HOARD'S DAIRYMAN

Can buying local food really save the planet?

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Local food is the new "sustainability" trend. Walk into any upscale restaurant and there's a good chance that the menu will be awash with proud proclamations of food sourced from local producers. Many of those statements will contain an implicit value assumption — if it's local, it must be better than food produced out-of-state or in another country. There are many economic and social reasons to support local production systems, and buying local food would intuitively seem to have a lower carbon footprint. But does this claim live up to the science?

A growing number of consumers describe themselves as "locavores" and will only eat food produced within 100 miles of their home. This movement has grown from a metropolitan consumer subculture to a mainstream ideology, with farmers markets and grocery stores labeling produce with the associated number of "food miles" (miles traveled by the food to reach the market).

In contrast, the contemporary food production system has evolved by matching climate and available resources to food production systems. For example, it is difficult to maintain grazing dairy systems in arid regions where summer temperatures are above 110° F for a considerable length of time. Likewise, it is difficult to grow alfalfa on steep rocky slopes with poor soil quality. This does not mean that these systems should be abolished, but it makes it more logical to grow corn on the fertile plains of Iowa than, for example, the dry hilly regions of eastern Washington.

When comparing the two systems, advocates for local food movement often lament the loss of this life-style. They argue that large-scale grocery stores that carry food from national and international sources are environmentally unfriendly. One reason often cited is long-distance food transportation uses significant amounts of fossil fuel. Is this claim true?

A recent analysis by the Innovation Center for U.S. Dairy demonstrated that less than 8 percent of the carbon footprint of a gallon of milk can be attributed to transport. In addition, recent work from our research group has shown that transportation accounts for less than 1 percent of the carbon footprint for each pound of beef. Nonetheless, niche production systems often seek to differentiate from conventional production on the basis of reduced fossil fuel use for transport and, therefore, implicit reductions in the carbon footprint.

The miles add up

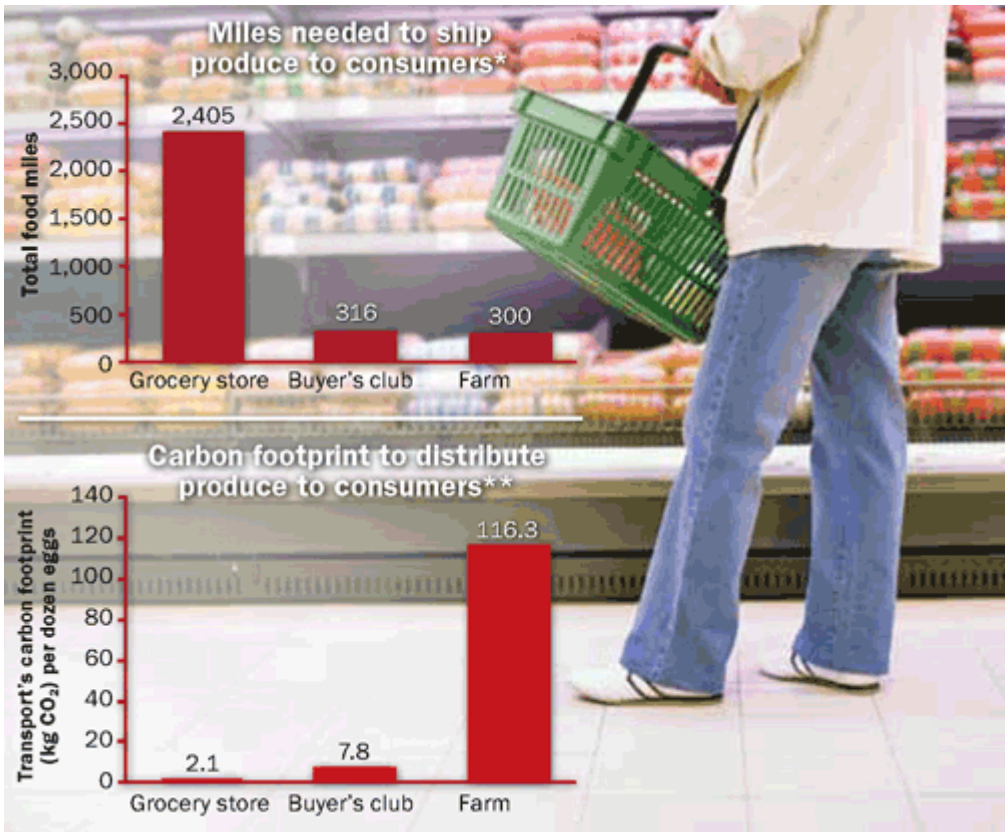
For example, one farm website proudly states that: “We do not ship anything anywhere. We encourage folks to find local producers and patronize them.” The same website describes their “Buyer’s Club” where food is transported to locations an average of 148 miles from the farm for consumers to collect. Yet, the website also includes the following quote from a consumer: “I drive to Farm X 150 miles one way to get clean meat for my family.” Does this claim make sense?

