuming centre. The marketing pattern and function of egg in Bangladesh were examined in this study. The researcher also identified the problems of egg marketing and provided of solution as suggested by egg traders.

Begum (2000) calculated cost and return of both broiler and layer firm. And found that both kinds of species provide benefit to farmers. And she said that poultry farming is a profitable business in Mymensingh district. This study also identified some problems in the production of poultry in the study area. Finally, based on the findings of the study, some recommendations were made for the development of poultry production in Bangladesh.

Rahman (2001) completed a study on prospects and problems of poultry industry in selected areas of Bangladesh with particular preference to marketing practices. For the study, Gazipur and Kishorgong districts were purposively selected. The researcher selected 130 respondents which included 25 contract growing farmers, 40 traders of broiler and 20layer farmers and 45

egg traders. He calculated average cost of raising broiler per batch was TK. 73322 for 1000 birds and net return per broiler farm per batch was TK. 8058. He also calculated the average cost of raising layer per farm per batch which was Tk.78940 per 1000 birds and net return per batch (72 weeks) for 1000 birds was estimated at Tk. 14047. The average marketing cost of broiler in Dhaka city and in Kishorgonj for wholesaler cum retailer and retailers were estimated at Tk.2844, Tk. 2046, Tk.2543 and tk.23702 per 1000 birds respectively.

Ahmed, M. F. U. (2001) made an economic analysis of broiler production under PROSHIKA supervision and private management. And he found that PROSHIKA provides better training to farmers under its supervision. And the trained farmers are skilled and their productivity is greater than the private management.

Ershad. S.M.E. (2005) conducted a study on performance of hybrid layer and native hens under farmers management in selected areas in Bangladesh. He conducted in Jessore district of Bangladesh during the period from January2003 to December 2004 to investigate the performance of Brown Shelled Hybrid Layer, White Shelled Hybrid Layer and Native Hen measured during only laying period (57 weeks).8 Brown Shelled Hybrid Layer farms,8 White Shelled Hybrid Layer farms and 10 Native Hen farms were reared intensive, intensive and scavenging systems respectively. Result revealed that the egg production, egg weight, final body weight, feed consumption, shell weight, age at first laying, feed cost, management cost, and net profit varied significantly due to different birds and different management system. Under intensive system Hybrid Layer rearing were better than Native Hen showed moderate performance in terms of higher egg production, higher weight of egg, higher body weight and lower mortality. Feed conversion efficiency, production number of eggs, egg mass, net profit and survivability was higher in White Shelled Hybrid Layers than Brown Shelled Hybrid Layers under intensive system. Under scavenging system NH was better also for the rural area of Bangladesh, because of lower production cost, higher market price of eggs, live bird price and good profit. Rural poultry plays a vital role in the existing farming systems of Bangladesh. It can be recommended here that the Native Hen farming under scavenging system without any investment and White Shelled Hybrid Layer or Brown Shelled Hybrid Layer i.e. anyone under intensive system farming are obvious for efficient and profitable egg production in Bangladesh.

Aziz and Miah (2005) conducted in their study on family poultry farming system in developing countries have stressed on economic justification of the introduction of family

poultry farming model herein Bangladesh by drawing an excellent example of ABFL in a brief version and advocated for their replication in the other developing countries.

Otte (2006) found that in Vietnam, poultry rearing in scavenging backyard system gave a rate of return to the tune of 600% which the farmers were able to cash-in in small amounts as and when the need arose. Given the opportunity, people moved from one livestock species to another to increase their household income and climb up the ladder of asset accumulation, starting with poultry and climbing up the ladder to goats, pigs or sheep, then a cow, bullocks and finally buffalo at the top of the ladder

Aklilu (2007) found that Ethiopian farmers considered poultry keeping as a strategy for poor to accumulate capital. Farmers there regarded poultry as the first and the last resource for the poor- initial capital for recovery from poverty and last capital when declining into poverty.

Beutler (2007) conducted a study where he said that in egg-producing farms, day-old chicks are purchased from specialized hatcheries that produce egg-producing pullets. These pullets are either raised by the egg producer or a pullet grower until they are ready to start laying eggs, which is usually at 19 weeks of age.

Abdullah et al. (2007) conducted a study on the economics of poultry production and its problems in Faisalabad, Pakistan. The study highlighted the different problems faced by the broiler producers in the study area. They estimated the percentage share of different stakeholders in total profit of the industry. It was observed that inequitable distribution of profit was the major obstacle in the expansion of the poultry industry .Their results recognized that 47% of the total profit is gained by the commission agent, followed by retailers whose share was 28% and the remaining share went to the pocket of producers The other issues highlighted in the study were the marketing of broilers in the hands of few functionaries rapid price fluctuations and high charges of commission.

Beutler (2007) reported that laying hens in egg producing farms are usually of small body frame and body weight compared to broilers. They can be classified into two groups: dual purpose chickens or egg producing chickens. Egg producing chicken breeds have been bred and raised for maximum egg production (up to 300 eggs per year) rather than high meat yield.

Mahaddes and Mazhari (2008) undertook a study on total and input productivity analysis of poultry production in Khurasan, Iran. This study was conducted for finding out the productivity level of the industry for the development of a sustainable and high productive system by using Transcendental and Cob Douglas production function. It was found that the

average productivity for the poultry farm was 1.07. This makes it clear that the income is approximately equal to the variable cost. When the fixed costs were taken into account the profit for the average farm became negative. It was concluded that the feed was used more than the optimal level while pullets were used less than the optimal level. So for increasing the profitability farmers should have used less feed and more pullets fir reducing the cost of production.

Farran (2009) reported that the egg production cycle lasts for about one year. The pullets and laying hens are raised mainly in environmentally controlled poultry houses in cage systems. To make the maintenance process easier, automated feeding, watering, and egg collection systems were developed. Feed and water are moved on rotating belts which pass by the cages. Another rotating belt collects the eggs and sends them to the sorting chamber to be tested for fertility, graded, and sorted according to size, making them ready for delivery to the market.

Akter and Uddin (2009) argue that as an important sub sector of livestock production, the poultry industry in Bangladesh plays a vital role in economic growth and simultaneously creates numerous employment opportunities. The poultry industry, as a fundamental part of animal production, is committed to supply the nation which a cheap source of good quality nutritious animal protein in terms of meat and eggs.

Akter et al., (2009) conducted a study to estimate the comparative profitability of Aftab Bahumukhi Farm Limited (ABFL) supervised broiler farms and farmers' own managed broiler farms. Data were collected from randomly selected 90 broiler farmers of which 45 were ABFL supervised farmers and 45 were own managed farmers. Descriptive statistical techniques were used to estimate cost and returns of broiler farming. The study revealed that on an average, total cost of raising broiler per batch per 1000 birds was estimated at Tk. 99,429.00 and Tk. 1,06,330.00 for ABFL supervised farms and farmers own managed farms respectively. The respective average variable costs and fixed costs per batch per 1000 birds were calculated at Tk. 96,218.00 and Tk. 1,02,926.00 respectively. These accounted for 96.77 percent and 96.80 percent of total costs respectably for ABFL supervised farms and independently managed farms. The estimated average gross return was Tk. 1,03,334.00 for ABFL supervised farms and Tk. 1,09,961.00 for independent farms respectively. The average gross margins per batch per farm for 1000 birds were at Tk. 7,470.00 and Tk. 7,035.00 for the ABFL supervised farms and for farmers own managed farms respectively and average net returns were estimated at Tk.

4,259.00 for ABFL supervised farms and Tk. 3,631.00 for farmers own managed farms respectively. From the statistical evidence it was found that profit earned by ABFL supervised broiler farms and own managed broiler farms were not significantly different.

