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Consumer Demand for Organic Milk Continues to Expand—Can the U.S. Dairy Sector Catch Up?

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The U.S. Department of Agriculture's (USDA) Market News reported widespread concern in 2014 about tightening organic dairy supplies, with supermarkets in many parts of the United States posting signs about organic milk shortages by the end of the year. U.S. food retailers and milk processors have informed customers that they can't meet demands for organic milk a number of times since the organic dairy sector gained traction with consumers over a dozen years ago. The number of certified organic milk cows in the United States increased rapidly between 2000 and 2008—to over 250,000 organic milk cows (3% of the U.S. total)—and then stagnated through 2011, according to USDA's most recent estimate (USDA Economic Research Service (ERS), 2013).

Some organic dairy producers exited the sector in 2009 when processors cut back on organic dairy contracts during the downturn in the U.S. economy. Organic milk demand rebounded quickly, but movement back into organic production is complicated by the three-year transition period required for land that is in conventional production. Expanding milk demand, along with recent drought conditions and high organic feed grain prices, especially in California, are also playing roles in the current shortages.

U.S. milk production began dispersing from its concentration in the Northeast, Upper Midwest, and Central regions—the traditional U.S. milk shed—many decades ago (Jesse, 2002). California is the top conventional dairy state, and also became the top organic dairy state in 2008 with the largest number of certified organic milk cows. Although California had nearly a quarter of the certified organic milk cows in the United States in 2011, traditional milk-shed

states still play large roles in organic dairy production.

Organic dairy pastures are beginning to disappear in California due to the devastating drought over the last several years. Organic dairy producers in California are also facing high organic feed grain prices and strong competition for their land from other high-value commodities, which could weaken organic dairy production in that state (Thomas, 2014). Even if California production declines, continuing development of organic dairy production in the traditional milk-shed states, lower feed grain prices, and diversity in the business models used for organic dairy production could support expansion of the U.S. organic dairy sector.

Consumer Base for Organic Dairy Continues to Widen

Organic dairy products are now the second leading food category—after fresh fruits and vegetables—for U.S. sales of organic food. Numerous studies have underscored consumer preferences for organically produced food because of their concerns regarding the environment, animal welfare, and their own health. Although nutritionists have not yet reached a consensus about whether organic food offers more nutrients than conventional food, there is evidence that enhanced nutrition is associated with organic dairy products. A recent meta-analysis of studies during 2009–11 comparing the nutrient quality of organic and conventional dairy products found that organic dairy products contain significantly higher protein, α -linolenic acid (ALA, C18 : 3 n-3), total omega-3 fatty acid, conjugated linoleic acid, and other nutrients. The meta analysis concluded that organic dairy farming leads to enhanced nutrient

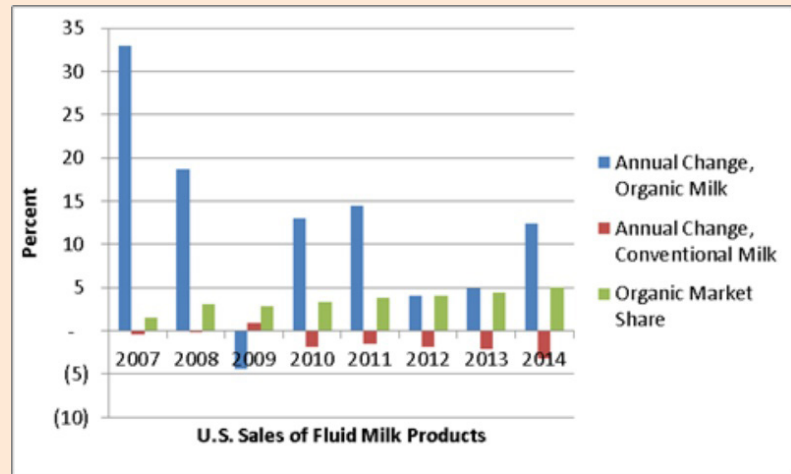
quality due to the higher fresh forage intake of organic cows (Palupil et al., 2012). A subsequent study—the first large-scale, nationwide study of fatty acids in U.S. organic and conventional milk—found that consumption of predominantly organic dairy products may enhance public health by decreasing dietary omega-6 to omega-3 ratios from today's generally unhealthy levels (Benbrook et al., 2013).

