

EFFECT OF BIRTH WEIGHT AND SEX OF THE CALF ON INCIDENCE OF CALVING DISORDERS IN BUFFALOES IN PUNJAB PROVINCE, PAKISTAN (A CASE STUDY)

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ABSTRACT. *The present research was planned to explore the relationship of size and sex of calf with incidence of calving disorders in buffaloes as information regarding these reproductive aspects of buffaloes in Pakistan is limited. The study was conducted on Nili-Ravi buffaloes kept in three agro-ecological zones of Punjab province. The study area comprised of three Districts, one from each zone i.e. from Southern Irrigated Zone District Multan, from Northern Irrigated Zone District Sialkot and from Arid Zone District Chakwal was selected. Six hundred buffaloes (n=600) were surveyed involving two hundred buffaloes from each agro-ecological zones for study. Information regarding calf size (small <35kg, medium 35kg approx. and large >35kg), sex of the calf and incidence of three calving related disorders i.e. uterine prolapse, retention of fetal membranes and dystocia were recorded. Results showed that highest number of affected buffaloes was recorded with medium calf size followed by small and large calf size in ranking order and all three differed significantly from each other (P<0.05). The obvious reason of grouping of large size calf with small size is limited number (09) of observations in this group. The buffaloes bearing male calves tended to have higher occurrence of calving disorders. When the data in the three agro ecological zones of Punjab was compared amongst each other with reference to calf size and sex, no significant difference (P>0.05) was observed for these parameters. It was concluded that both calf size and sex are related with incidence of calving disorders in Nili-Ravi buffaloes, however, zone difference did not seem to affect these parameters.*

Key words: Incidence, buffaloes, calving disorders, calf size, agro-ecological zones.

INTRODUCTION

Reproductive efficiency is most important economic trait for successful dairy buffalo enterprise. The profitability of enterprise lies in the successful events that lead to normal birth process and onset of next estrous cycle. Buffalo are generally known for poor reproductive behavior exhibiting delayed puberty, silent estrus, longer service/calving intervals and most importantly low AI conception rates [1]. The background underlying these reproductive issues are multiple including, genetics, environment, feeding and management. Calving disorders in buffaloes represent a major class of reproductive disorders that exert significant negative effect on reproductive efficiency in buffaloes. The harmful impacts on buffalo productivity are twofold by decreasing production and increasing management cost [2, 3]. These effects may be further deteriorating the reproductive efficiency by increasing postpartum ovarian quiescence thus contributing to days open. Poor reproductive process can badly affect fertility and future breeding progress. The contributing factors could be repeat breeding, longer dry periods, delayed maturity, reduced number of normal births and hence fewer lactations during the life span of the animal. These factors also result in increased cost of management along with additional cost of culling due to infertility [4, 5, 6]. Reproductive tract infections along with calving disorders in buffaloes cause significant drop in fertility of these animals which further contribute to poor reproductive performance.

Multiple factors can increase the incidence of calving disorders in the buffalo i.e., improper balance of hormones, nutritional deficiencies, manage-mental aspects and adverse climatic effects. Some studies have reported that calf size and

sex of the calf can also predispose buffaloes to increased incidence of calving disorders. Effect of calf size at birth (birth weight) and sex of the calf have shown increased incidence of calving difficulty in cattle [7, 8]. Studies exploring effect of birth weight and dystocia on perinatal mortality (alive or dead at 48 h of age) and dystocia (unassisted or assisted) also revealed that male calves requiring assistance were 25% greater compared with female calves in cattle [9]. Epidemiological studies of calving disorders in the buffalo focusing variable factors prevalent in various ecological regions of Punjab are scanty. Such studies provide baseline data and information required for planning preventive measures to reduce such disorders to enhance overall reproductive efficiency of animals. This research was planned to explore the relationship of birth weight and sex of calf with incidence of calving disorders in Nili Ravi buffaloes present in three agro-ecological zones of Punjab.

MATERIALS AND METHODS

The study was conducted on Nili-Ravi buffaloes kept in three agro-ecological zones of Punjab, Pakistan. The study area comprised of three Districts, one from each zone i.e. Southern Irrigated Zone (District Multan), Northern Irrigated Zone (District Sialkot) and Arid Zone (District Chakwal). The information regarding calving disorders was collected from all Tehsils (a subdivision of district), of the three districts under study (each district representing respective agro-ecological zone). The Multan District (Southern Irrigated Zone) comprised of three Tehsils i.e. Multan, Shujabad and JalalpurPirwala. The Sialkot District comprised of four

Tehsils i.e. Sialkot, Sambrial, Daska and Pasrur. The Chakwal District comprised of four Tehsils i.e. Chakwal, Chua Sayyeden Shah, KallarKahar and Tala Gang.

A field survey was conducted in the study area to assess the incidence of reproductive disorders in buffaloes raised in the three agro-ecological zones. Six hundred buffaloes (n=600) were surveyed involving two hundred buffaloes from each agro-ecological zones for study. Information regarding calf size (small <35kg, medium 35kg approx. and large >35kg), sex of the calf and incidence of three calving related disorders i.e. uterine prolapse, retention of fetal membranes and dystocia were recorded. The data were analyzed statistically by applying Chi Square Test to check the relationship between qualitative variables and to compare two proportions Z-test was applied [10].

RESULTS

I. Effect of Calf Size:

The frequency of distribution of buffaloes affected with calving disorders with reference to calf size in southern irrigated zone, northern irrigated zone and the arid zone was determined (Table 1). In the southern irrigated zone, the highest number of buffaloes that suffered from calving related reproductive disorders were with medium calf size followed by small calf size, large calf size in ranking order; the difference among all the groups being significant ($P<0.05$). For the northern irrigated zone the highest number of buffaloes that suffered from reproductive disorders were with medium calf size followed by small calf size, large calf size in ranking order; the difference among all the groups being significant ($P<0.05$). A similar trend was recorded for the arid zone, where the highest number of buffaloes that suffered from reproductive disorders was with medium calf size followed by small calf size, large calf size in ranking order; the difference among all the groups being significant ($P<0.05$).

