

Some Characteristics of Twin Births in a Holstein Herd

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Introduction

Dairymen in the USA look upon twinning in dairy cows as an undesirable and unwanted event because of the strong association with abortions, stillbirths, dystocias, retained fetal membranes, uterine infections, infertility, increased culling, and possible reduced milk production. The possible causes, associated factors, and consequences of twinning have been reviewed.¹⁻⁴ Unfortunately, there is evidence that twinning in dairy cows is increasing.⁵ Whether the adverse effect of twinning can be eliminated or reduced by improved feeding and management practices has not been substantiated.

The objective of this study was to gather data on twinning in one Holstein herd.

Materials and Methods

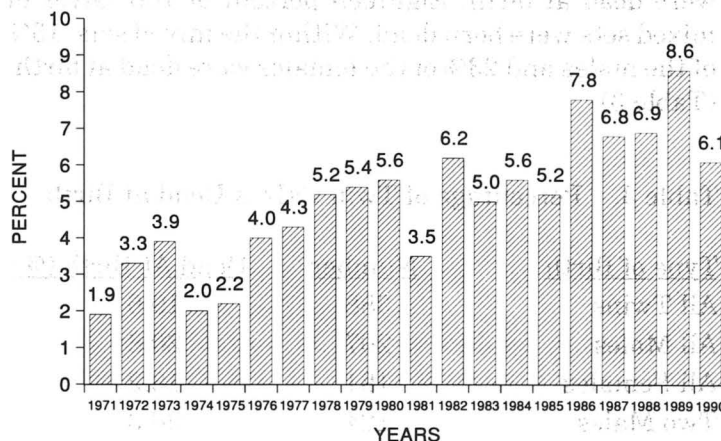
Data on twinning were collected from the Purdue University Dairy Center Holstein herd for the 20 year period, 1971 through 1990. Term births were recorded as singles or twins, alive at birth or stillborn and male or female. Nearly all calves, both living and dead, were weighed the day of birth. The presence of retained fetal membranes (failure of passage by 12 hours postpartum) was noted.

Results

In the 20 year period there were 3,792 term parturitions which included 3,597 singletons, 194 sets of twins, and one set of triplets. The yearly percentage of twins ranged from 1.9 to 8.6 with a mean of 5.1. The annual incidence increased during the study period. During the first 10 years the yearly percentage ranged from 1.9 to 5.6 with a mean of 3.9; during the second 10 years the range was 3.5 to 8.6 with a mean of 6.0. In six of the second 10 years the annual rate exceeded 6.0% (Figure 1). In addition to the term births, there were 47 abortions greater than 150 days of gestation which included 37 singletons, nine sets of twins and one set of triplets.

Retained fetal membranes (RFM) occurred following 64.4% of twin births. The RFM rate for 62 sets of two males was 71.0%; 83 mixed sets 62.7%; and 49 sets of two

Figure 1. Incidence of Twinning by Years



females, 59.2%. The differences in the incidence of RFM were not significant. For 3,597 single births the RFM rate was 15.6%; for 1,882 males, 17.3% and 13.8% for 1,715 females. The difference in the RFM rate between single males and females was significant ($P < 0.005$). (Table 1)

Table 1. Percentage of Retained Fetal Membranes Following Twin and Single Births

Type of Birth	Number	Percentage
All Twins	194	64.4
Two Males	62	71.0
Mixed	83	62.7
Two Females	49	59.2
All Singles	3,597	15.6
One Male	1,882	17.3*
One Female	1,715	13.8*

*Difference significant ($P < 0.005$)

Birth weights were recorded for 190 of 194 sets of twins and averaged 157 lbs. The average weight for 59 sets of two males was 164 lbs (range 123-225 lbs); 82 mixed sets, 155 lbs (range 100-205 lbs); and 49 sets of two females, 152 lbs (range 103-193 lbs). In mixed sets the male was heavier in 64 of 82 sets. (Table 2)