In order to determine the most environmentally friendly way to buy food, we calculated fuel use and the carbon footprint associated with buying one dozen eggs from three points of purchase:

Local grocery store. Using a low fuel-efficiency tractor-trailer to transport eggs from another state to the grocery store totaled 2,405 total food miles. This included 1,200 miles traveled to transport eggs to the store, 1,200 miles for the tractor-trailer to return empty, and 5 miles round-trip by car for the consumer to buy eggs from the store.

The buyer’s club example, using a moderate fuel-efficiency pickup truck, was intermediate at 316 miles (148 miles to transport eggs to the pickup point, 148 miles to return empty, and 20 miles round-trip for the consumer to pick up eggs from the collection point.

The farm example incurred 300 miles in total (150 miles each way to travel to the farm) in a comparatively high fuel-efficiency car. See figure for further explanation of all three systems. If food miles are the most important metric, driving to the farm to buy eggs would be assumed to be the most environmentally friendly choice. However, focusing on the total miles traveled misses one of the most critical factors in the carbon footprint equation — productivity.



**Grocery store example based on 2,400-mile tractor-trailer round-trip plus a 5-mile car round-trip; Buyer's club example based on a 296-mile pickup truck round-trip plus a 20-mile car round-trip; farm example based on a 300-mile car round-trip.*

**Grocery store example based on a tractor-trailer with a fuel efficiency of 5.4 mpg carrying 23,400 dozen eggs plus a car journey at 22.3 mpg; Buyer's club example based on pickup truck with a fuel efficiency of 18.1 mpg carrying 1,740 dozen eggs plus a car journey at 22.3 mpg; Farm example based on a car with a fuel efficiency of 22.3 mpg carrying one dozen eggs.

Must factor productivity, round trips

In the previous example, the tractor-trailer carries 23,400 dozen eggs per load, whereas the pickup truck carries 1,740 dozen eggs and the consumer's car carries one dozen eggs. In combination with the food miles and fuel efficiency data, the improved productivity of the tractor-trailer in the grocery store example outweighs the shorter distances and improved fuel efficiencies seen in the buyer's club and farm-direct examples.

Buying eggs from the grocery uses 0.24 gallon of fuel per dozen eggs. The carbon footprint is 2.1 kg CO2 per dozen eggs as shown in the figure. Compare this to the buyer's club example at 0.89 gallon of fuel per dozen eggs and 7.81 kg CO2 per dozen eggs. That difference is not too dramatic. However, the consumer quoted on the website as driving "150 miles each way" might

be surprised to learn that this purchasing decision dramatically raises fuel use 55-fold (13.2 gallons fuel per dozen eggs).

This example is a simplistic rendering that focuses on food miles. Improved productivity can alter all these examples. Nonetheless, the low productivity of the consumer's car compared to the tractor-trailer means that the farm would have to be 2.5 miles from the consumer's home in order to reduce the carbon footprint further than buying grocery store eggs.

In this comparison, all on-farm egg production systems are assumed to be similar. However, it could be argued that the farm-direct example might be associated with a "feel-good" factor from purchasing eggs that are perceived to be of higher quality. This would improve the social sustainability of such a choice, but it carries significant environmental consequences.

The challenge to all of us in food production is to celebrate positive environmental strategies. Demonizing highly efficient production and transportation systems through marketing efforts plays into popular misconceptions. It is imperative that consumers have the freedom to enjoy a selection of production systems and buying choices. Consumers making purchases based on environmental criteria should have all the facts. This includes sound science, rather than simple philosophical assumptions that ultimately lead to greater resource use and carbon emissions.