

Research Paper

# Reproduction and Milk Production Performance of Buffaloes in East Godavari District of Andhra Pradesh

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## ABSTRACT

An investigation was conducted in the Godavari delta, upland, and agency areas of East Godavari district of Andhra Pradesh to study the reproduction and milk production performance of dairy animals. The results showed that the average age at first calving ( $44.45 \pm 0.34$  mon), service period ( $135.70 \pm 1.66$  days), calving interval ( $443.78 \pm 1.74$  days), and dry period ( $104.65 \pm 1.34$  days) of graded Murrah buffaloes was significantly ( $p \leq .01$ ) lower in Godavari delta area and the mean peak yield ( $10.92 \pm 0.22$  lit), lactation milk yield ( $2183.72 \pm 44.66$  lit) and lactation period ( $339.13 \pm 1.86$  days) of graded Murrah buffaloes was also significantly ( $p \leq .01$ ) higher in Godavari delta. The service period ( $158.92 \pm 1.59$  days), calving interval ( $467.43 \pm 1.66$  days), and dry period ( $135.00 \pm 2.85$  days) of local buffaloes were significantly lower in the upland area. The average peak yield ( $5.92 \pm 0.10$  lit), lactation milk yield ( $1183.78 \pm 19.57$  lit) and lactation period ( $332.43 \pm 3.68$  days) of local buffaloes was significantly ( $p \leq .01$ ) higher in the upland area. The mean age at first calving ( $28.90 \pm 0.42$  mon) and dry period ( $68.28 \pm 1.03$  days) of crossbred cows was significantly ( $p \leq .01$ ) lower in the Godavari delta than that in the upland area. The mean age at first calving ( $43.95 \pm 0.80$  mon), service period ( $132.14 \pm 2.66$  days), calving interval ( $417.86 \pm 2.86$  days), and dry period ( $133.57 \pm 2.72$  days) of local cows was significantly ( $p \leq .01$ ) lower in Godavari delta. The average peak yield ( $4.48 \pm 0.09$  lit) and lactation milk yield ( $895.24 \pm 17.56$  lit) of local cows was significantly ( $p \leq .01$ ) higher in the Godavari delta than in upland and agency areas.

## HIGHLIGHTS

- ① The reproductive and productive performance of Graded Murrah buffaloes, crossbred and local cows was better in Godavari delta where as the performance of local buffaloes was better in upland area.
- ① The Jersey cross bred cows had better service period and calving interval where as the HF cross bred cows had better milk production performance in the study area.

**Keywords:** Buffalo, Crossbred cow, Production, Reproduction

Andhra Pradesh is one of the major milk producing states of the country with annual production of 15.04 MMT of milk and a milch animal population of 5.14 million (DAHD, 2019). East Godavari district is one of the potential districts for agriculture and dairying in Andhra Pradesh. The agri-Dairy-Horticulture farming system is predominant in the district.

Production and management practices are more locations specific because of different agro-climatic

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conditions, irrigation facilities, and infrastructure facilities available for dairying in East Godavari district. The essential traits contributing largely towards profit are high milk-producing ability and low maintenance cost. But the information available on these economic characteristics of dairy animals in the study area is very limited. Therefore, an effort was made in the present study to study the reproduction and milk production performance of graded Murrah, local buffaloes, crossbred cows, and local cows of the East Godavari district of Andhra Pradesh.

## MATERIALS AND METHODS

Five mandals were selected randomly from the Godavari delta, Upland and Agency (hilly) areas, and a total of 15 mandals were selected. Five villages were randomly selected from each Mandal from 15 mandals. A total of 75 villages were selected. Four dairy farmers were randomly selected from each village, resulting in 100 milk producers from the Godavari delta area, 100 from the upland area, and 100 from the agency (hilly) area of the district. The data collected during the period of study were scrutinized and tabulated. The data were subjected to frequency, percentage, arithmetic mean, standard error, and analysis of variance following the statistical methods according to Snedecor and Cochran (1994). The information obtained was analyzed, and interpreted.