Organic products have shifted from being a lifestyle choice for a small share of consumers to being consumed at least occasionally by a majority of Americans. Similarly, mass market retailers, rather than natural food stores, are now the top sales channels for organic food. Walmart, the largest food retailer in the United States, and other supercenters that often target budget-conscious consumers, are continuing to increase their organic food offerings—both Walmart and Target announced new organic food initiatives in 2014. Also, USDA Market News recently reported that a national drugstore chain added organic milk to its cooler section in 2014.

In 1997—the year that USDA published its first proposed rule to establish national organic standards—industry estimates pegged retail sales of organic milk, yogurt, butter, cheese, and other dairy products at \$382 million in the United States (Nutrition Business Journal, 2013). Retail sales of organic dairy products more than tripled between 1997 and 2002, to \$1.2 billion, and are forecast to reach \$5.5 billion in 2014.

In contrast, overall U.S. consumption of milk, yogurt, butter, cheese and other dairy products has fallen from 339.2 pounds per person in 1970 to 275.9 pounds in 2012 (Bentley, 2014), although total milk production increased during this period due to increasing consumption of yogurt, cheese, and other manufactured

Figure 1: U.S. Market Penetration of Organic Milk, 2007-2014



Source: AMS-USDA, Federal Milk Market Order statistics.

Note: Estimates for 2014 are for the first half only.

dairy products which take more pounds of milk to produce. Most of the decline in U.S. dairy consumption is due to the substantial drop in milk consumption during this period, and Americans now consume only about 75% of the amount of dairy products recommended in the Federal dietary guidelines designed to promote health and prevent diseases. The decline in recent years is illustrated by USDA estimates of fluid milk product sales, which show negative annual growth for conventional milk for most years between 2007 and the first half of 2014 (Figure 1).

The organic market share of total fluid milk sales in the United States has increased steadily—from 1.92 percent in 2007 to nearly 5 percent in 2013—although annual growth in organic milk sales has fluctuated. The annual growth in organic milk sales peaked at 33% in 2007. Organic dairy processors had recruited new organic dairy farmers to add capacity and pushed hard for them to transition to organic production before June 2007, when an organic regulatory provision that eased whole herd conversion from conventional to organic production was set to expire.

Unfortunately, just as U.S. organic dairy production was ramping up, the downturn in the U.S. economy started in late 2007 and organic milk sales actually declined 4% between 2008 and 2009—the only time in recent years that sales of conventional milk showed positive growth (Figure 1). Consumer demand for organic milk rebounded quickly in 2010, but organic dairy processors had not renewed their contracts with many producers, and conversion back to organic was a slow process.

While the current organic milk shortage also reflects impacts from the widespread drought in 2012 and higher prices for organic feed grains in recent years, growth in the milk sector has routinely been hampered by supply shortages. USDA's ERS conducted a nationwide survey of all certified organic processors and manufacturers in 2004, and inquired about which organic products were in short supply. Among the categories which had shortages—milk, feed grains, produce, and soybeans—milk had the most critical shortage, with 26% of the processors reporting milk shortages (Greene et al., 2009).

Landmark Policy Change on Pasture in 2010

The historical focus of organic agriculture is on ecologically based farming, and the national organic standards, published by USDA in 2000, maintain this focus. USDA regulations require that organic farms be “managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity” (USDA Agricultural Marketing Service, 2000). The national standards virtually exclude the use of synthetic chemicals, antibiotics, and hormones in crop production, and prohibit the use of antibiotics and hormones in livestock production.

The USDA national organic standards also require organic livestock production systems to accommodate an animal’s natural nutritional and behavioral requirements, to ensure that dairy cows and other ruminants have access to pasture. However, regulations published in 2000 lacked specific criteria that organic certifiers could use to measure whether organic producers were complying with the law. Although organic processors used images of cows grazing in pasture to sell milk to consumers, not all the organic dairies were providing their cows with pasture. A number of organic stakeholder groups—including organic dairy associations in the Northeast and other traditional milkshed states—urged USDA to add specific enforcement criteria for the use of pasture.

