

Table 57 (Continued)

Cottonseed hulls	214.8	221.5	207.0
Molasses	91.4	....	53.5
Amm. hydrol .....	....	94.6	....
Dehyd. amm. hydrol ..	....	....	58.8
Carcass grades:			
choice+	1	3	1
choice	3	2	3
choice-	4	1	2
good+ .....	....	3	1
good .....	....	....	2
good-	1	....	....

Table 58

Heifers Implanted with Two Levels of Stilbestrol at Beginning of the Fattening Period.

May 9, 1956, to September 6, 1956—120 days.

Implant level	0 mg.	24 mg.	36 mg.
Number heifers	9	9	9
Av. initial wt., lbs.	671	668	674
Av. daily gain, lbs.	1.59±0.08 ¹	1.60±0.12 ¹	1.62±0.07 ¹
Av. final wt., lbs.	860	860	868
Carcass grades:			
choice+	2	2	1
choice	4	2	2
choice-	3	....	4
good+ .....	....	3	1
good .....	....	1	1
good- .....	....	1	....
Selling price (\$/cwt.)			
25.25	9 head		
24.50			7 head
23.00		8 head	
20.00		1 head	2 head

1. Standard error of mean.

Nutritive Value of Forages as Affected by Soil and Climatic Differences (Project 430).

B. A. Koch, E. F. Smith, D. Richardson, R. F. Cox, and A. Ordoveza

This report is a summary of progress to date in one phase of the study designed to determine differences in the results obtained when cattle consume forage grown on limestone or sandstone soils.

In any study of this sort there are many variables which cannot be completely controlled or eliminated. Regardless of the care used in selection, pastures and meadows will differ somewhat in type and yield of forage. Rainfall differs, even on pastures within a few miles of each other. And the previous histories of the pastures are somewhat different. All these and many other variables affect the results obtained. Therefore, several years of comparisons will be needed before definite conclusions can be drawn. Results obtained to date should be looked upon as suggestive rather than as final conclusions.

Experimental Procedure

Thirty-nine choice Hereford heifer calves purchased from the Williams Ranches in Lovington, N.M., are being used in this study. The heifers were spayed to eliminate the possibility of their being bred during the study. They were then divided into two lots of approximately the same average weight. Twenty of the heifers were wintered on native sandstone

(78)

pasture and 19 were wintered on native limestone pasture. The predominant species in both pastures was native bluestem grass. The pastures were located within 8 miles of each other in Ellsworth County. Both lots of heifers received 1½ pounds of cottonseed cake daily as protein supplement during the winter period.

At the end of the winter period it was necessary to place the cattle in different pastures. Pastures used during the grazing period were approximately 20 miles apart and were as similar as possible except that one was on limestone soil and one was on sandstone soil. Frequency and quantity of rainfall differed on the two pastures. Rainfall was inadequate on both pastures during the grazing period.

Due to the drouth conditions of the pastures, the cattle were returned to Manhattan at the end of the pasture season. During the past winter they received prairie hay grown on either limestone or sandstone soil in Woodson County. One half of the heifers in each group received 4 grams of supplemental phosphorus per day during the winter period. All of the cattle received 1½ pounds of soybean meal per day during this period.

During all phases of the study the animals were weighed periodically. Blood samples were collected from a representative group of the animals at indicated intervals. Soil, water, and forage samples were also collected periodically throughout the different phases of the study.

March 11, 1957, the animals were started on a full feed fattening ration. They will be fed to choice slaughter grade. Further blood and skeletal studies are planned at the time of slaughter.

Results of all phases of the study to date are summarized in the tables that follow.

Table 59

Average Weight Gain of Spayed Heifers Eating Forage Grown on Limestone or Sandstone Soils.

Soil type	Limestone	Sandstone
Number of animals	19	20
Av. initial wt., lbs.	553	558
Phase 1—December 5, 1955, to April 15, 1956 (131 days)		
Av. total gain, lbs.	Pasture 63±5.7 ¹	Pasture 6±5.1 ¹
Phase 2—April 15, 1956, to October 8, 1956 (176 days)		
Av. total gain, lbs.	Pasture 180±5.6	Pasture 193±6.2
Phase 3—October 8, 1956, to March 8, 1957 (151 days)		
Av. total gain, lbs.	Dry lot 149±8.4	Dry lot 114±8.4
Av. total gain December 5, 1955, to March 8, 1957, lbs.	392	313
Av. wt., March 8, 1957, lbs.	945	871

1. Standard error of mean.

Table 60

Value of Added Phosphorus for Spayed Heifers Wintered on Prairie Hay from Limestone or Sandstone Soil Areas.

