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## Forage Research in Texas

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COMPARISON OF LIVELWEIGHT GAINS OF SUCKLING VS WEANED  
CALVES GRAZED AT FOUR STOCKING RATES

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SUMMARY

Fall-born and spring-born Simmental-sired, suckling calves were grazed at the same level of forage availability as were Brahman-cross weaned calves. Comparisons of gain per animal and gain per acre were made at each of four stocking rates of Coastal bermudagrass overseeded with 'Marshall' ryegrass and 'Mt. Barker' subterranean clover. Suckling calves gained more than three quarters of a pound a day more than weaned calves at all stocking rates. Because of differences in the calculated stocking rates for weaned calves vs cow-calf units, the weaned calves gained over 500 lbs/acre more than suckling calves at the low, medium low, and medium high stocking rates. At the high stocking rate, gain per acre was nearly equal for both sets of calves with only a slight advantage of 74 lbs/ac in favor of the suckling calf performance.

INTRODUCTION

As stocking rate increases, animal performance ultimately decreases. Because of milk production, primarily, as well as other factors, suckling calves are generally buffered from the dramatic influence of increased rates of stocking. The primary objective of this trial was to measure the influence of stocking rate on suckling and weaned calves.

PROCEDURE

The pastures used in this trial were Coastal bermudagrass oversown with 'Marshall' ryegrass and 'Mt. Barker' subterranean clover. A total of 250-100-100 lbs/ac of  $N-P_2O_5-K_2O$  was split-applied from October 1982, until August 1983. Grazing was continuous rather than rotational during the 210-212-day trial. Forage from a test area in each of the pastures was clipped to ground level (0" stubble height) at 28-day intervals to monitor forage availability. The put-and-take method of grazing was utilized to obtain a range in available forage across the four pastures. The high forage availability pasture (low stocking rate) was grazed to a level so that ad libitum intake would not be restricted. The low forage availability pasture (high stocking rate) was grazed to a level so

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that defecation areas were not detectable; and hence, spot grazing was not a significant factor. At the high stocking rate, intake of the grazing animal was restricted due to an insufficient quantity of available forage.

Three steers and two heifers (Brangus and Brahman-Simmental crosses) born in the summer of 1982 were allotted to each of the four pastures. These calves, which served as the "tester" animals for the weaned calves were approximately 8 months of age at the beginning of the trial and had received small grain-ryegrass pastures for approximately 90 days prior to initiation of the trial on March 1, 1983. Two sets of suckling calves were used to compare liveweight gains with the weaned calves. Simmental-sired calves (F-1 Brahman x Hereford dams) born in October-November 1982 (fall-born), and in February-March, 1983 (spring-born), were used as "tester" suckling calves. The fall-born calves grazed the test pastures from March to July and the spring-born calves grazed the test pastures from July to September. Both the weaned calves and suckling calves grazed the same pastures within a forage availability treatment. Animals were weighed at approximate 28-day intervals throughout the duration of the trial.

#### RESULTS AND DISCUSSION

The levels of available forage at each of the four treatment pastures are shown in Table 1. Expressed as a ratio of lbs DM/a forage:animal weight, there were some fluctuations within a particular pasture, but, in general, there was a fairly uniform separation in level of available forage across the four treatments. The average of the forage:animal ratio was 142, 62, 38, and 12, respectively, for the low (L), medium low (ML), medium high (MH), and high (H) stocking rates.

Liveweight gains of suckling vs weaned calves at L, ML, MH, and H stocking rates are presented in Tables 2, 3, 4, and 5, respectively. At the low stocking rate, suckling heifers had average daily gains (ADG) of .95 lbs more than the weaned heifers (2.59 vs 1.64 lbs); whereas, suckling steers had an ADG of .88 lbs more than weaned steers (2.70 vs 1.82 lbs) (Table 6). Using an average of both steers and heifers, the combined suckling calf ADG exceeded that of the weaned calf by approximately .9 lbs/hd/day. The calculated gains per acre presented are based on 600-pound equivalents for weaned calves and 1500-pound equivalents for an animal-unit (one cow plus one calf). And, the gains per acre shown are based on a pasture comprised of either heifers, steers, or a mixture of heifers and steers. Thus, the gains per acre presented for each sex of calf are not additive. It is of economic importance to note that the total calculated gains per acre of weaned calves was about 1.7 times greater than that for suckling calves. Gains per animal were influenced by milk production and other minor factors; and conversely, gain per animal were affected by the maintenance of a calf vs a cow plus a calf.

