

## COMPARATIVE EVALUATION OF REPRODUCTIVE PERFORMANCE OF GRADED AND CROSSBRED CATTLE OF CHHATTISGARH IN FIELD CONDITION

N. KHUNTE<sup>1</sup>, K. MUKHERJI<sup>2</sup>, V. JAIN<sup>3</sup> AND B. PATEL<sup>4\*</sup>

*College of Veterinary Science and Animal Husbandry, Durg - 491 001*

Received: 04.11.2016

Accepted: 04.01.2017

### ABSTRACT

The present study was undertaken to assess the reproductive performance of crossbred (Holstein Friesian/Jersey crossbred) and graded (Gir, Sahiwal and Red Sindhi grade) cattle (n=200) in Chhattisgarh. The age at first calving and dry period for crossbred cattle was lower ( $p < 0.05$ ) compared to other group of cattle. The period and season of calving as well as parity had no impact on reproductive parameters of crossbred or graded cattle. All the reproductive parameters improved ( $p < 0.05$ ) following availability of concentrate, green forage and dry fodder to animals compared to others receiving dry fodder or dry fodder and concentrate only. In brief, the crossbred cattle had superior reproductive performance over graded cattle, and the nutrition had influence on their reproductive performance.

**Keywords:** Cattle, Crossbred, Graded, Nutrition, Reproductive performance

As per livestock census-2012, Chhattisgarh has 9.8 million cattle population. The reproductive performance of Zebu crossed Friesian and other crossbred cattle depend upon their adaptability to varied climatic stresses (Tomar *et al.*, 1996). Under field conditions in Chhattisgarh, the grading up of non-descript cattle is more suitable, thus, grading up with Sahiwal, Red Sindhi, Gir, Ongole and Hariana was initiated. This study was planned to assess the reproductive performance of crossbred and graded cattle owned by rural smallholder dairy farmers in Chhattisgarh.

Fifty cattle from each genetic group namely Holstein Friesian/Jersey × Local (Crossbred), Gir × Local (Gir grade), Sahiwal × Local (Sahiwal grade) and Red Sindhi × Local (Red Sindhi grade) were analysed from Dhamtari district and Durg district of Chhattisgarh. The field data was collected from the State Government hospitals, dispensaries, key village block, A.I. (sub) centers and some data was collected by directly interviewing farmers. The calving year

was divided into Period-1 (2004 - 2008) and Period-2 (2009 - 2011), the year of calving was divided into summer (March - June), rainy (July - October) and winter (November - February) season, and the animals had one to four parities. The animals were reared on three types of feeding systems namely FS-1 (dry fodder), FS-2 (dry fodder + concentrate) and FS-3 (dry fodder + concentrate + green forage). The frequency distribution of parity and feeding system was similar between genetic groups. The reproductive parameters under investigation were age at first calving, calving interval, dry period and the number of services per conception. To study effect of genetic and non-genetic factors, Analysis of Variance was carried out utilizing SPSS statistical programme and the statistical model as  $Y_{ijklmn} = \mu + G_i + P_j + F_k + X_l + S_m + e_{ijklmn}$ , where,  $Y_{ijklmn}$  is  $n^{\text{th}}$  observation under the effect of  $i^{\text{th}}$  genetic group,  $j^{\text{th}}$  parity,  $k^{\text{th}}$  feeding system,  $l^{\text{th}}$  period and  $m^{\text{th}}$  season,  $\mu$  is over all mean,  $G_i$  is effect of  $i^{\text{th}}$  genetic group,  $P_j$  is effect of  $j^{\text{th}}$  parity,  $F_k$  is effect of  $k^{\text{th}}$  feeding system,  $X_l$  is effect of  $l^{\text{th}}$  period of calving,  $S_m$  is effect of  $m^{\text{th}}$  season of calving and  $e_{ijklmn}$  is random error ( $0, \sigma^2e$ ).

