

Sheep

Feedlot Fattening Experiments with Lambs, 1953-54

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cluded head shape which is obtained by means of the profilometer,³ length and diameter of the cannon bone, bone structure using X-ray, and cellular antigens of blood. Some of the preliminary studies have shown promise, but none of the techniques devised from these investigations for differentiating between carrier and non-carrier cattle have been adequately tested at present to justify recommendation to breeders.

Bone measurement and X-ray studies are still in progress at the Iowa Experiment Station and the blood antigen studies are being continued at the Ohio Station. All techniques are necessarily being checked with breeding tests which require much time and large experimental breeding herds.

Some herds and blood lines are claimed to be free from the dwarf gene. If this is true breeders can avoid dwarfism by using bulls from "carrier-free" families. Caution must be advised in the selection of sires on this basis because the dwarf gene may be present in these families or lines but at such a low frequency that no dwarf calves have as yet been produced. Pedigree errors may cause the dwarf gene to be introduced into families which were free or at least considered to be free from the dwarf gene.

Pedigree penalties may lead to complete discrimination against certain families although many individuals in carrier lines are non-carriers. If selection against dwarfism is carried to the extreme on a pedigree basis, breeders may lower the performance of beef herds in other traits associated with efficient production in beef cattle.

The disposal of animals closely related to dwarfs facilitates the disposal of carrier individuals from breeding herds. Even though there are many limitations to pedigree studies, the studies should be used to "screen" breeding herd replacements, particularly prospective sires to be placed on breeding tests. In many instances pedigree studies have been the only method of controlling dwarfism that has been available for adoption by breeders.

5. Summary

One type of dwarfism in Hereford cattle has been considered in this discussion and the primary aspects of the general problem that have been subjected to experimental study have been reviewed. Breeders should be aware of the following conclusions, which appear justifiable at this time.

1. Dwarfism in conventional Herefords is transmitted as a single, autosomal recessive gene.

2. The increase in the frequency of occurrence of dwarf calves suggests that carriers are being preferred over non-carriers in breeding selections although the reason has not been determined.

3. At present the only reliable technique for the identification of non-carrier sires is the progeny test.

4. Pedigree studies may be useful for controlling dwarfism.

5. It is not advisable to place all selection preference on freedom from dwarfism and to disregard many other traits which are also important in efficient beef cattle production.

3. The profilometer is an instrument developed by the California research workers to obtain the median profile contour of cattle heads.

The tests this year compared whole milo with steam-rolled milo, and ground milo when fed with a standard roughage ration of ground sorghum fodder (little grain), plus a protein supplement and supplemental salt and limestone. The roughage comparisons included: (1) all sorghum fodder, (2) sorghum fodder and alfalfa hay, (3) sorghum silage and alfalfa hay, (4) sorghum silage and sorghum fodder, and (5) beet top silage and alfalfa hay. One lot of lambs received the standard ration of fodder, milo grain, and protein in pellets containing all three ingredients.

The value of antibiotics was checked in one lot and the value of stilbestrol implants and progesterone-stilbestrol implants was checked in two other lots.

Lambs

The lambs for this year's tests were secured from New Mexico and included a large proportion of white-face fine wool lambs and a smaller number of black-face crossbred lambs, with a larger number of ewe lambs than usual. They entered the feeding tests weighing approximately 67 pounds.

Feed Prices

| | |
|-------------------------------------------------------------------------------------|------------------|
| Milo grain | \$ 2.10 per cwt. |
| Grinding | .10 per cwt. |
| Steam rolling | .15 per cwt. |
| Cottonseed meal | 80.00 per ton |
| Alfalfa hay | 30.00 per ton |
| Ground sorghum fodder | 11.00 per ton |
| Beet top silage | 8.00 per ton |
| Sorghum silage | 8.00 per ton |
| Pellets—60% dehydrated sorghum fodder, 35.3% milo grain, 4.7% cottonseed meal .. | 41.50 per ton |

Table 19.—Feedlot Tests.