Tables 3, 4, and 6 show the performance and gain advantage of suckling calves over weaned calves at both the medium low and medium high stocking rates. With the exception of the gain differences



between the steer groups at the ML stocking rate, the gain differences between weaned vs suckling calves were consistent with those differences detected at the low stocking rate. The gain per acre advantage of weaned calves over suckling calves ranged from about 525 to 600 pounds per acre over the L, ML, and MH stocking rates. Of particular interest is the magnitude of gain per acre calculated for the weaned and suckling steers at the MH stocking rate. Admittedly, there may be some error involved with the use of 600 and 1500-lb equivalents for calculating stocking rates; however, the potential magnitude of this error is not thought to be great. Assuming that the entire pasture consisted of weaned steers, the calculated gain was 1800 pounds per acre. On a cow-calf basis, suckling steer performance, using both fall- and spring-born calves, was 1174 pounds of gain per acre. These types of gains per acre resulted primarily from matching up a suitable type (breed, class, age, etc.) of livestock with an optimum (not maximum) level of forage utilization.

Tables 5 and 6 reveal the liveweight gain differences which existed between weaned and suckling calves at a high stocking rate. The gain advantage of steers vs heifers was about .3 lb/hd/day. At the high stocking rate, it was obvious that the cows continued to lactate to allow a considerable improvement in suckling calf liveweight gains. Suckling heifers gained more than twice that of weaned heifers; whereas, suckling steers gained more than 3.25 times more than weaned steers. And, at this level of grazing pressure, suckling steer gains per acre exceeded those of weaned steers by nearly 300 pounds per acre. Again, this is another example of the influence of milk production and the efficiency of utilization of the milk provided to the suckling calf. Any economic implications should be followed only after careful consideration has been given to factors such as margin of resale, pasture expenses, animal expenses, sex of calf for gain and termination point, risk, etc. For example, if one considers the sale of both cow and calf at the low stocking rate, then the calf gain of 870 lbs/acre, plus the cow gain of 195 lbs/acre, yields a total animal-unit gain of 1065 lbs/acre. In this case, the 1065 lbs/ac for the cow and calf is only 300 lbs/acre less than the 1361 lbs/ac for the weaned calf.

TABLE 1. AVAILABLE FORAGE AT FOUR STOCKING RATES

Date	STOCKING RATES											
	LOW			MEDIUM LOW			MEDIUM HIGH			HIGH		
	lb DM/ac <sup>1</sup>	100 lb BW	1b DM <sup>2</sup>	lb DM/ac	100 lb BW	1b DM	lb DM/ac	100 lb BW	1b DM	lb DM/ac	100 lb BW	1b DM
Feb. 24	3206	-	-	3331	-	-	2755	-	-	2880	-	-
March 14	2381	147	147	1603	59	59	1978	73	73	1037	28	28
April 13	2119	116	116	1185	68	68	1625	54	54	780	20	20
June 1	1046	49	49	1267	38	38	547	16	16	317	7	7
June 30	2899	114	114	1526	37	37	1488	37	37	922	14	14
July 27	2698	89	89	2304	63	63	1661	32	32	1046	12	12
August 31	7085	247	247	3235	95	95	1978	38	38	298	4	4
Sept. 26	6739	229	229	2448	76	76	912	19	19	86	1.3	1.3
AVG	3522	142	142	2112	62	62	1618	38	38	921	12	12

<sup>1</sup>Pounds of forage dry matter per acre harvested to ground level.

<sup>2</sup>Pounds of forage dry matter per 100 pounds of animal body weight.



TABLE 2. LIVEWEIGHT GAINS OF SUCKLING CALVES AND WEANED CALVES AT A LOW STOCKING RATE

Item	HEIFERS		STEERS		CALVES <sup>1</sup>	
	Weaned	Suckling	Weaned	Suckling	Weaned	Suckling
Initiation	3-1-83	2-28-83	3-1-83	2-28-83	3-1-83	2-28-83
Termination	9-29-83	9-29-83	9-29-83	9-29-83	9-29-83	9-29-83
No. Days	212	210	212	210	212	210
Initial Wt (lbs)	413		460		441	
Fall Born		340		395		368
Spring Born		428		403		416
Termination Wt (lbs)	762		847		813	
Fall Born		705		784		744
Spring Born		607		580		594
Trial Gain (lbs) <sup>2</sup>	349	544	387	566	372	554
Trial ADG (lbs) <sup>2</sup>	1.64	2.59	1.82	2.70	1.75	2.64
Gain/Acre (lbs) <sup>3</sup>	1361	854	1509	889	1451	870

<sup>1</sup>Combined average of steers and heifers.

<sup>2</sup>Includes both fall- and spring-born calf performance.

<sup>3</sup>Gain per acre calculated using Trial gain x Stocking rate. Stocking rate for weaned calves based on 600-pound calf-equivalent and cow-calf pairs based on 1500 lbs equal to one animal-unit.

