Dairy industry making strides toward reducing its carbon footprint

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Agricultural greenhouse gases (GHG) make up 8.1% of total U.S. GHG emissions. The dairy cattle farming industry is being challenged to reduce greenhouse gas emissions while maintaining or increasing profitability. In a study published in the *Journal of Dairy Science*, researchers report that farms with lower carbon footprints and higher-producing cows are more profitable, a win-win situation for everyone, including the cows.

Investigators Di Liang, PhD candidate, and Victor E. Cabrera, PhD, from the Department of Dairy Science, University of Wisconsin-Madison, used the Integrated Farm System Model (IFSM), available from the U.S. Department of Agriculture, to simulate the performance of a representative Wisconsin dairy farm and predict both financial and environmental outputs over a 25-year period. An IFSM simulation takes into account numerous interacting processes that include crop and pasture production, crop harvest, feed storage, grazing, feeding, and manure handling.

"We found that greenhouse gas emissions per kg of energy-corrected milk production will be reduced by increasing milk production, decreasing the herd replacement rate, or improving reproductive efficiency. Therefore appropriate dairy farm management strategies could provide a solution that increases the farm profit while decreasing the greenhouse gas emissions," noted Dr. Cabrera.

In their model, the farm had 100 large milking cows and 100 hectares of

rented cropland. Topography and soil type were defined, as were crop mix (alfalfa and corn), numbers and types of farm equipment, as well as planting and harvesting schedules. The researchers measured how the model responded to two major management practices: target milk production, whereby feed allocations are varied to achieve a desired output per animal; and herd-structure as represented by the percentage of young, first-lactation cows.

"The dairy industry is committed to the economic sustainability of our farmers by selecting a new generation of healthy, long-lived, high production cows," commented *Journal of Dairy Science* Editor-in-Chief Matthew C. Lucy, PhD, Professor of Animal Science at the University of Missouri. "What the models are telling us is that working toward this goal will reduce the carbon footprint of our industry." He believes that this study demonstrates that reducing dairy carbon footprint is not contrary to farm profitability, and in fact, the two are complementary.

More information: "Optimizing productivity, herd structure, environmental performance, and profitability of dairy cattle herds," by D. Liang and V. E. Cabrera. *Journal of Dairy Science*, Volume 98, Issue 4 (April 2015), DOI: dx.doi.org/10.3168/jds.2014-8856

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