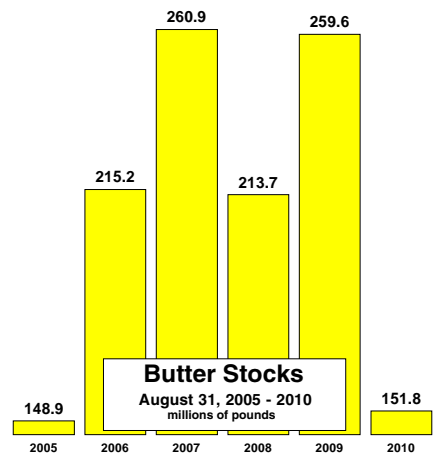




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On-Farm Practices Provide Best Opportunity To Lower Dairy Industry's Carbon Footprint, Study Concludes

Rosemont, IL—Because approximately 72 percent of the dairy industry's greenhouse gas emissions occur by the time milk reaches the farm gate, on-farm practices provide the "most significant opportunities" to lower the dairy industry's carbon footprint.

That's one of the conclusions of a US dairy industry carbon footprint study that was released this week.

In January 2009, the Innovation Center for US Dairy endorsed a voluntary goal to reduce greenhouse gas (GHG) emissions of fluid milk by 25 percent by 2020.

At the same time, the dairy industry commissioned a greenhouse gas life cycle assessment, or carbon footprint study, for fluid milk in order to identify where the industry can innovate to reduce GHG emissions across the supply chain to achieve the greatest gains.

The study also provides a benchmark to measure the industry's progress toward achieving its voluntary reduction goal.

The Innovation Center for US Dairy commissioned the Applied Sustainability Center at the University of Arkansas to conduct this first US national-level fluid milk carbon footprint study, and Michigan Technology University was chosen to assist, primarily in the crop and feed mill analysis.

For purposes of this study, the analysis was limited to greenhouse gas (GHG) emissions in order to estimate a carbon footprint for US dairy operations (fluid milk).

• See **Carbon Footprint**, p. 13

Large Dairy Operations Continue To Boost Share Of US Milk Production

Number Of Milk Cow Operations Fell 33% Since 2001, But Number Of Milk Cows, Milk Output Rose

Washington—Over the past eight years, total milk cow operations in the US have declined significantly, while the number of large operations has increased, according to a report released Wednesday by USDA's National Agricultural Statistics Service (NASS).

Overview of the United States Dairy Industry compares 2009 milk production year data to 2001 data released in the *US Dairy Herd Structure* report, which was published in September 2002.

There were 65,000 milk cow operations in the US in 2009, compared to 97,460 in 2001, a drop of 33 percent, the report noted. Despite this decline in milk cow operations, both milk production and milk cow numbers have been on the rise.

Milk production increased 15 percent over the period, from 165.332 billion pounds in 2001 to 189.32 billion pounds in 2009. Milk cow inventory showed a smaller increase, rising 1 percent, from 9.10 million

head in 2001 to 9.20 million head in 2009.

Although the overall number of milk cow operations has declined since 2001, the number of operations with 500 or more head of milk cows has increased. Since 2001, the number of operations with 500 or more head increased by 20 percent, from 2,795 to 3,350 last year.

The largest size group, operations with 2,000 or more head, showed the greatest percentage change from 2001, rising from 325 operations in 2001 to 740 operations in 2009, a gain of 128 percent.

While larger operations were growing in number, smaller operations declined in number, the report noted. Operations with less than 500 head went from 94,665 in 2001 to 61,650 in 2009, a decline of over 33,000 operations, or 35 percent.

As large operations have become more numerous, the share of inventory accounted for by large operations has also increased. In 2009, operations with 500 or more head accounted for 56 percent of total milk cow inventory, compared with only 35 percent in 2001, according to the report.

Operations with 2,000 or more head accounted for 30 percent of inventory in 2009, up from only 12 percent in 2001. And operations with less than 500 head accounted for 44 percent of total milk cow inventory in 2009, down from 65 percent in 2001.

As with inventory, the share of milk production accounted for by large operations has steadily increased, the report noted. Operations with 500 or more head accounted for almost 60 percent of all milk produced in 2009, up from 39 percent in 2001.

Production on operations with 2,000 or more head increased from just 13 percent in 2001 to 31 percent of total milk production in 2009.

