RYEGRASS STRAW FOR WINTERING SPRING-CALVING COWS[1/]

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The use grass straw, a by-product of the grass seed industry, under some conditions can provide beef producers with a cheap source of roughage and help grass seed producers recover the cost of removing the straw. These straws, low in protein and phosphorus, are marginal for calcium and high in fiber and lignin. Consequently, digestibility is poor, rate of passage is slow, and voluntary intake low. Supplementation increases passage rate and intake. This study was designed to test the feasibility of wintering spring-calving cows on annual ryegrass straw with two levels of supplement and to test the effects of monensin on feed efficiency with this type roughage.

EXPERIMENTAL PROCEDURE

Ninety-six pregnant, spring-calving, Hereford cows were stratified by age, production index, breeding date, weight, and condition score for random allotment to treatment. Pregnancy and age of fetus were determined by rectal palpation. Condition scores were ratios of heart girth and height at the hips to weight. Cows had been inseminated artificially to a single Angus sire over a period of 42 days and bred to Hereford clean-up bulls for 21 days. Cows were bred to calve in March and April.

The experimental design consisted of four treatments with three replications. Cows were replicated by expected calving dates into early, middle, and late. Treatments included two supplement levels, with the low energy groups receiving 1.5 pounds of cottonseed meal (CSM) and the high 0.4 pounds of CSM and 3.5 pounds of barley per head per day from October 31 to December 10. From December 10 to March 2, these supplement levels were lowered to 1 pound of CSM and 3.5 pounds of barley for the low and high energy levels. The isonitrogenous supplements were calculated to meet the protein needs of the cows. Monensin was fed to half the animals on each supplement level at the rate of 200 milligrams per head per day from December 8 to March 2 (84 days of the 122-day trial period). Annual ryegrass straw was fed free choice to all animals, with supplements hand fed daily in troughs. Straw was from two different sources, with straw fed from October 31 to February 17 running 5.3 percent crude protein and straw fed during the remainder of the trial running 3.4 percent. Free access to water, salt, and a 50-50 mix of bonemeal and salt was provided. Each replication or pen consisted of eight head. After March 2, cows were fed native meadow hay through the spring and turned out on range in mid-April.

[1/] Straw was provided by the Oregon Field Sanitation Committee.

Straw was weighed daily and refusals were weighed weekly. Cows were weighed every 28 days after an overnight shrink from feed and water. At calving, birth dates were recorded, birth weights were taken, bull calves castrated, and all calves identified with ear tags. First estrus postpartum was obtained by utilizing vasectomized bulls equipped with chin ball markers and visual observations. Cows were bred as described before with pregnancy determined by rectal palpation in the fall. Calving dates will be recorded next spring to see if there are any differences in calving interval because of treatment.

Calves were weaned on August 28. Weaning weights were adjusted to a steer equivalence and to 160 days of age.

RESULTS AND DISCUSSION

Daily straw intake and cow weight gains and losses are shown in Tables 1 and 2. The additional 2.5 pounds of supplement on the high energy treatment reduced straw intake by more than 3 pounds as compared to the low energy treatment. Monensin did not affect intake at either level. During the feeding period, cows on the low energy treatment gained 108 pounds as opposed to 92 on the high. During the period of monensin feeding, cows on the high energy treatment not receiving monensin lost twice as much weight and consumed slightly more feed. This improved feed efficiency with monensin agrees closely with results the last four years when monensin was fed to spring calving cows on meadow hay during the winter. However, there was no response to monensin feeding on the low energy level. It may be that monensin will not give a response on this poor roughage source with only 1 pound of supplement. It would be interesting to further test monensin with very poor quality roughages and low level supplements with cows in a sub-maintenance situation and see if the results repeat. Condition scores followed the same pattern as gains with low energy cows and those fed monensin maintaining their condition better than those on high energy or not receiving monensin.

Table 1. Daily straw intake

Treatment[1/]	10/31-12/13	12/13-3/2	12/13-3/2[2/] +monensin	10/31-3/2
	lb	lb	lb	lb
Low energy	24.5	23.7	24.0	24.1
High energy	21.3	21.0	20.7	21.0

1/ From 10/31-12/10 low energy treatment received 1.5 lb of cottonseed meal and the high energy 0.4 lb of CSM and 3.5 lb of barley. From 12/10-3/2 low energy received 1 lb of CSM and high energy 3.5 lb of barley.

