# STUDY ON PRODUCTION SYSTEM OF SWINE IN BACKYARD AND PIG DEVELOPMENT FARM


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# STUDY ON PRODUCTION SYSTEM OF SWINE IN BACKYARD AND PIG DEVELOPMENT FARM


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# CHAPTER 1

# STUDY ON PRODUCTION SYSTEM OF SWINE IN BACKYARD AND PIG DEVELOPMENT FARM

## ABSTRACT

This study was undertaken to investigate the difference between commercial pig farming and backyard pig farming in Rangamati district. It was a twenty days study, starting from May 9 to May 29, 2023. This study was comprehensively investigated multiple facts of swine production, encompassing housing, feeding, breeding, disease prevalence, vaccination- deworming protocols, biosecurity measures, marketing approaches, socio-economic contexts, and challenges in pig rearing. The research focused on uncovering patterns in pig farming practices and their implications. The insights gained from this study can significantly contribute to a deeper understanding of the dynamics within the swine production sector, informing strategic decisions and sustainable development initiatives. However, the financial outcome of the Pig Development Farm was found to be unsatisfactory as their main motive is to improve the pig breeds and sell the piglets among the poor farmers at affordable price. This study offers valuable insights into the operations of pig farming in Bangladesh, furnishing information that can guide managerial choices and contribute to the sustainable progress of the pig farming industry.

**Key words: Swine, Pig Development Farm, Backyard farming, Comparison**, **Formulated ration, Net profit.**

# CHAPTER 2

## INTRODUCTION

Certainly, here's a paraphrased version of the provided text:

Bangladesh is predominantly an agricultural nation, where the livestock sector holds vital significance due to its contribution to protein supply and employment generation, which, in turn, aids in addressing unemployment and foreign exchange earnings. Despite its moderate share in the GDP, the livestock sub-sector plays a crucial role in fulfilling the daily protein needs of the populace. Given the prevalence of landlessness, poverty, and unemployment among a substantial portion of the population, there is an urgent need to focus on the development of this sector (Hossain, M. *et al.*, 2012).

Pigs hold notable importance within the realm of livestock, especially among economically disadvantaged sections of society. Pork stands out as a major source of animal protein, offering an affordable means to supplement protein intake for financially struggling individuals. Pigs are known for their rapid growth and high reproductive capacity. Creating a suitable environment for pigs involves ensuring warmth, dry bedding, and protection from extreme weather conditions. Adequate space, fresh air, cleanliness, and access to essential resources such as food and water are crucial for maintaining their health and preventing injuries (Moore *et al.,* 2002).

Pig farming has been largely overlooked in Bangladesh due to the religious preferences of the predominantly Muslim population, as pigs are not raised for religious reasons. Nevertheless, pig farming holds economic promise through animal sales and product offerings. This practice empowers women by providing additional income opportunities, enabling them to take on more active roles within their families and communities. (Anower *et al.,*2017)

Furthermore, determining the precise pig population in Bangladesh presents challenges. However, pig numbers are on the rise in tribal regions. Pig rearing is becoming a significant strategy in these areas to alleviate poverty, primarily due to the high reproductive rates, ease of management, disease resistance, and cost-effectiveness. The traditional pig rearing approach prevails, primarily involving rural individuals with limited education, economic resources, and social standing. Indigenous pigs in Bangladesh are typically raised under free-roaming conditions, although confined or tethered rearing is not uncommon. Notably, a government-operated pig farm is located in the Rangamati Hill District, while wild relatives of indigenous pigs have been observed in forested regions (Rangamati and Hill Tracts). In the context of Rangamati, pig farming holds potential for enhancing social empowerment through improved livelihoods (Ritchil CH *et al.,* 2013).

The study was carried out to achieve the following goals:

1. To investigate production system of pigs under organized farming condition and backyard farming system.
2. To find out the differences between organized pig farming and backyard pig farming.
3. To find out the major constraints of pig production.

# CHAPTER 3

# MATERIALS AND METHODS

**3.1 Period of study:** The study lasted 20 days, from May 9th to May 29th.

**2.2 Area of study:** Historically, tribes have been the predominant raisers of pigs, especially within the Chittagong Hill tracts. Consequently, I opted to conduct my research on the swine production system specifically in the Rangamati area.