In June 2010, USDA published new rules on organic pasture and required compliance within a year. The pasture rules require that:

- Animals must graze pasture during the grazing season, which must be at least 120 days per year;

- Animals must obtain a minimum of 30% dry-matter intake from grazing pasture during the grazing season;
- Producers must have a pasture management plan and manage pasture as a crop to meet the feed requirements for the grazing animals and to protect soil and water quality; and,
- Livestock are exempt from the 30% dry-matter intake requirements during the finish feeding period, not to exceed 120 days. Livestock must have access to pasture during the finishing phase.

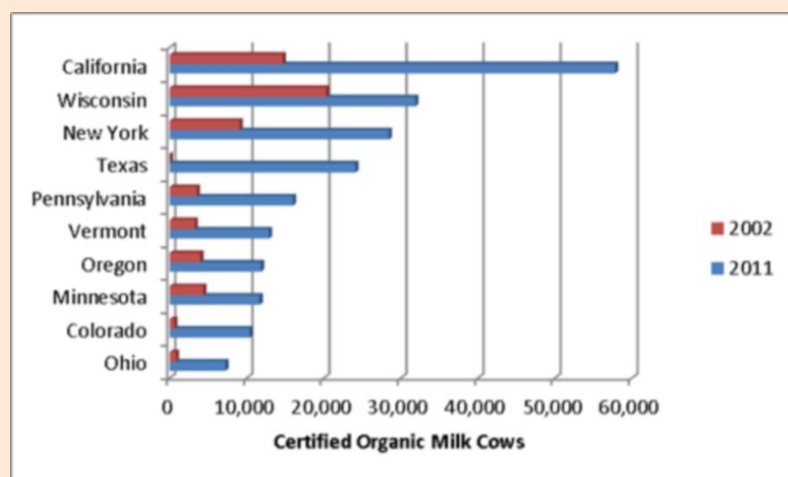
In announcing the new pasture requirements, Agriculture Secretary Tom Vilsack emphasized that it “will give consumers confidence that organic milk or cheese comes from cows raised on pasture, and organic family farmers the assurance that there is one, consistent pasture standard that applies to dairy products” (USDA Office of Communications, 2010). Small-scale dairy farmers, in particular, had been concerned that they weren’t on a level playing field with large-scale corporate dairies. USDA surveyed U.S. organic dairy farmers in 2005, prior to implementation of these requirements, and found that

pasture-based feeding was more common on smaller dairy farms and that 4% of organic dairy farms never used pasture (McBride and Greene, 2007).

Organic Dairy Production Still Regionally Diverse

Fast-growing consumer demand and large price premiums for organic milk have made the organic dairy sector a bright spot for many producers over the last dozen years. Researchers at ERS examined milk prices in the mid-2000s, using Nielsen supermarket scanner data, and found that the price for organic milk over conventional milk ranged from 72% above the conventional price in Western states to 126% above the conventional price in the East (Greene et al., 2009). The national average price premium for organic milk was 98% above the conventional price in 2004. Organic milk prices in 2006 varied substantially by fat content, container size, and branding, with organic price premiums for a half-gallon of milk ranging as high as 109% for name-brand organic milk above store-brand conventional milk. In contrast with conventional milk prices, organic milk prices were estimated to increase as the fat content declined.

Figure 2: Top Ten Organic Dairy States Reflect Regional Diversity



Source: USDA, Economic Research Service, based on information from USDA-accredited State and private organic certifiers.

U.S. organic dairy production had just started two decades ago when USDA reported that there were 6,000 certified organic dairy cows nationwide. Over the period between 2002 and 2011—USDA's most recent estimate—the United States expanded from 67,000 organic milk cows to 255,000 organic milk cows, approximately 3% of total dairy cows. USDA's Census of Agriculture reported that organic dairy farms accounted for 5% of total U.S. dairy farms in 2012. Most of this growth took place prior to 2008, when the sector contracted with the downturn in the economy.

California was the top state for both organic and conventional dairy production in 2011. Wisconsin and California traded places between 2002 and 2011 as the top state with the most organic dairy cows (Figure 2). The top 10 states with the most organic dairy cows were still regionally diverse in 2011, and all had substantial increases in the number of organic dairy cows during that period.

Various organic dairy business models are in play in the United States. While the majority of organic dairy farms are small-scale family farms, the United States also has large-scale corporate dairy farms as well. The challenges involved in meeting USDA's strong pasture standard implemented in 2011 may dampen the movement to large-scale dairy farms seen in conventional dairy production.