First Feeding Period—November 10, 1953, to February 23, 1954.

| Lot number | 1 | 2 | 3 | 4 |
|-------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|
| Number of lambs per lot | 48 | 48 | 48 | 48 |
| Ration fed | Beet top silage, milo, alfalfa hay, protein, salt, limestone | Stilbestrol implants, Axtell fodder, milo, protein, salt, limestone | Sorghum silage, milo, alfalfa hay, protein, salt, limestone | Milo (steam rolled), Axtell fodder, protein, salt, limestone |
| Number of days on feed | 105 | 105 | 105 | 105 |
| Initial wt. per lamb | 67.2 | 66.8 | 68.5 | 65.8 |

* Appreciation is expressed to the Cudahy Packing Company of Wichita for providing the carcass data from these experimental lambs.

Table 19 (Continued).

| | | | | |
|-------------------------------|---------|---------|---------|---------|
| Final wt. per lamb | 105.4 | 100.8 | 100.6 | 92.1 |
| Total gain per lamb | 38.2 | 34.0 | 32.1 | 26.3 |
| Daily gain per lamb | .36 | .33 | .31 | .25 |
| Feed per lamb daily: | | | | |
| Milo grain | 1.13 | 1.13 | 1.13 | 1.03 |
| Alfalfa hay | .50 | | .50 | |
| Axtell fodder | | 2.62 | | 2.05 |
| Beet top silage | 5.51 | | | |
| Sorghum silage | | | 3.61 | |
| Cottonseed meal | .20 | .20 | .20 | .20 |
| Salt-limestone | .018 | .035 | .029 | .043 |
| Feed cost per cwt. gain | \$16.89 | \$14.26 | \$17.61 | \$17.04 |
| Number of lambs lost | 0 | 0 | 0 | 0 |

**Feeding Period Following Shearing—February 23, 1954,
to April 1, 1954.**

| | | | | |
|---------------------------------------------|---------|---------|---------|---------|
| Number of days on feed | 37 | 37 | 37 | 37 |
| Number of lambs lost | 1 | 0 | 0 | 0 |
| Number of lambs finishing tests | 47 | 48 | 48 | 48 |
| Av. initial wt. | 105.5 | 101.0 | 100.6 | 92.1 |
| Av. final wt. | 111.5 | 106.7 | 103.9 | 93.9 |
| Av. fleece wt. | 7.3 | 6.9 | 7.6 | 7.5 |
| Total gain per lamb plus fleece wt. | 13.4 | 12.6 | 10.9 | 14.3 |
| Daily gain per lamb | .36 | .34 | .29 | .39 |
| Feed cost per cwt. gain | \$18.10 | \$15.81 | \$17.47 | \$13.83 |
| Total gain—both periods | 51.6 | 46.6 | 43.0 | 40.6 |
| Av. daily gain—both periods .. | .36 | .33 | .30 | .29 |

Table 20.—Feedlot Tests.

First Feeding Period—November 10, 1953, to February 23, 1954.

| | | | | |
|-------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Lot number | 5 | 6 | 7 | 8 |
| Ration fed | Stillhestrol and progesterone implants, milo, Axtell fodder, protein, salt, limestone | Ground milo, Axtell fodder, protein, salt, limestone | Axtell fodder, alfalfa hay, milo, protein, salt, limestone | Sorghum silage, Axtell fodder, milo, protein, salt, limestone |
| Number of lambs per lot | 48 | 48 | 48 | 48 |
| Number of days on feed | 105 | 105 | 105 | 105 |
| Initial wt. per lamb | 66.4 | 65.9 | 65.7 | 66.8 |
| Final wt. per lamb | 100.6 | 95.4 | 97.7 | 92.7 |
| Total gain per lamb | 34.2 | 29.5 | 32.0 | 25.9 |
| Daily gain per lamb | .33 | .28 | .30 | .25 |
| Feed per lamb daily: | | | | |
| Milo grain | 1.13 | 1.13 | 1.13 | 1.13 |
| Alfalfa hay | | | .50 | |
| Axtell fodder | 2.46 | 2.32 | 1.90 | .50 |

Table 20 (Continued).

| | | | | |
|-------------------------------|---------|---------|---------|---------|
| Beet top silage | | | | 3.06 |
| Sorghum silage | | | | |
| Cottonseed meal | .20 | .20 | .20 | .20 |
| Salt-limestone | .042 | .042 | .037 | .037 |
| Feed cost per cwt. gain | \$14.04 | \$16.44 | \$16.40 | \$19.26 |
| Number of lambs lost | 0 | 0 | 0 | 0 |

