EFFECT OF SEASON ON REPRODUCTIVE PERFORMANCE OF BUFFALOES AT AN ORGANIZED FARM

H.M. KHAN*, T.K. MOHANTY, M. BHAKAT*, V.S. RAINA*** and A.K. GUPTA***

National Dairy Research Institute, Karnal, Haryana

ABSTRACT

Calving records of 773 Murrah buffaloes for the period from 2000 to 2007 at an organised farm of National Dairy Research Institute, Karnal, Haryana, India was analyzed to study the effect of season on reproductive performance traits of the herd. The overall Days open, Days to first service (DFS), Services per conception (SC), Breeding interval (BI), Breeding interval between first and second service (BI1), Breeding interval between second and third service (BI2), Breeding interval between third and fourth service (BI3), Breeding interval between fourth and fifth service (BI4) and Breeding interval between fifth and sixth service (BI5) of Murrah buffalo in the herd were found to be 170.32 ± 4.67, 91.89 ± 1.99, 2.05 ± 0.05, 74.70 ± 0.08, 73.57 ± 2.98, 82.96 ± 4.00, 67.68 ± 4.40, 72.63 ± 8.31 and 66.73 ± 13.69, respectively. Days open (183.13 ± 8.12) and breeding interval (80.78 days) were highest in winter calvers. More services per conception were observed during rainy season (2.10 ± 0.08) and less during summer months (2.02 ± 0.12). Summer season calvers took more time in resumption of estrus cycle which resulted in longer time for days to first service (109.92 ± 5.28) as compared to other season, whereas opposite scenario was found in rainy season calvers (80.96 ± 2.59). The per cent heat detection was lower than 30% of the tabulated value signifying very severe problem in the level of heat detection in the herd. It can be concluded that heat detection should be improved to enhance the reproductive efficiency of the herd.

Key words: Heat detection, days open, breeding interval, service per conception, Murrah buffalo

INTRODUCTION

The population of buffalo is 93.13 million and is the major contributor to milk production of India (FAO, 2002) and holds indispensable position among Indian livestock. They are also used for meat and drought purpose and helps in socio-economic upliftment of poor farmers (Bandyopadhyay *et al.*, 2003). Full exploitation of productive and reproductive potential of buffaloes is difficult due to their inherent problems as a difficult breeder. In buffaloes reproductive efficiency is low and poor heat detection further contribute to the same. Inherent problem of buffalo is silent estrus and poor thermal tolerance. Heat symptoms are less intense in buffaloes, reflected through less flow of estrus mucous from vulva. Heat symptoms commonly occur from dusk to dawn may be the probable reason of missed heat (Hafez, 1954). In addition silent heat is the most serious and widespread problem that affects breeding efficiency of the animal (Remesh *et al.*, 2002). Anestrus and sub-estrus is common due to their susceptibility to environmental stress and poor nutrition causing prolonged intercalving period resulting in great economic losses. During summer months conception rate and services per conception are poor which may be due to long photoperiod and high temperature (Agrawal, 2003). Effective heat detection is important for timed insemination and success of artificial insemination. Failure to detect heat is a major factor contributing to low fertility and economic loss. Further there is need to understand basic mechanisms of reproductive

* Assistant Professor, Division of Livestock Production and Management, SKUAST-K.

** Senior Scientist, DCB Division, NDRI, Karnal, Haryana.

*** Principal Scientist, DCB Division, NDRI, Karnal, Haryana.

physiology in buffaloes to understand the unique characteristics and the interaction of these mechanisms in relation to season to improve the reproductive performance through proper managemental interventions. Therefore the present study was undertaken to study the effect of season of calving on reproductive performance traits in buffaloes.

MATERIALS AND METHODS

Data pertaining to 773 calving records of Murrah buffaloes from 2000 to 2007 at an organised farm National Dairy Research Institute, Karnal was analyzed to study the effect of season on reproductive performance traits. The parameters recorded Days open, DFS, SC, BI, BI1, BI2, BI3, BI4 and BI5. Heat Detection Efficiency was estimated by calculating the breeding interval, wherein,

$$\text{Breeding Interval (Days)} = \frac{\text{Average days open - DFS}}{\text{SC-1}}$$

Where,

Average days open= Date of successful insemination – Date of calving

SC= Services per conception

DFS= Days to First Service

Depending on the breeding interval in days percent heat detection was decided as:-

Table 1: Calculation of per cent heat detected from breeding interval

Breeding Interval (Days)	Per cent Heat Detected
23	90
26	80
30	70
35	60
41	50
50	40
60	30

After calculating heat detected in per cent, level of heat detection efficiency in the herd was decided as per Varner and Majeskie, (1983) as stated below.

