Probing Question: Are cow burps contributing to global warming?

March 4 2011, By Solmaz Barazesh Spence

Credit: Credit photos.com

When people think about sources of greenhouse gas emissions, they think of oil refineries, smokestacks and trucks spewing out thick black smoke. They don't usually think of cows.

But recently, the idea that cattle could be a source of greenhouse gas has been attracting attention. It turns out that the belches of cows, sheep and other livestock animals contain substantial amounts of methane, a particularly potent greenhouse gas that has about 25 times the global

warming potential of carbon dioxide.

Are cows emitting greenhouse gases?

"Yes — in fact, the Environmental Protection Agency estimates that cattle belching and manure management contribute about 28 percent of all anthropogenic methane emissions in the United States," Alexander Hristov, Penn State professor of dairy nutrition, said. "However, in the big picture of global greenhouse gas emissions, cows are a relatively small player."

Methane gas is a natural by-product of the complicated bovine digestive process, Hristov explained. As cattle feed makes its way into the largest compartment of the cow stomach, called the rumen, it is feasted upon by microbes and begins to ferment. The fermentation process breaks down the fibrous cattle feed, helping cows get nutrition from otherwise indigestible grass and hay — but also produces lots and lots of gas in the process. Methane makes up somewhere between 20 and 40 percent of the mix.

The bubbling of ruminants' stomachs isn't a new concern, Hristov added. "Millions of buffalo were emitting methane for thousands of years in North America before the white man replaced them with cattle," he explained. And the type of food that farmers give their cattle may not be to blame, either. "Wild ruminants such as deer, elk and moose also emit methane as a result of fermentation. Other herbivore animals, horses and elephants for example, also produce methane from a similar type of fermentation occurring in the large intestine, but in much smaller quantities."

But is all this hot air enough to contribute to global warming?

Despite methane's potency, "As a proportion of all greenhouse gases

emitted in the United States, livestock belches only contribute about 2.2 percent," noted Hristov. "The emissions from the energy and transportation sectors are much larger. In fact, looking at methane emissions alone, there are other human activities with larger methane footprints than livestock, such as emissions from landfills, for example."

That's good news, because research into methods of cutting down the amount of methane that cows emit is only just beginning. "There are a number of technologies that animal scientists are working on, but no 'magic bullet' yet," Hristov explained. "It is likely that none of these technologies will produce revolutionary reductions in methane emissions, and society has much better opportunities to mitigate environmental impacts, for example by developing more efficient methods for producing energy," he added.

The EPA's Greenhouse Gas Inventory Report concluded that fossil fuel combustion produced 78 percent of all greenhouse gases emitted in the United States.

In light of this huge number, "Farm animals are a relatively small player in the big picture of greenhouse gas emissions, particularly in the developed world," said Hristov.

Provided by Pennsylvania State University