

**Study on management and phenotypic performances  
of buffaloes on commercial farms in Anwara upazila,  
Chattogram**



Submitted by

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**Faculty of Veterinary Medicine  
Chattogram Veterinary and Animal Sciences University  
Khulshi, Chattogram-4225, Bangladesh.**

**August, 2023**

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**August, 2023**

## **Biography**

I am Kazi Asma Akther daughter of Kazi Md. Selim Ullah and Rasheda Khanom. I have completed my Secondary School Certificate examination from Bakalia Govt. High School under Chattogram board in 2014 (G.P.A-5.00) and Higher Secondary School Certificate examination from Hazera-Taju Degree College under Chattogram board in 2016 (G.P.A-5.00). Then I have admitted in Chattogram Veterinary and Animal Sciences University to receive DVM degree under the Faculty of Veterinary Medicine which is a combined degree of veterinary medicine, husbandry practice and basic sciences with a one year comprehensive internship and now I am an intern veterinarian. I have a keen interest in veterinary medical research and I want to serve the nation through my knowledge and creativity so that we can conquer the current challenges in this field.

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**The Author**

**August, 2023**

## **Abstract**

The study was undertaken as an attempt to know the management system of buffaloes in coastal areas in semi-intensive rearing system. With this purpose, the study was conducted for about 8 months by direct interviewing of farmers, farm visit, data collection etc. in Chattogram region. A sample of 50 buffaloes were observed to achieve the motives in the selected area. It was observed that the buffaloes are allowed to graze in the riverside areas for whole day and kept confined at night. They are given straw, sometimes green grass and very few amount of concentrate as feed supply other than grazing. Average milk production of a buffalo cow was noted 5 to 8 L/day. Other phenotypic traits like average body weight was  $300.90 \pm 2.74$  kg, Parity wise calf weight and average age of 1<sup>st</sup> breeding were  $5.28 \pm 0.34$  and  $49.27 \pm 0.41$ , respectively. Also other management activities like breeding method, housing system, feeding system and vaccination and deworming status was noted. Finally it was concluded that the production status can be increased by proper management and by giving proper training to the farmers.

**Keywords:** Buffalo, management, phenotypic performance.



# Chapter - I

## Introduction

The buffalo (*Bubalus bubalis*) is a multipurpose domestic livestock species, a member of the Bovidae family that provides people with high-quality milk and meat, hide and skin as industrial raw materials, dung as fuel and organic fertilizer and helps in better livelihood. They also serve people as good draught animals. That is why they are called triple-purpose animals.

According to FAO (2000), there are about 158 million water buffalo worldwide, 97% (approximately 153 million) found in Asia. Buffalo primarily originated from wild Asian buffalo, which were later domesticated thousands of years ago. On the other hand, according to Bilal (2004), the worldwide buffalo population has reached 130 million. Again according to DLS (2016), Buffalo population in Bangladesh is 14.71 million.

**Table 1. Worldwide buffalo population according to report of FAO (2005) (Million)-**

Country	Year 1990	Year 2003
Bangladesh	0.77	0.83
China	21.82	22.80
India	78.32	96.90
Pakistan	17.37	24.00
Nepal	3.01	3.75
Myanmar	2.60	2.06
Thailand	5.09	1.80
Vietnam	2.84	2.81

Buffaloes have better digestive capability than cattle to convert poor-quality roughages into high-quality milk and meat with better degradation of crude protein and non-protein dry matter than cattle (Hussain and Cheeke 1996; Bartocci et al.,

1997; Agarwal et al., 2008; Terramoccia et al., 2000). Also, they are raised by the farmers in a free grazing system in a semi-intensive system.

The management system depends on the purpose of raising the animals, and farmers raise them primarily for meat purposes, also sometimes for milk, as the demand for products prepared from buffalo milk is increasing day by day, even though buffalo farming is a less established practice in our country.

