

# Chapter: 1

## INTRODUCTION

Cattle are important domestic animal in Bangladesh. Most of the indigenous cattle in Bangladesh are of zebu type. Among them, some improved cattle variety such as Red Chittagong Cattle (RCC), Pabna cattle, Munshingonj cattle, Manikgonj cattle and North Bengal Grey cattle are potential producers of milk and meat (Azizunnesa *et al.*, 2008). The RCCs are considered as the national heritage of Bangladesh. They are tropically well adapted and distributed mostly in the southern regions (Raozan, Potia, Chandanaish, Satkania, Lohagara) upazillas of Chittagong of Bangladesh. RCC has distinct phenotypic characteristics like smaller size with red coat color, distinct reddish color of muzzle, horn, hoof, ears, eyeball, eyebrow, vulva and tail switch (Pirchner, 2000, Porter, 2002). It is a valuable indigenous bovine genetic resource of Bangladesh with many attributes better than other available indigenous types and is readily distinguishable from others due to its distinct phenotypic features (Bhuiyan *et al.*, 2007). The positive features of RCC lie on its ability to withstand extreme tropical climates and to survive on low quality feed during periods of feed shortage. Furthermore, they are reputed to give birth every year, lower calf mortality can give birth of to 8-10 calves in life time, attain sexual maturity earlier, suitable for tillage operation and traction, swift in their movement, hardworking in hot, humid and rainfall condition are considered unique characteristics of RCC (Habib *et al.* 2003). The indigenous cattle genetic resources of Bangladesh are now under threat condition because of urbanization and fast expansion of crossbreeding. Although data on productive and reproductive performances of exotic and crossbred cows are abundantly available but they are very limited in case of indigenous cattle of Bangladesh, because indigenous cattle has not yet been reared under close monitoring system. Indigenous cattle are reared scattered in the rural farmers' house as because very difficult to get information due to poor awareness of the farmers. These cattle are only found in Chittagong and its peripheral regions and reported to have been declining their number due to indiscriminate breeding with poor indigenous, exotic and crossbred cattle since last three and a half decades (Hossain *et al.*, 2006). The most important factor that the RCC are highly resistant to diseases especially under rural production systems, require lower input support than others and produce milk and beef of high quality (Bhuiyan, 2007). The Red Chittagong Cow attains sexual maturity earlier and calving regularly than that of non-descriptive

Deshi (Khan *et al.* 2000). Due to indiscriminate crossbreeding along with improper feeding, poor husbandry and health management practices it has been pushed on the verge of extinction, (Bhuiyan *et al.*, 2005). Therefore, data both on phenotypic and genetic parameters on RCC are to be made available for providing future guidelines in order to improve meat production potentiality of RCC in Bangladesh. Faster growth rate is a very important trait while meat production is the target. Growth performances are important traits influencing profitability in the majority of beef production systems (Rege and Famula, 1999). Improvement of live performance traits is an increasingly important breeding goal in beef cattle and other livestock production systems (Peters *et al.*, 1998). Although milk production of RCC dairy cows are lower than crossbreed cows, their other performances like feed conversion ratio (FCR), production of calf per year and disease resistance capacity are better. They can survive with locally available low quality feed resources (Mondal *et al.* 2005). Changes in live weight with age are important aspects of beef production from cattle. Growth studies are very important for livestock production because growth is the foundation on which the other forms of production such as milk, meat and work rest and it provides scope for early selection of animal. This study was performed to evaluate the body weights of RCC at several ages both on-farm and on-field and to compare their growth rate in the said management systems. Therefore, to improve the Growth rate of RCC, current study was undertaken addressing the factors associated with production systems of RCC and the dynamics of their feed availability. Now-a-days government and some non-government organizations are paying attention on this potential type of indigenous cattle. Considering the above condition the study work was undertaken to estimate the growth performance of RCC in backyard rearing system in Chittagong district.

These findings would be valuable to the policy makers and extension workers in order to guide policies towards increasing efficiency of the Red Chittagong Cattle production in Bangladesh. Considering these perspectives, this study was carried with the following

**Objectives:**

1. To observe the feeding management practices of Red Chittagong Cattle in intensive farming system & rural condition.
2. To observe the growth performance and production indices of the Red Chittagong Cattle as a native breed.

