BIRTH WEIGHTS OF CROSSBRED CALVES BORN THROUGH ARTIFICIAL INSEMINATION AND EMBRYO TRANSFER

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ABSTRACT

The goal of this study was to know whether there is any difference in birth weight (BW) of calves born through artificial insemination (AI) or Embryo Transfer (ET). The data was collected at Sabarmati Ashram Gaushala (SAG) from November, 1997 to June, 2004 taking into consideration the birth of 400 Holstein Friesian x Sahiwal (HF x S) crossbred calves, to eliminate the difference due to breed of dam / sire. All animals were managed under uniform standard feeding practices. Data was analysed with respect to ET/AI technique, year (1998 to 2004) and season. The Mean values of BW of ET born males and females and AI born males and females were 27.70±0.60, 25.16±0.53, 29.98±0.53 and 26.74±0.44 Kg, respectively, with significant differences ($P<0.05$). There was a significant difference in the BW of calves born during the year 1998 and 1999, while other did not show any significant difference. There was no significant difference in the BW in relation to different seasons. It was concluded that the difference in the BW might be due to the technique adopted in embryo production and its handling.

Key words : Calves, Birth weight, Artificial insemination, Embryo transfer

Already it is well established that male calves weigh heavier than females in their breed, at the time of birth. As noted by Wagtendonk-de Leeuw et al. (2000), the ET born calves tend to be higher in birth weights compared to AI born calves. Looking to huge amount of data available it was decided to analyze the birth weight of the AI and ET born calves at our farm. To eliminate the difference due to breed, HF X Sahiwal calves born on the farm by either technique were considered. The data was compiled from November-1997 to June-2004. Also data was analyzed for seasonal and year wise differences. Seasons were classified as March-June (Summer), July-October (Rainy) and November-February (Winter). Calves were weighed immediately after the birth on dial balance.

Data was analyzed using unvariate analysis of variance and the difference was significant in the birth weights of male and female with the particular technique (Table) involved. The overall mean birth weight was found to be 27.55 ± 0.28 Kg (400 calves born) and was observed that males were higher in weight than females in either technique, as indicated by King *et al.* (1985). There was also no significant difference among the calves born during different seasons (Table). There was significant difference in the birth weight of calves during year 1998 and 1999, which might be due to more no. of AI born calves born in 1999 (Table).

With the above results, it may be concluded that calves born through AI weighed more and the difference in the BW is due to the technique adopted in embryo production and its handling. As noted by Awasthi and Kavani (2005), during and following superovulation, non-physiological number of ovulatory follicles and corpora lutea produce estrogen and progesterone, respectively, which alter the local environment in oviduct and uterus. These changes may affect the sperm transport, maturation and selection in such a way that fertilization becomes less effective and efficient. Again due to removal of embryo from its conducive environment and placing in to the outside environment for few hours may be leading to unavailability of vital nutrients for development. Also the factors like hormones, flushing, handling in laboratory, freezing procedure and transfer in recipient may create less conducive environment to the embryo.

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Table: Mean values of birth weights of calves born by different technique, during various season and year

March - June				
YEAR	ET BORN		AI BORN	
	MALE	FEMALE	MALE	FEMALE
1998	–	22.30±1.62 (5)	NA	NA
1999	25.00±1.56 (5)	24.5 ± 0.00 (1)	26.61±1.64 (9)	25.75±1.05 (4)
2000	31.40± 3.20 (5)	25.75±2.68 (6)	33.00± 0.00 (1)	NA
2001	33.50± 6.50 (2)	27.00±2.66 (5)	3.25± 0.76 (3)	29.67±2.84 (3)
2002	29.00± 0.00 (1)	NA	31.08± 2.38 (6)	30.33±3.18 (3)
2003	30.00±5.00 (2)	25.00 ± 0.00 (1)	29.40±1.70 (10)	24.00±1.42 (9)
2004	30.75±2.81 (4)	25.33± 2.40 (3)	31.63± 2.35 (8)	26.18±1.19 (11)
TOTAL	28.38±1.21 (24)	25.07±1.09 (21)	29.82±0.91 (37)	26.23±0.80 (30)
July - October				
YEAR	ET BORN		AI BORN	
	MALE	FEMALE	MALE	FEMALE
1998	22.28± 0.83 (9)	20.80± 0.56 (5)	22.67± 2.66 (3)	22.50± 0.00 (1)
1999	27.50± 0.50 (2)	19.71± 2.05 (7)	28.69±1.72 (8)	25.28±1.46 (9)
2000	28.50± 0.89 (12)	29.50± 1.11 (6)	29.92±1.08 (6)	33.75± 4.25 (2)
2001	31.50± 0.50 (2)	30.00± 0.00 (1)	33.67± 4.97 (3)	25.00± 0.00 (2)
2002	32.67± 2.09 (6)	26.67± 1.85 (3)	32.17± 2.07 (6)	27.23±1.29 (15)
2003	NA	20.00± 0.00 (1)	33.50± 1.59 (8)	28.00± 1.21 (7)
TOTAL	27.63± 0.89 (31)	23.87±1.15 (23)	30.56± 0.94 (34)	27.00± 0.77 (36)
November – February				
YEAR	ET BORN		AI BORN	
	MALE	FEMALE	MALE	FEMALE
1998	24.20±1.44 (15)	21.25± 1.97 (6)	NA	NA
1999	24.00± 0.77 (5)	25.13± 1.91 (4)	24.88± 1.23 (4)	25.50± 0.74 (5)
2000	23.38± 0.82 (4)	25.75± 1.75 (4)	24.50± 0.50 (2)	18.00± 0.00 (1)
2001	28.44± 1.97 (9)	27.77± 1.35 (13)	30.75± 3.14 (4)	25.00± 0.00 (1)
2002	28.50± 1.92 (6)	26.43± 1.36 (7)	35.50± 0.50 (2)	31.50± 1.50 (2)
2003	34.33± 2.44 (6)	26.29± 1.44 (7)	28.54± 1.31(13)	28.38± 1.06 (16)
2004	35.33± 8.83 (3)	27.00± 0.00 (1)	31.47±1.79 (15)	25.22±1.56 (9)
TOTAL	27.41± 1.00 (48)	25.91± 0.70 (42)	29.64± 0.93 (40)	26.90± 0.76 (34)

Figures in parenthesis indicate no. of calves born.

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