Tijjani et al., (2012) conducted a study of economic analysis of poultry egg production in Maiduguri and environs of Borno state, Nigeria. Analysis of the finding of costs and returns associated with poultry egg production showed that costs of feed and hired labour accounts for 80.65 and 5.25% of the total costs in poultry egg production respectively. The result of input / output relationship in poultry egg production also indicates that the coefficients of the cost of hired labour, flock size, feed, depreciating cost of equipment and other operating expenses were all positive and significant at 5, 1,and 10% respectively. High cost of feed, inadequate drug, lack of governmental support, poor management practices, high mortality rate, high bird density and inadequate ventilation among others were the major problems associated with poultry egg production in the study area. It was recommended that farmers should form agricultural co-operative groups that will enable them obtain credit from government and financial institutions; and extension agents in the state should be properly trained and provided with all necessary technological packages required to teach and guide farmers on improved poultry egg production.

Sultana et al., (2012) conducted a study on Small scale broiler farming at Santhia Upazila of Pabna District during the period from February to March 2012. Data were collected using an interview schedule from 50 randomly selected respondents who were involved in broiler farming. In this study out of 50 respondents 60% were engaged in agriculture, 36% businessman and 4% were in services. About 48% respondents had small size farms (100-500) birds, 40% had medium (501-1000) birds and remaining were large size (1001-200) birds. Most of the respondents reared Cobb-500 strain, those were purchased from Kazi Farms Ltd. Out of 50% respondents 30% took necessary suggestions from the experienced farmers, (0% farmers regularly vaccinated their broilers and 70% farmers taken short training in broiler farming. About 78% respondents considered market weight as 1.5 kg per bird, whereas the rest 22% sold broiler weighing about 1.8 kg per bird. Most of the respondents sold broiler at 30-33d of age and about 80% respondents marketing the broiler at 110-115 taka per kg live bird. About 36% respondents had production cost approximately 90-95 taka per kg bird. In this study about 30% respondents reported lack of farming facilities, 32% reported higher cost of production and 30% reported lack of training facilities. In conclusion the result of present

study could be considered to useful farmers and researchers to identify the problems and their remedies on management and marketing related broiler production.

Chowdhury et al., (2015) conducted a study profitability of poultry farming in Bangladesh on Trishal Upazilla in Mymensingh District. This study aimed to determine cost, return and profitability of broiler production. Selected samples consisted of 80 poultry farm owners selected by using purposive sampling technique. In the selected area maximum people are related with agriculture. The findings revealed that poultry production was a profitable enterprise. These sectors are really helpful for income generation, women empowerment and nutritional improvement for the family. Again, in this study area 85% farmers opined that either poultry farming helped them to improve their life style. Thus, there is potentiality for further improvement of these sectors. They identified some problems in the production of broiler in the study area and finally give some recommendations for the development of broiler production in Bangladesh.

Roy (2017) analysed economic and profitability potential assessment of poultry farming of west Bengal. The study was conducted using a structured questionnaire. The study based on primary and secondary data collected from 120 poultry farmers by adopting purposive sampling. The total fixed cost in layer farming was estimated to be 0.66 per cent of the total cost for 1000 birds per batch. The return structure of layer farms indicates the total returns from the sale of eggs, sale of culled birds and manure from 1000 birds as Rs. 431590. Among the overall total returns, the sale of eggs accounted for about 91 per cent followed by sale culled birds (7.83 per cent). The net returns were Rs. 82946per annum of 1000 birds. Net returns per month were found to be Rs. 6912 per 1000 birds. Garrett's ranking technique was used to identify the constraints in the poultry farming and marketing in the study area.

Rahman et al., (2020) conducted a study poultry farming is considered a poverty reduction strategy in Bangladesh and one of the vital components of the agricultural economy that fulfil various activities, including food, nutrition, income, and savings, social and cultural functions.

Ami et al., (2020) conducted a study of Major problems and challenges of egg production and marketing in Bangladesh. Data were collected from 19 reputed layer farms owner and 48 egg traders located in two Upazilas at Mymensingh district. In this study, some problems were considering such as major marketing problems were economic problems, lack of information system, improper supply of medicine and vaccines, lack of adequate and suitable transportation

system and price instability. The study also evaluates some specific measures to minimize the existing problems in the poultry sector and they are as government interfere in capital, providing right information of layer farming system, provision of adequate supply of medicine and veterinary services, development of transportation system, price stability by market monitoring.

Uddin et al., (2021) conducted a study of Viability of medium scale layer farming in Gazipur District of Bangladesh. A total of 40 medium scale layer farmers were selected for primary data collection through a face to face interview during the period of October to December 2018. Cost analysis revealed that the production of the chicken layer was profitable. The average benefit cost ratio was estimated at 1.35. In the study area, the major problem faced by medium scale layer farmers were price fluctuation in different markets, lack of adequate storage facilities low market price etc. The net return of the medium-scale layer farm could be increased by eliminating these problems. Moreover, as layer farming is a capital-demanding business, institutional credit facilities should, therefore, be made available for all layer farmers on easy terms and conditions and an adequate amount. Thus, well-planned and management training in accordance with their problems can lead to them to increase farm production and income from layer farming.

Rabbani, G. and Ahmed, b. (2021) analysed Production and profitability small scale broiler farming in selected areas in Dinajpur District, Bangladesh. This study focuses on the production and profitability of the broiler farming by using Cobb-Douglas production function and Benefit-Cost analysis. For this purpose, data were collected from 50 broiler farmers living in Birol and Sadarupazila of Dinajpur district in 2020.Broiler farming can be an alternative way to promote self-employment for Bangladesh whose has a huge young population to convert from unemployed to employed persons. This also reveals that the broiler farmers living in Dinajpur district are also profitable in their farming that is indicated by net return of Tk.13563 per shed production where net return over the total cost was indicated at 0.075. The production function resulted that feed, medicines and human labour had significant positive effect on production of broiler whereas only rental cost had negative effect. Training had a highly significant ($p<0.01$) positive effect on production of broiler. Therefore, it can be recommended that training and proper use of drugs and medicine should be encouraged because of their significant impact. Government and NGOs should also arrange more training for improving broiler production in Bangladesh.

Remarks

The above review of literature revels that some studies have already been conducted on egg production in Bangladesh. All the above studies reviewed and provided valuable information in pursuit of the present study. The present study is expected to provide some basic information on egg production and aims to examine profitability of egg production in some selected areas of Tangail district. Policy makers will get information about the profitability level of egg production and marketing through this study. Thus, this study may bring benefits to policy makers and individual farmers.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction:

This chapter provides a discussion on Methodology applied in this study. Proper methodology is a prerequisite of a good research. The credibility of a scientific research depends to a great extent on the appropriate methodology used in the research. Using an inappropriate methodology may lead to an erroneous result. A researcher has to give a careful consideration in following a scientific and logical methodology for carrying out any scientific research. Selection of a particular method depends on many considerations, such as, nature and scope of the research, availability of literature and primary information, availability of funds, time etc. Survey method has been used in the present study because it is thought to have some advantages over the other methods. This method enables quick investigation, the result achieved has wider applicability and the method is usually more comprehensive. However, survey method has also some drawbacks.

3.2 Selection of the study area

The study area took place in Gopalpur and Ghatail upazila, Tangail District. The districts of Bangladesh are divided into sub-districts called Upazilas (Sarker,2010). Five specific villages of egg producing were selected based on their availability. The study mainly focused on their layer farms and a convenient way to meet with them. Among layer farming concentrated villages namely Saplabari, Monidoh, Dopakandi, Pichuria, kalipur were purposively selected. The population of this study were egg producers in the study area.

The reasons behind the selection of these areas are:

a. The study area is accessible to the researcher, who is familiar with the local dialects.

b. The villages of the five villages were found to be good egg producing areas.

c. Expected better co-operation from the farmers.

d. It was easier to communicate with expected respondents of these areas.

