

SEPTEMBER, 1922

CIRCULAR 96

# AGRICULTURAL EXPERIMENT STATION

KANSAS STATE AGRICULTURAL COLLEGE  
MANHATTAN, KANSAS

DEPARTMENT OF ANIMAL HUSBANDRY



YEARLING WETHERS READY FOR MARKET

## SHEEP FEEDING INVESTIGATIONS, 1920-21<sup>1</sup>

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The Department of Animal Husbandry of the Kansas Agricultural Experiment Station fed 96 yearling wethers and 132 lambs during the winter of 1920-21 for the purpose of securing data that might help to answer a number of questions often asked by prospective sheep feeders. This work will be discussed under three separate heads: (1) Fattening Yearling Wethers. (2) Fattening Lambs. (3) Fattening Lambs Versus Fattening Yearling Wethers.

### PART I

#### FATTENING YEARLING WETHERS

Two distinct problems were involved in fattening yearling wethers, the objects of which were:

<sup>1</sup> Contribution No. 68 from the Department of Animal Husbandry.

1. To compare the relative value of white shelled corn and yellow shelled corn when fed to yearling wethers receiving cottonseed meal, alfalfa hay, and cane silage.

2. To compare the relative value of cottonseed meal that had been treated with calcium chloride with untreated cottonseed meal when fed to yearling wethers receiving alfalfa hay, cane silage, and shelled corn.

#### FEEDING PLAN

Ninety-six close-wooled, compactly built yearling wethers were purchased on the Kansas City market and divided into three lots of 32 head each, particular care being observed to have each lot as uniform as possible in weight, quality, and conformation. They were quartered in an open shed which provided 280 square feet of ground space for each lot and a well-drained yard 13 feet wide and 100 feet long. They were started on a light feed, the amount being increased gradually. The grain was fed twice daily, the alfalfa hay in the morning and the cane silage at night. All feed was fed in a combination rack. It was planned to feed equal amounts of each kind of feed in each lot.

#### RESULTS

Detailed results secured in this experiment are given in Table I.

#### SUMMARY

The yearling wethers fed yellow shelled corn (lot 7) made 0.07 of a pound greater average daily gain per head than did the yearling wethers fed white shelled corn (lot 6). It required 113 pounds less yellow shelled corn than white shelled corn to produce 100 pounds of gain and the cost of 100 pounds of gain was \$1.94 less where yellow shelled corn was fed.

The yearling wethers fed cottonseed meal that had been treated with calcium chloride (lot 5) made 0.01 of a pound greater average daily gain per head than did those receiving untreated cottonseed meal (lot 6). It required 22 pounds less shelled corn and 4 pounds less treated meal to produce 100 pounds of gain and the gains cost \$0.37 less per 100 pounds.

#### OBSERVATIONS

For some unknown reason the yearling wethers fed yellow shelled corn did not relish it as much as the other lot did the white shelled corn. The yellow shelled corn, however, proved to be more efficient than the white shelled corn in producing gains.

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TABLE I.—YELLOW CORN VERSUS WHITE CORN AND TREATED VERSUS UNTREATED COTTONSEED MEAL FOR FATTENING YEARLING WETHERS

(December 28, 1920, to February 6, 1921)

