INCIDENCE OF CALVING ABNORMALITIES IN DAIRY CATTLE - A REVIEW

B. Balasundaram, A.K. Gupta and V.B. Dongre*

Dairy Cattle Breeding Division,
National Dairy Research Institute, Karnal - 132 001, India.

Received : 12-01-2011 Accepted : 23-05-2011

ABSTRACT

Dairying has become an important secondary source of income for millions of rural families and has assumed a most important role in providing employment and income generating opportunity. There has been tremendous progress in dairy production in the country during the last three decades and it has contributed to national income significantly. At present milk production in India is about 109.8 million ton (2008-2009) and dairy cows contribute around 40% of total milk produced in India and rest 60% by buffalo (55%) and other species (5%) like goat, camel, etc. As per 18th livestock census (2007), the breedable female crossbred cattle population was 13.24 million (about 21% of total breedable cows); which contribute more than 40% of total cow milk being produced in India. This reveals that the importances of crossbred cows are more as compared to indigenous cows for milk production.

Key words : Calving abnormalities, Dairy cattle, Crossbreds.

Crossbreds appear to be more prone to infections and disorders as compared to indigenous breeds. The major causes of losses have been udder and reproductive disorders. Reproduction disorders affect the herd life, reproductive efficiency of cows and economy of dairy herds and are responsible for removal of the cows from the herd. Disease losses have a tremendous impact on dairy industry due to mortality, discarded milk, reduced milk, treatment costs and reduced consumer preference. Premature culling due to reproduction problems account for a great loss of milk production as well as offspring, selection differential and hence lesser genetic progress due to removal of high genetic merit animals from the herd. In crossbred cattle the genetic level of parental breeds plays a major role in the occurrence of diseases. Evidence suggests that some animals may be genetically resistant or genetically susceptible to disease. This suggests a scope for breeding of animals for diseases resistance. So, genetic selection for resistance to reproduction disorders requires accurate selection criteria and must be balanced against genetic improvement of other traits.

Incidence of reproduction disorders:

A reproductive disorder in dairy cattle includes repeat breeding, metritis, retention of foetal membrane, dystocia, abortion, utero-vaginal prolapse and still birth.

Incidence of calving abnormalities:

Abortion

Abortion is the expulsion from the uterus of living foetus before it reaches a viable age or more commonly the expulsion of a dead foetus of recognizable size at any stage of gestation (Roberts, 1971).

Still birth

Death of offspring shortly before, during or up to 24 hours after parturition at normal term is considered as still birth (Roberts, 1971).

*Corresponding author: vilasndri@gmail.com
**Dystocia**

When the first or especially the second stage of parturition is markedly prolonged, it becomes difficult or impossible for the dam to expel the foetus without artificial aid, the condition is termed dystocia (Roberts, 1971).

Urade (2001) reported that the overall incidence of repeat breeding (8.08 %), metritis (5.32 %), retention of foetal membranes (5.00 %), dystocia (4.69 %), abortion (3.75 %), utero-vaginal prolapse (2.50 %), and still birth (2.34 %) in Sahiwal cattle.

Kulkarni et al. (2002) estimated the incidence of anoestrous (45.97 %), repeat breeding (25.05 %), retention of foetal membranes (8.79 %), dystocia (7.06 %), metritis and endometritis (0.74 %) in indigenous Gir, halfbreds, % bred and reciprocal crosses.

Chourewar et al. (2002) found the average incidence of anestrous, repeat breeding, metritis, abortion, still birth, dystocia, retention of foetal membranes and prolapse of uterus in crossbred cows as 16, 7, 0.10, 2, 0.70, 0.30, 2.20 and 1. %, respectively in crossbred cows. However, Satya pal (2003) reported that the average incidence of abortion, still birth, dystocia, prolapse, retention of foetal membranes and metritis in Karan Fries cows were 7.85, 2.87, 3.05, 0.12, 27.65 and 29.70 %, respectively.