3.3 Sampling technique and selection of the sample

Two factors need to be taken into consideration in selecting samples. The sample size should be large enough to allow for adequate degrees of freedom in statistical analysis. On the other hand, administration of field research, processing and analysis of data should be manageable within the limitations imposed by physical, human and financial resources (Mannan 2001). Due to limitations of time, resources and not availability of egg producers it was not possible to interview large sample farmers in the study area. For this reason, a reasonable size of sample was taken. Total 52 egg producers, 32 from Gopalpur Upazila and 20 from Ghatail Upazila, were selected for the study. Among the sample farmers, 10 farmers were from Saplabari village, 12 from Pichuria village, 10 from Dhopakandi village, 9 from Monidoh village, 11 from Kalipur village. A purposive sampling technique was followed to select the sample farmers.

Table 5: - Distribution of sample farmers

Upazila	Villages	Egg Producers
Gopalpur	Saplabari	10
	Pichuria	12
	Dhopakandi	10
Ghatail	Monidoh	9
	Kalipur	11

3.4 Preparation of interview schedule

A draft questionnaire was prepared in order to collect relevant information from the selected egg producers. The interview schedule was formulated in such a way that it covered all the information needed in the analysis and all aspects associated with the objectives could be included. The questions were included logically and in appropriate sequence to ensure that they could easily be understood by the informants and their responses could be quicker. The questionnaire was pre tested by interviewing some egg producers and then necessary modification and additions were made and then the draft questionnaire was finalized. The final questionnaire contained three types of information about the sample farmers, their socio-economic condition, cost and returns of egg production and the problems faced by them.

3.5 Period of the study

Data were collected during the period of March to June in 2022 through direct interview with the egg producers. Data relating to inputs and outputs were collected by making time to time visits in the study area during this period.

3.6 Data collection methods

For the present study, data were collected from primary sources through field survey and its collection was accomplished by direct interviews with the egg producers. Researcher herself collected the relevant data from the selected egg producers. At the time of interview, the researcher asked questions systematically and a brief introduction about the aims and objectives of the study was given to each respondent. The questions were asked in a very simple manner and information was recorded on the interview schedule. It was explained to the egg producer that the study was purely academic. Each time, when interview was over, the interview schedule was checked again to ensure that these were correct and properly recorded.

3.7 Processing, editing and tabulation of data

The collected data were manually coded and edited. Then all the collected data were scrutinized and summarized carefully. Data were processed and transfer to Excel sheets to facilitating in order to meet the objectives of the study. Moreover, data entry was made in computer and analyses were done using the concerned software Microsoft Excel.

3.8 Analytical technique

Data were analyzed in order to arrive at a meaningful result and achieving the objectives of the study. Descriptive statistics and profitability analysis as well as profit equation were chosen for this study.

3.8.1 Descriptive statistics

The descriptive statistic is a technique commonly used for the sum, average, percentage of costs, gross returns, net returns and profitability of egg producers. It is also used for analyzing

socioeconomic conditions like, age, income, literacy, occupation etc., marketing channel and problems faced by the egg producers.

3.8.2 Profitability analysis:

Net return was determined by subtracting total costs (variable and fixed cost) of production from total return. The following profit equation was used to assess the profitability of egg production.

$\pi = TR-TC$

Or, $\pi = TR- (VC+FC)$

Or, $\pi = \Sigma Q_e.P_e + \Sigma Q_c.P_c - \Sigma(X_i.PX_i) - TFC$

Where,

π =Net return from egg production (Tk./100 layers)

P_e = Per unit price of egg (Tk./per piece)

Q_e= Quantity of egg (piece)

P_c = Per unit price of layer chicken (Tk./price)

Q_c = Number of layer chicken

PX_i = Per unit price of the relevant inputs used for egg production. i = 1, 2, 3, …n

TFC = Total fixed cost involved in production

3.9 Problems faced in collecting data

There are some problems and difficulties faced by the researcher during the period of data collection. Data were collected within shortest possible time, due to limited fund. Most of the respondents did not keep any accurate records so the researcher had to depend solely on the memory of the respondents for collecting necessary information. Moreover, the egg producers always tried to avoid providing proper information relating to the actual size of holding income accrued from egg production. In a few cases, the egg producers were not found at home. This needed two or three visits to conduct even a single interview. To overcome all these problems and to obtain accurate information, it required a good deal of patience of the researcher.

3.10 Limitations of the study

The present study provides some useful information for researcher, farmers and decision makers regarding egg production. However, there are some limitations of the study, the main limitations are as follows:

i) The present study was conducted on a small sample size and in a specific geographic area (Gopalpur and Ghatail Upazilla of Tangail District) of Bangladesh due to shortage of time and fund.

ii) In rural Bangladesh, most of the farmers are illiterate or have a few years formal education, they do not keep any records of farm transactions, that's why it was difficult to get reliable information. As a result, the accuracy of data entirely depends upon their memories and sincerity. Hence, there may be possibility of data errors.

iii) Some farmers at first did not show interest to give information as there was no direct benefit for them.

iv) There was difference in data of cost and return collected from different farmers having same amount of area under egg production. It created some confusing situations.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter includes the minute discussion of socioeconomic characteristics of the egg producers, profitability analysis of egg production, marketing channels and the problems of the egg producers. The aim of this chapter is to mention all the findings which the researcher has found in the research field.

4.1 SOCIO-ECONOMIC CHARACTERISTICS OF EGG PRODUCERS

The purpose of this chapter is to discuss the socioeconomic characteristics of the egg producers. Socio-economic characteristics of any decision maker are very important for overall farm decision as production pattern and technology adoption are largely influenced by individual's socio-economic characteristics. People differ from one another in many aspects, because there are numerous interrelated and constituent attributes that determine the development of behaviour and personality. Some important features of the socio-economic profiles such as age, education, family size, farm size, occupation, income, etc. of the sample egg producers are presented below.

4.1.1 Age-wise distribution of egg producers

The selected egg producers were grouped into four categories according to their age. The different age groups of the egg farm owners from two locations, eg. Gopalpur and Ghatail Upazillas are given in Table 5. Different ages of egg producers have been found during the survey in five selected villages. Not only old men or middle-aged men are involved in this occupation but also young men are involved in this occupation. Some young boys help their father in this business as per time workers. From table 5 it has been found that 9.61 percent of egg producers age range is below 31 years, 48.08 percent range is 31 years to 45 years, 34.62 percent range is 46 years to 55 years and around 7.69 percent range is above 55 years.

Table 6 Age-wise distribution of egg producers

Age Group(years)	Frequency	Percent
Below 31	5	9.61
31-45	25	48.08
46-55	18	34.62
Above 55	4	7.69
Total	52	100

Source: Field Survey, 2022

4.1.2 Family size of the selected egg producers

Family is a primary social group that consists of parents and their offspring, the principle function of which is provision for its members. Family size in the study area has been defined as total number of persons living together and taking meals from the same kitchen. Table 7 shows the family size of respondents of the two locations. Majority of the sample farmers' families (65.38%) were Nuclear family. About 34.62% families were Joint families. Average family size of the sample farmers contains 5.12 members.

Table 7 Family size distribution of egg producers

Family members	Frequency	Percent
Nuclear family	34	65.38
Joint family	18	34.62
Total	52	100

Source: Field Survey, 2022

4.1.3 Education status

Education may be defined as the ability of an individual to read and write or formal literacy received up to a certain standard. It creates the power of understanding and analyzing fact and situations. Educated farmers have more access to improved production procedure and they are able to make rational economic decisions. Education helps to develop production process and to keep accurate account of production costs and returns. From the educational point of view, all members in the study area are categorized into five groups. i.e. up to primary, up to

secondary, up to higher secondary, B.A and up to masters. About 15.38 percent of egg producers involving their business after completing the primary level of education, 53.85 percent after secondary level, 13.46 percent after Higher secondary level,3.85 percent after B.A level 13.46 percent after Masters level according to table 5.