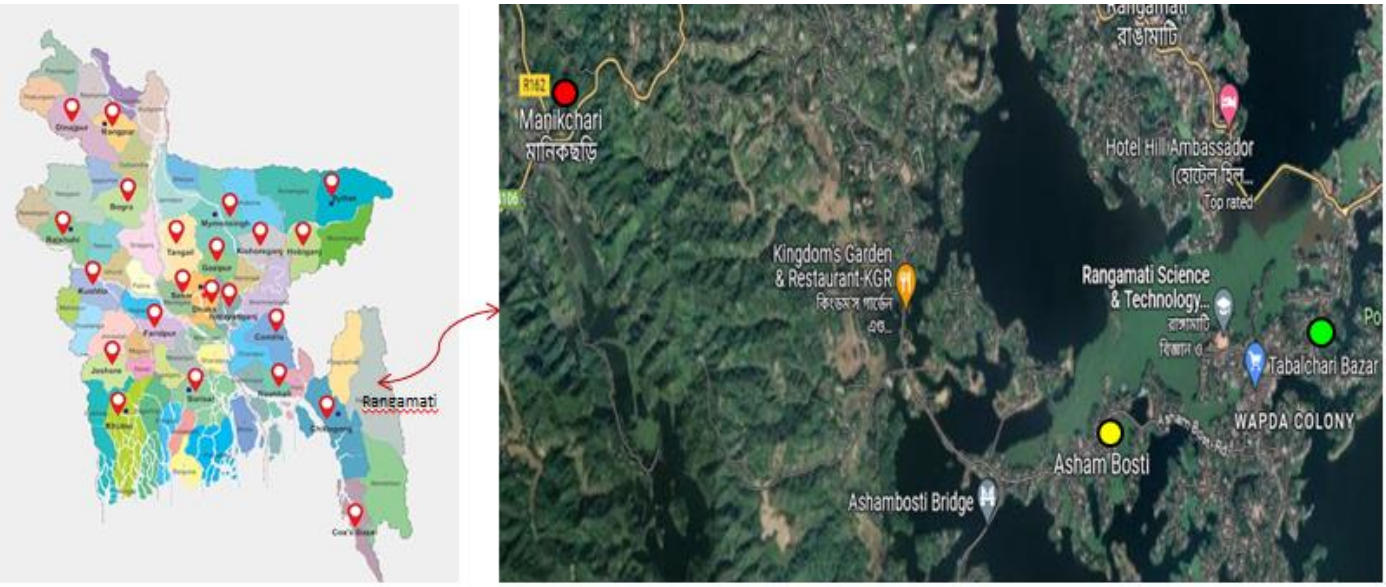


**Fig-01: Study area map**

**3.3 Selection of sample:** Because of the constrained study duration, the investigation was conducted at the Pig Development Farm in Rangamati, along with three unions in the Rangamati district—Asambosti, Tabalchori, and Manikchori. To obtain crucial information, a questionnaire was administered for interviews with both the senior assistant director of the pig development farm and the pig owners. Their valuable insights and experiences greatly aided me throughout the data collection process for swine production. The data was consistently gathered utilizing the identical questionnaire.

**3.4 Methods of data collection:**

As the data was in its unprocessed form, a significant amount of effort was required to collect information from numerous households without any specific selection, as outlined below:

### 3.4.1 Preparation of questionnaire:

The questionnaire was crafted to align with the objectives of the study, encompassing fundamental inquiries aimed at extracting details regarding the pig production system. Its content revolved around the socioeconomic aspects of pig proprietors, encompassing housing, feeding, breeding, marketing, and a pivotal hindrance encountered in pig production, alongside supplementary information.

**Fig-02: Collecting data from household pig raiser**

### 3.5 Data analysis:

All the data were entered into Microsoft Excel 2010 spreadsheet. For statistical analysis, Data is analyzed by STATA 13

# CHAPTER 4

## RESULTS AND DISCUSSION

The research encompassed both semi-intensive (at the Pig Development Farm) and backyard farming systems (with a sample size of N=51). The comprehensive swine production system was categorized into various sections, including the socioeconomic status of pig owners, the structure of pig farming in the study area, housing arrangements, feeding and watering practices, breeding methods, care for newborn piglets, prevalence of diseases, marketing strategies, prominent challenges in pig production, and potential recommendations.

