J. Dairy Sci. 96:6117–6126
http://dx.doi.org/10.3168/jds.2013-6662

The economic value of organic dairy farms in Vermont and Minnesota

J. K. O'Hara*[1] and R. L. Parsons†
*Food & Environment Program, Union of Concerned Scientists, Washington, DC 20006
†Department of Community Development and Applied Economics, 204A Morrill Hall, University of Vermont, Burlington 05405

ABSTRACT

This study quantifies the overall economic values of organic dairy farms in Vermont and Minnesota and estimates the economic impacts of organic dairy farm sales relative to an equivalent level of sales from conventional dairy farms in those states. This question is of interest because the development of the organic dairy sector has allowed some farms that likely would not have remained in the conventional dairy business to continue being economically viable as organic dairy farms. Thus, these sales provide an economic impact in regions when this milk is exported to nonproducing regions. Organic and conventional dairy farm financial data in Vermont and Minnesota were collected and assembled to develop dairy farm production functions by region and dairy type. These production functions were then used in state-level input-output models to calculate economic impacts. The opportunity costs of organic dairy farm production were also estimated by comparing the relative statewide economic impacts of organic and conventional dairy farms if both experience a hypothetical 5-million-dollar increase in sales. Between 2008 and 2010, Vermont's 180 organic dairy farms annually contributed $76.3 million in output (the value of an industry's production within the state), 808 jobs, $34.1 million in gross state product, and $26.3 million in labor income to Vermont's economy. Between 2009 and 2011, Minnesota's 114 organic dairy farms annually contributed $77.7 million in output, 552 jobs, $32.1 million in gross state product, and $21 million in labor income to Minnesota's economy. In Vermont, organic dairy farm sales revenue would result in greater state-wide impacts of 3% in output, 39% in labor income, 33% in gross state product, and 46% in employment relative to the impacts from an equivalent level of sales revenue to conventional dairy farms. In Minnesota, these economic impacts are 4, 9, 11, and 12% greater, respectively, for organic dairy farms relative to conventional dairy farms. This study concludes that organic dairy farms may contribute more to the local economy than average and similar-size conventional dairy farms in the Northeast and Upper Midwest and that organic dairy farm milk production supports economic development in rural communities.
Key words: organic dairy farm, economic development, input-output model

INTRODUCTION

Organic Milk Sector Background

In recent decades, dairies in the United States have become larger, fewer in number, more productive, and are increasingly operated as confinement systems. In 2009, there were 65,000 dairies in the United States, which is just 10% of the number of dairies that existed in 1970 (MacDonald et al., 2007; USDA NASS, 2010). The average herd size increased from 19 cows to 142 cows during this time period, and 31% of milk production now occurs on dairies with at least 2,000 cows (MacDonald et al., 2007; USDA NASS, 2010). Contributing factors to this trend include scale economies arising on larger dairies and inefficient operation of smaller dairies (Tauer and Mishra, 2006; Mosheim and Knox Lovell, 2009). For example, scale economies can occur on confinement dairy farms when installing capital equipment, such as a feed delivery or milking system, and housing structures (MacDonald and McBride, 2009). Although scale economies also exist on pasture-based dairies (Mayen et al., 2010), a limiting factor that does not apply to confinement dairy farms is that grazing land is constrained to be within proximity of the milking center.

As the dairy sector transformed, some consumers retained a preference for milk from traditional pasture-based dairies for a variety of reasons, including concern regarding the use of recombinant bovine somatotropin in conventional dairy production (Saucier and Parsons, accepted). The demand for this milk led to the formal development of the organic milk sector. In contrast to conventional dairy production, US Department of Agriculture regulations require that organic dairy cows obtain 30% of their food on a DM basis from pasture during the grazing season (the grazing season must be

Received February 4, 2013.
Accepted May 27, 2013.
[1]Corresponding author: johara@ucsusa.org

Table 1. Organic milk sales (2011) from cows: Top 10 states[1]

State	2011 Sales (USD)	2011 Farms (no.)	Cows (no.; December 31, 2011)	Average herd size	2011 Conventional production rank
California	127,201,275	72	32,939	457	1
Texas	120,232,218	8	26,225	3,278	6
Wisconsin	82,278,236	397	23,115	58	2
Oregon	69,140,278	43	16,256	378	18
New York	60,165,502	235	17,471	74	4
Pennsylvania	42,632,437	236	11,996	51	5
Vermont	41,702,950	180	11,813	66	17
Minnesota	33,187,033	114	9,381	82	7
Washington	25,628,798	35	6,570	188	10
Idaho	25,310,940	17	5,580	328	3
National total	764,685,911	1,823	199,737	110	

[1]Sources: USDA NASS (2012) and USDA ERS (2012a).

a minimum of 120 d), consume only certified organic feed, not receive any artificial hormones, and only receive homeopathic or natural treatments for health disorders (USDA AMS, 2010). In 2011, 1,823 organic dairy farms existed nationally with farm sales equal to $765 million (Table 1).

Most organic dairy farms were originally conventional dairy farms that transitioned to organic due to higher milk prices and greater price stability afforded through contract prices, a conversion that was relatively easy for dairies with cows already on pasture-based diets. These dairies may not have expanded to compete in the conventional milk market due to the existence of streams or valleys that constrained farm size, an inability to obtain the financing necessary to expand, or a lack of desire to operate a larger dairy if confinement systems were incompatible with their expertise or ethical values (Parsons, 2010; Saucier and Parsons, 2013).

Organic Milk Production and Economic Development

Whereas the disappearance of hundreds of thousands of small dairies has had adverse economic consequences in rural regions where they were once prominent, the development of the organic milk market helped preserve agricultural production and has contributed to the economy in regions where dairies would otherwise have ceased operations. Many organic dairy farmers in Vermont believe they would no longer be in business as a conventional dairy if they had not converted (Parsons, 2010).

Although economic impact studies have been conducted of the conventional dairy sector (Deller, 2007; Neibergs and Holland, 2007; Cabrera et al., 2008; Connecticut Department of Economic and Community Development and the Department of Agriculture, 2009), few studies have examined either the economic value of organic dairy farms or compared the relative economic impacts of conventional and organic dairy farm production systems. The objective of the study is to answer 2 specific questions that address these issues. First, the study quantifies the overall economic values of organic dairy farms within 2 states examined as case studies: Vermont and Minnesota. Second, the study compares economic impacts of organic dairy farm sales relative to an equivalent level of sales from conventional dairy farms. The study is conceptually similar to studies that evaluated the relative economic impacts of organic and conventional crop production (Mon and Holland, 2006; Swenson et al., 2007).

According to export base theory, exports can increase regional economic activity by a multiple of the initial level of sales due to the direct sales of the exporting sector and sales of non-exporting sectors in the region that sell intermediate inputs to the exporting sector (Shaffer et al., 2004). Thus, maintaining or increasing organic milk production provides net economic impacts in a region if the farms produce milk in excess of what their region's population can consume. This is a reasonable assumption in this study. If average per capita milk consumption in Vermont and Minnesota, the 2 states this study examines, is the same as the national average and residents only consume milk produced within their state, their residents would only be capable of consuming 14 and 33%, respectively, of the total milk produced in their state. This implies that the overall economic values calculated to address the first question can be interpreted as the net economic impacts of the organic sector if it is hypothesized that the dairies would no longer be in business if they had not converted.

The second question compares the net regional economic impacts if the organic dairy farms were to have remained as conventional dairy farms if they had not converted. The relative impacts of these 2 distinct dairy farm production systems depend upon the relative utilization of purchased inputs, such as feed, and primary