## Chapter: 2

### Materials & Methods

The study was conducted in 8 selected Union namely Durlober para, Bajalia, Dhormopur, kewochia, puranghor, Dohazari, Amilaish, Ghatiya dangha, and IDF (Integrated Development Foundation) RCC farm located at Satkania upzilla in Chittagong district of Bangladesh during the period of March to August 2017. After site selection a survey was made by going, IDF farm & door to door of farmers, who are rearing RCC. The farmers were given a brief description about the purpose of this study before interviewing. The survey schedule was prepared on the basis of following key items: Information about dam & sire, cows live weight, expected date of parturition, birth weight at birthday, gestation length, calves subsequent weight up to weaning, growth rate.

A total of 50 cows were selected from different selected Union & IDF farm for study. The selected cows were visited frequently and the information on the growth performances of each cow was collected by face to face interviewing the farmers by frequent visit and examination of the cows. In case of calf (up to 3month of age) weight was taken by digital weighing scale with the help of rope & Towel. In case of cows, weight was collected by measuring of heart girth length in inch & length of point of shoulder to point of Buttock, with the help of formula of Body Weight (W)=  $LG^2/660$  (Kg). After that, data were recorded. During investigation the management including feeding of suckling calves & weaned calves also observed and recorded in the questionnaire.

#### **2.1. Feeding and management of animals:**

Stall feeding was followed throughout the years in the IDF farm. Calves were supplied three different types of feeds such as green grasses (like Maize, Jumbo, Napier, Para, German etc.), concentrate mixture and rice straw (for suckling calves)/urea-molasses treated straw (for weaned calves) . All feeds were supplied twice daily in the morning and evening. The cattle are allowed to graze on natural pasture from 9 A. M. to 4 P. M in case of village condition. Straws are provided during the draught period. A concentrate mixture is provided twice daily (8 A. M. and 4

P. M.) on the basis of live weight at the rate of 1.5kg/100 kg body weight at IDF RCC farm.  
Concentrate Mixture for Lactating cows shown in Table 1.

**Table 1. Concentrate Mixture for Lactating cows**

Sl no	Ingredients	Amount(gm)
01	Wheat Bran	800
02	Crust Maize	1000
03	Rice polish	800
04	Lentil Bran	750
05	Mustard oil cake	500
06	Molasses	500
07	DCP	100
08	Vitamin & mineral Premix	50
09	Salt	50
10	Urea	40
11	Black Cumin	20
	Total	4.77kg

**Table 2. Feed allowance for RCC calves**

Sl no	Types of feed	Amount supplied (kg/day/individual)	
		Suckling calves	Weaned calves
01	Green grasses	Ad libitum	Ad libitum
02	Rice straw	Ad libitum	-
03	Urea-molasses-straw	-	Ad libitum
04	Concentrate mixture	0.25	0.25
05	Water	Ad libitum	Ad libitum

**Table 3. Composition of Urea-molasses-straw**

<b>Components</b>	<b>DM basis (%)</b>	<b>Fresh basis (%)</b>
Rice Straw	82	91
Molasses	15	21
Urea	03	03
Water		Equal to rice straw

**2.2. Statistical Analysis:** All related data were imported and edited in Microsoft Excel 2007 for calculating the growth performances of Red Chittagong Cattle under farm & rural condition. The mean value was compared using the Least Significant Different (LSD) test (Steel et al. 1997).

## Chapter: 3

### Results

#### 3.1 Weight gain and growth rate:

The body weight and growth rate of Red Chittagong cattle at different ages are shown in Table 4.

**3.2 Birth weight:** In present study the birth weight of male was heavier than female. Average birth weight of male & female were 13.02 kg. Where average birth weight of male was 14.31 kg & female birth weight was 11.73 kg. In case of farm condition male calves birth weight were heavier than rural condition. Average Birth weight of male calves under farm condition was 15.35 kg & female calves were 11.89 kg. In case of rural farming condition average birth weight of male was 13.27 kg & female was 11.58 kg.

**3.3 Weight of month age:** In case of farm condition average weight of male at one month of age was  $(24.67 \pm 0.34)$  kg & female was  $(20.85 \pm 0.41)$  kg. In case of village condition average weight of male was  $(21.38 \pm 0.36)$  kg & female was  $(19.67 \pm 0.50)$  kg.

