1950

ANNUAL REPORT

DICKINSON EXPERIMENT STATION
DICKINSON, NORTH DAKOTA

SECTION III

LIVESTOCK INVESTIGATIONS

By

Larkin H. Langford

LIVESTOCK INVESTIGATIONS

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Project

Turkey Production

Personnel and objective

The Dickinson Experiment Station, with the cooperation of the Poultry Department of the N.D.A.C., set up this project as a continuation of the turkey production work that has been conducted here since 1947. Though the approach has varied from year to year, our aim has always been to produce marketable turkeys as economically as possible. In 1947 and 1948 the results were fair, but the 1949 birds reflected some unscheduled economies in labor that should go into proper management. The objective for 1950 was to compare two levels of protein supplement on turkeys that had been carefully started and properly managed. Our plan was to employ the best production practices that had been brought out in the previous 3 years' work and at the same time determine the amount of each type of grain that turkeys would take when offered corn, wheat, oats and pelletized concentrate separately.

Present Status

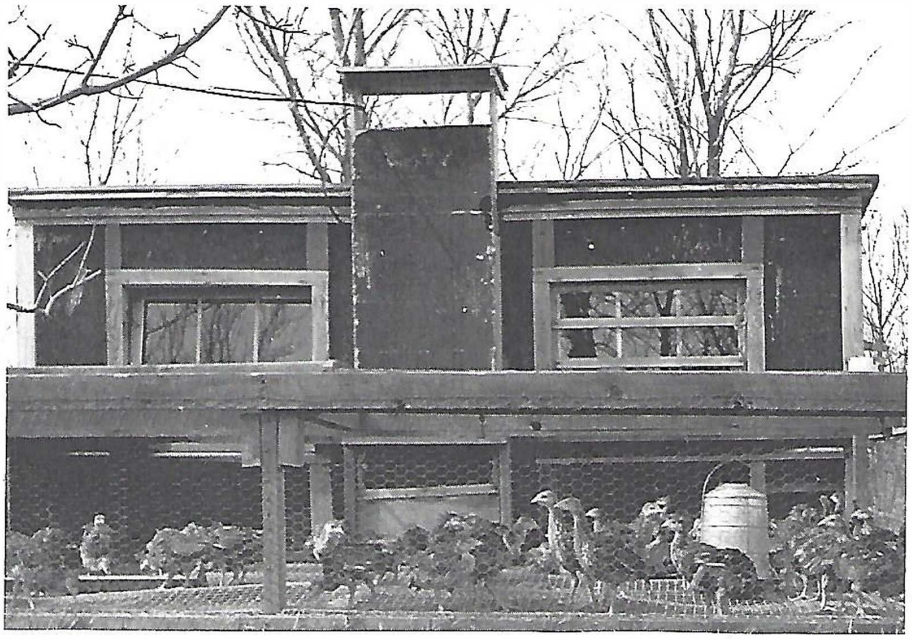
Two hundred fifteen Broad Breasted Bronze poults were delivered by Armour and Company of Bismarck, April 21, 1950. The poults were place on a burlap covered wire floor under an electric hover and started on Dakota Maid 26% pre-starter krumlets. Almost all poults were vigorous, took to their feed readily, and grew off well.

On the sixth day we clipped the last joint off the right wing of each bird to keep them on the ground. Three poults apparently bled to death as a result of this rough treatment but only a few others were visibly weakened.

On the eighth night a mechanical failure caused the electricity to be cut off sometime between midnight and five a.m. Thirty-two poults smothered in the resultant pile-up.

At 26 days of age, each poult was weighed and wing banded. The brooding period was 4 weeks along before the weather slacked up enough to allow the use of a sun porch. About 6 weeks, the 26% pre-starter ration was replaced with 24% starter.

When the 175 surviving poults were 60 days old they were divided into an even numbered lot and an odd numbered lot and moved to two similar cereal plots. Starter krumlets were gradually replaced by pellets carrying 20% protein in the even lot and 34% in the odd lot. Protein supplement, corn, wheat, and oats were all self-fed in separate feeder compartments. Both lots were moved to fresh cereal plots at two week intervals until August 1, when the cereal range gave way to sudan grass range. Fresh water, washed creek gravel, and a mineral mixture were kept before the turkeys.



1-Poults on sunporch at 4 weeks of age-May, 1950

2- Poults of the 34% protein lot on mixed wheat, oats, and barley range-June 22, 1950

3-Turkeys relish the leaves of young sunflowers at edges of range plots-July 15, 1950

4-Toms of the 20% protein lot strut their stuff as Thanksgiving approaches-November 10, 1950

Project

Purnell #129-Vitamin A in wintering beef cows. Altered for winter of 1949-50 to include role of phosphorus in wintering beef cows.

Personnel and cooperation

Dickinson Experiment Station, Dickinson, North Dakota
Department of Animal Nutrition, N.D.A.C., Fargo, North Dakota
Department of Botany, N.D.A.C., Fargo, North Dakota
Department of Veterinary Science, N.D.A.C., Fargo, North Dakota

Objective

To determine the effect of supplemental phosphorus in the winter ration upon beef breeding cows and upon weaning weight of their calves. A brief summary of two years results with vitamin supplements is included.

