

# OHIO'S DAIRY INDUSTRY:

## THE GEOGRAPHY AND IMPACT OF A KEY SECTOR

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### 1.0 INTRODUCTION

This report examines the current state of the dairy industry in Ohio, including the relatively recent phenomenon of concentrated animal feeding operations (CAFOs). Ohio ranks eleventh in the nation for milk production, which, not only contributes significantly to the agricultural sector, but to Ohio's economy. Most Ohio dairies are clustered in the northeast and northwest part of the state. However, large dairies are mainly clustered in the northwest and a few are scattered around Central Ohio, perhaps in avoidance of large population centers. As this dynamic industry continues to contribute significant income to the state's economy, having knowledge of the economics of the dairy industry, its geography and its regulatory environment, helps policy makers and other stakeholders make more informed decisions.

Below are just a few highlights from this report. The remainder of the report addresses the significance of the Ohio dairy sector within the state and across the nation, the geography of dairy production in the state, the status of CAFOs, and the regulatory environment.

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### 1.1 REPORT HIGHLIGHTS

- As Ohio's leading industry, the contribution of agriculture to the overall State economy is significant.
- Dairy is a very important subsector, according to one ranking it accounts for one third of the State's total agricultural income.
- Ohio has a relatively high number of dairy operations, ranking fifth in the nation with 4400.
- Further, Ohio ranks high on a number of other indicators on dairy. Ohio ranks first in Swiss cheese, eighth in overall cheese (excluding cottage cheese), fifth in manufactured dairy products, sixth in milk sherbet, tenth in ice cream and cottage cheese, and eleventh in milk production.
- Since the 1970s, the structure of the U.S. dairy industry has changed dramatically, with farms becoming larger and more specialized.
- Ohio's dairy structure is changing slower compared to that of the nation as a whole, but the directional change is similar in Ohio to that of the rest of the nation becoming larger and producing more milk per cow.
- Dairies are classified according to herd size with the largest being classified as Concentrated Animal Feeding Operations(CAFOs).
- In the early 1970s the U S Environmental Protection Agency and the Ohio Environmental Protection Agency began a permitting process for CAFOs. In 2000, the State of Ohio's permitting program for CAFOs was transferred by the Ohio General Assembly to the Ohio

Department of Agriculture (ODA). However, dairy farms that discharge or plan to discharge must obtain a federal permit – a National Pollution Discharge Elimination System Permit (NPDES) – from the Ohio EPA until the U.S. EPA approves transferring the federal program to ODA.

- This type of permitting is only one piece of the regulatory environment for Ohio dairies. All Ohio dairies are subject to voluntary participation in the pollution prevention programs implemented by a myriad of Federal and State agencies.
- As of December 2007, 41,517 of Ohio's estimated 276,000 cows were housed in permitted dairies (CAFEEOs).
- Opposition to larger dairy farms – as well as larger livestock farms in general, some of which are not large enough to be classified as a CAFO – has resulted in the formation of local advocacy groups that oppose the siting of such farms.
- Analysis illustrates that only 0.09% of Ohioans live within one mile of a permitted dairy (greater than 699 head) and only 1.47% within five miles of a permitted dairy. When examining all large dairies (greater than 599 head), only 2.67% of Ohioans live within five miles of any large dairy (permitted and non-permitted). In addition, all large dairies are, on average, 20.9 miles away from the edge of the closest major urbanized area.
- Traditionally, dairy farms are concentrated in Northeastern and Northwestern Ohio.
- However, large dairies are clustered in Northwestern Ohio and widely dispersed in Central Ohio.
- Many owners of these large dairies are foreign-born with Dutch ancestry. Of the 31 permitted and pending permitted large dairies or CAFEEOs<sup>1</sup>, 24 have foreign-born owners with Dutch ancestry. Of the six large, non-permitted dairies (600-699 head), all have foreign-born owners with Dutch ancestry. A driving force behind the siting of these dairies is the Vreba-Hoff Dairy Development firm.
- The industry continues to move into a bi-model or bifurcated structure – with larger, newer farms concentrating in the Northwest and Central Ohio (many of these farmers are foreign born with Dutch ancestry) and smaller, grazing-oriented farms in the Holmes, Wayne, Richland, Knox, Geauga, Ashtabula and Ashland County areas (many of these farmers are Mennonite or Amish).
- For Ohio, the outlook for the dairy industry is promising. While the dairy industry is not static, meaning that structural change and changes in markets will occur, the State does have a strong dairy infrastructure, particularly in the northern portion of the State.
- For smaller farmers, new emerging organic and locally-branded markets are opening. But with these emerging markets, come new industry debates, such as proper labeling of milk and selling of raw milk from farm units.
- Debates on large farms abound, particularly regarding the role, or lack thereof, of local governments in the permitting (and therefore, siting) process. One response of local governments to its role in the siting of large farms is to attempt to affect dairy locations through a local zoning ordinance and the building permit process. In May 2008 these issue were addressed by the courts and local governments cannot use zoning and building permits to regulation the location of large farms.

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<sup>1</sup> Data is current through December 2007.

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## 1.2 CONTEXT: AGRICULTURAL CHANGE IN OHIO AND NATIONWIDE

Ohio has over 14.5 million acres, or 56% of total acreage, dedicated to farming, compared to only 41% of the acres farmed nationwide (based on total acreage figures provided by Northeast-Midwest Institute 2006; ODA and USDA NASS 2007). In Ohio, the food and agricultural cluster accounted for 11% of Ohio's economic output and 8% of the gross state product in 2006 (Sporleder 2008).

Ohio's agricultural industry is competitive nationally. Ohio's two top crops, corn and soybeans, rank eighth and sixth in production, respectively (ODA and USDA NASS 2007). While the greatest amount of biggest crops in Ohio are corn and soybeans, Ohio also has a diverse array of important crops and livestock. These over 200 crops include winter wheat, hay, tomatoes for processing, apples, grapes, poinsettias, sweet corn, mushrooms, and maple syrup. Ohio leads the U.S. in production of Swiss cheese, ranks third in tomatoes, fifth in sweet corn, fifth in flowers and second in egg production.

The resources are excellent in Ohio for production of crops and food animals. Ohio is one of only five states in the country with over half of the land base in prime soils. However, Ohio ranks second in the nation for loss of prime farmland (behind Texas) (USDA NRI 2000).

Aside from losses in acreage, the structure of Ohio's agriculture has been changing. For example, since 1949, the generalized U.S. farm structure has been composed of larger farms, grossing more dollars, with more complex management. Overall, the number of farms has decreased, but output has increased, and production has become more concentrated and specialized. Farmers are older, work off-farm more and rent more land than previous generations of farmers (Gardner 2002; Hart 2003). These changes in the structure of agriculture have fundamentally altered the agricultural landscape. Ohio follows the nation in these respects, although the average size of Ohio farms remains less than half the average size in the U.S., with Ohio's average farm size at 189 acres compared with 443 acres nationwide and therefore the corresponding value of products sold from the farm is less (ODA and USDA NASS 2007). Average farmer age is slightly less and the ratio of owner operators is slightly greater as compared with the nation.

