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Finishing western wethers on grass and grain for early summer market.

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SHEEP FEEDING EXPERIMENTS

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2. Finishing Western Wethers for Early Winter Market.
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Finishing Western Wethers on Grass and Grain for Early Summer Market.

W. J. KENNEDY.  F. R. MARSHALL

Farmers throughout the central states annually feed and finish for market thousands of sheep. During the past decade a great many farmers have adopted the policy of purchasing western lambs and yearlings during the months of September, October, November and December with the intention of feeding them from sixty to one hundred and twenty days, depending upon the condition of lambs, markets, etc., and then selling them at an advance in price sufficient to return a nice profit on the investment.

Many sheep feeders claim that one year with another when sheep or lambs are fed on grain and hay that the feeder must have a margin of at least one cent per pound between the buying and selling price to warrant a profit. In other words, lambs or sheep purchased at four cents per pound must be sold for at least five cents per pound when finished in order that the feeder may make sheep feeding a paying business. A careful study of the cost of producing gains on sheep and lambs at this and other stations would indicate that a margin of one cent per pound between the buying and selling price is not always necessary. In summarizing the results of five trials at Wisconsin, Minnesota and Michigan stations where corn and hay were used, valuing hay at eight dollars per ton and corn at thirty-three cents per bushel, each pound of gain was made at a cost of four and one-half cents. At this station gains have been made on grass and corn at a cost of less than two cents per pound in which instance the sheep could have been sold without any advance over the buying price and a nice profit realized. Some of the things which have an important bearing on this matter are the price of feed stuffs, age of animals, season of the year when feeding is done, etc. When feed is low in price the feeder can work on a small margin and vice versa. Lambs can be handled on a much closer margin than yearlings or older sheep,
due to the fact that the younger the animal the better it can utilize its feed, thus more economical gains are made. Lambs purchased in the neighborhood of the feeder can be fed on a narrower margin than those purchased at some distant point as the freight charges must always be considered. The season of the year also has an important bearing on the matter, and as will be noted later in this bulletin, more economical gains can be made during the summer months on grass alone and grass and grain than can be made during the fall and winter months on grain and hay.

Desiring to obtain reliable data in regard to the economy of finishing lambs for the early summer market, the advisability of purchasing lambs in the spring of the year and carrying them over on grass to be finished in the fall on grain and hay for the early winter market, and to make a comparison of the relative economy of summer feeding on grass and grass and grain versus fall feeding on grain and hay, my predecessor, Professor John A. Craig, purchased a bunch of two hundred and sixty-one Idaho lambs (yearlings) on May 1, 1901, from Clay, Robinson & Company, commission merchants, Omaha, Neb., at four cents per pound. The freight from Omaha to Ames added an additional one-fourth of a cent, making the lambs cost us four and one-fourth cents delivered here. These lambs had been on light feed in Jansen, Neb., during the winter months. They were dipped before shipping to eliminate any possibility of scab or other contagious disease. After their arrival they were divided into six bunches, five of which were used in the summer feeding experiment. The remaining bunch which contained one hundred was carried over on bluegrass pasture for fall feeding purposes.

Lot No. 1 contained fifteen sheep which were put on good bluegrass pasture.

Lot No. 2 contained fifteen sheep which were fed corn in addition to a good bluegrass pasture.

Lot No. 3 contained fifteen sheep which were fed oats in addition to a good bluegrass pasture.

Lot No. 4 contained fifteen sheep which were fed barley in addition to a good bluegrass pasture.

Lot No. 5 contained one-hundred-one (101) sheep which were fed corn and oats (the oats being used as a starter were fed only for the first thirty days, after which time corn alone was fed) in addition to a good bluegrass pasture.

For the first four lots of sheep a good fourteen acre field
of bluegrass was divided into four equal lots, containing three and one-half acres each. The grass was abundant at all times and would have provided ample food for a larger number of sheep.