Discussion

Table 2. Birth Weights of Twin Sets

Type of Birth	Number	Mean Wt. (lbs.)	Range (lbs.)
All Twin Sets	190	157	100-225
Two Males	59	164	123-225
Mixed	82	155	100-205
Two Females	49	152	103-193

Of 388 twin calves born, 19.6 were dead at birth, 20.8% of males, and 18.2% of females. Of 124 males and 98 females born in like sets, 26% and 14%, respectively, were dead at birth. Eighteen percent of 166 calves of mixed sets were born dead. Within the mixed sets, 13% of the males and 23% of the females were dead at birth. (Table 3)

Table 3. Percentage of Twin Calves Dead at Birth

Type of Birth	Number	Dead At Birth (%)
All Twins	388	19.6
All Males	207	20.8
All Females	181	18.2
Two Males	124	26.0
Two Females	98	14.0
Mixed	166	18.0
Males (mixed sets)	83	13.0
Females (mixed sets)	83	23.0

The viability of sets of twins at birth *i.e.* both alive, one dead, both dead was: two males, 63%, 23%, and 14%; mixed, 73%, 17%, and 10% and two females, 76%, 20%, and 4% respectively. (Table 4)

Table 4. Viability of Sets of Twins at Birth

Type of Birth	Both Alive (%)	One Dead (%)	Both Dead (%)
Two Males	63	23	14
Mixed	73	17	10
Two Females	76	20	4

The 20 year twinning rate is similar to, but higher than, those reported in five surveys.^{1,2,3,5,6} The incidence of RFM for singles and twins is higher than rates in three reports.^{2,3,7} The upward trend in the twinning rate agrees with a similar finding in a large population of dairy cows and may be the result, in part, of improved nutrition and selection for increased milk production.⁵

There is a lack of information for birth weights of twins for comparison, but as expected, a set of males has the heaviest birth weight and a set of females the lightest with a wide spread in weights among both like and mixed sets.

The low viability of calves (19.6% born dead) represents a significant loss. Potential herd replacements are reduced by the loss of stillborn females and sterile females born co-twin with a bull.

Summary

During a 20 year period, 194 sets of twins were born, representing 5.1% of 3,792 parturitions. The annual incidence increased and ranged from 1.9-8.6%. The fetal membrane rate for all twin birth was 64.4%; with two males, 71.0%; mixed set, 62.7% and two females, 59.2%. Birth weights for 190 sets averaged 159 lbs. The average weight for two males was 164 lbs; mixed set, 155 lbs, and two females, 152 lbs. Of 388 twin calves born, 19.6% were dead at birth, 20.8% of males and 18.2% of females.

References

1. Erb, R.E., Morrison, R.A., Effects of Twinning on Reproductive Efficiency in a Holstein-Friesian Herd. *J.D. Sci* 42:512-159. 1959.
2. Eddy, R.G., Davies, O., David, C., An Economic Assessment of Twin Births in British Dairy Herds. *Vet Rec.* 129:526-529. 1991.
3. Nielsen, M., Schukken, Y.H., Scholl, D.T., Wilbrink, H.J., Brand, A., Twinning in Dairy Cattle: A Study of Risk Factors and Effects. *Theriogenology.* 32:845-862. 1989.
4. Roberts, S.J., *Veterinary Obstetrics and Genital Disease-Theriogenology.* Third Edition: 95-102, 1986.
5. Cady, R.A., VanVleck, L.D., Factors Affecting Twinning and Effects of Twinning in Holstein Dairy Cattle. *J. An. Sci.* 46:950-956. 1978.
6. Philipsen, H., Continued Investigations on Twin-Pregnancy Among Cattle and Two Methods to Prevent Twin-Birth. *Proceedings Third International Congress on Animal Reproduction.* 1:90-92. 1956.
7. Erb, R.E., Hinze, P.M., Gildow, E.M., Morrison, R.A. Retained Placenta-Its Relationship with Prolificacy of Dairy Cattle. *JAVMA.* 133:489-496. 1968.