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R. M. Jordan

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SOYBEANS

FOR FATTENING LAMBS



ANIMAL HUSBANDRY DEPARTMENT
Agricultural Experiment Station
South Dakota State College
BROOKINGS

SOYBEANS

for Fattening Lambs

R. M. JORDAN¹

LAMB FEEDERS might well consider using whole soybeans as a protein supplement. Trials show they compare favorably with soybean oil meal.

Background Relating to the Experiment

During the past 10 years soybeans have become an important crop in a large portion of the Corn Belt area. While soybeans are high in protein, only a small percentage of those grown in the Corn Belt are retained on the farm for feeding purposes.

Many years whole soybeans sell on the cash market for considerably less per pound than soybean oil meal. Whole soybeans contain about 38 percent total protein compared to about 44 percent in soybean oil meal. However, soybean oil meal is lower in total digestible nutrients (79 percent as compared to 88 percent for whole soybeans).

The fact that a majority of the soybeans are sold as a cash crop and not retained for feeding purposes by lamb feeders is probably due to a lack of appreciation of their feeding value. F. B. Morrison states in his 1951 *Feeds and Feeding* that whole soybeans are equal to soybean oil meal as a protein supplement for fattening lambs.

An experiment in which whole soybeans were compared with soybean oil meal as a protein supplement for fattening lambs was conducted at the South Dakota Experiment Station in 1953-54. This was done to familiarize lamb feeders with the value of whole soybeans as a home-grown protein supplement.

How the Experiment Was Conducted

Lambs of good to choice quality were full-fed a ration of shelled yellow corn, medium quality brome hay, and a protein supplement. The lambs were sheared prior to being placed on experiment and were housed in a shed with access to a small outside lot. Fresh water, salt, and a mineral supplement consisting of a trace-mineralized salt and bone meal were provided all lambs at all times.

Two trials were conducted. Protein supplements fed during the first trial were: Lot 1, .2 pound soybean oil meal per head daily; Lot 2, .2 pound whole soybeans; Lot 3, .1 pound whole soybeans and .1 pound soybean oil meal. The soybean oil meal used was solvent extracted. Protein supplements fed in

¹Former Associate Animal Husbandman, South Dakota Agricultural Experiment Station.

the second trial were the same as for Lots 1 and 2.

Daily feed consumption, rate of gain, feed efficiency, selling price, carcass yield, and carcass grade were obtained on the various lots. Palatability of the meat from lambs of both lots was compared in the last trial. Results of both trials are presented in Table 1.

Results

Rate of Gain. In both trials lambs which received whole soybeans as their protein supplement gained slightly faster than those which received soybean oil meal. However, the difference was not significant.

When a mixture of equal parts whole soybeans and soybean oil meal was fed, the rate of gain was equal to the lot that received whole soybeans. A corn-brome hay ration was apparently balanced as adequately by .2 pound of whole soybeans and soybean oil meal as by .2 pound soybean oil meal.

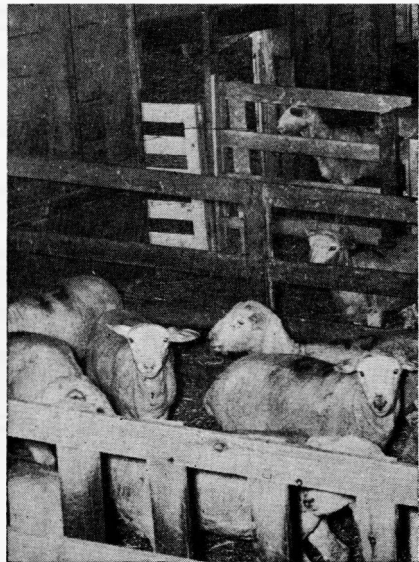
Feed Consumption. Whole soybeans contain approximately 18 percent fat. However, this high fat content did not adversely affect feed consumption in either trial. The lambs fed whole soybeans consumed as much or more grain and hay per head daily as those fed soybean oil meal which contains only 1 or 2 percent fat.

