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## Reproductive performance and disorders of Swamp buffalo cows under organized system of rearing in Guwahati Assam

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### Abstract

A study was conducted on 60 Swamp buffalo cows and heifers maintained at Network Project on Buffalo improvement (Swamp), College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam to accumulate data on reproductive performance and incidence of reproductive disorders. Reproductive performance was studied from the records maintained in the farm and incidence of reproductive disorders was studied by clinico-gynaecological examination of the animals and analyzing their breeding records. Average age at first calving, post-partum oestrus interval, service period, gestation period and intercalving period was  $1841.75 \pm 95.18$ ,  $262.90 \pm 30.27$ ,  $331.63 \pm 65.51$ ,  $304.18 \pm 2.05$  and  $795.39 \pm 104.53$  days respectively. Anoestrus was the most common reproductive disorder in Swamp buffalo occurring in 45.83 percent cows and 87.50 percent heifers.

**Keywords:** Swamp buffalo, anoestrus

### 1. Introduction

Buffalo has a significant role in the agriculture economy by providing milk, meat and draught power in many developing countries including India. In India dairy industry is mostly buffalo oriented. The phylogenetic study indicated that the Swamp type buffalo might have originated in China and was domesticated about 4000 years ago. Rate of reproduction is the basis of production in animals. Buffalo exhibits many of the known reproductive disorders including delayed onset of puberty, poor oestrus expression, longer postpartum ovarian inactivity, and most importantly lowered conception rates particularly when bred artificially<sup>[1]</sup>. Further, silent heat is considered as one of the major obstacles in understanding reproductive parameters and obtaining success of assisted reproductive technology in buffaloes<sup>[2]</sup>. Reproductive disorders can lead to economic losses in terms of reduced fertility, short time life production, longer calving interval and increased expenses on medication in farm animals. The reproductive disorders in the livestock could only be minimized when sufficient information regarding reproductive status of animal is available. The present study was conducted to study the reproductive performance and incidence of different types of reproductive disorders in Swamp buffaloes.

### 2. Materials and methods

#### 2.1 Ethical approval

This study was approved by institutional animal ethics committee, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam with approval no.770/ac/CPCSEA/FVSc/AAU/IAEC/16-17/384 dated 30.07.2016

#### 2.2 Studies on reproductive performance

Reproductive performance was studied based on data pertaining to the Swamp buffaloes maintained at Network Project on Buffalo Improvement (Swamp), College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam for the period from 2010 to 2016 and different parameters were recorded as follows-

##### 2.2.1 Age at first calving

It was the actual age of buffaloes at the time of its first calving and expressed in days.

### 2.2.2 Post-partum oestrus interval

It was considered as the period from calving to first postpartum oestrus and expressed in days.

### 2.2.3 Service period

It was considered as the period from calving to the post-partum oestrus at which the cow conceived and expressed in days.

### 2.2.4 Number of services per conception

It was considered the average number of inseminations or natural services required by the buffalo to become pregnant.

### 2.2.5 Gestation period

This was considered as the period in days from last day of service to birth of calf.

### 2.2.6 Intercalving period

It is the period between two successive calving and expressed in days.

### 2.2.7 Birth weight of calf

It was measured as the weight of the calf on day of birth and expressed in kilograms.

## 2.3 Studies on reproductive disorders

The reproductive disorder was studied on the basis of farm record maintained from January, 2010 to December, 2016 and direct clinico-gynaecological examination of buffalo cows and heifers. Breeding records of 42 cows and 18 heifers which were more than 4 years of age in January, 2010 were checked and percentages frequency of anoestrus in cows and heifers were worked out. A heifer was considered to be anoestrus when she failed to show the external signs of oestrus even after 4 years of age. A cow was considered to be anoestrus when she failed to show the external signs of oestrus even after 6 months of parturition. In addition present genital status of all 33 buffalo cows and 12 heifers was determined through clinico-gynaecological examination of each animal.

## 2.4 Statistical analysis

The statistical analysis of the data was done using software IBM-SPSS-20 (<http://www.spss.co.in>) and Micro Soft Excel-2010 (<http://office.microsoft.com>).

## 3. Results and discussion

### 3.1 Reproductive performance in female Swamp buffalo

Average values for various reproductive traits in Swamp buffalo cows as estimated from breeding records maintained in the college farm have been represented in Table 1.

In the present study mean age at first calving was recorded as  $1841.75 \pm 95.18$  days, which was similar with the finding of others<sup>[3-6]</sup> in Swamp buffaloes. The ranged varied from 56.63 to 62.17 months. However, shorter age at first calving was reported by others authors<sup>[7-9]</sup> in Swamp buffaloes ranging from 46.54 to 52.28 months. Post-partum oestrus interval was found to be  $262.90 \pm 30.27$  days on an average in the present study. However, shorter post-partum oestrus interval was reported by others<sup>[10, 11]</sup> in Nili- Ravi buffaloes of Pakistan and author<sup>[9]</sup> in Swamp buffaloes. The ranged varied from 84 to 165 days. Factor affecting prolong post-partum oestrus interval are suckling, nutrition, body weight, milk yield, parity and season in buffaloes<sup>[12]</sup>. Mean service period was found to be  $331.63 \pm 65.51$  days in the present study. While, other