Lots Nos. 1, 2, 3 and 4 were fed for sixty-three days and Lot No. 5 was on feed sixty days. The following table gives the total gains, average daily gains, cost of grain, etc.:

<table>
<thead>
<tr>
<th>No. of Sheep</th>
<th>Days Fed</th>
<th>Food Eaten</th>
<th>Av. Wt at beginning</th>
<th>Total Gain Lot Lbs.</th>
<th>Av Daily Gain Lbs</th>
<th>Feed per 100 Lbs. Gain</th>
<th>Cost per 100 Lbs. Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot 1 15</td>
<td>63</td>
<td>Bluegrass pasture</td>
<td>80.6</td>
<td>384</td>
<td>.406</td>
<td></td>
<td>$1.05</td>
</tr>
<tr>
<td>Lot 2 15</td>
<td>63</td>
<td>corn 755.5 pasture</td>
<td>80.6</td>
<td>436</td>
<td>.46</td>
<td>corn 170</td>
<td>1.95</td>
</tr>
<tr>
<td>Lot 3 15</td>
<td>63</td>
<td>oats 748 pasture</td>
<td>80.9</td>
<td>398</td>
<td>.42</td>
<td>oats 187.5</td>
<td>2.36</td>
</tr>
<tr>
<td>Lot 4 15</td>
<td>63</td>
<td>barley 740.5 pasture</td>
<td>80.26</td>
<td>372</td>
<td>.39</td>
<td>barley 199</td>
<td>2.75</td>
</tr>
<tr>
<td>Lot 5 101</td>
<td>60</td>
<td>oats 1473.5 corn 3933.5 pasture</td>
<td>75.3</td>
<td>2642</td>
<td>.435</td>
<td>oats 56</td>
<td>2.26</td>
</tr>
</tbody>
</table>

**Valuation of feed consumed.**

- Oats 23 cents per bushel.
- Corn 33 cents per bushel.
- Barley 40 cents per bushel.
- Pasture 3 cents per week per sheep.

At the conclusion of the experiment the various lots were labeled and consigned on July 15th to Clay, Robinson & Company, Chicago, who sold them separately to Armour & Company at the following prices: Lot 4, four and three fourths cents per pound; Lots 1, 2, 3 and 5 for five cents per pound, which was the extreme top of the market for that class of sheep on that day.

A careful study of the markets during the past few years will reveal the fact that sheep and lambs are usually lower in price during the latter part of April and the first of May than they are during the early part of July before what is commonly termed as "grass stock" arrives on the market. This is due to the fact that most of the western fed lambs are marketed during the month of April and the early part of May,
thus there is usually a period of from six to eight weeks' duration when good sheep are at a premium as the native lambs do not usually arrive before the middle of July or first of August. This is a factor which the feeder should consider, for oftentimes a heavy run will cause a sharp cut in prices when the half fat lamb can be purchased at a price which will warrant the feeder shipping them back to the farm for a forty or sixty days run on a good bluegrass pasture where they will not only increase in weight but also in value per pound.

The data obtained indicates—

1. That sheep will make practically as large gains on grass alone as on grain and grass.

2. That in economy of gain, grass alone gave the best results.

3. That corn at thirty-three cents per bushel is a more economical grain to feed sheep on grass than oats at twenty-three cents or barley at forty cents.

4. That mutton can be produced much more economically during the summer months on grass alone or grain and grass than it can be produced by feeding grain and hay during the fall and winter months.

5. That the feeder can oftentimes purchase half fat lambs during the latter part of April or the first part of May, and by grazing them for from forty to sixty days realize a good profit, due to the advance in market prices during the latter part of June and the first of July over those ruling in April and the first part of May.

_Finishing Western Wethers for Early Winter Market._

As previously stated in this bulletin, one hundred of the Idaho lambs purchased May 1, 1901, were carried over on bluegrass pasture during the summer months to be used for a fall feeding experiment. During the period of one hundred and fifty-two days they made an average gain of thirty-one pounds per head. Charging three cents per week per head for pasture the gains were made at a cost of about 2.12 cents per pound, thus showing the possibility of the economical production of mutton on grass alone during the summer months.

Desiring to obtain some definite information relative to the value of Emmer (commonly known as Speltz), soy beans
and gluten feed for sheep feeding purposes, the bunch was divided into seven lots and fed from October first to November twenty-fifth the following rations:

Lot No. 1, ten sheep fed on emmer and clover hay.
Lot No. 2, ten sheep fed on soy beans and clover hay.
Lot No. 3, ten sheep fed on corn two parts, gluten feed one part and clover hay.
Lot No. 4, ten sheep fed on corn and clover hay.
Lot No. 5, fifteen sheep fed on grass, rape and corn.
Lot No. 6, thirty sheep fed on grass and corn.
Lot No. 7, fifteen sheep fed on grass alone.

