High Protein-Sorghum Grain as the Only Protein Source in an 
all Concentrate Steer Finishing Ration (Project 253-6) 1965

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The finishing ration for yearling steers should contain a mini-
imum of about 10% protein. Sorghum grain frequently contains 10% 
protein; this test was to determine if such sorghum grain meets 
protein requirements.

The sorghum grain was obtained locally and had been tested for 
protein content at delivery during harvest. Sorghum grain testing 
10.0% protein or higher was stored in one bin and that below 10% 
in another bin. The division was by protein testing the first load 
of grain delivered by a seller. Subsequent loads were similarly 
divided. A Udy analyzer (Udy Analyzer Co., Boulder, Colo.) was 
used to determine protein content of the grain. Only sorghum grain 
of higher protein content was used.

Three treatments were compared with two lots of steers per treat-
ment and 10 steers per lot. The three treatments were:

Sorghum grain as the only protein source.

Sorghum grain with 1% urea added.

Sorghum grain with 0.75% urea and 
5% dehydrated alfalfa added.

Exception for the above variables all rations were as nutrition-
ally adequate and as equal as possible.

A premix and other ration ingredients were mixed with the dry 
rolled sorghum grain and the complete ration fed in a self-feeder.

The premix supplied per pound of feed consumed: 3.5 mg. of 
chlorotetracycline (Aureomycin), 0.5 mg. of diethylstilbestrol and 
750 I. U. of vitamin A. A trace mineral mixture supplied the follow-
ing in mg. per pound of feed: manganese, 23; iron, 23; copper, 2.3; 
zinc, 11.4; iodine, 0.68; cobalt, 0.23. Ground limestone was added 
to all rations to meet the required calcium level.

No hay or other roughage was fed after the test started.

Prior to the test the steers were started on a self-feeder with 
a mixture of 45% bran, 5% dehydrated alfalfa and 50% dry rolled 
sorghum grain with prairie hay fed free-choice. The bran and prai-
rie hay were gradually eliminated. The test being reported was 
initiated when the steers were receiving nearly an all sorghum 
grass diet.

The results are reported in table 1. Ration intake varied wide-
ly between lots within each treatment but differences between treat-
ments were small.
Daily gain ranged from 2.81 to 3.15 pounds per steer and feed per pound of gain from 6.4 to 8.2 pounds with no apparent difference due to treatments. Variation between lots receiving the same treatment was more than between treatments.

The carcasses graded choice or high good and averaged low choice. No differences were noted in carcasses between treatments; however, a complete record was not available because 13 of the 59 carcasses were shipped by the packer who bought the steers before all carcass data were collected.
Table 1
High protein sorghum grain in an all-concentrate steer finishing ration as the only protein source July 2 - October 23, 1965 - 112 days

<table>
<thead>
<tr>
<th>Protein source</th>
<th>Sorghum grain only</th>
<th>Sorghum grain &amp; Urea</th>
<th>Sorghum grain, urea and dehydrated alfalfa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition of self-fed concentrate mixture, percent:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry rolled sorghum grain</td>
<td>99.00</td>
<td>90.00</td>
<td>93.50</td>
</tr>
<tr>
<td>Urea</td>
<td>---</td>
<td>1.00</td>
<td>0.75</td>
</tr>
<tr>
<td>Dehydrated alfalfa (17% protein)</td>
<td>---</td>
<td>---</td>
<td>5.00</td>
</tr>
<tr>
<td>Ground limestone</td>
<td>0.75</td>
<td>0.75</td>
<td>2.50</td>
</tr>
<tr>
<td>Premix¹ (supplied trace minerals, antibiotics, diethylstilbestrol, and vitamin A, for more details see footnote 1 under table)</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Cost of concentrate mixture per ton²</td>
<td>$41.10</td>
<td>$42.04</td>
<td>$42.37</td>
</tr>
<tr>
<td>Percent protein in concentrate mixture (moisture free basis)</td>
<td>12.88</td>
<td>14.20</td>
<td>13.85</td>
</tr>
</tbody>
</table>

Lot number
18 19 20 21 22 23
No of steers per lot
10 10 10 9 10 10
Av initial weight, lb.
733 731 749 742 722 746

Av daily gain, lb.
3.00 2.81 3.09 2.98 2.90 3.15
Av daily feed intake, lb.
20.9 22.9 23.3 19.0 20.4 22.6

Feed per lb. of gain
7.0 8.2 7.5 6.4 7.0 7.2
Cost per cwt. of gain
$14.30 $16.75 $15.85 $13.41 $14.89 $15.25

1. The premix supplied per pound of feed consumed: 3.5 mg. of chlorotetracycline (aureomycin), 0.5 mg. of diethylstilbestrol and 750 I.U. of vitamin A. One pound of a trace mineral premix (Calcium Carbonate Co., Z5) was added per ton of complete feed which supplied in mg. per pound of feed approximately: manganese, 23; iron, 23; copper, 2.3; zinc, 11.4; iodine, .68; and cobalt, .23.

2. Feed prices are on inside back cover.