However, the productivity of buffaloes mainly depends on genetic improvement, balanced ratio, proper management and a suitable environment, as river buffaloes grow well in coastal areas. (Saadullah, 2012).

Productive and reproductive traits are the most important to consider while determining the phenotypic performances of buffaloes. The performances of indigenous buffaloes are usually poor, and two calves in 3 years are standard for them (Faruque et al., 1990; Faruque, 1994; Faruque and Amin, 1994; Faruque and Amin, 1995).

Though buffalo farming plays a significant role in the agro-economy of Bangladesh, very few studies are done regarding buffalo farming, and very little information is available on the management of buffaloes. This scientific report delves into the intricate interplay between management practices and the phenotypic performance of buffaloes in commercial farms. By scrutinizing various aspects of buffalo husbandry, nutrition, health management, and reproductive techniques, this study aims to comprehensively understand how different management approaches impact key performance indicators such as milk yield, reproductive success, growth rates, and overall animal health.

### **Objectives of the study:**

- To know the buffalo management system in rural areas in semi-intensive method
- Also to know their phenotypic performances according their management.

## **Chapter - II**

### **Literature review**

Buffalo is one of the important livestock assets in Asian and Mediterranean countries, and it plays an essential role in the agro-economy by providing the countries' milk, meat and draught power. Buffalo milk contributes to the total milk production of India and Pakistan by about 57% and 68%, respectively (FAO, 2010). It is called the Black gold of Pakistan due to the high content in milk (Bilal et al., 2006).

The climatic condition of Bangladesh is very favourable for raising buffalo in a semi-intensive system as there are so many coastal areas and marshy lands available. Government and Non-government organizations are paying massive attention to this sector, and buffalo farming is increasing tremendously.

River buffaloes are reared mainly for milk production, and they produce an average of 8-10L milk per day, which contains 7.5% Fat, 4.2% Protein and 5% Lactose. (Kay,1974;Rao and Nagarckenkar1977; Walstra et al, 1999;Thomas,2004).Buffalo milk contains 43% less cholesterol per gram of butterfat and, respectively, 58% and 40% more calcium and protein than cow milk. Also, it is enriched in iron, phosphorus and vitamin A (Bilal et al., 2006). Again, buffalo meat is healthier as it contains 40% less cholesterol than cattle meat (Nanda and Nakao, 2003). Considering it has been composed, it may be suggested to the people who are sensitive to cholesterol-enriched meat.

Among all breeds, Nili-Ravi is the highest milk-producing breed worldwide (Bilal and Ahmad, 2004) and Murrah is considered suitable for both milk and meat purpose (Mahadevan, 1992;Thomas, 2004).

According to Ganguli(1981), Buffaloes are generally aged 40 to 60 months during their first calving. However, Mediterranean and swamp buffaloes calved earlier than those of Indian subcontinent (Rao and Nagarckenkar 1977).

For the Nili-Ravi, the dry period has been recorded to be 90 to 150 days, while it ranged from 60 to 200 days for the Murrah (Wahid 1973).

Though buffalo milk has an increasing demand in our country and the Government is working for its extension, milk production is comparatively lower than in our neighbouring countries. It is insufficient to meet the national demand. So proper management is necessary to increase the production.

## Chapter - III

### Materials and methods

The study was conducted to determine the relationship between management and phenotypic performances of buffaloes in different commercial farms.

**3.1 Selection of the study area:** The study was conducted at Juidondi Village of Anwara Upazila in Chattogram District of Bangladesh. The coordination of the area was 22°9'9" North and 91°52'6" East. The area is located near the Sangu River and is suitable for buffalo rearing. So many local farmers here rear buffaloes for commercial purposes in semi-intensive rearing. The availability of the buffaloes is the main reason for selecting the area as the study area.



**Figure 1:** Location of the study area in the map

**3.2 Selection of Sample:** Random selection was done while selecting the farmers, and the criteria for the selection were that the farmer should have a minimum of one milking buffalo and a calf.

