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COMPARISON OF FIVE DAM BREEDS UNDER TWO NUTRITIONAL ENVIRONMENTS

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INTRODUCTION

Crossbreeding has become an accepted practice for beef cattle production. Hybrid vigor or heterosis of crosses among breeds of English origin, such as Angus, Hereford and Shorthorn have been well documented. Crosses utilizing breeds of European and dairy breeding have not been well documented for beef production, particularly in the Southeastern part of the United States. As most of the Southeastern U.S. is heavily involved in cow-calf programs an evaluation of crossbreds involving the use of British, European and dairy breeding is needed. This study is a portion of a comprehensive research project evaluating the performance of 5 dam breed groups over their first five years of production under two nutritional levels.

MATERIALS AND METHODS

Data used in this study were generated from 141 Angus or F₁ Angus crossbred dams born during 1975. The F₁ dams were initially generated by breeding straightbred Angus females to five sire breeds. The sire breeds included Angus, Polled Hereford, Charolais, Holstein and Simmental. All females produced from these matings were assembled in one location at weaning time, overwintered as a group and assigned to one of two nutritional groups as yearlings. All heifers were mated to a single sire breed and must have become pregnant as yearlings to be included in the study. Once assigned to a nutritional level, the heifers remained with that level throughout the study.

Level one females were maintained on Coastal Bermudagrass pastures during the grazing season and supplemented with Coastal Bermudagrass hay, corn silage and concentrates during the times when grazing was unavailable or inadequate due to weather conditions.

Level two females were grazed on Coastal Bermudagrass pastures overseeded with Yuchi Arrowleaf clover and on winter and summer annuals, specifically rye and Pearl Millet. The intent of level two was to allow the dams to have enough nutritional resources available for them to achieve maximum productivity.

Culling was not performed unless a female failed to raise two consecutive calves or developed a permanent anatomical injury. No culling was based upon performance.

During the five years of the study, all females were exposed to the

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same sires through artificial insemination and natural service. Only one sire breed was used each year. In year one, all females were mated to Red Poll sires, year two to Santa Gertrudis sires, year three to Angus sires, year four to F₁ Simmental-Angus sires and year five to Simmental sires.

BIRTH TRAITS

Birth data on 630 calvings were studied. Mean \pm S.E. birth weight for both nutrition levels was $34.8 \pm .6$ Kg with a 1.8 Kg difference ($P < .05$) observed for nutrition level. Differences were also observed for dam breed groups (Table 1). Calves from F₁ dams of Charolais-Angus, Holstein-Angus and Simmental-Angus breedings were heavier than those calves from Angus or Polled Hereford-Angus dams. These results are consistent with those reported by Bowden (1977) and Marshall et al. (1984). No differences were observed for level of nutrition or percent of cows requiring assistance at calving (7.5 and 7.7%, respectively for levels 1 and 2). Dystocia or calving difficulty scores were inconsistent for the various dam breeds and revealed no differences. Likewise, calf survival to weaning revealed no differences.

PREWEANING TRAITS

Level of nutrition and dam breed significantly influenced adjusted average daily gain (ADG). A difference of .09 Kg was observed between the nutrition levels (Table 2). All dam breeds except the Holstein-Angus showed an increase in ADG from Level I to Level II. In general, calves from dams of dairy and European breeding outgained calves from British breed dams. These findings were similar to those reported by Notter et al. (1978), Bowden (1977), Burns et al. (1973), Gross et al. (1966), Holloway et al. (1979), Holloway et al. (1982) and Holloway et al. (1983). Also, calves from the European and dairy crossbred dams graded higher ($P < .05$) than calves from British bred dams (Table 2) and Level II calves excelled by one-half of a grade.

Weaning weights were influenced ($P < .01$) by dam breed and level of nutrition. Except for the Holstein-Angus dams, the dam breeds showed an approximate nine percent increase from Level I to Level II. Mean adjusted 205-day weaning weights were 206.7 and 224. Kg for Levels I and II, respectively.

PREGNANCY AND CULLING

Pregnancy rates for rebreeding of the dam breeds revealed a significant genotype x environmental interaction for Charolais-Angus and Holstein-Angus dams (Table 3). Pregnancy rates were 20% higher during the first year for the Level II dams. This finding is consistent with that reported by Koger et al. (1961).