**3.4 Weight at second month:** Table 3 shows that the body weight gain of RCC in farm condition was higher than rural condition. The average weight of male under farm condition was  $(34.45 \pm 0.36)$  kg & female was  $(30.14 \pm 0.42)$  kg. But in rural condition male weight was  $(29.22 \pm 0.38)$  kg.

**3.5 Weight at third month:** It was found that the male calves attain  $44 \pm 0.34$ kg live weight and female calves attain  $39.20 \pm 0.48$ kg weight at 3 months of age under farm condition. However, in rural it was lower  $37.17 \pm 0.37$  kg for male and  $37.17 \pm 0.37$  kg for female.

**3.6 Weight gain per day:** In farm condition weight gain per day was better than weight gain of rural condition. In case of RCC, under farm condition, males' gain was 325gm per day & female was 307gm per day. Whereas in rural condition weight gain of male was 268gm per day & female was 273gm per day.

**Table 4. Live weight & weight Gain of RCC Male & Female Calf under farm & Village Condition**

Days	Rearing system			
	Farm Condition		Village Condition	
	Male (Average $\pm$ SE)	Female (Average $\pm$ SE)	Male (Average $\pm$ SE)	Female (Average $\pm$ SE)
Day old	15.35 <sup>b</sup> $\pm$ 0.28	11.89 <sup>a</sup> $\pm$ 0.38	13.27 <sup>b</sup> $\pm$ 0.41	11.58 <sup>a</sup> $\pm$ 0.47
15Days	19.95 <sup>c</sup> $\pm$ 0.32	16.29 <sup>a</sup> $\pm$ 0.38	17.05 <sup>b</sup> $\pm$ 0.36	15.58 <sup>a</sup> $\pm$ 0.48
30Days	24.67 <sup>b</sup> $\pm$ 0.34	20.85 <sup>a</sup> $\pm$ 0.41	21.38 <sup>a</sup> $\pm$ 0.36	19.67 <sup>a</sup> $\pm$ 0.50
45Days	29.50 <sup>a</sup> $\pm$ 0.36	25.43 <sup>a</sup> $\pm$ 0.41	25.50 <sup>a</sup> $\pm$ 0.38	24 <sup>a</sup> $\pm$ 0.44
60Days	34.45 <sup>c</sup> $\pm$ 0.36	30.14 <sup>a</sup> $\pm$ 0.42	29.22 <sup>a</sup> $\pm$ 0.38	28 <sup>a</sup> $\pm$ 0.50
75Days	39.22 <sup>b</sup> $\pm$ 0.34	34.72 <sup>a</sup> $\pm$ 0.45	33.27 <sup>a</sup> $\pm$ 0.38	32.17 <sup>a</sup> $\pm$ 0.45
90Days	44 <sup>a</sup> $\pm$ 0.34	39.20 <sup>b</sup> $\pm$ 0.48	37.17 <sup>a</sup> $\pm$ 0.37	35.75 <sup>a</sup> $\pm$ 0.53
Weight gain grams/ Day	325	307	268	273

Means with different superscripts differed significantly with 5% level of significant

**3.7 Feeding under farm condition & village condition:** Under farm conditions stall feeding was followed throughout the years. Calves were supplied three different types of feeds such as green grasses (like Maize, Jumbo, Napier, Para, German etc.) and concentrate mix. On the other hand the rural RCC are normally graze in road side, embankment and fellow land and some concentrate supplements were fed for milking cows only. Concentrate mixture was shown in table 1 which consist of Wheat bran, crust maize, rice polish, lentil bran, mustard oil cake, molasses DCP, Vitamin & mineral Premix ,common salt, urea, Black cumin etc are provided two times (8.00 AM & 4.00 PM). In case of lactating animal average 4.5 to 5.0 kg concentrate mixture were given per animal.

Feed allowance for RCC calves shown in Table 2. Green grass were provided adlibitum amount in both suckling calves & weaned calves .Rice straw provided adlibitum amount only in suckling calves./urea-molasses treated straw(shown in table 4) only provided adlibitum amount in weaned calves. Concentrate mixture were provided 0.25kg in both suckling & weaned calves. Water also provided in both weaned & suckling calves' adlibitum amount.