**Table-1 Socioeconomic status of pig farmers**

| Variables | Categories | Percentage (%) |
|---|---|---|
| Sex | Male | 48 |
| | Female | 52 |
| Age | 20-29 years | 16 |
| | 30-55 years | 73.5 |
| | 55+ years | 10.5 |
| Education | Primary | 20 |
| | Secondary or higher | 80 |
| Occupation | Farmer | 48 |
| | Housewife | 50 |
| | Others | 2 |
| Land | No agro land | 20 |
| | Farming land | 80 |
| Farming experience | (0-1) year | 36.67 |
| | (2-3) year | 36.67 |
| | (4-5) year | 23.33 |
| | >5 year | 03.33 |
| Purpose of rearing | Selling and Earning money | 98 |
| | Consumption | 2 |

| | | |
|---|---|---|
| Rearing | Extensive | 92 |
| | Semi intensive | 08 |
| Rearing percentage of Boar and Sow | Boar | 86.67 |
| | Sow | 3.33 |
| | Boar and Sow | 10 |
| Feeding | Fermented rice | 3.33 |
| | Fermented rice and rice polish | 44 |
| | Fermented rice, rice polish and kitchen waste | 43 |
| | Fermented rice, rice polish, vegetable | 9.67 |
| Watering | Tubewell | 66.67 |
| | Kaptai lake | 26.67 |
| | Pond | 6.67 |
| Deworming | Yes | 20 |
| | No | 80 |
| Vet Consultancy | Yes | 18 |
| | No | 82 |
| No training on pig rearing | | 100 |

# Socio-economic status of pig farmers

**Sex and age characteristics of respondents**:

Based on the findings, the sample revealed a higher representation of female pig keepers (52%), while males constituted a smaller portion (48%). This distribution has implications for women's empowerment, encompassing aspects like access, rights, social security, and familial dynamics. The respondents' age distribution highlighted that a significant majority (73.5%) fell within the 30-55 age range, with 16% and 10.5% belonging to the 20-29 and 55+ age brackets, respectively (Table 1). The significance of these age groups participating in pig farming lies in their increased adaptability to novel techniques and applications (King VL *et al.*, 1998).

**Table2: Comparison on general information of pig farmers of backyard and commercial farming**

| Variable | Categories | Backyard | Commercial | *P value* |
|---|---|---|---|---|
| Gender | Male | 48% | 100% | *0.02* |
| | Female | 52% | | |
| Education | Below SSC | 20% | | *0.65* |
| | Higher than SSC | 80% | 100% | |

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In this study, more women are involved in backyard goat farming. In fisher exact test for gender variable the P value is less than 0.05. So the difference between commercial and backyard farming is significant. But in case of educational qualification the difference is not significant.

**Educational characteristics of respondents:**

The educational background of pig owners in the research locale is presented in Table 1. A significant proportion of pig keepers possess literacy, ranging from basic reading and writing skills up to primary education (20%), while the majority (80%) have attained secondary or higher education levels. These educational attainments could potentially facilitate the implementation of a more efficient swine production system.

**Land holding:**

The study indicates that 20% of respondents owned no agro land while 64% have land for farming.

**Structure of the pig distribution in the study area:**

**Categories of pigs reared in the households**

**Table no -2 Categories of pigs reared in the households**

| Sl. no. | Categories of pigs | Total number in house hold | Percentage (%) |
|---|---|---|---|
| 1 | Boar (breeding) | 32 | 62.74 |
| 4 | Sow | 19 | 37.25 |
| | Total | N=51 | 100% |

Pigs were typically fattened to an average body weight ranging from 65kg to 70kg prior to their sale. Farmers who raised sows typically had a yield of 4-5 piglets per sow pregnancy, but a noteworthy 44% mortality rate was observed among these piglets. Given the pivotal importance of effective piglet management, it's worth noting that many farmers lacked prior experience in pig rearing. Consequently, there exists a greater preference among farmers to raise boars rather than sows. The study brought to light that, for these farmers, pig farming served as a supplementary, tertiary source of income.

