

## INDUCTION OF PARTURITION IN CATTLE

Article Id: AL201929

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**T**he induction of parturition is a very useful tool for managing the time of calving. For both the natural and induced parturitions, the stages of labour, pelvic relaxation, calf viability, colostral transfer and milk production are similar in healthy animals, but the knowledge of proper breeding dates and high incidences of retention of the placenta are main constraints. The induction of parturition is indicated to save the viability of the fetus as well as that of the cow. Since the fetus gains about 0.5 kg/day during the last weeks of normal gestation, induction of parturition can be a useful tool to prevent dystocia from an oversized fetus. Induction of parturition is also beneficial when the gestation is prolonged which allows the cows extra time to resume reproductive cyclicity to breed again. Potentially, parturition induction can be used to schedule calving to occur during daylight hours on known dates, so that it can be managed by the adequate number of personnel.

### Indications

- Advancing the time of calving to coincide with the availability of suitable pasture for enhancing milk production.
- To ensure that the cow parturates at a pre-determined time when skilled personnel is available so that proper attention can be given to the cows.
- To reduce the birth weight of the calf so as to reduce the occurrence of dystocia by shortening the length of gestation.
- Also indicated in diseased or injured cows for the treatment of cardiac failure, uterine hydropsy or other critical conditions to save the life of fetus and cow.
- To prevent udder edema and distension that predisposes difficulty in milking which may lead to mastitis.

### **Various protocols of induction of parturition**

A number of studies have been carried out for the induction of parturition using different types and combinations of hormonal treatments along with their efficacy and safety. They are described below.

#### **Short-acting corticosteroids**

The most widely used corticosteroid for induction of parturition is Dexamethasone (20 to 30 mg) or Flumethasone (8 to 10 mg) given as a single intramuscular injection. The efficacy of induction of parturition is 80 – 90% when it is administered within 2 weeks of the normal term. The parturition commences within 24 to 72 hours of administration of an injection. The average duration is 48 hours. Retreatment is often recommended if the parturition does not commence within 72 hours of injection.

#### **Long and intermediate-acting corticosteroids**

Long-acting corticosteroids are used when the lactation is to be synchronized with the grazing season and the viability of the calf is not important. It includes Dexamethasone trimethyl acetate (20 mg) or Triamcinolone acetonide (4 to 8 mg) (medium acting). The single intramuscular injection is to be administered one month before the due date of calving. The calving occurs over 4 to 26 days of administration of the injection. The udders of the treated cows get engorged with milk about one week after injection. Milking can be done in these animals before parturition if the udder is already full to prevent the regression of secondary tissue.

The occurrence of retained placenta is quite less (9-22%) compared to short-acting corticosteroids. However, the incidence of calf mortality is more (7% to 45%) due to premature placental separation and also the birth of the premature calf.

#### **Prostaglandins**

Prostaglandins give similar results to induction of parturition as short-acting corticosteroids with a range of 24 -72 hours (average of 45 hours) from treatment to calving. There is also a high chance of retained placenta and failure of induction when administered within 2 weeks of the normal term.

#### **Prostaglandin and corticosteroid combination**

Hormones generally used for induction of parturition initiate endocrine events that are triggered by fetal cortisol. Corticosteroids remove the placental source of progesterone by converting placental progesterone into estrogen. Failure to induce parturition may occur due to the non-removal of the ovarian source of progesterone. On the other hand, prostaglandins

remove the ovarian source of progesterone. But they may fail in the induction of parturition due to remaining placental progesterone. So, a combination of two hormones can remove both the sources of progesterone and can efficiently induce parturition.

A combination of both prostaglandin and dexamethasone induces parturition within 25 to 42 hours of treatment and the interval from injection to calving is also less variable.

### **Combination of long-acting corticosteroid, dexamethasone, and cloprostenol**

This combination is used to induce calving during daylight and a low incidence of retention of the placenta. Long-acting corticosteroids lead to the lowest incidence of retained placenta but there is high variability in the interval from treatment to calving, whereas, dexamethasone and cloprostenol combination has the least variability in the interval from treatment to calving. So, the combination of long-acting corticosteroid, dexamethasone and cloprostenol induce parturition in daylight hours with a low incidence of retained placenta.

### **Summary of treatments for induction of parturition in cattle**

For early induction (250-275 days of gestation): Long-acting corticosteroid followed by short-acting corticosteroid or PGF<sub>2α</sub> after 8 days if the calving has not occurred. The calving occurs after 48 hours of the last injection.

For late induction (after 275 days of gestation): PGF<sub>2α</sub> or short-acting corticosteroid

### **Some disadvantages of induction of parturition**

- It is not always effective.
- The birth weight of the calf in induced parturition is lower than that of normal parturition.
- High incidence of retention of fetal membranes when the short-acting corticosteroids are used.
- Milk yield is initially affected. There is a delay in reaching peak lactation.

### **Conclusion**

Induction of parturition plays an important role in managing to calve, synchronizing the calving with the availability of pasture to maximize the milk production, in reducing the chances of post-partum health problems of the cow. But the treatment protocols are also having some undesired consequences like retention of the placenta which is harmful to the reproductive health of the cow. So, an effective treatment regimen at the proper time of the gestation period may give a successful induction of parturition.

## References

- Bo, G. A., Fernandez, M. and Barth, A. D. and Mapletoft, R. J. (1992). Reduced incidence of retained placenta with induction of parturition in the cow. *Theriogenology*, 38:45-61.
- Davis, K. L. and Macmillan, K. L. (2001). Controlled calving with induction of parturition on day 274 of gestation in dairy cows. *Proc. NZ. Soc. Anim. Prod.*, 61:184-186.
- Johnson, W. H., Manns, J. G., Adams, W. M. and Mapletoft, R. J. (1981). Termination of pregnancy with cloprostenol and dexamethasone in intact or ovariectomized cows. *Can. Vet. J.*, 22:288-290.
- MacDiarmid, S. C. (1983). Induction of parturition in cattle using corticosteroids: a review. Part 2. Commonwealth bureau of animal breeding and genetics. *Animal Breeding Abstracts*, 51:499-508.
- Wood, C. E. (1999). Control of parturition in ruminants. *J. Reprod. Fertil. Suppl.*, 54:115-126.