**3.3 Duration of study:** The total procedure of this study, including questionnaire preparation, farm visits, data collection, and data review, was held from January to August of 2023.

**3.4 Preparation of Questionnaire and data collection:** The questionnaire was prepared following the objectives of the study, and it was finalized after being checked and cross-checked to minimize the hassle during data collection. Both qualitative and quantitative data were collected by visiting the farms and individual interviews.

**3.5 Data management:** For this study, some specific criteria were selected as variables according to the objectives of the study. Those variables are as follows: Rearing system, Feeding system, Reproductive condition, Live weight, Average milk yield, Breeding system, Calf weight, Parity and Vaccination and deworming.

**3.6 Data analysis:** After the collection of data from the field, the data were edited and then transferred to MS Excel 2007 for processing and summarizing. After that, the data were analyzed with the help of SPSS statistical software.

## Chapter - IV

### Result and Discussion

#### 4.1 Demography of study population

##### 4.1.1 Herd size

Average herd size of the selected farms ranges from 6 to 20 animals per holdings.

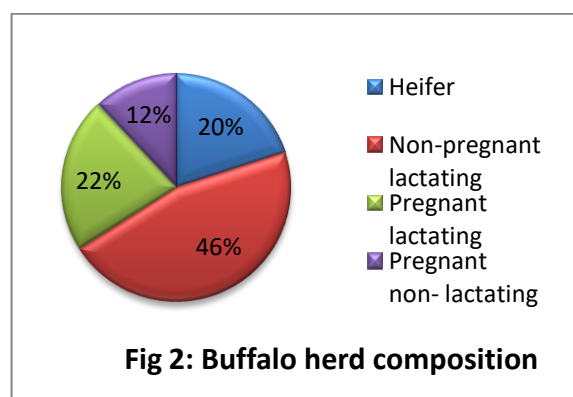
The herd size composed of different categories of buffalo according to their reproductive status and percentage of their population size were 20% heifer, 46% non-pregnant lactating cows, 22% of pregnant cows and 12% non-lactating pregnant cows.

All the farmers in the study area follow semi-intensive rearing system for the farming as it is a coastal area. According to Faruque (2000), the percentage of milking cows, non-lactating cows and heifers were 35, 15 & 16 respectively in the upper part of coastal area reared under semi intensive management system which somewhat resembles our findings.

However, we didn't include the buffalo bulls in the study but there was sufficient amount of bull for natural breeding in the area.

**Table 2: Demographic statistics of study population**

Reproductive status	Count (%)
Heifer	10 (20)
Non-pregnant lactating	23 (46)
Pregnant lactating	11 (22)
Pregnant non-lactating	6 (12)
<b>Total</b>	<b>50 (100)</b>



## 4.2 Feeding system

The feeding system in the study area was mainly semi-intensive system. After milking in the morning the animals were allowed to graze in the *char* area for about 6-7 hours. During confinement from afternoon to next morning, the animals are given straw and small amount of concentrate feed. The amount of feed was decided upon their production status. In the area, only a few farmers have their own land to produce green fodder for their animals. Those who have no fodder land only depend on the free grazing method.



Fig 3: Fodder land & Straw-storing shed

## 4.3 Production phenotypes

### 4.3.1 Body weight

In this study, production status wise body weight was measured and the result showed that the lowest body weight recorded in heifer ( $282.5 \pm 4.67$ ) and highest was non-lactating pregnant cows ( $320.83 \pm 6.88$ ). Overall body weight among all classes of animals was  $300.90 \pm 2.74$ . In table 3, the body weight of total study population is recorded according different production status of buffaloes.