## RESULTS AND DISCUSSION

### Reproduction and milk production performance of graded Murrah buffaloes

The mean age at the first calving of graded Murrah buffaloes in the study area was  $46.69 \pm 0.29$  months (Table 1). The results are similar to the findings of Rangamma *et al.* (2017). But it was slightly higher than the findings of Sunil *et al.* (2007), who reported an average age at first calving of  $41.27 \pm 0.36$  months in graded Murrah buffaloes. But it was lower than the observations of Rao *et al.* (1995), who reported an average age at first calving of 1530 days (51 months). It was also found that the average age at first calving (months) of graded Murrah buffaloes was significantly ( $p \leq .05$ ) lower in the Godavari delta area ( $44.45 \pm 0.34$ ) than that in the upland area

( $48.49 \pm 0.33$ ) and agency area ( $50.42 \pm 0.51$ ) in the study area.

The mean service period of graded Murrah buffaloes in the study area was  $138.77 \pm 1.38$  days. It was lower than the findings of Rangamma *et al.* (2017), who reported an average service period of  $157.65 \pm 15.27$  days in graded Murrah buffaloes, and Rao *et al.* (1995) who reported an average service period of 258 days. It was also observed that the average service period (days) of graded Murrah buffaloes was significantly ( $p \leq .01$ ) lower in the Godavari delta area ( $135.70 \pm 1.66$ ) than that in agency area ( $152.50 \pm 3.69$ ).

The mean calving interval of graded Murrah buffaloes in the study area was  $447.22 \pm 1.42$  days. It was almost similar to the observations of Rangamma *et al.* (2017), who reported a calving interval of  $466.32 \pm 14.54$  days, whereas, Shashishankar *et al.* (2009) reported a calving interval of  $424.32 \pm 2.60$  days. It was also found that the average calving interval (days) of graded Murrah buffaloes was significantly ( $p \leq .01$ ) lower in the Godavari delta area ( $443.78 \pm 1.74$ ) than that in the agency area ( $461.25 \pm 3.73$ ) of the district.

The mean peak yield of graded Murrah buffaloes in the study area was  $9.61 \pm 0.17$  liters. It was almost similar to the findings of Prasad (1993) and Shashishankar *et al.* (2009), who reported an average peak yield of  $9.03 \pm 0.16$  and  $8.45 \pm 0.11$  kg, respectively. But it was lower than the observations of Rangamma *et al.* (2017), who reported an average peak yield of  $11.46 \pm 0.67$ . It was observed that the average peak yield (liters) of graded Murrah buffaloes was significantly ( $p \leq .01$ ) higher in the Godavari delta area ( $10.92 \pm 0.22$ ) than that in the upland area ( $8.54 \pm 0.14$ ) and agency area ( $7.46 \pm 0.23$ ).

The mean lactation milk yield of graded Murrah buffaloes in the study area was  $1922.16 \pm 33.50$  liters. It was higher than the findings of Prasad (1993) and Rao *et al.* (2000), who reported an average lactation milk yield of  $1705.95 \pm 42.99$  and  $1719.02 \pm 35.65$  liters, respectively. But it was lower than the observations of Rangamma *et al.* (2017), who reported an average lactation milk yield of  $2292.50 \pm 138.41$  liters. It was also found that the average lactation milk yield (litres) of graded Murrah buffaloes was significantly ( $p \leq .01$ ) higher in the Godavari delta area ( $2183.72 \pm 44.66$ ) than that in

**Table 1:** Reproduction and milk production characters of graded murrah buffaloes of sample households in Godavari delta, upland and agency areas of East Godavari district (Mean  $\pm$  SE)

