

## NEWS RELEASE

### **New research shows shrinking “water footprint” of Canadian beef production**

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Canada’s beef industry has dramatically reduced its water footprint over the past several decades, and that trend is expected to continue, a new study has found.

The amount of water required to produce one kilogram of Canadian beef has decreased by 17% from 1981 to 2011, due largely to enhanced efficiency in how feed crops for beef cattle are produced, as well as enhanced efficiency in raising beef cattle and producing more beef per animal.

These results are from the most comprehensive and sophisticated study ever done assessing the water footprint of Canadian beef production, conducted by researchers at the University of Manitoba and Agriculture and Agri-Food Canada (AAFC) Lethbridge. It involved extensive data integration, modelling, and assessment of numerous factors associated with the water footprint of Canadian beef over a 30-year period, using the data-rich principal census years of 1981 and 2011 as the reference.

While Canada is recognized as one of the most water-efficient countries regarding water use in beef production, the industry is still committed to further improvement. Opportunities for further improvement highlighted by the study include additional advances in feeding efficiencies and in reducing water requirements for feed crop and pasture production.

The study is part of a larger project entitled “Defining the Environmental Footprint of Canadian Beef Production”, which previously found similar reductions in greenhouse gas (GHG) emissions and resource use intensities related to Canadian beef production over the same period.

“Our focus has been to develop an accurate assessment of the Canadian beef industry’s water footprint and how that is evolving with advances in production efficiencies,” said Dr. Tim McAllister, a research scientist at AAFC Lethbridge and one of the study’s principal investigators. “Our results show very clearly the water footprint per kilogram of beef produced has been reduced over the years and that the industry is operating at a high level of sustainability from a water use perspective. There are also opportunities for continuous improvement through further advances in support of highly efficient Canadian beef production.”

The study is unprecedented in detail and scope for Canada and is among the most advanced globally. It used advanced data collection, analysis and modelling to produce a highly robust, multi-level examination of water use in all areas relevant to producing Canadian beef over the study period. Among numerous variables, it took into account water used for feed and pasture crop production, water used by cattle for drinking, water used in feeding systems, and water used as part of meat processing. It also factored in potential evapotranspiration from lands used for beef production, which is an estimate of the sum of evaporation from the land surface plus transpiration from plants. The evapotranspiration calculations were done utilizing data from 679 weather stations across Canada. Regional differences in beef production and water use were also accounted for. Water use was compared to beef production output, using information on cattle populations and key performance metrics such as average daily gain and carcass weight.

The study examined water use intensity for both “blue” water (surface and ground water) and “green” water (precipitation or rain water). Drinking water consumed by cattle accounted for less than 1% of total water use related to beef production, while feed production – i.e. water required (including precipitation) to grow

pasture, crops or produce by-product feeds – accounted for 99% of total water use related to beef production. By-product feeds are usable feedstuffs leftover from other types of agri-processing, representing a valuable way to recycle these materials within agriculture. While overall the amount of water required to produce one kilogram of Canadian beef decreased 17% over the full period, the decrease was even more pronounced with blue water, which declined 20% over the thirty years.

“A number of factors have driven this progress,” said Dr. Getahun Legesse Gizaw of the University of Manitoba, one of the lead investigators of the study. “The improvements related to feed production were due primarily to improvements in crop productivity, with feed crops yielding higher with less water use. Additional improvements were due to beef production advances, in areas including increases in carcass weight, reproductive efficiency, and average daily gain. There has also been substantial investment in southern Alberta to improve the efficiency of irrigation infrastructure and lower evaporative water losses in an area where most of Canada’s feedlot cattle are finished.”

“There are maintenance requirements for every animal and as the industry has made advances and investments to produce more beef, more efficiently from every animal, the amount of inputs and energy including water has been substantially reduced relative to overall production,” said McAllister.

The water footprint study and broader environmental footprint project are part of the commitment of Canada’s beef industry to continuous improvement in sustainability. Information from these initiatives will support transparency, accuracy, and planning related to industry sustainability activities, both domestically and internationally. Among various outputs, the study will contribute to the efforts of the Canadian Roundtable for Sustainable Beef (CRSB), including the CRSB’s National Beef Sustainability Assessment.

“Water is a precious resource and Canadian beef producers are committed to supporting responsible water use across our production systems,” said Bryan Thiessen, manager of Namaka Farms near Strathmore, AB and Chair of the Beef Cattle Research Council. “Knowledge is critical. Studies like this one are helping us build a comprehensive understanding of the industry’s past, present and future environmental footprint, to not only operate efficiently and responsibly but also to continue to contribute globally as leaders in sustainable beef production.”

Complete detailed results of the study, [“Water use intensity of Canadian beef production in 1981 as compared to 2011.”](#) are published in Science of the Total Environment, one of the leading international peer-reviewed scientific journals covering environmental science. The study was funded by the Beef Cattle Industry Science Cluster under the Growing Forward 2 framework.

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*The Canadian Roundtable for Sustainable Beef (CRSB) is the go-to forum for sustainable beef production in Canada. It is a collaborative, multi-stakeholder community across the beef value chain devoted to advancing environmental, social and economic sustainability in the Canadian beef industry.*

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