Soil type	Limestone		Sandstone	
	Control	+P	Control	+P
Treatment	9	10	10	10
Number of animals	861	869	787	798
Av. initial wt., lbs.	861	869	787	798
Av. total gain, lbs., November 28, 1956, to March 8, 1957	74±7.1 ¹	79±8.9 ¹	80±5.0 ¹	79±8.4 ¹
Av. hay consumed per day, lbs.	17	18	17	17
Soybean meal per day, lbs.	1.5	1.5	1.5	1.5
P from H ₂ PO ₄ ² per day, gms. ..	0	4	0	4

1. Standard error of mean.

2. Phosphoric acid mixed in soybean meal.

(79)

Table 61

Blood Analyses of Cattle on Limestone or Sandstone Forage.

Soil type	Date taken	Limestone, Mgs. %	Sandstone, Mgs. %
Calcium	3/14/56	11.44±0.16	11.26±0.10
	11/13/56	11.31±0.27	11.37±0.20
	3/13/57	11.45±0.31	11.44±0.12
Phosphorus	3/14/56	7.68±0.12	8.00±0.18
	11/13/56	7.58±0.28	6.98±0.21
	3/13/57	7.74±0.25	6.84±0.33

1. Standard error of mean.

Table 62

Analyses of Forage Grown on Limestone or Sandstone Soils.

Component	Winter pasture		Summer pasture		Prairie hay	
	Limestone	Sandstone	Limestone	Sandstone	Limestone	Sandstone
Dry matter, %	94.6	93.4	93.4	94.6	94.4	94.4
Protein (NX6.25), %	7.1	4.7	6.1	5.7	4.9	4.9
Ether extract, %	1.8	1.6	2.3	2.2	1.9	2.2
Crude fiber, %	29.6	31.1	29.4	30.5	34.6	34.1
Nitrogen free extract, %	42.0	45.0	48.3	48.9	46.5	47.1
Ash, %	14.1	11.0	7.1	6.2	6.5	6.2
Calcium, %	.9	.4	.8	.5	.5	.5
Phosphorus, %	.5	.2	.1	.1	.1	.1

Soil and Water Analyses from Limestone and Sandstone Areas.

Water analyses	Limestone pasture		Winter pasture		Sandstone pasture	
	Winter	Summer	Winter	Summer	Winter	Summer
Total hardness (ppm CaCO ₃)	567.0	140.0	87.3	408.0	1.2	1.2
P (ppm)	.03	0.5	.01	15.7	57.0	57.0
Ca (ppm)	108.0	26.0	8.7	82.0	10.0	10.0
Na (ppm)	14.0	167.5	6.8	13.5	5.0	5.0
K (ppm)	5.0	13.5	6.8	10.0	24.0	24.0
Cl (ppm)	24.0	23.0	2.2	97.0	2.2	2.2
Soil analyses						
Organic matter content (%)	3.2	2.86	2.27	2.42	7.13	7.13
Available phosphorus, lbs. per acre	31.00	18.0	21.33	14.8	476.7	476.7
Exchangeable potassium, lbs. per acre	476.7	347.2	491.0	447.0		

1. Water trucked to summer pasture due to drought.

The Effect of Feeding a Systemic Insecticide to Control

Departments of Animal Husbandry and Entomology, Cooper, and H. R. Smith

The steer calves used in this study were purchased near Sankara, Rosa and Melrose, N.M., and were received at Manhattan in November, 1956. One hundred calves were assigned on the basis of weight to four lots in November, 1956. Three of the lots were fed a systemic insecticide (0,0-dimethyl 0-2,4,5-trichlorophenyl phosphorothioate) which was mixed with soybean meal and made into pellets. The treatment each lot received was as follows:

- Lot 3—No treatment.
- Lot 1—Red 50 mgs. per kg. of bodyweight of systemic insecticide daily for three days.
- Lot 7—Red 75 mgs. per kg. of bodyweight of systemic insecticide daily for three days.
- Lot 2—Red 110 mgs. per kg. of bodyweight of systemic insecticide for one day.

