

Study on the Productive and Reproductive Performances of Red Chittagong Cow at rural areas in Chittagong

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Abstract: The result of the collected data revealed different reproductive performances of Red Chittagong Cow such as age at puberty 2.68 ± 1.72 years, days required to first heat during post partum period 3.08 ± 1.00 months, calving interval 14.00 ± 1.19 months, service per conception 1.36 ± 0.60 and gestation length 279.92 ± 5.27 days. In this survey some data were recorded to observe the production performances of Red Chittagong Cows. Milk production per day and lactation length was 2.10 ± 0.63 liter and 238.8 ± 30.6 days, respectively. The maximum milk production per day was 4 liter per cow and the minimum production was 1 liter per day per cow. The cow produced 1.88 ± 0.51 liter milk supplied with roughage only on the other hand 2.42 ± 0.57 liter milk produced by the cow supplied some amount of concentrate along with roughage. The level of production difference between two groups were highly significant ($p < 0.0001$).

Key Words: Lactation, Puberty, Service per conception, RCC.

Introduction:

The primary objective of a dairy cow is to have a live calf in every 12 month. In spite of our large cattle population (21.57 millions, BLRI, 2004), the calf and milk production is not satisfactory. The major causes of low fertility or low reproductive efficiency and milk production are poor nutritional management particularly during calving and thereafter, frequent suckling at long duration because there is no practice of weaning, use of cow in draught power, high proportion of inaccurate estrous detection, artificial insemination in incorrect time, unskilled inseminator, lack of knowledge about heat detection (Shamsuddin *et al.* 2001).

The people of Bangladesh are rearing three categories of cattle like pure breed, crossbreed and local-breed. In Bangladesh the best local cattle are available in some selected areas *viz* Pabna, Sirajgonj, Chittagong and Munshigonj areas. In Chittagong a beautiful Red cattle with some distinct characteristics are seen known as Red Chittagong Cattle and produce 2.0 ± 0.65 kg milk in farm condition and 1.80 ± 0.87 kg in rural condition per day (Khan *et al.*, 2000). The crossbred animals provide higher amount of meat and milk and better performance but they are prone to suffer from various diseases, especially paracitic diseases are most common in crossbred and other indigenous cattle (Samad, 1988).

Red Chittagong Cattle is red in body color. They have some exotic blood. History of development of this variety is not clear and somebody

speculated that variety has involved by interbreeding among them on the basis of natural selection (Ali, 1965). The Red Chittagong cattle are not internationally considered as a pure breed but as a variety (Mason, 1982). The most important factor that the animals 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). Khan *et al.* (1999) reported that the red Chittagong cow attain sexual maturity earlier and calving regularly than that of non-descriptive Deshi.

Adaptation and development of Red Chittagong cattle (RCC) in our local environment is favorable which enables them to produce, and reproduce normally on the other hand imported breeds have serious problems. The indigenous cattle genetic resources of Bangladesh are now under threat condition because of urbanization and fast expansion of crossbreeding. For cattle development and rural livelihood enhancement in Bangladesh, conservation of RCC is emerging issue. Considering the above condition the current research work was undertaken in order to meet up the following objectives:

- To know the existing reproductive and productive performances of Red Chittagong Cow in rural condition.
- To know the management practice of RC cow in Chittagong region under rural condition.
- To know the effect of feed on milk production

Methodology:

The study was conducted at the five thanas namely Potia, Rawjan, Satkania, Candhanish and Anwara located Chittagong district in Bangladesh. These five thanas were selected on the basis of number of RCC observed frequently. Before site selection, a good relationship was built up with different relevant offices and other related people in the project areas. District Livestock offices were played an important role to get more information and easy to collect data. After site selection a survey was made by going door to door of farmers who are rearing RCC and a total 250 cows were selected (50 cows from each thana) from different selected upazillas during the period May 07 to June 08. The selected cows were visited frequently and the information on the productive and reproductive performances of each cow was collected by face to face interviewing the farmers by frequent visit and examination of the cow. After that, all data were recorded in a separate designed survey questionnaire prepared according to objectives. Before interviewing the farmers were given a brief description about the purpose of this study. The survey schedule was prepared on the basis of following key items: age at puberty, gestation length, days to post partum heat, calving interval, days open, age at first calving, service per conception, daily milk production per cow, total lactation length. During investigation the management including feeding, housing, ventilation, hygiene etc were also observed and recorded the in the questionnaire. The studied animals were divided into two groups; group A (animals were supplied Roughage only) and group B (animals were supplied concentrate plus Roughage). Diseased animals were also treated if any during farm visit.

