

Emission accomplished: Cattle burp methane expulsion measured from space for first time

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Cattle burping while chowing on feed in California's San Joaquin Valley generated plumes of a powerful greenhouse gas that have been detected by satellites for the first time, shedding light on how agriculture may be

contributing to climate change.

Methane emissions from the Bear 5 feedlot near Bakersfield, California, ranged from 443 kilograms (977 pounds) to 668 kilograms per hour on Feb. 2, according to GHGSat Inc., which owns high-resolution satellites. If those emissions are sustained for a year, the cattle would release 5,116 tons of gas, enough to power 15,402 homes, the Montreal-based company said in a statement.

"This has not been done at an individual facility scale for the [agriculture sector](#), as far as we know," said Brody Wight, sales director at GHGSat. "The idea is that we need to measure first before you can take real positive action."

Compared with energy and other [pollution sources](#), the challenge with cattle is that their emissions are more diffuse and whipped about by the wind, making them difficult to track from ground meters, Wight said. The new findings were possible because of [scientific advances](#) in reading satellite images, he said.

Methane as a global-warming agent is more than 84 times more powerful than [carbon dioxide](#) in its first two decades in the atmosphere. A panel of United Nations-backed scientists warned in a report this month that global [methane](#) emissions must be reduced by a third by 2030 to help slow the planet's warming.

Methane emissions are largely from [human activity](#) including agriculture, in which cattle are the biggest source globally.

In the U.S., agriculture accounted for about 11% of total greenhouse gas emissions in 2020, with more than a quarter of that from cattle and other livestock, according to the Environmental Protection Agency. As of Jan. 1, the U.S. had 91.9 million cattle including calves, of which 16% were

in feedlots for slaughter, U.S. Department of Agriculture data show.

Contrary, perhaps, to most people's assumption, flatulence accounts for only a small portion of the methane generated by cattle. The rest—about 95%—comes out as burps, and the majority of that is released through the nose.

The industry is exploring ways to reduce the feedlot plumes. Those efforts include using gas-capturing masks on the cattle and changing the content of the feed. This week, New Zealand's Fonterra Cooperative Group, the world's largest dairy exporter, said that a seaweed supplement is showing promise as a solution.

GHGSat will go from scanning the globe on a weekly basis with two satellites to 10 capable of daily surveillance early next year, Wight said.

"Finding big sources quickly is the best way we think to have an impact in the near term," he said.

American cattle typically spend the first part of their lives grazing in pastures. The microbes in their stomachs that break down grassy fibers are the reason that they belch so much methane.

At the feedlots, where they head for a "finishing period" to build their fat marbling and flavor, they binge on more easily digested corn, which generates less methane, said Frank Mitloehner, a professor of animal science at the University of California at Davis.

Steers sent to feedlots usually hit their slaughter weight at the age of 14 to 16 months, whereas grazers live to 28 to 30 months, Mitloehner said. That means feedlots account for about 5% to 10% of the total life cycle emissions of [cattle](#), including the production and transportation of the corn, he said.

"I am not telling you one system is better than the other, there is more nuance to the discussion," he said.

The industry has looked at several dozen feed additives and emissions data from a feed lot can show the impact of dietary changes on [methane emissions](#), he said. "You can't easily use them in a pasture when they are roaming free."

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