Prior to the test, the calves were being fed soybean pellets. However, the pellets containing the medication were larger and were not readily consumed. About 1 pound of ground milo grain was fed per calf daily and after the treatment period of three days, the calves were all placed together in one lot and fed sorghum silage, a small quantity of alfalfa hay, and about 1 pound of protein concentrate per head per day for the remainder of the test.

Table 64

The Value of Feeding a Systemic Insecticide for Cattle Grub Control.

Treatment	No treatment		75 mgs. per kg. bodyweight for 3 days		110 mgs. per kg. bodyweight for 1 day	
	Lot number	Number steers per lot	Lot number	Number steers per lot	Lot number	Number steers per lot
Av. initial wt., lbs.	25	369	25	368	25	369
Av. final wt., lbs.	465	454	455	454	454	454
Av. daily gain, lbs.	1.09	1.04	.98	.87	.96	.85
Av. number of grubs:						
December 4, 1956	5.5	4.2	11.0	13.2	13.2	13.2
January 3, 1957	5.4	2.3	1.7	5.9	5.9	5.9
February 2, 1957	1.8	.4	0	.3	.3	.3
March 2, 1957	0	0	0	0	0	0

1. A product called Dow ET-57, chemical name: 0,0-dimethyl 0-2,4,5-trichlorophenyl phosphorothioate, furnished by the Dow Chemical Company, Midland, Mich.

At the beginning of the test and each 28 to 30 days thereafter, each steer was checked for grubs, and the number of grubs that could be felt on their backs was recorded.

Observations

December 5, when the calves were first fed the pellets containing the systemic insecticide, they would not readily eat the pellets. Ground milo grain was mixed with the pellets in the bunks and the pellets were crushed to obtain better consumption. Some of the calves may not have 1. The material fed was furnished by Dow Chemical Company, Midland, Mich. and is known by its code name: Dow ET-57. Its chemical name is 0,0-dimethyl 0-2,4,5-trichlorophenyl phosphorothioate.

consumed their share of the medication. Lots 1 and 7 treated again December 6 and 7 consumed all their pellets by noon without the addition of ground milo.

The number of grubs was decreased in all treated lots by the end of the first 30 days, and at the close of 60 days scarcely any remained. No grubs were recorded for any of the steers treated or nontreated at the end of 88 days on March 2.

Treatment for grubs had no apparent effect on rate of gain.

Table 65
Chemical Analysis of Feeds Used in Beef Cattle Feeding Trials, 1956-57 (As Fed).

Description	Protein (N _{62.5}), %	Ether extract, %	Crude fiber, %	Moisture, %	Ash, %	N-free extract, %	Carbo- hydrates, %
Alfalfa hay	15.63	1.48	29.49	6.98	7.93	38.49	67.98
Rolled corn	11.00	3.44	1.92	11.19	1.36	71.09	73.01
Ground corn	10.06	4.10	1.94	11.38	1.56	70.96	72.90
Rolled milo	9.94	3.19	2.24	9.48	1.80	73.35	75.59
Ground milo	10.56	3.12	1.90	11.45	1.79	71.18	73.08
Pelleted ground milo	10.00	3.28	1.83	10.89	1.72	72.28	74.11
Milo mill-feed	10.50	8.01	4.60	10.62	4.10	62.17	66.77
Cottonseed meal	41.19	2.95	11.15	8.42	6.46	29.83	40.98
Sorghum silage (as received)	3.68	1.01	11.64	52.87	4.07	26.73	38.37
Sorghum silage (dry)	7.80	2.15	24.69	6.80	8.63	56.73	81.42
Soybean oil meal	49.69	1.55	5.47	5.38	6.44	30.05	35.52
Prairie hay, limestone soil	5.10	1.87	34.60	5.38	6.52	46.50	81.10
Prairie hay, sandstone soil	4.88	2.12	34.06	5.62	6.20	47.08	81.14