NOTES ON WINTERING BEEF CATTLE

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A THESIS PRESENTED TO THE GRADUATE COMMITTEE
OF THE VIRGINIA POLYTECHNIC INSTITUTE
IN APPLICATION FOR THE DEGREE OF
MASTER OF SCIENCE.

BY

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EXPERIMENT

Wintering Beef Steers

The experiment was conducted by the Virginia Agricultural Experiment Station for the purpose of comparing the values of several feeds for wintering beef steers with especial regard for local conditions.

The objects of the experiment were in detail as follows:

1. To compare the results of wintering two-year old steers on corn meal and corn stover, corn silage and cotton seed meal, and corn silage alone.

2. To determine the advisability of using cotton seed meal in connection with corn silage for wintering steers.

3. To determine the amount of corn silage required to winter steers when fed 1# cotton seed meal per head per day, so that their weights will vary as follows:

   (1) To gain 25# to 50#
   (2) To lose 1# to 25#
   (3) To lose 50# to 75#

4. To determine the relative cost and advisability of using the above rations.

The cattle used were high grade Short-horn 2 year olds, averaging about 1000 lbs. in weight and in good condition. They were taken from pasture on November 23rd and divided into five lots of five steers each with due regard for uniformity of size, condition, quality, and breeding.
The feed lots, about one-third of an acre in size each, were situated in rather an exposed location near the top of a small hill. Shelter was furnished by sheds 12 x 15 feet, enclosed on three sides and open to the South. Saw-dust was used for bedding. Water was available at all times.

The steers were weighed individually every four weeks for three successive days, and every two weeks on one day. A drive of perhaps 300 yards was necessary to reach the scales.

Before beginning the experiment the steers were fed regular rations for eight days and the first weights were taken on December 1st, 2nd, 3rd.

Feeding was done twice daily at about seven A.M., and four thirty P.M., the same rations being furnished at each time.

Rations were given each lot as follows:

Lot 1 - 35 lbs of corn silage and one lb. of cotton seed meal per head per day. The silage was increased 2 lbs. on December 16th and again on January 27th.

Lot 2 - 30 lbs of corn silage and one lb. of cotton seed meal per head per day. Silage was increased as with lot 1.

Lot 3 - 25 lbs. of corn silage and one lb. of cotton seed meal. Silage increased as with lot 1.

Lot 4 - 35 lbs. of corn silage alone. Silage increased as with lot 1.

Lot 5 - 20 lbs. of shredded corn stalk and one lb. of corn meal. The meal was increased ½ lb. on March 2nd and again on March 25th.
All feeds were in good condition. The stover was left in the field and about two weeks supply hauled under shelter at a time, thus duplicating local conditions as much as possible, where the stover is fed in the fields.

After February 1st the stover depreciated noticeably in value due to weathering.

In no case did the animals fail to clean up their rations well with the exception of those fed stover. These left small amounts of stalks after each feeding. From results found by Missouri and Kansas stations whole stover had practically same feeding value as shredded stover.

The experiment was continued until April 27th when the cattle were turned on grass.

**Prices of Feeds**

The actual costs of the feeds used were per ton as follows:

- Corn silage--- $5.00
- Stover------ $8.00
- Cotton seed
  - meal------ $30.00
- Corn meal--- $38.00

To make due allowance for possible variations in these values and the consequent effects upon the results, three different values have been given each material used and combinations of prices made by holding the concentrates constant and varying the roughages and vice-versa.
The table and weight curve given below will demonstrate the losses and gains of the respective lots and the costs of same.

The values given in the table were based on the following prices per ton:
1. Silage $5.00, Stover $8.00, Cotton seed meal $30.00, Cornmeal $38.00
2. " $4.50 " $7.00 " " " " " "
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Table ofウィンスアンドコスス
Curves showing weight variations.

Lot 1
Lot 2
Lot 3
Lot 4
Lot 5
DISCUSSION

In a comparison of lots 1, 2, & 3 all of which received one lb. of cotton seed meal and an average silage ration of 38, 33, and 28 lbs., respectively, we note that the additional cost of lot 1 over lot 2 varied from 37 to 30 cts. per head per month according to the different values assigned the feeds. Similarly the additional cost of lot 2 over lot 3 varied from 37 to 29 cts. per head per month according to varying prices.

Since the additional gain of lot 1 over lot 2 amounted to 52 lbs. per head at a cost of 37 cts. at the most per month or $1.85 for the five months, and since the difference in weight between lot 2 and lot 3 amounted to 47 lbs. at the end of the feeding at an additional cost of 37 cts. at the most per head per month or $1.85 for the five months, it seems safe to say that the addition of either five or ten lbs. of silage to a basal ration of 28 lbs. silage and 1 lb. of cotton seed meal will be well worth the cost.

A comparison of lot 3 receiving a ration composed of one lb. of cotton seed meal and 28 lbs. of silage with lot 4 whose ration consisted of 38 lbs. of silage alone shows slight loss in weight in both cases, 25 lbs. per head with lot 3 and 12 lbs. with lot 4 on silage alone. However although lot 4 lost 13 lbs. less per head, it was at an additional cost of from 39 to 15 cents per steer per month, depending on the values of feeds.
The cost of additional 13 lbs. per head then for the five months in the case of lot 4 over lot 3 would be at a cost ranging from $1.95 to .75 cts.

With feed values at the first figure the addition of the one lb. of cotton seed meal to replace 10 lbs. of silage would be profitable. With values at the second figure, the silage alone would be more profitable.

These two lots came through the winter in so nearly the same condition that we may say that either ration would be advisable for maintenance purposes. The steers on silage alone, were in good shape and seemed to stand the cold weather equally as well as those receiving one lb. of cotton seed meal.

Lot 5 wintered on 20 lbs. of corn stover and an average of 1.15 lbs. of corn meal per head per day lost an average of 127 lbs. per head, 102 lbs. more than lot 3 which was the next heaviest loser. In addition to this the cost of lot 5 was much greater than any lot with the exception of lot 1, which made a gain per steer of 74 lbs. per head against a loss of 127 lbs. in the case of lot 5. Or a total difference per steer of 201 lbs. in favor of lot 1.

It is undoubtedly true that the stover deteriorated in value especially after February but it was kept under usual conditions.

This method of wintering then seems undesirable.

CONCLUSIONS
1. That under given conditions corn meal and corn stover will not produce the satisfactory results derived from the use of either corn
silage and cotton seed meal, or corn silage alone.

2. Thirty-eight lbs. of corn silage per head daily will maintain steers without material loss of weight, but that in most cases the substitution of one lb. of cotton seed meal for ten lbs. of silage will be slightly more economical and produce almost identical results.

3. When steers are fed one lb. of cotton seed meal daily, 28 lbs. of silage per day will cause a loss in weight of from 1# to 25#. That an increase of 5 lbs. of silage per head per day will cause a gain of 1# to 28# instead of a loss for the five months.

That a further increase of 5 lbs. per head per day will cause an additional gain of 50 lbs. or a total gain of from 50# to 75# per head for five months.

4. That it is not advisable financially to use corn stove and corn meal for wintering steers.

That substitution of one lb. of cotton seed meal for ten lbs. of silage is slightly more economical unless silage can be secured for $4.00 per ton or less, when the silage alone will be preferable.

Steers may be maintained at constant weight economically on one lb. of cotton seed meal and 28 lbs. of silage per day, but that the 5 or 10 lbs. of additional silage to the daily allowance per head will produce profitable gains in weight.