Prabhu and Chaterjee (1970) observed 50% higher abortion in crossbreds (11-12%) than in zebu cattle. Pandey and Desai (1972) reported abortion incidence of 3.76% and 4 % in Friesian x Sahiwal and Friesian x Red Sindhi crosses, respectively.

Kaikini et al. (1976) reported the incidence of embryo mortality, abortions and still births as 1.50%, 1.30% and 1.13%, respectively in Sahiwal cattle. Singh (1979) found incidence of abnormal calving as 2.3 - 3.0% in zebu breeds and 7.0-9.6% in zebu crossbreds with Brown Swiss. Pandit et al. (1982) calculated the incidence of dystocia and abortion in cattle as 3.5 % and 2.5 %, respectively. Mukherjee et al. (1993) reported incidence of abortion, still birth and dystocia as 4.36%, 2.00% and 2.00 %, respectively in Karan Fries cows. However, Kumar and Reddy (1986) reported the overall incidence of abnormal calving in Karan Fries cattle as 4.88 % abortions, 1.77 % still births and 2.44% premature births.

Tomar and Verma (1988) observed the incidence of abnormal calving as 4.87 % in Karan Fries cattle and did not differ among different genetic groups having exotic inheritance from 50 to 75 %.

Lalrintluanga (2003) reported that 6.25 % incidence of abortion in crossbred dairy cows. The incidence of abortion followed by retention of foetal membranes in this study was 28.57 %. However, the incidence of abortion and still-birth was 6.9% and 2.4%, respectively in Brown Swiss cattle (Vaccaro and Vaccaro, 1981) and 3.26% and 2.69%, respectively in Karan Swiss heifers (Bhatnagar and Sharma, 1985).

Roy and Tripathi (1989) reported incidence of different types of calving in various grades of Holstein-Friesian x Sahiwal/Tharparkar crosses at military dairy farms and NDRI, Karnal. Incidence of normal calving, abortion, still birth, premature birth and dystocia was found to be 89.8%, 3.9%, 2.6%, 1.8% and 1.9 %, respectively in pooled data based on all farms. In NDRI farm, the incidence of normal calving, abortion and still birth was 94.4%, 3.9% and 1.7 %, respectively.

Higher levels of incidence of abortion were reported as 6.25 % (Lalrintluanga, 2003), 6.84 % (Prabhu and Chaterjee, 1970) in crossbred cows and 7.85 % in Karan Fries cows (Satya pal, 2003). However, Islam and Nadroo (2006) assessed the incidence of abortion and still birth in Jersey and crossbred cows. The incidence of abortion in cattle varied from 1.96% to 8.33 % in crossbred cows and 4.55% to 7.70 % in Jersey. The overall incidence of abortion in crossbred cattle was lower than in Jersey (1.32 %). No significant difference in incidence was observed among the years. The incidence of still birth varied from 0 to 8.33 % in crossbred cows and 0 to 9.09 % in Jersey cows. Higher level of incidence of still birth to the tune of 4.1 % was found by Rao (1982) in crossbred cows.

**Effect of genetic group on the incidence of calving abnormalities :**

Pandey and Desai (1972) observed highest incidence of abortion of 7.89%, 7.61% and 6.82 %
in 5/8, 3/4 and 1/2 Friesian x Sahiwal grades, respectively. However, the grade and farm differences were not found to be significant.

Deshmukh and Kaikini (1999) reported that halfbreds were less susceptible to reproductive disorders as compared to ¾ breds. Tomar and Verma (1988) found that the frequency of abnormal births (4.87 %) did not differ significantly among different genetic groups produced from matings in various combinations of Holstein x Sahiwal and Holstein x Tharparkar at NDRI, Karnal.

Urade (2001) compared crossbred genetic groups for incidence of reproductive disorders. It was found that the maximum incidence of various reproductive disorders was found in Jersey x Non-descript and crossbreds (14.39 %), which was followed by Jersey x Sindhi (13.77 %), pure Sahiwal and Jersey x Tharparkar (1.87 % each), HF x Hariana (1.25 %), HF x Non-descript and Brown Swiss x Gir (1.09 % each), HF x Gir (0.46 %) and Jersey x Gir crossbreds (0.15 %).

