1961 REPORT OF LIVESTOCK INVESTIGATIONS

BY LARKIN H. LANGFORD

THE BEEF BREEDING HERD

During the breeding seasons, about June 20 to July 31, of 1958, 1959, and 1960, the cow herd has been divided into three groups. One bull has been placed with each group, and a fourth bull has run with yearling heifers. For the late season clean-up, cows have been combined into two herds with one bull per herd. This system of management, combined with recorded birth weight and weaning weights, has given us enough data on the reproductive performance of each bull to form a basis for evaluation. Bulls which sire calves of inferior weight or quality can be eliminated from the herd. The bulls that have been used are:

Sire 4 - Zato Heir 9, bred by A. W. Powell, Sisseton, South Dakota

Sire 5 - Zato Heir 18, bred by A. W. Powell, Sisseton, South Dakota

Sire 6 - TTT Silver Lad, bred by Thor Tagestad, Towner, North Dakota

Sire 8 - DGH Rupert Aster, bred by Don Hoag, Harwood, North Dakota

Table 1. Weaning Weights and Ages of Calves by 4 Sires, 3 Seasons. Does Not Include Calves From 2-Year Old Heifers.

	Sire 4			Sire 5		Sire 6			Sire 8	
	1959	1960	1961	1959	1960	1959	1960	1961	1960	1961
No. calves	40	23	24	17	22	6	17	17	11	28
Weaning Wt.	333	344	384	369	333	346	351	375	326	358
Age in Days	172	194	197	177	176	185	191	193	163	179
Wt/Day of Age	1.94	1.78	1.95	2.08	1.89	1.87	1.84	1.94	2.00	2.00

Bulls No. 4 and 6 were sold in the Fall of 1961. Weights are taken on all breeding animals regularly. Table 2. Summarizes the breeding herd record for three years. Two-year olds and their calves were not included.

Table 2. Cow Weights and Calf Production for 1959, 1960, 1961

	1959	1960	1961
No. Cows, 3 yrs. and older	81	82	77
Wt. at weaning, fall before	1057	1012	1068
Wt. March 30, before calving	1094	1081	1127
Wt. at weaning, current year	1036	1106	1059
Cow Ration, Preceding Winter:			
Corn Silage, Lb.	25	12-3 mo., 0-3 mo.	0
Crested and Brome Hay, Lb.	12	12-3 mo., 17-3 mo.	12-4 mo., 19-2 mo.
Straw, Lb.	0	5	7-4 mo, -mo.
Ground Barley	0	0	2-2 mo.
Calf Production:			
No. Born Alive	75	71*	72*
No. Weaned	71	71	72
No. Dry Cows	6	1	0
Av. Birth Wt.	71.7	73.6	70.8
Av. Weaning Wt.	344.1	338.5	371.9
Av. Weaning Age, Da.	175	182	189
Av. Wt. Per Da. of Age	1.97	1.86	1.96
*Not included in data were 9 late calves in 1960 and 3 late ones in 1961. Also, one was born dead in 1960, and two died young in 1961.			

CREEP FEEDING OF CALVES

On June 22, 1961, the 91 cows which comprised the breeding herd were divided into three groups. This allotment was made across previous lot lines taking into account the age and weight of cows, weight and sex of calves, and over-all quality of the cows. The purpose was to begin a study in creep feeding whole oats to the calves of one group, while grazing the other cow and calf pairs in the usual manner without a creep feeder. Since the three pastures are not equal in every respect, this study will have to be repeated, using a different pasture for the creep feeding each' year until weaning weights have been taken on each pasture, with and without a creep feeder. Creep

feeding was begun July 1 and continued until weaning, October 30.

Table 3. Creep-Feeding Whole Oats to Calves - 1961			
	East Park	**West Park**	**Home Pasture**
	No Creep	**No Creep**	**Creep Feeder**
No. Cows	29	30	30*
Av. Wt. Cows, June 22	978	956	990
Av. Wt. Cows, Oct. 30	1032	1031	1021
Summer Gain/Hd., Cows	54	75	31
No. Steer Calves Weaned	17	16	16
No. Heifer Calves Weaned	12	14	14
Birth Wt. All Calves	70.6	69.1	70.3
Weaning Wt. All Calves	348.6	346.2	383.7
Total Wt. Oats Fed, Lbs.			5,133
Av. Wt. Oats Fed/Calf			171
Av. Additional Wt./Calf			36
Value of Oats/Bu. Using 28¢ Per Lb. Average Calf Price			$1.88
*Two cows lost calves before the grazing season; were removed from averages.			

