

Table 27
Level of protein for heifer calves wintered on bluestem pasture, December 6, 1963, to March 4, 1965—451 days.

Treatment	Sorghum grain			Sorghum grain and soybean oil meal			Soybean oil meal		
	1	3	4	2	4	5	5	5	5
Lot no.	11	11	11	11	11	11	11	11	11
No. of heifers	433	424	436	427	427	426	426	426	426
Initial wt. per heifer, lbs.									
Winter grazing period—December 6, 1963, to May 1, 1964—146 days.									
Daily gain per heifer, lbs.	0	.12	.45	.47	.49	.40			
Daily ration per heifer, lbs.									
Ground sorghum grain	2	2	1	1	1	1	1	1	1
Soybean oil meal	...	...	...	1	1	2	2	2	2
Dicalcium phosphate	1	1	.075	.075	.075	.05	.05	.05	.05
Vitamin A, IU			15,000						
Bluestem pasture									
Salt									
Summer grazing—May 1, 1964, to December 3, 1964—214 days.									
Initial wt. per heifer, lbs.	426	447	502	495	491	494			
Daily gain, lbs.	1.03	1.03	.86	.93	.97	.86			
No. of heifers pregnant	8	10	11	11	8	10			
Winter grazing—December 3, 1964, to March 3, 1965—91 days.									
No. of heifers	8	10	11	11	8	10			
Initial wt., lbs.									
Daily gain per heifer, lbs.	646	667	687	694	639	678			
Daily ration per heifer, lbs.	2	2	1	1	1	1	1	1	1
Ground sorghum grain	...	...	...	1	1	2	2	2	2
Soybean oil meal									
Bluestem pasture									
Salt									
Summary, December 6, 1963, to March 3, 1965—451 days.									
Final wt., per heifer, lbs.	594	635	728	730	759	744			
Gain per heifer, lbs.	161	211	289	283	333	306			
Daily gain per heifer, lbs.	.36	.47	.67	.67	.74	.68			

1. Average weights and gains from this point are based on pregnant heifers only.

Over the entire period, heifers receiving only sorghum grain gained less (an average daily gain of 0.37 pound per head) than either those receiving 1 pound of sorghum grain and 1 pound of soybean oil meal per head daily (an average daily gain of 0.66 pound per head) or those receiving 2 pounds of soybean oil meal per head daily (an average daily gain of 0.71 pound per head).

The results indicate level of protein in the winter ration had no effect on conception rate.

Improvement of Beef Cattle Through Breeding (Project 286).

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The purebred Shorthorn cattle breeding program was continued during 1964 according to the plan initiated in 1949. Inbreeding of the two lines has been continued. The Wernacre Premier Line is in its fifth generation and the Mercury line in its fourth generation of inbreeding. The inbreeding program for both lines has been basically to continue successive generations of half-sibbing.

The study was initiated to study the inheritance of production traits in beef cattle, to evaluate the effects of inbreeding in cattle and to explore the feasibility of using inbred lines of beef cattle for the breeding improvement of their production traits. No extensive line crossing has been attempted because of the relatively low levels of inbreeding represented in both lines to date, and the limited number of animals in the project during its progress. Inbreeding levels will continue to be increased as a major objective.

Numerous production data have been collected on both lines. Some data have been subjected to preliminary statistical analyses.

Management of the experimental cattle includes weighing each cow and calf immediately following parturition. Summer pasture breeding is practiced and the calves are born during the spring and early summer each year. Creep feeding during the suckling period is not practiced. Calves are weaned, weighed and scored for type at approximately 6 months and the standardized weaning age for weaning weight adjustment is 180 days. All calves are placed on individual feeding trials for record-of-performance tests for 182 days shortly after they are weaned. The final age at the termination of the feeding test is approximately 265 days. Feed consumption and live weight gains are maintained during the feeding period. The calves are weighed and scored for type at the termination of the feeding trials. Individuals possessing higher gains or weight per day of age and type scores have been retained for breeding replacements.

The full-feed ration for the bulls consists of 75% cracked corn and 25% chopped alfalfa hay; that for the heifers, 55% cracked corn and 45% chopped alfalfa hay. No calves have been castrated and fed as steers since 1957.

Production data for the 1963 calves are summarized in Table 28. The 1964 calves had not completed their feeding tests when this was written. Thirty-seven calves of the 1964 calf crop are being fed individually.

To date, no abnormalities attributable to inbreeding have occurred in either inbred line. More calves have been still-born in the Mercury line than the Wernacre Premier.

Table 28
Summary of the 1963 Shorthorn calves.

Tag no.	Coefficient of inbreeding	Birth weight	Weaning weight	Weaning score	Days fed	Initial weight	Final weight	Total gain	Av. daily gain	Final score	T.O.N. per cwt. gain
Mercury Line, Bulls											
5	18.75	48	317	2	182	260	776	419	2.25	2-	540
6	12.50	67	400	2+	182	440	835	395	2.17	1-	532
8	16.24	79	359	1	182	391	845	454	2.40	2+	472
13	9.38	75	405	2	182	430	960	530	2.91	2+	447
14	17.19	67	293	2+	182	327	836	503	2.76	1-	406
18	6.25	51	338	2-	182	385	840	455	2.50	3+	409
19	5.26	52	322	2	182	355	750	385	2.12	2+	510
21	12.50	48	325	2	182	352	850	495	2.74	1-	461
23	15.50	61	370	2	182	395	895	509	2.75	2	444
25	14.69	80	312	2	182	340	821	481	2.64	2-	421
28	13.50	60	349	2	182	380	805	425	2.34	2-	422
30	16.25	79	355	1-	182	384	848	464	2.55	2	463
32	7.81	80	398	2	182	432	840	408	2.24	2+	461
33	15.63	61	272	2-	182	315	710	425	2.34	3+	418
34	12.50	72	310	2-	182	342	760	418	2.30	3	490
Av.	12.92	65	342	2	...	376	826	456	2.47	2	462
Helfers											
1	15.63	55	235	2	182	260	617	357	1.96	2	532
2	18.15	55	241	2	182	255	680	325	1.79	2	478
5	15.63	65	240	2	182	230	565	335	1.84	2-	455
16	7.18	76	358	1	182	380	778	398	2.19	1	455
12	13.92	75	225	1-	182	233	568	332	1.83	1-	386
16	15.63	73	295	1	182	335	740	405	2.23	1	464
17	18.75	61	257	3+	182	275	640	365	2.01	2+	480
21	16.75	59	219	3+	182	245	612	367	2.02	2	421
27	17.50	48	315	2+	182	340	655	315	1.73	1-	528
35	7.81	61	250	2	182	257	585	328	1.80	2	511
Av.	14.43	63	264	2	...	281	634	352	1.94	2+	492
Wernacre Premier Line, Bulls											
11	33.65	55	325	3	182	355	835	480	2.64	3+	464
20	30.86	70	340	3+	182	369	850	491	2.70	3	508
37	29.81	73	370	3	182	398	880	482	2.65	3+	492
Av.	31.24	66	345	3	...	371	855	484	2.66	3+	488
Helfers											
3	31.43	75	193	3-	182	265	575	369	2.03	3-	432
7	30.25	68	300	2-	182	323	685	360	1.98	3+	557
22	30.86	70	215	3	182	222	550	328	1.80	3	381
26	34.05	82	280	3-	182	285	640	355	1.95	3	605
29	28.27	70	311	3	182	340	650	310	1.70	3-	663
38	34.09	80	270	3	182	338	730	332	1.82	3	686
Av.	31.49	74	278	3	...	296	638	342	1.88	3	554