Present Status

On October 28, 1949, 26 of the original Purnell #129 cows and 10 of their yearling heifers that had been bred were divided into two equal groups and put in dry lots for the winter. Both lots received the same ration which consisted of about 29 lb. corn silage per head per day and 8 lb. of oat hay, or prairie hay later. The cows in lot A had free access to a mixture of equal parts steamed bonemeal and iodized salt, while the cows in lot B were allowed a free choice mixture of equal parts ground limestone and iodized salt. After each cow had calved she was given 4 lb. of ground oats and barley or corn and cob meal per day. Blood samples were taken each month for determination of phosphorus level. All cows and calves were turned on pasture together June 2, 1950, and remained there until calves were weaned Sptember 23, 1950.

All cows maintained their weights quite well until calving time, and appeared to come through the long winter in healthy condition with those exceptions that will be mentioned.

Average monthly weights of the cows in each lot are tabulated.
Calving period extended from February 11 to April 27.

	Oct.28-'49	Nov. 28	Dec.30	Jan. 31	Feb. 28	Mar. 31	May 3	May 24	June 28
Lot A Bonemeal	1056	1060	1071	1049	1033	991	983	938	1022
Lot B Limestone	1056	1058	1069	1044	1041	1000	997	926	1011

The switch from good oat hay to poor quality prairie hay, plus cold, muddy weather in May brought about a sharp drop in body weights as recorded in the May 24 weighing. No continuing difference between the two lots of cows is shown by their mean monthly body weights. Eighteen lot A cows consumed 1230 lb. of bonemeal and salt mixture in 215 days, while the same number of lot B cows only wanted 1000 lb. of limestone and salt mixture.

Only 26 live calves were born to the 36 cows and those 26 calves were divided equally between the two lots. Of the 13 calves in each lot, 10 were from old cows and 3 were from heifers. Six of the 26 old cows were not with calf. All 10 of the heifers were with calf but one aborted, one died at calving time, and three lost their calves at calving time. The calf of the heifer that died was saved.

The lot A(bonemeal) cows had more than half of the observed difficulties during and after parturition. Six of the ten cases of retained placentae were in lot A. Both the heifer that aborted and the one that died were in lot A. Two of the three calves lost at birth were out of lot B heifers.

Average birth weight of all lot A calves was 71.8 lb., and the average for lot B was 73.0 lb.

Average weaning weight of the 13 calves from lot A was 401.5 lb., while the average weaning weight of the 13 lot B calves was 404.2 lb.

Average pounds per day of age, for 20 calves from mature cows only, was 2.257 in lot A at weaning and 2.273 in lot B at weaning.

Conclusions:

1. No significant differences were observed in body weights of cows, in birth weights of calves, nor in weaning weights of calves between the phosphorus supplemented lot and the control lot.
2. Blood phosphorus levels in the control lot dropped below those of the phosphorus supplemented lot but phosphorus did not drop to the critical level.

Two years of vitamin A studies with the same cows gave the following results:

1. No significant difference between body weights of cows in vitamin A supplemented lot and control lot was recorded.
2. No consistent difference in birth weights of calves from cows of the two lots was recorded.
3. Only 8 of the 34 cows that started the vitamin study have calved and remained free from calving difficulty each year. Cases of porlapse, retained placenta, and stillbirth were about equally prevalent in the vitamin supplemented and control lots.
4. Weighted mean weaning weights of calves were highest in the lot in which dams received supplemental vitamin A and E, and were lowest in the lot receiving no vitamin supplements.

		1948 calf wts.	**1949 calf wts.**
Lot I	Supplemental vitamin A and E	384.46 lb.	403.20 lb.
Lot II	" " A only	363.10 lb.	387.20 lb.
Lot III	" " E only	373.80 lb.	388.90 lb.
Lot IV	No vitamin supplement	357.78 lb.	365.90 lb.

These differences in weaning weights cannot be considered conclusive but on the hunch that those same cows would demonstrate the same relative calf-raising ability in 1950 when no vitamin feeding was practiced, we ran the weighted mean weaning weights again. Lot I-426.6; Lot II-434.4; Lot III-461.7; Lot IV-438.3. We note that Lot I dropped from highest to lowest and Lot III jumped from second highest to highest.

Cow Wintering Trials for 1950-51

Objective

Recognizing the fact that in three years out of five the chief limitation to cattle production is an inadequate supply of winter feed, we have started a series of winter feeding trials using the common feeds that are grown locally. It is believed that accurate information obtained in Western North Dakota setting forth certain minimum feeding standards for wintering pregnant beef cows would be of great financial value to the many beef producers of the area. Our aim is to get some information that will have immediate practical value to cattlemen who wish to take advantage of it.