TWO LEVELS OF WINTERING STEERS FOLLOWED BY DIRECT OR DEFERRED FINISHING. 4-YEARS' RESULTS

This report covers the fourth and final year of a steer calf wintering experiment begun in the fall of 1957. Each winter, two equal lots of 16 steer calves were wintered on a 'normal' and a 'low' ration. On May 1 both lots were divided into two groups, one group from each lot was summer grazed and finished the following winter, while the other group from each lot was finished in summer dry lot.

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

The purpose of this experiment was to compare costs and profits between the two wintering rations and follow each group of steers through dry lot finishing, whether summer grazed or fed out immediately following the wintering period.

Table 4 shows results of the wintering phase; Table 5 summarizes the summer dry-lot feeding; and Table 6 combines summer grazing and dry-lot finishing which followed. Feed prices used throughout this report:

Corn Silage	7.20 per ton
Alfalfa Hay	18.00 per ton
Barley	.72 per bushel
Oats	.56 per bushel
Soybean Meal	80.00 per ton
Steamed Bonemeal	130.00 per ton
Trace Min Salt	54.00 per ton
Pelleted Beet Pulp	40.00 per ton
Grinding Grain	1.00 per ton when done at home
Grazing Yearlings	1.50 per hd. per month

Table 4. Wintering Steer Calves, 2 Rations, 4 Winters

	Normal Ration		Low Ration	
	1960-61	4-Yr. Av.	1960-61	4-Yr. Av.
Fall Weaning Wt.	349	359	349	360
Spring Wt.	583	592	491	496
Av. Daily Gain	1.27	1.27	.77	.78
Daily Feed:				
Corn Silage	22	23	19	20
Cr. Wht. Grass Hay	4	4	4	4
Whole Oats	2	2	0	0
Feed Per 100 Lb. Gain:				

Corn Silage	1735	1849	2522	2733
Cr. Wht. Grass Hay	309	313	507	550
Whole Oats	157	158	0	0
Feed Cost/100 Lb. Gain	$11.78	$12.24	$13.64	$14.79

Table 5. Summer Dry-Lot Finishing of One-Half the Steers In Wintering Lots

	From Normal Winter Lot		From Low Winter Lot	
	1961	4-Yr. Av.	1961	4-Yr. Av.
Initial Wt. (About May 1)	583	595	492	495
Final Wt. (about Oct. 30)	999	1018	923	945
Av. Daily Gain	2.38	2.39	2.46	2.54
Daily Feed:				
Corn Silage	40.60	45.00	41.30	42.50
Alfalfa Hay	2.50	2.50	2.50	2.50
Soybean Meal	1.50	1.50	1.50	1.50
Ground Barley	3.95	1.34	3.95	4.34
Bonemeal & Salt, 3:1	.20	.20	.20	.20
Feed Per 100 Lb. Gain:				
Corn Silage	1705	1857	1674	1681
Alfalfa Hay	105	104	101	97
Soybean Meal	62.6	63	60.3	59
Ground Barley	166	181	160	171
Bonemeal & Salt, 3:1	8.4	8.4	8.0	8.0
Feed Cost Per 100 Lb. Gain	$12.62	$13.38	$12.28	$12.35
Selling Price Per 100 Lb.	$22.40	$23.34	$22.75	$23.39
Return Per Hd. Above Feed From Weaning to Market	$64.87	$68.00	$58.06	$61.17

Tables 4 and 5 show that it was $6.83 per head more profitable to winter steer calves well (1.27 lbs. per day) than to winter them light, (.78 lb. per day) when all were fed out in dry lot immediately after the wintering period. Table 6 gives a three-year summary which indicates that the well-wintered calves returned $4.00 per head more gross profit than the lighter calves, when the first winter was followed by summer grazing and dry-lot finishing in the following winter. One more trial in this series is in progress.

Table 6. Steers Summer Grazed And Fed Out In Winter to Sell as Two-Yr. Olds

	Steers From Normal Winter Lots 3-Yr. Av.	**Steers From Low Winter Lots 3-Yr. Av.**
No. Steers	8	8
Wt. to grass	595	496
Wt. off grass	807	746
Days of grazing	146	146
Daily pasture gain	1.45	1.72
Days in Dry Lot	166	166
Daily Dry-Lot Gain	2.02	1.99
Finished Wt.	1139	1073
Daily Ration, Dry Lot:		
Corn Silage	55	56
Ground Barley	3.32	3.32
Soybean Meal	1.68	1.68
Alfalfa Hay	2.50	2.50
Bonemeal & Salt, 3:1	.27	.27
Feed Per 100 Lb. Gain:		
Corn Silage	2893	2881
Ground Barley	178	175
Soybean Meal	87	87
Alfalfa Hay	129	128

Bonemeal & Salt, 3:1	14	14
Feed Cost/100 Lb. Dry Lot Gain	$18.55	$18.39
Selling Price Per cwt.	$23.90	$24.43
Return Per Hd. Above Feed, Weaning to Market	$90.62	$86.62

In the dry-lot feeding of long yearlings, Table 6, it has been the practice to start them in September with only corn silage, 2 lbs. soybean meal, 2.5 lbs. alfalfa hay, bonemeal, and salt for the first 60 days. After 60 days, soybean meal was reduced to 1.5 lbs., and 4 lbs. of ground barley was added. In the first two winters, the barley allowance was raised to 8 lbs. per day for the final month of feeding. All feeding was done once daily, in the morning.

