Management Considerations for Use of Perennial Ryegrass Straw as a Forage Source for Beef Cattle

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Introduction

In the Pacific Northwest, grass seed is a major agricultural product. One of the most common grasses grown is perennial ryegrass. The traditional manner of straw disposal following seed harvest has been burning; however, the large amount of smoke produced causes adverse impacts upon the environment and can create situations that prove dangerous or fatal to humans. An alternative way to dispose of grass seed straw is use by ruminant livestock. Straw can be a low-cost winter forage resource for cow/calf operations in the Pacific Northwest.

In recent years, much of the grass seed industry's focus has been on producing "turf-type" grasses. Many of the "turf-type" perennial ryegrass varieties contain a fungal endophyte. This can be a problem because the endophyte produces the ergot alkaloid lolitrem B, which can have toxic effects (ryegrass staggers) when consumed by livestock. Symptoms of ryegrass staggers include uncoordination, staggering, tremors, head shaking, and collapse. Therefore, the objective of our study was to evaluate the effect of increasing lolitrem B concentration in perennial ryegrass straw on beef cattle.

Experimental Protocol

Sixteen steers in Experiment 1 and 72 pregnant (approximately 200 days) Angus × Hereford cows in Experiment 2 were used to evaluate the effect of increasing lolitrem B in perennial ryegrass straw on nutrient intake and digestibility, physiological variables (heart rate, respiration rate, and temperature), and cow performance. The perennial ryegrass straw was low quality (5 percent crude protein [CP]); therefore, approximately 2 lb/day of soybean meal was provided as a CP supplement in both experiments. In Experiment 1, steers were provided perennial ryegrass straw containing 0, 511, 1,038, or 1,550 parts per billion (ppb) lolitrem B for 25 days. In Experiment 2, cows were provided straw containing 467, 1,242, or 2,017 ppb lolitrem B during the last third of gestation (approximately 90 days). Following calving, all cows were provided meadow hay (6 percent CP) and soybean meal until spring turnout.

Results and Discussion

Experiment 1. No symptoms of ryegrass staggers were observed in steers consuming perennial ryegrass straw containing up to 1,550 ppb lolitrem B. Also, lolitrem B concentration had no effect on straw intake or digestibility by steers. Similarly, increasing lolitrem B concentration did not alter ruminal fermentation. Heart rate, respiration rate, and body temperature were normal for all steers, with little effect due to lolitrem B level.

Experiment 2. Thirteen of 24 (54 percent) cows consuming perennial ryegrass straw with 2,017 ppb lolitrem B developed ryegrass staggers. They were removed from the study and provided meadow hay and a CP supplement up to calving. These cows all calved normally, weaned a healthy calf, and were pregnant at weaning. Total dry matter intake by cows was not affected by lolitrem B concentration. Additionally, cow weight and body condition score change during the study were not affected by the lolitrem B content of the perennial ryegrass straw. Also, milk production of cows, measured approximately 8 weeks after calving, was not negatively affected by the lolitrem B level in straw consumed during the last third of gestation.

Management Implications

Feeding perennial ryegrass straw with greater than 2,000 ppb lolitrem B to beef cattle can cause neurological disorders that increase management concerns. While death can occur from the disorder, it usually is associated with misadventure (e.g., stumbling off of a cliff, entering a pond to cool off and drowning, etc.). Animals suffering from perennial ryegrass staggers should be removed from the causative feed source. Clinical signs normally subside in 2–14 days. Blending of straws containing low and high concentrations of lolitrem B to obtain a concentration equal to or less than 1,550 ppb can be a safe and economical management alternative for Intermountain cow/calf producers.