| Lot No. ....  | 5             | 6             | 7             |
|---|---------------|---------------|---------------|
| Number of wethers in lot .....                                      | 32            | 32            | 32            |
| Number of days on experiment .....                                  | 40            | 40            | 40            |
| Av. initial weight per wether at feedlot .....                      | 79.41 lbs.    | 79.05 lbs.    | 77.04 lbs.    |
| Av. final weight per wether at feedlot .....                        | 91.57 "       | 91.16 "       | 91.94 "       |
| Av. total gain per wether at feedlot .....                          | 12.16 "       | 11.63 "       | 14.40 "       |
| Av. daily gain per wether at feedlot .....                          | .30 "         | .29 "         | .36 "         |
| Selling weight per wether at Kansas City .....                      | 87.50 "       | 86.72 "       | 87.81 "       |
| Percent shrinkage in marketing .....                                | 4.44 "        | 4.87 "        | 4.49 "        |
| Av. dressing percent. ....  | 49            | 49            | 49            |
|   | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> |
| Average daily ration per wether:                                    |               |               |               |
| White shelled corn .....  | 1.41          | 1.41          | 1.41          |
| Yellow shelled corn .....   |               |               |               |
| Cottonseed meal (treated) (a) .....                                 | .23           | .23           | .23           |
| Cottonseed meal (untreated) .....                                   |               | .23           | .23           |
| Alfalfa hay .....   | .82           | .77           | .80           |
| Cane silage .....   | 1.61          | 1.56          | 1.51          |
| Salt .....  | .01           | .01           | .01           |
| Feed required for 100 pounds gain at feedlot:                       |               |               |               |
| White shelled corn .....  | 465.16        | 486.83        |               |
| Yellow shelled corn .....   |               |               | 373.12        |
| Cottonseed meal (treated) (a) .....                                 | 76.80         |               |               |
| Cottonseed meal (untreated) .....                                   |               | 80.98         | 84.91         |
| Alfalfa hay .....   | 298.80        | 285.73        | 222.83        |
| Cane silage .....   | 529.89        | 567.21        | 419.82        |
| Salt .....  | 3.85          | 4.03          | 3.26          |
| Cost of feed for 100 pounds gain at feedlot .....                   | \$9.52        | \$9.89        | \$7.95        |
| Av. initial cost per wether at feedlot .....                        | 5.37          | 5.38          | 5.24          |
| Av. labor cost per wether .....                                     | .25           | .25           | .25           |
| Av. feed cost per wether .....                                      | 1.16          | 1.14          | 1.15          |
| Int. on investment per wether at 8 percent .....                    | .056          | .056          | .056          |
| Int. on equipment per wether at 8 percent .....                     | .042          | .042          | .042          |
| Shipping and selling cost per wether .....                          | .63           | .63           | .63           |
| Total cost per wether when sold at Kansas City .....                | 7.508         | 7.498         | 7.398         |
| Selling price per wether at Kansas City .....                       | 6.125         | 6.70          | 6.147         |
| Loss per wether .....   | 1.383         | 1.428         | 1.221         |
| Cost per cwt. at feedlot .....                                      | 6.76          | 6.76          | 6.76          |
| Necessary selling price per cwt. at Kansas City to break even ..... | 8.58          | 8.64          | 8.39          |
| Selling price per cwt. at Kansas City .....                         | 7.00          | 7.00          | 7.00          |

(a) Treated with calcium chloride.  
Price of feeds: Corn, 56 cents per bushel; cottonseed meal, \$40 per ton; alfalfa hay, \$15 per ton; cane silage, \$5 per ton.

There was no appreciable difference in the quality and but 1 percent difference in the moisture content of the two kinds of shelled corn. The yellow corn contained 15 percent moisture and the white shelled corn 16 percent.

The wethers were fed only 40 days because at the end of that time these particular wethers were fat enough for market.

These wethers dressed an average of 49 percent. Fifty-two of the carcasses graded "X" which is Wilson & Company's best grade. The other forty-four graded "Red" which is considered a very good carcass. No differences in quality of carcasses that might be attributed to the rations fed were noted.

**PART II**  
**FATTENING LAMBS**

Three problems in particular were involved in fattening the lambs in this experiment, the objects of which were:

1. To compare the value of cottonseed meal that had been treated with calcium chloride with untreated cottonseed meal when fed to lambs with cane silage, alfalfa hay, and shelled corn.
2. To compare the value of wheat straw and alfalfa hay when fed to lambs receiving shelled corn, cottonseed meal, and cane silage.
3. To compare the value of linseed oilmeal and cottonseed meal as protein supplements for fattening lambs, and to ascertain the relative effect of each of these protein supplements upon shrinkage in shipping.

**FEEDING PLAN**

One hundred thirty-two thrifty, light lambs were purchased on the Kansas City market. When these lambs arrived at the feedlots they were divided into four lots of 33 head each. The same general plan of weighing, quartering, and feeding was followed with the lambs that has been outlined in Part I for the yearling wethers.

**RESULTS**

Table II gives in detail the results secured.