WINTERING STEER CALVES ON CORN SILAGE WITH OATS, BARLEY, AND DRY BEET PULP

In each of the last two winters, four lots of steer calves have been fed corn silage with 3 to 6 pounds of grain to compare to oats, barley, and pelleted beet pulp in wintering rations. All lots received 1.5 pounds of alfalfa hay, .15 pound of steamed bonemeal, .05 pound of salt, and either .5 or 1 pound of soybean meal, depending upon the level of grain fed.

There has been little difference in gains or costs of the four rations. In the first winter, 3 pounds each of oats and barley produced the highest daily gain (2.21 lb.); and in the second winter, the best gaining steers (2.20 lb.) were fed 2 pounds each of oats, barley, and beet pulp. Feed costs per 100 Lb. gain have ranged from a low of $10.81 for 3 pounds each of oats and barley to a high of $11.85 for 2 pounds each of oats, barley and beet pulp. The experiment is being run a third time in 1961-62. Results for the first two winters are summarized in Table 7.

Table 7. Comparing Oats, Barley, Beet Pulp for Wintering Calves

	Oats		Barley		Oats & Bly.		Oats, Bly., & Beet Pulp	
	59-60	**60-61**	**59-60**	**60-61**	**59-60**	**60-61**	**59-60**	**60-61**
No. Steers Per Lot	8	8	8	7	8	8	8	8
Initial Wt.	406	399	403	398	404	399	405	399
Final Wt.	758	785	756	759	796	784	764	805
Av. Daily Gain	1.99	2.10	2.00	1.96	2.21	2.09	2.03	2.20
Days on Feed	177	184	177	184	177	184	177	184

Av. Daily Ration:								
Corn Silage	31	33	31	33	27	28	26	29
Alfalfa Hay	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Soybean Meal	1	1	1	1	.5	.5	.5	.5
Ground Oats	2.9	3	0	0	3	3	2	2
Ground Barley	0	0	2.9	3	3	3	2	2
Pelleted Beet Pulp	0	0	0	0	0	0	2	2
Bonemeal & Salt, 3:1	.2	.2	.2	.2	.2	.2	.2	.2
Feed Per 100 Lb. Gain:								
Corn Silage	1568	1568	1562	1698	1223	1337	1279	1319
Alfalfa Hay	76	72	75	74	68	72	74	68
Soybean Meal	49	47	49	51	22	23	27	22
Ground Oats	148	142	0	0	135	140	96	89
Ground Barley	0	0	148	151	135	140	96	89
Pelleted Beet Pulp	0	0	0	0	0	0	96	89
Bonemeal & Salt, 3:1	10	10	10	10	9	9	10	9
Feed Cost Per 100 Lb. G	$11.39	$11.16	$11.07	$11.67	$10.81	$11.50	$11.85	$11.41

BARLEY, STEAM ROLLED, DRY ROLLED, OR TEMPERED AND ROLLED FOR YEARLING STEERS, WITH CORN SILAGE AND SUPPLEMENT

There has been much controversy over the relative merits of steam rolling, dry rolling, and rolling of tempered barley for beef cattle. All three methods of preparation are being used successfully by cattle feeders. Perhaps the know-how of the individual feeder is of greater importance than the method of feed preparation. Six lots, two on each type of feed, were fed for 114 days to compare the three methods of rolling barley. Steam rolling was by a commercial mill. Dry rolling was done at the farm, as was the rolling of tempered barley. 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 up to about 18 per cent at rolling time, 24 hours after mixing with water. This toughened the grain so that the dry roller did a better job of rolling than with dry grain. It was found that when the moisture content ran much above 20 per cent, grain stuck to the roller. Tempered and rolled barley lost most of the added moisture within a few days without causing heating or molding. Fresh feed was prepared about every week to ten days by each of the three methods. All cattle were sold on grade and yield at the close of the trial. The results are shown in Table 8.