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## 1.3 CONTEXT: OHIO'S DAIRY INDUSTRY COMPARED NATIONWIDE

Of the 76,000 farms in Ohio, almost 6% (4400) have milk cows (ODA and USDA NASS 2007). The majority is small, with fewer than 200 cows; however, dairy farm sizes are growing. The overall number of farms with milk cows has decreased by 35% over the past 10 years, while the largest of these farms (those with greater than 500 cows) increased by 500% in that same time period (see Table 1), pointing to relatively rapid industry concentration.

Year	Farms with milk cows	Farms with <100 cows	Farms with <200 cows	Farms with 200+ cows	Farms with 500 + cows
1995	6800	6300	6700	100	-
1996	6500	6100	6400	100	-
1997	6000	5300	5880	120	10
1998	5900	5180	5780	120	10
1999	5700	4980	5580	120	10

2000	5500	4770	5370	130	15
2001	5200	4510	5060	140	20
2002	5000	4360	4840	160	25
2003	4700	4060	4530	170	30
2004	4500	3800	4325	175	35
2005	4400	3700	4200	200	50
2006	4400	3700	4190	210	50

Source: Data are compiled from Ohio Department of Agriculture Annual Report and Statistics, years 1998-2006, and from The U.S. Department of Agriculture's National Agriculture Statistical Service Agricultural Census 2002.

**Table 1. Number and Size of Milk Cow Operations, Ohio 1995-2006**

These changes in dairy farm number and size are consistent with general structural changes brought about by agricultural industrialization. In recent decades, there has been a general decrease in farm numbers, accompanied by increasing farm size, across animal commodities (Albrecht 1997; Welsh 1996; Reynnells 2004). Nationwide, from 1982 to 2002, the number of farms with milk cows decreased by 67%, beef cattle decreased by 17%, and hogs by 76%. In this same period, animal inventories experienced considerably slower change: inventories of dairy cows decreased by 25%, beef decreased by only 2.5%, and hogs increased by 9%. The broiler business has experienced agricultural restructuring in a slightly different way than the large-animal industries, with a 6% increase in the number of broiler farms and a 150% increase in broiler chicken inventories (see Table 2).

	1982	1987	1992	1997	2002*	% change 1982-2002
<b>Milk cows</b>						
# farms	277,762	202,068	155,339	116,874	91,989	-67
# head	10,849,890	10,084,697	9,491,818	9,095,439	9,103,959	-25
<b>Beef</b>						
# farms	957,698	841,778	804,595	804,595	796,436	-17
# head	34,202,607	31,652,593	34,066,615	34,066,615	33,398,271	-2.5
<b>Hogs</b>						
# farms	329,833	243,398	191,347	109,754	78,895	-76
# head	55,366,205	52,271,120	57,563,118	61,206,236	60,405,103	+9
<b>Broilers<sup>+</sup></b>						
# farms	30,100	27,645	23,949	23,937	32,006	+6
# head	3,516,622,889	4,361,975,630	5,428,589,485	6,741,927,110	8,500,313,357	+150

Source: The U.S. Department of Agriculture's National Agriculture Statistical Service Agricultural Census Historical Highlights: 2002 and Earlier Census Years (USDA NASS 2007)

\* Adjusted for incomplete data, other years not adjusted for incomplete/missing data. Actual percentage differs marginally, due inflation caused by the correction of the 2002 data used in calculating percent change.

+ Statistics on layers not available

**Table 2. Nationwide Change in Farm Numbers and Size across Select Animal Commodities, 1982-2002**

Within the U.S., Ohio has a relatively high number of dairy operations, ranking fifth in the nation with 4400. In terms of number of milk cows, Ohio ranks tenth, with 276,000. This reflects a 2% increase over the previous year's inventory of 266,000 (ODA and USDA NASS 2007). Similar to

livestock farms across the nation, rapid industry concentration is evident in a comparison of average dairy farm sizes over just the last eight years, though not as dramatic as the national average. Since 1998, the average dairy farm size in the U.S. has increased by 57%, while the average Ohio dairy farm size has increased by 41%. While Ohio's dairy structure is changing more slowly compared to the nation as a whole, Ohio is still having similar directional changes as the rest of the nation (Table 3). This trend reflects the history of dairy industrialization, which took off on the west coast in the 1920s, at the crux of the more widespread agricultural transition away from smaller and toward larger farms (Gilbert and Wehr 2003).

The shift toward industrialized dairy production systems has spread more slowly to the Midwest and has only become obvious in recent years. Although large dairy farms have existed in Ohio for a number of years, it is only within the last ten years or so that larger-scale dairy farms have proliferated, and although the size of Ohio dairy farms is growing, most operations are still small. (See Table 1.)

Average Farm Size (number of milk cows)	1998	2000	2002	2004	2006	% Change 1998 to 2006
Ohio	44	45	50	55	62	+ 41%
U.S.	74	83	93	108	116	+ 57%

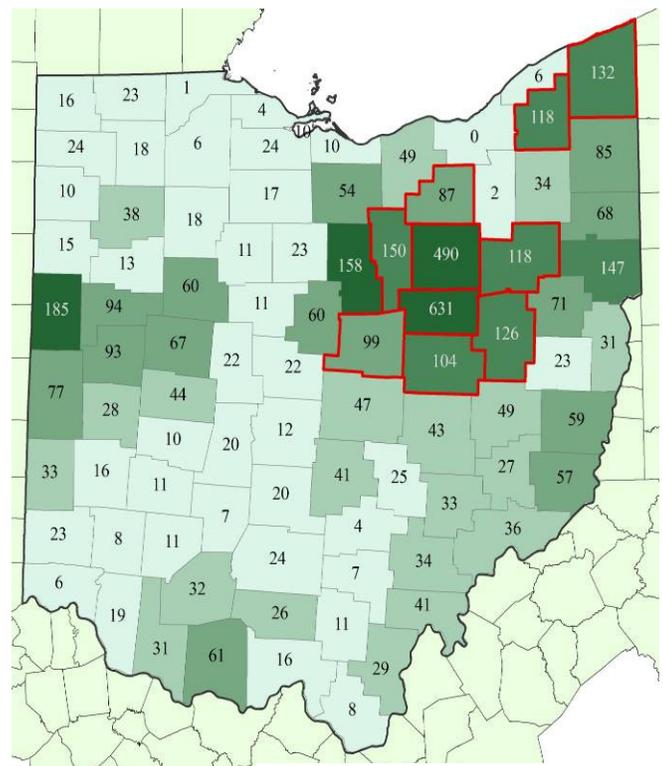
Source: Data are compiled from Ohio Department of Agriculture Annual Report and Statistics 1998-2006

**Table 3: Average Dairy Farm Size: Ohio and U.S., 1998 to 2006**

Changes in the structures of dairies have also resulted in changes of the business organization. Smaller dairy farms tend to grow more of their own feed and raise their own heifers. Labor on large farms is usually hired and on small farms the operator and the operator's family are usually relied upon for labor. Finally, large farms tend to confine milk cows and small farms tend to graze their cows on pasture (MacDonald et al. 2007).