The three largest organic milk processors in the United States—Organic Valley, Horizon, and Aurora—illustrate different approaches to organic dairy production. Organic Valley is a farmer-owned cooperative, with 1,779 participating farm families in 2014 that sets member-determined pay prices and provides equity ownership in a leading national food brand. Organic Valley indicates that “the central mission of our cooperative is to support rural

communities by protecting the health of the family farm—working toward both economic and environmental sustainability.”

Aurora Organic Dairy owns and operates 5 organic dairy farms in Colorado and Texas, with a total herd of more than 22,000 organic dairy cows, and an organic dairy processing plant in Platteville, Colo. Aurora Organic Dairy is the leading producer and processor of store-brand organic milk and butter for U.S. retailers, and develops initiatives “to be a responsible corporate citizen and to be good stewards of our natural resources.”

Horizon Organic began processing organic milk 20 years ago and currently sources milk from nearly 700 certified organic family farms in 21 states. Horizon Organic indicates that “our family farmer partners supply 99% of our milk. Horizon Organic also owns and operates a farm in Maryland that supplies 1% of our milk.” Horizon Organic also owned large dairy farms in Colorado and Idaho until recently.

Organic Dairies are Much Different than Conventional Dairies

USDA surveyed organic milk producers in 2005 and again in 2010 as part of USDA's annual survey of farm and ranch operators the Agricultural Resource Management Survey (ARMS). These surveys sample organic dairy producers at much higher rates than their occurrence in the population in order to develop sufficient data for a comparison of practices and costs on conventional and organic farms. Organic milk producers usually begin as operators of conventional dairies before undergoing what can be a challenging and costly transition process. Conventional dairy producers need to adjust their approach to dairy herd management during the transition to comply with USDA organic standards.

ERS researchers compared organic and conventional dairy production in 2005 and 2010. The primary difference in the production practices used by organic versus conventional dairies is in the feeding system (McBride and Greene, 2007). In 2005, more than 60% of organic operations reported using pasture-based feeding that provided more than half of seasonal forage (during the grazing months) from pasture, compared to just 18% for other operations. The growth hormone recombinant bovine somatotropin (rbST) is not available to organic producers, but was used by 17% of conventional operations, who also were much more likely to utilize regular veterinary services and a nutritionist. The use of these practices likely contributed to the significantly higher production per cow on conventional versus organic operations. Organic operations averaged about 13,600 pounds of milk per cow in 2005, versus nearly 19,000 pounds on conventional operations.

According to the 2005 ERS analysis of national dairy survey data, total economic costs were significantly higher for organic dairy and soybean operations than for conventional operations. With an average price premium of \$6.69 per hundredweight (cwt., which is 100 pounds of milk) for organic milk, organic milk producers covered most of the additional operating costs of organic production in 2005. The value of production minus operating costs was higher for organic producers than for conventional producers in 2005 and 2010, for all size groups (Table 1). However, the premium didn't cover the total costs of organic producers, which includes the opportunity cost of unpaid labor, in either year for any size group. The value of production minus total economic costs was also negative for most size groups in conventional production. Only the largest size groups of conventional producers had positive returns above total economic costs.

Table 1: U.S. Milk Production Costs and Returns per Hundredweight Sold, by Size and Type of Operation, 2005 and 2010

Item	Year	Organic						
		Fewer than 50 Cows	50-99 Cows	100-199 Cows	200 or more Cows	500-999 Cows	1,000 Cows or more	All Sizes
		\$/Hundredweight Sold						
Value of Production, Minus Operating Costs ¹	2010	8.08	9.16	7.82	10.56	N/A	N/A	9.18
Value of Production, Minus Operating Costs ¹	2005	8.72	8.41	7.65	7.19	N/A	N/A	7.92
Value of Production, Minus Total Costs ²	2010	-19.38	-11.4	-7.61	-0.43	N/A	N/A	-8.42
Value of Production, Minus Total Costs ²	2005	-12.91	-8.45	-5.63	-1.2	N/A	N/A	-6.19
Percent of Farms	2010	49	34	12	5	N/A	N/A	--
Percent of Farms	2005	45	42	8	5	N/A	N/A	--
Percent of Milk Production	2010	19	27	20	34	N/A	N/A	--
Percent of milk production	2005	18	33	12	37	N/A	N/A	--
		Conventional						
Item	Year	Fewer than 50 Cows	50-99 Cows	100-199 Cows	200-499 Cows	500-999 Cows	1,000 Cows or more	All Sizes
		\$/Hundredweight Sold						
Value of Production, Minus Operating Costs ¹	2010	2.52	3.64	4.16	3.94	5.29	5.63	4.82
Value of Production, Minus Operating Costs ¹	2005	5.57	4.62	5.69	5.94	5.49	6.8	5.93
Value of Production, Minus Total Costs ²	2010	-20.03	-11.24	-5.72	-3.61	-0.04	1.78	-2.58
Value of Production, Minus Total Costs ²	2005	-12.22	-7.94	-3.62	-0.67	0.49	2.95	-1.39
Percent of Farms	2010	29	36	19	9	4	3	--
Percent of Farms	2005	31	35	19	9	3	2	--
Percent of Milk Production	2010	4	11	13	14	16	41	--
Percent of milk production	2005	5	14	16	18	15	32	--

