Project 286: The Improvement of Beef Cattle Through Breeding Methods

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The purebred Shorthorn cattle breeding project has proceeded according to plan this year. The project was planned to facilitate the collection of production data which will be used to devise testing and breeding procedures useful to cattlemen for the improvement of cattle.

Pedigree barriers were established in the original College herd for the development of two inbred lines. College Premier 29th, 2368167, and Gregg Farms Hoarfrost, 2492499, have been used as herd sires for this purpose and the inbred lines have been designated as the Wernacre Premier and Mercury lines for these respective sires. An inbreeding program was initiated for the Wernacre Premier line in 1949 and the first inbred calves were produced in 1950. Calves representing the second generation of inbreeding were produced in 1952. The inbreeding program for the Mercury line was initiated in 1952 and the first inbred calves for this line will be produced in 1953.

Data for a study of the feasibility and effects of inbreeding are being collected as the project progresses.

The females in the project are pasture-bred to calve in the spring of each year. The calves are not creep-fed during the suckling period while the cows are on grass. The calves are weaned at 182 days of age and placed on individual feeding trials for 182-day periods after a short adjustment period following weaning.

The full-feed ration for the bulls and steers consists of 75 percent corn and 25 percent chopped alfalfa hay, and that for the heifers 55 percent corn and 45 percent chopped alfalfa hay.

The steers are maintained on a fattening ration after the termination of the regular feeding trial and slaughtered in the College meats laboratory for detailed carcass studies.

The feeding trial data for the 1951 calf crop are summarized in Table 33, and a partial summary of the 1952 calf crop is presented in Table 34. The feeding trials for the 1952 calf crop have not been completed to date and the number of days of feeding are designated for each animal.

Table 33.—Summary of the 1951 Shorthorn Calves Representing the Wernacre Premier and Mercury Inbred Lines.

Tag number	Coefficient of inbreeding	Birth weight	Weaning weight	Weaning score	Days fed	Initial weight	Final weight	Total gain	Average daily gain	Final score	Lbs. corn per 100 lbs. gain	Lbs. alfalfa per 100 lbs. gain
Wernacre Premier Line—Bulls												
81	6.25	78.0	470	2−	182	637	1117	480	2.64	2+	476	279
120	15.60	80.0	425	2−	182	534	904	370	2.03	3	496	291
189	14.06	71.0	515	2+	182	442	884	442	2.43	3+	503	252
Average	11.90	76.3	470	2	182	538	968	431	2.37	2−	492	274
Steers												
39	3.10	66.0	400	3+	182	533	824	291	1.60	3	711	405
61	18.75	81.0	400	3−	182	555	897	342	1.88	3	569	330
Average	11.00	73.5	400	3	182	544	861	317	1.74	3	640	368
Heifers												
154	0.00	69.9	410	2+	182	553	856	303	1.66	2+	461	403
14	14.10	69.0	405	2−	182	434	736	302	1.66	2	497	430
72	12.50	74.0	410	2+	182	485	856	371	2.04	2+	452	394
108	6.25	74.0	400	2+	182	372	683	311	1.71	3	510	437
58	15.60	66.0	358	2−	182	407	714	307	1.69	2−	559	482
105	18.75	74.0	310	3	182	328	619	291	1.60	3−	363	316
Average	11.20	71.0	382	2−	182	430	744	314	1.73	2−	474	410
Mercury Line—Bulls												
760	0.00	74.0	445	1−	182	537	982	445	2.45	2+	480	275
Steers												
92	0.00	67.0	410	2	182	422	862	422	2.32	3+	531	297
4	0.00	52.0	380	1−	182	425	794	369	2.03	3+	437	247
Average	0.00	59.5	395	2+	182	424	828	396	2.18	3+	484	272
Heifers												
53	0.00	53.0	340	2	182	375	725	350	1.92	1−	419	366
23	0.00	54.0	355	2	182	393	657	264	1.45	2	481	409
55	0.00	56.0	400	1−	182	471	758	287	1.58	2+	575	502
13	0.00	60.0	355	2	182	381	647	266	1.46	2−	493	436
2	0.00	71.0	440	1	182	454	765	311	1.71	1	439	379
87	0.00	58.0	325	2−	182	330	574	244	1.34	3	394	361
90	0.00	43.0	260	3−	182	280	550	270	1.48	3−	395	348
22	0.00	58.0	355	1−	182	353	610	257	1.41	2	489	420
56	0.00	59.0	343	1−	182	361	589	228	1.25	2+	443	386
180	0.00	56.0	300	2	182	295	611	316	1.74	2	466	399
Average	0.00	56.8	347	2−	182	369	646	279	1.53	2	459	401

Table 34.—Partial Summary of the 1952 Shorthorn Calves Representing the Wernacre Premier and Mercury Inbred Lines.