Table 8 Education level of egg producers

Education group	Frequency	Percent
Primary (1-5)	8	15.38
Secondary (6-10)	28	53.85
Higher Secondary (11-12)	7	13.46
Graduation (13-16)	7	13.46
Masters (17/18)	2	3.45
Total	52	100

Source: Field Survey, 2022

4.1.4 Occupational status

Layer farming was the main occupation and major source of livelihood of most of the selected household in the study area. Beside layer farming, a few numbers of farmers were engaged in agriculture, business, service and others as their main occupation. Table 6 shows the occupation status of the sample farmers. About 3.85 percent of egg producers involving their business, 61.54 percent of egg producers involving their layer farming, 30.77 percent of egg producers involving service, 3.85 percent of egg producers involving as agriculture according to table 4.

Table 9 Main Occupation of egg producers

Items	Frequency	Percent
Layer farming	32	61.54
Agriculture	2	3.85
Business	2	3.85
Service	16	30.77
Total	52	100

Source: Field Survey, 2022

4.1.5 Farm size Distribution of egg production

Firm size in the study area are categorized into three groups such as small (100-500) birds, Medium (501-1000) birds, large (1001 to above) birds. About 23.08 percent respondents involves in small farm size, about 28.85 percent respondents involved in medium farm size and 48.08 percent respondents involves in large farm size.

Table 10: - Farm size distribution of egg production.

Parameter	Categories	No. of Respondent	Percentage
Farm size	Small (100-500 birds)	12	23.08
	Medium (501-1000 birds)	15	28.85
	Large (1001 to above)	25	48.08
Total		52	100

Source: Field Survey (2022)

4.1.6 Land Distribution

Table 7 shows that land distribution level of egg producers. Data shows that average homestead area is 21 decimal which is 11.2% of total land area. The average own land is 137.2 decimal which is 73.2% of total land area. The average rent in land is 16.3 decimal which is 8.3% of total land area. The average rent out land is 14.5 decimal which is 7.5% of total land area. Their average total land holding is 186 decimal.

Table: - 11 Average Land distribution level of egg producers

Item	Average area (decimal)	Percentage
Homestead	21	11.2
Own land	137.2	73.2
Rent in	16.3	8.3
Rent out	14.5	7.5
Total	186	100

Source: Field Survey, 2022

4.1.7 Level of income of the egg producer

Family income refers to the total earning by the respondents and their family members through cropping, business, job or other service works. Income of the egg producers at the study area is presented at table 4.6. Majority of the egg producers had an annual family income of less than 1.5 lacks.

Table: - 12 Income status of the egg producers

Level of Income (Tk.)	Frequency	Percentage
Less than 1.5 lacks	35	67.3
1.5 lacks to 2.5 lacks	14	26.92
Above 2.5 lacks	1	1.92

Source: Field Survey, 2022

4.2 PROFITIBILITY ANALYSIS OF EGG PRODUCTION

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 finally the profitability of the farm. The main aim of layer farm is the production of egg. After egg production rejected birds are sold this meets the demand for meat. Thus layer farm's return comes from both egg and meat. The relevant cost and returns of the present study are discussed below-

4.2.1Total cost:

The cost items are classified into two broad categories, i.e. (a) Fixed cost and (b) variable costs. Egg production includes different types of costs under the following heads:

4.2.2 Fixed Cost:

a) Land use cost:

In our study area average land use cost is 5905.98tk which percentage is 2.97 of average total cost for 100 layers.

b) Housing Cost:

Housing cost is the most important cost for layer production. In the present study, some layer house found within the living house and some were outside of living house. The housing cost is calculated by the summation of total making cost. House is a fixed asset. In our study area average housing cost is 16590.12 tk which percentage is 8.34 of average total cost for 100 layers.

c) Equipment Cost:

The egg producers use different tools and equipment, such as- food container, water jar, feeder, bowl, case etc. In our study area, average equipment cost is 9835.11 which percentage is 4.94 of total average cost.

d) Interest on operating capital:

Interest on operating capital was determined on the basis of opportunity cost principle. The operating capital actually represented the average operating cost over the period, because all costs were not incurred at the beginning or at any single point of time. The cost was incurred throughout the whole production period; hence, at the rate of 10 percent per annum interest on

operating capital for 24 months was computed for egg. Interest on operating capital was calculated by using the following formula:

$$IOC = AIit$$

Where,

IOC= Interest on operating capital

i = Rate of interest

AI= Total operating capital

t = Total time period of a production cycle of egg

In this study, interest on operating capital was charged at the rate of 10 percent per annum and was estimated for the duration of 24 months. Average Interest on operating capital was calculated Tk. 27772.64 in the study area.

4.2.3 Variable Cost:

a) Feed Cost:

Feed cost is the major cost item for layer farms. In our study area, farms purchase feed from market. So, in every day a part of capital is invested for feeding the bird. In the study area average feed cost for 24 months is 79287.22tk. which shows 39.85% of average total cost for 100 layers.

b) Purchasing Day Old Cost:

This cost is primary cost for the egg producers. This cost varies from one farm to another according to the size and numbers. Here average purchasing day old chicken cost is 5824.44tk.

c) Labour cost:

The larger portion of egg production cost was the cost of human labor. It was the most important and largely used input of egg production. Human labor required for different operations of egg production such as housing, providing feed, cleaning, collecting egg etc. In the study area average labor cost is 21240.85 tk. which shows 10.68% of average total cost.

d) Electricity cost:

Electricity is connected for once its bill is paid by month. For a farm with 100 birds has average electricity bill of 325 tk. It raises as the number of birds rises. Table shows that average electricity bill was 7832.41 which is 3.94% of total average cost.

e) Veterinary Cost:

Veterinary expense is another important cost item of layer production. Veterinary services included cost of vaccine, medicine, and fees of doctors. Total medicines costs were calculated by taking current market prices. Here average veterinary cost is 7647.59tk. which is 3.84% of total average cost.

f) Transportation Cost:

Transportation cost includes such as cost for bringing feed from market, cost for bringing chicken from market, cost for selling chicken to market, cost for bringing medicine etc. Average transportation cost for 100 layers is 9810.97tk for 24 months which shows 4.93% of total average cost.

g) Maintenance cost:

Average maintenance cost for 100 layers is 2052.72tk for 24 months which shows 1.43% of total average cost.

Total variable cost has been shown 138863.24tk which represents 69.79% of total average cost for 100 layers and total fixed cost is 60103.74 which represents 30.21% of total average cost for 100 layers.

Table 13: - Total cost in egg production in 100 layers in 2 years

Cost items	Average cost	Percentage of average total cost
1.Variable cost		
Feed cost	79287.22	39.85
Purchasing day old chick cost	5824.44	2.93
Labour cost	21240.85	10.68
Electricity cost	7832.41	3.94
Veterinary cost	7647.59	3.84
Transportation cost	9810.97	4.93
Maintenance cost	2052.72	1.43
Miscellaneous cost	4309.14	2.17
Total variable cost	138863.24	69.79
2.Fixed cost		
Land use cost	5905.98	2.97
Housing cost	16590.12	8.34
Equipment cost	9835.11	4.94
Interest on operating capital @ of 10%	27772.64	13.96
Total fixed cost	60103.74	30.21
Total cost	198966.98	100

Source: Field Survey, 2022

4.2.4 Income from eggs

Average total number of eggs are sold 33786 for 100 layers in 18 months which unit price is 7.3tk. Egg producers get amount 246637.8tk from selling egg.

Table 14: -Income from eggs for 100 layers

Items	Value (Tk.)
Quantity (total number of eggs sold)	33786
Unit price (Tk.)	7.3
Total Value	246637.8

Source: Field Survey, 2022

4.2.5 Gross return

The return item includes sale of birds and eggs. Total return was calculated by multiplying the total amount of main product and by product with their respective market prices. Table 13 shows that egg producers get amount 246637.8tk from selling egg which represents unit price is 7.3. Egg producers also get amount 38528tk from layer chicken. Gross return from egg production was 285165.8tk. Egg producers get average 33786 eggs from 100 layers. So the researcher also can say that gross return is 285165.8 tk. for 33786 eggs production or 100 layers.

