

LONGEVITY OF BOS TAURUS AND BOS INDICUS x BOS TAURUS BREED
TYPES IN A DRY, TEMPERATE CLIMATE

C. M. Bailey
University of Nevada
Reno, NV 89557, USA

SUMMARY

Dams representing diverse breed types were evaluated during eight breeding cycles. Those that survived were removed from the experiment at 10 years of age. Of the 301 original dams, 34.2% died or were removed from the herd because of injury, serious illness, or poor reproductive performance. Breed differences in measures of longevity were statistically significant. Percentages of Hereford, Red Poll, Hereford x Red Poll, Red Poll x Hereford, Angus x Hereford, Angus x Charolais, Brahman x Hereford and Brahman x Angus dams that survived until the eighth mating season were 48.5, 71.4, 52.8, 71.4, 73.2, 67.5, 90.0 and 79.5, respectively. Lifetime total number of calves weaned by dams in these breed categories were 4.54, 5.45, 4.45, 5.49, 5.98, 5.57, 6.96 and 6.22, respectively. Brahman-cross ($P < .01$) and Angus x Charolais ($P < .10$) dams exceeded Hereford dams in lifetime total number of calves weaned but did not differ from Angus x Herefords. There was no evidence of heterosis in longevity of Hereford x Red Poll crosses.

INTRODUCTION

Female longevity is an important consideration in formulating strategies for profitability in commercial beef herds. Although data are limited, there is evidence of differences in productive longevity of traditional British beef breeds, dairy types and Zebu crosses (Stewart and Martin, 1981; Rohrer et al. 1988). Fredeen et al. (1981) reported substantial location effects on lifetime productivity of first-cross beef cows.

A long-term project to evaluate life-cycle productivity of diverse breed types, including Bos indicus x Bos taurus crosses, was initiated at Reno, Nevada in 1973. Results on longevity traits are summarized in this report.

MATERIALS AND METHODS

The experiment was conducted at Reno, Nevada. The mean maximum temperature in Reno in July is 32° C and the mean minimum temperature in January is -7.5° C. Mean annual precipitation is 180 mm. Elevation is 1,341 m.

Hereford, Red Poll, Angus and Charolais-Cross heifers were obtained from 29 herds in eight states. These foundation females were mated with Hereford, Red Poll, Angus or Brahman sires to produce four calf crops. All first-generation (F_1) daughters born from 1975 to 1978 ($N=301$) were retained for evaluation. First-calf heifers were exposed to Red Angus sires at an average age of 19.5 months; Santa Gertrudis sires were

used for each cow's second and third mating seasons. Limousin sires were used for the fourth to eighth breeding seasons. Cows were culled from the breeding herd only if they were injured, became seriously ill, or failed to wean a calf in two consecutive years. Surviving dams were removed from the experiment at 10 years of age. The mating period lasted 65 d until 1982 when it was shortened to 45 days. Calves were born from late February to April. Cows were maintained on irrigated pastures during the summer; supplemental hay was provided during the winter.

The statistical model included terms for dam breed group, dam birth year and the first-order interaction. The CATMOD procedure (SAS, 1987) was employed in the analysis of binary (0, 1) traits. Least square methods (Harvey, 1979) were used to analyze lifetime total number of calves weaned.

RESULTS

Survival rates for dam breed groups are depicted in Figure 1. There were no differences in percent survival between dam breed groups for the first four mating seasons. Significant differences were observed in the fifth ($P < .10$), sixth and seventh ($P < .05$) and eighth ($P < .01$) mating seasons. In the final mating season, 90% of the original Brahman x Hereford dams were still in the herd, but only 48.5% of straightbred Herefords and 52.8% of Hereford x Red Polls had survived.

By the age of 10 years, 34.2% of the 301 original dams had died or were removed from the herd because of injury, serious illness, or poor reproductive performance. Brahman crosses had the lowest culling rate, while straightbred Hereford dams and Hereford x Red Polls were highest in percentage of dams culled (Table 1). Dam breed group differences in percentage of cows culled for poor reproductive performance (failed to wean a calf in two successive years) were not statistically significant; however, dam breed was an important ($P < .10$) source of variation in percentage culled for other reasons with Angus x Charolais and Brahman crosses showing the lowest values. These three breed types were highest in percentage of dams that weaned a calf in each of eight breeding cycles. Brahman cross ($P < .01$) and Angus x Charolais ($P < .10$) breed types exceeded straightbred Herefords in lifetime total number of calves weaned but did not differ from Angus x Hereford dams. There was no evidence of heterosis in longevity traits of Hereford-Red Poll crosses.

