

# ANNUAL REPORT OF LIVESTOCK INVESTIGATIONS

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Since 1958, all cows have been wintered together as one herd, but divided into three groups during the breeding season. One bull was used with each group, and a young bull was placed with yearling heifers in a fourth pasture. All cows were weighed monthly, calves were weighed and marked at birth, and weaning weights were averaged by sire groups. Some sires were used for four successive years. One or two bull calves were purchased from a purebred herd each fall for limited use the following summer.

A record of the calves from three sire groups of 1962, and the average for all calves from each sire is presented in Table 1.

<b>Table 1. Calf Birth Weights and Weaning Weights by Sire, Excluding Calves from 2-Year Old Heifers.</b>						
	<b>Bull #4</b>		<b>Bull #6</b>		<b>Bull 38</b>	
	<b>1962</b>	<b>4-Yr. Av.</b>	<b>1962</b>	<b>4-Yr. Av.</b>	<b>1962</b>	<b>2-Yr. Av.</b>
No. of Calves	19	26.5	22	15.5	23	25.5
Av. Birth Wt.	75	72.8	68	67.5	73	73
Av. Weaning Wt.	393	363.5	366	359.5	390	374
Av. Age in Days	184	187	182	188	182	181
Wt. Per Day of Age	2.14	1.95	2.01	1.92	2.14	2.07
Bull #4 - Zato Heir 9, bred by A. W. Powell, Sisseton, South Dakota						
Bull # 6 - TTT Silver Lad, bred by Thor Tagestad, Towner, North Dakota						
Bull #8 - DGH Rupert Aster, bred by Don Hoag, Harwood, North Dakota						

Bulls number 4 and 6 were sold after the 1961 breeding season. Bull number 8 will not be used after the 1962 season. Two other Powell bulls, number 5 and 10, were used during the 1962 season, and a yearling Tagestad bull, number 11, saw some service in 1962.

From 98 cows which started the winter, November 1, 1961, we weaned 84 calves October 15, 1962. Six cows were sold during the year, five died, two lost calves, and one was dry.

<b>Feed Prices Used In This Report</b>	
Corn Silage	7.20 per ton

Barley	.80 per bushel
Alfalfa Hay	18.00 per ton
Oats	.56 per bushel
Soybean Meal	80.00 per ton
Pelleted Beet Pulp	40.00 per ton
Steamed Bonemeal	130.00 per ton
Trace Mineral Salt	54.00 per ton
Grinding or Dry Rolling	2.00 per ton (at home)
Steam Rolling	4.00 per ton
Grazing Yearlings	1.50 per month

### CREEP FEEDING OF CALVES

A creep-feeding experiment was started in 1961 and continued in 1962. All cow-calf pairs were divided into three groups as equally as possible on June 22, 1961, and June 21, 1962. Age and weight of cows, age and sex of calves, sire of calves and previous records of cows were considered in making the allotments. Each year, one of the three groups of calves had access to a creep feeder filled with whole oats after July 1. The creep was placed in a different pasture each year.

Calves were slow to use the creep in 1962, but oats consumption rose very rapidly in late September and October. It was discovered at weaning time that at least one cow had been eating from the creep, so the record of oats consumption was not usable for cost comparison. The results of the first two years' creep feeding are reported in Table 2. The date of weaning was October 30, 1961, and October 15, 1962.

	East Park		West Park		Home Pasture	
	1961	1962	1961	1962	1961	1962
			Creep		Creep	
No. Cows	29	26	30	25	30	22
Av. Wt. Cows, June 21	978	1089	956	1098	990	1095
Av. Wt. Cows, Weaning	1032	1082	1031	1085	1021	1150

Summer Gain/Hd., Cows	55	-7	75	-13	31	55
No. Steer Calves Weaned	17	14	16	14	16	11
No. Heifer Calves Weaned	12	12	14	11	14	11
Av. Birth Wt., All	70.6	70.8	69.1	72.3	70.3	70.8
Av. Weaning Wt., All	348.6	351.3	346.2	391.4	383.7	379.1
Total Oats Fed, Lbs.				5,000	5,133	
Av. Oats Per Calf*				179	179	
Av. Additional Wt. Per Calf				26	36	

\*Oats record inaccurate for 1962, because cows got into feeder. There were three additional calves in each lot in 1962, not included in this summary. In East Park one crossbred calf and two late calves for which birth weight was not recorded were omitted. In West Park two calves died late in the summer and one had no recorded birth weight. In Home Pasture there were three calves for which the birth weight was not recorded.

### CREEP-FED CALVES VS NON-CREEP-FED CALVES IN THE FEED LOT

Calves from three groups of cows were divided more or less evenly among the several experimental feeding lots at weaning in 1961. At the close of the summer feeding period the gain data for creep-fed calves were compared with data for the non-creep-fed calves. As seen in Table 3, the creep-fed calves as a group, gained less rapidly in the feed lot than did the non-creep-fed calves.

**Table 3.** Feed Lot Record of Creep-Fed and Non-Creep-Fed Calves, 1962.

	Summer Lot No.	No. of Calves	Weaning Wt.	Final Wt.	Days on Feed	Av. D. Gain	Total Feed-Lot Gain
<b>Steers</b>							
Creep-fed	7 to 12	6	443	1083	297	2.15	640
Not creep-fed	7 to 12	9	412	1070	297	2.21	658
Creep-fed	13 to 15	6	372	1033	362	1.83	661
Not creep-fed	13 to 15	12	360	1017	362	1.82	657
Creep-fed	16 & 18	3	312	917	314	1.93	605

Not creep-fed	16 & 18	7	278	921	314	2.05	643
Heifers							
Creep-fed	3 to 6	5	334	828	314	1.57	494
Not creep-fed	3 to 6	15	336	860	314	1.67	524
Creep-fed (Replacements)		7	416	812	350	1.03	396
Not creep-fed (Replacements)		8	382	793	350	1.17	411

In all comparisons except one, the creep-fed calves gained less rapidly than the non-creep-fed calves. In only one comparison, (replacements) was a maintenance ration used, and in no lot was a full-feed of grain fed from weaning to market.

