CORN VERSUS OATS FOR WORK MULES

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The economical maintenance of mature work mules is an important problem on many Missouri farms. To secure reliable information concerning the relative efficiency and economy of corn and oats in rations for mature mules doing farm work, the Missouri Agricultural Experiment Station conducted a test for two years.

The plan of this experiment was to divide two pairs of mature work mules into two lots in such a manner that one mule in each pair was in each of the lots. It was the plan to work the mules in each pair together and on an evener
during the entire experiment in order to insure the performance of an equal amount of labor by mules on the different rations. The mules were used during the experiment to perform regular farm labor and such hauling and grading as was necessary at the Experiment Station during that time.

All four mules received mixed clover and timothy hay as roughness. One mule in each team received a grain ration of shelled corn; while the team-mate of each received oats.

The amount of feed was governed by the condition and appetite of the mules.

The experiment was continued with the mules thus matched and fed for 364 days. At the close of this 364-day period, the two lots of mules were reversed so that during the second period the mules which had received corn were fed oats, and those which had received oats were fed corn. Three weeks were required to make this change, and then the experiment was continued for another 364-day period.

The efficiency and economy of the respective rations can be approximately measured by: (1) The maintenance of health and appetite of the mules; (2) The maintenance of weight and flesh; (3) The ability to endure hard work and hot weather; (4) The spirit shown by the mules; (5) The amount of food consumed; (6) The amount of labor performed; (7) The residual effect; (8) The cost of maintenance of the animals.

The mules used in this experiment were raised in Missouri and had been used on the University Farm for some time prior to the experiment. Each pair was well matched in type, size, quality and age. One pair, ten years old, had an average weight of 1217 pounds. The other pair, five years old, were heavier draft mules and averaged 1382 pounds. All the mules started on the experiment in good working condition.

FEEDS USED

Both corn and oats were fed shelled. The corn was No. 2 mixed and the oats were of good average quality. The hay varied somewhat, but the quality was generally good. It was mixed clover and timothy and the amount of clover varied from 10 to 25 per cent. The mules were fed from the same hay, consequently, the factor of variation in hay was constant in both lots.

The mules were fed grain three times a day and were fed hay twice a day.

THE RESULTS

Examination of the weights taken at 28-day intervals throughout the two years of this experiment shows that mules receiving corn gained an average of 18.1 pounds each in a 364-day period; while those receiving oats sustained an average loss of 2 pounds each.

Figures on the amount of feed eaten by the mules in this experiment show that the oat-fed mules ate an average of 145 pounds more grain and 75 pounds more hay in a year than the corn-fed mules. The oat-fed mules ate an average of 9.36 pounds of grain and 11.89 pounds of hay daily per 1000 pounds of live weight; while the corn-fed mules ate 8.90 pounds of grain and 11.51 pounds of hay per 1000 pounds of live weight daily.

These mules were well matched in their ability to perform labor as was shown in the work done prior to the experiment. No difference was detected in their spirit nor in their ability to endure hard work and extreme heat. Dur-
The heaviest summer weather when the mules were doing heavy work, they evidenced exhaustion to the extent that they occasionally did not eat their noon allowance of grain, but this was true in both lots.

The average for the two years shows that the corn-fed mules worked over 100 hours more than the mules which received a ration consisting of oats and mixed hay. This difference was due to the fact that the oat-fed mules were laid off on account of lameness or other disability a greater number of hours than their corn-fed team-mates.

The lighter pair of mules used in the experiment.

The heavier pair of mules used in the experiment.
RESIDUAL EFFECTS

All of the mules used were owned by the Experiment Station and worked on its farm nearly two years after the close of the experiment. So far as could be determined there were no residual effects on any of the mules which could be traced to either ration fed during the experiment. They retained good health, normal appetite, average weight, normal spirit and ability to endure hot weather and hard work.

COMPARATIVE COSTS

The average costs of the feeds used in this experiment demonstrated that each corn-fed mule was maintained at an expense 28 per cent less than the cost of keeping each oat-fed mule.

In order to make possible a more convenient study of the data accumulated, the following summary is presented, showing the average of two 364-day periods.

<table>
<thead>
<tr>
<th>Ration</th>
<th>Corn and hay</th>
<th>Oats and hay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average loss or gain in weight</td>
<td>18.5 pounds gain</td>
<td>2. pounds loss</td>
</tr>
<tr>
<td>Total corn per mule per 364-day period</td>
<td>4142.75 pounds</td>
<td></td>
</tr>
<tr>
<td>Total oats per mule per 364-day period</td>
<td></td>
<td>4288.5 pounds</td>
</tr>
<tr>
<td>Total hay per mule per 364-day period</td>
<td>5360.31 pounds</td>
<td>5434.87 pounds</td>
</tr>
<tr>
<td>Hours of heavy labor per mule</td>
<td>433.12 hours</td>
<td>374.75 hours</td>
</tr>
<tr>
<td>Hours of medium labor per mule</td>
<td>197.50 hours</td>
<td>188.75 hours</td>
</tr>
<tr>
<td>Hours of light labor per mule</td>
<td>1002.12 hours</td>
<td>956.75 hours</td>
</tr>
</tbody>
</table>

The work herein reported extends over a period of two years. It contains data on four mules for that time.

Although the number of animals used was not large, the lots were so reversed as to tend to eliminate individuality.

Mules receiving corn and hay maintained good health and appetites as did the mules receiving oats and hay.

The mules which received corn and mixed hay maintained their weight slightly better than did the mules fed oats and mixed hay.

The mules receiving corn and hay endured hard work in hot weather as well as did those receiving oats and hay.

No difference in spirit could be detected in the different lots of mules.

Mature mules required 3 per cent more grain and 1.4 per cent more hay to maintain live weight, approximately, when fed oats and mixed hay than when fed corn and mixed hay.

The mules receiving corn and mixed hay did 6 per cent more work when the number of hours is used as a basis, than did the mules which received oats and hay.

No abnormal effect could be noticed in any of the mules receiving either ration.

The mature mules in the two-year test were maintained 28 per cent more economically on a ration of corn and mixed timothy and clover hay than on one consisting of oats and mixed clover and timothy hay.