

early part of the breeding season and it is also possible that the artificially induced estrus or heat was not accompanied by conditions necessary for successful conception.

In Table 24 it may be seen that the untreated ewes lambled a little earlier than the ones receiving the estrogenic material, "E.C.P." Three ewes failed to lamb in the treated group compared with one in the controlled group.

These tests further indicate the difficulty in securing earlier and more uniform lamb crops by use of hormones.

#### The Effect of Cottonseed Meal and Soybean Oilmeal Fed Separately and Together upon the Digestibility of a Ration Fed to Lambs, 1953.

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There is a variation in the digestibility of protein in the various concentrates fed to livestock. It has been shown that the digestibility of nutrients in a ration with a mixture of protein concentrates is closely related to the proportion of the various protein sources in the ration. However, opinions differ on the effect of single and mixed proteins upon the digestibility of protein and other nutrients in the ration of cattle and sheep. This preliminary study was to evaluate further the nutritive value of single and mixed protein concentrates in the lambs' ration.

Hampshire, Shropshire, and Rambouillet wether lambs that averaged about 100 pounds each were used. Sorghum stover, ground in a hammer mill, was used as the roughage. In addition to the stover, each lamb received a daily ration of 1 pound of yellow corn, 1/10 pound of dehydrated alfalfa pellets, 1/10 pound of ground limestone, and 1/4 pound of cottonseed meal, or its equivalent in protein from soybean meal or a mixture of 1/2 each cottonseed meal and soybean meal.

The results of this preliminary study are shown in Table 25.

Table 25.—The Effect of Cottonseed Meal and Soybean Oilmeal Fed Separately and Together Upon the Digestibility of a Ration Fed to Lambs.

|  | Crude protein | Percent apparent digestibility of Ether ext. | Crude fiber | N-free ext. | Percent total dig. nutr. |
|--|---------------|--|-------------|-------------|--------------------------|
| Cottonseed meal as protein supplement                      |               |  |             |             |                          |
| Lamb   |               |  |             |             |                          |
| 2  | 52.31         | 72.43  | 34.07       | 79.60       | 44.87                    |
| 3  | 52.97         | 73.99  | 28.91       | 81.52       | 49.02                    |
| 6  | 55.41         | 75.12  | 40.63       | 82.74       | 47.15                    |
| 8  | 58.37         | 77.29  | 42.26       | 81.10       | 48.75                    |
| Average  | 54.76         | 74.69  | 36.77       | 81.23       | 47.32                    |
| Soybean oilmeal as protein supplement                      |               |  |             |             |                          |
| Lamb   |               |  |             |             |                          |
| 1  | 66.11         | 73.09  | 45.55       | 83.71       | 49.74                    |
| 4  | 60.69         | 70.30  | 38.20       | 81.77       | 46.87                    |
| 7  | 66.12         | 74.47  | 50.87       | 84.07       | 48.72                    |
| Average  | 63.81         | 72.11  | 43.24       | 82.94       | 48.34                    |
| Cottonseed meal plus soybean oilmeal as protein supplement |               |  |             |             |                          |
| Lamb   |               |  |             |             |                          |
| 2B   | 64.76         | 69.38  | 45.27       | 82.64       | 47.85                    |
| 3B   | 57.23         | 73.33  | 31.79       | 80.72       | 47.14                    |
| 6B   | 66.63         | 78.44  | 56.38       | 84.05       | 49.91                    |
| 8B   | 58.95         | 76.19  | 45.44       | 76.63       | 45.10                    |
| Average  | 61.92         | 74.35  | 45.16       | 81.01       | 47.50                    |

#### Observations

1. The digestibility of protein and total nutrients was lowest when cottonseed meal was used in the ration.

2. The digestibility of protein and total nutrients was highest when soybean oilmeal was used in the ration.

3. The digestibility of protein and total nutrients in the ration using a mixture of cottonseed meal and soybean oilmeal was greater than for cottonseed meal alone but less than for soybean oilmeal alone. This agrees with previous work with cattle and sheep at other experiment stations.