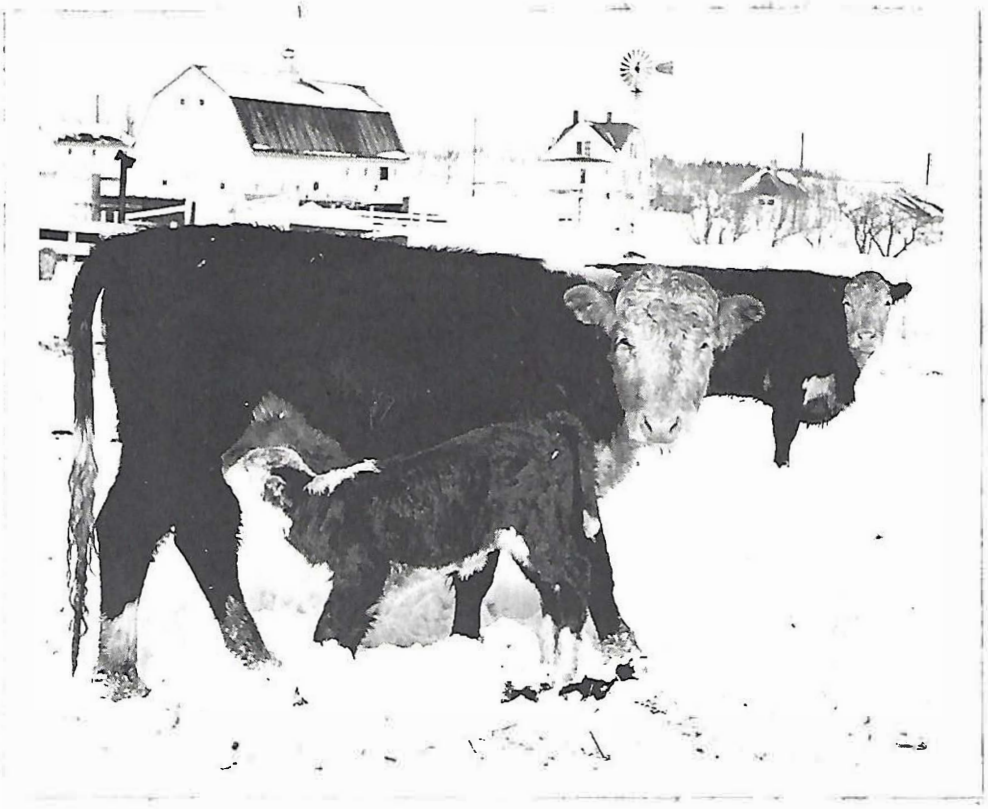
Present Status

The 24 mature cows, 9 two year olds, and 10 yearling heifers comprising the beef herd at the Dickinson Station were divided as equally as possible into 4 lots to get this feeding project underway at once. Division of animals was made on the basis of age, weight, past breeding record, and demonstrated ability to raise good calves.

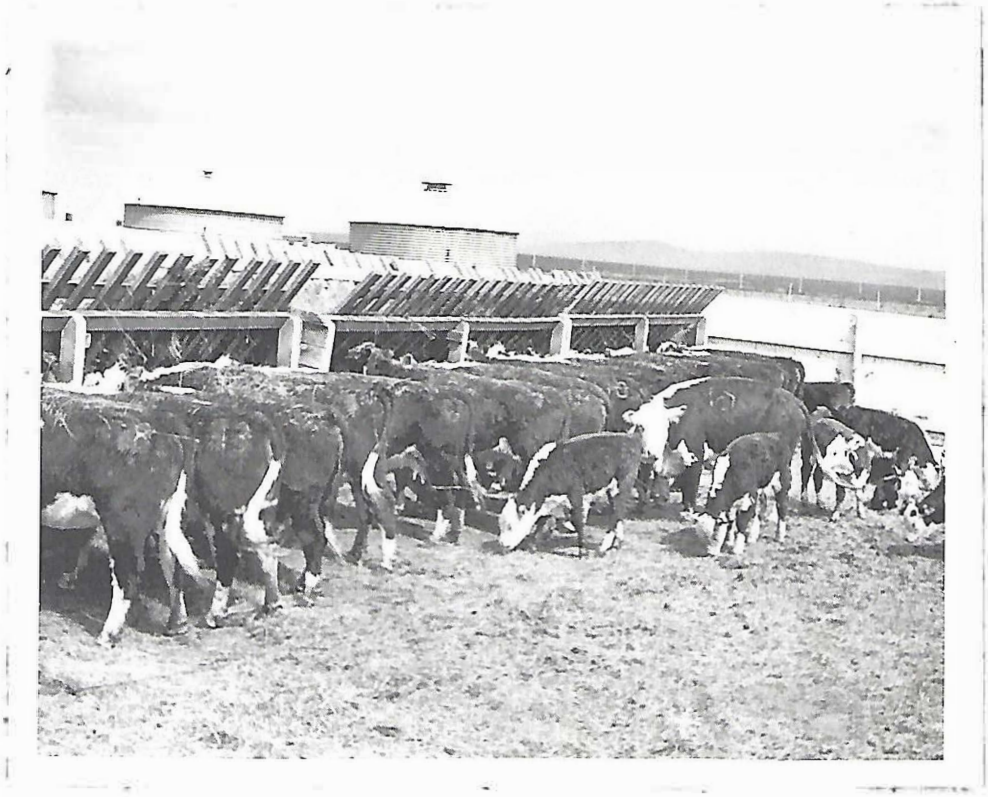
Each of the two 75 ft. open cattle sheds and adjacent lots at the station was divided by a board fence to give four equal size lots, each with a shed for shelter. One 8 ft. water tank was quartered by fences to allow each lot of cows access to water. One 16 ft. hay and silage rack was placed in each lot near one fence enabling the herdsman to fill every rack without driving into the cow lots. All feed is weighed as fed and monthly weights are taken on the cows. Blood samples were taken at the beginning of the trials and will again be taken at the end of the feeding period.