TABLE 3. LIVESTOCK GAINS OF SUCKLING CALVES AND WEANED CALVES AT MEDIUM LOW STOCKING RATE

Item	HEIFERS		STEERS		CALVES <sup>1</sup>	
	Weaned	Suckling	Weaned	Suckling	Weaned	Suckling
Initiation	3-1-83	2-28-83	3-1-83	2-28-83	3-1-83	2-28-83
Termination	9-29-83	9-29-83	9-29-83	9-29-83	9-29-83	9-29-83
No. Days	212	210	212	210	212	210
Initial Wt (lbs)	399		456		433	
Fall Born		338		382		360
Spring Born		424		394		409
Termination Wt (lbs)	667		793		742	
Fall Born		670		710		690
Spring Born		567		527		547
Trial Gain (lbs) <sup>2</sup>	268	475	337	461	309	468
Trial ADG (lbs) <sup>2</sup>	1.26	2.26	1.58	2.20	1.45	2.23
Gain/Acre (lbs) <sup>3</sup>	1340	955	1685	927	1545	941

<sup>1</sup>Combined average of steers and heifers

<sup>2</sup>Includes both fall- and spring-born calf performance.

<sup>3</sup>Gain per acre calculated using Trial gain x Stocking rate. Stocking rate for weaned calves based on 600-pound calf-equivalent and cow-calf pairs based on 1500 lbs equal to one animal-unit.

TABLE 4. LIVESTOCK GAINS OF SUCKLING CALVES AND WEANED CALVES AT MEDIUM HIGH STOCKING RATE

Item	HEIFERS		STEERS		CALVES <sup>1</sup>	
	Weaned	Suckling	Weaned	Suckling	Weaned	Suckling
Initiation	3-1-83	2-28-83	3-1-83	2-28-83	3-1-83	2-28-83
Termination	9-29-83	9-29-83	9-29-83	9-29-83	9-29-83	9-29-83
No. Days	212	210	212	210	212	210
Initial Wt (lbs)	397		465		438	
Fall Born		357		387		372
Spring Born		434		412		423
Termination Wt (lbs)	618		742		692	
Fall Born		634		705		669
Spring Born		568		542		555
Trial Gain (lbs) <sup>2</sup>	221	411	277	448	254	430
Trial ADG (lbs) <sup>2</sup>	1.04	1.96	1.30	2.13	1.20	2.04
Gain/Acre (lbs) <sup>3</sup>	1437	1077	1801	1174	1651	1127

<sup>1</sup>Combined average of steers and heifers.

<sup>2</sup>Includes both fall- and spring-born calf performance.

<sup>3</sup>Gain per acre calculated using Trial gain x Stocking rate. Stocking rate for weaned calves based on 600-pound calf-equivalent and cow-calf pairs based on 1500 lbs equal to one animal-unit.



TABLE 5. LIVESTOCK GAINS OF SUCKLING CALVES AND WEANED CALVES AT HIGH STOCKING RATE

Item	HEIFERS		STEERS		CALVES <sup>1</sup>	
	Weaned	Suckling	Weaned	Suckling	Weaned	Suckling
Initiation	3-1-83	2-28-83	3-1-83	2-28-83	3-1-83	2-28-83
Termination	9-29-83	9-29-83	9-29-83	9-29-83	9-29-83	9-29-83
No. Days	212	210	212	210	212	210
Initial Wt (lbs)	401		468		441	
Fall Born		355		389		372
Spring Born		423		422		423
Termination Wt (lbs)	534		562		551	
Fall Born		573		644		609
Spring Born		483		471		477
Trial Gain (lbs) <sup>2</sup>	133	278	94	304	110	291
Trial ADG (lbs) <sup>2</sup>	.62	1.32	.44	1.45	.51	1.39
Gain/Acre (lbs) <sup>3</sup>	1290	1090	912	1192	1067	1141

<sup>1</sup>Combined average of steers and heifers.<sup>2</sup>Includes both fall- and spring-born calf performance.<sup>3</sup>Gain per acre calculated using Trial gain x Stocking rate. Stocking rate for weaned calves based on 600-pound calf-equivalent and cow-calf pairs based on 1500 lbs equal to one animal-unit.

TABLE 6. ADVANTAGES OF SUCKLING CALVES VS WEANED CALVES AT EACH OF FOUR STOCKING RATE

Stocking Rate	HEIFERS		STEERS		CALVES <sup>1</sup>	
	Weaned <sup>3</sup>	Suckling <sup>2</sup>	Weaned	Suckling	Weaned	Suckling
Low-Stocked						
ADG advantage	-	.95	-	.88	-	.89
Gain/acre advantage	507	-	620	-	581	-
Medium-Low Stocked						
ADG advantage	-	1.0	-	.62	-	.78
Gain/acre advantage	385	-	758	-	604	-
Medium-High Stocked						
ADG advantage	-	.92	-	.83	-	.84
Gain/acre advantage	360	-	627	-	524	-
High-Stocked						
ADG advantage	-	.70	-	1.01	-	.88
Gain/acre advantage	200	-	-	280	-	74

<sup>1</sup>Combined average of steers and heifers.

<sup>2</sup>Includes both fall- and spring-born calf performance.

<sup>3</sup>Gain per acre calculated using Trial gain x Stocking rate. Stocking rate for weaned calves based on 600-pound calf-equivalent and cow calf pairs based on 1500 lbs equal to one animal-unit.