**Feeding Period Following Shearing—February 23, 1954,
to April 1, 1954.**

| | | | | |
|---------------------------------------------|-------|-------|-------|-------|
| Number of days on feed | 37 | 37 | 37 | 37 |
| Number of lambs lost | 0 | 1 | 0 | 4 |
| Number of lambs finishing tests | 48 | 47 | 48 | 44 |
| Av. initial wt. | 100.6 | 95.8 | 97.7 | 93.6 |
| Av. final wt. | 106.5 | 99.7 | 101.4 | 93.9 |
| Av. fleece wt. | 7.2 | 7.8 | 7.6 | 7.5 |
| Total gain per lamb plus fleece wt. | 13.1 | 11.7 | 13.2 | 7.7 |
| Daily gain per lamb | .35 | .32 | .36 | .21 |
| Feed cost per cwt. gain | 14.80 | 15.86 | 15.01 | 26.29 |
| Total gain—both periods | 47.3 | 41.2 | 45.2 | 33.6 |
| Av. daily gain—both periods .. | .33 | .29 | .32 | .24 |

Table 21.—Feedlot Tests.

First Feeding Period—November 10, 1953, to February 23, 1954

| | | | |
|-------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Lot number | 9 | 10 | 11 |
| Ration fed | Antibiotics, milo, Axtell fodder, protein, salt, limestone | Standard, milo, Axtell fodder, protein, salt, limestone | Pelleted ration, milo, Axtell fodder, protein, salt, limestone |
| Number of lambs per lot | 48 | 48 | 48 |
| Number of days on feed | 105 | 105 | 105 |
| Initial wt. per lamb | 66.8 | 66.5 | 66.9 |
| Final wt. per lamb | 93.7 | 93.1 | 98.7 |
| Total gain per lamb | 26.9 | 26.3 | 31.8 |
| Daily gain per lamb | .26 | .25 | .30 |
| Feed per lamb daily: | | | |
| Milo grain | 1.13 | 1.11 | .58 |
| Axtell fodder | 2.25 | 2.14 | .019 |
| Cottonseed meal | .20 | .20 | 2.59 |
| Pellets | | | .037 |
| Salt-limestone | .037 | .033 | |
| Feed cost per cwt. gain | \$17.30 | \$17.20 | \$28.74 |
| Number of lambs lost | 0 | 0 | 0 |

**Feeding Period Following Shearing—February 23, 1954,
to April 1, 1954.**

| | | | |
|------------------------------|----|----|----|
| Number of days on feed | 37 | 37 | 37 |
| Number of lambs lost | 1 | 0 | 2 |

Table 21 (Continued).

| | | | |
|------------------------------------------|---------|---------|---------|
| Number of lambs finishing tests | 47 | 48 | 46 |
| Av. initial wt. | 93.9 | 93.1 | 99.6 |
| Av. final wt. | 98.3 | 95.3 | 100.5 |
| Av. fleece wt. | 6.9 | 7.4 | 7.7 |
| Total gain per lamb plus fleece wt. | 11.3 | 9.6 | 8.6 |
| Daily gain per lamb | .30 | .26 | .23 |
| Feed cost per cwt. gain | \$16.14 | \$17.29 | \$31.87 |
| Total gain both periods | 38.2 | 35.9 | 40.4 |
| Av. daily gains for both periods | .28 | .25 | .28 |

Observations

The lambs were shorn late in February and early in March. Stormy and cold weather during the shearing period may have affected the later shorn ones more than those shorn earlier. Because of the difficulty in securing representative weights before Lamb Feeders' Day at Garden City March 20, tests were summarized as of February 23 and the data presented in the Garden City Lamb Feeders' Day bulletin. This information on the initial feeding period of 105 days is shown in the first portions of Tables 19, 20, and 21. Information on the feeding period following February 23 is presented in the second portions of the same tables. Total gain and average daily gain for the entire feeding period of 142 days are shown on the last two lines of each table.

No lambs died during the initial feeding period but nine died during the second period. Six died from exposure; two, with enterotoxemia; and one, with urinary calculi.

Largest gains over the entire feeding period were made by lambs receiving the best top silage, followed by those receiving stilbestrol and stilbestrol-progesterone implants.