Table 8. Steam Rolled, Dry Rolled, and Tempered Barley for Steers			
	Steam Rolled	**Dry Rolled**	**Tempered**
No. Steers	10	10	10
Initial Wt. May 4, 1961	787	788	788
Final Wt. Aug. 26, 1961	1060	1087	1068
Daily Gain	2.40	2.62	2.45
Daily Ration:			
Corn Silage	38.2	41.1	40.2
Rolled Barley	9.4	9.4	9.4
Supplement	1.0	1.0	1.0
Feed Per 100 Lb. Gain:			
Corn Silage	1591	1566	1639
Rolled Barley	390	359	382
Supplement	42	38	41
Feed Cost Per 100 Lb. Gain	$13.45	$12.19	$12.88
Carcass Selling Price Per 100	$35.99	$36.12	$36.01
Grade (9=G 10=Ch.)	9.4	9.5	9.4
Dressing %, on home wt.	57.8%	58.2%	58.2%
Both dry-rolled and tempered-rolled barley priced at $31.00 ton; Steam Rolled @ $34.00 ton; Supplement at $52.00 ton; mixed as follows: 24% ground alf. hay, 15% wheat bran, 11% soybean meal, 9% steamed bonemeal, 6% salt, 5% feeding limestone. 800,000 units Vitamin A, 200,000 units Vitamin D			

CORN SILAGE OR BEET PULP FOR STEERS

Two lots of 297-pound steer calves were fed ten months on ground barley, alfalfa hay, soybean meal, bonemeal and salt, vitamins A and D, and either pelleted beet pulp or corn silage. One steer in the beet pulp lot was a chronic bloater, yet after he was removed to a ration of corn silage, barley and supplements, the bloating stopped. The remaining steers in the beet pulp lot consistently outgained the silage-fed steers and returned about $5.00 per head more profit, but dressed about 2 per cent lower. Table 9 summarizes the trial.

Table 9. Corn Silage vs. Beet Pulp in Fattening Steer Calves, 1960-61		
	Lot 6 Beet Pulp & Barley	**Lot 5 Silage & Barley**
No. of Steers	6	7
Initial Wt.	291	297
Final Wt.	1003	901
Av. Daily Gain	2.39	2.03
Days on Feed	298	298
Feed Consumed Per Day:		
Corn Silage	0	23.1
Beet Pulp	6.0	0
Ground Barley	6.7	6.5
Alfalfa Hay	1.4	1.6
Soymeal	.90	.88
Bonemeal	.11	.11
Trace Mineral Salt	.04	.04
Vitamin A	5,000	5,000
Vitamin D	1,000	1,000
Feed Per 100 Gain:		
Corn Silage	---	1141
Beet Pulp	252	---
Ground Barley	280	321
Alfalfa Hay	57.5	78.0
Soymeal	37.6	43.2
Bonemeal	4.6	5.0
Trace Mineral Salt	1.6	2.0

Feed Cost Per 100 Lb. Gain	$11.78	$11.94
Carcass Selling Price/100	$36.15	$36.03
Grade (9=G 10=C)	9.5	9.4
Dressing %, on home wt.	57.7%	59.8%
Return Above Feed Cost/hd., Figuring Steer Calves @ $26.20	$49.09	$44.20

HEIFERS FATTENED ON STEAM-ROLLED BARLEY, WITH & WITHOUT CORN SILAGE

Last year, we reported that heifers self-fed steam-rolled barley gained more (2.07 lbs. per day) than heifers receiving 4 or 10 pounds per day of crested wheatgrass hay, with steam-rolled barley (1.74 & 1.60 lbs.). Other work, the most recent being that in the November-December, 1961 issue of 'North Dakota Farm Research' from the State University in Fargo, has indicated that a small amount of roughage with heavy barley feeding may give better results than no roughage. This report concerns three lots of heifer calves fed for nine months on steam-rolled barley, steam-rolled barley plus 7 pounds of corn silage, and steam-rolled barley plus 13 pounds of corn silage. Table 10 shows the results.

Table 10. Heifers Fattened On Steam-Rolled Barley, With and Without Silage

	Lot 1 Hand Fed	**Lot 2 Hand Fed**	**Lot 3 Self Fed**
No. of Heifers	9	9	9
Initial Wt.	294	295	295
Final Wt.	789	823	801
Av. Daily Gain	1.83	1.96	1.87
Days on Feed	270	270	270
Av. Daily Ration:			
Corn Silage	13.4	7.1	0
Alfalfa Hay	1.3	1.3	0
Steam-Rolled Barley	8.2	10.5	12.7

Supplement	.87	.93	.93
Feed Per 100 Lb. Gain:			
Corn Silage	729	362	0
Alfalfa Hay	68	64	11 (grass hay)
Steam-Rolled Barley	446	540	677
Supplement	47	47	50
Feed Cost/100 lb. Gain	$12.53	$12.76	$13.39
Carcass Selling Price/100	$34.65	$34.95	$34.95
Grade (9=G 10=Ch)	9.7	9.9	9.9
Dressing %, on home wt.	57.0%	58.3%	60.1%
Return Above Feed Cost/Hd. (Calves @ $23.65)	$24.27	$30.55	$30.73

Although the self-fed heifers (Lot 3) returned as much profit as the hand-fed heifers with limited roughage (Lot 2), there were several stiff animals in Lot 3 which would have sold lower under some market conditions.