When the data in the three agro ecological zones of Punjab was compared amongst each other with reference to calf size, it revealed that significantly higher ($P<0.05$) percentage of buffaloes that suffered from calving disorders was recorded in the northern irrigated zone followed by those in the southern irrigated zone and the arid zone for the large calf size; with no difference between the later two. No significant difference was however recorded as regards the medium and small calf size ($P>0.05$) in the three agro ecological zones.

When the data was pooled, it revealed that highest number of affected buffaloes was recorded with medium calf size followed by small and large calf size in ranking order and all three differed significantly from each other ($P<0.05$).

II. Effect of Calf Sex

The frequency of distribution of buffaloes affected with calving disorders with reference to calf sex in southern irrigated zone, northern irrigated zone and the arid zone was determined (Table 2). In the southern irrigated zone, significantly higher ($P<0.05$) number of buffaloes that suffered from calving related reproductive disorders was with male calf. A similar trend was recorded in the northern irrigated zone and the arid zone as regards the sex of the calf;

the difference between the male and female calf was significant ($P<0.05$) in all the three zones.

When the data in the three agro ecological zones of Punjab was compared amongst each other with reference to calf sex, no significant difference ($P>0.05$) was recorded for male and female calf.

When the data was pooled, it revealed that significantly high number of affected buffaloes was recorded with the birth of male calf ($P<0.05$).

DISCUSSION

Overall incidence of calving disorders was higher in buffaloes with medium calf size followed by small size of the calf and with male sex of the calf, whereas lowest in buffaloes with large calf size and female sex of the calf. The mothers bearing male calves tended to have higher occurrence of calving disorders. Similar findings have been reported by Correa *et al.* (1993) who observed higher occurrence of calving disorders with male calves. Khan and Khan (1991) and Nix *et al.* (1998) have also reported higher incidence of dystocia in the mothers bearing male calves. Males calves are generally heavier than females calves at birth so they tend to pose calving difficulty to dams as compared to females calves. This factor is most critical in case of younger dams as pelvic cavity has not fully developed yet and hence experiences more difficulties at calving as compared to older cows. It has been reported that in case of younger dams where 58% of females calves and 37% of males were born unassisted [13]. Due to this increased rate of calving difficulty, it also affects calf survival invariably increasing calf losses in males as compared to females [14]. Similarly, the occurrence of dystocia and mastitis had been found low in case of female calves [7]. This scenario is well established in beef cattle where breeders generally used crossbreeding to exploit heterosis and breed complementarity to exploit economic traits of two or more different breeds. When sires of terminal breed has a higher birth weight as compared to dam breed, then increased frequency of calving difficulty scores has been observed in animals. Studies in beef cattle have reported the effect of calf birth weight was the most important factor determining calving difficulty [15]. However, Nix *et al.* (1998) reported no effect of calf sex on dystocia rates in beef cattle. However, in crossbred dairy cattle the calves, which were born without assistance, had lower body weight (1.29kg). Moreover, male calves were delivered with more difficulty, which was due to their bigger size and greater birth weight [16]. However, it has been observed that birth of a male calf had greater odds of stillbirth than female calves as male calves were generally heavier in Iranian buffaloes [17]. Incidence of calving disorders did not differ in buffaloes present in different ecological zones of Punjab province.

CONCLUSION

The success of buffalo husbandry lies in ensuring proper and optimal reproductive rhythm of individual animals in the herd. Increased incidence of calving disorders especially difficult birth is associated with size and sex of the calf which

needs special attention to address the issue by reproductive and size. management and planning mating of animals of suitable age

Table:1 Distribution of buffaloes affected with calving related reproductive disorders, with reference to calf sex in three agro-ecological zones of Punjab, Pakistan.

Sex of calf	Southern Irrigated Zone	Northern Irrigated Zone	Arid Zone	Total
	Buffaloes with calving disorders n (%)	Buffaloes with calving disorders n (%)	Buffaloes with calving disorders n (%)	
Male	119 (59.5%) ^A	130 (65.0%) ^A	116 (58.0%) ^A	365 (60.8%) ^A
Female	81 (40.5%) ^B	70 (35.0%) ^B	84 (42.0%) ^B	235 (39.2%) ^B
Total	200 (100.0%)	200 (100.0%)	200 (100.0%)	600 (100.0%)

The values with different superscripts in the same row (small letters) except for totals, and in the same column (capital letters) differ (P<0.05)

Table:2 Distribution of buffaloes affected with calving related reproductive disorders, with reference to calf size in three agro-ecological zones of Punjab, Pakistan.

Size of calf	Southern Irrigated Zone	Northern Irrigated Zone	Arid Zone	Total
	Buffaloes with calving disorders n (%)	Buffaloes with calving disorders n (%)	Buffaloes with calving disorders n (%)	
Large (>35 kg)	1 (0.5%) ^{b c}	7 (3.5%) ^{a c}	1 (0.5%) ^{b c}	9 (1.5%) ^c
Medium (35 kg approx.)	157 (78.5%) ^A	158 (79.0%) ^A	164 (82.0%) ^A	479 (79.8%) ^A
Small (<35kg)	42 (21.0%) ^B	35 (17.5%) ^B	35 (17.5%) ^B	112 (18.7%) ^B
Total	200 (100.0%)	200 (100.0%)	200 (100.0%)	600 (100.0%)

The values with different superscripts in the same row (small letters) except for totals, and in the same column (capital letters) differ (P<0.05)

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