Sl. No.	Production and reproduction characters	Godavari delta area (n=86)	Upland area (n=57)	Agency (hilly) area (n=24)	Overall (n=167)
1	Age at first calving (months)**	44.45 $\pm$ 0.34 <sup>c</sup>	48.49 $\pm$ 0.33 <sup>b</sup>	50.42 $\pm$ 0.51 <sup>a</sup>	<b>46.69<math>\pm</math>0.29</b>
2	Service period (days)**	135.70 $\pm$ 1.66 <sup>c</sup>	137.63 $\pm$ 2.49 <sup>b</sup>	152.50 $\pm$ 3.69 <sup>a</sup>	<b>138.77<math>\pm</math>1.38</b>
3	Calving interval (days)**	443.78 $\pm$ 1.74 <sup>c</sup>	446.49 $\pm$ 2.53 <sup>b</sup>	461.25 $\pm$ 3.73 <sup>a</sup>	<b>447.22<math>\pm</math>1.42</b>
4	Peak yield (liters)**	10.92 $\pm$ 0.22 <sup>a</sup>	8.54 $\pm$ 0.14 <sup>b</sup>	7.46 $\pm$ 0.23 <sup>c</sup>	9.61 $\pm$ 0.17
5	Lactation milk yield (liters)**	2183.72 $\pm$ 44.66 <sup>a</sup>	1708.77 $\pm$ 27.91 <sup>b</sup>	1491.67 $\pm$ 45.01 <sup>c</sup>	<b>1922.16<math>\pm</math>33.50</b>
6	Lactation period (days)**	339.13 $\pm$ 1.86 <sup>a</sup>	326.75 $\pm$ 2.35 <sup>c</sup>	328.16 $\pm$ 3.73 <sup>b</sup>	333.32 $\pm$ 1.43
7	Dry period (days)**	104.65 $\pm$ 1.34 <sup>c</sup>	119.74 $\pm$ 1.57 <sup>b</sup>	133.13 $\pm$ 2.44 <sup>a</sup>	<b>113.89<math>\pm</math>1.24</b>

n= Number of animals; \*\* Means with different superscripts row wise under each character differ significantly at ( $p \leq .01$ ).

the upland area (1708.77 $\pm$ 27.91) and agency area (1491.67  $\pm$  45.01).

The mean lactation period of graded Murrah buffaloes in the study area was 333.32  $\pm$  1.43 days. It was almost nearer to the observations of Rao *et al.* (1995), Sharma *et al.* (2010), and Rangamma *et al.* (2017), who reported an average lactation period of 341, 331.30, and 332.59  $\pm$  1.88 days, respectively. It was also observed that the average lactation period (days) of graded Murrah buffaloes was significantly ( $p \leq .01$ ) higher in the Godavari delta area (339.16 $\pm$ 1.86) than that in the upland area (326.75 $\pm$ 2.35) and agency area (328.16 $\pm$ 3.73) of the study area.

The mean dry period of graded Murrah buffaloes in the study area was 113.89  $\pm$  1.24 days. It was lower than the findings of Shashishankar *et al.* (2009) and Rangamma *et al.* (2017), who reported an average dry period of 130.48  $\pm$  1.32 and 128.53  $\pm$  14.47 days, respectively. It was also recorded that the average dry period (days) of graded Murrah buffaloes was significantly ( $p \leq .01$ ) lower in the Godavari delta area (104.65 $\pm$ 1.34) than that in the upland (119.74 $\pm$ 1.57) and agency area (133.13 $\pm$ 2.44).

### Reproduction and milk production performance of local buffaloes

The mean age at the first calving of local buffaloes in the study area was 57.91  $\pm$  0.34 months (Table 2). It was almost similar to the findings of Rangamma *et al.* (2017), who reported an average age at first calving of 55.24 $\pm$ 3.45 months. It was also observed that the average age at first calving (months) of local buffaloes was higher in the agency area (58.14 $\pm$ 0.46)

than that in the upland area (57.46 $\pm$ 0.41). But the difference was not statistically significant.

The mean service period of local buffaloes in the study area was 163.88  $\pm$  1.61 days. It was lower than the observations of Rangamma *et al.* (2017), who reported an average service period of 210.62  $\pm$  12.34 days. It was also found that the average service period (days) of local buffaloes was significantly ( $p \leq .05$ ) lower in the upland area (158.92 $\pm$ 1.59) than that in the agency area (166.50  $\pm$  2.27).

The mean calving interval of local buffaloes in the study area was 472.85  $\pm$  1.62 days. It was lower than the observations of Rao *et al.* (2000) and Rangamma *et al.* (2017), who reported an average calving interval of 634  $\pm$  5.08 days and 520.08  $\pm$  11.92 days, respectively. It was also observed that the average calving interval (days) of local buffaloes was significantly ( $p \leq .01$ ) lower in the upland area (467.43  $\pm$  1.66) than that in the agency area (475.71  $\pm$  2.25) of the district.

The mean peak yield of local buffaloes in the study area was 5.09  $\pm$  0.08 liters. It was lower than the finding of Shashishankar *et al.* (2009) and Rangamma *et al.* (2017), who reported an average peak yield of 6.80  $\pm$  0.11 and 8.87 litres, respectively. It was also found that the average peak yield (liters) of local buffaloes was significantly ( $p \leq .01$ ) higher in the upland area (5.92  $\pm$  0.10) than that in the agency area (4.65 $\pm$ 0.06).