Smaller operations continue to produce a smaller share of total production; operations with less than 500 head accounted for nearly 41 percent of milk production in 2009, down from 61 percent in 2001.

In 2009, operations with 500 or more head accounted for 5 percent of the total milk cow operations, 56 percent of the milk cows, and 60 per

• See **Large Operations**, p. 14

US Judge Grants Injunction To Halt New Pennsylvania Over-Order Premium Plan

Harrisburg, PA—US District Judge William W. Caldwell late last week granted a motion for a preliminary injunction that at least temporarily stalls a new method of calculating over-order premiums paid to Pennsylvania milk producers.

The new over-order premium pricing method was to have taken effect on October 1, 2010.

Plaintiffs in the case are Fair Oaks Farms, Gaylord Millard (d/b/a Millard Dairy) and the Pennsylvania Association of Milk Dealers. Defendants are Richard Kriegel, Luke Brubaker and Barbara Grimbine, in their official capacities as members of the Pennsylvania Milk Marketing Board (PMMB).

The plaintiffs filed a lawsuit to challenge a PMMB order changing the way the over-order premium payable to Pennsylvania dairy farmers for their milk is calculated, Caldwell noted.

Plaintiffs argued that the order violates the Commerce Clause by

discriminating against milk from outside Pennsylvania.

Currently, Pennsylvania milk dealers are required to pay an over-order premium to Pennsylvania milk producers for Class I milk. Under the current formula for calculating the over-order premium, out-of-state raw milk is excluded from the calculation.

Under the current formula, Caldwell explained, the over-order premium rate is multiplied by the ratio of the quantity of raw milk purchased in Pennsylvania to the milk dealer's total quantity of raw milk purchased, and then multiplied by the amount of the dealer's Class I finished product sold in Pennsylvania.

Under the newly adopted formula, the over-order premium obligation is no longer calculated by using only the percentage of Pennsylvania raw milk purchases to the

• See **Pennsylvania Plan**, p. 12

Milk Production Rose 2.8% In August Despite Drop In Milk Cow Numbers; CA Output Up 4.9%, Wisconsin Production Up Just 0.5%

Washington—US milk production in the 23 reporting states during August totaled 15.019 billion pounds, up 2.8 percent from August 2009, USDA's National Agricultural Statistics Service (NASS) reported last Friday.

That was the smallest percentage increase in milk production for the 23 reporting states since May, when output was up 1.5 percent from May 2009. June production was up 2.9 percent and July output rose 3.0 percent.

For the US as a whole, August

• See **Milk Output Rises**, p. 6

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Milk Tops Other Beverages When It Comes To Nutrient Density In Relation To Climate Impact: Study

Uppsala, Sweden—A recent study of the nutrient density of beverages in relation to climate impact concludes that milk both has the highest nutrient density per se, and has the highest nutrient density in relation to greenhouse gas (GHG) emissions of the compared beverages.

This study, conducted by researchers in Sweden and at the University of Washington, is described as the first to estimate the composite nutrient density in relation to cost in GHG emissions of the production from a life cycle perspective, expressed in grams of carbon dioxide equivalents, using an index called the Nutrient Density to Climate Impact (NDCI) index. Calculations of the NDCI index were based on semi-skimmed milk (1.5 percent fat).

For this study, the NDCI index was calculated for milk, soft drinks, orange juice, beer, wine, bottled carbonated water, soy drink, and oat drink. The nutrient density of the beverages was based on calculations including protein, carbohydrates, fat and 18 vitamins and minerals, including phosphorus, calcium, potassium, magnesium, zinc, iodine, vitamin D, vitamin E, retinol equivalents, riboflavin, and others.

The GHG emissions included in this analysis were generated by the following production phases in the life cycle of the beverages: the production phase at farm level; the manufacturing phase; the packaging phase; and transportation. GHG emissions from the consumer phase, including transportation of the beverage from the retailer, storage at home and waste were not included.

Nutrient density of a food item was calculated by summarizing the proportions of recommended daily intake of each nutrient provided by 100 grams of the food item multiplied by the proportion of nutrients contributing to more than 5 percent of the Nordic Nutrition Recommendations (NNR).

