



Beef Cattle Production: What Have You Herd About 2050?

(credit: K. Blair)

What's going on and coming up?

Beef production contributes over \$30 billion to Canada's annual economy¹. And about 40% of the 4 million Canadian beef cows are in Alberta¹. Climate change projections are for increases of 3°C in the average winter temperature by 2050², as well as an increase in the number of frost free days. This increase in winter temperature may provide opportunities as well as challenges for cattle producers. Here we consider some of the possible impacts associated with cattle production if warmer winters prevail on the Prairies.

The good...

Over the last decade, many producers have moved from confinement feeding to low-cost alternatives for overwintering cattle including grazing of stockpiled forage, standing or swathed corn, swathed cereal grains and hay bales in fields. Recent survey data from Alberta suggests that almost 70% of producers winter their cows in non-confined overwintering areas. The economic advantages of these systems are substantial³⁻⁵. Performance of cattle in these environments, in general, is comparable to those in confinement. However, in some circumstances, cattle may lose condition. In a three-year study conducted in central Alberta, swath grazing reduced weight gain in cows compared to those fed in confinement⁵. Another Prairie study⁴ reported weight loss over a 78-day period in cattle overwintered in a swath (6.4 kg) or straw-chaff (6.5 kg) grazing system, while animals in the dry lot realized gains of 9 kg. Greatest losses (21.6 kg) occurred in cattle that were grazed in the swath-grazed system. However, the following year, cattle in all systems gained weight with the



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greatest gains realized by swath-grazed (28.1 kg) and dry lot cows (32.9 kg). Differences in gain in some of these studies may partially be attributed to inaccessibility of the feed due to adverse weather⁶ and increased maintenance costs to the animal for thermoregulation during periods of extreme cold⁷. Predicted increases in winter temperatures may lead to improvement in animal performance over the winter grazing period as a consequence of decreased maintenance costs. A warmer climate with longer growing seasons is expected to increase both winter annual crops and longer-season crops such as corn. As these crops are ideal candidates for winter grazing systems, cow-calf producers will have the opportunity to utilize a range of annual crops, as well as varieties with characteristics that are well-suited for winter grazing. Similarly, more crop acres of corn and/or soybeans will offer feedlots a wider range of cost-effective feedstuffs for finishing diets.

The bad, and the ugly...

Alternatively, increased frequency of extreme weather events in winter may lead to challenges including more frequent freeze-thaw cycles, periods of extreme cold and above-average snow accumulations; all of which may compromise cow-calf performance and well-being, particularly in extensive overwintering environments. Increased frequency of freeze-thaw cycles creating crusted snow, as well as significant accumulations of snow may limit cattle access to stand or swath-grazed forage. Further, many producers have shifted from winter to spring calving to avoid extreme cold which historically occurs in January. Extremes in temperature and or fluctuating temperature at calving can be particularly problematic for calves, leading to increases in calf scours and pneumonia.

Increased frequency of weather events will result in obvious challenges including water availability for animal and crop production including hay and pasture and other feedstuffs. For example, periods of drought in Manitoba have led to circumstances in which cattle numbers exceed feedstuff availability (Figure 1).

What is less apparent is the potential survival and/or exposure to organisms which persist under extreme condition of either drought or flooding. Anthrax spores, for example, can survive in the soil for decades, coming to the surface during period of flooding or extreme drought. Animals become infected if they ingest the spores while grazing. Potential increases in liver fluke populations may also occur as a consequence of increased precipitation and standing water. This parasite, which impacts animal performance and also leads to condemnation of the liver, is more abundant in wet condition as the eggs require shall water to hatch.

“increases in winter temperatures may lead to improvement in animal performance over the winter grazing period”

AREA OF TAME HAY AND NUMBER OF BEEF COWS MANITOBA, 1931-2013

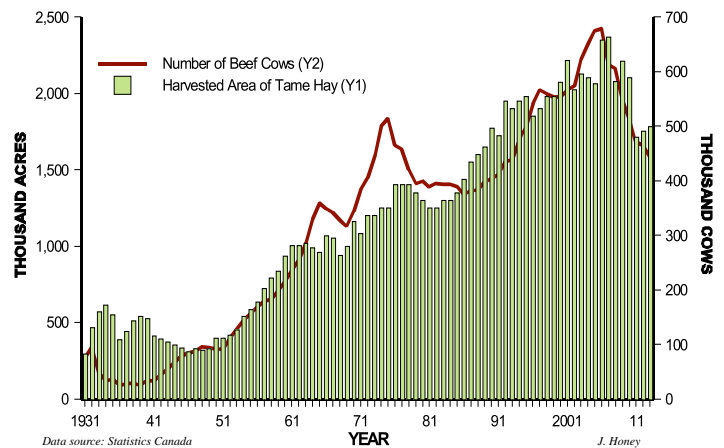


Figure 1: Periods of droughts such as that which occurred in 2002 can result in shortages in available forage required for the cow herd⁸.

Where to from here?

Changes in climate by 2050 will present both challenges and opportunities for cattle producers. They can expect large inter-annual fluctuations in winter temperatures, as well as a similar magnitude in day-to-day variability that is experienced today. In addition, they will need to consider extreme cold periods, wind protection, and frozen water limitations for cattle, even if the mean conditions are warmer overall.

To adapt, not only must they consider new cropping options but potentially new vaccination protocols, which may be regionally specific for organisms such as anthrax and liver flukes. In addition, flexibility in facilities including alternative watering facilities and calving areas

should be considered to deal with potential extremes in weather throughout the production cycle.



(credit: D. Timmerman)