It is hoped that we can increase the number of lots to six next winter to include two lots in which a protein supplement will be fed.

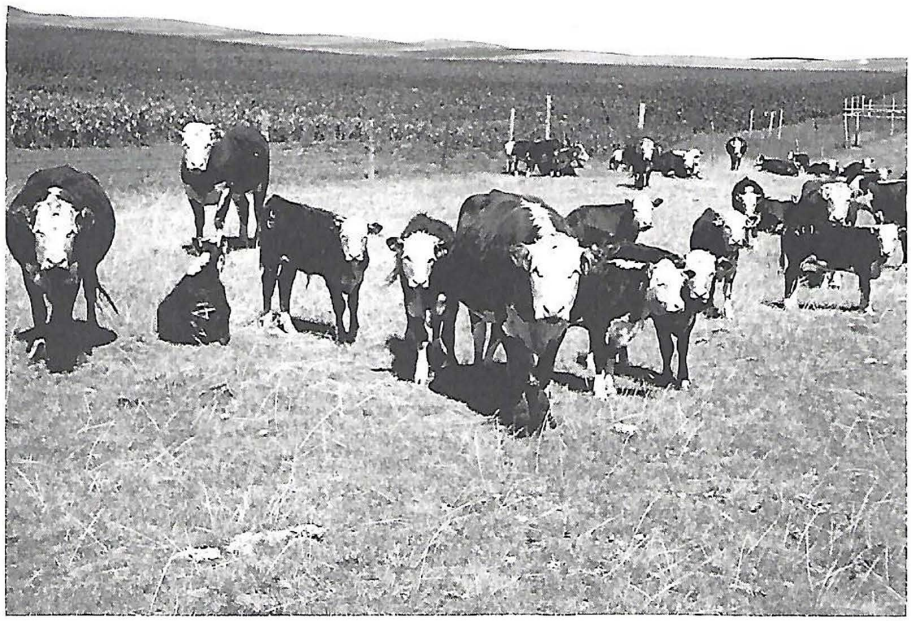
See appendix table 1 for an outline of the project showing rations fed.



5-Two-year-old heifer 19 and calf in lot A-March 28, 1950



6-Cows and calves of lot A on last day in dry lot-June 2,1950



7-Cows and calves on pasture-August 8, 1950

8-Mean weaning weight of 26 calves was 402 lb.-Sept. 23,1950

Project

Bonemeal versus limestone as mineral supplement for wintering calves.

Objective

This mineral feeding experiment with calves was planned to parallel the mineral work being carried on in the Purnell #129 cow herd during the winter of 1949-50. We sought to determine how important a phosphorus supplement is to calves that are wintered on an otherwise adequate ration of native grown feeds.

Present Status

Twelve steers and ten heifers, weaned from Purnell #129 cows September 13, 1949, were placed in a lot and fed as a unit from November 1, 1949 to May 31, 1950. The ration consisted of crested wheatgrass hay, oats and soybean cake. Each day except in severe storms the calves were separated by branded numbers into two equal lots and allowed to access to troughs of mineral and salt mixture for about one hour. Six steers and 5 heifers in lot A were given a 1:1 mixture of iodized salt and steamed bonemeal. An equal number of steers and heifers in lot B was allowed a 1:1 mixture of iodized salt and ground limestone. In seven months lot A consumed 145 lbs. of bonemeal and salt while lot B calves took only 120 lbs. of limestone and salt. The average weight of all 13 calves in each lot at monthly intervals throughout the experiment follows:

	Oct.31-'49	Nov. 28	Dec.30	Jan. 31	Feb. 28	Mar. 31	May 1	May 31	Av. gain per calf in 212 days
Lot A Bonemeal	459.5 lb.	489	526	534	558	579	612	615.5	156 lb.
Lot B Limestone	450.5 lb.	480	515	520	543	564	598	605.5	155 lb.

Feed consumed by all 22 calves in the trials averaged 17.9 lbs. crested or prairie hay, 1 lb. oats, and ¼ lb. soy cake per calf per day. The feed that was required to put on the average gain of .73 lb. per day cost slightly less than 21¢ per calf. The steers from the experiment were sold after a summer of grazing for an average price of $29.08. Thus, we can calculate that the net daily profit over feed cost amounted to ½ cent per calf during the wintering period. The 10 heifers have been incorporated into the cow herd.

Conclusion:

A mineral supplement of steamed bonemeal for wintering calves resulted in no significant gains over a supplement of ground limestone.

9-Calves were fed together in the bonemeal vs limestone trial: straps around neck identify one lot Feb.6, 1950

10-Twenty of same calves after summer on grass. 16 steers were sold September 6, 1950

Project

An attempt to demonstrate phosphorus deficiency symptoms in weanling calves by feeding a ration low in phosphorus.

Objective

In order to best understand phosphorus deficiency symptoms it was desired to produce such symptoms in 4 steer calves by feeding a special low phosphorus ration.