## 2. OHIO GEOGRAPHY PART 1: WHERE ARE THE DAIRIES?

Although dairy farms are throughout Ohio, they tend to be located in the northern and western parts of the State (Figure 1; see Appendix A for a map of Ohio counties). Large numbers of dairy farms in particular are concentrated in the northeast, partly because of the agroecology of the rolling hills and partly because of cultural reasons, such as the Amish (Cross, 2006). (See the red highlighted counties in Figure 1.) In the west, perhaps due to less human

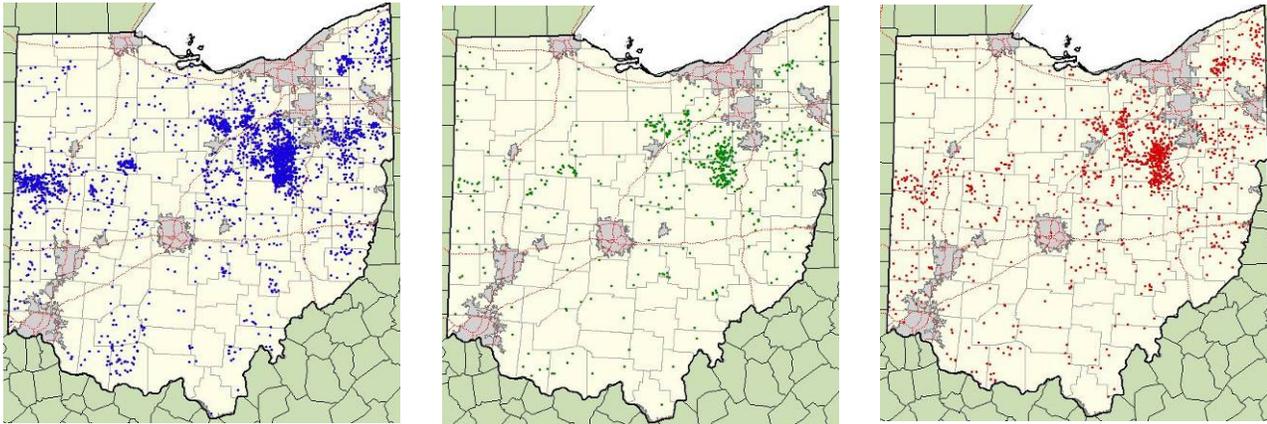


Source: Milk cow data are from Ohio Department of Agriculture Annual Report and Statistics 2006; Amish data from Donnermeyer and Cooksey, 2007

**Figure 1. Number of Farms with Milk Cows, by County, 2006 and High Density Amish Counties, 2006** (darker colors indicate greater number of milk cows in the county)

population density and more abundant land, there are also concentrations of dairy farms.

While the majority of the farms do concentrate in these general areas, the production units in this industry are quite dynamic. For instance, in the period from 1999 to 2003, Ohio sustained 2777 dairy farms, lost 1221 farms, and gained 590 new farms (see Figure 2). This rate of loss appears to have slowed since 2003, as indicated by the relatively stable farm numbers reported in Table 1.



Source: Data from Garabis, Elena M. 2005

Figures 2 a, b and c: Dairies Persisting (blue), Entering (green), and Exiting (red), 1999 to 2003

### 3. REGULATION AND PERMITTING

The regulation of Ohio farms is based primarily on voluntary participation in pollution prevention programs implemented by Federal, State and local agencies, such as soil and water conservation districts (SWCD). All farms in Ohio are subject to the authority of the Ohio Department of Agriculture (ODA), the Ohio Environmental Protection Agency (OEPA), the Ohio Department of Natural Resources (ODNR), and the U.S. Department of Agriculture (USDA). However, only a small number of farms are directly regulated. About half of Ohio’s 76,000 farms house livestock, 168 of these are directly regulated by the ODA. Just 31 of these are dairy farms (see Figure 3). Eleven livestock farms are awaiting permits, eight of which are dairy farms.

This section covers dairy regulations and permitting (in general), followed by a more specific discussion of large dairy farm permitting, ending with a description of the regulations for milk producers and handlers.

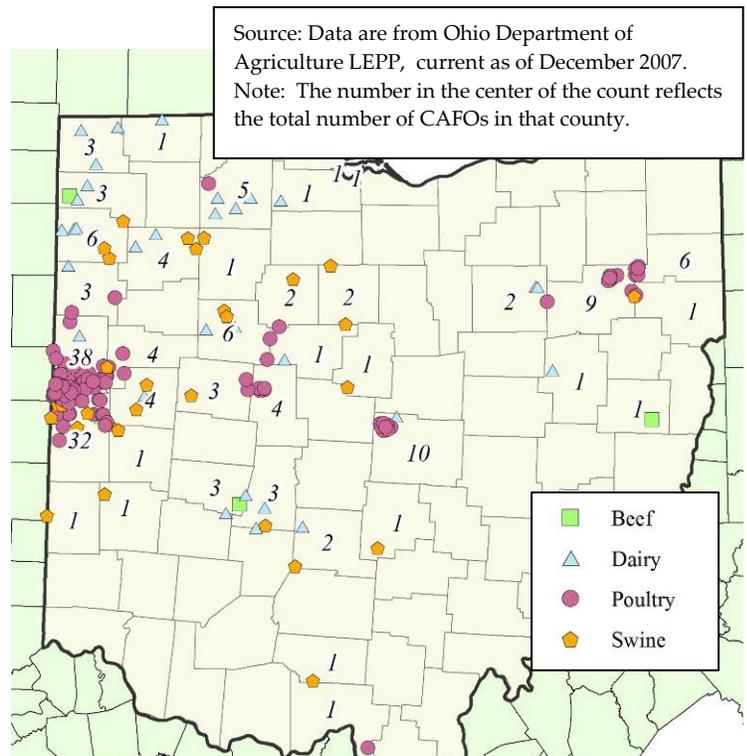


Figure 3: Ohio Permitted Large Farms by Species 2007

### 3.1 DAIRY REGULATION AND PERMITTING

As noted previously, the overall size of farms is rapidly growing. Farms now have greater livestock inventories than ever before, and are becoming more specialized. This approach to maximize efficiencies and gain greater control over animals through confinement production systems, led to new farm classifications based on the number of animals a farm contains and management practices. Farms that have (concentrate/confine) a specific number of farm animals are considered CAFOs (Table 4).

Direct regulation of CAFOs resulted from the 1972 Clean Water Act, which considered feedlots to be point source polluters. After CAFOs were defined in 1976, these units were considered subject to the National Pollutant Discharge Elimination System (NPDES). More specific information on this topic is in Section 3.2.

By standards set forth in the Clean Water Act, amended in 2002, a dairy is considered a large CAFO if it confines 700 or more mature cows. A dairy is considered a medium CAFO if it confines 200 to 699 cows, and has either pipes or ditches carrying water to surface water or animals that come in contact with surface water. Small CAFOs are those dairy farms with less than 200 cows but have been deemed a significant contributor of environmental pollutants by a regulatory agency.