CRACKED WHEAT VS. STEAM-ROLLED BARLEY FOR FATTENING STEERS

Cracked wheat is sometimes available at elevators and seed houses as a by-product of the cleaning process. The price is usually competitive with other feed grain prices, and the cracked wheat is often used in swine and poultry rations. Since there is little information available as to the value of cracked wheat in beef cattle rations, it was decided to run a test comparing it with steam-rolled barley. It should be recognized that the usual recommendation is to mix wheat with about equal parts of another grain in feeding cattle. No difficulty was experienced in keeping cattle on feed in this trial, probably because corn silage made up about 40 per cent of the dry matter in the ration. It was observed that the cattle did not appear to like wheat as well as rolled barley. The wheat lot always required more time to clean up their grain than the barley lot. The cracked wheat was dry-rolled to insure uniform small particle size. The wheat contained a noticeable amount of small black weeds seeds, mostly wild buckwheat and mustard, but the heifers rook this mixture as readily as they took clean cracked wheat, which was fed several times as a check on their appetite. Table 11 summarizes this trial. Cracked wheat was priced at $30.00 per ton.

Table 11. Cracked Wheat vs. Steam-Rolled Barley for Yearling Heifers

	Cracked Wheat	

	Dry Rolled	Steam-Rolled Bly.
Initial Wt.	474	474
Final Wt.	828	845
Average Daily Gain	2.02	2.12
Average Ration:		
Cracked Wheat	8.34	---
Steam-Rolled Barley	---	8.37
Corn Silage	23.6	26.3
Protein Supplement	1.0	1.0
Feed Per 100 Lb. Gain:		
Cracked Wheat	412	---
Steam-Rolled Barley	---	395
Corn Silage	1166	1243
Protein Supplement	49	47
Feed Cost/100 Lb. G	$11.86	$12.41
Selling Price/100 lb.	$21.30	$22.40
Return Above Feed/Hd. (Yearlings @ $23.00)	$25.36	$34.22

GRAIN FOR STEERS ON GOOD SPRING PASTURE

A preliminary trial in the spring of 1959 showed little additional gain on yearling steers which were fed 4 pounds of ground barley and oats while grazing good crested wheatgrass and alfalfa pasture. Average daily gains for 66 days of grazing were 3.06 pounds with grain, and 2.95 pounds without grain. In 1960, steers receiving 4 pounds per day of ground barley on grass averaged 2.73 pounds gain, while unsupplemented grass produced 2.17 pounds gain. Again, in 1961, 4 pounds of ground barley on grass produced 2.57 pounds daily gain, while grass alone produced only 2.13 pounds daily gain. The steers used in 1959 were reallotted after spring grazing for another experiment. All steers used in this grazing trial during 1960 and 1961 were placed in dry lot for immediate finishing. Table 12 shows how the steers performed on grass and in dry lot, and includes a third lot of similar steers which were kept in dry lot the entire summer of 1961 for comparison:

Table 12. Spring Grazing, With & Without Grain, Followed by Dry-Lot Feeding

	4 Lb. Bly.	On Grass	Grass Alone		Dry Lot
	1960	1961	1960	1961	1961
No. Steers	6	6	6	6	6
Wt. to Grass, 5/2/60, 5/4/61	478	486	477	487	486
Wt. off Grass, 7/14/60, 7/10/61	677	658	635	629	662
Av. Daily Gain on Grass	2.73	2.57	2.17	2.13	2.63
Initial Wt., Dry Lot	677	658	635	629	662
Final Wt.	952	884	927	856	850
Av. Daily Gain, Dry Lot	1.79	2.09	1.89	2.10	1.74
Av. Daily Gain, all summer	2.09	2.27	1.98	2.11	2.08
Av. Daily Ration, Dry Lot:					
Days in Dry Lot	154	108	154	108	175
Corn Silage	41	44	41	44	37
Ground Barley	4	4	3.9	4	4
Alfalfa Hay	1.9	2.5	1.9	2.5	2.5
Soybean Meal	1.5	1.5	1.5	1.5	1.5
Bonemeal & Salt, 3:1	.2	.2	.2	.2	.2
Feed Per 100 Lb. Gain:					
Corn Silage	2306	2105	2149	2088	1759
Ground Barley	222	191	205	192	192
Alfalfa Hay	105	120	99	119	120
Soybean Meal	83	72	77	72	72
Bonemeal & Salt, 3:1	11	10	10	10	10
Feed Cost/100 Lb. Gain, Dry lot	$16.58	$15.02	$15.41	$14.96	$13.79
Cost/100 Lb. Inc. Grazing	11.37	10.39	10.81	10.09	13.79
Selling Price/100 Lb.	25.10	22.50	24.75	22.40	22.70