author<sup>[3-5, 7]</sup> recorded lower service period in Swamp buffalo cows of Assam, ranged varied from 177.34 to 205.44 days. In the present study number of services per conception was recorded as  $2.09 \pm 0.27$ , which is in agreement with findings of others<sup>[11, 13-15, 6]</sup> in different breeds of buffaloes. The ranged varied from 1.7 to 2.57. However, number of services was higher ( $3.5 \pm 2.5$ ) was reported by author<sup>[8]</sup> in Thai Swamp buffalo. Gestation period was found to be  $304.18 \pm 2.05$  days on an average in the present study, which is in agreement with the findings of others<sup>[3-5, 7]</sup> in Swamp buffalo of Assam ranging from 323.41 to 326.80 days. Mean intercalving period was recorded as  $795.39 \pm 104.53$  days in the present study. while, shorer intercalving period was reported by others<sup>[3-5, 7]</sup> in Swamp buffaloes of Assam ranging from 465.79 to 532.24 days. However longer intercalving period was recorded by author<sup>[6]</sup> in Swamp buffaloes maintained at extensive farming system ( $681.00 \pm 24.35$  days) might be due to poor management and poor reproductive performance. Average birth weight of calf was recorded as  $26.34 \pm 0.88$  kg, which is in agreement with similar findings of author<sup>[6]</sup> in Swamp buffalo cows ( $26.82 \pm 0.70$  kg). However, a higher birth weight of calf was recorded by author<sup>[3]</sup> in Swamp buffalo ( $32.33 \pm 0.12$  kg).

## 3.2 Studies on reproductive disorders

### 3.2.1 Based on farm records

On examination of farm records it was observed that there were no records of genital disorders affecting the animals during the period included in the study. However the incidence of anoestrus in cows and heifers was worked out and presented in Table 2.

### 3.2.2 Based on clinico-gynaecological examination

Reproductive status of 33 buffalo cows and 12 heifers under the present study has been presented in Table 3.

Results obtained in the present study indicated that anoestrus was the major reproductive problem in Swamp buffaloes with the overall incidence of 45.23 percent in cows and 83.33 percent in heifers. On clinico-gynaecological examination, 44.44 percent animals were found to be true anoestrus with smooth ovaries, 40.00 percent silent oestrous and 15.56 percent pregnant. Author<sup>[16]</sup> also reported that anoestrus was the most common form of infertility in buffaloes with the overall incidence of 29.12 which was much lower than the incidence observed in the present study. However, on the basis of rectal palpation the author determined the incidence of true anoestrus as high as 60.58 percent in Murrah and upgraded Murrah buffaloes. Others author<sup>[17, 18]</sup> in buffaloes reported 27.40 and 20.84 percent as the incidence of true anoestrus. The incidence of silent oestrus as observed in the present study was 40.62 percent. However, author<sup>[17]</sup> in Murrah buffaloes reported much higher incidence of silent oestrus 80.00 percent. The cause of anoestrus in animals was found to be varied. According to author<sup>[16]</sup> anoestrus in buffaloes was due to negative energy balance, mineral deficiency as well as higher environmental temperature affecting folliculogenesis and steroidogenesis. Suckling, level of nutrition, loss of body weight during post-partum period, parity, season of the year and presence and absence of bull were found to be the factors determining the incidence of post-partum anoestrus in buffaloes<sup>[12, 19]</sup>. According to author<sup>[20]</sup> silent oestrus might be due to lack of adequate secretion of oestradiol by mature and secondary follicle or due to need for a higher threshold of oestrogen in the central nervous system to produce the characteristic nervous symptoms.

#### 4. Conclusion

The present study was concluded that Swamp buffalo cows had longer intercalving period and post-partum oestrus

interval and anoestrus was the most common reproductive disorder in Swamp buffalo cows and heifers.

**Table 1:** Reproductive traits in Swamp buffalo cows

Parameters	No of observation	Mean $\pm$ SE	Range
Age at first calving (days)	55	1841.75 $\pm$ 95.18	1129-2486
Post-partum oestrus interval (days)	58	262.90 $\pm$ 30.27	44-1015
Service period (days)	60	331.63 $\pm$ 65.51	83-1146
Number of service per conception (times)	60	2.09 $\pm$ 0.27	1-6
Gestation period(days)	60	304.18 $\pm$ 2.05	285-315
Intercalving periods (days)	59	795.39 $\pm$ 104.53	391-1752
Birth weight of calf (kilogram)	50	26.34 $\pm$ 0.88	20-34

**Table 2:** Incidence of anoestrus in Swamp buffalo cows and heifers as determined from breeding records

Types of animals	No of animals investigated	No of observations	Incidence (%)
Cows	42	19	45.23
Heifers	18	15	83.33

**Table 3:** Reproductive status in Swamp buffalo cows and heifers based on clinico gynaecological examination

Reproductive status	No of observation	Incidence (%)
Pregnant	7	15.56
Smooth ovaries (True anoestrus)	20	44.44
Silent oestrus	18	40.00

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