### GRAIN FOR STEERS ON GOOD SPRING PASTURE

Beef cattle make their most economical gains on good pasture. While it is unquestioned that supplements fed to cattle on poor pasture will increase gains, it is not generally recognized that the supplementation of good spring pasture with grain is a paying practice. This experiment has compared grain vs. grass alone for yearling steers in three successive years. In two of the years a third lot of similar steers was fed in dry lot. All pasture steers were placed in dry lot when the spring pasture failed to support continued high gain.

Both the grazing and finishing phases of the three trials are summarized in Table 4.

<b>Table 4.</b> Spring Grazing, With and Without Grain, vs. Dry-Lot Feeding, Followed by Dry-Lot Finishing.								
	4 Lb. Barley On Grass				Grass Alone			
	1960	1961	1962	3-Yr. Av.	1960	1961	1962	3-Yr. Av.
No. of Steers	6	6	6	6	6	6	6	6
Wt. to Grass	478	486	434	466	477	487	435	466
Wt. off Grass	677	658	596	644	635	629	584	616
Days of Grazing	73	67	72	71	73	67	72	71
Daily Gain on Grass	2.73	2.57	2.24	2.51	2.17	2.13	2.07	2.12
Daily Gain, Dry Lot	1.79	2.09	1.95	1.94	1.89	2.10	1.90	1.96
Final Weight	952	884	903	913	927	865	885	889

Daily Gain, All Summer	2.09	2.27	2.04	2.13	1.98	2.11	1.96	2.02
Daily Ration: Dry Lot								
Days in Dry Lot	154	108	158	140	154	108	158	140
Corn Silage	41	44	44	43	41	44	44	43
Ground Barley	4	4	4	4	3.9	4	3.8	3.9
Alfalfa Hay	1.9	2.5	2.5	2.3	1.9	2.5	2.5	2.3
Soybean Meal	1.5	1.5	1.0	1.3	1.5	1.5	1.0	1.3
Bonemeal & Salt, 3:1	.2	.2	.2	.2	.2	.2	.2	.2
Feed/100 Lb. Gain, Dry Lot								
Corn Silage	2306	2105	2269	2227	2149	2088	2301	2179
Ground Barley	222	191	205	206	205	192	202	200
Alfalfa Hay	105	120	128	118	99	119	130	116
Soybean Meal	83	72	51	69	77	72	51	67
Bonemeal & Salt, 3:1	11	10	9	10	10	10	9	10
Feed Cost/100, dry lot	\$17.10	\$15.47	\$15.48	\$16.03	\$15.89	\$15.41	\$15.56	\$15.63
Feed Cost/100, all gain	11.78	10.82	11.99	11.53	11.12	10.39	11.21	10.91
Selling Price/100	25.10	22.50	24.56	24.05	24.75	22.40	24.24	23.80
Carcass Grade	---	---	3 G. 3 Ch.	---	---	---	3 G. 3 Ch.	---
Dressing %	---	---	58.06	---	---	---	57.38	---
	Dry Lot, All Summer							
	1961	1962	2 Yr. Av.					
No. of Steers	6	6	6					
Initial Weight	486	435	461					
Wt. at Close of Grazing Period	662	645	654					

Daily Gain, First Phase	2.63	2.92	2.78
Daily Gain, Final Phase	1.74	1.72	1.73
Final Weight	850	917	884
Daily Gain, All Summer	2.08	2.09	2.09
Days in First Phase	67	72	70
Days in Final Phase	108	158	133
Daily Ration:			
Corn Silage	37	38	38
Ground Barley	4	4	4
Alfalfa Hay	2.5	2.5	2.5
Soybean Meal	1.5	1.0	1.3
Bonemeal & Salt, 3:1	.2	.2	.2
Feed Per 100 Lb. Gain:			
Corn Silage	1759	1815	1787
Ground Barley	192	191	192
Alfalfa Hay	120	119	120
Soybean Meal	72	48	60
Bonemeal & Salt, 3:1	10	9	10
Feed Cost/100 Gain	\$14.24	\$13.41	\$13.83
Selling Price/100	22.70	24.14	23.42
Carcass Grade	---	4 Ch. 2 G.	---
Dressing %	---	56.76	---

**TWO LEVELS OF WINTERING STEER CALVES FOLLOWED BY  
DIRECT OR DEFERRED FINISHING**

Each winter for four successive years, two equal lots of 16 steer calves each, were wintered on a 'normal' and a 'low' ration. Beginning

about May 1 each year, one-half of the steers from each winter lot were turned on pasture and brought back for dry-lot finishing the following winter. The other half of the steers from each winter lot were fed out in summer dry-lot.

All steers were implanted with 24 mg. of stilbestrol when placed in dry-lot for finishing.

Table 5 summarizes the wintering phase of the four years' work. Table 6 reports the results of the summer dry-lot feeding immediately following the wintering phase. Table 7 concerns the summer grazing and winter finishing which followed.

<b>Table 5. Wintering Steer Calves, 2 Rations, 4 Years</b>					
	<b>Normal Ration</b>				
	<b>57-58</b>	<b>58-59</b>	<b>59-60</b>	<b>60-61</b>	<b>4-Year Av.</b>
Steers/lot	16	14	16	16	15.5
Weaning Wt.	360.0	380.4	346.2	349.4	359.0
Spring Wt.	606.6	607.9	571.6	582.5	592.2
Days in lot	181	189	181	184	184
Av. daily gain	1.36	1.20	1.24	1.27	1.27
<b>Daily Ration:</b>					
Corn silage	25	24	23	22	23.5
Cr. wht. grass hay	4	3.9	4	3.9	4.0
Whole Oats	2	2	2	2	2
Feed Cost/100 Lb. G	\$12.00	\$12.89	\$12.27	\$11.78	\$12.24
Winter Feed Cost/Hd.	29.59	29.32	27.66	27.46	28.51
	<b>Low Ration</b>				
	<b>57-58</b>	<b>58-59</b>	<b>59-60</b>	<b>60-61</b>	<b>4-Year Av.</b>
Steers/lot	16	14	16	16	15.5
Weaning Wt.	360.3	388.9	346.2	349.0	361.1
Spring Wt.	511.3	506.4	475.3	491.3	496.1
Days in lot	181	189	181	184	184
Av. daily gain	.83	.62	.90	.77	.78