**Size Thresholds (number of animals)**

Type of Operation	Large CAFO	Medium CAFO	Small CAFO
Mature dairy cattle	700 or more	200-699	Less than 200
Cattle or cow/calf pairs	1000 or more	300-999	Less than 300
Veal calves	1000 or more	300-999	Less than 300
Swine (over 55 lbs)	2500 or more	750-2499	Less than 750
Swine (under 55 lbs)	10,000 or more	3000-9,999	Less than 3,000
Horses	500 or more	150-499	Less than 150
Sheep or lambs	10,000 or more	3000-9,999	Less than 3,000
Turkeys	55,000 or more	16,500-54,999	Less than 16,500
Laying or broiler hens	30,000 or more	9,000-29,999	Less than 9,000
Chickens other than laying hens (with liquid manure handling system)	125, 000 or more	37,500-124,999	Less than 37,500
Laying hens	82,000 or more	25,000-81,999	Less than 25,000
Ducks	30,000 or more	10,000-29,999	Less than 10,000
Ducks (with liquid manure handling system)	5,000 or more	1,500-4,999	Less than 1500

Source: USEPA "Regulatory Definitions of Large CAFOs, Medium CAFOs, and Small CAFOs," [http://www.epa.gov/npdes/pubs/sector\\_table.pdf](http://www.epa.gov/npdes/pubs/sector_table.pdf), 2006

**Table 4: CAFO Designations**

Most farms are considered sources of non-point source pollution and are self-regulated through a variety of voluntary pollution prevention programs provided by the ODNR, USDA, Ohio EPA, and county SWCDs. Non-point source pollution occurs when water picks up contaminants, such as manure, chemicals, pesticides, sediment, etc. and carries them to common bodies of water, such as lakes, streams, or creeks (ODNR DSWC et al. 2003). These programs provide technical and financial assistance to farmers using Best Management Practices (BMPs). A major component of BMPs is a Comprehensive Nutrition Management Plan (CNMP), which involves manure and wastewater management and storage, nutrition management, and other farm management practices considered effective in preventing non-point source pollution. Some of these programs include the Agricultural Pollution Abatement Cost-Share Program (APAP), the USDA-Natural Resources Conservation Services Environmental Quality Incentives Program (USDA-NRCS EQIP), and the Water Pollution Control Loan Fund (WPCLF).

The APAP provides financial assistance to producers to implement BMPs and is administered through the ODNR Division of Soil and Water Conservation and county SWCDs, who provide the technical and financial assistance to farms within their prospective counties. Each SWCD consists of locally elected representatives who determine their county's resources and needs. Similarly, the USDA-NRCS EQIP program provides technical, cost-share, and financial incentives to aid producers to make environmental and conservation improvements on their farms.

The WPCLF is administered by the Ohio EPA's Division of Environmental and Financial Assistance (DEFA) and the Ohio Water Development Authority (OWDA) and awards low-interest loans to non-point source pollution facilities using BMPs and conservation practices. CAFOs are not eligible for this program (ODNR DSWC et al. 2003).

While participation in these programs is voluntary, violations may result in sanctions against farmers if they are found to be originators of pollution, whether or not they are program participants. Many farmers volunteer in pollution prevention programs to help build relationships with their non-farm neighbors and to help alleviate some of the costs of BMPs (ODNR DSWC et al. 2003).

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### 3.2 REGULATION OF LARGE DAIRIES

CAFOs are regulated through the Ohio Department of Agriculture via Ohio's state permitting program. This regulatory program precludes any local regulation of permitted facilities (see ORC 903.25). Additionally, if the CAFO has a discharge or plans to discharge, they are regulated through the Ohio EPA via the NPDES permitting program. These units are considered sources of point-source pollution and are therefore required to go through a special permitting process. Whether new or simply expanding in size, all dairy farms with 700 or more cows are required to file for a permit to install (PTI) and a permit to operate (PTO) with ODA. The PTI gives an operation approval to build. The PTO regulates operations with plans for manure management, insect and rodent control, mortality management, and emergency response, as set forth by the ODA's Livestock Environmental Permitting Program (LEPP) and must be renewed every five years. The PTO requires farmers to keep detailed records of farm activities, particularly as they pertain to manure handling and pest control (ODA LEPP 2006). Farms with less than 700 cows are not required to file for the permits unless they have been found to have a history of non-compliance with pollution prevention standards specified by the ODNR (ODNR DSWC et al. 2003).

Permitted facilities undergo regular inspections by the ODA to ensure compliance with BMPs and environmental assurance. Failure to comply with the permitting process, or violations of the standards set forth by the conditions of the permits is grounds for disciplinary action (ODNR DSCW et al. 2003).

In addition to a PTI and a PTO, dairy farms that discharge or plan to discharge must also obtain a NPDES permit from the Ohio EPA. Through legislation signed into law in December 2000, the NPDES permitting and compliance program was to be administered by ODA's Livestock Environmental Permitting Program. However, the NPDES program cannot be transferred to ODA until the U.S. EPA approves its delegation application, currently under review.

Farms with ten times the number of animals required for CAFO designation must also obtain a certified livestock manager certificate, which consists of a battery of environmental and BMPs training sessions. The license must be renewed every year with ten hours of supplemental training.

All farms are subject to the same authority as the general public in terms of violating pollution and nuisance laws as designated by the ODNR and the Ohio Revised Code. These laws prohibit anyone from discharging pollutants into Ohio's public waterways, killing wildlife, or interfering with one's reasonable enjoyment of their property (ODNR DSWC et al. 2003).

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### **3.3 REGULATIONS FOR MILK PRODUCERS AND HANDLERS**

Regardless of size, all dairy farms producing milk for public consumption are required to be licensed. To produce milk for public consumption, any person who produces or controls the production of cow or dairy goat milk for sale must be licensed by the state to sell milk. As of March 2008, 3,365 farms were licensed to produce and market Grade A (fluid milk) or Grade B (manufacturing quality) milk in Ohio (ODA, Dairy Division 2008). Grade A milk producers are inspected every six months and Grade B producers are inspected every 12 months to ensure they are meeting minimum requirements for general sanitary conditions, cleanliness, pest control, and water quality (OSU 2003).

Operations in all phases of the dairy production process must be state licensed. The license, administered by ODA, is to operate or control any facility where milk is handled, collected, processed, stored, pasteurized, bottled, or prepared for distribution. Likewise, milk haulers (those who transport raw milk to processors), milk dealers (those who receive milk for the purpose of selling, processing, or distributing milk), and milk weighers, samplers, or testers (those who assess volume, weight, or composition of milk at a dairy farm or producer) must also obtain licenses. All licenses are valid unless revoked, cancelled, or suspended (ODA, Dairy Division 2008).

