

Production performance of indigenous cows under a village condition of Sherpur District

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ARTICLE INFO

ABSTRACT

Article history

Received: 29 October 2022

Accepted: 21 November 2022

Keywords

Local cows, Production performance, Milking yield and Village condition

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The research work was conducted to find out the present condition of indigenous cow rearing and milk production performance to give important suggestions for production constraints. The experiment was conducted at a nearby village named Andharupara, union poragaon adjacent to Hill area, Sherpur district having 100 local cows were taken under this study. Fifty (50) farmers were selected with direct interview. Data was compiled statistically only for tabular, percentage, mean and standard deviation. Body weight and condition score of the observed value were 130.21kg and 2.75, respectively. Average daily intake of feed was 12.5 kg (fresh basis) and 7.72 kg (DM basis). From the results of the experiment, it was found that average daily milk yield of the indigenous cows for whole lactation period was 1.43 kg per day. The mean value of hemoglobin (Hb), packed cell volume (PCV) and fat percentage were 7.95 (g 100/ml), 51 (%) and 57.40 g/kg, respectively. The age at first calving for local cows found 51.70 months and lactation length was 238.5.6 days. The average birth weight of the local calves found 13.45 kg. From the study it can be concluded that morphometrics and production traits of indigenous cows was favorable and profitable practices in selected areas.

Introduction

Livestock plays an important role in Agriculture as well as in national economy in Bangladesh. Our present government has taken a massive long-term program for poverty alleviation throughout the country especially rural people by their own fund and foreign aid. Many Government departments, Board, Autonomous body and Non Government Organization (NGO) are amalgated in this program. Cattle are the valuable components of livestock sector in Bangladesh. Dairying is a biological efficient system that converts large quantities of inedible roughage to milk, the most nutritious food known to man. Milk is known as an "almost complete" as well as natural nutritious food for all mammals including human being (Debnath et al. 2014). It is a more efficient and intensive system in term of nutrient and protein production for human consumption. Dairy cattle are exposed to stressful climatic condition in tropical regions, which influence their productivity and welfare. The indigenous zebu (*Bos indicus*) cattle are adapted and tolerance to the hot environments because of low metabolic rate and great sweating capacity (Hansen, 2004; Hossain et al., 2017).

Despite being an important sector in Bangladesh agriculture, its contribution to the agricultural GDP is much less than those of crop agriculture and fisheries. The contribution of animal farming has remained largely stagnant with a share of around 13 per cent of agricultural GDP over the last two decades. A disaggregated picture, however, shows satisfactory growth for poultry (over 4.5 per cent), followed by goats/sheep (around 4 per cent) in recent years. According to the estimate of the Department of Livestock Services, the present population of cattle, goat, buffalo and poultry is about 242.38 million, 262.67 million, 14.86 million and 3470.35 million, respectively (DLS, 2019). Livestock Department's available statistics show that the domestic production of milk, meat and egg are 99.23 lakh metric ton, 75.14 lakh metric ton, and 1711 crore numbers in the fiscal year 2019 against the demand of 152.02 lakh metric ton, 72.97 lakh metric ton, and 1732.64 crore number in 2019 fiscal year, respectively (DLS, 2019). Cattle of Bangladesh can be classified into two categories (1) indigenous and (2) cross bred. Average live weight of indigenous cow is about 123 kg and cross bred is about 137 kg (Islam et al., 2010). Cross breeding cattle has been adopted for blending the adaptability of tropical cattle with the high milking potential of

exotic breeds. However, the local environment can sustain only composite genotypes of a moderate level *Bos taurus* blood (Musa et al., 2008). Friesian crossbreds were noted to be the suitable for their adaptability in addition to their high milking capacity. Adaptation to tropical environment has been reduced. The livestock sector has received little priority in overall government development plans. Less attention has been placed by the policy makers to livestock sector compared to the crop sector, primarily because of the poor state of knowledge about methods and problems of production and utilization of livestock in the country (Hossain et al., 2016). People of our country are rearing their cows using traditional methods. They have very little knowledge about the scientific methods of rearing cattle. In order to improve the livestock production at first we have to know the details of our livestock. Our local cows are the resource of our country. Their milk quality is very good. Their hides and skin quality is better than that of exotic breeds. Local cows are easy to handle, easy to management; feed cost is low, more resistant to disease and more economic than exotic cattle (Hossain et al., (2016).