Kulkarni et al. (2002) reported that the incidence of reproductive disorders were decidedly low (12.24 %) in HF-Jersey-Gir, then comes Brown Swiss-HF-Gir crosses (23.27 %) and highest in HF-Jersey-Gir (31.55 %) crosses in ascending order. The incidence of reproductive disorders recorded in reciprocal crosses (Rathi-Jersey + Rathi-Hariana combined) was less as compared to ½ and ¾ breds (HF-Jersey-Gir + Jersey-Gir-Gir + Brown Swiss-HF- Gir combined). There was non-significant difference when halfbreds was compared to ¾ breds.

Chourewar et al. (2002) reported highest incidence of reproductive disorders in genetic group that consisting of Holstein Friesian (25 %) and Hariana (25 %) crossed with Jersey (25 %) and Sahiwal (25 %).

It is therefore summarized that halfbred were less susceptible for the different calving abnormalities as compare to the genetic groups having more than two breeds cross. However, with two indigenous and one exotic breed crosses were also shown less incidence of calving abnormalities.

**Effects of various non-genetic factors on calving abnormalities:**

Prabhu and Chatterjee (1970) and Sharma and Jain (1982) reported that parity had no effect on incidence of abnormal calving. However, Tomar et al. (1975) and Kaikini et al. (1976) observed significant effect of parity on abnormal calving being highest incidence in younger buffaloes. Pandey and Desai (1972) observed that about 50 % of total abortion was recorded during monsoon season which significantly differed from frequency in winter and summer season.

Tomar et al. (1975) reported that season had no significant effect on abnormal calving. On the contrary, Singh (1979) observed seasonal variation in the incidence of abnormal calving being high in hot dry and hot humid seasons.

Vaccaro and Vaccaro (1981) found that incidence of abortion was significantly affected by years but not by season of calving in Brown Swiss and Friesian crosses. Whereas, Sharma and Jain (1982) reported parity had a non significant effect on abortion and still birth. Kumar and Reddy (1986) reported significant effect of period on abnormal calving in Karan Fries cattle.

Mukherjee et al. (1993) reported that abortion was significantly affected due to season of calving. However, still birth and dystocia was not affected by the same. Incidence of abortion and still birth was low during winter but high during summer season. Parity had a significant effect on the calving abnormalities. However, Bhagat Singh et. al. (1997) reported that the differences in incidence of dystocia due to sire, breed of dam, season, period and parity were non-significant.

Satya pal (2003) reported the incidence of abortion in Karan Fries cows was significantly affected by parity, season and period and the incidence was lower during winter and it is higher during second and third lactation. In this study, incidence of dystocia was significantly affected by parity and it was higher during first lactation.

Finally, it can be summarized that parity had non-significant effect on calving abnormalities (Prabhu and Chatterjee, 1970; Sharma and Jain, 1982), however, few workers (Tomar et al., 1975; Kaikini et al., 1976) did mention a significant effect.
Most of the workers (Singh, 1979; Vaccaro and Vaccaro, 1981; Mukherjee et al., 1993; Satya pal, 2003) documented significant effect of season on calving abnormalities and very few (Tomar et al., 1975) reported non-significant effect.

**Genetic parameters of calving abnormalities:**

Mukherjee et al. (1993) estimates the heritability for abortion, still birth, retention of foetal membranes, metritis and dystocia were 0.23, 0.086, 0.068, 0.015 and 0.143, respectively. In case of abortion and stillbirth, low heritability estimates have also been reported by Bolgov (1984) in exotic cattle. Erb et al. (1959) and Yaillard and Charaz (1982) reported low heritability of retention of foetal membranes (0.16) and of dystocia (0.05 ± 0.01), respectively. However, low heritability estimates were reported by Erb et al. (1959) of abortion (0.05) and still births (0.05); and by Yaillard and Charaz (1982) for still-births. However, Bolgov (1984) found that heritability of abortion and still birth was less than 0.06.

Sethi and Balaine (1978) found low heritability of retention of foetal membranes in Hariana cattle (0.20) and moderate to high (0.26 - 0.55) for crossbreds.