Present Status

Four of the smaller steer calves from the Purnell #129 herd were placed in a large stall in the barn on November 1, 1949, and wintered on a ration of crested wheatgrass and prairie hay, dried beet pulp, and blood meal. It was believed that none of these feeds contain adequate amounts of phosphorus for calves. Iodized salt was available to them.

After one month of learning to eat blood meal, these 4 steers consistently made greater monthly gains than did their half brothers and sisters that were on the other side of the barn eating a normal growing ration. The average gain of these 4 calves was 219 lbs. in 212 days of the test. Feed consumed per calf per day averaged 11.4 lb. hay, 4.01 lb. dried beet pulp, and .27 lb. blood meal. This ration cost 26.8¢.

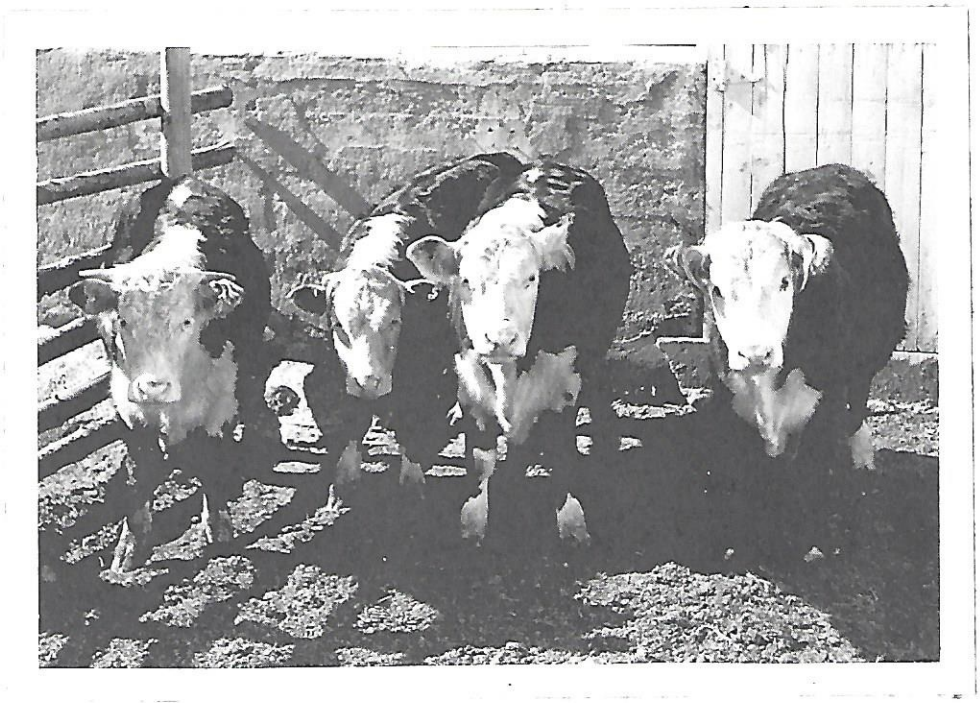
The only deficiency symptom observed was the chewing of boards in the pen by the calves after mid-March.

Conclusion:

No symptoms of phosphorus deficiency other than the chewing of boards were demonstrated by 4 calves that were maintained on a low-phosphorus ration for 7 months.

See pictures next page.

11-Steers on low phosphorus ration 2 months after start of feeding period-January 11, 1950



12-Same steers at close of feeding period-May 26, 1950

CALF FEEDING TRIALS FOR 1950-51

In an effort to learn what amounts of our locally grown feedsare required to winter calves, a feeding project was undertaken on November 1, 1950, which we expect to continue for several winters.

Twenty-six calves weaned September 23, 1950, were divided into two lots and will be wintered separately on two levels of feeding. The following rations will be fed:

Lot A	Lot B
Crested wheatgrass hay- 4 lb.	Crested wheatgrass hay- 4 lb.
Cereal silage---------- 30 lb.	Cereal silage---------- 20 lb.
Oats---------- 2 lb.	

A mineral and salt mixture of 2 parts salt and 1 part steamed bonemeal will be kept in both lots.

These two rations were set up in the expectation that the higher level ration would produce about 1 lb. per day gains, while the lower level ration would only allow minimum gains of perhaps less than ½ lb. per day. Cereal silage is being used because we have some of it and do not have sufficient corn silage to keep all cattle throughout the winter.

********** **Please insert following pictures in this location**********

(SAVED AS – **Section III – Calf Feeding Trials - page 13**)

13-Lot A calves go after cereal silage which makes up the major part of their ration-November 11, 1950

DEPARTMENTAL WORK NOT COVERED IN PROJECTS

Crested Wheatgrass and Cereal silage

The cool, wet spring of 1950 promised to be good for forage production so it was decided to gamble with about 25 acres of crested wheatgrass in an attempt to make some grass silage. We felt that while we were trying grass silage it would be well to try some cereal silage also, using wheat, oats and barley.

Between June 21 and June 26, 1950, crested wheatgrass was mowed, side delivered and picked up with a field chopper to make up 8 large loads of fresh cut forage. This chopped forage was blown into an upright concrete block silo without the addition of any preservatices or water. Dr. Whitman took samples and determined that some of the grass was going into the silo with less than 45% moisture. Two and one half loads of first cutting alfalfa were sandwiched into the grass silage.