The mean lactation milk yield of local buffaloes in the study area was 1017.77  $\pm$  15.76 liters. It was lower than the observations of Rao *et al.* (2000), Shashishankar *et al.* (2009), and Rangamma *et al.* (2017), who reported an average lactation milk yield

**Table 2:** Reproduction and milk production characters of local buffaloes of sample households in upland and Agency (hilly) areas of East Godavari district (Mean  $\pm$  SE)

Sl. No.	Production and reproduction characters	Upland area (n= 37)	Agency (hilly) area (n=70)	Overall (n=107)
1	Age at first calving (months)	57.46 $\pm$ 0.41	58.14 $\pm$ 0.46	57.91 $\pm$ 0.34
2	Service period (days)*	158.92 $\pm$ 1.59	166.50 $\pm$ 2.27	163.88 $\pm$ 1.61
3	Calving interval (days)*	467.43 $\pm$ 1.66	475.71 $\pm$ 2.25	472.85 $\pm$ 1.62
4	Peak yield (liters)**	5.92 $\pm$ 0.10	4.65 $\pm$ 0.06	5.09 $\pm$ 0.08
5	Lactation milk yield (liters)**	1183.78 $\pm$ 19.57	930.00 $\pm$ 12.44	1017.77 $\pm$ 15.76
6	Lactation period (days)**	332.43 $\pm$ 3.68	316.29 $\pm$ 2.84	321.87 $\pm$ 2.36
7	Dry period (days)**	135.00 $\pm$ 2.85	159.43 $\pm$ 2.12	150.98 $\pm$ 2.03

n = Number of animals; \*\* Significant at ( $p \leq .01$ ); \* Significant at ( $p \leq .05$ ).

**Table 3:** Reproduction and milk production performance of cross bred cows in Godavari delta and upland areas in East Godavari district (Mean  $\pm$  SE)

Sl. No.	Production and reproduction characters	Godavari delta area (n=29 )	Upland area (n= 21 )	Overall (n= 50)	F ratio
1	Age at first calving (months)	28.90 $\pm$ 0.42	31.24 $\pm$ 0.65	<b>29.88<math>\pm</math>0.40</b>	10.002**
2	Service period (days)	114.83 $\pm$ 3.09	123.57 $\pm$ 4.50	<b>118.50<math>\pm</math>2.65</b>	2.745
3	Calving interval (days)	399.31 $\pm$ 3.18	409.76 $\pm$ 4.52	<b>403.70<math>\pm</math>2.71</b>	3.810
4	Peak yield (liters)	13.31 $\pm$ 0.65	12.10 $\pm$ 0.32	<b>12.80<math>\pm</math>0.40</b>	2.260
5	Lactation milk yield (liters)	2662.07 $\pm$ 129.08	2419.05 $\pm$ 64.60	2560.00 $\pm$ 80.81	2.260
6	Lactation period (days)	331.03 $\pm$ 3.30	330.24 $\pm$ 4.09	<b>330.70<math>\pm</math>2.54</b>	0.023
7	Dry period (days)	68.28 $\pm$ 1.03	79.52 $\pm$ 2.34	<b>73.00<math>\pm</math>1.39</b>	23.141**

n= Number of animals \*\*Significant at ( $p \leq .01$ ).

of 1155  $\pm$  13.93, 1106.85  $\pm$  8.79, and 1774.52  $\pm$  110.60 liters, respectively. It was also observed that the average lactation milk yield (liters) of local buffaloes was significantly ( $p \leq .01$ ) higher in the upland area (1183.78  $\pm$  19.57) than that in the agency area (930.00  $\pm$  12.44).

The mean lactation period of local buffaloes in the study area was 321.87  $\pm$  2.36 days. It was higher than the findings of Shashishankar *et al.* (2009), who reported an average lactation period of 293.92 days, whereas it was lower than the observations of Rao *et al.* (2000) and Rangamma *et al.* (2017), who reported an average lactation period of 391.67  $\pm$  3.37 and 350.70  $\pm$  5.08 days respectively. It was also found that the average lactation period (days) of local buffaloes was significantly ( $p \leq .01$ ) higher in the upland area (332.43  $\pm$  3.68) than that in the agency area (316.29  $\pm$  2.84) of the study area.

