Minimize Food Miles: Keep a Local Fluid Milk Supply for Connecticut
Prepared for Public Hearing by the Environment Committee of Connecticut's General Assembly
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I appreciate the opportunity to submit testimony on behalf of dairy farmers in Connecticut. I live and have a herd of Jersey cows in Ashford, Conn., and have daily responsibilities on the farm. Additionally I am the Young Farmer and Rancher chairperson of the Connecticut Farm Bureau and am employed by First Pioneer Farm Credit in Enfield, Conn.

Connecticut's dairy farms are vital to the state in many ways. Not only do they preserve a picturesque, ecologically sound and working landscape but they also contribute to their local communities' infrastructure in various ways while offering a safe and wholesome product: milk. Specific benefits have been described in other reports, most recently a joint effort by the Department of Economic and Community Development and the Department of Agriculture in cooperation with the University of Connecticut, Dept. of Agricultural and Resource Economics published in January 2009.

There is more reason to maintain Connecticut's dairy farms for providing fresh fluid milk for those living here. By consuming local milk, we minimize trucking product in from other areas in order to meet the dairy demand requirements here, thereby lessening a negative impact on the environment. I estimate that we save nearly 6,595,000 pounds of carbon dioxide from being emitted into the atmosphere.

The idea of tracking "food miles" is not new. "Food miles" has been coined as a term to describe the distance the food you consume traveled to get to your plate. This paper attempts to estimate a portion of the food miles and resulting carbon emissions avoided by having access to our local milk supply in Connecticut.

Background

In Connecticut, we consume over 75 million gallons of fluid milk per year.[1] For simplicity purposes, this paper will take a big picture view and focus on fluid milk consumption versus butter, cheese, frozen and other dairy products. Our Connecticut dairy farms produce and sell about 41 million gallons[2] of fluid milk or about 55% of what we consume. The balance of fluid milk needed to meet demand comes from out of state sources. Further, of the twenty-five milk processors located throughout the state, there are five that work in the fluid milk market. Some Connecticut farmers will send their milk out of state for processing such as those who are members of a regional dairy cooperative like Agri-mark with facilities just over the state border in West Springfield, Mass.

Methodology

To determine what it would take to transport the milk produced by Connecticut dairy farmers, 41 million gallons, a series of calculations have been made after gathering the necessary data. The remaining demand for fluid milk in Connecticut is about 34.5 gallons, and trucked in generally from plants in New York and Vermont, which I used as a source. For estimating purposes, Hartford was used to determine mileage from out of state plants. Milk processors categorized as Pool Distributing Plants, Partially Regulated Distributing Plant, Cooperative as Handler (where applicable), Pool Supply System Plant and Pool Supply Unit Plant were used in calculations. The average distance in mileage, removing plants 350 or more miles away, is 202 miles.[3] See appendix.

Tractor trailer trucks are the major source of fluid milk transportation. At times, straight trucks are used to pick up milk on farms but trailers are preferred. They range in capacity from a maximum payload of 47,000 pounds for older trucks to 54,000 pounds in newer. A 50,000-pound maximum is used in calculations. This equates to about 5,500 gallons, (8.8 pounds in a gallon of milk). In order to replace the 41 million gallons, 7,500 truckloads of milk would be required in a year.

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[1] United States Department of Agriculture, Economic Research Service, Food Availability Tables, 2006. Using July 1, 2007 Connecticut population estimate of 3,502,309. Per capita consumption is 190.14 pounds/person.
[2] USDA, National Agricultural Statistics Service, Milk Production, Disposition and Income Summary, 2005-2006
[3] Northeast Federal Milk Marketing Order, www.fmmone.com

Fossil fuel combustion from vehicles is responsible for the majority of energy-related emissions contributing to U.S. anthropogenic greenhouse gas emissions, according to the EPA. Carbon dioxide (CO_2) is the main gas released and the one which is focused on in this paper. Additionally, however, it should be noted that other gases are released as well: methane, nitrous oxide, nitrogen oxides, carbon monoxide, and non-methane volatile organic compounds. There are approximately 2,778 grams of carbon dioxide in one gallon of diesel fuel[4], which equates to 22 pounds when emitted, (see appendix). Heavy-duty tractor trailer trucks on average report that they get 5.1 miles per gallon[5].

Calculation

The following table shows the calculation to arrive at 6,595,000 pounds of carbon saved. I've rounded up from 6,594,705 pounds of carbon, which is reasonable as this calculation does not take into account other non-conventional fluid milk sales such as raw milk. For a summary of all assumptions in one table, see appendix.

Table 1. Step-by-step calculation of pounds of carbon that would be produced by replacing Connecticut-produced fluid milk with that trucked in.

a. Gallons of milk provided by Conn. dairy farms	41,000,000
b. Average gallons milk carried by tractor trailer truck	5,500
c. Number of trucks needed (a/b)	7,500
d. Average miles traveled into Conn. from Ny. and Vt.	202
e. Total miles traveled (c*d)	1,515,000
f. Average miles per gallon	5.1
g. Gallons of fuel required (e/f)	297,100
h. Pounds of carbon dioxide per gallon of diesel fuel*	22.2
j. Pounds of carbon dioxide produced (e*h)	6,595,000

*See appendix for pounds carbon dioxide produced formula.

[4] Emission Facts, EPA420-F-05-011 US Environmental Protection Agency, February 2005
[5] Transportation Energy Data Book, Edition 27-2008, US Dept. of Energy, Office of Energy Efficiency and Renewable Energy

Conclusion

There are many reasons that my colleagues and industry supporters have recited today and in the past to keep Connecticut's dairy farms viable- from the value of a working open space to economic benefits to food security. This paper correspondingly offers one more: that by supporting the continued sustainability of Connecticut's dairy farms and utilizing their product, we save approximately 6,595,000 pounds of carbon dioxide from being emitted into the atmosphere.

If you have questions or would like to explore more calculations, please feel free to contact me at jsamuelson56@yahoo.com

Thank you.

Appendix

Exhibit A-1. Summary of assumptions

Fluid milk consumption, per capita in pounds	190.14
Conn. population estimate, July 1, 2007	3,502,309
Total milk consumption in pounds	665,929,033
Total milk consumption in gallons (8.8 lbs per gal)	75,673,753
Pounds milk produced in Conn.	363,000,000
Gallons produced in Conn.	41,250,000
Average miles traveled to Conn. from NY & VT plants	202
Pounds milk capacity of tractor trailer trucks	50,000
Gallons milk capacity of tractor trailer trucks	5,500
Average fuel efficiency for heavy duty trucks in mpg	5.1
Number of trucks needed to haul 41 million gallons	7,500
Pounds of carbon dioxide emitted from one gallon of diesel fuel	22.2

Exhibit A-2. To determine grams of carbon dioxide in one gallon of diesel fuel

While the EPA determines there is 2,778 grams of carbon in one gallon of diesel fuel, a few other factors are considered in figuring how much CO_2 is actually emitted. An oxidation factor of 0.99 is used. You must also multiply by the ratio of their molecular weights – m.w.44 for CO_2 and m.w.12 for carbon.

Thus:
Grams of CO_2 emissions from one gallon of diesel fuel = 2,778
1000 grams/kilogram
1 kg = 2.2 pounds

CO_2 emissions from a gallon of diesel = 2,778 grams x 0.99 x (44/12) = 10,084 grams = 10.1 kg/gallon = 22.2 pounds/gallon

Exhibit A-3. Map of Milk Handler locations