The sheep in all of the lots were started on a light grain ration, about one-third of a pound per head, which was gradually increased until the emmer lot were eating two and four-tenths pounds per head per day and the soy bean lot, the corn and gluten feed lot and the corn lot were each eating two pounds per head per day. Bran was added to all the rations at the beginning and continued during the first fifteen days, after which it was dropped from the ration. Bran is a good regulator for the system of the animal, and may well be used during the first few days in getting any class of stock to take readily to eating a new food.

The length of the feeding period was shorter than it would have been had not the burning of our experiment station barn and feeding sheds rendered it impossible for us to continue the work. At the close of the experiment, however, all the lots were in good flesh except Lot No. 7 which was on grass alone. This lot did not make heavy gains during any part of the experiment, which may be accounted for in the fact that the pasture land which they had access to had been burned off during the early part of September, thus the grass, being very soft and watery, did not contain enough nutritive substance to make good gains.

On account of the low market prices due to the heavy run of sheep which were being sent in from all parts of the country as a result of shortage of feed caused by the dry season, the sheep were not marketed at the close of the experiment. They were fed a liberal ration of corn, bran and corn fodder until January 6th when they were sold by Clay, Robinson & Company, Chicago, to Swift & Company for five cents per pound, the top of the market for that class of sheep.

The following table gives total gains, average daily gains
and the amount of food consumed by each lot for each one hundred pounds of gain:

<table>
<thead>
<tr>
<th>No. of Sheep</th>
<th>Days on Feed</th>
<th>Feed Eaten</th>
<th>Av. Wt. at Beginning</th>
<th>Total Gain for Lot Lbs.</th>
<th>Av. Daily Gain Lbs.</th>
<th>Food per 100 Lbs. Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot 1 10</td>
<td>56</td>
<td>Clover hay 1086</td>
<td>111.3</td>
<td>256.3</td>
<td>.457</td>
<td>Clover hay 423</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bran 48 Emmer 835</td>
<td></td>
<td></td>
<td></td>
<td>Bran 19 Emmer 326</td>
</tr>
<tr>
<td>Lot 2 10</td>
<td>56</td>
<td>Clover hay 1078</td>
<td>110</td>
<td>228</td>
<td>.407</td>
<td>Clover hay 473</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bran 48 Soybeans 751.5</td>
<td></td>
<td></td>
<td></td>
<td>Bran 21 Soy beans 229</td>
</tr>
<tr>
<td>Lot 3 10</td>
<td>56</td>
<td>Clover hay 1078</td>
<td>109.8</td>
<td>254</td>
<td>.453</td>
<td>Clover hay 424</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bran 48 Corn 507 Gluten feed 253.5</td>
<td></td>
<td></td>
<td></td>
<td>Corn 200 Gluten feed 100</td>
</tr>
<tr>
<td>Lot 4 10</td>
<td>56</td>
<td>Clover hay 1073</td>
<td>109.5</td>
<td>254.7</td>
<td>.454</td>
<td>Clover hay 421</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bran 48 Corn 769</td>
<td></td>
<td></td>
<td></td>
<td>Bran 19 Corn 302</td>
</tr>
<tr>
<td>Lot 5 15</td>
<td>56</td>
<td>Grass and rape</td>
<td>109.3</td>
<td>381</td>
<td>.453</td>
<td>Bran 9 Corn 241</td>
</tr>
<tr>
<td>Lot 6 30</td>
<td>56</td>
<td>Grass</td>
<td>109.7</td>
<td>686.3</td>
<td>.409</td>
<td>Bran 12 Corn 300.5</td>
</tr>
<tr>
<td>Lot 7 15</td>
<td>56</td>
<td>Grass</td>
<td>108.6</td>
<td>234.3</td>
<td>.279</td>
<td></td>
</tr>
</tbody>
</table>