**Daily Ration:**

Corn silage	20	20	20	19	20
Cr. wht. grass hay	4	4	4	3.9	4
Feed Cost/100 Lb. G	\$13.27	\$17.24	\$15.01	\$13.64	\$14.79
Winter Feed Cost/Hd.	20.04	20.26	19.38	19.41	19.77

**Table 6.** Summer Finishing of Steers From Two Winter Ration Groups

	Normal 1 <sup>st</sup> Winter Group				
	1958	1959	1960	1961	4-Yr. Av.
No. steers/lot	8	5	8	8	7.25
Initial wt.	605.6	633.0	571.9	583.1	598.40
Final wt.	1053.8	1125.0	933.1	999.4	1027.83
Days on feed	182	174	178	175	177.25
Av. daily gain	2.46	2.83	2.03	2.38	2.43
<b>Daily Ration</b>					
Corn Silage	48	54	37	41	45.0
Soybean meal	1.5	1.5	1.5	1.5	1.5
Alfalfa hay	2.5	2.5	2.5	2.5	2.5
Ground barley	4.7	4.7	4.0	4.0	4.35
St. bonemeal & salt, 3:1	.2	.2	.2	.2	.2
<b>Feed/100 Lb. Gain</b>					
Corn silage	1964	1937	1810	1705	1854
Soybean meal	61	53.4	74	62.5	62.72
Alfalfa hay	102	88	122	104.5	104.13
Ground barley	190	166	197	166	179.75
St. bonemeal & salt, 3:1	8.2	7.1	9.9	8.4	8.4
Feed Cost Per 100 Lb. Gain, Summer Only	\$13.82	\$12.86	\$14.17	\$12.62	\$13.37



Selling Price/100	\$25.50	\$23.00	\$22.35	\$22.40	\$23.31
Feed cost Per Hd., Weaning to Market	\$91.53	\$92.59	\$78.84	\$80.00	\$85.74
	<b>Low 1<sup>st</sup> Winter Group</b>				
No. steers/lot	8	8	8	8	8
Initial wt.	507.5	503.8	475.6	491.9	494.7
Final wt.	946.9	1014.4	895.6	923.1	945.0
Days on feed	182	174	178	175	177.25
Av. daily gain	2.41	2.93	2.36	2.46	2.54
Daily Ration					
Corn Silage	45	48	36	41	42.5
Daily feed of soybean meal, alfalfa hay, barley and minerals are same as for lots above.					
<b>Feed/100 Lb. Gain</b>					
Corn silage	1867	1646	1536	1674	1681
Soybean meal	62.5	51.4	64	60.3	59.55
Alfalfa hay	104	80	105	101	97.50
Ground barley	194	160	170	160	171.0
St. bonemeal & salt, 3:1	8.4	6.8	8.5	8.0	7.93
Feed cost/100 Lb. Gain, Summer Only	\$13.63	\$11.55	\$12.14	\$12.28	\$12.40
Selling Price/100	\$25.15	\$23.10	\$22.50	\$22.75	\$23.38
Feed Cost/Hd., Weaning to Market	\$79.93	\$79.23	\$70.37	\$72.36	\$75.47

<b>Table 7. Summer Grazing and Winter Finishing of Steers</b>					
	<b>Steers From 'N' Ration 1<sup>st</sup> Winter</b>				
	<b>58-59</b>	<b>59-60</b>	<b>60-61</b>	<b>61-62</b>	<b>4-Yr. Av.</b>
No. steers/lot	8	8	8	8	8
Wt. to grass	606.9	607.5	571.3	581.9	591.9
Wt. off grass	858.1	830.6	731.3	761.2	795.3

Days of grazing	152	136	149	144	145.2
Daily pasture gain	1.65	1.64	1.07	1.25	1.40
Final wt.	1111.9	1190.6	1113.1	1063.8	1119.9
Daily dry lot gain	1.47	2.22	2.36	1.77	1.955
<b>Daily Ration: Dry Lot</b>					
Corn silage	58	52	56	48	53.5
Soybean meal	1.68	1.69	1.66	1.72	1.69
Alfalfa hay	2.50	2.50	2.50	2.50	2.50
Ground barley	4.05	3.41	2.49	2.61	3.14
St. bonemeal & salt, 3:1	.27	.27	.27	.27	.27
<b>Feed/100 Lb. Gain</b>					
Corn silage	3953	2336	2390	2730	2852
Soybean meal	115	76	71	97	89.75
Alfalfa hay	170	112	106	141	132
Ground barley	276	153	106	147	170.5
St. bonemeal & salt, 3:1	18	12	11	16	14.2
Feed Cost/100 Lb. Dry-Lot G	\$25.63	\$15.49	\$14.65	\$18.14	\$18.47
Selling Price/Cwt	\$24.80	\$24.40	\$22.50	\$23.10	\$23.70
Feed Cost Per Hd., Weaning to Market	\$102.24	\$91.88	\$91.04	\$89.55	\$93.68
	<b>Steers From 'L' Ration 1<sup>st</sup> Winter</b>				
No. steers/lot	8	8	8	7	8
Wt. to grass	510.6	503.1	475.0	491.4	495.0
Wt. off grass	800.6	761.3	676.9	722.9	740.4
Days of grazing	152	136	149	144	145.2
Daily pasture gain	1.91	1.90	1.36	1.61	1.70
Final wt.	1084.4	1081.3	1053.8	1034.3	1063.45
Daily dry-lot gain	1.64	1.99	2.33	1.82	1.945