Tag number	Coefficient of inbreeding	Birth weight	Weaning weight	Weaning score	Initial weight	Weight on 4-10-53	Days on trial	Daily gain during trial
Wernacre Premier Line								
Bulls								
105	6.25	75	455	2	469	801	100	3.32
184	14.06	88	514	2	530	840	100	3.10
2	23.44	64	400	3+	473	572	25	3.60
Average	14.58	76	456	2−	491	738	......	3.34
Steers								
37	14.06	78	386	2	403	640	100	2.37
7	12.50	91	365	2−	380	560	100	1.80
72	6.64	67	336	3+	371	421	25	2.00
Average	11.07	79	362	2−	385	540	......	2.06
Heifers								
49	15.62	67	357	3	367	542	161	1.09
39	15.62	75	363	2	398	610	161	1.32
10	18.75	65	392	2−	410	580	100	1.70
154	6.25	56	295	3+	347	393	25	1.84
14	27.73	55	301	2−	406	473	25	2.68
108	19.73	55	270	3	346	410	25	2.56
23	22.27	57	329	3+	361	420	25	2.36
56	23.44	65	295	3+	338	400	25	2.48
Average	18.67	62	325	3+	372	479	......	2.00
Mercury Line								
Bulls								
61	0.00	64	366	1−	400	690	161	1.80
9	0.00	84	434	2	448	715	100	2.67
4	0.00	69	391	2+	411	725	161	1.95
90	0.00	71	430	2	440	735	100	2.95
Average	0.00	72	405	2+	425	716	......	2.34
Steers								
68	0.00	62	335	3+	360	570	100	2.10
Heifers								
82	0.00	66	353	1−	378	550	100	1.72
180	0.00	68	380	1	401	555	100	1.54
92	0.00	68	363	2+	376	565	161	1.17
58	0.00	57	342	2	360	555	100	1.95
79	0.00	59	311	2+	330	514	100	1.84
Average	0.00	64	350	2+	369	548	......	1.64

Table 35.—Feed Prices Used in Beef Cattle Tests, 1952-53.

Corn, bushel	$ 1.60
Soybean oilmeal or pellets, ton	95.00
Special supplement, ton	82.00
Alfalfa hay, ton	40.00
Alfalfa silage, wilted and nonwilted, ton	10.00
Atlas sorgo silage, ton	10.00
Prairie hay, ton	25.00
Corn cobs, ton	12.00
Dry bluestem pasture, calves, per head per month	.50
Dry bluestem pasture, yearlings, per head per month	.75
Brome pasture, winter, per head per month	1.00
Vitamin A concentrate, lb.	1.18
Mineral (2 lbs. bonemeal to 1 lb. salt), cwt.	5.00
Salt, ton	12.00

Table 36.—Chemical Analysis of Feeds Used in Beef Cattle Feeding Trials, 1951-52, 1952-53.

	Moisture %	Protein %	Fat %	Fiber %	N-Free extract %	Mineral matter %	Calcium %	Phosphorus %	Carotene mg/ 100 gms. on dry basis
1951-52									
Cottonseed oilmeal	5.67	40.88	5.36	12.15	29.30	6.64			
Cottonseed oilmeal pellets	6.03	42.88	5.35	11.19	28.16	6.39	.19	1.07	
Milo grain	11.85	9.94	2.76	2.12	71.55	1.78			
Prairie hay	4.55	6.31	2.37	32.60	47.39	6.78	.28	.10	1.99
Sorghum silage (Tenn. O)	73.00	1.49	.57	8.29	14.25	2.40	.07	.05	1.47
Sorghum silage (Atlas, Black Amber)	63.63	1.90	.72	12.45	17.63	3.67	.01	.08	.78
Nonwilted alfalfa silage[1]	75.28	4.00	.93	9.84	7.44	2.51	.04	.06	.63
Nonwilted alfalfa silage[2]	75.90	4.27	.85	9.49	7.18	2.31	.04	.08	.62
Wilted alfalfa silage[1]	57.00	7.58	.89	16.50	13.61	4.42	.49	.11	.36
1952-53									
Corn	11.58	9.19	4.20	1.90	71.68	1.45			
Soybean oilmeal pellets	9.60	45.56	4.66	4.81	29.66	5.71			
Special cattle supplement	11.27	34.13	1.97	4.91	35.61	12.11			
Ground corn cobs	8.87	2.31	.45	33.86	52.92	1.59			
Prairie hay	5.22	5.88	2.46	32.35	46.91	7.18			1.94
Alfalfa hay	5.95	13.56	1.90	32.18	38.21	8.20			
Atlas sorgo silage	65.00	2.77	.88	8.00	20.70	2.65			
Nonwilted alfalfa silage	75.00	4.86	1.14	7.33	8.77	2.90			12.9
Wilted alfalfa silage	64.70	5.69	.98	11.34	13.56	3.73			1.0

Table 36.—(Continued.)

1952—Bluestem pasture grasses:		
February 9	0	3.96
March 15	0	4.25
June 23—mature	0	7.00
June 23—immature	0	6.78
July 9—mature	0	5.58
July 9—immature	0	5.68
July 21—mature	0	6.50
July 21—immature	0	7.06
August 4—mature	0	6.19
August 4—immature	0	7.83
August 12—mature	0	5.47
August 12—immature	0	7.71
September 9—mature	0	6.63
September 9—immature	0	10.57
September 11—mature	0	5.93
September 11—immature	0	8.26
September 20—mature	0	5.23
September 20—immature	0	8.07

1. Sample 1.
2. Sample 2.