Table 15: - **Gross return, Gross margin, net return from egg production of 100 layers in two years**

Item	Value (tk.)
Gross return	
Total number of eggs sold	246637.8
Total number of layer chicken sold	38528
A. Total Gross return	285165.8
B. Total cost	198966.98
C. Variable cost	138863.24
Gross margin (A-C)	146302.56
Net return(A-B)	86198.82
BCR (A/B)	1.43
BCR (A/C)	2.04

Source: Field Survey, 2022

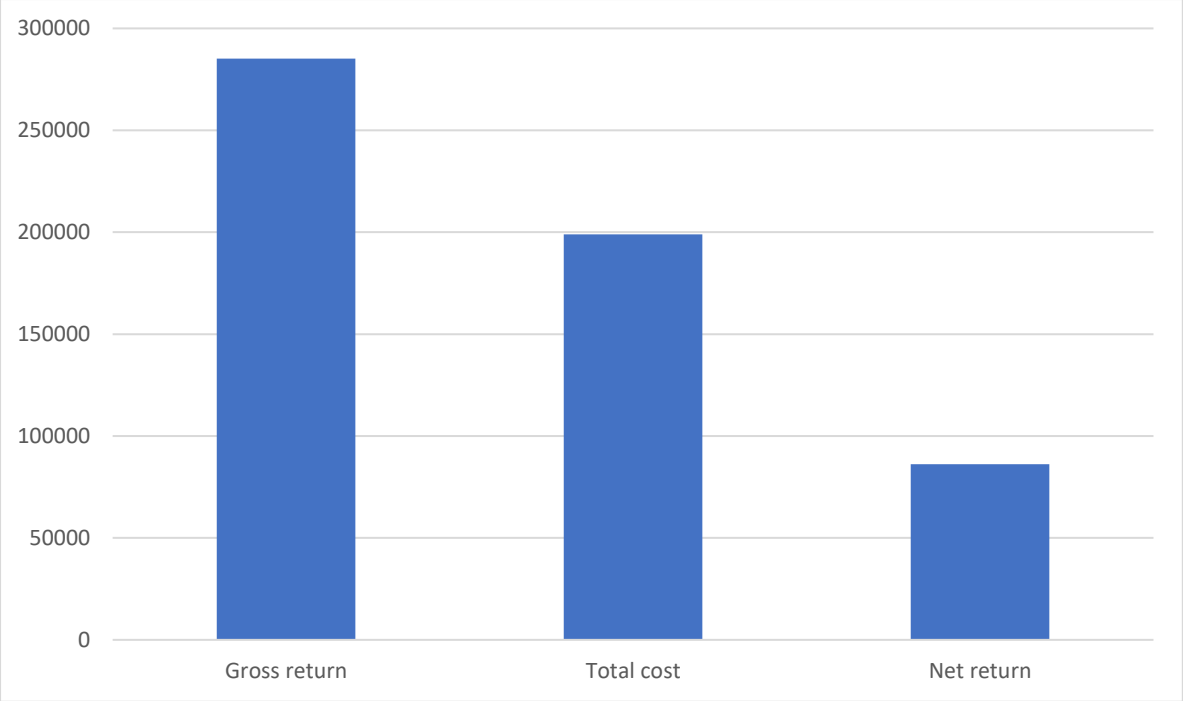

Fig. 3: Gross return, total cost and net return for egg production of 100 layers

Table 16: - Gross return and net return from per egg production

Item	Value (Tk.)
Gross return	8.44
Total cost	5.89
Net return	2.55

Source: Field Survey, 2022

4.2.6 Net return:

Net return was obtained by deducting total costs from gross return. Calculating net returns represents the performance of any enterprise. Egg producers get average 33786 eggs from 100 layers. For 100 layers or 33786 eggs net return of egg production was calculated 86198.82. The researcher also calculates net return for per egg production. Table 14 shows that net return of per egg production is 2.55tk. The Results presented at the table reveals that egg production is a profitable business in the study area.

4.2.7 Benefit cost ratio

BCR refers to undiscounted benefits and costs which was calculated by dividing gross return by gross cost. Benefit Cost Ratio on total cost basis was 1.43 which indicates that egg production was profitable in the study area. Benefit Cost Ratio on variable cost basis was 2.05.

4.3 MARKETING CHANNEL OF EGG

A marketing channel consists of the people, organizations, and activities necessary to transfer the ownership of goods from the point of production to the point of consumption. It is the way products get to the end-user, the consumer; and is also known as a distribution channel. The main aim of layer farming is to earn profit by placing the eggs at the disposal of the consumers. It involves a number of important activities at different stages which are performed by a series of intermediaries, linking the producers with the consumers. Marketing channels are alternative routes of product flows from layer farm owner to consumers (Kohls and Uhl, 1980). According to Gandhi (1983), marketing channel may be defined as "a pathway composed of intermediaries also called middlemen, who perform such functions as needed to ensure smooth and sequential flow of goods and services from the manufacturing ends to the consuming ends in order to achieve marketing objectives of a **company**". In my study area the marketing channels of eggs are in the following: -

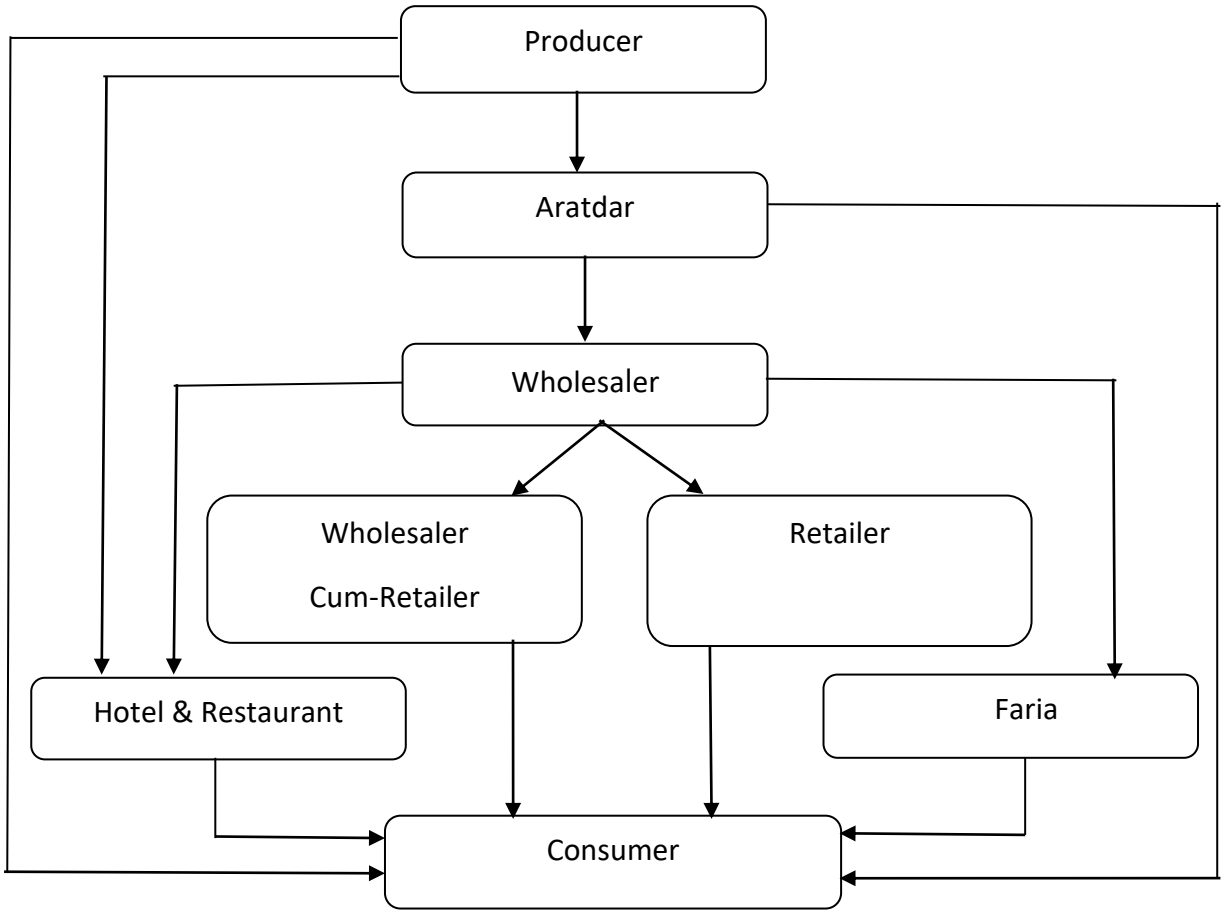

Fig. 4: - Marketing channels of Egg in Tangail district

On the basis of Figure the following channels can be identified:

1: Producer→ Aratder → wholesaler → Retailer → Consumer

2: Producer → Aratder → wholesaler → Wholesaler Cum Retailer → Consumer

3: Producer → Aratder → wholesaler → Wholesaler Cum Retailer →Retailer → Consumer

4: Producer→ Aratder → wholesaler → Hotel & Restaurant → Consumer

5: Producer → Aratder → wholesaler → Faria → Consumer.