Daily Ration: Dry Lot					
Corn silage	58	53	56	50	54.3
Daily feed of soybean meal, alfalfa hay, barley and minerals are same as for lots above.					
<b>Feed /100 Lb. Gain</b>					
Corn silage	3559	2663	2420	2772	2953
Soybean meal	103	85	72	95	88.75
Alfalfa hay	152	125	107	141	131
Ground barley	247	170	107	143	166.8
St. bonemeal & salt , 3:1	16	13	11	15	13.7
Feed Cost/100 Lb. Dry-lot gain	\$23.91	\$17.46	\$14.82	\$18.09	\$18.34
Selling Price/Cwt	\$25.35	\$25.00	\$22.95	\$23.00	\$24.07
Feed Cost/Hd., Weaning to Market	\$95.50	\$82.93	\$82.69	\$82.94	\$86.02

In summary, Table 5 showed that better wintered calves gained 98 pounds per head more at a feed cost of \$8.74 per head more than the low-wintered calves. Table 6 showed that although the low-wintered calves gained faster and at lower feed cost in summer dry-lot, they still were 83 pounds lighter when marketed at about 18 months of age than the calves which had been better fed during the first winter. In Table 7, it is seen that the low-wintered calves gained .3 pound per day more on summer pasture than the better-wintered calves; yet gained no faster in winter finishing lot. When steers were sold at 24 months of age, the animals which had been fed a limited ration the first winter were still 57 pounds lighter than those calves which had received a normal-growing ration the first winter.

The difference in profit per head above feed costs, weaning to market, was not great but favored the calves which had gained 1.27 pounds per day the first winter, over the calves which had gained only .78 pound per day in the first winter.

Feed prices used in computing tables 6 and 7 were different from the prices used in all other tables in this report, in that ground barley was priced at \$1.55 per cwt. for tables 6 and 7, but at \$1.77 per cwt. in all other tables.

### **SILAGE FROM 120-DAY CORN AND 85-DAY CORN COMPARED IN FEEDING HEIFER CALVES**

One silo was filled with silage made from 120-day corn and another was filled with silage made from 85-day corn. Two lots of heifer calves were designated to receive silage from each silo for the entire feeding period of 284 days. All lots were supplemented with limited amounts of alfalfa hay, ground barley, soybean meal and minerals. One lot on each type of silage was supplemented with 30,000 units of Vitamin A

palmitate per day. A summary of results is presented in Table 8.

<b>Table 8.</b>				
	<b>120-Day Corn Vit. A</b>	<b>120-Day Corn No 'A'</b>	<b>85-Day Corn Vit. A</b>	<b>85-Day Corn No. 'A'</b>
No. of heifers per lot	7	7	6*	7
Initial wt. Nov. 29	382	391	385	396
Final wt. Sept. 9	832	867	878	884
Av. Daily gain	1.58	1.68	1.74	1.72
<b>Daily Ration</b>				
Corn Silage	33.8	33.9	35.4	35.0
Alfalfa hay	1.4	1.4	1.4	1.4
Ground barley	3.4	3.4	3.4	3.4
Soybean meal	1.0	1.0	1.0	1.0
Bonemeal & salt, 3:1	.20	.20	.20	.20
Vitamin A	30,000 units	0	30,000 units	0
<b>Feed Per 100 Lb. Gain</b>				
Corn Silage	2136	2023	2039	2038
Alfalfa hay	90	85	82	83
Ground barley	217	205	198	200
Soybean meal	63	59	58	58
Bonemeal & salt, 3:1	13	12	12	12
Vitamin A (Thousands of units)	1,893	0	1,728	0
Feed Cost/100 Lb. Gain	\$15.86	\$14.63	\$14.80	\$14.52
Live Wt. Selling Price	\$23.48(All sold together)			
Carcass Price	\$41.65			
Dressing Percent (Based on home wts.)	56.4%			
U. S. Grades	10 choice, 15 Good, 2 Standard			

\*One heifer was lame and fell behind others in rate of gain, so was removed.

Combining the two lots on 120-day corn silage and comparing them with the two lots on 85-day corn silage, we have the results shown on Table 8-A.

<b>Table 8-A. Silage from 120-Day Corn vs. Silage from 85-Day Corn for Fattening Heifers</b>		
	<b>120-Day Corn</b>	<b>85-Day Corn</b>
No. of heifers	14	13
Initial wt.	386.5	390.5
Final wt.	849.5	881.0
Av. Daily gain	1.63	1.73
<b>Average Daily Ration</b>		
Corn silage	33.85	35.2
Alfalfa hay	1.4	1.4
Ground barley	3.4	3.4
Soybean meal	1.0	1.0
Bonemeal & salt, 3:1	.2	.2
<b>Feed Per 100 Lb. Gain</b>		
Corn silage	2080	2039
Alfalfa hay	88	83
Ground barley	211	199
Soybean meal	61	58
Bonemeal & salt, 3:1	13	12
Feed Cost Per 100 Lb. Gain	\$15.25	\$14.66

The heifers on the 85-day corn silage appeared to have slightly better appetites and made .10 pound greater daily gain than then heifers on the silage made from 120-day corn.

When we combine the two lots which received supplemental Vitamin A and compare them with the non-supplemented lots, we have the

story told by Table 8-B.

<b>Table 8-B. Supplemental Vitamin A in a High Silage Ration for Fattening Heifers</b>		
	Vitamin A	No 'A'
No. of animals	13	14
Initial wt.	383.5	393.5
Final wt.	855.0	875.5
Av. daily gain	1.66	1.70
<b>Feed Per 100 Lb. Gain</b>		
Corn silage	2088	2031
Alfalfa hay	86	84
Ground barley	208	203
Soybean meal	61	59
Bonemeal & salt, 3:1	13	12
Vitamin A	1,810,000 units	0
Feed Cost Per 100 Lb. Gain	\$15.33	\$14.58

No benefit appears to have been derived from the supplemental Vitamin A fed in this experiment.

