First 'dairy sustainability' report looks at greenhouse gases

By Ron Johnson
Dairy Editor

In its continuing quest to shrink the size of its "carbon footprint," the U.S. dairy industry has published its first "sustainability progress report."

A carbon footprint is a measure of the amount of carbon dioxide equivalents generated. Carbon dioxide is one of the greenhouse gases (GHG) thought to contribute to climate change.

The average carbon footprint of a gallon of U.S. milk, measured from a dairy farm to a consumer's kitchen table, is 17.6 pounds of carbon dioxide equivalents, according to the Innovation Center for U.S. Dairy. The center released its 60-page "U.S. Dairy Sustainability Commitment Progress Report" last week.

This report summarizes dairy industry efforts to make dairying more economically, socially and environmentally sustainable, according to the center. One dairy industry goal is to cut by 25 percent the amount of greenhouse gas emissions that producing, processing and transporting a gallon of milk creates. The industry hopes to accomplish that by 2020.

Thomas Gallagher, chief executive officer of the Innovation Center for U.S. Dairy and Dairy Management Inc. (DMI), says, "U.S. dairy is an industry of great people with strong values, who are passionate about the nutrient-rich products we supply, and about our commitment to healthy people, healthy products, (and a) healthy planet. As we move forward, we are committed to continuous collaboration to realize our collective vision of forging a more sustainable and profitable U.S. dairy industry."

Among other things, the report discusses the state of carbon production by the U.S. dairy industry. It also looks at key findings of the first national GHG life-cycle assessment—or carbon footprint study—of fluid milk.

The report goes on to discuss some of the advancements from 10 projects aimed at reducing greenhouse gas emissions. Those projects, says the center, should also "create business value across the industry."

Back to that gallon of milk, the report says the carbon footprint can range from a low of 15.3 pounds of carbon diox-

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ide equivalents to a high of 20.7. Meanwhile, the report pegs the "total fluid milk carbon footprint" of the U.S. dairy industry at roughly 35 million metric tons. Even so, it adds that dairying is responsible for approximately just two percent of all U.S. greenhouse gas emissions.

REDUCTIONS POSSIBLE

It is possible to lower the amount of GHG dairying produces, says the report. Using "best management practices" makes the greatest difference in the amount of greenhouse gases produced. The size or location of the farm or milk processor is not as important as the use of certain practices, the report states.

"There are opportunities for improvement across the supply chain," according to the report. "...For example, on the farm, feed efficiency (how effectively a cow's diet helps her produce milk), and manure management represent the greatest opportunities to further reduce GHG emissions."

It's not only farms and processors that can cut their greenhouse gas emissions.

"Businesses at each stage of the value chain have opportunities to cut costs and emissions from fossil fuels and electricity," the report says. "Refrigerants are a key source of emissions in the retail sector."

FEED

The road to producing greenhouse gases begins on farms when feed is grown, notes the report. Tilling soil, making commercial fertilizer, and using energy to power equipment all contribute to the carbon footprint. The report says feed production contributes 20.2 percent of dairying's carbon footprint.

According to the report, "While many farmers currently incorporate best (management) practices into their crop production, they often lack the specific data that is relevant to their farm in terms of climate, air quality, soil, land and watershed—information that can lead to "greener" decisions, as well as reduced costs in the production of feed."

There are "opportunities," says the report, to "explore the relationship among manure and feed efficiency, precision agriculture, good no-till management, better grazing management and better irrigation and fertilization management."

MILK

As for milk production itself, greenhouse gases are released to the atmosphere in three general ways: from dairy cattle themselves (enteric emissions), from manure, and from using energy.

Milk production is said to account for 51.5 percent of dairying's greenhouse gas emissions. Dairy cattle account for 25.1 percent of the milk production emissions, according to the report.

"In milk production, the primary source of GHG emissions is the cow herself," the report says. "A dairy cow's unique, four-chambered stomach allows her to digest the high-fiber feed necessary for milk production. This process also produces methane gas, which is 25 times more potent than carbon dioxide as a greenhouse gas. Methane...is released by dairy cows primarily through burps or enteric emissions."

Opportunities to lower the emissions that emanate straight from cows include changing their feed, putting additives into the feed, and cutting back on the number of organisms in cows' rumens.

Changing the feed includes using mineral supplements and probiotics, along with making feed particles smaller. "Improving dairy feed can create a more efficient dairy cow, meaning fewer cows are needed to meet production requirements—resulting in less methane emissions all around," the report says.

Natural additives for feed include fatty acids, like flax seed, and plants like yucca and brown seaweed. Both, say the report's authors, "have shown potential in reducing methane emissions."

When it comes to reducing the number of rumen organisms, the report notes that they are "a significant contributor to the enteric methane emissions. Developing safe and effective methods of reducing or eliminating these microorganisms could contribute to the overall reduction of a cow's methane emissions."

MANURE

Dairy cattle manure is said to be responsible for 22.8 percent of the greenhouse gas emissions involved in the farm aspect of producing milk. When manure decomposes, methane is released.

The report suggests two ways of lessening methane emissions from manure. They are: "applying manure to fields, as fertilizer" and using anaerobic digestion and capturing and using the gas that's released.

ENERGY USAGE

Finally, on the energy used on farms to produce milk, the report says the average amount spent per year for electricity, per cow, is $40. That electricity is used for cooling milk, ventilating buildings, the actual milking, and lighting.

"Some best (management) practices might be as simple as starting up motors at different times so as not to trigger high peak-use rates, and repairing outdated machinery and equipment," suggests the report. "Other common energy conservation practices include variable-speed vacuum pumps, water-cooled plate coolers, and energy-efficient...fans."

In all, energy usage accounts for 3.6 percent of the greenhouse gases emitted on dairy farms in the process of producing milk.

The "U.S. Dairy Sustainability Commitment Progress Report" is available at: usdairy.com/sustainability.