6. Producer →Aratder → Consumer.

7. Producer → Consumer.

8. Producer → Hotel & Resturant → Consumer

4.3.1. Producer

The first link in the chain of egg marketing was the layer farm owners. The layer farm owners produced eggs in their farms thought the year. They sold their eggs to the intermediaries. In the study areas producer sold their eggs directly to the Aratdar and sometimes they sold their eggs directly to consumer.

4.3.2 Wholesaler

Wholesalers were the professional traders in the channels of egg marketing. They purchased large volume of eggs directly from the Aratdar at market place and sold them Wholesaler-cum-retailer, retailer, Hotel and restaurant and Faria.

4.3.3 Wholesaler-cum-retailers

Wholesaler-cum-retailers were the professional traders in the channels of egg marketing. They have fixed business premises in the market. They performed both wholesaling and retailing activates. They purchased large volume of eggs directly from the farmers at market place and sold them to retailers and consumers.

4.3.4. Retailer:

In the study area, most of retailers purchased eggs from the wholesaler and wholesaler-cum-retailers and some retailers purchased eggs from the farmers and sold to the ultimate consumers in the local market.

Table 17 shows that most of the traders or 28.85% traders used the marketing channel where producer sales eggs to Aratder, Aratder to wholesaler, wholesaler to retailer and retailer to consumer.

Table17:- Egg marketing in different channels of the study area

Channels	Percentage
Producer→ Aratder → wholesaler → Retailer → Consumer	28.85
Producer → Aratder → wholesaler → Wholesaler Cum Retailer → Consumer	15.38
Producer → Aratder → wholesaler → Wholesaler Cum Retailer →Retailer → Consumer	11.54
Producer→ Aratder → wholesaler → Hotel & Restaurant → Consumer	9.62
Producer → Aratder → wholesaler → Faria → Consumer.	9.62
Producer →Aratder → Consumer.	11.54
Producer → Consumer.	5.77
Producer → Hotel& Restaurant → Consumer	7.69

4.4 THE PROBLEM FACED BY EGG PRODUCERS

The following section will provide information about the problems layer farmers face every day in their business. Farmers face every day in their business. Farmers faced a number of barriers to promoting access to information, technological breakthroughs and new value chains (Sarker et al., 2022). All these problems have been identified during the field survey. The layer farmer has to face different problems like lack of capital, high bank interest, price of layer feed and feed materials, irregular electricity supply, Non availability of medicine, inadequate supply of vaccines, high price of veterinary drugs, lack of government support, lack of information in layer farming system, inadequate knowledge of layer diets, poor quality of feed, Non availability of day old chicks, water related Problem in layer farming system.

4.4.1 Economic problems:

Farm owners were asked to identify some economic problems related to egg production. The problems which were identified and faced by them are discussed below:

Table 18: Economic problems faced by layer farm owners

Economic problem	Number	Percentage
Lack of capital	29	55.77
Price of poultry feed and feed materials	52	100
High price of veterinary drugs	52	100
Lack of government support	52	100

Source: Field Survey, 2022

4.4.1.1 Lack of capital:

This is the most important problem which affects more than 55.77% of farm owners. Amount of capital determine the level of farm and determine how the farm will be equipped. Access to capital will make farm to grow faster than those that do not have access to any financial assistance. Though, starting a layer farm business requires little money, but that is when farm owners can access this at right time.

4.4.1.3 Price of layer feed and feed materials:

One of the major problems in the development of the layer subsector in Bangladesh is the lack of sufficient and appropriate feed. Both manufactured and mixed ingredient feeds are used in

the sub-sector. The manufactured feeds of different feed mills are not available and homogeneous in nature. According to layer farm owner all of them (100%) point out problem about high price of layer feed. Feed must be purchased by farm owner and they felt stuck in financial problem because of high price of feed so it also may cause debt.

4.4.1.4 High price of veterinary drugs:

Diseases are a major problem for the layer industry in Bangladesh. The mortality rate of layer is high (35-40%) because of disease and predators. Layer farm owners usually carry out vaccination and medication for common layer diseases (IBD, Newcastle, fowl pox, fowl cholera, fowl typhoid, Salmonella, Myco-plazma, infectious oryza, coccidiosis, infectious bronchitis and EDS). However, the medical facilities are poor at district and Upazila level livestock offices. The prices of essential animal drugs are high. They nearly always urgently need to buy vaccines at high prices on the open market. During field survey five villages farm owners (100%) opined that cost of drugs caused fall of layer farming.

4.4.1.5 Lack of government support:

All the egg producers (100%) opined that it is essential to increase the government financial support and supervision to improve the layer sector to ensure the adequate supply of feed and vaccine at cheaper price. They also opined that timely supply of credit should be ensured.

4.4.2 Technical problem:

A layer farm owner should have technical knowledge to run a layer farm but most of the layer farm owners started this business without being properly trained. Technical problems related to conducting layer business are stated below:

Table 19: Technical problems faced by layer farm owners

Technical problems	Number	Percentage
Lack of information in layer farming system	42	80.77
Inadequate knowledge of layer diets	30	57.69
Poor quality of feed	46	88.46
Non availability of Day old Chicks	47	90.38
Water related Problem in layer farming System	48	92.31
Non availability of medicine	52	100
Inadequate supply of vaccines	52	100
Irregular electricity supply	52	100

Source: Field Survey, 2022

4.4.2.1 Lack of information in layer farming system:

This problem is as bad as the first point. If farm owners want to succeed in life in any business or in anything at all, that need the right information about that thing. In study area 80.77% farm owners just rush into layer farming system without the proper information, while some got information from the wrong source.

4.4.2.2 Inadequate knowledge of layer diets:

Feeding is more than just given the birds feeds. They need balanced diets if egg producers want them to do well. Some layer farm owner mixes complete feeds with cheaper scratch grains, but doing so dilutes the levels of nutrients the chickens are receiving, and nutrient deficiencies can occur. But it was found that 57.69% egg producers were went through inadequate knowledge about layer diet.

4.4.2.3 Poor quality of feed:

Sometime quality of feed cannot be maintained properly specially at the time of high price. 88.46% of egg producers mentioned that poor quality of feed in the study area was an important problem.

4.4.2.4 Non-availability of Day Old Chicks:

Many egg producers (about 90.38%) faced this problem, not every company that sell day old birds are the right place to get birds. Farm owners are victim, no way out, they were going to spend a lot on drugs and many a time they lose many of their birds.

4.4.2.5 Water related Problem in layer farming system:

This problem should not be underrated, the quality of water available is very important. The acidity of the water must be checked and balanced before we give to the birds. Acidic water implies negative effect to the life of the birds as this affects them in many ways. About 92.31% of farm owners worried about clean and safe water supply in layer farm.