**Categories of pigs reared in Pig Development Farm Rangamati**

| Description | No. of pigs | Percentage (%) |
|---|---|---|
| Boar | 132 | 30 |
| Sow | 98 | 22.27 |
| Grower | 118 | 26.81 |
| Piglets | 62 | 14 |
| Total | N=440 | 100% |

**Table-3 Categories of pigs reared in Pig Development Farm Rangamati**

**Breeds of pig in Pig Development Farm Rangamati**

There are 14 breeds of pig in the Pig Development Farm, Rangamati. They are Large white, Gloucester Old Spot, Large Black, Barkshire, Duroe, Oxford Sandy and Black, Hamshire, Zovawk, Mulefoot, Hamshire, Hereford, Saddle black, Jeju Black,Local(Deshi),Meishan.

**Breeds of pig in backyard farming:**

In backyard farming, we found these breeds and their cross breeds together the most of the time. Local(Deshi), Gloucester Old Spot(GOS), Large Black, Hamshire, Large white, Hereford.

**Source of buying piglets:**

**Table-4: Source of buying piglets in backyard farming.**

| Source | No. of household | Percentage (%) |
|---|---|---|
| Pig Development Farm, Rangamati, | 33 | 64.70 |
| Market | 14 | 27.45 |
| Neighbour | 4 | 7.84 |
| Total | 51 | 100 |

So, Pig Development Farm plays a vital role for collecting of piglets for rearing. The selling price of pigs in Pig Development Farm, Rangamati is given below:

Piglets (45 days) = 2000/-

Piglets (60 days)= 2500/-

Piglets (90 days) = 3500/-

Piglets (105 days) = 4000/-


**Fig 03:Buying prices of piglets**

**Housing system of pigs in backyard farming**

**Table-5: Housing system of pigs in backyard farming**

| Type of house | | No. of households (N=51) | Percentage (%) |
|---|---|---|---|
| Extensive | | 24 | 47.05 |
| Semi - intensive | Fencing system | 19 | 37.25 |
| | Girth tethering system | 1 | 1.96 |
| | Tin shed housing | 6 | 1.17 |
| Total | | 51 | 100% |

Based on the provided table, the predominant method of raising pigs (47.05%) was categorized as extensive or free-ranging. This approach was favored due to its lower feed requirements and the freedom it afforded to pigs to scavenge for food independently.

**Fig-04 Extensive housing system**

**Fig-05 Girth tethering system**

**Fig 06- Tin shed housing system**

**Housing system of pigs in Pig Development Farm, Rangamati**

The pig development farm employed a semi-intensive rearing system, and the sheds were strategically positioned on moderately elevated land, ensuring efficient drainage of rainwater from the premises. To facilitate proper ventilation, the sheds were oriented in an east-west direction. The farm consisted of three distinct sheds: Karnafuli (maternity shed), Chengi (growing shed), and Sangu (pregnancy shed). The dimensions of the sheds were approximately 250 feet in length, 25 feet in width, and 10 feet in height. The construction of the buildings involved the use of materials like concrete, concrete blocks, and bricks for the base. In contrast, the backyard farm did not adhere to specific standard measurements.

**Fig 07: Housing system in Pig Development farm Rangamati**

## Feeding system

In backyard farming, there was no provision for balanced feed supplements. The pig owners used to supply fermented rice which is a by-product of rice wine as an energy source. They also supply rice polish, sometimes vegetables and kitchen waste to the pigs. But they never used vitamin-mineral premix in ration. This mixture of feed given twice a day. Around 0.5 kg feed is given to the pigs per day.