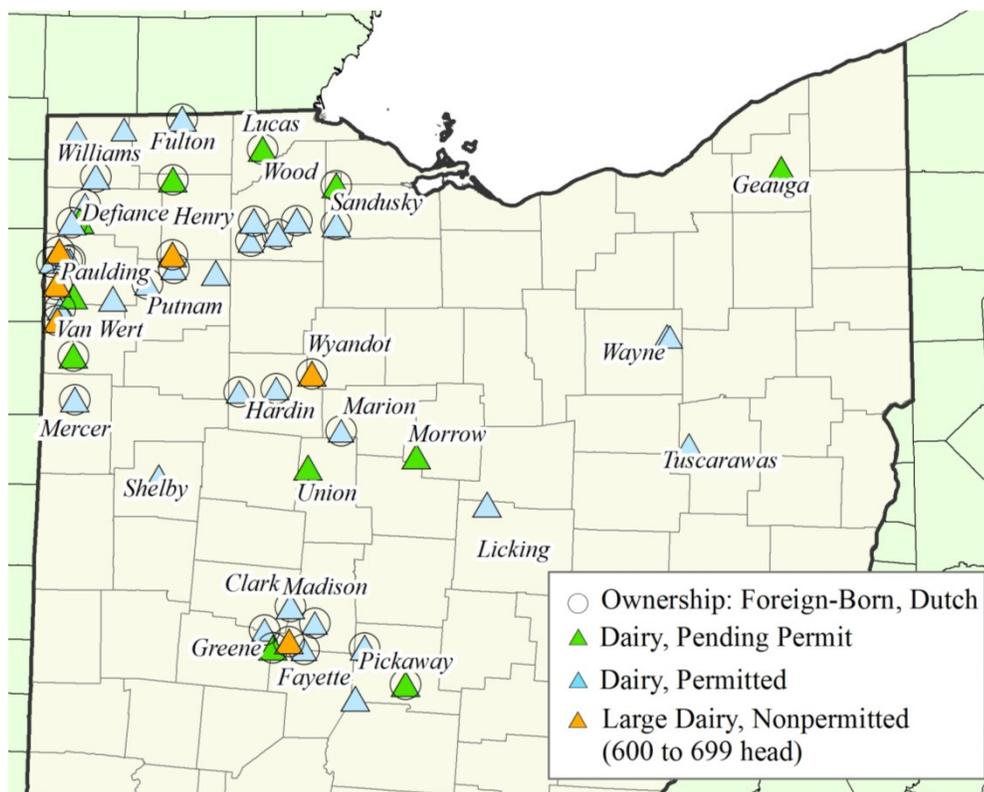
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## **4. OHIO GEOGRAPHY PART 2: WHERE ARE THE LARGE, PERMITTED DAIRIES?**

Farms now house greater milk cow inventories than in the past (see Table 3). Although average dairy size is still relatively small, there has been a proliferation of large-scale dairy farms throughout the U.S. Northern Ohio has seen an influx of these large dairies in the past few years. As of December 2007, permitted dairies housed 41,517 of Ohio's estimated 276,000 cows. This section illustrates the geography of these large dairies. Figure 4 depicts their number, distribution and concentration throughout the state.

Many of the new large dairies coming into Ohio are owned by foreign-born farmers of Dutch ancestry (see Figure 4). At the end of 2007, 24 of the 31 of the permitted and pending dairy farms (700 head and over), are Dutch. In Ohio, there are six large non-permitted (600-699 head). All are owned by foreign-born farmers of Dutch ancestry. Ohio's rich landscape, abundant land, and regulatory processes are attractive to foreign interests. Further, Vreba-Hoff Dairy Development aids Dutch dairy farmers who want to relocate to the U.S. in finding sites in states like Ohio. Vreba-Hoff helps farmers obtain visas, purchase land, and apply for dairy permits. Although the idea of Dutch dairies is new to Ohio, dairy farmers of Dutch ancestry have long had a connection to the U.S. and have played a significant role in the development of modern dairy production methods. Farmers of Dutch ancestry have been dairy farming in the U.S. as early as the 1920s, when they brought their cultural and technological assets to the West coast (Gilbert and Wehr 2003).

Between April 2005 and December 2007, Ohio gained 16 new permitted dairies and eight more are pending permitting. While dairies, in general, are concentrated in the northeast and the northwest, the permitted dairies are clustered in the northwest and scattered around Central Ohio.



Source: Pending and permitted dairy data, Ohio Department of Agriculture LEPP, current as of December 2007; Data on large, non-permitted farms, 600-699 head, provided by ODA LEPP (2008)

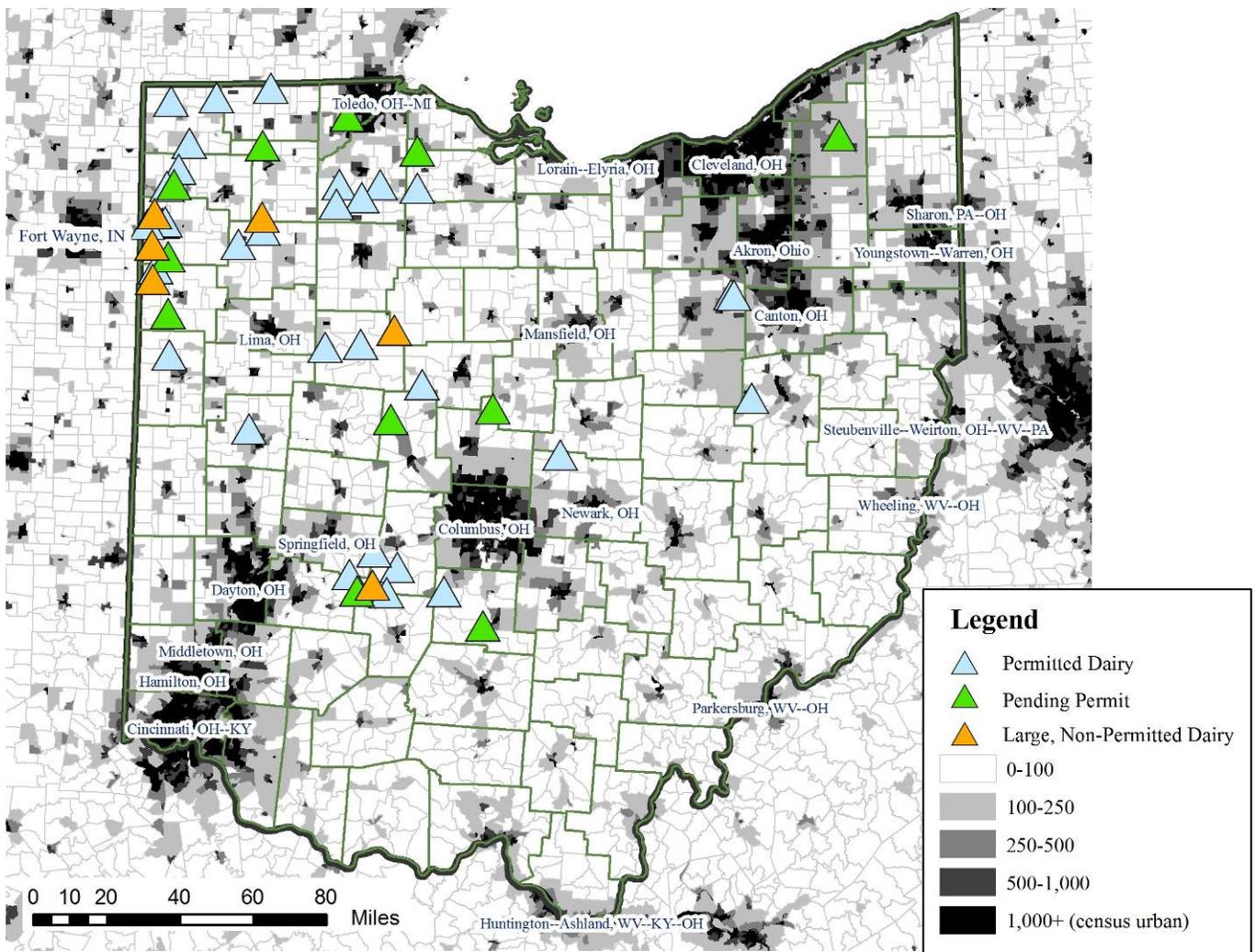
**Figure 4: Large Dairy Facilities: Permitted farms >700 head; Large dairies 600-699 head; Ownership: Foreign-Born, Dutch**

#### 4.1 DAIRIES AND OHIO'S POPULATION LANDSCAPE

The relationship of dairy farms to the community has been a recent topic of contestation. As large dairies are either sited, or grow to the point they seek a permit, citizen groups have been forming to oppose them. A couple of examples are the Wood County Citizens Opposed to Factory Farms

(<http://www.wccoff.org/>) and Ohio Alliance for Responsible Agriculture (<http://ohioara.org/>). Numerous issues have come to the forefront, mostly regarding environmental effects and health risks. The proximity of these dairies to communities is a chief concern.

