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Calf Performance Grazing Crop Residues in Combination with Rye in Fall and Winter

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Calves grazing rye in combination with crop residues tended to gain more weight in winter; however, animals grazing crop residues alone completely compensated by the end of finishing.

Summary

Two trials in the fall and winter of 1997-98 evaluated calf performance when grazing either rye with crop residues or crop residues alone. While not significant, calves grazing rye followed by corn residues tended to gain faster compared to calves grazing residues alone (2.26 versus 1.84 lb/d, respectively). Calves grazing corn residues only fully compensated for the weight difference at the end of winter grazing by slaughter. No differences were found in finishing performance or slaughter breakevens. In Trial 2, steers grazed rye and milo or milo residue alone. Steers grazing rye/milo gained faster ($P < .05$). Using rye to supplement animals on milo residues resulted in steers not leaving the rye portion of the field.

Introduction

Crop residues are an important resource for many cattle producers. Milo and corn are typically harvested in the early fall, coinciding to a time when pasture resources become limiting. Many producers place cows and/or weaned calves on residues as soon as they

become available. However, residues are characterized as being low to moderate in digestibility (50-65 percent) and low in crude protein (5-6 percent). Therefore, animals grazing crop residues require some protein source to aid in forage digestion, and in the case of younger animals, support growth. Typically, protein supplementation has been accomplished by delivering a mixed supplement to animals in fields. Cover crops, such as rye, which are planted in late summer or early fall have potential to reduce winter erosion and may provide some grazing opportunities for beef cattle. Growth characteristics of rye include limited fall growth (.25 ton/acre), followed by excellent spring forage yields (1.9- 2.2 ton/acre). However, if fall rye is used as the protein supplement rather than a primary forage source, it may provide an economical alternative to delivering a more expensive and labor intensive mixed supplement.

Two trials were conducted in the fall-winter of 1997 to compare the performance of calves grazing crop residues with rye and calves grazing crop residues alone.

Procedure

Trial 1

From November 15, 1997 through January 2, 1998, 362 exotic cross steer and heifer calves grazed rye followed by cornstalks or cornstalks alone. Calves were received and weaned for a period of 30 days. Upon arrival, animals were processed and given a Synovex® H or S implant. Following weaning, animals were weighed and sorted randomly to form two equal groups, each consisting of 87 steers and 94 heifers. One group of steers and one group of heifers were

placed on rye for 15 days, at which time they were then moved to cornstalk fields. The second groups of steers and heifers were placed directly into cornstalk fields. Rye was planted in wheat stubble in mid-to late August. While grazing rye, calves were allowed ad-libitum access to trace mineralized salt blocks. While grazing cornstalks, all calves were supplemented with 5 pounds (DM basis) of wet corn gluten feed and a range mineral mixture consisting of limestone, salt and trace minerals. Following removal from stalks, calves were placed into a feedlot and put through the first of two step-up diets. After 90 days on feed, heifers were implanted with Finiplex®, and steers with Revalor®.

Animal performance was measured in terms of ADG. Calves were weighed once before going to winter treatments, again following removal from cornstalks and for the last time when unloaded at the packing house.

Trial 2

From December 3, 1997 through March 2, 1998, 108 steers were used in a completely randomized design to evaluate rye grazed with milo or milo alone. Steers were assigned randomly to either rye with milo stalks or milo stalks alone. As in Trial 1, rye was established in wheat stubble in mid- to late August. Stocking rate was one animal/acre and was based on the acreage contained in the milo fields. Acreage in the rye field was not considered because rye was used as the protein supplement for the rye/milo treatment. Steers grazing only milo stalks were supplemented with 1.5 lb/hd/d (as-is) of a 44 percent CP supplement (DM basis).

Animal performance was measured in terms of ADG. Both initial and final

Table 1. Performance of calves grazing rye and cornstalks or cornstalks alone.

| Item | Rye/Cornstalks | Cornstalks |
|------------------|-------------------|-----------------|
| Grazing | | |
| Days | 60 ^{a,b} | 60 ^a |
| Initial wt., lb | 619 | 624 |
| ADG, lb | 2.26 | 1.84 |
| Final wt., lb | 754 | 734 |
| Finishing | | |
| Days | 136 | 137 |
| Initial wt., lb | 754 | 734 |
| ADG, lb | 2.78 | 3.01 |
| DMI, lb/d | 21.2 | 21.4 |
| F/G ^c | 7.67 | 7.17 |
| Final wt., lb | 1131 | 1144 |

^aDays included 47 days grazing and 13 days in drylot on the first 2 step-up rations.

