

Michigan Tech News

Don't Blame Dairy Cows for (Greenhouse) Gas Emissions

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Jersey Cow. Photo by Stephen Kennedy, courtesy of the Innovation Center for US Dairy

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Forget all the tacky jokes about cow flatulence causing climate change. A new study reports that the dairy industry is responsible for only about 2.0 percent of all US greenhouse gas emissions.

The study, led by the University of Arkansas in association with Michigan Technological University, measures the carbon footprint of a gallon of fluid milk from farm to table and

uses 2007 and 2008 data from more than 500 dairy farms and 50 dairy processors, as well as data from more than 210,000 round trips transporting milk from farm to processing plant. It was commissioned by the Innovation Center for the US Dairy, an industry-wide group.

The University of Arkansas addressed carbon emissions from the dairy to the milk in your cereal bowl. The Michigan Tech group looked further upstream. “We focused on the carbon footprint of the feed crops,” said chemical engineering professor David Shonnard, director of the Sustainable Futures Institute. “Animal feed is a major contributor to carbon emissions.” Using US Department of Agriculture data, Shonnard’s team, including PhD student Felix Adom and four undergraduates (Ashely Maes, Charles Workman, Zachary Bergmann and Lilian Talla), analyzed the impact of variables ranging from fertilizer and herbicides to harvesting and transportation. “We also looked at a Michigan feed mill, where grain gets combined with any of over a hundred different additives,” he said.

The team concluded that the cumulative total emission of greenhouse gases associated with all fluid milk consumed in the US was approximately 35 million metric tons in 2007. While the emissions are lower than sometimes reported, there is still room for improvement for dairy farms and businesses of all kinds, the study concluded. In particular, manure management, feed production and enteric methane (cow gas) were cited as areas that are ripe for innovation on farms. Energy management provides the greatest opportunity in the processing, transportation and retail segments.

The project has also raised other dairy-related issues that Shonnard’s group is investigating. They are studying the eutrophication of water—what happens when nutrients such as manure and fertilizers get into surface water, causing an overbloom of algae that sucks oxygen from the water and kills fish. The team is also investigating water consumption and land use in the dairy industry. “Growing crops is becoming more productive all the time, and we may be able to use less land to satisfy demand,” Shonnard said.

Michigan Technological University (mtu.edu) is a leading public research university developing new technologies and preparing students to create the future for a prosperous and sustainable world. Michigan Tech offers more than 130 undergraduate and graduate degree programs in engineering; forest resources; computing; technology; business; economics; natural, physical and environmental sciences; arts; humanities; and social sciences.