



RESEARCH FACTS

RESEARCH & TECHNOLOGY DEVELOPMENT FOR THE CANADIAN BEEF INDUSTRY

Beef Science Cluster



Improved swath grazing through new annual forage varieties and grazing management

Project Title:

Innovative Swath Grazing/Increasing Forage Research Capacity

Researchers:

Project Code: FRG.04.13

Completed: 2018

Vern Baron, Ph.D. vern.baron@agr.gc.ca

Vern Baron, Ph.D. and Raquel R. Doce, Ph.D. (Agriculture and Agri-Food Canada), John Basarab, Ph.D., Patricia Juskiw, Ph.D., Mazen Aljarrah and Mary-Lou Swift, Ph.D. (Alberta Agriculture and Rural Development), John McKinnon, Ph.D., (University of Saskatchewan), Albert Kuipers (Grey Wooded Forage Association), and Al Sheaffer, Ph.D. (Agriculture and Agri-Food Canada)

Background

Through improved agronomic and grazing management practices, researchers and producers have increased the yields of the crops seeded for swath grazing. This has reduced overwintering feed costs for the cow herd. However, improving the overall nutritive value of the swathed-grazed crop is necessary and reducing weathering during fall, winter and spring continues to limit pasture carrying capacities.

Objectives

To further improve pasture carrying capacity and reduce overwintering costs by evaluating new annual forage varieties and developing management strategies with improved forage quality that is maintained throughout the swath grazing season.

What they did

A five-year winter-feeding study was conducted in central Alberta (2008-09 through 2012-13). Angus x Hereford and Red Angus x Charolais cows were fed barley silage, barley grain, barley straw and hay in confinement, or swath-grazed on triticale or corn for 120 days. Confined cows were fed once daily and had a heated waterbowl. Swath grazed cows were restricted to three or four days of feed at a time using electric fences; they also had an all-season waterer, bedding pack and windbreak. Forage quality was monitored weekly (confined feeding) or monthly (swath grazing); protein levels were adequate for all diets, and fiber levels and

digestibility were similar. All production costs were calculated and cow weight, body condition score and ultrasound backfat depth were monitored for all five years. Emissions of three greenhouse gases (carbon dioxide from crop production and yardage, methane from rumen digestion and manure, and nitrous oxide from soil and manure) were calculated for the first three years.

What they learned

Feed production: Growing feed for the confinement-fed control cows was always costlier than raising triticale for swath grazing. Corn was more expensive to grow than triticale, and at least as costly as the feed used in the confined treatment in three out of five years. But because yardage costs were lower for swath grazing than for confined feeding, average total feed costs for triticale (\$0.78/cow/day) and corn grazing (\$1.05/cow/day) were much lower than for confined feeding (\$1.98/cow/day).

Greenhouse gas emissions were 11% lower for the triticale swath grazing and 24% lower for the corn swath grazing compared to the confined feeding treatment. Nitrous oxide emissions from manure were slightly higher for swath grazing than confined feeding. But confined feeding had slightly higher carbon dioxide emissions (from burning diesel to haul feed, process feed, feed cows, and haul manure) and much higher manure methane emissions than the swath grazed treatments. In fact, methane emissions accounted for nearly a quarter of total emissions in the confined treatment, but less than 2% in the swath grazing treatments.

Body weight and condition scores: Over the 120-day winter feeding period, confined cows maintained their body condition and backfat and gained weight. Swath grazed cows lost weight and a small amount of body condition and backfat. At the end of the 120-day wintering feeding period, cows fed in confinement weighed at least 100lbs more than either group of swath grazed cows.

What it means

We've known for a long time that well-managed extended winter grazing programs can considerably reduce daily winter-feeding costs. However, the new finding that extended winter grazing generates measurable reductions in greenhouse gas emissions is important, especially considering the emission source. Most of the greenhouse gas emission reductions in swath grazed cattle came from lower manure methane emissions, not from burning less diesel fuel. Using less diesel, time, labor and equipment to clean corrals and spread manure provides a direct benefit to the swath grazing producer. But the fact that manure deposited during swath grazing emits less greenhouse gas than manure in a corral bedding pack really benefits society more than the producer. That's an ecological good.

The loss in body condition score and weight in the swath grazed cows is equally noteworthy. Swath grazed cattle have higher energy needs because they are more exposed to wind chill and work harder for their feed. These swath-grazed research cattle lost body condition and weight even though they were provided with water, bedding, a windbreak, and cross-fencing to ensure that fresh feed was available every few days. They probably would have lost much more weight, backfat and body condition if they had not had bedding or a windbreak, or if uncontrolled access to the swaths had allowed them to eat the best quality feed first and waste the rest, or if snow had been used as the sole water source. This goes double for heifers and young cows that are still growing. Cows that don't reach their optimal body weight and condition before the breeding season starts will cycle later, rebreed and calve later (or not at all), and be culled sooner. The economics of mismanaged extended winter grazing may be profoundly unfavorable if females are culled before they have weaned enough calves to pay for themselves.

Proudly Funded By:



The Beef Cattle Industry Science Cluster is funded by the Beef Cattle Research Council, a division of the Canadian Cattlemen's Association, and Agriculture and Agri-Food Canada to advance research and technology transfer supporting the Canadian beef industry's vision to be recognized as a preferred supplier of healthy, high quality beef, cattle and genetics.

For More Information Contact:

Beef Cattle Research Council
#180, 6815 - 8th St. NE
Calgary, AB T2E 7H7
Tel: (403) 275-8558 Fax: (403) 274-5686
info@beefresearch.ca

For More Information Visit:

www.beefresearch.ca

RESEARCH AND TECHNOLOGY DEVELOPMENT FOR THE CANADIAN BEEF INDUSTRY