DISCUSSION

During the initial phase of this project, calves in all eight breed groups tended to be similar in survival rate, although a higher percentage of Angus x Hereford calves survived during the preweaning period compared with Brahman x Herefords (Bailey and Moore, 1980; Bailey, 1981). After entering the breeding herd Brahman-cross females were outstanding in longevity but they did not surpass Angus x Herefords in lifetime total number of calves weaned. A high incidence of ocular squamous cell tumors (Bailey et al., 1990) and below-average reproductive performance contributed to the low survival rate of straightbred Hereford dams. Rohrer et al (1988) reported longer life spans for Brahman crosses than for Angus x Hereford dams which, in turn, survived longer than straightbred Herefords under Texas conditions. Stewart and Martin (1981) found that straightbred Milking Shorthorn cows in Indiana remained in the breeding herd for a shorter period and

produced fewer calves than either Angus or Angus-Milking Shorthorn crossbred dams. In contrast to results of the present study, longevity of crosses exceeded that of purebred cows.

REFERENCES

BAILEY, C.M. 1981. *J. Anim. Sci.* 52:1244-1252.
 BAILEY, C.M., HANKS, D.R. and HANKS, M.A. 1990. *J. Amer. Vet. Med. Assoc.* (In Press).
 BAILEY, C.M. and MOORE, J.D. 1980. *J. Anim. Sci.* 50:645-652.
 FREDEEN, H.T., WEISS, G.M., LAWSON, J.E., NEWMAN, J.A. and RAHNEFELD, G.W. 1981. *Can. J. Anim. Sci.* 61:539-554.
 HARVEY, W.R. 1979. USDA, ARS, Washington, DC.
 ROHRER, G.A., BAKER, J.F., LONG, C.R. and CARTWRIGHT, T.C. 1988. *J. Anim. Sci.* 66:2826-2835.
 SAS. 1987. Proprietary Software Release 6.03, SAS Inst., Inc., Cary, NC.
 STEWART, T.S. and MARTIN, T.G. 1981. *J. Anim. Sci.* 52:51-56.

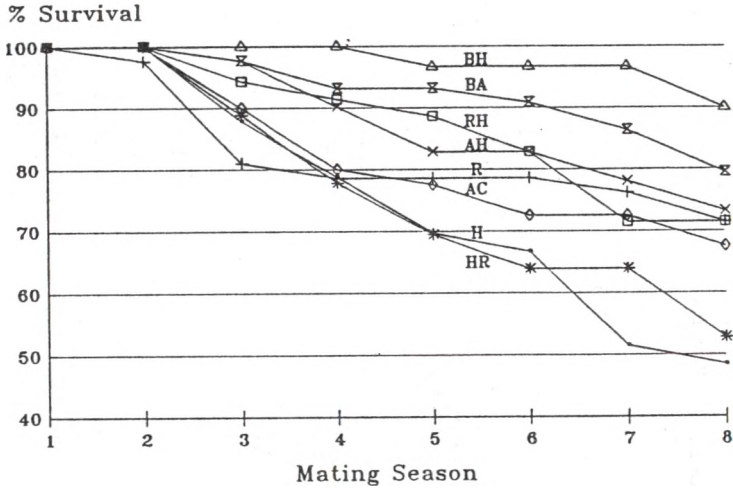


Figure 1 Survival Rate for Dam Breed Groups. H = Hereford, R = Red Poll, A = Angus, C = Charolais and B = Brahman

Table 1 Culling Rate and Number of Calves Weaned According to Dam Breed Group

Dam Breed Group	Initial No. of Dams	Removed from Herd			Weaned 8 calves %	Total No. Calves Weaned
		All Reasons %	Poor Reproduction %	Other Reasons %		
Hereford	33	51.5	27.3	24.2	18.2	4.54
Red Poll	42	31.0	14.3	16.7	26.2	5.45
Hereford x Red Poll	36	50.0	19.4	30.6	13.9	4.45
Red Poll x Hereford	35	40.0	28.6	11.4	20.0	5.49
Angus x Hereford	41	29.3	12.2	17.1	29.3	5.98
Angus x Charolais	40	35.0	27.5	7.5	42.5	5.57
Brahman x Hereford	30	13.3	6.7	6.7	50.0	6.96
Brahman x Angus	44	25.0	18.2	6.8	36.4	6.22
	301	*		+	+	**

+ Dam breed difference $P < .10$; * Dam breed difference $P < .05$; ** Dam breed difference $P < .01$.