The mean dry period of local buffaloes in the study area was 150.98  $\pm$  2.03 days. It was similar to the observations of Shashishankar *et al.* (2009), who

reported an average dry period of 150.93  $\pm$  1.30 days, whereas it was lower than the observations of Rao *et al.* (2000) and Rangamma *et al.* (2017), who reported 242.84 days. It was also noticed that the average dry period (days) of local buffaloes was significantly ( $p \leq .01$ ) lower in the upland (135  $\pm$  2.85) than that in the agency area (159.43  $\pm$  2.12).

### Reproduction and milk production performance of crossbred cows

The mean age at first calving of crossbred cows was 29.88  $\pm$  0.04 months (Table 3). It was similar to the findings of Dharmi *et al.* (2017), who reported the average age at first calving of 29.64  $\pm$  3.86 and 30.24  $\pm$  3.26 months in tribal and non-tribal areas, respectively. It was also found that the average age at first calving (months) of cross-bred cows was significantly ( $p \leq .01$ ) lower in the Godavari delta (28.90 $\pm$ 0.42) than that in the upland area (31.24 $\pm$ 0.65). The mean service period and calving interval of crossbred cows were 118.50  $\pm$  2.65 and 403.70  $\pm$  2.71



days, respectively. It was lower than the findings of Prasad *et al.* (1991) and Rao *et al.* (2000). It was also observed that there was no significant difference in the service period and calving interval of crossbred cows between Godavari delta and upland areas.

The average peak yield and lactation milk yield (liters) of crossbred cows were  $12.80 \pm 0.40$  and  $2560.00 \pm 80.81$ , respectively. It was higher than the finding of Rao *et al.* (2000), who reported an average lactation milk yield of  $2345.35 \pm 67.75$ . It was also found that there was no significant difference in the peak yield and lactation milk yield of crossbred cows in the Godavari delta and the upland area.

The mean lactation period and dry period of crossbred cows were  $330.70 \pm 2.54$  days and  $73.00 \pm 1.39$  days, respectively. It was lower than the observations of Rao *et al.* (2000). The average dry period of crossbred cows was significantly ( $p \leq .01$ ) lower in the Godavari delta ( $68.28 \pm 1.03$ ) than that in the upland area ( $79.52 \pm 2.34$ ). But there was no significant difference in the lactation period of crossbred cows between delta and upland areas.

The mean age at first calving (months) was significantly ( $p \leq .05$ ) lower in HF crossbreds ( $28.95 \pm 0.51$ ) than that in Jersey crossbreds ( $30.55 \pm 0.55$ ) (Table 4). The average service period ( $112.24 \pm 3.38$  days) and calving interval ( $397.41 \pm 3.50$  days) were significantly ( $p \leq .01$ ) lower in Jersey crossbreds than that in HF crossbreds. The mean peak yield ( $13.90 \pm 0.73$  lit) and lactation milk yield ( $2780.95 \pm 146.65$  lit) was significantly ( $p \leq .05$ ) higher in HF crossbreds than that in Jersey crossbreds. The mean lactation period (days) was also significantly ( $p \leq .01$ ) higher in HF crossbreds ( $340.95 \pm 3.21$  lit) than that in Jersey crossbreds ( $323.28 \pm 3.08$ ) indicating that the milk production performance of HF crossbred was higher than jersey crossbreds which is in tune with the consensus.

### Reproduction and milk production performance of local cows

From the Table 5, it was observed that the overall mean age at first calving in local cows was 47.94 0.65 months. It was higher than the findings of Prasad *et al.* (1991) and Shah and Sharma (1994),