2/ From 12/8-3/2 half the cows from each energy level received 200 mg of monensin per head per day.

Table 2. Cow weight gains and losses (ADG)

Treatment	Initial weight	10/31-12/8	12/8-3/2	12/8-3/2 +monensin	12/31-3/2
	lb	lb	lb	lb	lb
Low energy	944	123(3.24)	-15(-.18)	-15(-.18)	108(.89)
High energy	932	117(3.08)	-33(-.39)	-17(-.20)	92(.75)

The straw intake and gain data show considerations that need to be taken into account when feeding low quality roughages and developing a supplement for them. Experience on the station with all classes of cattle and a wide array of roughages has shown that when we exceed 3 pounds of supplement, intake of the roughage goes down and performance is no better (and often poorer) than a lower level of supplement. However, protein requirement of the animal needs to be met before maximum performance can be realized from a roughage. Added energy to growing animals or cows on a feed so poor they cannot maintain themselves in adequate condition will be an efficient and economical practice up to the point where roughage intake is reduced. Beyond this, a supplement is questionable. The only way to increase gain or performance beyond this point is to push the supplement up to very high levels and feed a relatively low roughage diet or switch to a higher quality roughage.

The importance of quality of straw also was pointed out in these data. Early gains on these cows were 3.2 pounds per day on 5.3 percent crude protein straw. These excess gains were the reason all supplement levels were lowered. Even then, cows continued to gain weight or hold their own until about February 1. Cow gains are often difficult to obtain or maintain during the spring. As the weather warms up and fields become muddy, intake will be reduced. This factor plus switching to a 3.4 percent crude protein straw caused considerable weight loss the last two weeks of the trial. Straw that contains 5 to 6 percent crude protein actually is a high quality straw and cows probably can be maintained through the fall and early winter on straw alone. A supplement would have to be provided in the last trimester of pregnancy and after calving. However, straw containing 3 to 4 percent crude protein is very poor quality and would require a supplement all the way through the fall and winter. It is essential to know the quality of straw and needs of the animals to effectively set up a supplement program.

Table 3 presents calf performance and cow reproductive performance. Adjusted weaning weights were 376 pounds for calves from cows on low energy and 349 pounds from cows on high energy. Calves from cows fed monensin weaned at 367 pounds as opposed to 358 pounds on the controls.

Table 3. Calf performance and reproductive performance

Treatment	Birth weight	Adjusted[1/] weaning weight	First estrus postpartum	Conception rate
	lb	lb	days	%
Low energy	73	370	60	100
Low energy + monensin	77	382	64	91
High energy	71	344	63	86
High energy + monensin	75	353	63	96

1/ Weaning weights were adjusted to a steer equivalence and to 160 days of age.

Days to first estrus were 62 and 63 for low and high energy treatments and 64 and 62 for monensin versus control cows. The conception rate for cows on low energy was 96 percent and 91 percent for cows on high energy. Cows fed monensin and those not receiving monensin each had a conception rate of 93 percent.

Cows in the late calving replication gained more weight during the trial period and ended up with a higher condition score and consumed less straw than cows in the earlier calving reps. This points out that cows do have somewhat higher nutrient requirements during the last trimester of pregnancy. Cows in rep 2 calved 12 days later and cows in rep 3 calved 31 days later than those in rep 1. Cows in rep 1 were 11 days longer after calving to show first estrus than the other reps, but all of them conceived, as opposed to 97 and 84 percent for reps 2 and 3. Actual weaning weights for the three reps were 368, 341, and 299 for reps 1, 2, and 3. These data point out the importance of having cows calve early in the calving period. The late calving rep cows had a 16 percent lower conception rate, over a 63-day breeding season, and 69 pound lighter calves than the early calving cows in rep 1.

In summary, the most economical treatment for these spring-calving cows wintered on annual ryegrass straw was the 1 to 1.5 pounds of CSM. When 2.5 pounds of grain were added to this, all productive and reproductive measures were poorer. Added supplementation increased the expense of the ration and reduced performance. Condition and age of cows and severity of the winter would be important considerations in addition to knowing the quality of straw and needs of your animals when developing a winter feed program.