It will be noticed by the above table that all of the lots except No. 7, which was on the fresh grass pasture, made very large gains. The gains made by Lot 7 are just fair in comparison with those made by the other lots, but they are up to the average obtained in sheep feeding experiments at other stations. Lot No. 1 fed on emmer and clover hay made the largest total gain and also the highest average daily gain per head, which indicates that emmer is a valuable feed for sheep feeding purposes. It is rather difficult to arrive at the relative cost of producing one hundred pounds of gain with the different rations, due to the fact that neither emmer nor soy beans are as yet grown in large enough quantities to give them a set market value for feeding purposes. The market quotations on either of these grains is solely or almost solely confined to their value for seed purposes, thus cannot be used in this connection to estimate the cost of producing mutton.

By using corn, the most common grain used for sheep feeding purposes throughout the central states, as a unit of value we can estimate the value of emmer and soy beans from the results obtained in the above table. Corn cost us forty-six
cents per bushel, and on this basis the results of the above experiment would give emmer a value of twenty-six and one-half cents per bushel of thirty-five pounds, and soy beans a value of forty-five cents per bushel of sixty pounds for sheep feeding purposes. This places but a low value on soy beans, one which in the writer’s estimation is much too low. Soy beans in this experiment were fed as a sole grain ration in connection with clover hay to yearling wethers. On account of their high protein content it is very likely that if they had been fed as part of the grain ration in conjunction with corn, for instance, much better results would have been obtained. Or if instead of clover hay, which is a protein food, timothy hay or corn fodder were fed as roughage, much more favorable results might have been obtained so far as the use of soy beans was concerned. Furthermore, had the animals used been lambs instead of yearlings soy beans might have given better results as on account of their high protein content they should make an excellent food for growing animals.

By placing the following valuation on the various feeds consumed the cost per 100 pounds can be obtained:

<table>
<thead>
<tr>
<th>No. of Sheep</th>
<th>Ration Fed</th>
<th>Cost per 100 Lbs. Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot 1</td>
<td>Emmer, clover hay (and bran to start on)</td>
<td>$4.35</td>
</tr>
<tr>
<td>Lot 2</td>
<td>Soy beans, clover hay (and bran to start on)</td>
<td>4.35</td>
</tr>
<tr>
<td>Lot 3</td>
<td>Corn, gluten feed, clover hay (and bran to start on)</td>
<td>4.38</td>
</tr>
<tr>
<td>Lot 4</td>
<td>Corn and clover hay (and bran to start on)</td>
<td>4.35</td>
</tr>
<tr>
<td>Lot 5</td>
<td>Grass, rape and corn (and bran to start on)</td>
<td>3.03</td>
</tr>
<tr>
<td>Lot 6</td>
<td>Grass and corn (and bran to start on)</td>
<td>3.62</td>
</tr>
<tr>
<td>Lot 7</td>
<td>Grass</td>
<td>1.54</td>
</tr>
</tbody>
</table>

Clover hay, $8.00 per ton.
Gluten feed, $17.00 per ton.
Bran, $19.00 per ton.
Corn, 46 cents per bushel.
Emmer, 26½ cents per bushel.
Soy beans, 45 cents per bushel.
Pasture, 3 cents per week per sheep.

THE DATA OBTAINED INDICATES,

1. That when corn is worth forty cents per bushel, emmer is worth twenty-six and one-half cents per bushel of thirty-five pounds for sheep feeding purposes.
2. That when corn is worth forty cents per bushel, soy beans, when they compose the sole grain ration, are worth but forty-five cents per bushel for sheep feeding purposes.
3. That corn alone when fed in conjunction with clover hay produced larger and more economical gains than the ration of corn, two parts; gluten feed, one part, and clover hay.
4. That sheep can be fattened more economically on grass and corn or on grass alone than on emmer and clover hay, soy beans and clover hay, corn two parts, gluten feed one part and clover hay, or corn and clover hay.
5. That soy beans on account of their high protein content should not form the sole grain ration in conjunction with clover hay for sheep feeding purposes.
6. That pound for pound corn is more valuable than emmer for sheep feeding purposes.
7. That mutton can be produced economically on grass alone during the summer months.
Kennedy and Marshall: Finishing western wethers on grass and grain for early summer mar