Statistical Analysis:

Collected data were compiled and entered into Microsoft excel and the data were analyzed for Student 't' test using SPSS.

Results and Discussions:

Age at puberty:

Age at puberty is the most important reproductive trait. Early oestrus for a heifer is very important on the reproductive point of view. In this study the average age at puberty of RC cow was 32.21 ± 20.72 months (Table 1). One of the research findings was established by BLRI (2004) reported that the average age at puberty of RCC

was 15.0 months. On the other hand Khan *et al.* (2000) reported that the average age at puberty of RCC was 33.25 ± 2.75 months in farm conditions and 33.41 ± 4.23 months in rural conditions. Ahmed and Islam (1987) found the age at puberty on indigenous cows was varying from 36 to 42 months which is longer than RCC. The age at puberty of Fx heifer was 33 months (Rahman, 1993) which is more or less similar to RCC. Other researchers reported that age at puberty on LocalxFx heifer was 42 months (Asraf, 1998) and 40.18 ± 4.46 months (Azizunnesa, 2002). From the above discussion it is noted that the age at puberty of RCC comparatively lower than that of other crossbred or indigenous heifers though it was not standard for a dairy farm on the economic point of view. Age at puberty depends on different factors: genetic character, a good management including feeding of colostrum, supply of balance feed during growing stage of heifer, body weight gain, regular deworming, disease control and treatment of diseases if any are the most important factors which influence the onset of puberty. In this study most of the farmers reared their RCC calf without any extra care. The traditional calf management systems were observed in the projected areas. Delayed age at puberty may be the causes of this poor management provided by the farmer. Debnath *et al.* (2003) stated that feeding supplementary concentrates containing undegradable protein has beneficial effect on body weight gain on calves of RCC.

Table 1. Reproductive performances of Red Chittagong Cow

Parameters	Mean	SD	Minimum	Maximum
Age at puberty (in month)	32.21	20.72	12.0	50
Days to Post partum heat	92.46	30.27	30	300
Calving Interval (in month)	14.00	1.19	12	18
Service per conception	1.36	0.60	1	4
Gestation length (in days)	279.92	5.27	271	290

Days to post partum heat:

Reduce the number of days from calving to the subsequent service of cow increase the economic value of a dairy farm. The average days to post calving heat of RCC in this study was 92.46 ± 30.27 days (Table 1). Ali *et al.* (2000) observed that the

average post partum heat period was 109.59 ± 26.87 and 103.83 ± 18.54 days in crossbred and in indigenous cows, respectively. Islam (2000) that post partum heat period of indigenous cows varied from 2-6 months. In another study by Khan *et al.* (2000) reported that days required for post partum heat of rural RCC was 73.42 ± 43.36 and in farm conditions was 54.28 ± 11.7 days.

Calving Interval:

Calving interval is the most important reproductive parameter that measures the overall reproductive performance of herd. The average calving interval of RCC was 14.0 ± 1.19 months (Table 1). Talukder (2003) observed the average calving interval in RCC in farming conditions was 374.73 days (12.49 months) which is lower than that of this study. But Khan *et al.* (2000) found the average calving interval of RCC in farm conditions and in rural conditions were 458.40 ± 71.82 days and 529.35 ± 127.50 days, respectively which is higher than that of this study. BLRI (2004) reported the inter calving interval of RCC was 12.0 months under traditional production systems. On the other hand, inter calving interval of crossbred was 635.10 ± 84.90 days and in indigenous cows was 539.40 ± 128.10 days (Ali *et al.* 2000). Azizunnesa (2002) stated that the average calving interval of subsistence dairy cow was 18 ± 5 months in Mymensingh district. From the above points it is observed that the calving interval is the lowest in RCC which is very essential for economic purpose of a dairy cow.

Service per conception:

In this result the average service per conception was 1.36 ± 0.60 (Table 1). The result is more or less similar to the findings of Khan *et al.* (2000) which were 1.47 ± 0.61 in rural RCC and 1.57 ± 0.53 in farm conditions. Other researchers observed the service per conception was 1.45 of RCC in BAU dairy farm (Talukder, 2003) and 1.5 in rural cow in Mymensingh (Azizunnesa, 2002). The minimum number of service per conception is one of the indicators of economically profitable dairy farm. For an ideal and sustainable dairy farm the optimum service per conception should be 1.33 (de Kruif, 1978). It is noted that the RCC required minimum number of service per conception compare to other dairy cows which is a better criteria for sustainable dairy production in rural areas.

