

UNDESIRABLE NATURE OF TWINNING IN HORSES AND COWS

1. Multiple births or twinning in horses and cows is undesirable and in most cases is pathological and often disastrous to the dam as well as to the foetuses.
2. It is an economic waste or loss and is a reflection of genital disease rather than of health.
3. The abortion rate of twin foetuses in horses is exceedingly high, about 90%.
4. After twin births in mares usually less than half of the foals survive and these frequently require careful nursing care.
5. In cows the abortion rates for twins after 3 months of gestation is much greater than for single foetuses. It is estimated that 30 to 40 % of twin pregnancies terminate in abortion or some say as high as 50 %. In normal single pregnancies only 3 to 5 percent end in observable abortions. A 13.1 % incidence of double ovulations in a herd is reported but only a 1.92 % incidence of twin births. This was an 85 % loss of twin zygotes. The conception rate after double ovulations was one half that following single ovulation. Ten percent unicornual and 90 % bicornual bovine twins have been interpreted as loss of embryos due to double ovulations in one ovary.
6. Many twin pregnancies terminate prematurely. Data have shown that the gestation period for bovine twins is an average of 5 days shorter than for single calves. Male twins were carried 1 to 2 days longer than twins of both sexes and 3 to 5 days longer than female twins. The incidence of abortion and premature births is even higher in triplets and greater multiples. Fewer fertile female progenies are associated with twinning in cattle than with single births.
7. Viable twins are of smaller size and vigor than single young. Single bovine males weigh 25 to 45 % more than twin males, and single females weigh 40 to 50 % more than twin females. This reduced weight of the individual twin is possibly due to a reduced placenta area or a reduced amount of available nutrients for each foetus, and to the shortened gestation period. The combined weight of both twins is usually 35 to 50 percent greater than that of a single calf. A much higher percentage of dead twin foetuses are expelled at term than is the case in single pregnancies. 4.5 % twins are expelled dead as compared to 0.9 %. In addition about three times as many twins die at a young age as to calves born singly.
8. Following twin births or abortions, delayed uterine involution, retained placenta, septic metritis, and temporary or permanent sterility are common. Retained placenta occurs in about 50 % or more of twin calvings, 5 to 10 times as frequently as in single births. The placental retention is probably due in most cases to the abbreviated gestation period, to a lowering of the resistance to infection by the overloaded uterus, to poor involution of uterus and possibly a genetic factor is implicated. Retained placenta followed 75 % of male twins, 42 % of mixed-sex twins and only 20 % of female twins. Calving interval following twinning was definitely prolonged over those preceding twin pregnancy due to greater infertility associated with retained placenta and postpartum metritis.
9. Mortality in dams following twin birth is much higher than in single births.

10. The incidence of dystocia at the termination of twin pregnancy is also much greater than in single births even though the foetuses are smaller. This is due to various causes including:
  - i. The atonicity of the distended uterus,
  - ii. The frequent presence of a dead, flaccid foetus,
  - iii. The wedging of the extremities of bicornual twins in the pelvis, and
  - iv. The frequent occurrence of posterior presentation in one of the twin foetuses with the hindlimbs extended beneath the body.
11. In dairy cows decreased milk production, probably associated with the postpartum metritis, usually follows a twin pregnancy.
  - i. Twins are uneconomical for herd replacements since half the pairs consist of male and female and 91 % of these females are sterile.
  - ii. The male calf may be normal or have reduced fertility, but in most herds those are sold for veal.
  - iii. The incidence of foetal monsters is increased in twin pregnancy in which anastomosis of placental vessels makes possible the nutrition of acardiac or amorphous monsters.
  - iv. Incomplete separation of monozygotic twins result in double monsters, constituting a severe obstetrical problem.

#### CAUSES OF TWINNING

1. The causes of multiple births should be considered so that possible suggestions may be obtained for the prevention of this undesirable and often disastrous occurrence.
2. The cause of twinning in uniparous animals may be divided between those which are environmental and those which are hereditary
3. Environmental causes of twinning includes season, age of the dam, breeding too soon after parturition, sires and hormone injection of FSH.
4. Hereditary causes include breed differences, differences between dam's, sire's and families, repetition of multiple births in same cows and effect of inbreeding.
5. Effect of season: Dairy cows have a slightly greater number of twins during June and July calving, the conception might have occurred in September, October, while beef breeds have greater number of twins during August calving, the conception in them might have occurred during November.
6. Effect of Age of dam: Incidence of twinning in the young is low and increases with age until senile changes commence, at which time the incidence again is lowered.
7. Effect of breeding too soon after parturition: In cows bred within 30 to 40 days after parturition and mares bred about the ninth day after foaling the incidence of abnormal ovulations and twinning is possibly increased. There has been a conflicting report also which indicated no correlation between the length of interval after calving up to 90 days and incidence of multiple ovulation in the cow.
8. Effect of sires: The immediate influence of sires on the production of twins is limited to monozygotic twins, a relatively small percent of total number of twins.
9. Effect of Hormonal injection of FSH: Multiple births have been induced in beef type of cattle by intramuscular injection of 800 to 2000 i.u. of PMSG on 16<sup>th</sup> and 17<sup>th</sup> day of estrous cycle at the time of manual removal of corpus luteum. Superovulation was not induced if the cow exhibited estrum within 3 days after the injection of PMSG. Conception rates at 60 days where 2, 3, 4, and 5 to 6 ova were released were 55.3%, 48.7, 29.2 and 25 %,

respectively. Low conception rates were frequently observed when superovulation was confined to a single ovary. Superovulation and conception rates unpredictable and in general not highly satisfactory usually only about 25 to 30 per cent of treated cattle had twin or triplet pregnancies.

HEREDITARY CAUSES:

10. Effect of Breeds: Twinning in beef breeds is low. It is an indication that twinning in dairy breeds may be due to milk production and to deficiencies of pituitary hormones resulting in abnormal ovulations, cystic ovaries. Incidence of twinning in dairy breeds is more in Holstein Friesian and Brown swiss, intermediate in Guernseys and Ayrshire and lowest in Jersey. In a herd twinning rate was observed to be 8.8 % in Holstein Friesian and less than 2 % in rest of the breeds.
11. Effect of Dam's, Sire's and families within breed: Hereditary tendency for twins is passed from sire to its daughters. Dams which had twinning tendency also passes its incidence to their daughter. Then there are tendencies of twinning inherited in the families.
12. REPETITION OF MULTIPLE BIRTHS in the same cow – 8 to 12 %.
13. Cystic ovaries is a pathological condition, high producing cows during peak of their lactation are affected more, this is also associated with twinning. Condition is also hereditary and bulls may transmit the tendency to their daughter.
14. In herds where selection was practised for twinning, twinning rose to 29 %. Twinning is influenced by heredity. Outbred have more twins than inbred.
15. It was postulated that twinning is caused by a simple recessive character with modifying genes and environmental factors that could influence its expression.