**SUMMARY**

The lambs fed cottonseed meal treated with calcium chloride (lot 1) made 0.01 of a pound greater average daily gain than did the lambs fed the untreated meal (lot 2) when fed with shelled corn, alfalfa hay, and cane silage. The cost of feed per 100 pounds of gain was \$6.21 for the lot fed treated cottonseed meal and \$6.20 for the lot fed untreated meal. There was a loss of 24 cents per head on the lambs fed the untreated meal (lot 2) and 41 cents per head on the lambs fed the treated meal (lot 1), the difference being due to the lambs in lot 2 selling for 25 cents per hundred more than the lambs in lot 1.

The lambs fed alfalfa hay (lot 2) made 0.15 of a pound greater average daily gain than did the lambs fed wheat straw the first 60 days and alfalfa hay the last 17 days (lot 3). Shelled corn, cottonseed meal, and cane silage were also fed in each lot.

The lambs fed cottonseed meal (lot 3) made 0.10 of a pound greater average daily gain per head than the lambs fed linseed oilmeal (lot 4), but the loss on the lambs fed linseed oilmeal (lot 4)

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TABLE II.—TREATED VERSUS UNTREATED COTTONSEED MEAL; COTTONSEED MEAL VERSUS LINSEED MEAL; AND ALFALFA HAY VERSUS WHEAT STRAW FOR FATTENING LAMBS

(January 2 to March 29, 1921)

| Lot No. ....   | 1          | 2          | 3          | 4          |
|--|------------|------------|------------|------------|
| Number of lambs in lot.....  | 33         | 33         | 33         | 33         |
| Number of days on experiment.....                                  | 79         | 79         | 79         | 79         |
| Av. initial weight per lamb at feedlot.....                        | 56.34 lbs. | 57.20 lbs. | 58.09 lbs. | 56.14 lbs. |
| Av. final weight per lamb at feedlot.....                          | 87.23 "    | 88.46 "    | 75.58 "    | 86.8 "     |
| Av. total gain per lamb at feedlot.....                            | 30.89 "    | 31.26 "    | 19.49 "    | 30.66 "    |
| Av. daily gain per lamb at feedlot.....                            | .39 "      | .40 "      | .25 "      | .39 "      |
| Selling weight per lamb at Kansas City.....                        | 81.82 "    | 82.42 "    | 70.30 "    | 80.61 "    |
| Percent shrinkage in marketing.....                                | 6.20 "     | 6.83 "     | 6.98 "     | 7.13 "     |
| Av. dressing percent.....  | 49         | 49.3       | 46.8       | 50.7       |
|  | Pounds     | Pounds     | Pounds     | Pounds     |
| Average daily ration per lamb:                                     |            |            |            |            |
| Shelled corn.....  | 1.10       | 1.10       | 1.03       | 1.10       |
| Cottonseed meal (treated) (a).....                                 | .18        |            |            |            |
| Cottonseed meal (untreated).....                                   |            | .18        | .18        |            |
| Linseed oilmeal.....   |            |            |            | .18        |
| Alfalfa hay.....   | .87        | .90        | (b) .15    | .85        |
| Wheat straw.....   |            |            | .08        |            |
| Cane silage.....   | 1.16       | 1.18       | 1.08       | 1.18       |
| Salt.....  | .01        | .01        | .02        | .01        |
| Feed required per 100 pounds gain at feedlot:                      |            |            |            |            |
| Shelled corn.....  | 281.46     | 278.18     | 419.28     | 283.59     |
| Cottonseed meal (treated) (a).....                                 | 47.29      |            |            |            |
| Cottonseed meal (untreated).....                                   |            | 46.74      | 74.96      |            |
| Linseed oilmeal.....   |            |            |            | 47.64      |
| Alfalfa hay.....   | 223.06     | 228.15     | (b) 60.81  | 220.28     |
| Wheat straw.....   |            |            | 32.04      |            |
| Cane silage.....   | 297.05     | 299.03     | 438.88     | 304.84     |
| Salt.....  | 3.63       | 3.68       | 7.31       | 3.76       |
| Cost of feed for 100 pounds gain at feedlot.....                   | \$6.21     | \$6.20     | \$7.43     | \$6.47     |
| Av. initial cost per lamb at feedlot.....                          | 4.349      | 4.415      | 4.33       | 4.334      |
| Av. labor cost per lamb.....                                       | .50        | .50        | .50        | .50        |
| Av. feed cost per lamb.....  | 1.92       | 1.94       | 1.45       | 1.91       |
| Int. on investment per lamb at 8 percent.....                      | .108       | .11        | .10        | .107       |
| Int. on equipment per lamb at 6 percent.....                       | .083       | .083       | .083       | .083       |
| Shipping and selling cost per lamb.....                            | .614       | .614       | .614       | .614       |
| Total cost per lamb when sold at Kansas City.....                  | 7.574      | 7.662      | 7.077      | 7.548      |
| Selling price per lamb at Kansas City.....                         | 7.159      | 7.417      | 5.870      | 7.356      |
| Loss per lamb.....   | .415       | .245       | 1.207      | .192       |
| Cost per cwt. at feedlot.....                                      | 7.72       | 7.72       | 7.72       | 7.72       |
| Necessary selling price per cwt. at Kansas City to break even..... | 9.26       | 9.30       | 10.07      | 9.36       |
| Selling price per cwt. at Kansas City.....                         | 8.75       | 9.00       | 8.35       | 9.15       |