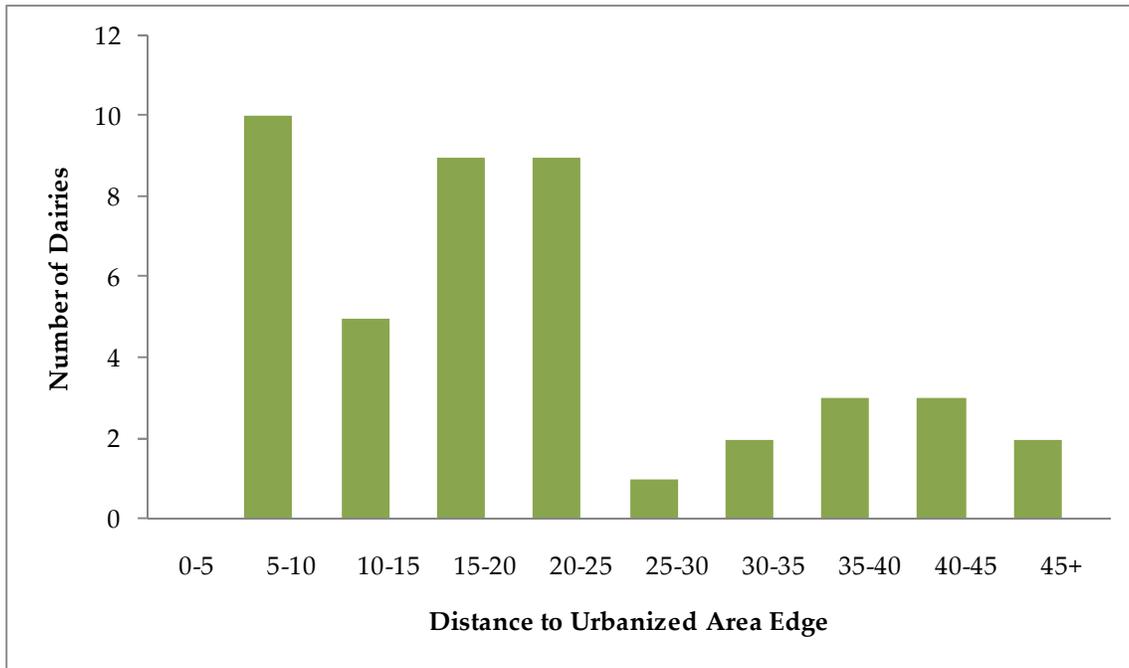
Figures 5 and 6 and Table 5 demonstrate the relationship of large dairies with Ohio residents. Figure 5 illustrates large dairies' proximity to urban populations. As is evident in the map, the majority of dairies are located in areas with less dense populations. Further, Figure 6 shows the distance from large dairy farms to the closest urbanized area<sup>2</sup> edge. The ten large dairies that are within 10 miles of an urbanized area are located near Toledo, Ohio and Fort Wayne, Indiana. The names of urbanized areas are shown in type on Figure 5. Large dairy farms are located an average of 20.9 miles away from the edge of the closest major urbanized area. Finally, Table 5 shows how many Ohioans live within one, three, and five miles of large dairies. Only 0.09% of Ohioans live within one mile of a permitted dairy and only 1.47% live within five miles of a permitted dairy. When examining all large dairies, only 2.67% of Ohioans live within five miles of any large, permitted and non-permitted, dairy.



<sup>2</sup> The “urbanized areas” is a U.S. Census definition and refers to the entire urban concentration that include a ‘principal’ or ‘core’ city (cities) and any surrounding suburbs with a continuous high density (1,000 persons/square mile) and a total population of at least 50,000.

Source: Dairy data from Ohio Department of Agriculture, LEPP; Population data from U.S. Census; ODA LEPP (2008)

**Figure 5: Dairies (CAFOs, 2007; Large Dairies, 600-699 head, 2008) in Relation to 2006 Pop. Density**



**Figure 6. Large Dairy Distance to Closest Urbanized Area Boundary\***

\*including urban areas in nearby states

	Aggregate Pop. w/in 1 mile*	Aggregate Pop. w/in 3 mi.*	Aggregate Pop. w/in 5 mi.*
Dairy, Permitted	9,814	49,669	168,431
Dairy, Permit Pending	6,229	43,698	147,469
Large Dairy (600 to 699 head)	2,750	10,559	17,783
<i>All Dairies</i>	13,776	90,504	306,531

**Table 5: Ohio Population (2006) within 1, 3 and 5 miles of Large and Permitted Dairy farms**

\* Ohio's population in 2006 was estimated at 11,478,006.

## 5. THE ECONOMICS OF OHIO DAIRY

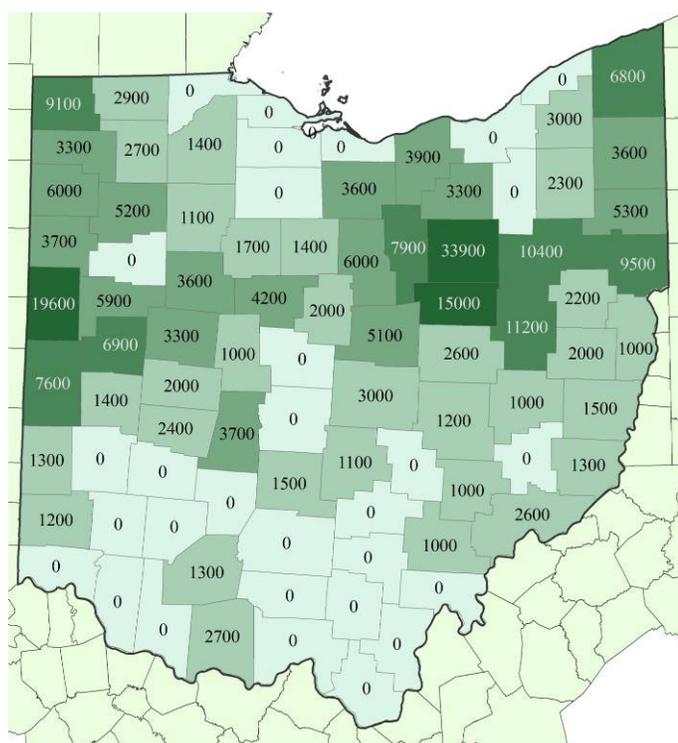
The dairy industry accounts for a significant portion of Ohio's economic sector. In 2006, the total value of Ohio's agricultural goods and services was nearly \$7 billion, providing about \$1.5 billion in income to farmers (Sporleder 2005). Ohio's dairy industry accounted for one third of the state's total agricultural income, with an annual gross revenue of over \$750 million (ODA and USDA NASS 2007).