### STILBESTROL IMPLANTS FOR HEIFERS

The same heifers which were used in the silage comparison reported in Table 8 were implanted across lots at weaning time, one month before the silage feeding trial started. Sixteen of the 27 head completing the experiment were implanted with 1-12 mg. stilbestrol pellet at weaning, and again six months later. Since the treatment was across all four lots and the cattle were sold as a unit, there was no feed or carcass information.

<b>Table 8-C. Stilbestrol Implants for Fattening Heifers</b>		
	<b>12 Mg. Stilbestrol Twice, at 6 Mo. Interval</b>	<b>No Stilbestrol</b>
No. of heifers	16	11

Initial wt.	342	335
Final wt.	891	828
Av. daily gain, 313 days	1.75	1.57
Additional gain per head	56	

As a further supplement to Table 8-A comparing silage from 85-day corn with silage from 120-day corn, the following 3-year record of yield and protein content of silage made from corn of 3 maturity ranges is presented.

### SILAGE PRODUCTION OF CORN HYBRIDS IN EARLY, MEDIUM, AND LATE RELATIVE MATURITY RANGES

Relative Maturity Range	Average Yield, tons @ 70% Moisture				Average Protein, %			
	1960	1961	1962	3-Yr. Av.	1960	1961	1962	3-Yr. Av.
80-89 days	3.2	3.3	6.9	4.5	3.37	3.30	3.00	3.22
93-102 days	4.1	3.6	8.0	5.2	2.17	3.50	3.30	3.00
105-120 days	4.6	3.5	9.5	5.9	2.33	3.60	3.30	3.08

### COMPARING OATS, BARLEY, BEET PULP FOR WINTERING STEER CALVES

This steer wintering experiment was conducted for three successive winters. The purpose of the trial was to determine whether oats, barley, oats and barley, or oats, barley and pelleted beet pulp combined constituted the best grain supplement for steer calves on a high silage ration. Table 9 presents the 1961-62 winter results and the three-year summary:

	3-Lb. Ground Oats		3-Lb. Ground Barley		3-Lb. Ground Oats & 3-Lb. Bly.		2 oats, 2 barley, 2 beet-pulp	
	61-62	3-yr. av.	61-62	3-yr. av.	61-62	3-yr. av.	61-62	3-yr. av.
No. steer per lot	8	8	8	8	8	8	8	8
Initial wt.	427	411	426	409	426	410	426	410
Final wt.	751	765	761	759	748	776	779	783

Av. daily gain	1.82	1.97	1.88	1.95	1.80	2.03	1.98	2.07
Days on feed	178	180	178	180	178	180	178	180
<b>Av. Daily Ration</b>								
Corn silage	29	31	30	31	26	27	27	27
Alfalfa hay	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Soybean meal	1.0	1.0	1.0	1.0	.5	.5	.5	.5
Grain	3.0	3.0	3.0	3.0	5.7	5.9	5.7	5.9
Bonemeal & salt, 3:1	.2	.2	.2	.2	.2	.2	.2	.2
<b>Feed/100 Lb. G</b>								
Corn silage	1573	1570	1587	1616	1466	1342	1345	1314
Alfalfa hay	83	77	80	76	83	74	75.7	73
Soybean meal	54	50	53	51	26	24	24	23
Grain	163	151	158	152	314	288	287	281
Bonemeal & salt, 3:1	11	10	10	10	11	10	10	10
Feed Cost/100 Lb. G.	\$12.19	\$11.69	\$11.90	\$11.78	\$13.34	\$12.22	\$12.37	\$12.12
The results obtained with these four rations were so nearly alike that it is impossible to say that one ration was better than another. Average daily gains for three years ranged from a low of 1.95 pounds per day in the lot which was fed 3 pounds of barley, to a high of 2.07 pounds in the lot receiving oats, barley, and beet pulp in combination.								

### STILBESTROL IMPLANTS

The steers reported on in Table 9 were implanted at weaning with 0, 12, and 24 mg. of stilbestrol across lots. At the close of the winter feeding period, all steers were implanted, regardless of winter treatment. Spring implants were 24 mg. per head in 1960 and 1961, but 36 mg. in 1962. A summary of average weight gains for the three years is presented in Table 10.

<b>Table 10. Stilbestrol Implants for Steer Calves at Weaning, and again as Yearlings</b>												
	24 mg. at Weaning				12 mg. at Weaning				None at Weaning			
	1959	1960	1961	3-Yr. Av.	1959	1960	1961	3-Yr. Av.	1959	1960	1961	3-Yr. Av.
Weaning wt.	401	400	430	410	406	397	426	410	407	399	427	411



Spring wt.	777	810	774	787	777	786	768	777	744	756	740	747
Winter gain/day	2.12	2.23	1.94	2.10	2.09	2.11	1.92	2.04	1.91	1.94	1.76	1.87
Winter gain/head	376	410	344	377	371	389	342	367	337	357	313	336
Spring Implant	24 mg.	24 mg.	36 mg.		24 mg.	24 mg.	36 mg.		24 mg.	24 mg.	36 mg.	
Final wt.	1046	1101	1083	1077	1039	1066	1098	1068	993	1034	1065	1031
Summer gain/day	2.28	2.55	2.62	2.48	2.22	2.46	2.79	2.49	2.11	2.44	2.75	2.43
Summer gain/head	269	291	309	290	262	280	330	291	249	278	325	284
Total gain/head	645	701	653	667	633	669	672	658	586	635	638	620

No other single treatment or nutrient has paid so well in relation to its cost as has the use of stilbestrol.

### STEAM ROLLED, DRY ROLLED, OR TEMPERED AND ROLLED BARLEY FOR YEARLING STEERS

An experiment to compare three types of rolled barley was conducted in 1961 and repeated with modifications in 1962. Steam rolling was done by a commercial mill; dry rolling, and tempering and rolling were done at the farm. In tempering, the barley was elevated to an overhead bin by a 4-inch auger into which water was metered to bring the moisture content of the barley to about 18% at rolling time. The dampened grain stood in the bin 24 hours before being rolled.