Table 2: Calculation of level of heat detection efficiency

Per cent Heat Detected	Level of Heat Detection Efficiency
Under 50%	Severe Problem
50-65%	Moderate Problem
66-80%	Adequate Efficiency
Over 80%	Excellent Efficiency

Season of calving was classified into four season namely Season 1: December to March (Winter), Season 2: April to December (Summer), Season 3: July to September (Rainy) and Season 4: October and November (Autumn). Effect of season of calving on reproductive performance traits was calculated by t test using Systat 6 software package (Snedecor and Cochran, 1994).

RESULTS AND DISCUSSION

In the present study the overall days open, DFS, SC, BI, BI1, BI2, BI3, BI4, BI5 of Murrah buffalo was found to be 170.32 ± 4.67, 91.89 ± 1.99, 2.05 ± 0.05, 74.70 ± 0.08, 73.57 ± 2.98, 82.96 ± 4.00, 67.68 ± 4.40, 72.63 ± 8.31 and 66.73 ± 13.69, respectively. Kamboj and Chawla (2006) reported less number of services per conception in Nili Ravi buffaloes (1.62), but Qureshi *et al.* (1999) reported similar results (2.0 ± 1.4). Days open was found highest (183.13 ± 8.12) in winter calvers followed by summer (176.54 ± 11.33), rainy (162.89 ± 8.33) and autumn (161.17 ± 10.23). Highest breeding interval was found in winter calvers (80.78 days) and lowest in summer calvers (65.31 days). It was observed that more number of services were required for conception during rainy season (2.10 ± 0.08) where as less number of services were required during summer months (2.02 ± 0.12). Summer season calvers took more time in resumption of estrus cycle resulted

in longer time for days to first service (109.92 ± 5.28) as compared to other seasons, where as an opposite scenario was found in rainy season calvers (80.96 ± 2.59).

On appraisal of the results regarding breeding interval, winter season calvers had more breeding interval, followed by rainy, autumn and summer. The per cent heat detection was lower than 30 % (beyond the tabulated value) which followed the same trend as was for breeding interval signifying very severe problem in the level of heat detection (Vamer and Majeskie, 1983) in buffaloes. From these observations it was inferred that the animals which are actually cycling are not presented or detected in heat in the herd at proper time or some animal after postpartum estrus again become anestrus due to seasonal stress or hormonal imbalance. This can be the reason for high infertility problems in the buffaloes. The problem is alarming and represents defective heat detection methods used in the herd which needs to be addressed in the light of introducing better and efficient heat detection methods and regular examination of the animals for ovarian function. Human error, faulty management, nutritional factors, disease conditions, environmental effects and other unknown causes need to be evaluated in the near future for addressing this grave problem for improving reproductive efficiency of the buffaloes.

In the present investigation the number of animals receiving inseminations at less than 17days and 25 to 30 days were also categorized into; having received hormonal intervention/ wrong time inseminations and early embryonic mortalities, respectively. The number of animals receiving hormonal interventions or wrong time inseminations were 2, 0, 9 and 1 in winter, summer, autumn and rainy season, respectively. The corresponding figures for embryonic mortalities were 12, 15, 17 and 13, respectively. Silent heat in the buffalo is one of the most important unsolved impediments to efficient breeding. It occurs often in the hot seasons (Prakash *et al.*, 2005). A combination of estrus detection methods may be necessary for identification of animals in heat (Ramesh *et al.*, 2002). Heat detection efficiency is very serious issue in buffalo reproduction which needs regular monitoring indicating the need of exploring the feasibility of better heat detection aids for augmenting reproductive efficiency.

Keen observation is of primary importance in detecting heat. Several aids are also available to identify and confirm cows not exhibiting obvious signs of heat. All aids require careful application and proper interpretation of data to be successful. Estrus detection aids include heat expectancy chart, breeding wheel or herdex record system, computer generated action lists, mount detection aids (Kamar pressure-sensitive mount detectors, tailhead markings with chalk, paint, or crayon, chin ball markers and electronic mount detectors), videotape, heat detector animals (penile-blocked bull, vasectomized bull, prepuce/penis-deviated bull, caudal-epididymectomized bull and androgenized female), vaginal electrical resistance, radiotelemetry and milk or blood progesterone test. The following management practices may be considered in estrus detection: observe for heat when buffaloes are likely to mount, avoid scheduling observation periods at feeding time or during the warmest hours in summer, provide an area with a good footing surface where cattle are free to interact and where few obstacles hinder movement, minimize lameness problem by trimming hoofs periodically and treat infected feet, train employees to recognize signs of heat, easy identification of animal, proper record maintenance, follow estrus synchronization and maintenance of body condition through adequate nutrition.

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