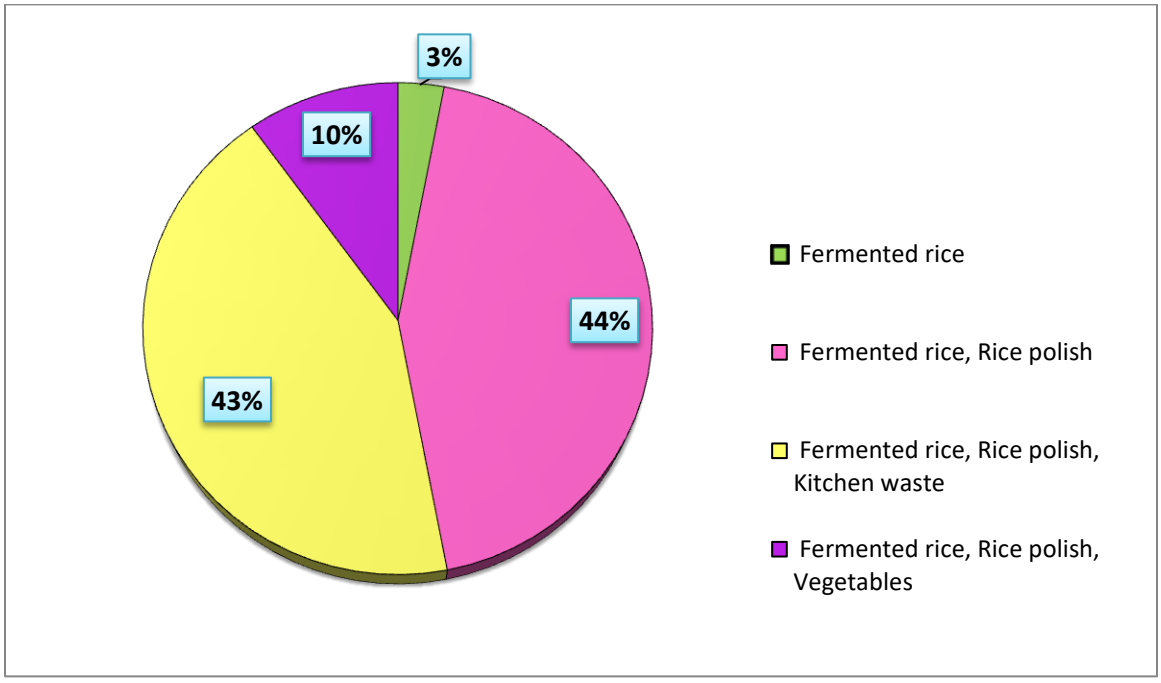


**Fig 08: Types of feed ingredients are used in backyard pig farming**

**Fig 09: Fermented rice, by-product of rice wine**

The quantity of feed required for pigs is contingent upon factors such as their age and reproductive stage. This feed mixture is provided twice daily. Each pig receives approximately 0.5 kg of feed per day. It's recommended that concentrate feed be administered in the morning and evening, while roughage is supplied at midday. The sustenance of pigs relies on a combination of both concentrated feed and roughage. Although rice polish is the prevalent dietary component, incorporating concentrate feed proves beneficial, as it provides a well-rounded blend of carbohydrates, protein, fats, and other essential elements. Additionally, the inclusion of vitamins and minerals contributes to their accelerated growth. Piglets necessitate higher protein intake compared to fully grown pigs**.**

**Feeding system in Pig Development Farm, Rangamati:**

They supplied a formulated ration two times a day at 10.00 AM and 8.00 PM . The ration is given below;

**Table-6: List of ingredients used in pig ration at Pig Development Farm Rangamati**

| **Ingredients** | **Quantity(kg)** |
|---|---|
| Rice polish | 50 |
| Maize | 30 |
| Vegetable Oil | 2 |
| Protein Concentrate | 5 |
| Soyabean Meal | 5 |
| Mustard oil cake | 5 |
| DCP | 2 |
| Common Salt | 0.5 |
| Vitamin – Mineral Premix | 0.5 |
| Total | 100 |

**Table 7: Daily feed intake for different categories of pigs**

| **Sl. no.** | **Different animal** | **Amount of feed (kg)/day** |
|---|---|---|
| 1 | Boar | 2 |
| 2 | Sow | 1.50 |
| 3 | Lactating sow | 3.5 |
| 5 | Grower pig | 1.25 |

They also supply mixed vegetables at 3 PM. This amount of vegetable is for 440 pigs.

**Table 8: List of vegetables provided in Pig Development Farm Rangamati**

| **Vegetables** | **Amount/day(kg)** |
|---|---|
| Pumpkin | 104 |
| Potato | 70 |

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**Watering System:**

In the pig farm, the primary water source was a deep well. In contrast, backyard farming utilized various water sources, including tubewells (67%), Kaptai Lake (26%), and ponds (6%).

**Veterinary Consultancy:**

Within backyard farming, only 18% of households sought veterinary consultation when encountering issues. Conversely, pigs at the pig development farm were overseen by the senior assistant director. Sick pigs were isolated in an isolation shed and provided with treatment. Government-provided medications such as Renamycin®, SP-vet®, Amoxi-vet®, Anora®, and DB-vitamin® were administered.

**Vaccination:**

Vaccines were administered to counteract diseases like HS, FMD, and other disorders. HS required a booster shot 15 days after the initial dose.