Before planning we should know the morphometrics characterization, production and reproduction traits of livestock throughout the country. At the same time present rearing system of livestock in rural areas and their present production characteristics are needed to be monitored. In this connection the available data on livestock in this country are not sufficient compared to crop statistics. We have very limited information on the production performance of different types of dairy cows available in Bangladesh. In this connection the present piece of study was undertaken to know the present management condition and production performance of local cows.

Materials and Methods

Management of cow site

One typical village named Andharupara which is about 10 kilometer away from Nalitabari upazila town had been chosen and selected for this trial. The villagers are mostly resource poor small holder farmers and 20% of them were landless. Every family had some indigenous cattle. The village was well communicated from the upazila and district town. The farmers were very cooperative and much interested for this type of study. Constant visit and collection of data from farmer's level was easy and

possible due to the better communication exists between the village and upazila town. The cows of villagers were generally used for multi purpose such as dairy, draught and meat. Rice straw was the main source of the animals as residual part of crop. The road side green grass used *ad libitum* as succulent feed. Wheat bran, oil cake and common salt were fed to the cows by the comparatively better off farmers. Cows were mainly stall feed and sometimes tethered with rope.

Number of animals in study

Sixty individual farmers having totaled 100 indigenous cows were taken for this study. Baseline data were collected having 100 animals through direct interviewing with 50 farmers. The animals received as usual feed supplied by the farmers of that area on the basis of availability.

Productivity indices

Cows were milked once in the morning. Calves were usually tied up at night and they had free access to their dam during the whole day. Productivity had been monitored by supplied International Atomic Energy Agency (IAEA) draft data sheets for measurement of milk production and changes in live weight, condition score (1-5). Scheduled visits and Sampling 100 cows had been chosen for this trial and set up ear tagged (1-100) for identification. The cows, calves, and milk yield were weighed daily. Faecal eggs were examined for the counting of parasites from the collected faecal sample of individual cow.

Methods of feeding

Cows were fed as usual traditional system by the villagers. Most of the animals were mainly stall fed and sometimes tethered. Determination of Dry matter, crude protein (CP) and Ash were done according to AOAC (2005) in the laboratory of the Department of Animal Nutrition. RDP, UDP, digestibility of CP and DM were done according to the Scottish Agricultural College bulletin (1984).

Condition score and daily milk yield

Body condition of the cows had been estimated monthly. The Scottish Agricultural College grading i. e. 1-5 had been used for this purpose. Our indigenous cows score ranges were between 2.25 to 3.50. Milk yield of individual cows were recorded daily.

Statistical analysis

Data were analyzed by descriptive statistics such as number, range, percentages, mean and standard deviation. A number of tables were prepared keeping in view the objectives of the study.

Results and Discussion

Phenotypic and morphometric characteristics of indigenous cows

Initial baseline data along with laboratory analysis has been summarized from 100 cows and their calves are presented in Table 1. Average body weight of the local cows was 130.21 kg. Ahmed (1995) observed the average body weight of local cows under village condition was 167.21. Khan and Hossain (1994) reported that the local cows' body weight was 174.13kg. A number of factors may influence the age of body weight. All these results were not in agreement with the findings of present study. Genetic makeup is the main factor which influences this factor. Balanced nutrition, environmental condition, parasitic infestation, care and management may also affect body weight. The observed heart girth of the local cows was 130.50 cm and range was 122.65-139.25 cm. There was positive correlation within body weight, condition score and heart girth. Body weight directly influences the heart girth. Condition of body status and health of animal may influence this factor. Size of animal partially influences the heart girth. Birth weight of local calves was found 13.45 kg. Hossain et al. (2017) reported that the birth weight of indigenous cows' calves was 18.29 kg. So within the breed selection of individual superior sire could be an important factor in term of improving birth weight of calves. The means for body length, height at wither, heart girth, pouch girth, length of tail, switch, neck, ear and head were 83.668, 91.942, 113.146, 121.181, 54.196, 26.098, 32.705, 18.131 and 35.035 cm, respectively (Kayastha et al., 2011). There are several factors which influence the birth weight of calves e.g. genetic background is the most important among them. Nutritional status of pregnant dam and body condition also had remarkable effect on this trait. Sex of calf, twinning and season of birth also affect the weight of calves. The observed condition score of local cows was

