

Calving and weaning performance of calves from heifers bred to easy calving sires

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¹Agriculture Canada Research Station, Lacombe, Alberta, Canada T0C 1S0; and ²Department of Animal Science, University of Alberta, Edmonton, Alberta, Canada T6G 2P5. Scientific paper no. 750¹, received 4 August 1993, accepted 9 December 1993.

Tong, A. K. W., Vincent, B. C., Newman, J. A., Jones, S. D. M. and Price, M. A. 1994. **Calving and weaning performance of calves from heifers bred to easy calving sires.** *Can. J. Anim. Sci.* **74**: 375-377. In a calving ease comparison involving 106 calves born to first calf heifers, calves sired by Red Angus bulls were heavier at birth and required more calving assistance than Corriente-sired calves. However, the easier calving Corriente-sired calves experienced equivalent death loss and were significantly lighter at 3, 5 and 7 mo of age.

Key words: Beef, ease of calving, birth weight, weaning weight, Red Angus, Corriente

Tong, A. K. W., Vincent, B. C., Newman, J. A., Jones, S. D. M. et Price, M. A. 1994. **Performance au vêlage et au sevrage chez des veaux nés de génisses primipares et de pères de race à vêlage facile.** *Can. J. Anim. Sci.* **74**: 375-377. Lors d'une comparaison pour la facilité de vêlage effectué sur 106 veaux nés de génisses primipares, les veaux de pères Red Angus étaient plus lourds à la naissance et requerraient plus d'assistance au vêlage que les veaux de pères Corriente, race reconnue pour la production de petits veaux. Toutefois chez les veaux de pères Corriente, le taux de mortalité était sensiblement le même et le poids à 3, 5 et 7 mois était significativement plus léger.

Mots clés: Bovin à viande, facilité de vêlage, poids au vêlage, poids au sevrage, Red Angus, Corriente

Calving problems and associated calf losses substantially reduce economic returns to cow-calf producers. Studies have shown that a reduction in the frequency of calving difficulties is unlikely to be achieved by increasing the dam's mature weight because larger cows tend to produce larger calves (Petit 1975). Improvement of calving difficulty, particularly in heifers, requires reduction in the calf's birth weight without increasing the size of the dam. To accomplish this, producers are using bulls of breeds with low birth weights. Red Angus bulls are a popular choice for easy calving sires and the Corriente breed, a Mexican breed of Criollo origin is now available to the industry and is reputed to produce small calves which are extremely easy calving. Criollo strains of cattle are descended from original importations of Spanish stock to Spanish America where they have adapted through many generations of primarily natural selection (Rouse 1970). This study was conducted to compare Red Angus with Corriente sires in terms of calving ease and survival of calves born to first-calf heifers.

The study was part of an experiment to evaluate the feed conversion efficiency of once-calved-heifers for beef production (Newman et al. 1992). The animals used in this study were cared for under guidelines comparable to those laid down by the Canadian Council of Animal Care. The work involved 120 British × "exotic" crossbred heifers with 7/16 to 14/16 British beef breeding. These heifers were allocated to two groups of 60 by stratified sampling within breed composition and yearling weight. One group was exposed

to each sire breed. Breeding took place in feedlot pens of 10 heifers utilizing a Red Angus bull in each of six pens and a Corriente bull in each of the remaining six pens. The bulls were obtained from private herds in central Alberta with no selection for any performance trait except a satisfactory semen test. Red Angus bulls were obtained from two herds but all Corriente bulls came from a single herd. The breeding season lasted 42 d and 106 conceptions resulted. This represented a conception rate of 0.9 for Red Angus bulls and 0.87 for Corriente bulls. Calves were born and reared in feedlot pens. For weaning, they were allocated in equal numbers to 3-mo, 5-mo and 7-mo weaning treatments.

The data recorded included calf birth weight, calving ease, presentation, death loss and weaning weight. The significance of differences in the incidence of assisted and unassisted calvings between breed of sire and sex of calf was determined using Fisher's exact probability test (Siegel 1956). Birth weights were analyzed by a model which included sex of calf, breed of sire and its interactions, while weaning weights were analyzed by a 2 × 2 × 3 factorial model which included sex of calf, breed of sire and age at weaning and its interactions. The GLM and FREQ procedures of SAS were used for the analyses (SAS Institute, Inc. 1989).