As in past years the carcass yields and grades of the hormone-treated lambs this year were much lower than the yields and grades of lambs receiving the same rations but receiving no hormones. The carcass grades and yields for the two hormone-treated lots and the control lot are shown below. Abnormal development of the accessory reproductive glands was found in the hormone-treated lambs again this year.

| Treatment groups | Yield | Carcass grades | | | |
|--------------------------------------|---------|----------------|------|---------|------|
| | | Choice | Good | Utility | Good |
| Controls | 50.07 % | 5 | 31 | 10 | 1 |
| Stilbestrol treated .. | 46.5 % | | 11 | 23 | 5 |
| Stilbestrol and Progesterone treated | 46.10 % | | 12 | 31 | 2 |

The lambs on the steam-rolled milo went off feed several times during the early part of the test but gained rapidly during the second feeding period. Gains of .29 pound per head daily were made by the lambs receiving steam-rolled and ground milo compared with .25 pound by lambs receiving the unground milo.

When sorghum silage replaced a portion of the sorghum fodder, the rates of gain were slightly reduced and the cost of gain increased. The gains also were slightly lower when sorghum silage replaced the sorghum fodder fed with alfalfa hay as roughage. The cost per pound of gain increased when the silage was fed. In previous years, silage has generally produced slightly larger gains, but at higher costs than roughage entirely of sorghum stover. In this year's tests, fodder was used instead of stover. While the grain content of the fodder was low, it still may have been enough to cause some variation in results from previous years.

Alfalfa hay replacing part of the sorghum fodder or all of the fodder

when fed with silage increased the rate of gain. The gains were also a little cheaper when alfalfa hay was fed as part of the roughage.

Lambs receiving antibiotics made slightly larger gains than lambs on the same ration without antibiotics. The lambs receiving the completely pelleted ration also gained a little more than lambs receiving the unpelleted ration, but the cost of the pelleting processes made the cost of gains much higher for lambs receiving pellets.

The Relationship of Physical Balance and Energy Value in Sheep Rations, Summer, 1953.

PROJECT 236

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Lamb-fattening rations varying in proportions of roughage to concentrates have been studied in this project for several years. Experimental evidence shows that a ratio of 55 percent roughage and 45 percent concentrates has been most efficient in the utilization of feed nutrients. In recent years much interest has been shown by feeders in rations that are ground, mixed, and the entire ration put into a pellet.

Objects of the 1953 studies:

1. To determine if a ration of corn and alfalfa hay would produce larger and more economical gains when fed as pellets than when the hay was fed long and the corn was unground.

2. To determine if certain proportions of roughages to concentrates were more desirable than others in the completely pelleted ration.

Table 22.—Physical Balance in Lamb Fattening Studies.
Pelleting Trials, June 27-August 24, 1953

| | Lot 1 | Lot 2 | Lot 3 | Lot 4 |
|----------------------------------------------------------------|----------------------------------|----------------------------------------|----------------------------------|----------------------------------------|
| | Pellets Corn 45 % Hay 55 % | Whole corn 45 % Long hay 65 % | Pellets Corn 35 % Hay 65 % | Whole corn 35 % Long hay 65 % |
| Number of lambs per lot | 10 | 10 | 10 | 9 |
| Initial wt. per lamb | 70.5 | 71.6 | 71.1 | 70.1 |
| Final wt. per lamb | 95.2 | 92.0 | 93.0 | 89.0 |
| Total gain per lamb | 24.7 | 20.4 | 21.9 | 18.9 |
| Average daily gain | .36 | .30 | .33 | .27 |
| Pounds of feed daily per lamb . | 2.6 | 2.6 | 2.6 | 2.6 |
| Feed per cwt. gain | 716 | 867 | 807 | 971 |
| Feed cost per cwt. gain* | 17.80 | 16.34 | 18.94 | 17.04 |
| Initial cost of lamb at \$17 per cwt. | 11.98 | 12.17 | 12.09 | 12.03 |
| Total cost of lambs and feed | 16.38 | 15.51 | 16.23 | 15.12 |
| Final cost per cwt. | 17.21 | 16.79 | 17.46 | 17.01 |
| Return over cost per lamb— selling price, \$21.50 cwt. | 4.09 | 4.27 | 3.76 | 3.99 |

* Corn, \$1.60 per bushel; Alfalfa hay, \$25 per ton; Cost of pellet preparation (hauling, grinding, and pelleting), \$12 per ton.

* Grateful acknowledgement is given to Morris Johnson, graduate student in animal husbandry, for his help in summarizing these data.