**Table 4:** Reproduction and milk production performance of cross bred cows in East Godavari district (Mean  $\pm$  SE)

Sl. No.	Production and reproduction traits	HFCB (n= 21 )	JCB (n= 29 )	Overall (n= 50)	F ratio
1	Age at first calving (months)	28.95 $\pm$ 0.51	30.55 $\pm$ 0.55	29.88 $\pm$ 0.40	4.199*
2	Service period (days)	127.14 $\pm$ 3.53	112.24 $\pm$ 3.38	118.50 $\pm$ 2.65	8.948**
3	Calving interval (days)	412.38 $\pm$ 3.60	397.41 $\pm$ 3.50	403.70 $\pm$ 2.71	8.526**
4	Peak yield (liters)	13.90 $\pm$ 0.73	12.00 $\pm$ 0.40	12.8 $\pm$ 0.40	5.961*
5	Lactation milk yield (liters)	2780.95 $\pm$ 146.65	2400.00 $\pm$ 80.02	2560.00 $\pm$ 80.81	5.961*
6	Lactation period (days)	340.95 $\pm$ 3.21	323.28 $\pm$ 3.08	330.70 $\pm$ 2.54	15.166**
7	Dry period (days)	71.43 $\pm$ 2.07	74.14 $\pm$ 1.86	73.00 $\pm$ 1.39	0.879

n= Number of animals; \*\* Significant at ( $p \leq .01$ ) \* Significant at ( $p \leq .05$ ).

**Table 5:** Reproduction and milk production characters of local cowsof sample households in Godavari delta, upland and agency (hilly) areas of East Godavari district (Mean  $\pm$  SE)

Sl. No.	Production and reproduction traits	Godavari delta area (n=21)	Upland area (n=21)	Agency (hilly) area (n=35 )	Overall (n=77)
1	Age at first calving (months)**	43.95 $\pm$ 0.80 <sup>c</sup>	47.33 $\pm$ 1.11 <sup>b</sup>	50.69 $\pm$ 0.97 <sup>a</sup>	47.94 $\pm$ 0.65
2	Service period (days)**	132.14 $\pm$ 2.66 <sup>c</sup>	137.38 $\pm$ 3.91 <sup>b</sup>	161.57 $\pm$ 2.05 <sup>a</sup>	146.95 $\pm$ 2.20
3	Calving interval (days)**	417.86 $\pm$ 2.86 <sup>c</sup>	424.52 $\pm$ 3.92 <sup>b</sup>	447.86 $\pm$ 2.10 <sup>a</sup>	433.31 $\pm$ 2.23
4	Peak yield (liters)**	4.48 $\pm$ 0.09 <sup>a</sup>	4.05 $\pm$ 0.09 <sup>b</sup>	2.99 $\pm$ 0.07 <sup>c</sup>	3.67 $\pm$ 0.09
5	Lactation milk yield (liters)**	895.24 $\pm$ 17.56 <sup>a</sup>	809.52 $\pm$ 18.13 <sup>b</sup>	597.14 $\pm$ 13.89 <sup>c</sup>	736.36 $\pm$ 17.63
6	Lactation period (days)	284.29 $\pm$ 4.41	277.38 $\pm$ 4.32	282.86 $\pm$ 3.24	<b>281.75<math>\pm</math>2.23</b>
7	Dry period (days)**	133.57 $\pm$ 2.72 <sup>c</sup>	147.14 $\pm$ 2.86 <sup>b</sup>	165.00 $\pm$ 2.13 <sup>a</sup>	151.56 $\pm$ 2.08

n= Number of animals; \*\* Means with different superscripts row wise under each character differ significantly at ( $p \leq .01$ ).

who reported an average age at first calving of 36.68 and 45 months, respectively. It was also found that the average age at first calving (months) of local cows was significantly higher in the agency area ( $50.69 \pm 0.97$ ) than that in the upland ( $47.33 \pm 1.11$ ) and delta area ( $43.95 \pm 0.80$ ).

The mean service period and calving interval in local cows were  $146.95 \pm 2.20$  and  $433.31 \pm 2.23$  days, respectively. It was higher than the observations of Chakravarthy *et al.* (2002), who reported an average service period and calving interval of  $103.80 \pm 10.80$  and  $389.84 \pm 7.95$  days in Ongole cows. It was also found that the average service period and calving interval were significantly higher in the agency area than in the upland and Godavari delta areas.

## CONCLUSION

The mean age at first calving, service period, calving interval, and dry period of graded Murrah buffaloes, cross-bred cows, and local cows were lower in the Godavari delta of the study area. The mean peak yield, lactation milk yield, and lactation period of graded Murrah buffaloes cross-bred cows, and local cows were higher in the Godavari delta, indicating the better reproductive and productive performance of dairy animals maintained in the Godavari delta area. Local buffaloes' reproductive and productive performance was good in the upland area. The service period and calving interval were lower in Jersey crossbred, whereas HF crossbred cows had better milk production performance and age at first calving in the study area.

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