N/A = not applicable.

¹Operating costs include feed, veterinary services, medicine, bedding, fuel, electricity, repairs, certification, and marketing services.

²Total costs include operating costs, plus allocated overhead (hired labor, opportunity cost of unpaid labor, capital recovery of machinery and equipment, opportunity cost of land (rental rate), taxes, insurance, and general farm overhead).

Notes: Coefficients of variation (CVs) were checked for the category totals: gross value of production, and feed, operating, allocated overhead, and total costs. All CVs were less than 25 percent.

Source: USDA-Economic Research Service, based on data from USDA Agricultural Resources Management Surveys in 2005 and 2010.

The trend toward larger farms in conventional dairy production was evident in the five years between the two USDA organic surveys. The largest size group for conventional production—1,000 cows or more—represented 2% of conventional dairy farms and had 32% of total milk production in 2005 (Table 1). In 2010, the largest group contained 3% of conventional farms in 2010 representing 41% of total production. Although the larger size groups in the organic dairy sector had higher economic returns, a trend toward concentration of production was not as evident. The largest size group for organic production—200 or more cows—represented 5% of the dairy farms in 2005 and accounted for 37% of total production. The largest organic size group still represented 5% of the dairy farms in 2010, but

accounted for a slightly smaller percentage of total production—34%—in 2010.

The Future of Organic Milk Production

As is always the case, the future of organic milk production is largely in the hands of the consumer. Without growing demand, production will not expand. Consumer demand for organic milk expanded rapidly for several decades, jumping from a niche market in natural foods stores to shelf-space allocations in most mainstream food stores. In recent years, even the large retailers, like Walmart and Target, have been responsive to consumer demand for organic milk. While U.S. sales of organic milk have dropped from the double-digit annual increases shown until the general

economy experienced a recession, annual sales growth is still in the high single digits. The growing scientific consensus on the nutritional benefits of organic milk, and wider availability in mainstream markets, could help push consumer demand higher.

Another bright note for organic dairy producers is that a recent study of U.S. consumer demand for milk shows that organic milk demand is price elastic, and that the substitution pattern between organic and conventional milk with differing fat content shows greater movement toward organic milk than back to conventional milk (Li, Peterson, and Xia, 2012). With stricter pasture rules raising costs in the organic dairy sector, higher producer prices for organic milk are likely needed to attract more dairy farmers into this sector. Even prior to USDA enforcement of stricter

pasture rules in 2011, ERS analysis of the organic dairy sector in 2005 and 2010 found that none of the size groups covered total economic costs in either year. The discrepancy was largest for the smaller farms, partly because they had higher labor costs and lower yields from using more pasture for feed.

Even with stronger USDA pasture requirements, coexistence of organic producers with very different business models is likely to persist in the organic dairy sector to some degree. Some analysts argue that organic sector expansion that includes large-scale farms with lower costs can make organic food—which has less pesticide residue and other positive attributes—more affordable for low-income consumers (Johnson, 2013). USDA's organic regulatory program plays a key role in setting and enforcing strict standards, and ensuring that all producers demonstrate compliance with the rules. These rules provide a framework for future innovations in organic dairy production systems. In particular, research is needed on ways to lower the costs and improve the quality of pasture-based dairy systems in the challenging climates and conditions across the country.

For More Information

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