Saloniemi et al. (1986) reported the heritability of retention of foetal membranes, metritis and dystocia to be 0.03, 0.07 and 0.02, respectively in Finnish Ayrshire cows. Findings of Franz et al. (1988) indicated that heritability of metritis ranged from 0.18 to 0.39 in German black pied first calf heifers.

Singh and Singh (1998) reported low estimates of heritability for abortion, still birth and retention of foetal membranes and were 0.066, 0.014 and 0.015, respectively. Heritability estimates for incidence of dystocia and uterine prolapse were zero.

Van Dorp (1998) reported heritability estimates of retention of foetal membranes and metritis as 0.01 and 0.02, respectively. However, the repeatability estimates for abortion, stillbirth, retention of foetal membranes, metritis and dystocia were reported as 0.038, 0.024, 0.072, 0.103 and 0.153, respectively (Mukherjee et al. 1993).

**Effects of calving abnormalities on production and reproduction performances:**

Tomar and Tripathi (1988) observed that Murrah buffaloes following abnormal calvings produced significantly lesser milk for a shorter length of lactation than those which had normal calvings and did not experience utero-vaginal disorders.

Pandey and Tomar (1988) found that Tharparkar cows coming into production after abnormal calving (abortion and still birth) produced significantly lesser milk than those coming into production following normal calving and had significantly longer period but the service period of both the groups remained unaltered.

Mukherjee (1989) revealed the significant effect of abortion on 305 days milk yield and total milk yield in Karan Fries cattle. JadHAV et al. (1994) reported in crossbred cattle of Holstein x Sahiwal that the cows which calved normally had higher lactation yield (3298.1 kg) than those which had experienced abortion (1965.3 kg).

Satya pal (2003) found that the abnormal calving had significant effect on lactation yield (1713.91 ± 132.76 kg vs 3408.86 ± 58.00 kg) and lactation length (185.17 ± 13.47 days vs 309.02 ± 8.29 days) and non- significant effect on service period in Karan Fries cattle. However, Konermann et al. (1969) reported that fertility was about 10 to 15 percent lower in cows following dystocia than that following normal births but the milk yield did not appear to be affected by dystocia. Laster et al. (1973) found that animals which experienced difficulty at calving had significant fall in milk production. They also reported that animals which had experienced dystocia had shorter lactation length than the normal calvers in exotic cattle.

Langley (1983) found that service period increased from 83.5 to 88.8 days as calving difficulties increased in Holstein Friesian cattle. Hayes and Mangurkar (1983) also reported similar findings in the same breed.

Joshi et al. (1988) observed that the buffaloes with dystocia were associated with poor lactation yield and shorter lactation period. Whereas, Sauerer et al. (1988) reported that milk yield was
not significantly affected in cows with difficulty at the time of calving.

Dystocia had significant effect on 305 days milk yield and total milk yield. The Karan Fries cattle affected with dystocia had less 305 days milk yield (434 kg), total milk yield (875 kg) than non affected group as reported by Mukherjee (1989). However, Rajala and Grohn (1998) found that the effect of dystocia on milk yield varied among cows in different parities. The milk production of first parity cows was not affected at all by dystocia, but dystocia had an impact on the yield of older cows (second and third parity).

**CONCLUSION**

Poor management with poor housing was commonly observed in dairy farms and good management practices can reduce the incidence of reproductive problems. The lack of trained manpower is another major issue and the incidence of various reproductive disorders can be minimized by employing skilled A.I. technicians. It is concluded that proper feeding and management is the right solution to decrease the incidence of reproductive disorders. Herd, year and parity are some of the important environmental factors found to affect the reproduction problems significantly. Though information on incidence and inheritance of reproduction disorders in dairy cattle of advanced temperate countries is well reported, yet such estimates are scanty for crossbred strains developed in India. Further identification of genetic and non-genetic factors influencing reproductive disorders will facilitate developing breeding and management strategies for realizing higher intensity and increased accuracy of selection of elite cows in the herd.

**REFERENCES**