(a) Treated with calcium chloride.

(b) This lot was fed alfalfa hay in place of wheat straw for the last 17 days.

Price of feeds: Corn, 56 cents per bushel; cottonseed meal, \$40 per ton; linseed oilmeal, \$50 per ton; alfalfa hay, \$15 per ton; wheat straw, \$8 per ton, cane silage, \$5 per ton; salt, \$15 per ton.

was only 19 cents per head, while the loss on the lambs fed cottonseed meal (lot 2) was 24 cents per head, due to the lambs in lot 4 selling for 15 cents per hundred higher in Kansas City as a result of a little better quality of finish.

There was very little difference in the dressing percent of lots 2 and 4. The lambs fed the cottonseed meal (lot 2) dressed 49.3 percent and those fed linseed oilmeal dressed 50.7 percent.

The shrinkage was particularly the same, the lambs fed cottonseed meal (lot 2) shrinking 6.83 percent and those fed linseed oilmeal (lot 4), 7.13 percent.

### OBSERVATIONS

Cottonseed meal treated with calcium chloride may have some advantages over untreated cottonseed meal as a protein supplement during the early part of a lamb-feeding period, but this advantage was not maintained through the whole 80-day period of this experiment.

Wheat straw cannot be satisfactorily substituted for alfalfa hay in a ration for fattening lambs.

Linseed oilmeal has a slight advantage over cottonseed meal as a protein supplement in fattening lambs because it has a tendency to produce a little better quality of finish.

The relative cost of linseed oilmeal and cottonseed meal should be the determining factor in the purchase of either as a protein supplement in a lamb-feeding ration. This experiment indicates that one can afford to pay slightly more for linseed oilmeal than cottonseed meal.

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### PART III

#### FATTENING LAMBS VERSUS FATTENING YEARLING WETHERS

One lot of lambs and one lot of yearlings were each fed cottonseed meal treated with calcium chloride, and one lot of lambs and one lot of yearling wethers were each fed untreated cottonseed meal. Each of the four lots also received shelled corn, alfalfa hay, and cane silage.

These four lots also offer a splendid opportunity for a comparison of the feed required to produce 100 pounds of gain, shrinkage, dressing percent, and returns from feeding lambs and yearling wethers.

#### RESULTS

Results showing these comparisons in detail are given in Table III.

#### SUMMARY

In this experiment lambs made gains for \$3.69 per 100 pounds less than did yearling wethers when both were fed a ration consisting of shelled corn, untreated cottonseed meal, alfalfa hay, and cane silage. Lambs made gains for \$3.31 per 100 pounds less than did yearling wethers when both were fed a ration consisting of shelled corn, treated cottonseed meal, alfalfa hay, and cane silage.

The lambs shrank 1.86 percent more than did the yearling wethers. Both lambs and wethers dressed an average of 49 percent.