These numbers indicate that profit from dairy products is increasing. From 2000 to 2004, income from dairy products experienced a 26% increase (ODA 2008). Furthermore, it is estimated that every \$1 demand for dairy products results in a \$1.70 economic gain for Ohio (Sporleder 2005).

This section reviews the contribution of milk to the economy and other factors affecting the manufacturing and distribution of milk products both on and off the farm.

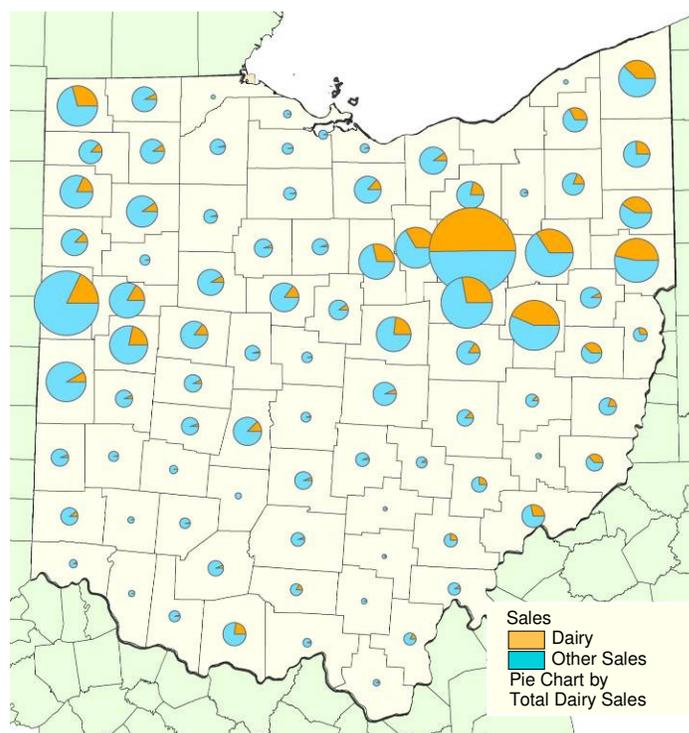
### 5.1 MILK COWS AND PRODUCTION

Ohio currently ranks tenth in the nation in number of milk cows, with an inventory of 276,000 dairy cows. Dairy cow numbers increased from 2005, but history shows that cow inventories have decreased over time. Current inventory is about half of what it was in 1965 (see Table 6). The majority of cows are located where dairy farms are concentrated, in the northeastern and western parts of the state (Figure 7 and 8). Wayne County is the state’s dairy leader in milk cow inventory and milk marketed (ODA and USDA NASS 2007).



Source: ODA and USDA NASS 2007

**Figure 7: Milk Cow Inventories by County, 2005**



**Figure 8. Dairy v all other Crop and Livestock Sales, by Dairy Sales**

In 2005, Ohio’s cows produced 4.7 billion pounds of milk, for an average per cow yield of 17,567 pounds. This puts Ohio eleventh in nationwide milk production for the year (USDA NASS 2007). Although the number of dairy cows in Ohio has decreased, production has increased. In 1965, half a million cows produced 5.2 billion pounds of milk per year, compared with only the number of cows producing almost as much milk today (see Table 6). Milk yields per cow are associated with the use of new production technologies and management strategies (OSU 2003) likely associated with the overall trend toward dairy industrialization, primarily the concentration of dairy herds (Jackson-Smith and Buttel 1998).

Year	Number of Cows	Milk, lb/year (billion)	Ave Pounds of Milk per Cow, 1000
1965	555,000	5.20	9.37
1970	446,000	4.42	9.91
1975	400,000	4.26	10.65
1980	375,000	4.31	11.49
1985	369,000	4.87	13.20
1990	339,000	4.67	13.77
1995	289,000	4.60	15.92
2000	258,000	4.46	17.29
2005	266,000	4.74	17.83
2007	274,000	--	--

Source: Ohio Department of Agriculture Ohio Historical Statistics and Profile of Ohio Agriculture, various years

**Table 6: Ohio Cow Inventories and Milk Production, 1965-2007**

## 5.2 MILK PRICES

Milk prices appear to be experiencing a general increase in the last few years, in spite of the fact that average milk prices dropped 5% from 2004 to 2005 (ODA and USDA NASS 2007). Average milk prices were at a record high of \$16.60 per 100 pounds in 2005. There was a marked increase in milk prices in the 1970s, but since then milk prices have plateaued at double their early 1970s prices with prices fluctuating between \$12 and \$13.90 per 100 pounds. Prices currently appear to be moving toward a new price range of \$15 to \$16. Prices are greater for Grade A, or fluid, milk than for Grade B milk which is used in manufacturing (see Table 7).

Year	Milk price (\$/cwt)*	Grade A milk (\$/cwt)	Grade B milk (\$/cwt)	Value of Milk Produced (x\$1000)
1960	4.27			
1965	4.32			
1970	5.97			
1975	8.94			
1980	13.00			
1985	12.80			
1990	13.90			
1995	13.10			
2000	12.60	12.80	10.70	562,086
2001	15.20	15.40	12.80	652,840
2002	12.60	12.80	11.20	563,850

2003	13.10	13.20	11.80	588,190
2004	16.60	16.70	15.10	756,960
2005	15.80	-	-	749,394
2006	13.80	-	-	670,680

Source: Ohio Department of Agriculture 2005, Tables 57, 58 and 29

\*cwt means "per hundred weight," or per 100 pound quantity

**Table 7: Average Milk Prices: Ohio, 1960 to 2006**

### 5.3 PROCESSING AND MANUFACTURING

Some attribute overall dairy growth to increasing consumer demand for dairy products (Blayney and Gehlhar 2005; OSU 2003), but others (Jackson-Smith and Buttel 1998) contend that dairy industry growth is more the result of processor demand. There is support for this, as demand for fluid milk has declined in the last 20 years and 70% of all milk produced in the U.S. is used in manufacturing (Geisler 2006). Additionally, processing accounts for the largest dairy sector contribution to Ohio's economy, generating about \$2.14 for the state economy for every \$1 increase in demand for dairy products (Sporleder 2005).

Ohio is home to 92 milk processors (ODI 2008), which process milk for drinking, cream, butter, and other products. Most of these processors are small operations, such as independent ice creameries.

About half of all milk in the U.S. is consumed in the form of cheese (Geisler 2006). Ohio is a major contributor in this trend, ranking first in the nation for Swiss cheese production and is also a prolific manufacturer of other cheese varieties and ice creams (see Table 8).