## Chapter: 4

### Discussion

#### **Birth Weight and growth rate:**

The body weight and growth rate of Red Chittagong cattle at different ages are shown in Table 3. In the present study, body weight and daily gain at different ages differed significantly ( $P < 0.05$ ) between male and female except the daily gain during 1 to 3 months of age. Males are heavier than the females at all ages from birth to adult. Similar observations were reported by many other researchers (Habib, 2001; Jalil *et al.*, 2002 and Gaur *et al.*, 2003). In present study, the RCC male calves at birth (14.31kg) are heavier than their opposite sex (11.735kg). The average birth weight of the present study (13.023kg) was lower than the same animal (16.70 kg) reared under confinement in Bangladesh Agricultural University (Habib, 2001 and Khan *et al.* 2000). In present study it is also reported that the average birth weight (13.62kg) of RCC reared in farm condition is higher than average body weight (12.425kg) of RCC reared in village condition. Khan *et al.* (2012) observed similar birth weight of RCC under rural conditions. On the other hand, Gaur *et al.* (2003) reported higher body weights of Indian Gir cattle under its breeding tracts than that of the present study. They found 56.1kg for male and 52.4 kg for female at 3 months of age. But in present study it was found that the male attained 40.58kg & female attained 37.475kg at 3 months of age, which were lower than Gaur *et al.* (2003). This may be due to genetic variation. But the extent of differences in weight of RCC between male and female is higher than that of the others. This difference may be considered as an economic genetic trait of RCC for meat production or draught power from the male and low input based milk from the female.

#### **Weight Gain per Day:**

The daily gain of RCC is higher in Birth to 1 months of age compare to that in birth to 2 months or the average of birth to 3 months of age. Mostari (2007) reported the average growth rate of RCC Male & female calves as 350gm & 334gm per day, which is close to the average growth Productive and reproductive efficiency of red Chittagong cattle rate found during birth to 3

months of age of RCC male & female calves of the present study. Hossain and Routledge (1998) studied growth rate performances of Pabna and *Deshi* calves and found 278 and 268 gm per day, respectively which were slightly lower than the present study.

## **Limitation**

There were some limitations of the study such as sample size were smaller, observation period were very short.

## **Conclusion**

From this study, it may be concluded that the male calves grew faster than the females and farm condition was better than rural condition due to proper feeding and management. Appropriate feeding, management, are required for improvement of growth traits of RCC. Though the male calves grew faster therefore by taking extra management and care it can be used as meet purpose. However, for confirm this findings it require more confined study with larger sample size.

## Image Gallery



**Figure 1:** Measuring of Length of dam in IDF farm



**Figure 2:** Measuring of Heart Girth of dam in IDF farm.



**Figure 3:**RCC Dairy cows shed of IDF farm



**Figure 4:** preparation of hanging scale





**Figure 5:** Tying of towel for hanging of calves



**Figure 6:** Measuring of calves weight.



**Figure 7:** Measuring of heart girth of dam of village condition RCC.



**Figure 8:** Measuring of length of dam of village condition RCC.

## Appendix:

### A Questionnaire on Growth performance & feeding practice of Red Chittagong Cattle(RCC) in Satkania, Chittagong

<b>Farm ID :</b>	<b>Farm Name :</b>	<b>Owner Name :</b>
<b>Village:</b>	<b>Upazilla :</b>	<b>District :</b>

**Table-1 : Growth Performance of the studied farm.**

Sl.no	Sire	Dam	Cows tag no	Cows Live wt.	Calf	Date	Calf tag no	Birth Wt.	Calves subsequent weight upto weaning						
									Birth day	D-15	D-30	D-45	D-60	D-75	D-90
Cow-1					Male										
					Female										
Cow-2					Male										
					Female										
Cow-3					Male										
					Female										

**Table-1 : Feed allowance for RCC calves.**

Sl no.	Types of feed	Amount supplied (KG/day/individual)	
		Suckling calves	Weaned calves
01	Green grass		
02	Rice straw		
03	Urea-molasses-straw		
04	Concentrate mixture		
05	Water		

**Data Collector:**

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## **Biography:**

I am Nazim Uddin, son of Abdul Shukkur and Khirunnesa Begum. I passed my Secondary School Certificate(SSC) examination in 2008 and Higher Secondary Certificate(HSC) in 2010. I enrolled for Doctor of Veterinary Medicine (DVM) degree in Chittagong Veterinary and Animal Sciences University(CVASU), Bangladesh. I have immense interest to work in the field of Animal Genetics.