When we cleaned off the top of the grass silage in August to prepare for filling the silo with corn it was found that only about 1 foot of spoiled material covered what appeared to be good grass silage. We estimate there are about 30 tons of wheatgrass and alfalfa silage.

Approximately 14 acres of each of Gopher oats and Trebi barley were chopped and blown into separate snowfence silos from July 24 to August 3. A 10 foot binder cut and windrowed the grains while in the dough stage, then the field chopper picked the windrows up immediately. A paper lined silo 16 feet in diameter and 7 feet high was filled with each type of grain. We estimated each silo to contain 25 tons of silage but we have learned in feeding it that the silage is not so dense and heavy as corn silage.

A third silo about 11 feet in diameter was filled with chopped green wheat but we did not get to the wheat before hot winds had seriously depleted its moisture content.

The wheat silage has already been fed to weanling calves and we are starting on the barley silage. The wheat silage had molded inward toward the center until a core of less than 3 tons of good silage remained. The barley silage is in much better condition; the shell of the molded material being only about 20 inches thick. The cereal silage we made smells good and apparently is palatable to calves but is quite dark in color.

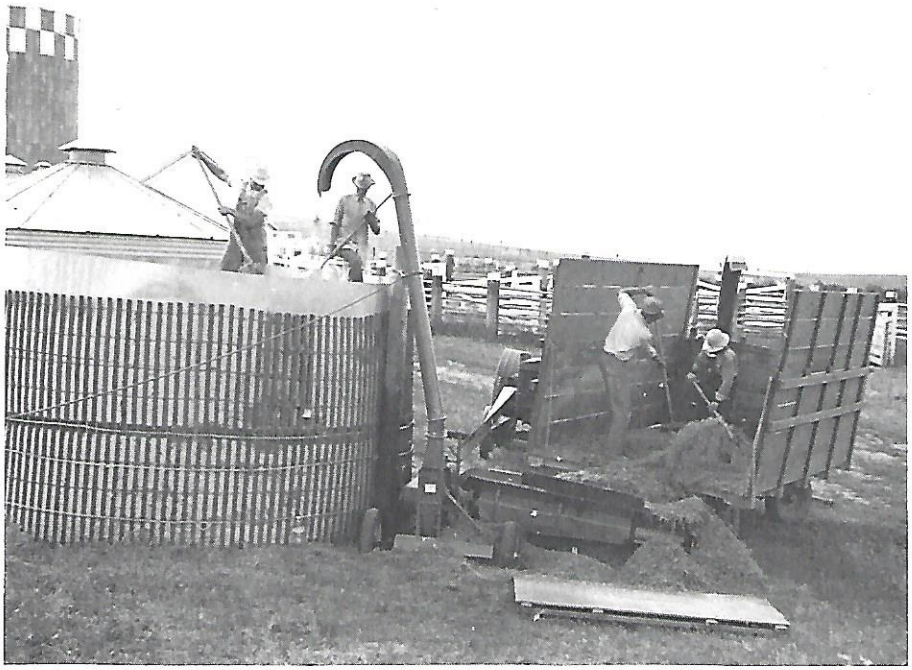
Conclusion:

1. We can disregard what the books say about the danger of putting up forage that is too high in moisture. The problem in this area will be getting enough moisture.

Chicken flock

We secured 150 White Leghorn chicks from Nokota Hatchery at Devils Lake April 24, 1950. Hens of the same breeding have been found to lay well in two previous years. We had excellent luck in the brooding of the chicks and 75 nice pullets were housed in September. These pullets were laying at a rate higher than 70% production in mid-November.