Gestation length:

This study reported the average gestation length was 279.92 ± 5.27 days (Table 1). Talukder (2003) reported that the gestation length of RCC was 279.58 ± 1.85 days in BAU dairy farm. Another research work conducted by Khan *et al.* (2000). They found the length of gestation of RCC in rural conditions was 282 days and in farm conditions was 281 days. Azizunnesa (2002) observed the mean gestation period was 273.08 ± 7.48 days in farm condition in crossbred cows. The standard gestation length of cows is 285 ± 5 days (Hafez, 1993).

Production performance:

The average milk production per cow per day in RCC was 2.10 ± 0.63 litre and lactation length was 238.8 ± 30.6 days (Table 2). BLRI (2004) found the total lactation yield was 800 litre in RCC under rural condition. Khan *et al.* (2000) reported that the average milk production per cow per day of RCC was 2.0 ± 0.65 kg in farm condition and 1.80 ± 0.87 kg in rural condition.

Table 2. Production performances in Red Chittagong Cow

Parameters	Mean	SD	Minimum	Maximum
Milk production per day (in liter)	2.10	0.63	1	4
Lactation length (days)	238.8	30.6	150	330

Daily milk production of local cows in farm condition was 2.56kg per cow (Ahmed & Islam, 1987) and 2.50kg per cow in rural condition (Haque *et al.*, 1988) which is slightly higher than that of the present study. Another finding by Azizunnesa (2002) reported the average milk production of subsistence dairy farm was 3.2 ± 2.2 kg per day per cow.

It might have been the lack of nutrition supply, lack of proper management system parasitic infestation, etc were the possible causes of low milk production in this study area. Azad *et al.* (2007) reported the milk production drops to as low as 1.5 ± 0.89 litre per day in pabna milk shed area of Bangladesh during the period of low feed supply and when cows were fed rice straw only.

The lactation period of RCC in this study was 238.8 ± 30.6 days (Table 2). Khan *et al.* (2000) stated the average lactation length of RCC was 222.85 ± 16.03 days in farm condition and

214.71±21.68 days in rural condition. Ali *et al.* (2000) found the average lactation period of crossbred was 266.42±30.87 days and 220.21±21.69 days for indigenous cows. The average lactation period of indigenous cows was 228 days observed by Halim (1992).

The length of lactation period depends upon some factors. Heredity, adequate nutrition, milk production, weaning practice, are the most important factors which influence the lactation length. Minimum 2 months off milking prior to delivery is important for return to heat in post partum period and conception and even subsequent milk production.

Relationship between milk production and feed supply

Table 3. Relationship between milk production and feed supply

Group	Mean of milk (litre)	SD	P value for t-test
A (Roughage group)	1.88	0.51	p=<0.0001
B (Concentrate plus Roughage group)	2.42	0.57	

Nutrition is most important factor in milk production. The Table 3 represented that the relationship between milk production and feed supply. The average 1.88±0.51 litre milk were produced per day by group A. On the other hand group B produced 2.42±0.57 litre milk per day (Table. 3) and the difference between two groups was statistically significant (p= <0.001). The concentrates like wheat bran, rice gruel, rice bran, vitamin mineral premix etc were supplied by farmers to their RCC. It was observed that majority of farmers supplied minimum amount of concentrate during lactation period only. But it is very important to supply adequate feed during dry period as well as during pregnancy especially prior to parturition and followed by after delivery for maintain better health care, body condition score and subsequent milk production. Debnath *et al.* (2003) reported that the significantly (p<0.05) higher level of milk (2.2±0.07 litre) was produced by RCC supplied with feeding supplementary concentrate containing more undegradable protein (UDP) than that of non UDP supplied group of RCC was 1.85±0.07 litre per cow per day.

The result of this study revealed that reproductive and productive performances of Red Chittagong Cow in rural area are sustainable though the milk

production is low. The management practice of RCC in rural area in Chittagong is ordinary. Average production of milk from RCC is low but it can be significantly increased by supplying roughage with concentrate. However further study will be required to observe the productive and reproductive performances of RCC supplying with balance feed and providing well reproductive herd health management.

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