Reproductive Performance of Non-Descriptive Buffaloes Reared Under Subsistence Farming Conditions in Coastal Areas of Patuakhali District in Bangladesh

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Abstract: *Poor reproductive performance is a major constraint for increased production of buffaloes all around the world indicating that profitability of buffalo farming is more or less directly related to the reproductive performance of the animals. To have a breakthrough in changing the present scenario, improved reproductive management practices is necessary for developing buffalo production to a satisfactory level. This study evaluated the reproductive performance and management given to non-descriptive buffaloes of Bangladesh reared under subsistence farming at certain coastal areas covering all Upazillas of Patuakhali district. Data on reproductive parameters and management given to 150 buffaloes were collected by personal interviewing of selected farmers using pre-tested questionnaires.The reproductive parameters evaluated were: age at first service (36.86±0.14 months), age at first calving (48.84±0.15 months), service period (118.78±3.41 days), services per conception (2.09±0.10 times), calving interval (475.77±10.15 days), lactation length (200.63±2.45 days) and dry period (161.35±2.67 days). The data indicates poor reproductive performances and poor breeding practices which could be attributed due to poor feeding and lack of scientific knowledge of the farmers on efficient reproductive and other management events of buffaloes reared in the region.*
Keywords: *Bangladesh, buffalo, coastal area, reproductive performance, subsistence farming*

I. Introduction

Livestock plays a pivotal role in agriculture. It contributes directly and indirectly to the national development. In tropical and subtropical countries, buffalo is an important animal to boost up agricultural economy (Suhail et al. 2009). Buffaloes, the so-called 'Black gold' holds an strategic place next to the cattle in the overall livestock economy in Bangladesh contributing as an important source of milk, meat, drought power, hides and skins etc. (Islam et al. 2017). However the productivity of buffalo is reported to be lowest (410 kg milk buffalo^{-1} year^{-1}) in Bangladesh compared to other south Asian countries, studies show increasing buffalo population with the increasing demand of milk and meat in course of time in the country (Islam et al. 2017, Siddiky and Faruque 2017).

The buffalo population is estimated to be 1.45 million (FAO, 2014) and it has earlier been reported that the coastal regions possess approximately 40% of the total buffalo population in Bangladesh (Huque and Borghese 2013). Despite the vital importance of the species and livelihood dependency of farmers in the subsistence farming system, the productivity of indigenous non-descriptive buffaloes in the coastal belt is far below than the actual potential of the animal. Several factors are thought to be responsible for this lower level of buffalo production among which reproduction is one of the most important considerations. Efficient reproductive performance is very much essential for increased productivity and profitability of buffalo farming, particularly the performance of dairy buffalo production system relies on the acceptable level of reproduction. Thus, the reproductive efficiency is considered as an important parameter, which ultimately influences the economics of milk production of buffalo cows.

Report has been shown that any impairment of normal reproductive function results in infertility and sterility of animals, leading to economic losses due to widening of dry period and calving interval, and thus reducing calving and lactation yield during the lifetime of animals (Agarwal et al. 2005). Several reports have

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been published regarding reproductive and productive parameters as well as management systems of buffaloes (Hadi 1965; Faruque et al. 1990 and 1995; El-Kirabi 1995; Suhail et al. 2009 and Dhaka et al. 2017) however, information on those parameters in buffaloes are scanty in the coastal areas of Bangladesh. Thus a need was felt to understand the current status of reproductive performance and management of buffaloes in the coastal areas in Patuakhali, the most southern district of Bangladesh. The information obtained from this study could serve as a basis of exploitation of genetic potential, adopting appropriate breeding policies and good management practices for buffalo development in the area.

II. Materials And Methods

The present study was conducted in a portion of coastal areas covering all Upazillas of Patuakhali district in Bangladesh. One hundred fifty (150) buffalo cows were randomly selected to collect data regarding reproductive parameters with the help of a structured questionnaire through direct interviewing. A total of 45 farmers were interviewed during the period from July 01, 2018 to February 28, 2019.

The reproductive performance of the dairy animals were determined on the basis of the reproductive parameters like age at first service, age at first calving, service period, services per conception, calving interval, lactation length and dry period. Data were analyzed using the Statistical Package for the Social Science Software Package for Windows (SPSS v.18; SPSS Inc., Chicago, IL, USA). Results were expressed as the percentage, mean ± SEM.

III. Results And Discussion

3.1 Reproductive Performance

The findings of reproductive performance of buffaloes are presented in Table 1. In the present study age at first service was 36.86±0.14 months. Timsina et al. (2015) reported that the age at first service of local buffaloes as 34.2 months. An average age at first service of 35.26 months in local buffaloes in Bhutan was reported by Wangdi et al. 2014. The age at first calving is very important for high/longer life time production. The mean estimated age at first calving observed in this study was 48.84±0.15 months. Similar observations (50.88±1.71 and 51.00±1.80 months) were also found in the adjacent coastal areas to Patuakhali (Pirojpur and Barguna districts, respectively) by Paul et al. 2015. The finding has also been supported by the report of Ranjana et al. (2015). Although the age at first calving in good herds was reported to be 36 to 40 months (Viswanath 2002). The delay in first calving in the study area might have resulted from the low level of management with poor feeding of calves and heifers at their earlier stage, and thus might have an influence on their growth rate and contributed in delayed puberty. The low resource base of the farmers may also be a factor in providing limited amount of feed to their animals.