Return/Hd., Yearlings @ 25¢	65.56	36.05	61.53	32.76	21.25
Value of crested wheatgrass and Alfalfa Pasture Per Steer/Acre		$19.00		$16.27	

STILBESTROL IMPLANTS

Stilbestrol implants have consistently given increased gains in steers at the Dickinson Experiment Station. Steer calves were implanted with 0, 12, or 24 mg. pellets at weaning time for four consecutive winters. The rations fed were all based on a heavy allowance of corn silage and 3 to 6 pounds of grain, plus a protein supplement, bonemeal and salt. Since the treatments were across lots, only rate of gain data could be secured. Response to the implants in the four winters was as follows:

Table 13. Stilbestrol Implants for Steer Calves on Wintering Rations

	Implanted 12 mg.		**Implanted 24 mg.**				**Not Implanted**			
	1959-60	1960-61	1957-58	1958-59	1959-60	1960-61	1957-58	1958-59	1959-60	1960-61
No. Steers	12	11	7	7	12	12	7	7	8	8
Initial Wt.	401	399	396	451	406	400	397	451	407	399
Final Wt.	777	777	747	799	777	810	701	788	744	756
Av. Daily Gain	2.12	2.06	1.97	1.81	2.09	2.23	1.71	1.75	1.91	1.94
Days on Feed	177	184	177	192	177	184	177	192	177	184

Two lots of yearling heifers were implanted across lot lines in the spring of 1961. The heifers were full-fed corn silage and grain with supplement for 175 days with the following results:

Table 14. Stilbestrol Implants for Yearling Steers

	12 mg. Implants	**No Implants**
No. Heifers	8	4
Initial Wt.	474	474
Final Wt.	853	805
Av. Daily Gain	2.16	1.89

Days on Feed	175	175

EARLY SPRING GRAZING

Yearling steers have been grazed on crested wheatgrass pastures, and on crested wheatgrass and alfalfa pastures for seven consecutive years. All pastures have been used heavily for about two months in the spring only. Nitrogen fertilizer was applied to one crested wheatgrass pasture at the rate of 50 Lb. N. per acre for three years. For a complete report on this experiment, including forage yield and consumption, see Dr. Warren Whitman's section of this report. A summary of animal gains only is given in Table 15.

Table 15. Steer Gains, Early Spring Pasture, 8-Acre Plots

	Year	No. Hd.	Date In	Wt. In	Date off	Wt. Off	Daily Gain	Gain Per Acre
Crested Wht-grass	1955	7	May 4	494	July 5	568	1.44	64
Crested Wht-grass	1956	6	May 17	520	June 30	601	1.79	60
Crested Wht-grass	1957	6	May 4	478	July 3	622	2.44	108
Crested Wht-grass	1958	6	April 29	553	June 30	680	2.02	95
Crested Wht-grass + N.	1959	6	May 8	528	June 29	661	2.50	99
Crested Wht-grass	1959	6	May 8	529	June 29	671	2.67	106
Crested Wht-grass + N.	1960	8	May 2	521	June 29	686	2.27	166
Crested Wht-grass	1960	6	May 2	523	June 29	658	1.86	102
Crested Wht-grass + N.	1961	8	May 4	516	June 21	623	2.23	107
Crested Wht-grass	1961	6	May 4	525	June 21	636	2.31	83
7-Yr. Av. Without N.		6		517		634	2.08	88
3-Yr. Av. With N.		7		521		656	2.32	124
Crested & Alfalfa	1955	7	May 4	494	July 5	600	2.07	92
Crested & Alfalfa	1956	8	May 17	520	June 30	616	2.14	96
Crested & Alfalfa	1957	9	May 4	498	July 3	639	2.36	158

Crested & Alfalfa	1958	8	April 29	550	June 30	683	2.11	133
Crested & Alfalfa	1959	8	May 8	523	June 29	636	2.13	113
Crested & Alfalfa	1960	8	May 2	521	July 14	658	1.88	138
Crested & Alfalfa	1961	8	May 4	515	June 21	608	1.95	94
7-Year Average		8		517		634	2.10	118

HOGS, 1960-61

The three growing-finishing rations used in pig feeding experiments of 1960 and 1961 were mixed as follows:

	Soybean Meal	Buttermilk & Soybean Meal	DES Supplement
Ground Barley	1240	1240	1260
Ground Oats	620	620	640
Soybean Meal	100	60	0
Dry Buttermilk	0	60	0
Steamed Bonemeal	30	30	20
Trace Mineral Salt	10	10	10
Dry Blood Meal	0	0	30
Meat & Bonemeal	0	0	30
Ground limestone	0	0	8
A & B Vitamins	0	0	3 1/4

The soybean meal ration was compared with the buttermilk and soybean meal ration on pigs started at 27 pound body weight in the summer of 1960. The latter ration gave faster and cheaper gains than the former (1.18 and .95 pounds daily gain , $8.52 and $8.98 per 100 pounds gain). The same two rations fed to pigs at 56 pounds initial weight showed less difference in gains and costs. The buttermilk and soy combination gave daily gains of 1.39 pounds at a cost of $9.08 per 100 pounds. The soybean meal alone produced gains of 1.23 pounds per day of $8.91.

In our opinion, the simple soymeal ration was satisfactory when pigs were placed on feed at 56 pounds, but when starting 27 pounds pigs, the combination soymeal and buttermilk was superior.

In the fall of 1960, six lots of pigs were started on the three rations listed above. The three rations were fed as pellets in the summer of 1960, but as meal in the winter of 1960-61. Winter feeding results are tabulated in Table 16.

Table 16. Growing-Finishing Fall Pigs, 1960-61

	Soybean Meal		Buttermilk & Soybean Meal		DES Supp.	
	Lot 3	**Lot 4**	**Lot 5**	**Lot 6**	**Lot 1**	**Lot 2**
No. Pigs	5	5	4	5	11	5
Initial Wt.	58.0	58.0	57.5	58.0	27.1	58
Final Wt.	185.6	184.2	182.8	190.6	189.4	187.2
Av. Daily Gain	1.25	1.24	1.23	1.30	1.17	1.27
Days on Feed	102	102	102	102	139	102
Feed Per 100 Gain	453	454	457	503	402	503
Feed Cost Per 100 G.	$8.20	$8.22	$9.05	$9.96	$7.60	$9.51

In this winter feeding trial, no significant difference between the three rations was evident, except in feed efficiency. The light-weight pigs of Lot 1 were a little more efficient as might be expected. Lots 2 and 6 were low in efficiency, possibly because of waste at the feeder.

SUMMER 1961 HOG FEEDING TRIALS

The Dickinson Experiment Station ration (D.E.S. Sup.) listed above was fed to pigs of 10 lots in the summer of 1961. Concrete dry lot was compared with winter wheat pasture (spring seeded), and two additives were tested, Copper Sulfate and Zinc Bacitracin. All feeders were pelleted and all lots were started on feed May 22. first, in Table 17, we will consider the lots on winter wheat pasture, with and without growth booster additives, $CuSO_4$ and Zn Bacitracin with Penicillin.

Table 17. Growth Boosters, $CuSO_4$ and Zn. Bacitracin in the DES Pig Ration

	Lot 2	Lot 3	Lot 4	Lot 5	Lot 6
	Check DES	**7.5 gms. Zn. Bac. 2.5 gms. Penicillin Per Ton**	**2 Lb. Cu SO_4 Per Ton**	**Same As Lot 3**	**Same As Lot 4**
Initial Wt.	35	35	35	25	25

Final Wt.	197	152	185	165	170
Av. Daily Gain	1.35	.98	1.25	1.17	1.21
Days on Feed	120	120	120	120	120
Feed/100 Lb. Gain	345	367	343	340	338
Feed Cost/100 Lb. G.	$8.07	$8.77	$8.27	$8.13	$8.15

Neither Copper Sulfate nor Zinc Bacitracin and Penicillin appeared to have a beneficial effect upon rate or efficiency of gains in this trial. About 25 per cent of the pigs in the above five lots were found to be affected with Rhinitis; therefore, the trial was closed prematurely to clean up this disease.