Duplicate lots of five head each were fed each year. All lots were hand-fed in 1961, but one lot on each type of barley was self-fed in 1962. Table 11 shows the results of the 1962 trials.

	Dry-Rolled		Steam-Rolled		Tempered	
	Self-fed	Limited	Self-fed	Limited	Self-fed	Limited
		Hand-fed		Hand-fed		Hand-fed
Initial wt.	765	764	766	765	765	765
Final wt.	1077	1043	1090	1081	1131	1090
Av. daily gain	2.64	2.36	2.75	2.68	3.10	2.75
Days on feed	118	118	118	118	118	118

<b>Daily Ration</b>						
Corn silage	12	40	12	40	12	40
Rolled barley	14.2	8.8	16.0	8.8	16.7	8.8
Supplement	1	1	1	1	1	1
<b>Feed Per 100 Lb. G</b>						
Corn silage	452	1679	442	1500	391	1467
Rolled barley	537	371	582	328	537	319
Supplement	38	42	36	37	32	36
Feed Cost Per 100 Lb. G.	\$12.27	\$13.89	\$13.56	\$12.65	\$11.87	\$12.01
Carcass Price/100	\$41.00	\$39.85	\$41.00	\$38.70	\$41.00	\$38.80
Carcass Grades	all good	4 good	all good	3 good	all good	3 good
Dressing % (on home wt.)	60.0	58.3	59.2	58.0	58.9	57.7
Carcass Grades (cont.)		1 std.		2 std.		2 std.

The supplement used in these lots was made as follows: Ground alfalfa hay 40 lb., soybean meal 25 lb., wheat bran 15 lb., Di-Calcium phosphate 6 lb., Ground limestone 5 lb., Trace mineral salt 8 lb., Vitamin A 1 million units, Vitamin D 100,000 units. The steers were charged \$3.00 per 100 pounds for this supplement.

Self-feeding produced faster gains and a higher grading carcass in each of the three comparisons with limited hand-feeding. The two lots on tempered barley outperformed those on dry or steam-rolled barley in 1962.

For a closer look at the relative merits of dry, steam, and tempered barley, the results of both the 1961 and 1962 trials are combined in Table 12.

<b>Table 12. Dry Rolled, Steam Rolled, or Tempered and Rolled Barley for Steers</b>			
	<b>2-Year Averages</b>		
	<b>Dry Roll</b>	<b>Steam Roll</b>	<b>Tempered Roll</b>
No. of steers	20	20	20
Initial wt.	776	776	777
Final wt.	1074	1073	1089

Av. daily gain	2.56	2.56	2.69
<b>Feed Per 100 Lb. Gain</b>			
Corn silage	1316	1281	1284
Rolled barley	407	423	405
Supplement	39	39	38
Feed Cost Per 100 Gain	\$13.11	\$13.69	\$12.92
Carcass Selling Price/100	\$38.27	\$37.92	\$37.96
*Carcass Grade	9.2	9.1	9.1
Dressing %, on home wt.	58.68	58.20	58.25
*A score of 10 means US. Choice, 9 Good, and 8 Standard.			

There appears to be no clear advantage for one method of rolling over the other methods. The lots on tempered did very well in the second trial, therefore, showed the most profit in the averages.

### CORN SILAGE OR BEET PULP FOR STEERS

It was shown in Table 9 that beet pulp mixed with barley and oats in equal parts made a very satisfactory grain mixture for steer calves wintered on a high silage ration.

The purpose of this trial was to compare dried beet pulp with corn silage as roughages for the entire feeding period. Light weight steer calves were fed ground barley at a moderate level, with alfalfa, soybean meal, minerals and vitamins. In one lot, corn silage made up, 40% of the total dry matter in the ration, and in one lot, pelleted beet pulp made up about 40% of the dry matter in the ration. The experiment was conducted twice with the results shown in Table 13.

<b>Table 13. Corn Silage vs. Beet Pulp for Growing, Fattening Steer Calves</b>				
	<b>Beet Pulp 61-62</b>	<b>Corn Silage 61-62</b>	<b>Beet Pulp 2-yr. av.</b>	<b>Corn Silage 2-yr. av.</b>
No. of steers	5*	8	5.5	7.5
Initial wt.	301	298	296	298
Final wt.	930	932	967	917

Av. daily gain	2.01	2.02	2.20	2.03
Days on feed	313	313	306	306
<b>Daily Ration</b>				
Corn silage	0	27.00	0	25
Pelleted beet pulp	6.38	0	6.19	0
Ground barley	6.35	6.00	6.53	6.25
Alfalfa hay	1.56	1.50	1.48	1.55
Soybean meal	.97	.92	.94	.90
Bonemeal & salt, 3:1	.16	.17	.16	.16
Vitamin A, units	10,140	9,780	7,570	7,290
Vitamin D, units	1,014	978	1,007	989
<b>Feed Per 100 Lb. Gain</b>				
Corn silage	0	1332	0	1237
Pelleted beet pulp	317	0	285	0
Ground barley	316	296	298	309
Alfalfa hay	77.5	73.8	68	76
Soybean meal	48.3	45.6	43	44
Bonemeal & salt, 3:1	8.0	8.4	7	8
Vitamin A, (thousands of units)	504	483	357	365
Vitamin D, (thousands of units)	50	48	46	49
Feed Cost Per 100 Lb. Gain	\$15.11	\$13.09	\$13.76	\$12.88
Carcass Selling Price	\$43.27	\$43.27	\$39.71	\$39.65
**Carcass Grade	9.46	9.46	9.48	9.43
Dressing % (on home wt.)	56.35	56.35	57.03	58.08

\*Eight calves started the trial, one died of enterotoxemia, one died on coccidiosis, and one died of undetermined causes.

\*\* A score of 10 means a grade of Choice, 9 means Good, 8 means Standard. Both lots were sold together in 1962, so no differences in price or dressing % were obtained.

