Changes in the Size and Location of U.S. Dairy Farms

The emergence of large dairy farms, and the continued shift of production toward such farms, is the principal focus of our analysis. We also touch on geographic shifts in production, a closely intertwined component of structural change.

Between 1970 and 2006, the number of farms with dairy cows fell steadily and sharply, from 648,000 operations in 1970 to 75,000 in 2006, or 88 percent (fig. 1). Total dairy cows fell from 12 million in 1970 to 9.1 million in 2006, so the average herd size rose from just 19 cows per farm in 1970 to 120 cows in 2006.[1] Moreover, because milk production per cow doubled between 1970 and 2006 (from 9,751 to 19,951 pounds per year), total milk production rose, and average milk production per farm increased twelvefold.

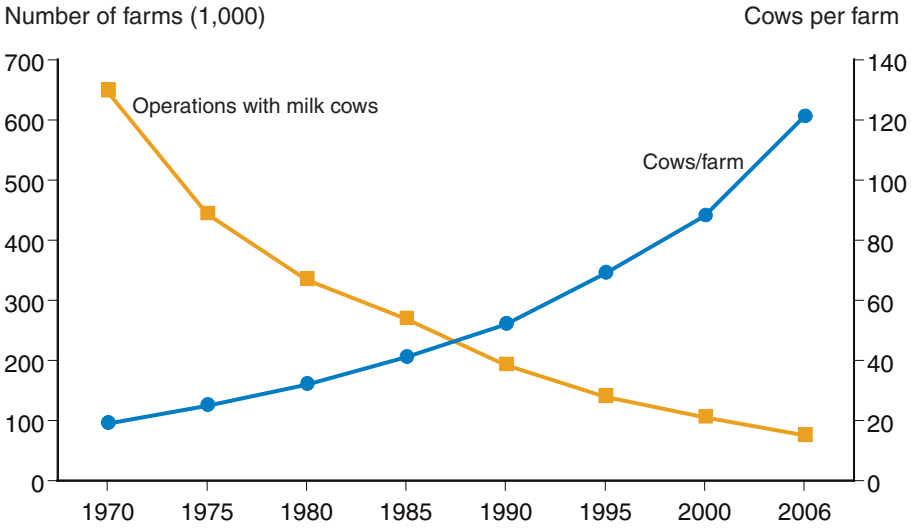
These changes reflect a trend toward greater specialization as well as greater size. However, like much of agriculture, dairy farms come in a wide range of sizes. The largest U.S. dairy farms have over 15,000 cows, though farms with 1,000–5,000 cows are more common. Large dairy farms account for most inventory and production in Western States, and a growing share of production elsewhere.

The smallest class of dairy farms (fewer than 30 cows) still accounted for nearly 30 percent of all operations with milk cows in 2006, but had only 2 percent of all cows and provided just over 1 percent of total dairy production (table 1). Such farms, which frequently combine a very small dairy enterprise with other commodity enterprises or with off-farm work, are disappearing rapidly.

The next three size classes (30–200 cows) tend to specialize in dairying. These classes are also in sharp decline, with farm numbers falling by 30 percent between 2000 and 2006 (table 1). Production is shifting to farms with

Figure 1

The number of dairy farms is declining, while average size is growing



Source: USDA, NASS.

[1]Dairy enterprises have calves and heifers, which are not yet ready to give milk; they may have bulls; and they have milk cows, which have given birth to calves. At any time, some fraction of a farm's milk cows are dry, usually in preparation for calving. Unless otherwise noted, herd sizes in this report refer to the number of milk cows on a farm, including dry milk cows.

Table 1

Changes in the size structure of U.S. dairy farms, 2000-2006

Herd size	Number of operations		% change	Percent of inventory		Percent of production	
No. Head	2000	2006		2000	2006	2000	2006
1-29	30,810	21,280	-31.0	2.9	1.9	1.8	1.2
30-49	22,110	14,145	-36.0	9.1	6.0	7.7	4.9
50-99	31,360	22,215	-29.2	22.0	16.3	19.4	14.3
100-199	12,865	9,780	-24.0	18.0	14.1	17.3	13.0
200-499	5,350	4,577	-14.4	16.7	15.0	18.0	15.0
500-999	1,700	1,700	0	12.0	12.6	13.7	14.3
1,000-1,999	695	870	+25.2	10.1	12.5	11.6	13.9
2,000+	280	573	+104.6	9.2	21.6	10.5	23.4
Total	105,170	75,140	-25.5	100.0	100.0	100.0	100.0