The age at first calving and dry period was

<sup>1</sup>Veterinary Assistant Surgeon, <sup>2</sup>Professor, <sup>3,4</sup>Research scholar; \*romi10888@gmail.com

**Table 1: Reproductive performance of graded (G) and crossbred (CB) cattle**

Effect	N	Age at First Calving, d	N	Calving interval, d	N	Dry period, d	N	Services/conception, n
Mean	200	1264.2±27.3	212	489.1±10.6	137	96.0±3.9	200	1.2±0.07
<b>Genetic group</b>								
CB	50	1173.7±24.1 <sup>c</sup>	69	447.7±9.6	36	79.5±3.4 <sup>c</sup>	50	1.3±0.08
Gir G	50	1348.1±32.8 <sup>a</sup>	48	485.6±10.8	31	90.9±3.5 <sup>b</sup>	50	1.2±0.06
Sahiwal G	50	1236.4±28.4 <sup>bc</sup>	46	516.4±13.8	36	102.9±5.0 <sup>a</sup>	50	1.2±0.06
Red Sindhi	50	1298.6±24.1 <sup>ab</sup>	49	506.9±8.3	34	110.7±3.6 <sup>a</sup>	50	1.2±0.06
<b>Period of calving</b>								
P-1	123	1283.5±19.6	130	478.3±7.5	95	94.8±3.06	126	1.2±0.04
P-2	77	1233.3±20.3	82	495.3±8.3	42	98.57±3.5	74	1.2±0.06
<b>Season of calving</b>								
Summer	58	1244.2±17.4	52	497.61±11.3	39	99.2±5.1	49	1.2±0.6
Rainy	48	1282.2±30.6	68	490.2±10.6	28	99.1±3.6	65	1.1±0.6
Winter	94	1267.3±20.5	92	473.7±8.0	70	93.0±3.5	86	1.1±0.05
<b>Parity</b>								
1 <sup>st</sup>	-	-	67	478.1±9.8	54	95.8±3.0	63	1.2±0.07
2 <sup>nd</sup>	-	-	58	494±10.8	55	97.0±3.3	54	1.2±0.06
3 <sup>rd</sup>	-	-	59	489.4±11.8	28	94.2±3.9	55	1.3±0.04
4 <sup>th</sup>	-	-	28	472.6±12.5	-	-	28	1.2±0.07
<b>Feeding system</b>								
FS-1	74	1319.3±26.0 <sup>a</sup>	80	486.3±7.3	36	114.1±4.6 <sup>a</sup>	74	1.3±0.07 <sup>a</sup>
FS-2	63	1266.6±23.0 <sup>a</sup>	66	492.5±12.0	51	114.1±2.8 <sup>b</sup>	63	1.2±0.05 <sup>a</sup>
FS-3	63	1197.1±23.1 <sup>b</sup>	66	475.5±10.2	50	77.4±2.9 <sup>c</sup>	63	1.0±0.03 <sup>a</sup>

<sup>a,b,c</sup>p<0.05: Means with different superscripts in the same column differ significantly; P-1, 2004-08; P-2, 2009-11; FS-1, dry fodder; FS-2, dry fodder + concentrate; FS-3, dry fodder + concentrate + green forage

different ( $p < 0.05$ ) genetic group wise with lowest number of days in crossbred cattle (Table 1). Others also reported significant effect of genetic groups of cattle under field conditions on age at first calving and dry period (Hossain *et al.*, 2005 and Kumaresan *et al.*, 2008). The feeding system had impact ( $p < 0.05$ ) on age at first calving and dry period (Table 1). With the exception of feeding system, all other non-genetic factors had no affect ( $p > 0.05$ ) on dry period. It was found that better feeding system lowered dry period. Other factors such as period of calving, season of calving and parity had no impact on age at first calving, calving interval, dry period and number of services per

conception (Table 1). Thus, the crossbred cattle had superior reproductive performance over graded cattle in field conditions and the feeding system clearly had influence on the reproductive performance of cattle.

#### REFERENCES

- Hossain, M.M., Alam, M.M., Rashid, M.M., Asaduzzaman, M. and Rahman, M.M. (2005). Small-scale dairy farming practice in a selective area of Bangladesh. *Pak. J. Nutr.*, **4**(4): 215-221.
- Kumaresan, A., Prabhakaran, P.P., Bujarbarauh, K.M., Pathak, K.A., Chhetri B. and Ahmad, S.K. (2008). Reproductive performance of crossbred dairy

cows reared under traditional low input production system in the eastern Himalayas. *Trop. Anim. Health Prod.*, **41**(1): 71-78.

Tomar, A.K.S., Prasad, R.B. and Bhandula, S.K. (1996). First lactation performance of Holstein, Sahiwal and their halibreds in tarai region of northern India. *Indian J. Anim. Res.* **30**(2): 129-133.