## FATTENING STEERS WITH AND WITHOUT GRAIN

Three lots of steer calves were started on a 12-month feeding period to compare rate and cost of gain and corn silage and commercial supplement, corn silage and home-made supplement, and corn silage plus grain and soymeal. The purpose was to seek an answer to the claim that steers can be fattened as economically on corn silage and a protein supplement, as on the conventional ration of corn silage, grain, and supplements.

The home-mixed supplement used was mixed as follows:

Linseed meal	100
Soybean meal	100
Wheat bran	80
Di-Calcium Phosphate	10
Trace Mineral Salt	8
Zinc Bacitracin	15 gms.
Penicillin	5 gms.
Vitamin A	4.5 million units
Vitamin D	250,000 units

The cost of ingredients plus mixing was determined to be \$4.60 per hundred weight. The commercial supplement cost \$7.00 per 100 pounds.

The three lots of cattle were sold on grade and yield to get accurate carcass information. Table 14 shows the results of the experiment.

<b>Table 14.</b> Commercial Supplement, Home-Made Supplement, or Grain and Soymeal with Corn Silage			
	Commercial Supp.	Home-Made Supp.	Grain & Soy
No. steers per lot	8	8	8
Initial wt.	369	369	368
Final wt.	998	1027	1093
Av. daily gain	1.74	1.82	2.01

Days on feed	361	361	361
<b>Daily Ration:</b>			
Corn silage	45.8	44.4	30.4
Alfalfa hay	0	1.5	1.5
Ground barley	0	0	6.7
Supplement	1.5	1.5	0
Soymeal	0	0	.7
Bonemeal & Salt, 3:1	0	0	.2
<b>Feed Per 100 Lb. Gain</b>			
Corn silage	2626	2436	1515
Alfalfa hay	0	82.3	74.7
Ground barley	0	0	333
Supplement	86.0	82.3	0
Soymeal	0	0	35.7
Bonemeal & Salt, 3:1	0	0	9.5
Feed Cost Per 100 Lb. G	\$15.47	\$13.29	\$14.08
Carcass Value Per 100 Lb.	\$43.35	\$43.56	\$43.96
Live Wt. Value Per 100 Lb.	\$23.50	\$23.76	\$25.55
Dressing %, on home wts.	54.2	54.6	58.1
Carcass Grades	2 Choice 6 Good	3 Choice 5 Good	5 Choice 3 Good

There was not a significant difference in gains between the steers fed Home Supplement and those fed Commercial Supplement, but the Home Supplement allowed considerably more profit above feed costs. The faster-gaining grain-fed steers dressed and graded higher than either of the other lots; therefore, sold higher and returned substantially more profit than either of the other two lots.

## HOG FEEDING 1961-1962

Four rations were fed to six lots of fall pigs weaned in November, 1961. All rations were fed in meal form. They were formulated as follows:

	<b>Soybean Meal</b>	<b>Soybean Meal + Bacitracin</b>	<b>High Soybean Meal</b>	<b>Buttermilk &amp; Soybean Meal</b>
Barley	1240	1240	1180	1140
Oats	620	618	580	560
Soybean meal	100	100	200	100
Dried buttermilk	0	0	0	160
Steamed bonemeal	20	20	20	20
Ground limestone	10	10	10	10
Trace mineral salt	10	10	10	10
ZN Bacitracin & Penicillin	0	20 grams	0	0
Calculated Protein %	14.3	14.3	15.9	15.7

Two lots of late fall pigs were allotted November 20 and self-fed the high soybean meal ration against the buttermilk and soybean meal ration. After 120 days, the protein supplements were cut 50% in each lot.

	<b>High Soybean Meal</b>	<b>Buttermilk and Soybean Meal</b>
Initial wt.	25.2	25.8
Final wt.	160.8	216.8
Av. daily gain	.87	1.23
Days on test	155	155
Feed/100 Lbs. Gain	474	424
Feed Cost/100 Lb. Gain	\$9.66	\$10.30
Selling Price/100 Lbs.	\$14.60	\$15.50

Feed Cost/Head	\$13.10	\$19.67
Sale Price Per Head	\$23.47	\$33.60
Gross Profit Per Head	\$10.37	\$13.93

Although the pigs in the second lot were charged 9 cents per pound for the dried buttermilk, they paid all feed bills and returned about \$3.50 per head more profit than the pigs which did not receive the animal protein. Soybean meal is usually our cheapest source of protein, but it cannot take the place of milk and its by products in the diet of young animals.

Six other lots of fall pigs were fed in pairs, each pair consisting of one lot of 47-pound pigs and one lot of 32-pound pigs. All lots were weighed off and the trial was terminated February 27, 1962, when the heavier pigs were ready for market. The gain data are summarized in Table 17.

<b>Table 17. Three Rations for Fall Pigs, Winter, 1961-1962.</b>						
	<b>Soybean Meal</b>		<b>High Soybean Meal For 72 Days, Then Soybean Meal</b>		<b>Soybean Meal and Bacitracin</b>	
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
Initial wt.	32	47	32	47	32	47
Final wt.	167	199	142	177	162	188
Av. daily gain	1.22	1.37	.99	1.17	1.17	1.27
Days on feed	111	111	111	111	111	111
Feed/100 Lb. Gain	387	435	462	485	414	492
Feed Cost/100 Lb. G.	\$7.62	\$8.57	\$9.39	\$9.87	\$8.57	\$10.18

The pigs in lots 3 and did not perform well on the high soybean meal ration. Lowering the soybean meal level did not result in a boost in gains, however, so the cause of the low rate of gain was probably not in the soybean meal. The antibiotic in the ration of lots 5 and 6 gave no boost in gains.