The NDCI index for milk was "substantially higher" than for the other beverages studied, researchers noted. This can be explained by a very high nutrient density value, both with regard to the number of nutrients and their amount relative to recommendations.

Orange juice and soy beverage had similar NDCI index values, but lower than milk. The nutrient density of orange juice was higher than that of soy drink, but the GHG emissions were also higher.

"This study helps support the importance of bringing nutrient density to the discussion as the carbon footprint of beverages and foods is examined," said Dr. Greg Miller, president of the Dairy Research Institute.

Carbon Footprint

(Continued from p. 1)

The greenhouse gas life cycle assessment (LCA) is comprehensive and includes all inputs to the dairy industry, from crop farming to the final disposition of the packaging at the end of the supply chain.

The dairy supply chain is broadly divided into eight stages: feed production, milk production, delivery to processor, processing and packaging, distribution, retail, consumption, and disposal.

Individual carbon footprints are included for each of the four primary fluid milk varieties (whole milk, reduced fat, lowfat and fat-free) in the report, but the aggregated total, based primarily on 2007-08 data, for fluid milk consumed in the US is 17.6 pounds of carbon dioxide equivalents (CO_{2e}) per gallon of milk consumed.

The study found that the cumulative total emission of greenhouse gases associated with consumption of all fluid milk in the US was approximately 35 million metric tons carbon dioxide equivalents in 2007.

The majority of the greenhouse gas emissions occur by the farm gate, at approximately 72 percent of the total.

Manure Management Is Key

In particular, the relative contribution of manure to the total footprint is larger than previously estimated, while feed and on-farm fuel have smaller relative contributions from the scan analysis of previous literature.

This indicates an even greater importance to manure management opportunities in terms of meeting industry GHG reduction goals than previously anticipated, the report noted.

Deep bedding (stored longer than one month) and anaerobic lagoons are two of the largest sources of methane from manure management, and opportunities for reduction of GHG emissions associated with modification to these practices should continue to be explored.

Feed still represents a major contributing factor and the opportunity associated with conservation and no-till operations in the feed supply chain remains; it is a singular opportunity for the dairy farmers who grow their own feeds or have some control through contracts with the crop production farms.

The study considered biogenic carbon, which is carbon in the relatively short-term cycle from the atmosphere through crops and back to the atmosphere, to be neutral with respect to GHG emissions; therefore, carbon sequestration by plants and the respiration of the animals were considered to balance and were not specifically accounted.

Long-term sequestration of carbon associated with crop and pasture management is being studied, and it appears that tillage practices signifi-

cantly influence sequestration in the soil.

The single most important factor in explaining differences in GHG emissions across all farms is feed conversion efficiency, the study noted. This is not a particularly surprising result: feed is a major farm input and directly affects both enteric emissions and the quantity of manure excreted.

Opportunities with some large farms where anaerobic lagoons are a common management system may be significant, the study said. In addition, further work to continue increasing feed conversion efficiency is also important, as this variable alone explains over one-half of the observed variability in the feed and enteric methane contribution to the farm-gate footprint.

Milk Processing's Carbon Footprint

Several dairy cooperatives provided detailed information regarding transportation of milk from farms to processing facilities. This contributed 1.27 million metric tons CO_{2e} or approximately 0.05 kilograms CO_{2e} per kilogram milk delivered to processors.

Also, 50 fluid milk processing facilities provided data on energy use and production to help develop a

processing footprint. The gate-to-gate resulting carbon footprint is 0.2 kilogram CO_{2e} per kilogram milk delivered to retail.

Two interesting observations were associated with analysis of survey results from the milk processing industry, the report stated. First, there was not a strong correlation between processing plant age and GHG emission intensity (kilograms of CO_{2e} per kilogram packaged milk); and second, there was also no correlation between plant size and GHG emission intensity.

US Secretary of Agriculture Tom Vilsack on Thursday praised US dairy farmers and processors for their commitment to sustainability following the release of the carbon footprint study.

Last December, USDA and the Innovation Center for US Dairy signed a memorandum of understanding to work together on sustainability issues and to reduce the industry's carbon footprint.

More information about the US fluid milk carbon footprint study is available at www.usdairy.com/sustainability.

The carbon footprint study will be published in a peer-reviewed scientific journal in 2011. r

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For more information, circle #12 on the Reader Response Card on p. 18