The Effect of a Cottonseed Meal Supplement on the Performance of Nursing Calves

W.E. Kunkle, P. Hogue, S. Sumner

Summary

A protein supplement was fed to nursing calves to evaluate the effect on calf gain. Two trials were conducted with a supplement containing 92% cottonseed meal and 8% salt. Nursing calves averaged 430 to 560 lb at the start of the two summer trials. Consumption of the cottonseed meal-salt supplement averaged .95 lb/head/day in Trial 1 and .75 lb/head/day in Trial 2. Calves fed the cottonseed meal supplement gained .45 lb/head/day more (1.65 vs 1.20 lb/head/day) in Trial 1 and .36 lb/head/day more (1.95 vs 1.59 lb/head/day) in Trial 2 compared to control cattle. It required 2.1 lb supplement per pound added gain in both trials. Creep feeding a high-protein supplement was profitable in these two trials.

Introduction

Most of the nutritional requirements of the calf are provided by the cow's milk during the first 60 days after calving. A cow's milk production peaks approximately 2 months after calving and declines until weaning. However, as the calf grows, the cow's milk provides a declining portion of the nutritional requirements of the calf and pasture becomes increasingly important. Many hays and standing forages are low in protein and a protein supplement may stimulate consumption and improve utilization of the forage. Protein supplementation of the calf 2 to 4 months before weaning also may improve calf growth.

A summary of four trials in Oklahoma showed nursing calves that consumed .72 lb/head/day of cottonseed meal gained .27 lb/head/day more than unsupplemented calves. One trial in Florida showed .19 lb/head/day improvement in gain when calves consumed .4 lb/head/day of a cottonseed meal supplement. A second trial showed .14 lb/head/day improvement in gain when calves consumed .84 lb/head/day of a cottonseed meal supplement. The first Florida trial showed a 2.0 ratio of supplement per added gain compared to a 6.5 supplement-to-added-gain ratio in the second trial. Additional research is needed to further evaluate the effect of a limit-fed protein supplement on the performance of nursing calves. The objective of this research was to determine the effect of a cottonseed meal supplement on the performance of nursing calves.

Procedure

Trial 1

Thirty-two mature Santa Gertrudis cows with heifer calves were divided into two groups. Both groups were grazed on bahiagrass pastures with 3 acres of pasture for each cow-calf pair. Excess forage was available for both groups.

Calves in one group were offered a cottonseed meal supplement in a portable creep feeder. The feeder had creep gates on both sides that allowed calves access to the feeder. During the first 2 weeks of the trial, the calves were fed 100% cottonseed meal. After 2 weeks, the calves were fed a diet containing 92% cottonseed meal and 8% salt.

The heifers calves were individually weighed at the start (11 July 88) and end (26 August 88) of the 46-day trial. This trial was conducted at Willow Ranch in Polk County, Florida.
**Trial 2**

Two groups of cow-calf pairs were used to evaluate the effects of a high-protein creep feed. Fifteen unsupplemented steer calves were randomly selected out of a herd of 134 cows and calves. The steer calves were sired by Simmental and Limousin bulls, and their dams were Brahman crossbred. The control calves were individually identified, weighed, and condition scored at the start (14 June 88) and end (30 August 88) of the trial. The cows and calves were rotationally grazed in two bahiagrass-white clover pastures and one sorghum-sudangrass pasture. Excess forage was available during the trial.

The protein-supplemented group comprised 11 randomly selected cows with steer calves. The steer calves were sired by Simmental, Limousin, and Hereford bulls; their dams were Brahman crossbred. Protein-supplemented calves were individually identified, weighed, and condition scored at the start (01 July 88) and end (06 September 88) of the trial. Cows and calves were continuously grazed in a Pangola-bahiagrass-white clover pasture and excess forage was available during the trial. Calves were offered cottonseed meal during the first 2 weeks of the trial and a cottonseed-salt diet thereafter, as described in Trial 1. Frequent rains during Trial 2 resulted in mold growth in the feed. An estimated 50% of the supplement molded and was removed during the trial. This trial was conducted at Yucatan Ranch in Highlands County, Florida.

**Results**

Consumption of the cottonseed meal-salt supplement averaged .95 lb/head/day in Trial 1 and .75 lb/head/day in Trial 2 (Table 1). Feed records for Trial 2 indicate that an estimated 50% of the feed offered molded due to rain water in the feeder and was not consumed by the cattle. Consumption of the supplement in Trial 2 was also low during the first month. The cottonseed meal supplement improved gains of heifers .45 lb/head/day in Trial 1 and gains of steers .36 lb/head/day in Trial 2. Supplement-to-added-gain ratio was 2.1 in both trials.

The supplement cost of added gain was $.32/lb for both trials, in which the supplement cost $300/ton. These two trials indicate that creep supplementation resulted in economical increases in gain and would result in increased profits in most situations.

Results of these trials and the two trials conducted previously showed an average consumption of .74 lb/head/day (.40 to .95 lb/head/day range) for a cottonseed-salt diet fed to nursing calves. Average gains increased .29 lb/head/day (.14 to .45 lb/head/day range), and 3.2 lb (2.0 to 6.5 range) of supplemental feed was required for each pound of added gain. Creep feeding a high-protein supplement to nursing calves was profitable in 3 of the 4 trials.
Table 1. Effect of a high-protein supplement on the performance of nursing calves

<table>
<thead>
<tr>
<th>Item</th>
<th>Trial 1(^a)</th>
<th></th>
<th></th>
<th>Trial 2(^b)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>CSM(^c)</td>
<td>SE(^d)</td>
<td>Control</td>
<td>CSM(^c)</td>
<td>SE(^d)</td>
</tr>
<tr>
<td>Number of calves</td>
<td>15</td>
<td>17</td>
<td>---</td>
<td>15</td>
<td>11</td>
<td>---</td>
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<tr>
<td>Trial length (days)</td>
<td>46</td>
<td>46</td>
<td>---</td>
<td>77</td>
<td>67</td>
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<tr>
<td>Initial weight (lb)</td>
<td>446</td>
<td>429</td>
<td>13</td>
<td>469</td>
<td>562</td>
<td>13</td>
</tr>
<tr>
<td>Final weight (lb)</td>
<td>502</td>
<td>506</td>
<td>15</td>
<td>591</td>
<td>693</td>
<td>14</td>
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<tr>
<td>Calf daily gain (lb)</td>
<td>1.20</td>
<td>1.65</td>
<td>.09</td>
<td>1.59</td>
<td>1.95</td>
<td>.11</td>
</tr>
<tr>
<td>Added gain (lb)</td>
<td>---</td>
<td>.45</td>
<td>---</td>
<td>---</td>
<td>.39</td>
<td>---</td>
</tr>
<tr>
<td>Supplement daily consumption (lb/head/day)</td>
<td>---</td>
<td>.95</td>
<td>---</td>
<td>---</td>
<td>.75(^e)</td>
<td>---</td>
</tr>
<tr>
<td>Supplement-to-added-gain ratio</td>
<td>---</td>
<td>2.1</td>
<td>---</td>
<td>---</td>
<td>2.1</td>
<td>---</td>
</tr>
</tbody>
</table>

\(^a\)Trial conducted at Willow Ranch in Polk County, Florida.
\(^b\)Trial conducted at Yucatan Ranch in Highlands County, Florida.
\(^c\)Cottonseed meal (100%) fed during first 2 weeks, then cottonseed meal-salt mixture (92:8) fed to end of trial.
\(^d\)SE = Standard error of mean.
\(^e\)Rain water contamination of feed caused molding. Consumption determined after subtracting estimated spoiled feed.

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