Feed Efficiency. Feed efficiency (grain, hay, and protein supplement required to produce 100 pounds of gain) was slightly improved in the lots that received whole soybeans. This can largely be explained by the fact that they

gained slightly faster in all cases with no substantial increase in feed consumption. Any increase in feed efficiency accompanied by lower feed costs results in a greater chance for a profitable feeding enterprise.

Carcass Quality. Lambs that received whole soybeans or a mixture of whole soybeans and soybean oil meal produced carcasses of higher grade and yield than those fed soybean oil meal. The difference in the number of lambs that graded choice or prime between the two types of protein supplements does not reveal entirely the true picture of the difference in the carcass grades. Lambs that graded choice in the lots fed whole soybeans were actually in the top half of the choice grade; whereas a higher percentage of the choice lambs in the lot that

A portion of the lambs used in the trials.



received soybean oil meal was considered by the packer-grader to be just average choice, and in many instances low choice.

Some packer-buyers have the opinion that whole soybeans, when fed as part of a grain ration or as the protein supplement, will cause soft and greasy lamb carcasses. Particular attention was paid to this when the carcasses were appraised. In no instance was a soft or greasy condition evident. On the contrary, the carcasses of the lambs that were fed whole soybeans were firmer and of brighter color than those of the lambs fed soybean oil meal.

Palatability tests were conducted by six impartial tasters. Four of the tasters could not tell the difference between meat prepared from a lamb fed whole soybeans and that

from a lamb fed soybean oil meal.

Summary

Two lamb feeding trials were conducted in which soybean oil meal, whole soybeans, and a mixture of equal parts soybean oil meal and whole soybeans were compared as protein supplements. In both trials lambs fed whole soybeans were slightly better in rate of gain, feed efficiency, carcass yield, carcass grade, and selling price than lambs fed soybean oil meal.

It can be concluded from these trials that when whole soybeans can be purchased or produced for less than it costs to buy an equal amount of soybean oil meal, lamb feeders can advantageously feed whole soybeans without sacrificing rate of gain, feed efficiency, or carcass yield or quality.

Table 1. Soybeans as a Protein Supplement for Fattening Lambs, 1953-54

| | Trial I, Oct.-Jan. | | | Trial II, Feb.-Apr. | |
|-----------------------------------|------------------------------|----------------------------|--|------------------------------|----------------------------|
| | Soybean Oil Meal Lot 1 | Whole Soybeans Lot 2 | $\frac{1}{2}$ Soybean Oil Meal $\frac{1}{2}$ Soybeans Lot 3 | Soybean Oil Meal Lot 1 | Whole Soybeans Lot 2 |
| Number of lambs | 20 | 20 | 20 | 20 | 20 |
| Days fed | 87 | 87 | 87 | 92 | 92 |
| Average initial weight, lbs. | 69.4 | 71.4 | 71.2 | 65.4 | 69.3 |
| Average final weight, lbs. | 92.1 | 96.1 | 95.9 | 98.2 | 103.6 |
| Gain per lamb, lbs. | 22.7 | 24.7 | 24.7 | 32.8 | 34.3 |
| Average daily gain, lbs. | .26 | .28 | .28 | .36 | .37 |
| Average daily feed consumed, lbs. | | | | | |
| Shelled corn | 1.21 | 1.28 | 1.27 | 1.44 | 1.48 |
| Brome hay | 1.57 | 1.57 | 1.57 | 1.10 | 1.14 |
| Protein supplement | .2 | .2 | .2 | .2 | .2 |
| Feed per hundredweight gain | | | | | |
| Shelled corn | 463.6 | 450.7 | 447.2 | 403.3 | 396.7 |
| Brome hay | 601.5 | 552.8 | 552.8 | 308.1 | 305.6 |
| Protein supplement | 77.6 | 70.4 | 70.4 | 58.8 | 53.6 |
| Selling price per hundredweight | \$17.75 | \$18.50 | \$18.50 | \$22.50 | \$23.00 |
| Yield, percent | 47.3 | 50.0 | 49.8 | 48.0 | 50.7 |
| Carcass grade | | | | | |
| Prime | 1 | 2 | | 1 | |
| Choice | 14 | 18 | 18 | 13 | 16 |
| Good | 5 | | 2 | 5 | 3 |