14-Field chopper picking up oats from windrow-July 26, 1950



15-Filling temporary silo with oats forage-July 26, 1950

PERSONAL ACTIVITIES

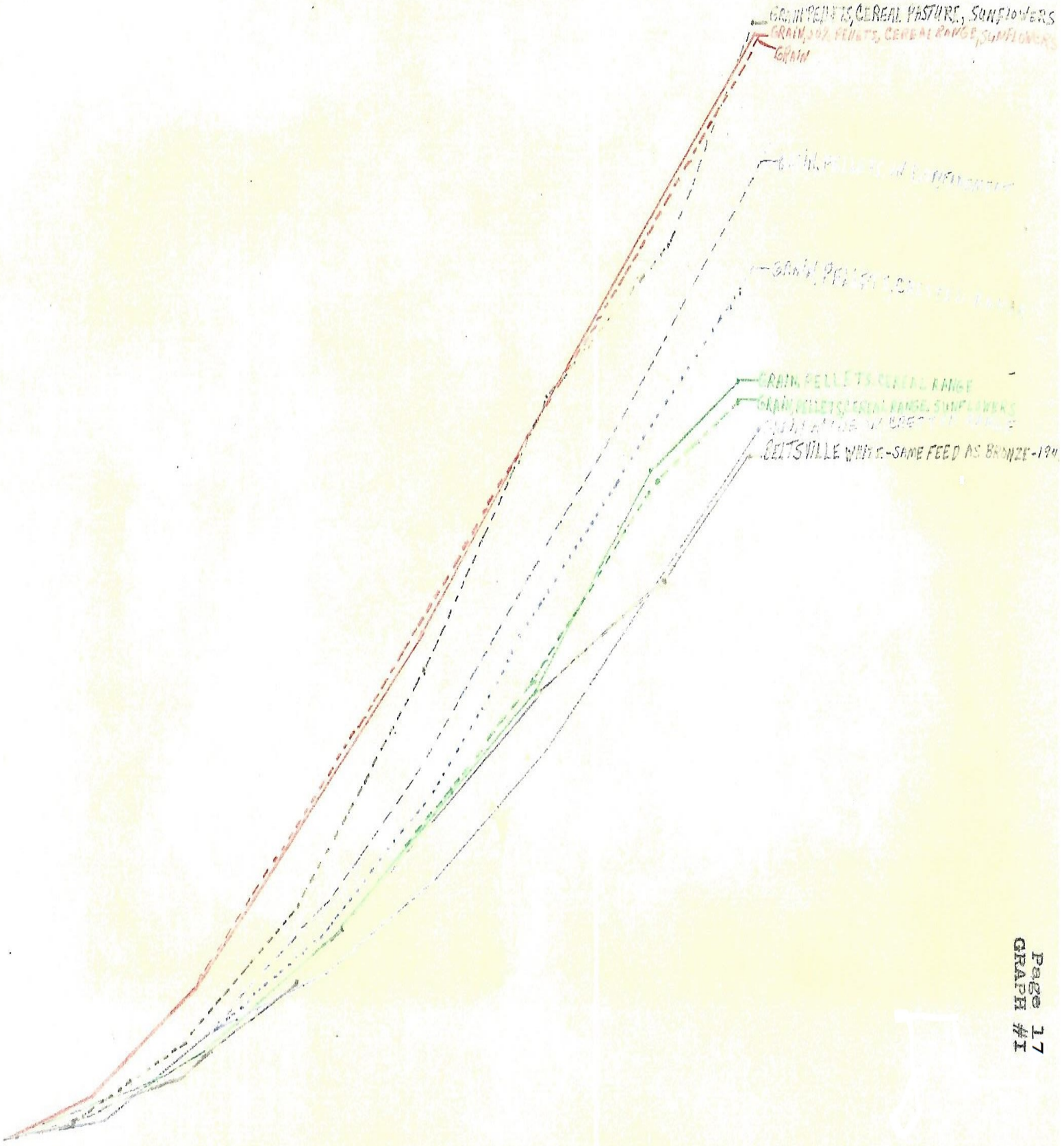
Conferences away from headquarters

Jan 17-20 Branch Station Superintendents meeting-Fargo

Public Meetings Attended		**Attendance**	**Participation**
Dec. 6-'49	Co. Agents Meeting, Dickinson	15	Disc. min. feeding
Dec. 17	Visited all 4-H projects – Belfield Chapter	16	Disc. calf feeding
Feb. 15-'50	Annual Farmers Meeting-Beach	200	Described Sta. work
Feb.16-17	Annual New England Institute		Led disc. on Livestock Management-1 hr.
May 10	Met with Animal Nut. Class-Dix. State Teachers College	15	Forage Feeding
June 8-10	N.D. Stockmens Ass'n. Ann. Meeting	300	
June 14	4-H demonstration and judging practice at Pete Kirsch farm	75	
July 11	Annual Field Day & Co. Committemen's Conference	100	Stopped briefly at Livestock Unit
July 14	4-H Regional judging contest-Dick.	75	Took reasons-cattle
July 20	Stroh Farm Demonstration-Killdeer	50	Disc. silage & feeding
Sept. 5	Golden Valley Co. Achievement Day-Beach	Several hundred	Judged livestock
Sept. 22	Stark Co. Harvest Festival	Several Hundred	Judged 4-H livestock
Oct. 22-23	Tri-State Hereford Futurity Show and Sale	Several Hundred	
Oct. 27	Co. Agents Meeting-Dickinson	12	Disc. salt and mineral feeding.
Nov. 4	Adams Co. Livestock Assoc. Ann. Show and Sale	Several hundred	
Nov. 8	Rotary luncheon-Dickinson	30	Disc. feeding operations at Station

LETTERS:

Eighty-nine letters have been written by the Ass't. Animal Husbandman since the 1949 Annual report.