The optimum service period helps an animal to recover from the stress of calving and also to get the reproductive organs back to normal. The data pertaining to service period of buffalos was found to be 118.78±3.41 days/animal (Table 1). The longer service period might be due to low identification of heat in animals or may be due to unavailability of insemination facilities in nearby areas. Ranjana et al. (2015) also reported that the average service period in indigenous breed were 142 days/animal. It was observed that two or more services were required to conceive for majority of the buffaloes.

The mean number of services per conception was 2.09±0.10. The finding is in line with the findings of Vitthalrao (2010) and Verma (2012). The calving interval in this study was observed to be 475.77±10.15 days that clearly reflects the evidence of poor reproductive performance of non-descriptive buffaloes in the area reared under subsistence farming conditions. In separate studies, Meena et al. (2015 and 2016) found similar calving intervals of indigenous buffaloes to be 505 days and 495 days, respectively. Another report has shown that the average calving interval of buffaloes would be 450 days (Ranjana et al. 2015) which is very similar to the present finding, however, Paul et al. (2015) observed more longer calving intervals in indigenous buffaloes in the coastal districts (547.92±10.88 and 547.24±14.32 days for Pirojpur and Barguna district, respectively). This longer duration of calving interval might be due to poor feeding and other management practices under the subsistence farming condition.

The optimum lactation length is one of the best indicators of the performance of the dairy animals. The lactation length of non-descriptive buffalo cows in the present study was found 200.63±2.45 days, whereas it was found to be more longer in a study conducted by Paul et al. (2015) in indigenous buffaloes in the coastal regions (286.12±11.27 and 290.44±10.92 days for Pirojpur and Barguna district, respectively). The present result is in agreement with the finding of Dhaka et al. (2017). The dry period is a crucial time of lactation cycle. During this time, the buffalo and her udder are prepared for the next lactation. It is observed that the dry period of buffalo was 161.35±2.67 days. This finding is similar with that of the observations reported by Ranjana et al. (2015) and Verma (1993).

Table (1). Reproductive parameters of buffalo

Parameters	Reproductive performance (mean±SE)
Age at first service (M)	36.86±0.14
Age at first calving (M)	48.84±0.15
Service Period/days open (D)	118.78±3.41
Services per conception (No.)	2.09±0.10
Calving Interval (D)	475.77±10.15
Lactation Length (D)	200.63±2.45
Dry period (D)	161.35±2.67

3.2 Breeding Practices

The outcomes regarding various breeding practices followed by the buffalo owners are presented in Table 2. For heat detection, bellowing and vaginal discharge were the most common symptoms observed by majority of respondents in addition to observing the frequent urination and mounting on other animal. The similar findings were also noticed by Brar and Nanda (2004); Tanwar et al. (2012); Kumar et al. (2014) and Patel et al. (2014). As far as the method of breeding is concerned, respondents were practicing natural service. This means that the dairy farmers breed their animals with the locally available bulls.

During heat, time of insemination is very crucial aspect in conception; the buffalo owners of the survey areas were inseminating their buffalo cows mainly within 12-18 hours (64.44%) of heat manifestation and 22.22% of farmers inseminating their animals after 18 hours of heat. The findings of this research was in agreement with Patel et al. (2014); Tanwar et al. (2012); Sabapara et al. (2010) who reported that the natural service or AI was performed between 12-24 hrs of heat detection by majority of respondents. It was very remarkable to know that 17.78% of farmers were keeping the breeding records; but the records keeping were not complete. Farmers were keeping records of milk yield, parity number and date of insemination. The similar practice has been shown by Patel et al. (2014).

Table (2). Breeding management practices followed by buffalo owners

Practices	Particulars	Number	Percent
Heat Detection methods	Vaginal Discharge	32	71.11
	Bellowing	40	88.89
	Vulval Swelling	16	35.56
	Frequent Urination	12	26.67
	Mounting on other animal	19	42.22
	Allow other animal to mount	5	11.11
Methods of breeding	Natural service	45	100.00
	AI	0	0.00
Time of breed (Natural/AI)	Before 12 hrs	6	13.33
	within 12~18 hrs	29	64.44
	after 18 hrs	10	22.22
Drying off	Yes	7	15.56
	No	38	84.44
Record Keeping	Yes	8	17.78
	No	37	82.22

IV. Conclusion

It is concluded that the reproductive performance of dairy buffaloes in the study area are relatively poor. The overall scenario about the existing breeding management practices followed by the buffalo farmers is not satisfactory and this situation definitely influences the productivity of animals, adversely. For a standard reproductive and other management practices in the area, scientific knowledge and skills on buffalo rearing need to be upgraded. Therefore, both government and non-government enterprises may undertake and adopt appropriate breeding program, spotlight on improving the poor reproductive performance of the buffaloes and educate farmers on improved management practices.

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