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Effect of Green Fodder on Milk Production and Age at First Calving In Gir Cows

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The Gir is a famous Indian milch cow breed. The native tract of the breed is Gir hills and forests of Kathiawar including Junagarh, Bhavnagar, Rajkot and Amreli districts of Gujrat. The Gir animals are famous for their tolerance to stress conditions and resistance to various tropical diseases. The breed received less attention from development perspectives and hence, requires exploration in further improving its production potential.

Heritability of age at puberty, age at first conception and age at first calving are generally low, indicating that these traits are highly influenced by environmental factors. Age at puberty is an important determinant of reproductive efficiency. Estimates of age at puberty in Bos indicus cattle in the tropics and subtropics range between 16 and 40 months. *Bos indicus* cattle reach puberty later than *Bos taurus x Bos indicus* cross breeds or pure breed taurine cattle. This is due to genetic and environmental factors including disease, temperature and season of birth. These factors affect heifer's growth rates. The average age at first calving in Bos indicus cattle is about 44 months compared to about 34 months in *Bos taurus* and *Bos indicus* X *Bos taurus* crosses in tropics. Sabino *et al* (1981) found that neither month of birth nor breed significantly affected age at first calving. Earlier the age of puberty of animal earlier it will conceive and will give birth to progeny. In general, earlier first calving increases life time productivity of cows.

Yield in dairy animal can be improved either by increasing the number of calving by reducing the age of first calving through improvement in health environment, or by improving the yield per lactation, or by both. For both the methods, role of proper feeding is most important.

Methodology

At Kasturbagram Gir Dairy, before 2009-10, first calving used to take place at the age of 5-6 years. Milk yield per lactation too was very low, resulting in poor milk production in dairy. A detail study indicated

that feeding of cows and heifers is not up to the mark and required drastic change in the health environment of the dairy.

Reproduction management of livestock is vital to successful dairy management. Reproductive life of an animal is governed through a number of parameters viz. age at first conception, first service period, age at first calving and first gestation length. However, this study is limited to reproductive management in terms of age of heifers at first conception and at first calving.

The production improvement among dairy animals can be made through proper management, feeding and handling etc. Before 2009-10, least attention was paid to improve the feeding management which resulted in low milk production and higher age of heifers at first calving. After 2009-10, three types of fodder combinations i.e. I. Wheat Straw + Bund Grasses during rainy season, II. Wheat Straw + Barseem during winter and III. Wheat straw + maize along with green cobs were provided. Green fodder was chopped out with the help of chaff cutter machine. To study the reproductive performance of heifers, 9 different heifers of Kasturbagram Gaushala were selected to study their age at first conception and age at first calving. All these heifers were maintained on good standards of feeding. Their ration comprises of dry fodder, green fodder and concentrate to meet their body requirement. In all the heifers and cows natural mating is practiced for their conception.

Result and Discussion:

Feed and fodder quality is most important in maintaining dairy health and production. Wheat straw and bund grasses proved least effective in improving the health and milk production. Wheat straw + Barseem gave good results. However, Wheat straw + Maize along with green cobs provided maximum benefit in improving health and milk yield. During 2010-11 maize fodder was introduced in the Kasturbagram dairy and thereafter, major emphasis was laid on this fodder. This resulted in drastic improvement in milk yield during 2011-12 and onwards, as seen from table-01. Maize fodder helped in maintaining good health of heifers and they gained desired body weight very fast, resulting in early puberty, as detailed in table-02.

Table-01 Annual Milk production of Kasturbagram Dairy

Year	**Production (in liters)**
Before 2009-10	less than 40000
2010-11	61336
2011-12	67230
2012-13	70756
2013-14	68752

Table-02 The details of heifers selected for study

Name of heifer	Date of birth	Age at first conception (months)	Age at first calving (months)
Geeta	08.08.2008	31	41
Ragini	23.04.2008	36	45
Meena	22.08.2008	33	43
Ambaji-02	04.11.2009	37	46
Dhenu-03	02.04.2010	36	45
Moti-02	19.11.2010	30	39
Maina-02	19.01.2011	28	37
Sandhya	12.03.2011	38	47
Lok-03	09.09.2011	33	43
Mean		**33.5**	**42.8**

First calving marks the beginning of a cow's productive life. Age at first calving is closely related to generation interval and, therefore, influences response to selection. Under controlled breeding, heifers are usually mated when they are mature enough to withstand the stress of parturition and lactation. This increases the likelihood of early conception after parturition. In traditional production system, however, breeding is often uncontrolled and heifers are bred at the first opportunity. This frequently results in longer subsequent calving interval. The average age at first calving in *Bos indicus* is about 44 months.

In the present finding, the age of heifer at first calving was minimum 37 months and maximum 47 months and mean age at first calving was 42.8 months. This minimum age at first calving was obtained only because of good feeding and breeding practices adopted at Kasturbagram Gaushala. These findings are in close collaboration with the finding of Malik and Ghei, (1977) who reported the average age of heifer at first calving 38 to 55 months with an average of 51.05 months in Gir cow. However, Gaur *et al*., (2003) reported the average age of heifer at first calving 52.49 months. Thus, good health and early calving obtained through nutritious feeding, added two additional lactations and better yield per lactation, thereby improving the total production and profitability of the dairy.

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