At the DES Station other spring pigs were finished in concrete floored pens using the DES ration, DES with Zn. Bacitracin and Penicillin, and the Dry Buttermilk and Soymeal ration listed on the preceding page. Table 18 summarizes this series of trials:

Table 18. Three Rations on Concrete for 2 Weights of Feeder Pigs

	Lot 1-C	**Lot 2-C**	**Lot 3-C**	**Lot 4-C**	**Lot 5-C**	**Lot 6-C**
	DES	**B Milk & Soy**	**DES & Zn. Bac.**	**DES**	**B Milk & Soy**	**DES & Zn. Bac.**
Initial Wt.	54	54	52	35	35	34
Final Wt.	172	176	167	159	158	190
Av. Daily Gain	1.28	1.33	1.25	1.03	1.03	1.30
Days on Feed	92	92	92	120	120	120
Feed/100 Lb. Gain	380	359	372	387	360	358
Feed Cost/100 Lb. G.	$8.89	$8.83	$8.89	$9.06	$8.86	$8.56

The large (54 Lb.) pigs performed about the same on all three rations in this set of concrete floored pens. The lighter (34 Lb.) pigs gained slower than the larger pigs on the DES and Buttermilk & Soy rations, but gained as well as the larger pigs (1.30 Lb. per day for lites, compared 1.28, 1.33 & 1.25 for heavies) on the ration supplemented with Zinc Bacitracin and Penicillin.

1961 POULTRY FLOCK

The usual 500 day-old white Plymouth Rock chicks were picked up at the Blue Ribbon Hatchery in Mandan, March 30, 1961. They were

brooded under two electric brooders in a brooder house that was heated by an oil heater. For three weeks, a commercial starter krumlet was fed, 500 pounds in all; then one ton of custom-made grower pellets was fed. Pullets were moved to an open front range shelter at seven weeks. As the pelleting mill was destroyed by fire, the cockerels were finished on grower mash, home mixed.

The cockerels were sold at twelve weeks of age, averaging more than four pounds per head. No sickness was seen in the flock at any time and mortality was about three per cent. For the first time in several years of straight-run chick raising, pullets outnumbered cockerels. There were only 190 cockerels in 500 chicks.

About 250 of the best pullets were moved from the range house to the laying house September 19. The laying house was remodeled before the pullets were housed.

The month by month laying record for pullets housed August 23, 1960, was as follows:

September	41.6%
October	59.7%
November	59.5%
December	45.8%
January	35.8%
February	24.6%
March	42.4%
April	44.8%
May	48.1%
June	46.7%
July	41.2%
August	38.0%

PUBLIC MEETINGS, 1961

Date	Meeting and Subject	Attendance
January 10-13	Annual Branch Station Conference, Fargo	

January 14	Sidney Feeders Tour, Sidney, Montana	200
January 26	Hettinger County Cattle Feeders Tour, Mott	200
January 30-February 4	American Society of Range Management, Salt Lake City	875
February 7	Annual Sheep Day, Hettinger Experiment Station	225
February 9	Dunn County Feeder Tour and meeting, Killdeer	75
February 10	North Dakota State University Cattle Feeder's Day, Fargo	
February 15	Golden Valley County Feeder Tour and meeting, Beach	100
February 16	Slope County Crops and Livestock Meeting, Amidon	70
February 25	McKenzie County Feeder Tour and meeting, Watford City	100
March 6-7	Valley City Winter Show, Valley City	
March 13	Baron's Club, Dickinson, "Beef Production"	25
May 12	Dr. Whitman's Range Management Class visited Station	16
May 29	Farm Group from Wishek toured Station	30
July 10	Baron's Club, Dickinson, Picnic and tour	30
July 10	Prof. Murphy's Agriculture Class, 1 hour lecture	27
July 12	Annual Crops Day, Tour of Feed Lots	225
July 13-15	American Society of Range Management, Maple Creek, Sask.	70
July 19	Rotary Picnic and tour of Station	60
July 21	4-H District Livestock Judging Contest	70
August 14	Baron's Club toured cattle feed lots	15
September 2	Richardton 4-H Festival	
September 12-15	National Barrow Show, Austin, Minnesota	
October 7	Land Judging Contest, Dickinson	75
October 24	Rotary Farmer's Night, Dickinson	70
October 25	Morton Burleigh County Agricultural Improvement Association, Bismarck	40
December 6	Twelfth Annual Livestock Research Roundup	1350

RADIO PROGRAMS, 1961

Date	Subject
January 19, 1961	Barley, Supplements, and Rates of Feeding
February 9, 1961	Calf Feeding
March 2, 1961	Rolled Barley and Supplements for Cattle
March 23, 1961	Results of Winter-Feeding of Big Steers
April 13, 1961	Five Months' Progress Report on Feeding
May 4, 1961	Summer Feeding Trials Planned
June 1, 1961	Summer Cattle Feeding Progress
June 29, 1961	Creep Feeding Calves
July 27, 1961	Cattle Feeding Work in Progress
August 24, 1961	Sale of Finished Heifers, July 31
September 21, 1961	Recently Marketed Fat Steers
October 12, 1961	Value of Spring Pasture for Cattle
November 2, 1961	The Year's Cattle-Feeding Experiments
November 23, 1961	Abstracts of Research Roundup
December 14, 1961	Summary of 4-Years' Calf Wintering Trials