Calving Ease

There was no sex of calf by breed of sire interaction for birth weight ($P = 0.51$). Corriente calves were 5.9 kg lighter and were born with less difficulty than Red Angus calves

Table 1. Frequency of calving ease, birth weight and weaning weight means by breed of sire and sex of calf

Measurements	Breed of sire		Sex of calf	
	Red Angus	Corriente	Male	Female
Unassisted	37	52	36	53
Assisted	17	0	10	7
	$P=0.00^x$		$P=0.19^x$	
Slight manual assist	11	0	7	4
Other assist ^z	6	0	3	3
Mal presentation	2	0	1	1
Calf losses	5	5	7	3
Cow losses	1	0	1	0
Number of calves at calving	54	52	46	60
Birth weight (kg) ^y	34.7 ± 0.7	28.8 ± 0.7	32.2 ± 0.8	31.3 ± 0.7
	$P=0.00$		$P=0.37$	
Number of calves at 3 mo	15	17	13	19
Weight at 3 mo (kg) ^y	121.4 ± 5.4	89.3 ± 5.3	106.1 ± 5.9	104.6 ± 4.9
	$P=0.00$		$P=0.84$	
Number of calves at 5 mo	17	16	14	19
Weight at 5 mo (kg) ^y	182.5 ± 5.1	138.0 ± 5.7	169.8 ± 5.9	150.8 ± 4.9
	$P=0.00$		$P=0.01$	
Number of calves at 7 mo	17	14	12	19
Weight at 7 mo (kg) ^y	265.9 ± 5.3	219.7 ± 5.7	255.7 ± 6.1	230.0 ± 4.9
	$P=0.00$		$P=0.00$	

^xProbability from Fisher's exact probability test of the proportions of assisted vs. unassisted calvings.

^yLeast squares means and standard errors of the mean, P is the probability of significance for breed of sire or sex of calf.

^zOther assist included puller and caesarian section.

(Table 1). All Corriente calves were born unassisted, whereas 20% of the Red Angus calves required slight manual assistance and 11% required a greater degree of assistance. The difference in the overall incidence of calving assistance was highly significant. There were two calvings involving abnormal presentations from Red Angus sires, and none from Corriente sires. Total calf death loss was the same (five calves) for the two sire breed groups, but the one heifer that died as a result of calving had been bred to a Red Angus bull.

The difference observed between male and female calves for birth weight or calving ease traits were not statistically significant (Table 1). Laster et al. (1973) also observed a low sex difference for birth weight in calves born to 2-yr-old heifers (1.0 kg) although the difference was higher in older cows.

Weaning Weight

A breed of sire difference in growth performance was apparent at each of the three weaning ages (Table 1). There were no significant breed of sire by weaning age interactions ($P = 0.36$). Red Angus calves, although subject to more calving difficulty, were 36, 32 and 21% heavier than Corriente calves when weaned at 3, 5 and 7 mo of age, respectively. The within breed correlations between birth weight and average daily gain from birth to weaning were 0.42 and 0.43 for Angus sired and Corriente sire calves, respectively. This suggests that the weaning weight differences (Table 1) are due to the difference in birth weight, rather than the genetic difference between breeds. The unfavorable positive correlation of calf birth weight and subsequent growth rate has been reported in many studies (e.g. Gregory et al. (1978)).

There was no significant sex of calf by breed of sire interaction ($P = 0.16$), which means that the sex difference in weaning weight was similar for both breeds of sires.

Female calves gained as rapidly as male calves to three months of age, but their growth rate was less at five and seven months of age (Table 1).

No economic analysis was attempted in this note. However, it is evident that the Red Angus calves produced 46 kg more weaned weight at a cost of 31.4% calving assistance and the loss of one calving heifer (1.8%). The cost of one assisted calving can be estimated as $(46x/0.314) - 0.018y$, where x is the calf price per kg and y is the cost of a breeding heifer. If the calf price per kg is \$2.00 and the cost of a breeding heifer is \$800, this equation yields a cost of assisted calving of \$278.59 at which the Corriente-sired calves would be as profitable as the Red Angus-sired calves. When the cost of an assisted calving is more than \$278.59, the Corriente-sired calves become more profitable than the Red Angus-sired calves.

Conclusions

1. Red Angus-sired calves were heavier at birth and required more calving assistance than Corriente-sired calves.
2. Calf death losses were not reduced by the easier calving observed in the Corriente-sired calves.
3. The advantage of easy calving conferred by the Corriente bulls was compromised by reduced calf growth which was evident as early as 3 mo of age.

Gregory, K. E., Cundiff, L. V., Smith, G. M., Laster, D. B. and Fitzhugh, H. A., Jr. 1978. Characterization of biological types of cattle — Cycle II. 1. Birth and weaning traits. *J. Anim. Sci.* 47: 1022-1030.

Laster, D. B. and Gregory, K. E. 1973. Factors influencing peri- and early post-natal calf mortality. *J. Anim. Sci.* 37: 1092-1097.

Newman, J. A., Jones, S. D. M., Price, M. A. and Vincent, B. C. 1992. Feed efficiency in once-calved and conventional systems of heifer beef production. *Can. J. Anim. Sci.* **73**: 915–930.

Petit, M. 1975. Early calving in suckling herds. Pages 157–176 in J. C. Taylor, ed. *The early calving of heifers and its impact on beef production.* ECC, Luxemburg.

Rouse, J. R. 1970. *World cattle.* vol II, xxiv + 485 pp., University of Oklahoma Press, Norman, OK.

SAS Institute, Inc. 1989. *SAS/STAT user's guide.* Version 6, 4th ed. SAS Institute Inc., Cary, NC.

Siegel S. 1956. *Nonparametric statistics for the behavioral sciences.* McGraw-Hill Book Co., Toronto, ON.