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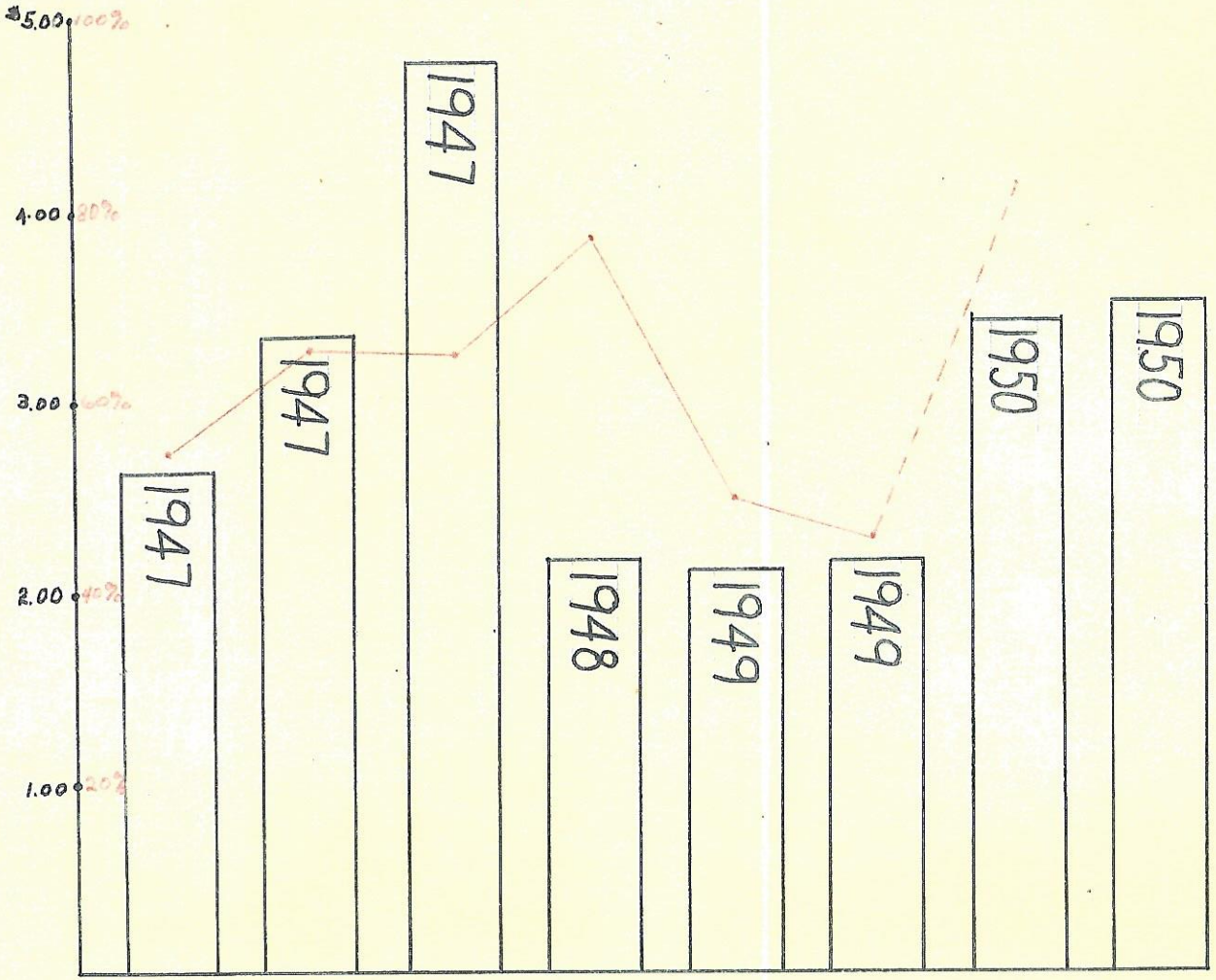
GRAPH #I

GRAPH #2

FEED COST* PER FINISHED TURKEY 1947-50

PERCENTAGE OF TURKEYS GRADING A 1947-50*



* COST DATA DO NOT INCLUDE COST OF MINERALS, GRIT, OR PASTURE

* GRADING WILL NOT BE DONE UNTIL THE BIRDS ARE DRESSED

APPENDIX TABLE I

DICKINSON EXPERIMENT STATION, DICKINSON, NORTH DAKOTA

COW LOTS FOR 1950-51 WINTER FEEDING TRIALS

LOT I					LOT II		
Cow No.	Weight	Calves Raised			Cow No.	Weight	Calves Raised
1	1140	3			7	1170	3
20	1320	1			11	1125	3
25	1195	2			19	1220	3
26	1080	3	RATION		21	985	3
29	1110	3	10 lb. crested wh. hay	10 lb. prairie hay	28	1355	2
33	1015	2	30 lb. corn silage	30 lb. corn silage	36	1050	3
40	690	1	T.D.N. 8.98 lb.-N.R. 1:8.5	T.D.N. 8.86-N.R. 1:16.4	38	875	-
43	935	-			41	720	1
H-2	620	open hfr.			H-10	685	bred hfr
H-32	705	bred hfr.			H-22	625	open hfr
Tot. Wt.	9810				Tot. Wt.	9810	
H-29	775	Alternate			37	945	Alternate
LOT III					**LOT IV**		
Cow No.	Weight	Calves Raised			Cow No.	Weight	Calves Raised
8	1080	3			5	1365	2
13	1100	3			6	1095	3
15	1210	3			10	1245	1
18	1215	2	7.5 lb. crested wh. hay	7.5 lb. prairie hay	14	1035	3
30	1050	2	22.5 lb. corn silage	22.5 lb. corn silage	27	1050	3
35	1220	3	T.D.N. 6.74 lb.-N.R. 1:8.5	T.D.N. 6.65 lb.-N.R. 1:16.5	32	1180	3
42	770	1			45	670	1
44	770	-			46	775	1
H-8	685	bred hfr.			H-20	660	open hfr
H-27	730	open hfr.			H-26	740	bred hfr
Tot. Wt.	9830				Tot. Wt.	9815	
H-13	745	Alternate					

A mix of 2 parts crushed rock salt to 1 part steamed bonemeal will be kept before all lots at all times.
Cows numbered 1 through 36 are 5 yrs. old; 37 and up are 2 yrs. old.