#### Adaptability of Breeds of Rams and Breed-Types of Range Ewes to Market Lamb Production in Kansas.

PROJECT 347

T. Donald Bell and Lewis Holland\*

Western ewes of the three predominant types (Texas ewes or fine wools, Blackface crossbreds, and Northwestern Whiteface crossbreds) commonly found in Kansas were secured as ewe lambs in the fall of 1951 and bred to Hampshire, Suffolk, Shropshire, and Southdown rams two seasons. A different set of yearling rams has been used each year and the ewes are being rotated so that the same ewes are not bred to the same breed of ram each year. Lamb production and wool production records are being obtained from the different types of ewes, and lamb production figures are being obtained for the four sire groups.

#### Results

Lamb production figures for the 1952-53 lamb crop are presented in Table 26.

Table 26.—Lamb production by ewes of different types and from sires of different breeds in 1953.

| Ewe types           | No. ewes bred | No. lambs weaned | % lambs weaned | Av. weaning weight | Lbs. lamb weaned per ewe bred |
|---------------------|---------------|------------------|----------------|--------------------|-------------------------------|
| Finewools           | 43            | 40               | 93             | 87                 | 81                            |
| Northwest Whiteface | 45            | 39               | 87             | 84                 | 73                            |
| Northwest Blackface | 52            | 49               | 94             | 81                 | 76                            |
| Sire groups         |               |                  |                |                    |                               |
| Hampshire           | 35            | 31               | 88             | 92                 | 81                            |
| Suffolk             | 35            | 36               | 103            | 91                 | 94                            |
| Southdown           | 35            | 28               | 80             | 82                 | 65                            |
| Shropshire          | 35            | 33               | 94             | 70                 | 66                            |

\* Much assistance in collecting and summarizing the data for this experiment was given by Arthur W. Gardner, a graduate student in animal husbandry.

Table 27 gives the lambing performance and production of the three types of ewes for 1954.

**Table 27.—Lambing Data and Lamb Production from Ewes of Different Types and from Sires of Different Breeds, 1954.**

| Ewe types              | No. ewes bred | Av. lambing date | Av. birth weight | No. lambs alive April 13, 1954 | Av. weight April 13, 1954 |
|------------------------|---------------|------------------|------------------|--------------------------------|---------------------------|
| Finewools .....        | 51            | 12/18/53         | 11.1             | 45                             | 82.6                      |
| Northwest Whiteface .  | 42            | 1/11/54          | 10.7             | 38                             | 71.8                      |
| Northwest Blackface .. | 52            | 1/1/54           | 10.5             | 49                             | 73.1                      |
| Single groups          |               |                  |                  |                                |                           |
| Hampshire .....        | 36            | 12/18/53         | 11.4             | 35                             | 80.2                      |
| Suffolk .....          | 36            | 1/23/54          | 10.8             | 30                             | 80.3                      |
| Southdown .....        | 37            | 1/14/54          | 11.0             | 32                             | 79.2                      |
| Shropshire .....       | 36            | 1/7/54           | 10.7             | 35                             | 67.8                      |

Table 28 gives the average body weights following lambing in 1954 and the grease wool production for 1953.

**Table 28.—Body Weights of and Wool Production from Ewes of Different Types.**

|                           | 1953 grease wool production lbs. | Body weight in lbs. following lambing, 1953-54 |
|---------------------------|----------------------------------|--|
| Finewools .....           | 11.7                             | 132  |
| Northwest Whiteface ..... | 13.7                             | 152  |
| Northwest Blackface ..... | 10.7                             | 158  |

The Rambouillet or finewool ewes have lambed the earliest both years of the test; their lambs have been heavier at weaning time in 1953 and their lambs were heavier on April 13, 1954, because of their age. The Northwest Whitefaces have lambed the latest both years of the test.

Lambs sired by Hampshire and Suffolk rams were heavier at weaning time than the Southdown and Shropshire-sired lambs and they produced more pounds of lamb per ewe bred in the 1953 tests. April 13, 1954, there was little difference in the weights of lambs sired by Hampshire, Suffolk, or Southdown rams. The Shropshire lambs were lighter but there were more twins in the Shropshire-sired group than in the Suffolk- or Southdown-sired groups.