Overall percentages pregnant, open and culled did not vary significantly for dam breed (Table 4). A mean of 77% pregnant, 18% open

TABLE 1. Birth traits for five dam breeds from 630 calvings

	Birth weights (Kg)		Percent ^b Assisted		Percent ^b Dead	
	Level ^a					
	I	II	I	II	I	II
Angus	31.7	33.2	4.5	6.9	9.1	3.4
P. Hereford-Angus	32.0	35.2	7.3	2.5	4.2	7.5
Charolais-Angus	36.0	37.1	13.8	9.4	10.3	6.3
Holstein-Angus	36.7	36.7	7.1	8.5	4.7	5.6
Simmental-Angus	34.3	35.9	3.8	12.3	5.7	6.2
\bar{X}	33.9	35.7	7.5	7.7	6.5	5.9

^a $P < .05$ ^bDifferences non-significant ($P < .05$).

TABLE 2. Calf preweaning traits for dam breeds (Kg)

	ADG ^a		Grade ^{b,c}		A 205 WW ^c	
	Level		Level		Level	
	I	II	I	II	I	II
Angus	.81	.87	11.3	11.7	197.5	211.0
P. Hereford-Angus	.77	.88	11.2	11.7	190.9	216.3
Charolais-Angus	.85	.94	11.8	12.3	209.6	229.6
Holstein-Angus	.97	.94	12.1	12.4	236.2	229.4
Simmental-Angus	.89	.98	12.0	12.4	216.6	236.4
\bar{X}	.84	.92	11.6	12.1	206.7	224.6

^aEffect of dam breed different ($P < .05$).^b12 = low choice^cEffect of dam breed nutrition level different ($P < .05$).

and 5% culled was observed for Level I, whereas Level II results revealed 85% pregnant, 12% open and 3% had been culled.

SUMMARY

Comparison of five dam breed groups indicated that level of nutrition influenced calf birth weight ($P < .05$) but not dystocia or percent death loss. Dam breed did significantly affect ADG, grade and adjusted 205-day weaning weight. Level of nutrition also influenced grade and adjusted 205-day weaning weight. A genotype x environmental interaction was reported for rebreeding rate of two-year-old lactating Charolais-Angus and Holstein-Angus females and increased overall pregnancy rates by 20 percent. Percentages pregnant, open and culled (1977-81) did not reveal any significant difference due to dam breed or nutritional level.

TABLE 3. Rebreeding percentage of lactating 2-year-olds by dam breed and level

Dam breed ^a	Level I		Level II	
	Pregnant	Open	Pregnant	Open
Angus	69	24	83	16
P. Hereford-Angus	85	11	82	12
Charolais-Angus	74	20	82	16
Holstein-Angus	74	19	88	9
Simmental-Angus	74	21	89	8
Mean	77	18	85	12

^aGenotype by Environmental Interaction shown ($P < .01$) for Charolais-Angus and Holstein-Angus dams.

TABLE 4. Percentages of dams pregnant, open and culled 1977-81^a

	Level I			Level II		
	Pregnant	Open	Culled	Pregnant	Open	Culled
Angus	69	24	7	83	16	1
P. Hereford-Angus	85	11	4	82	12	6
Charolais-Angus	74	20	6	82	16	2
Holstein-Angus	74	19	2	88	9	3
Simmental-Angus	74	21	5	89	8	3
Mean	77	18	5	85	12	3

^aDifferences non-significant ($P < .05$).

LITERATURE CITED

- Burns, J. C. 1974. Legumes in animal production systems for the upper south. Proceedings of the 30th and 31st Southern Pasture and Forage Crop Improvement Conference.
- Holloway, J. W., W. T. Butts and T. L. Worley. 1982. Utilization of forage and milk energy by Angus calves grazing fescue or fescue-legume pastures. J. Anim. Sci. 55:1214.
- Holloway, J. W., W. T. Butts, J. D. Beaty, J. T. Hopper and N. S. Hall. 1979. Forage intake and performance of lactation beef cows grazing high or low quality pastures. J. Anim. Sci. 48:692.
- Holloway, J. W. and W. T. Butts. 1983. Phenotype x nutritional environment interactions in forage intake and efficiency of Angus cows grazing fescue-legume or fescue pastures. J. Anim. Sci. 56:960.
- Koger, M., W. G. Blue, G. B. Killinger, R. E. L. Greene, H. C. Harris, J. M. Myers, A. C. Warnick and N. Gammon. 1961. Beef production, soil and forage analyses, and economic returns from eight pasture programs in North Central Florida. University of Fla. Agric. Exp. Sta. Bull. 631. Gainesville, FL.
- Marshall, D. M., R. R. Frahm and G. W. Horn. 1984. Nutrient intake and efficiency of calf production by two-breed cross cows. J. Anim. Sci. 59:317.
- Notter, D. R., L. V. Cundiff, G. M. Smith, D. B. Laster and K. E. Gregory. 1978. Characterization of biological types of cattle. VI. Transmitted and maternal effects on birth and survival traits in progeny of young cows. J. Anim. Sci. 46:892.