2.75 and range was 2.25-3.50. There was a positive correlation between condition score and body weight. Environmental condition directly influences condition score. Season and weight of the animal may also influence this factor.

Table 1: Summary of the baseline information for indigenous cows and calves

Parameter (No. of cows: 100)	Mean \pm SD
Body weight of cows (kg)	130.21 \pm 12.02
Heart girth of cows (cm)	130.50 \pm 4.45
Condition score of cows	2.75 \pm 0.33
Milk yield per day (liter)	1.53 \pm 0.64
Milk fat(g kg ⁻¹)	57.40 \pm 9.1
Milking per day	1.00 \pm 0.00
Age at first calves (month)	51.70 \pm 11.30
Lactation length (days)	238.5 \pm 20.4
Age of cows (year)	5.45 \pm 1.32
Birth wt. of calves (kg)	13.45 \pm 2.56
Age of calves (days)	30.30 \pm 10.01
Body wt. of calves (kg)	17.25 \pm 5.12

Chemical composition of village level feed for indigenous cow

From Table 2, in the analysis of village level feed that sesame oil cake contains highest amount of DM and lowest amount in green grass. Sesame oil cake also contains highest amount of CP (g/kg DM) and lowest in rice straw. In Digestibility of DM% sesame oil cake contain lowest amount and highest in wheat bran. The UDP and RDP in sesame oil cake found highest and lowest in rice straw. Ash contain highest in rice straw and lowest in green grass. Taher et al. (2002) reported that the DM and CP of rice straw and wheat bran were 910 & 890 and 121 & 131g per kg, respectively. Hossain et al. (2016) reported that the DM and CP of sesame oil cake were 890 and 311 g/kg, respectively.

Feed intake of village feed for indigenous cows

Daily feed intake has been measured at the village level of cows. Table 3 shows the feed intake of village level feed. Measurement of daily intake of feed was not always possible during rainy season due to muddy roads of the village. From table 3, highest amount of DM, RDP, UDP and CP were found in rice straw and lowest in wheat bran (DM) and in road side grass of other composition.

Table 2: Chemical composition of village level feed

Feed ingredients	Average composition of the feed						
	DM g/kg	Ash g/kg	RDP g/kg DM	UDP g/kg DM	CP g/kg DM	Digestibility of CP%	Digestibility of DM%
Rice straw	855	138	4	13	54	73	38
Green grass	200	56	50	20	71	74	71
Wheat bran	885	67	112	40	155	72	86
Sesame oil cake	895	131	195	115	314	63	9

DM= Dry matter, CP=Crude protein, RDP= Rumen degradable protein, UDP= Undegradable protein

Table 3: Average daily intake of village feed for indigenous cows

Ingredients	Fresh wt. (kg/ day)	DM (kg /d)	RDP (g /d)	UDP(g /d)	CP(g /d)
Rice straw	7.50	6.38	255	83	338
Roadside grass*	4.50	0.90	47	18	65
Wheat bran*	0.50	0.44	50	18	68
Total	12.50	7.72	352	119	471