4.4.2.6 Irregular electricity supply:

Irregular electricity supply was a major problem of layer farming in the study area. Egg producers faced the problem of load-shading and irregular electricity supply, which hampered egg production. About 100% egg producers about electricity supply in layer farm.

4.4.2.7 Non availability of medicine:

This is a big threat to all layer farm owners (100%), not all drugs require are available in the market, sometime those available are not effective, meaning they are fake. When some prolong are in used, they build resistance to its effect.

4.4.2.8 Inadequate supply of vaccines:

Inadequate supply of vaccines is common because of improper transportation and storage, handling and application. Most layer farm owners actually 100% of them use vaccines without knowing the maternal antibody status of their flocks.

4.4.3 Marketing problem

Marketing problem is one of the most important problem for the layer farm owner. There were some problems faced by the sample farm owners in marketing their eggs which are presented in Table 17.

Table20: - Marketing problems faced by layer farm owners

Marketing problems	Number	Percentage
Fluctuation of consumer demand	30	57.69
Problem of marketing systems and middlemen	52	100
Breakage of eggs in transportation	48	92.31
Lack of market in-formation and communication system	20	38.46
Price variation of day-old chicks (DOCs)	48	92.31

Source: Field Survey, 2022

4.4.3.1 Fluctuation of demand: Demand of layer eggs sometimes fluctuates specially during winter season. In winter season birds are affected by ―Avian Influenza or in the easy term bird flu (MMWR, 2015). Once this virus attacks any bird it spared too fast as all birds in that region were affected and most them died. In winter demand of egg were lower than other seasons it was stated by about 57.69% of layer farm owners.

4.4.3.2 Problem of marketing systems and middlemen:

Most of the times eggs and chickens are being marketed through middlemen, as a result the farm owners do not get actual price. The unscrupulous middleman is taking the advantages. As a result, the all farm owners (100%) have counted huge losses for some times, as the production cost is high and selling price is low. The actual layer farm owner doesn't get the benefit of the high price as they are oppressed by the middlemen who suck the profit. Moreover, the end users i.e., customer has to pay higher price.

4.4.3.3 Breakage of eggs in transit: It occurred due to car-less handling and unfavourable condition of roads. They considered it as one of the major problems in egg marketing.

4.4.3.4 Lack of market information and communication system: The right market information and good communication system helps the farm owners to operate smoothly their business. Many of respondents (about 38.46%) claimed that lack of proper information and communication gap was a constraint of egg marketing system.

4.4.3.5 Price variation of day-old chicks (DOCs): The price of day-old chicks is set by hatchery owners which vary from month to month. There is no bargaining between buyers and

sellers of DOCs at any point in the supply chain, since the markets basically supply driven. About 92.31% respondents opined that DOCs are usually sold in cash at a fixed price to farm owners and agents, but with a commission to agents. Hatchery owners sell the DOCs at the hatchery or through their sales centre directly or through sales agents to the layer farm owners. The DOCs are usually packed in paper boxes or bamboo baskets. A few hatcheries use their own or hired trucks to transport DOCs from the hatchery to the sales centres or agents. Mostly, however, layer farm owners do not transport DOCs by specialized vehicles but use buses, rickshaws or vans, which are hazardous and increases the likelihood of chick mortality.

4.4.4 Suggestion to overcome these problems

In field survey time egg producers have given some important suggestions to overcome these problems.

4.4.4.1 Low interest government bank loan

Many egg producers fall into the problem of lack of capital. The government can arrange low interest loans with easy terms and conditions. It has been seen by 55.77 percent of egg producers suggest low interest govt bank loans.

4.4.4.2 Providing right information of layer farming system:

In layer farming system, it should be strongly advised by80.77 percent egg producers to get right information from ministry of agriculture or from qualified veterinary doctor, hope it will help them for producing quality eggs.

4.4.4.3 Providing medicine in time

In layer farming system, it should be strongly advised by 100 percent egg producers to provide medicine timely which can reduce bird’s mortality rate.

4.4.4.4 Getting training facilities

It has been suggested by 57.69 percent of egg producers to take training.

4.4.4.5 Adequate supply of feed

Some layer farm owners should not mix complete feeds with cheaper scratch grains which it reduces nutrient. It has been suggested by 67.31 percent of egg producers to supply adequate feed timely.

Table 21: Suggestions to overcome these problems

Suggestion to overcome problems	Frequency	Percentage
Low interest government bank loan in capital	29	55.77
Providing right information of layer farming system	42	80.77
Providing medicine in time	52	100
Getting training facilities	30	57.69
Adequate supply of feed	35	67.31

Source: Field Survey, 2022

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion:

The present study has been undertaken considering the importance of egg sector in the economy of Bangladesh. It examines profitability of egg production and marketing channels at the selected study area. The specific objectives of the study were as follows:

i. To illustrate Socio-economic characteristics of the egg producers.

ii. To estimate the profitability of egg production.

iii. To examine the existing marketing channel of egg.

iv. To identify the problems and constraints associated with egg production and marketing and to suggest possible solutions for those.

The present study was carried out in some villages under Gopalpur Upazila and Ghatail Upazila of Tangail district. The study areas were purposively selected. 52 egg producers were selected from the study areas. In the present study, purposive sampling technique was followed for minimizing time and cost and to achieve the ultimate objectives of the study. The study is mainly based on primary data which were collected through direct interview with the respondents by the researcher herself. Survey method was used for collecting relevant information regarding profitability of egg for 100 layers by interviewing sample egg producers. After necessary editing the data were tabulated and analysed by using MS Excel.

Socio-economic characteristics of the sample egg producers were identified in the present study. Almost 69.23 percent egg producer's academic qualification were primary and secondary school certificate, 13.46 percent Higher secondary level, 3.85 percent B.A level, 13.46 percent Masters level. Average family size of the sample farmers consisted of 5.12 members. A nuclear family is maintained by 65.38 percent. A joint family is maintained by 34.62 percent of egg producers. It has been found that 34.62 percent of egg producers age range is 31 years to 35 years, 15.38 percent range is 36 years to 40 years, 32.69 percent range is 41 years to 45 years and around 17.31 percent range is 46 years to 51 years. Majority of the egg producers were at the age group 31 to 45 years, what refers to having more strength and experience of farming. 9 egg producers among 52 were of above 45 years age. Layer farming

was the main occupation of 32 egg producers among the 52 sample farmers. Others were engaged in agriculture, business and various service sectors who took farming as subsidiary occupation. Average farm size was 5.12 decimal in this study.

Profitability was calculated to know the profit from egg production. In this study, cost items were feed cost, purchasing day old chicken, electricity, veterinary, transportation, maintenance, land use cost, housing, equipment and miscellaneous cost. For 100 layers total costs in producing egg was Tk. 198966.98. The findings of the study showed that the average yield of egg was 246637.8tk for 100 layers. The gross return from selling egg and by product was Tk.285165.8 for 100 layers. The average net return was found to be 86198.82 for 100 layers. The study also examined the existing marketing channel of egg. In the study area, most of the traders or 28.85% traders used the marketing channel where producer sales eggs to Aratder, Aratder to wholesaler, wholesaler to retailer and retailer to consumer. The study also identified the problems faced by the egg producers during egg production. With regard to major problems, the finding revealed that price of poultry feed and feed materials, high price of veterinary drugs, lack of government support, lack of information in layer farming system, inadequate knowledge of layer diets, poor quality of feed, non-availability of Day Old Chicks, water related Problems in layer farming system, non-availability of medicine, inadequate supply of vaccine, irregular electricity supply. Egg production contributes to the national economy by employment creation and also by income generation. The findings of the study reveal that egg production is a profitable business in Bangladesh. The major problems faced by layer farmers were inadequate capital, low market price, high transportation cost, lack of feed supplies, etc. also hampered egg production. Moreover, egg production is a capital demanding business and so institutional credit facilities should be available to all egg producers on easy terms and conditions and adequate amount. Thus, well-planned, and management training in accordance with their problems can lead to them to increase egg production and income from egg producing. If proper remedial measures are taken, egg production and marketing could be a more viable and attractive commercial enterprise in Bangladesh.