**De-worming:**

Merely 20% of households considered pig deworming, and many lacked awareness about it. The pig farm adhered to a structured deworming schedule using government-supplied albendazole.

**Biosecurity:**

The pig farm maintained stringent biosecurity measures, restricting access to authorized personnel and requiring workers to wear proper attire like gumboots. The farm's sheds

were sanitized twice daily with disinfectant solutions. Regular vaccination and deworming were part of the routine. Hygiene was emphasized through the regular cleaning and disinfection of water tanks, lines, and troughs. Deceased animals were appropriately disposed of by burial.

Conversely, backyard farming lacked comprehensive biosecurity measures.

**Table-09: Comparative management system of Swine production in backyard and organized farm**

| Variable | Categories | Backyard (%) | Commercial (%) | *P value* |
|---|---|---|---|---|
| Rearing system | Extensive | 92 | | *0.05* |
| | Semi-intensive | 8 | 100 | |
| Vaccination | Yes | 10 | 100% | *0.01* |
| | No | 90 | | |
| Deworming | Yes | 20 | 100 | *0.01* |
| | No | 80 | | |
| Disease prevalence | Diseased | 20 | 26.5 | *0.287* |
| | Healthy | 80 | 73.5 | |

The difference between rearing system of backyard and commercial pig farm is significant. In backyard most of the pig is reared in extensive way in the meanwhile in Pig Development Farm pigs were reared in a semi-intensive way. In case of vaccination and deworming, in farm proper vaccination and deworming was maintained but in backyard people barely care about it. But there is no significant difference between farm and backyard in disease prevalence. Maybe it is because of better immunity of local pigs.

**Net profit:**

In backyard farming the production cost and net profit (Year: 2021-2022) is given below:

**Table-10: Budgeting in backyard farming**

| **Household no** | **Total costs ( Taka)** | **Selling price of all adult pigs (Taka)** | **Net (Taka) profit/year** |
|---|---|---|---|
| Household no 01 | 48100 | 110000 | 61900 |
| Household no 02 | 32780 | 70000 | 37220 |
| Household no 03 | 154750 | 175000 | 20250 |
| Household no 04 | 39365 | 90000 | 50635 |
| Household no 05 | 109580 | 152000 | 42420 |
| Household no 06 | 192000 | 225000 | 33000 |
| Household no 07 | 71200 | 105000 | 33800 |
| Household no 08 | 72200 | 120000 | 47800 |
| Household no 09 | 51090 | 360000 | 308910 |
| Household no 10 | 33700 | 60000 | 26300 |
| Household no 11 | 65420 | 114000 | 48580 |
| Household no 12 | 37200 | 70000 | 32800 |
| Household no 13 | 35700 | 80000 | 44300 |
| Household no 14 | 33700 | 80000 | 46300 |
| Household no 15 | 69200 | 105000 | 35800 |
| Household no 16 | 35700 | 80000 | 44300 |
| Household no 17 | 33700 | 60000 | 26300 |
| Household no 18 | 99220 | 120000 | 20780 |
| Household no 19 | 31180 | 60000 | 28820 |
| Household no 20 | 167250 | 200000 | 32750 |
| Household no 21 | 66530 | 120000 | 53470 |
| Household no 22 | 172413 | 680000 | 507587 |
| Household no 23 | 32020 | 60000 | 27980 |

| | | | |
|---|---|---|---|
| Household no 24 | 117300 | 120000 | 2700 |
| Household no 25 | 34400 | 90000 | 55600 |
| Household no 26 | 82540 | 210000 | 127460 |
| Household no 27 | 10750 | 0 | -10750 |
| Household no 28 | 23100 | 60000 | 36900 |
| Household no 29 | 25700 | 97000 | 71300 |
| Household no 30 | 57000 | 110000 | 53000 |
| Household no 31 | 82540 | 120000 | 37460 |
| Household no 32 | 10750 | 30000 | 19250 |
| Household no 33 | 23100 | 510000 | 486900 |
| Household no 34 | 25700 | 55000 | 29300 |
| Household no 35 | 57000 | 110000 | 53000 |
| Household no 36 | 28979 | 62000 | 33021 |
| Household no 37 | 25366 | 56000 | 30634 |
| Household no 38 | 21753 | 42000 | 20247 |
| Household no 39 | 18140 | 39000 | 20860 |
| Household no 40 | 14527 | 30000 | 15473 |
| Household no 41 | 10914 | 20000 | 9086 |
| Household no 42 | 7301 | 15000 | 7699 |
| Household no 43 | 34000 | 70000 | 36000 |
| Household no 44 | 66530 | 150000 | 83470 |
| Household no 45 | 35380 | 90000 | 54620 |
| Household no 46 | 17151 | 40000 | 22849 |
| Household no 47 | 10764 | 19000 | 8236 |
| Household no 48 | 14377 | 29000 | 14623 |
| Household no 49 | 17990 | 35000 | 17010 |
| Household no 50 | 21603 | 45000 | 23397 |
| Household no 51 | 25216 | 51000 | 25784 |