^bFirst 15 days were on rye field, last 45 days were on cornstalks.

^cFeed/gain analyzed as gain/feed. Gain/feed is the reciprocal of feed/gain.

weights were the average of two consecutive day weights following three days of limit feeding at 2 percent of body weight. Steers were removed from fields when, based on visual appraisal, quantity of forage became limiting in milo residue.

Results

Trial 1

Calf performance on winter treatments was similar (Table 1). No differences were noted in ADG or final weight off cornstalks. The rye pasture was able to support calves for 15 days, and performance of animals grazing rye followed by cornstalks tended to be greater compared to calves grazing only cornstalks. Again in the feedlot no significant differences were noted in performance (Table 1). However, it does appear calves grazing cornstalks did compensate for the slightly reduced performance in the winter period. Although no differences were found in DMI, feed conversion or final weight,

calves grazing cornstalks alone over the winter did have a numerically higher final weight at slaughter despite being lighter following winter treatments, indicating compensatory gain occurred in the feedlot. Animals which had grazed cornstalks over the winter had a lower slaughter breakeven (Table 2), but the difference was not significant. One factor in the higher breakeven for calves grazing rye in the winter was the cost establishing rye. While calves grazing rye did gain slightly more weight over the winter period, rye was grazed for only 15 days. In addition, at the same time calves were grazing rye, calves grazing only corn residues were being supplemented with a relatively cheap

Table 2. Economics of calves grazing rye and cornstalks or cornstalks alone.

| Item | Rye/Cornstalks | Cornstalks |
|-----------------------------------|----------------|------------|
| Calf cost, \$^a | | |
| Interest ^b | 23.31 | 23.57 |
| Health ^c | 25.00 | 25.00 |
| Winter costs, \$ | | |
| Feed ^{d,e} | 34.83 | 29.79 |
| Yardage ^f | 11.80 | 13.30 |
| Interest ^b | 0.36 | 0.33 |
| Finishing costs, \$ | | |
| Feed ^{d,e} | 197.09 | 199.89 |
| Yardage ^f | 40.80 | 40.95 |
| Interest ^b | 3.99 | 4.05 |
| Death Loss, \$^h | | |
| | 6.75 | 6.80 |
| Total costs, \$ | | |
| Final weight, lb | 1131 | 1144 |
| Breakeven, \$/100 lb ⁱ | 73.14 | 72.70 |

^aInitial weight × \$80/100 lb for steers, and \$76/100 lb for heifers.

^bInterest rate = 9%.

^cHealth costs include processing, medication, etc.

^dIncludes rye establishment = \$20/acre, cornstalk wet corn gluten feed supplementation = \$.0515/lb (DM basis), step-up rations = \$.0653/lb (DM basis).

^eYardage = \$.10/d on rye, \$.20/d on cornstalks, \$.30/d in drylot.

^fYardage cost = \$.30/hd/d.

^gRation costs = \$.0685/lb (DM basis).

^hIncludes 1% death loss.

ⁱSlaughter breakeven price.

energy source (compared to corn) in the form of wet corn gluten feed. In the feedlot, calves which had grazed only corn residues completely compensated for less total weight gain over the winter period, resulting in a lower breakeven.

Trial 2

Steers grazing rye and milo residues gained faster ($P < .05$) compared to steers grazing only milo (1.61 vs 0.48 lb/d, respectively). Observation of grazing steers indicated steers on the rye/milo treatment did not spend significant time grazing the milo residue. Steers were forced into the milo residue on three or four occasions, but would immediately return to the rye portion of the field. It was intended that rye would serve as the protein supplement for that group of animals. Rye is high in CP, much of which is in the form of degradable intake protein. Calves grazing milo alone were provided a supplement which contained 44% CP and was formulated to be high in degradable intake protein (70-80 percent). However, as mentioned, steers on the rye/milo treatment spent most of their time in the rye. Therefore, much of the gain by steers on the rye/milo treatment was accomplished on the rye alone. When steers were removed from fields, a great deal of the milo residue remained for the rye/milo steers; however, animals were removed due to complete utilization of the milo residue by steers grazing only milo. While the rye/milo treatment did carry steers through the winter and produce excellent gains compared to milo residue alone, steers failed to utilize both the rye and milo as was intended.

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