5.3 Recommendations

The contribution of egg producers is very important in economic development of a developing country like Bangladesh so our government should adopt proper egg producer base policies to develop this sector to upgrade the social-economic status of the egg producers. These sectors play important role to solve poverty, unemployment and malnutrition problem. Though, egg producing sectors are important for poverty alleviation but it is not so profitable than other sectors. Farmers of these sectors face various problems. To overcome the difficulties of poultry farming and to make this production more profitable in the economy, the following recommendation are put forwarding-

1. To establish large scale farm, adequate financial support is necessary. For this reason loan can be provided to the producers by both government and NGOs on easy terms and conditions. Even the rate of interest can be comparatively less.

2. To reduce the high price of day-old chick, government can fix the maximum price of a chick after consultation with the hatchery association. Moreover the government should establish new veterinary care centre with qualified veterinarian, field assistance and modern logistics supports.

4. Proper training on proper farming system, balance diet of feed, primary diseases recognition should be arranged by the government and NGOs. Proper training leads farm owners to get a profitable business.

5. Government should identify the areas where layer farming is visible than other area and take proper step to supply sufficient electricity. Government should also take proper step to ensure the stable and reasonable price for egg by floor price scheme and giving price incentives to the farm owners.

6. Social security should be provided and Public awareness about layer farming should be developed.

5.4 Scope for Further Research

The present study is not a comprehensive study. A broad-based study on egg production covering all areas could be undertaken to examine various aspects of egg production. The present study might be helpful for further research to arrive at any plan for the development of the egg producers. So, lots of research and development activities should be continued to increase yield and production of egg.

REFERENCES

Ahmed, M.F.U. (2001). "A comparative Economic analysis of broiler production under PROSHIKA supervision and private management in some selected area Tangial district". M.S. Ag. Econ. Thesis, Dept. Of Agricultural Economics, Bangladesh Agricultural University, Mymensingh.

Akter, A. (2013). Financial Profitability and Resource use efficiency of Broiler Farming in Selected Some Area of Bangladesh. Doctoral Dissertation, Dept. of Agricultural Economics. Sher-E-Bangla Agricultural University, p. 19.

Ali, M. A. (1993). An Economic Analysis of Poultry Farming in some selected Areas of Dhaka City, An published MASTER degree thesis, Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh.

Altahat, E., Al-Sharafat, A., Altarawneh, M., (2012). Factors affecting profitability of layer hens' enterprises. American Journal of Agricultural and Biological Sciences, 7(1):106-113.

Anas, A.Z.M., (2015). Branded Meat Sector Grows as Middle Classed man Rises. Published in Financial Express.

Aziz, M.A. and Miah, M.A.H. (2005). Family Poultry Planning System in Developing Countries, a Paper Presented at the 4th International Poultry Show and Seminar Organized by WAPSA, Bangladesh Branch, Dhaka.

BBS (2021). Statistical Year Book of Bangladesh, Bangladesh Bureau of Statistics. Government of the People's Republic of Bangladesh, Dhaka.

Begum, S. (2000). An Economic Analysis Broiler and Layer Production in selected areas of Mymensingh District".M.S.Ag.Econ. Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh.

Beutler, A. (2007). Introduction to poultry Production in Saskatchewan, University of Saskatchewan, Saskatoon, Saskatchewan, S7N 5A8.

Chowdhury, M.S.R., Chowdhury, M.M., (2015). Profitability analysis of poultry farming in Bangladesh: A case study on Trishal Upazilla in Mymensingh District. Developing Country Studies, 5(19): 107-114.

DLS., (2021). Annual report on livestock (2021). Division of Livestock Statistics, Ministry of Fisheries and Livestock, Farmgate, Dhaka, Bangladesh.

Ershad, S.M.E. (2005). Performance of Hybrid Layers and native Hens Under Farmers Management in a Selected area of Bangladesh. International Journal of poultry Science 4(4): 228-232.

FAO (2009). The State of Food and Agriculture 2009: Livestock in the Balance. Food and Agriculture.

Gandhi, J.C., (1976). Marketing: A Managerial Introduction. TATA McGraw Hill publishing Company Limited, India.

Hassan, M.M., (2020). Socio-economic state of sample layer farmers in Bangladesh, An Investigation Based on Dhaka and Kishorgonj District. The journal of Applied business and Economics, 22(2), 101-119.

HIES., (2016). Household income and expenditure survey HIES. Bangladesh Bureau of Statistics. Statistical Division, Ministry of Planning, People's Republic of Bangladesh.

Islam, M.S. (1976). Egg Marketing in Mymensingh Town. Unpublished M.SC. term paper, Department of cooperation and Marketing, Bangladesh Agriculture University, Mymensingh.

Miah, M.I.A., Akbar M.A. and Barman J.N., (1992). An economic Analysis of Poultry Marketing of Mymensingh District: Amicro level study. Bangladesh Journal of Animal Science, Vol.21. (1-2).

Nmadu, J.N., Ogidan, I.O., Omolehin, R.A., (2014). Profitability and resource unefficiency of poultry egg production in Abuja, Nigeria. Kasetsart Journal, 35:134-146.

Rahman, K.M., Hossain, M.J., And Rana, M.S., (2020). Livestock and Poultry Rearing by Smallholder Farmers in Hoar Area in Bangladesh; Impact on Food Security and Poverty Alleviation. The Bangladesh Journal of agricultural Economic, 41(1), 73-86.

Rahman, M. (2003). Poverty alleviation and employment opportunity through poultry. Presented in Third International Poultry Show and Seminar, February 28-March 2,2003, Organized by Worlds Poultry Science Association, Bangladesh.

Rahman, M.M., (2014). Analysis of Economic Sustainability of Small-scale Broiler Farms in Bogora and Shirajgong District, Bangladesh. Master thesis University of Leipzing, Germany.

Rahman, S.M., (2001). A Study on Prospects and Problems of Poultry Industry Selected Area of Bangladesh with Particular Reference to Marketing Practice. Unpublished M.S. thesis, Department of Co-operation and Marketing, Bangladesh Agricultural University, Bangladesh.

Roy, A. (2017). Economic and Profitability Potential Assessment of Poultry Farming in West Bengal. Indian Journal of Poultry Science, 52(3): 343-346.

Sarker, M. M. R. (2010). Determinants of arsenicosis patients' perception and social implications of arsenic poisoning through groundwater in Bangladesh. International Journal of Environmental Research and Public Health, 7 (10), 3644-3656.

Sarker, M. M. R., Khan M., Parvin M.M., Jury F. H., and Fagun A. N., 2022. Determinants of Adoption of Climate-Smart Agriculture Technologies in Rice Production in Bangladesh. American Journal of Environmental Protection. Vol.11, No.4, pp. 97-102.

Srivastava, A.K., Singh R.P., and Shukla P.K.I., (1994). Price Spread in Marketing of Eggs in Lucknow City, Indian Journal of Poultry Science, vol, 29(3).

Tijjani, B.A., and Sadiq, M. (2012). Economic Analysis of poultry Egg Production in Maiduguri and Environs of Borno State, Nigeria. Journal of Agricultural Science vol. 2 (12), pp. 319-324.

Uddin, M.R., Akhi, K., Kamruzzaman, M., Islam, S. and Rahman., (2021). Viability of Medium Scale Layer farming in Gazipur district of Bangladesh. Journal of Bangladesh, Agricultural university, 19(3):354-360.

Yusuf, M.B., Ahungwa, G. T., Gama, E. N. and Oke, F. O. (2016). Profitability of Medium Scale Layer Production in Kumbotso and Nassarawa Council Areas, Kano State, Nigeria. PAT,12 (2): 23-32

Yusuf, T.M., Tiamiyu, S.A. and Aliu, R.O. (2016). Financial analysis of poultry production in Kwara State, Nigeria. African Journal of Agricultural Research, 11(8): 718-723