From above this table, we can see that the net profit is almost double than the total cost in backyard farming.

Meanwhile in Pig Development Farm, the net profit is not calculated, the main objective is to achieve the target. The targets and achievements are given below:

**Table-11: Targets and achievements in Fiscal Years of Pig Development Farm.**

| Fiscal Year | Piglets Production | | Revenue | |
|---|---|---|---|---|
| | Target | Achieved | Target | Achieved |
| 2020-2021 | 1125 | 789 | 25,30,000 | 9,29,400 |
| 2021-2022 | 1125 | 609 | 25,30,000 | 11,22,550 |

From Table- 10, we can see that the pig farm is in loss. The causes of this loss it's high labour cost. There are around 11 labors who are working in the pig farm every day. Moreover, the government compromises 50% subsidiaries. The motive of the pig development farm is to improve the breeds of pig and selling pigs to the poor farmers at affordable prices.

## Major constraints of pig production

1. **Islamic Dietary Restrictions:** Due to Islamic dietary laws forbidding pork consumption, pig husbandry interest is low among the predominantly Muslim population of Bangladesh.

2. **Challenges in Feeding:** Pigs' omnivorous nature leads to significant daily food requirements, posing difficulties for rural pig owners in meeting these needs effectively.

3. **Malnutrition Concerns:** Inadequate feeding practices contribute to malnutrition issues among pigs, impacting their overall health and well-being.

4. **Limited Feed Quality:** Available pig feed options are of subpar quality, failing to support optimal productivity and reproductive performance.

5. **Indigenous vs. Foreign Breeds:** The local pig population mainly consists of indigenous breeds, which exhibit lower productivity compared to foreign breeds.

6. **Reducing Piglet Mortality:** Ensuring minimal piglet mortality rates is a critical goal to enhance overall pig farming efficiency.

**7. Lack of Knowledge:** Many farm owners lack awareness about proper disease management practices and show limited concern regarding pig diseases.

In summary, pig husbandry in Bangladesh faces challenges due to religious dietary restrictions, feeding difficulties, inadequate feed quality, lower productivity of indigenous breeds, and a lack of knowledge regarding disease management among pig owners.

## Recommendations to overcome the problems:

- By establishing pork marketing system;
- By giving free training to the farmers about pig farming.
- By organizing free deworming and vaccination program.

## CHAPTER 5

# CONCLUSION

In conclusion, pig husbandry in Bangladesh holds promise to address protein shortages and unemployment. Despite religious considerations, pig farming can offer practical solutions for nutrition and economic concerns. The study examines diverse pig production methods, with backyard and semi-intensive farming being prominent models. The study emphasized the need to address challenges related to feed quality, disease management, and low productivity of native breeds. Recommendations were made to establish pork marketing systems, provide training to farmers, and implement healthcare initiatives. By tackling these issues, pig farming can assume a notable role in enhancing nutritional intake and income, especially for disadvantaged communities in the region.

## CHAPTER 6

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# CHAPTER 7

## Biography

I am Anika Binte Belal, daughter of MD Belal Hossain and Nasima Akther. I have completed my Secondary School Certificate examination from Lakers' Public School and College , Rangamati in 2015 and Higher Secondary School Certificate from Chattogram Cantonment Public School and College, Chattogram in 2017. I am an intern veterinarian at Chattogram Veterinary and Animal Sciences University, Bangladesh under the Faculty of Veterinary Medicine. I hold a profound passion for veterinary medical research, and I am eager to leverage my skills and creativity to make a positive impact on our country's challenges in this field. My goal is to contribute significantly to overcoming the current difficulties we encounter in veterinary medicine through innovative research and solutions.

# CHAPTER 8

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