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TABLE III.—FATTENING LAMBS VERSUS FATTENING YEARLING WETHERS  
(Comparison of costs of gains and shrinkage and dressing percents)

| Lot No. ....   | 1          | 5          | 2          | 6          |
|--|------------|------------|------------|------------|
| Number of animal in lot.....                                       | 33         | 32         | 33         | 32         |
| Kind of animals.....   | Lambs      | Wethers    | Lambs      | Wethers    |
| Number of days on experiment.....                                  | 79         | 40         | 79         | 40         |
| Av. initial weight per animal at feedlot.....                      | 56.34 lbs. | 79.41 lbs. | 57.20 lbs. | 79.53 lbs. |
| Av. final weight per animal at feedlot.....                        | 87.23 "    | 91.57 "    | 88.46 "    | 91.16 "    |
| Av. total gain per animal at feedlot.....                          | 30.89 "    | 12.16 "    | 31.26 "    | 11.63 "    |
| Av. daily gain per animal at feedlot.....                          | .39 "      | .30 "      | .40 "      | .29 "      |
| Selling weight per animal at Kansas City.....                      | 81.82 "    | 87.50 "    | 82.42 "    | 86.72 "    |
| Percent shrinkage in marketing.....                                | 6.20       | 4.44       | 6.83       | 4.87       |
| Av. dressing percent.....  | 49         | 49         | 49.3       | 49         |
|  | Pounds     | Pounds     | Pounds     | Pounds     |
| Average daily ration per animal:                                   |            |            |            |            |
| Shelled corn.....  | 1.10       | 1.41       | 1.10       | 1.41       |
| Cottonseed meal (treated) (a).....                                 | .18        | .23        |            | .23        |
| Cottonseed meal (untreated).....                                   |            |            | .18        | .23        |
| Alfalfa hay.....   | .87        | .82        | .90        | .77        |
| Cane silage.....   | 1.16       | 1.61       | 1.18       | 1.56       |
| Salt.....  | .01        | .01        | .01        | .01        |
| Feed required for 100 pounds gain at feedlot:                      |            |            |            |            |
| Shelled corn.....  | 281.46     | 465.16     | 278.18     | 486.83     |
| Cottonseed meal (treated) (a).....                                 | 47.29      | 76.80      |            |            |
| Cottonseed meal (untreated).....                                   |            |            | 46.74      | 80.38      |
| Alfalfa hay.....   | 223.06     | 268.60     | 228.15     | 265.73     |
| Cane silage.....   | 297.05     | 529.89     | 299.03     | 567.21     |
| Salt.....  | 3.63       | 3.85       | 3.68       | 4.03       |
| Cost of feed for 100 pounds gain at feedlot.....                   | \$8.21     | \$9.52     | \$6.20     | \$9.89     |
| Av. initial cost per animal at feedlot.....                        | 4.349      | 5.37       | 4.415      | 5.38       |
| Av. labor cost per animal.....                                     | .50        | .25        | .50        | .25        |
| Av. feed cost per animal.....                                      | 1.92       | 1.16       | 1.94       | 1.14       |
| Int. on investment per animal at 8 percent.....                    | .108       | .056       | .11        | .056       |
| Int. on equipment per animal at 6 percent.....                     | .083       | .042       | .083       | .042       |
| Shipping and selling cost per animal.....                          | .614       | .63        | .614       | .63        |
| Total cost per animal when sold at Kansas City.....                | 7.574      | 7.508      | 7.662      | 7.498      |
| Selling price per animal at Kansas City.....                       | 7.159      | 6.125      | 7.417      | 6.70       |
| Loss per animal.....   | .415       | 1.383      | .245       | 1.428      |
| Cost per cwt. at feedlot.....                                      | 7.72       | 6.76       | 7.72       | 6.76       |
| Necessary selling price per cwt. at Kansas City to break even..... | 9.26       | 8.58       | 9.30       | 8.64       |
| Selling price per cwt. at Kansas City.....                         | 8.75       | 7.00       | 9.00       | 7.00       |

(a) Treated with calcium chloride.

Price of feeds: Corn, 56 cents per bushel; cottonseed meal, \$40 per ton; alfalfa hay, \$15 per ton; cane silage \$5 per ton.

It required 66 percent more corn and 80 percent more cane silage to produce 100 pounds of gain on yearling wethers than on lambs, necessitating a 20 percent greater margin between purchase and selling price per hundred to break even in the case of yearling wethers than in the case of lambs; whereas, the lambs sold for 25 percent more per hundred than did the yearling wethers.