**Table 3: Production status wise body weight in the study population**

<b>Production condition</b>	<b>Body weight (Mean± SE)</b>
Heifer	282.50 ± 4.67
Non-pregnant lactating	295.04± 2.15
Pregnant lactating	319.55 ± 5.02
Pregnant non-lactating	320.83 ± 6.88
<b>Overall</b>	<b>300.90 ± 2.74</b>

#### 4.3.2 Daily milk yield & calf weight

Variation in parity wise daily milk yield and parity wise calf weight are summarized in table 4 and 5 respectively. The result shows that highest milk yield found in the cows with parity 3 and it was average  $5.50 \pm 0.50$ . So it can be predicted that average milk yield is higher in multiparous animals compared to primiparous. Similar findings were reported by Marumo *et al.* (2022).

On the other hand, the average calf weight was recorded  $49.27 \pm 0.41$  and the result shows the highest calf weight at 2<sup>nd</sup> parity.

**Table 4: Parity wise daily milk yield in the study population**

<b>Parity</b>	<b>Daily Milk Yield (Mean± SE)</b>
Parity 1	5.29± 0.38
Parity 2	5.00± 1.00
Parity 3	5.50± 0.50
<b>Overall</b>	<b>5.28± 0.34</b>

**Table 5: Parity wise calf weight in the study population**

<b>Parity</b>	<b>Calf weight (Mean± SE)</b>
Parity 1	49.20± 0.43
Parity 2	50.00± 2.41
Parity 3	49.00± 1.00
<b>Overall</b>	<b>49.27± 0.41</b>



#### **4.4 Breeding system**

Most of the farmers in the study area prefer natural insemination than artificial insemination (AI) due to availability of breeding bulls in their locality. They think AI is very complicated for them as there are low availability of semen and also lack of AI worker. Moreover they can't get the service at right time always. According to Akbar et al. (2009), there always adequate number of breeding bull available in coastal areas and no further fertility problem was recorded.

#### **4.5 Average age of 1st breeding (Yr)**

The average age of 1<sup>st</sup> breeding recorded in the study area was 2 years in maximum buffalo cows. Several reports showed that minimum age of 1<sup>st</sup> calving for buffalo is 3-3.5 years which is more or less similar to the present study. Fadzil (1969) found that minimum age of 1<sup>st</sup> breeding was 2 years swamp buffalo in Malaysia which supported the present study.

#### **4.6 Vaccination & Deworming**

In the study area, all farmers mentioned that they have vaccinated their buffaloes against infectious diseases like FMD, BQ, Anthrax and HS. It indicates that they have some knowledge about the prevalence of infectious diseases in buffaloes. According to Gupta et al. (2014), the prevalence of infectious diseases like FMD, HS, BQ were the main health hazard in buffalo farming.

Moreover, maximum buffaloes were dewormed on regular basis according to the farmers saying. They all take the medical service from the local LSPs as Upazila Veterinary Hospital is far and away from their locality.

#### **4.7 Housing system**

Different types of housing were noticed in the selected area. But most of the houses had only roof with no fence. The farmers don't have adequate knowledge on different age group housing. Only few of them have separate maternity, calf shed and isolation shed. Akbar et al. (2009) reported that most of the buffalo house in the

*bathan* area was made with only roof prepared with straw or tin without boundary wall and floor was always muddy which was very similar to our current study.



Fig 4: Buffalo shed

## Chapter - V

### Limitations

There were many difficulties had to face during the study. Some majors of them are as follows-

- ❖ Unable to get adequate and proper response through questionnaire due to the ignorance of the farmers.
- ❖ No proper veterinary service in the study area and the farmers only depend on LSPs.
- ❖ Insufficient data and previous scientific research on buffalo in Bangladesh.

## **Chapter - VI**

### **Conclusion**

In this study we summarized a total scenario of buffalo farming in rural areas in Chittagong region in semi-intensive method with different phenotypic performances of the buffaloes in accordance with the management system.

Buffalo farming can be considered to have a very bright future in Bangladesh as a riverine country, proper and scientific management system need to be ensured for successful farming. Also the farmers need to be trained with better farming system.

Hence Bangladesh can get more advantages from buffalo farming.

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