The Northwest Whiteface ewes have sheared more wool than either of the other types of ewes both years of the tests. The finewool ewes have ranked second in wool production, although the Blackfaces sheared only 1 pound less in 1953.

#### Conclusion

1. The tests so far indicate fairly clearly that the finewool ewes will lamb earlier than the other two types and that the Whiteface crossbreds will shear the most wool. While there is some indication that some breeds of rams will produce more pounds of lambs, the figures are too limited and variable for definite conclusion; tests need to be repeated several years to give a reliable indication.

**Physical Balance in Lamb Fattening Rations. Pelleted and Unpelleted Rations for Creep-fed Lambs, Spring 1954.**

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While information is becoming available concerning the pelleting of complete rations for fattening lambs, no studies have been made using pelleted rations for creep-fed lambs still nursing their mothers. To secure information on the merits of such a practice, lambs in the College experimental breeding trials were used for such tests. The lambs with their mothers were separated into four groups sired by Hampshire, Suffolk, Southdown, and Shropshire rams, respectively. Each sire group was then divided as nearly equally as possible into two groups—one fed the pelleted ration and one, the unpelleted ration. The pellets were 25 percent ground alfalfa hay, 68 percent sorghum grain, and 7 percent cottonseed meal and were fed free choice in the creeps. A mixture of ground alfalfa hay from the same source as that in the pellets, whole milo, and cottonseed meal in the same percentages as in the pellets was fed free choice in the creeps of the lambs receiving the unpelleted rations. In addition, some long alfalfa hay was provided in the creeps of all lots. The ewes in all lots were fed the same ration which consisted of approximately 1½ pounds of alfalfa hay, 4 pounds of corn silage, and 1 pound of mixed grain (milo, bran, and cottonseed meal) per head daily.

Table 29 shows the response of the different lots of lambs during the feeding period from March 2, 1954, to April 13, 1954.

**Table 29.—Comparative Performance of Creep-Fed Lambs Receiving Pelleted and Unpelleted Rations.**

March 2-April 13, 1954.

|                            | No. lambs | Pellets or grain mixture consumed daily per lamb | Alfalfa eaten in creep daily per lamb | Av. daily gain per lamb | Creep feed cost per 100 lbs. gain |
|----------------------------|-----------|--|---------------------------------------|-------------------------|-----------------------------------|
| Hampshire-sired lambs:     |           |  |                                       |                         |                                   |
| Pelleted creep ration .... | 15        | 1.5  | .23                                   | .72                     | \$6.90                            |
| Unpelleted ration .....    | 14        | 1.6  | .24                                   | .63                     | 6.31                              |
| Suffolk-sired lambs:       |           |  |                                       |                         |                                   |
| Pelleted ration .....      | 16        | 1.6  | .22                                   | .78                     | 6.78                              |
| Unpelleted ration .....    | 14        | 1.7  | .24                                   | .72                     | 5.82                              |
| Southdown-sired lambs:     |           |  |                                       |                         |                                   |
| Pelleted ration .....      | 15        | 1.6  | .23                                   | .60                     | 7.78                              |
| Unpelleted ration .....    | 16        | 1.5  | .21                                   | .57                     | 6.46                              |
| Shropshire-sired lambs:    |           |  |                                       |                         |                                   |
| Pelleted ration .....      | 16        | 1.3  | .20                                   | .66                     | 6.29                              |
| Unpelleted ration .....    | 16        | 1.2  | .18                                   | .60                     | 4.73                              |

The pellets increased the rate and efficiency of gain in the creep-fed rations, but when the \$12 a ton cost of pelleting is included in the feed costs, gains of lambs on the pelleted rations were all more expensive than gains of those fed unpelleted rations. These results are consistent with results obtained in several tests with feeder lambs where rate and efficiency of gain were increased with pelleted rations, but extremely high costs of pelleting made costs of gains of lambs receiving pellets higher than gains from unpelleted feeds.

\* Recognition is given to Morris Johnson and Wendell Gardner, graduate students in animal husbandry, for their help in collecting and summarizing these data.