Cheese (Thousand Pounds)					Ice Cream (Thousand Gallons)		
Cottage Cheeses	Cheddar	American	Swiss	Total Cheese	Ice cream	Ice cream mix	Sherbet
34,255	26,269	39,143	125,646	198,717	25,939	13,011	1,446

Source: Ohio Department of Agriculture 2005 Annual Report and Statistics, Table 31

**Table 8: Ohio Cheese and Ice Cream Production 2005**

### 5.4 DAIRY IMPORTS AND EXPORTS

The dairy industry is primarily a domestic market (Jackson-Smith and Buttel 1998). Most milk produced in the U.S. is also consumed in the U.S. However U.S. consumption of dairy outpaces local supply. The U.S. imported \$2.68 billion worth of dairy products during 2005. Most of these imports were casein, milk protein concentrates, butterfat, whey, and other ingredients used in manufacturing. This points to the demand of processors and manufacturers for dairy products as ingredients in processed foods. Only \$1 billion of these imports were cheeses (Geisler 2006), primarily from New Zealand and the European Union (Blayney and Gehlhar 2005).

U.S. dairy export is driven largely by demand from developing countries increasing their milk consumption and developed countries seeking specialty products (Blayney and Gehlhar 2005). The U.S. exported \$1.81 billion worth of dairy products in 2005. Mexico is the destination for the majority of U.S. fluid milk and cream exports, as perishability complicates the transportation of fresh milk over long distances (Geisler 2006). The U.S. has supplied 20% of China's cheese, ice cream, and other dairy

product imports in recent years (UDC 2000). More than 90% of U.S. dairy exports in 2005 were commercial, unsubsidized products, such as milk powders (Geisler 2006).

In light of import/export disparities, efforts are being made to ensure U.S. control over international dairy markets. The U.S. Dairy Export Incentive Program provides assistance to U.S. dairy suppliers offering exports at competitive international prices through tariff protection and import limitations, and removes certain products from the domestic market to increase prices (Geisler 2006).

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## 5.5 MILK “DEFICIT”

Although statistics are not readily available, Ohio dairy exports seem to follow national trends. The value of Ohio dairy exports in 2004 was \$35.3 million (ODA and USDA NASS 2007), a negligible portion of the total value of the State’s dairy products. This has led some to believe that Ohio is facing a “milk deficit,” wherein a small percentage of Ohio’s milk demand must be met by suppliers outside the State. For example, in 2003, processors bought 4.88 billion pounds of milk, but producers only supplied 4.49 billion pounds, about 92% of the total demand (Demland 2004). Further, demand for all dairy products grows by approximately 2% every year (OSU 2003). Some worry that Ohio will suffer from a supply/demand imbalance; however, as we have already seen, the number and size of dairy farms in the State is increasing fairly rapidly, as is production per cow. Such an imbalance does not necessarily reflect a true deficit, as the majority of demand is actually for milk-derived ingredients for manufacturing and not reflective of direct fluid milk demand.

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## 5.6 PRICE SUPPORTS AND SUBSIDIES

A few programs are in place to help the dairy industry maintain profitability. The government has long maintained a supportive relationship with the agriculture industry, although support programs have decreased substantially over the years. This is particularly true when it comes to the dairy industry.

Dairy benefits generally come in the form of price supports. Two Federal dairy price-support programs are currently in place: the milk price support program and the Federal Milk Market Order. The milk price support program authorizes the Commodity Credit Corporation (CCC) to buy butter, cheddar cheese, or nonfat dry milk for the purpose of establishing a minimum milk price to stabilize the prices dairy that farmers receive (Normile and Leetman 2004). Currently the price floor is set at \$9.90/cwt. (OSU 2003). Federal Milk Marketing Orders establish different classes and prices for milk for the purpose of benefiting dairy producers (Normile and Leetman 2004). They require handlers to pay at least the minimum specified prices for milk purchased from producers.

Currently only one direct payment support program is in effect: the Milk Income Loss Contract (MILC). MILC compensates farmers for losses incurred when domestic milk prices decrease below a certain level. Payments are made monthly for as long as milk prices are below the determined domestic price floor and cease when they again reach this level. Payments are to be made on up to 2.4 million pounds of milk per year per organization (Normile and Leetman 2004, USDA).

In response to recent natural disasters, dairy disaster support programs have been implemented. The Dairy Disaster Assistance program, effective in 2005, provides temporary relief to producers who suffered losses as a result of the 2004 hurricanes (USEPA 2005). Similarly, the 2005

Hurricane Livestock Compensation Program and 2005 Hurricane Livestock Indemnity Program II provide compensation for losses accrued in livestock industries as a result of Hurricane Katrina and other hurricanes in 2005.

In 2002, 33% of U.S. farms and 37% of Ohio farms received some form of government subsidies. That year, almost \$850 million of those subsidies went to the U.S. dairy industry, while \$32 million went to the Ohio dairy industry. Compare this to nearly \$17 million going to the U.S. and \$380,000 going to the Ohio dairy industries in 2005 (EWG 2006).

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## 6. CONCLUSION -- DAIRY'S FUTURE

Overall, the dairy industry in the U.S. appears to have a bright future, at least into 2009. A greater number of milk cows and slightly greater output per cow could mean higher milk production into 2008 (USDA ERS 2007). However, greater retail prices for fluid milk have dampened consumption; specifically for Ohio, the outlook is very good. While the dairy industry is not static, meaning that structural change and changes in markets will occur, the State does have a strong dairy infrastructure, particularly in the northern portion of the State (Shoemaker 2008). Ohio dairy farmers have more options than neighboring states for processing. For example, Ohio still has maintained significant processing for fluid milk, in addition to having outlets for such items as cheese, ice cream, cottage cheese and yogurt.

In recent years, Ohio has experienced an increase in the number of cows, although a decrease in the total number of herds. The industry continues to move into a bi-model or bifurcated structure – with larger, newer farms concentrating in the Northwest and Central Ohio and smaller, grazing-oriented farms in the Holmes, Wayne, Richland and Ashland County areas. These Northeastern counties have a large Amish population that focuses on smaller herds.

For these smaller “English” farms, new entry and generational transition are the greater challenges (Shoemaker 2008). In response, Extension programming has focused on estate planning and farm succession, the transition of the business to the next generation. But programming to foster new start-ups is needed (Shoemaker 2008).

Further, as the structure of dairy becomes bifurcated along “large” and “small” lines, new emerging organic and locally-branded markets are opening for the smaller farms. With these emerging markets come new industry debates. Two examples of debates that may affect local sales, niche marketing and value-added ventures are milk labeling and producer sales of raw milk (Gumpert 2006; Lewis 2008). For the time being, milk labeling and raw milk debates, with a new regulation and court holding recently in place.

Controversy still remains with the larger farms. The very large farms are mostly new operations (compared with versus growing from within). The siting of these new farms has become controversial. To complicate matters, the lack of a local governmental role in the permitting and therefore siting of these facilities has caused some tensions and controversy (Hall, 2008; Cordell, 2008). One response by local governments has been to attempt to affect dairy locations through a local zoning ordinance and the building permit process. For example, Ross Township, Greene Co. denied Meerland Dairy the agricultural certificate that would have exempted the dairy from the building permit process (Sutherly 2008). Further, Ross Township required large dairies to get a conditional use permit and this

requirement is being questioned by Meerland Dairy (Sutherly 2008), but the conditional use zoning provision was recently declared unconstitutional by the Ohio Court of Appeals in May 2008.

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## APPENDIX A – OHIO'S COUNTIES

