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Removal of dairy cows from the United States may reduce essential nutrient supply with little effect on greenhouse gas emissions

Research in the Journal of Dairy Science® *examines the potential impact of various animal removal assumptions on the environment and nutritional supplies*

Philadelphia, October 15, 2020 – The US dairy industry contributes roughly 1.58 percent of the total US greenhouse gas emissions; however, it also supplies the protein requirements of 169 million people, calcium requirements of 254 million people, and energy requirements of 71.2 million people. A suggested solution to increasing food production worldwide while reducing greenhouse gas emissions has been to eliminate or reduce animal production in favor of plant production. In an article appearing in the *Journal of Dairy Science*, scientists from Virginia Tech and the US Dairy Forage Research Center studied the effects of dairy product removal on greenhouse gas emissions and nutrient availability in US diets under various removal scenarios.

The authors of this study assessed three removal scenarios—depopulation, current management (export dairy), and retirement. In depopulation, consumers would stop consuming dairy products, resulting in depopulation of the animals; in current management (export dairy), the cattle management would remain the same and milk produced would be used for products other than human food or exported for human consumption; in retirement, the cattle would be retired to a pasture-based system but reduced to numbers that could be supported by available pastureland.

“Land use was a focus in all animal removal scenarios because the assumptions surrounding how to use land made available if we remove dairy cattle greatly influence results of the simulations,” said lead investigator Robin R. White, PhD, Department of Animal and Poultry Science, Virginia Tech, Blacksburg, VA, USA. “If dairy cattle are no longer present in US agriculture, we must consider downstream effects such as handling of pasture and grain land previously used for producing dairy feed, disposition of byproduct feeds, and sourcing fertilizer."

Caption: A new study published in the *Journal of Dairy Science* suggests that the removal of dairy cattle from US agriculture would only reduce greenhouse gas emissions by 0.7 percent and lower the available supply of essential nutrients for the human population (Credit: iStock.com/singkamc).

Greenhouse gas emissions were unchanged in the current management (export dairy) scenario, with a decrease in nutrient supplies, as expected. Emissions declined 11.97 percent for the retired scenario and 7.2 percent for the depopulation scenario compared to current emissions. All 39 nutrients considered in human diet quality were decreased for the retired scenario, and although 30 of 39 nutrients increased for the depopulation scenario, several essential nutrients declined.

The results of the study suggest that the removal of dairy cattle from US agriculture would only reduce greenhouse gas emissions by 0.7 percent and lower the available supply of essential nutrients for the human population.

Professor White added, "Production of some essential nutrients, such as calcium and many vitamins, decreased under all reallocation scenarios that decreased greenhouse gas emissions, making the dairy removal scenarios suboptimal for feeding the US population."

This study illustrates the difficulties in increasing supplies of critically limiting nutrients while decreasing greenhouse gas emissions.

Notes for editors
The article is "Contributions of dairy products to environmental impacts and nutritional supplies from United States agriculture," by D. L. Liebe, M. B. Hall and R. R. White (https://doi.org/10.3168/jds.2020-18570). It appears in advance of the *Journal of Dairy Science*, volume 103, issue 11 (November 2020), published by FASS Inc. and Elsevier.

The article will be openly available at www.journalofdairyscience.org/article/S0022-0302(20)30785-2/fulltext.

Full text of the article is available to credentialed journalists upon request. Contact Eileen Leahy at +1 732 238 3628 or jdsmedia@elsevier.com to obtain copies. Journalists wishing to interview the authors should contact the corresponding author, Robin R. White, Virginia Tech, at rrwhite@vt.edu.

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