Productive parameters of indigenous cows

The productive parameters of indigenous cows are presented in Table 1. Average daily milk yield of indigenous cows was 1.53 kg. Initial data shows that the average milk production was lower under present situation. Animals were mainly under feed. Cows in the research area were milked only in the morning i. e. once a day. So, the actual milk production could have to be higher than that of present average figure of 1.43 kg/day. Hossain et al. (2016) showed that average milk yield per day of local cows was 1.43 kg. Ali (1994) reported that the milk production varied according to season and area. He conducted the experiment on local cattle using data collected from four different areas of Bangladesh and highest milk was observed in winter season (1.93 kg per day). He also found the highest milk yield in Pabna cows (20.50 kg per day). Bhuiyan and Faruque (1994) studied the performances of local cows under rural condition and average milk yield was 1.63 kg. The cow produced 1.88 liter/day milk supplied with roughage only. On the other hand, 2.42 liter milk/day produced by the cow supplied some amount of concentrate along with roughage (Azizunnesa et al., 2010). It is fact, that concentrate supplement was an important factor for increasing milk yield. There are several factors which influence the milk production of cows such as quality and quantity of feed, ambient temperature, humidity and care of the herd. Moreover, the animals were infested by parasites and that could be one of the responsible factor for less milk production and poor fertility. Suckling

blood and damaged liver cause anemia and abnormal physiology of the body.

The lactation length of indigenous cows was 238.5 days. This result was in accordance with Azizunnesa et al., 2010. Khan et al. (2000) stated the average lactation length of Red Chittagong Cattle (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 mean fat content of local cow's milk during the whole study period was 57.40 g/kg. A little information is available on the fat content of local cow's milk. Islam (1990) studied on the milk composition of local cows from Manikganj district and found the fat 46.9 g/kg of milk. Fat content of local cows were greater than that of exotic and crossbred cows due to straw based diet intake of the local cows. On the other hand, the production of local cows is low. It is said in dairy cattle rearing that maximum milk production contain minimum fat and minimum milk production contain maximum fat. Fat percentage may be affected by the quality of feed, number of lactation, stage of milking, exercise of animals, season of year as well as quantity of milk yield. Calves were ties up at night and cows were milked once a day early in the morning. Calves were free access for suckling to their dam throughout the day which is good feeling for the farmers for the better health of calves.

Blood parameters of indigenous cow

Estimate of Hemoglobin (Hb)

The estimation of Hb was found 7.95 g/100ml (Table 4). Similar result was found by Hossain et al. (2016). Normal Hemoglobin (Hb) values in most mammals were between 8-15g/100 ml (Banerjee, 1988). Excitement might be increased not only the Hemoglobin concentration but the PCV% and erythrocyte number per unit volume increased (Swenson, 1977). Turkson and Ganyo (2015) reported that the Hb concentration was 10.9 g/100 ml of blood where observation cattle were 440. Many researchers reported that Hb level of blood indicates the deficiency of protein level in feed. It was sure that ration was not properly balanced. The animals were suffering from mal nutrition and anemia. As a result hemoglobin level was found lower from the normal level.

Determination of Packed Cell Volume (PCV)

The PCV percentage of the local cows was found 51 and range was 28-80 % (Table 4). The PCV values fall in early lactation as milk yield rises then tends to rise as lactation progresses. Turkson and Ganyo (2015) reported that the PCV value was 28% of blood where observation cattle were 440. However, values are often low in late winter but recover when cows go out to pasture. Values are highest in summer but in many circumstances high level may be indicative of dehydration. Sometimes this could be due to a reduced water intake which might be caused by social drinking. The observed value of PCV percentage was high. It is clear to identify that the indigenous cows were not supplied sufficient fresh drinking water resulting in higher PCV values.

Table 4: Result of Blood parameters analysis

Parameter	Range	Mean ± Sd
Hemoglobin (g /100ml)	6.10-10.20	7.95±1.20
PCV%	28-80	51±6.00

Conclusions

In conclusion, above reveals that there are marked differences of production performance of indigenous cattle regarding phenotypic characterization and productive traits in selected area as well as throughout the whole areas of Bangladesh. These characteristics might be helpful for researchers, scientists and extension peoples for further relevant studies.

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