### HOG FEEDING - SUMMER - 1962

In the summer of 1962, 14 lots of spring pigs were fattened, 8 lots on concrete, and 6 lots on winter wheat pasture. The 8 lots on concrete were set up to compare grinding, dry rolling, steam rolling, and pelleting of barley, with the same supplement in all lots. The six lots of pigs on pasture were fed supplement in all lots. The six lots of pigs on pasture were fed unsupplemented barley prepared by each of the four



methods above, and these were checked against standard rations with protein and mineral supplements. Table 18 shows gain and feed cost data for the pigs on concrete. Table 19 gives the results of the lots fed on pasture. The ration used in all lots on concrete was mixed as follows: Barley 1855 lbs., soybean meal 100 lbs., steamed bonemeal 20 lbs., ground limestone 10 lbs., trace mineral salt 12 lbs., plus Vitamins B, D, and A.

<b>Table 18. Barley Prepared by Grinding, Steam Rolling, Dry-Rolling, or Pelleting for Pigs on Concrete - 1962</b>							
	<b>1-C</b>	<b>2-C</b>	<b>7-C</b>	<b>3-C</b>	<b>8-C</b>	<b>4-C</b>	<b>5-C</b>
	<b>Ground Bly.</b>	<b>Steam Rolled Bly.</b>		<b>Dry Roll Bly.</b>		<b>Pelleted Bly.</b>	
No. of pigs	10	10	0	10	10	10	9
Initial wt.	47	47	36	47	36	47	36
Final wt.	183	171	182	166	174	199	211
Av. daily gain	1.21	1.11	1.16	1.07	1.09	1.36	1.39
Days on feed	112	112	126	112	126	112	126
Feed/100 Lbs. G	402	426	377	412	385	366	333
Feed Cost/100 Lbs. G.	\$8.04	\$8.95	\$7.92	\$8.24	\$7.70	\$8.78	\$7.99

<b>Table 19. Barley Prepared by Grinding, Steam Rolling, Dry Rolling, or Pelleting for Pigs on Pasture - 1962</b>						
	<b>1-P</b>	<b>2-P</b>	<b>3-P</b>	<b>4-P</b>	<b>5-P</b>	<b>6-P</b>
	<b>Ground Bly. No Supp.</b>	<b>Steam-roll Bly. No. Supp.</b>	<b>Dry-Roll Bly. No Supp.</b>	<b>Pelleted Bly. No Supp.</b>	<b>Steam-Roll Bly. w/supp.</b>	<b>Ground Bly. With Supp.</b>
No. of pigs	10	9	10	9	10	10
Initial wt.	47	48	47	47	36	36
Final wt.	199	182	167	201	201	200
Av. daily gain	1.14	1.01	.90	1.16	1.31	1.31
Days on feed	133	133	133	133	126	126
Feed 100 Lb. G.	391	410	423	392	343	399
Feed Cost/100 Lb. G.	\$6.96	\$7.71	\$7.53	\$8.55	\$7.20	\$8.14

In Table 18, the lots fed pelleted barley with supplement gained faster and more efficiently than those pigs fed ground or rolled barley with supplement. Neither method of rolling was quite equal to grinding in this table. In Table 19 the pellets made without a supplement were no better than ground feed in producing pork. The two lots of smaller pigs which were fed a ration of barley with protein, mineral and Vitamin supplements on pasture outgained the unsupplemented lots.

### PUBLIC MEETINGS 1962

Date	Meeting and Subject	Attendance
January 8-11	Annual Branch Station Meeting	
February 7	Stark County Livestock Tour, Dickinson	125
February 8	Golden Valley County Livestock Tour, Beach	100
February 13	Hettinger Station Annual Sheep Day, Hettinger	150
February 16	McKenzie County Livestock Tour, Charlson	100
February 21	Slope County Crops and Livestock Meeting, Amidon	60
February 23	Farm Bureau Stockmens' Meeting, Dickinson, "Diseases"	50
March 14	President Albrecht, Directors Hazen and Schulz visited Station briefly	
April 27	Dr. William Dinusson spent day discussing our summer feeding trials	
May	No Meetings	
June 13	Attended Grassland Field Day, Mandan	
June 12	Attended North Dakota Stockmen's Convention, Bismarck	
June 15	4-H Judging work-out at Station	
July 11-13	Attended section meeting of American Society Range Mgt., Havre, Montana	55
July 18	Annual Crops Day, Dickinson Experiment Station	150
July 19	Spoke to the General Agriculture Class of DSTC	15
July 27	Dean Hazen and family stopped at Station	
August	No Meetings	
September 11	Dr. Dinusson visited Station, Discussed trials	

September 15	Richardton 4-H Festival - Judged livestock	
September 21	Stark-Billings 4-H Roundup - Judged Livestock	
September 26	Extension Livestock meeting at Dickinson	
October 1	Western North Dakota Hereford Tour	250
October 6	Chapter Meeting of Northern Great Plains Sec., A.S.R.M., Mandan	30
November 7	Attended Rotary-Farmers Meeting, Dickinson	100
November 21	Attended O'Bach's production sale at Schnell's	
December 5	Livestock Research Roundup	1100
December 6 and 20	Rural Areas Development meetings, Dickinson	
December 8	Farmer's and Feeder's meeting, Hebron	30
December 10-14	State Extension Conference, Fargo	

### RADIO PROGRAMS, 1962

Date	Subject
January 18, 1962	Economical Feeding and Management
February 8, 1962	Feed and Water for Calves in Feed Lot
March 1, 1962	Heritability Estimates in Beef Cattle
March 22, 1962	Four Months' Progress Report, Beef Cattle Feeding
April 12, 1962	Two-Year Old Steers Sold March 15
May 3, 1962	Some Results of Winter Feeding
May 24, 1962	Feed Yearlings on Grass for More Beef
June 21, 1962	Hog Feeding
July 26, 1962	Cattle Feeding Work
August 16, 1962	Summer Hog Feeding
September 20, 1962	Creep Feeding Calves

October 11, 1962	Summer Hog Feeding Trials
November 1, 1962	Stilbestrol Implants
December 12, 1962	Finishing Steers on Barley
December 13, 1962	Break-Even Prices on Calves

## PUBLICATIONS

North Dakota Farm Research, "Effect of First Winter Feed on Later Gains" - November-December, 1962, by Raymond J. Douglas, Larkin H. Langford, M. L. Buchanan