Source: USDA, NASS *Milk Production*, Feb. issue (through 2004); USDA, NASS *Farms, Land in Farms and Livestock Operations* (after 2004).
Herd size refers to all dairy cows on an enterprise, including dry cows but excluding calves, heifers, and bulls.

at least 500 cows, with the most striking changes occurring in dairies with at least 2,000 milk cows. The number of farms in this largest size class more than doubled between 2000 and 2006, as did its shares of cow inventory and total milk production.

Large and small dairy farms are organized in fundamentally different ways (Short, 2004; Sumner and Wolf, 2002). Large farms usually purchase significant amounts of feed and contract with other operations to raise their heifers offsite. Small farms grow more of their own feed and raise their heifers onsite. Large operations tend to confine their milk cows in large barns or in drylot feedyards, while small operations may graze their cows on pasture. Most labor on small dairy farms is provided by the operator and the operator's family, whereas large farms rely extensively on hired labor (although they are usually family-owned and operated).

Changes in the location of milk production are closely intertwined with changes in farm size. In table 2, production and structure indicators are reported for each of the 16 largest dairy States, which together account for 83 percent of U.S. milk production. For each State, we report milk production and the share of a State's production in small (fewer than 100 cows) and large (500 or more cows) farms.[2] Production data are for 1994, 2000, and 2006 (the most recent available) and structure indicators are for 2000 and 2006.

[2]The largest class in State-level data covers farms with 500 or more cows.

Large farms dominate in California, the Nation's largest milk-producing State. Farms with at least 500 cows accounted for 88 percent of California's production in 2006, and production there grew by more than half between 1994 and 2006, as the State's share of national production rose from 16 to 21 percent (table 2). Other States in the West and Southwest show similar patterns—substantial growth in production and a concentration in large dairy farms.

Milk production in traditional dairy States in the Northeast, Eastern Corn Belt, and Upper Midwest comes more from small dairies than from large. Although the three regions together maintained stable milk production volumes in 1994–2006, their share of national production fell by 4.5 percentage points.

Table 2

Milk production and farm structure in major dairy States

State	Production			Herd size			
				<100 head		>499 head	
	1994	2000	2006	2000	2006	2000	2006
	(Billion pounds)			*(Percent of State production)*			
Northeast	24.0	25.5	25.3	46.5	38.9	10.4	21.3
NY	11.4	11.9	12.0	34.0	28.5	16.0	31.0
PA	10.2	10.9	10.7	63.0	53.0	3.0	10.0
VT	2.4	2.7	2.6	35.0	26.0	16.0	29.0
E. Corn Belt	12.3	12.8	15.3	39.9	28.4	13.1	31.2
IN	2.3	2.6	3.3	51.0	29.0	10.0	43.0
MI	5.5	5.9	7.1	28.0	18.0	20.0	39.0
OH	4.5	4.3	4.9	49.5	36.0	5.5	23.0
Upper Midwest	31.7	31.0	31.8	56.7	48.2	8.9	15.6
MN	9.3	8.8	8.4	59.5	47.5	8.5	17.5
WI	22.4	22.2	23.4	56.0	45.0	9.0	19.0
Southwest	11.6	13.6	17.8	2.8	1.6	78.2	87.3
NM	3.3	5.6	7.6	0.2	0.2	98.0	98.0
AZ	2.1	2.9	3.7	0.4	0.5	95.0	98.0
TX	6.2	5.1	7.1	7.0	2.0	47.0	78.0
West	37.3	50.1	59.9	1.8	1.3	73.4	84.2
CA	25.0	33.3	38.8	0.6	0.5	78.0	88.0
CO	1.6	1.9	2.5	3.0	1.9	63.0	83.0
ID	3.8	7.8	10.9	4.5	2.0	74.0	89.0
OR	1.7	1.6	2.2	8.0	6.0	39.0	54.0
WA	5.2	5.5	5.5	3.0	2.4	58.0	70.0
16 major States	116.9	133.0	150.1	26.9	20.4	41.0	54.0
US	153.6	167.6	181.8	28.9	20.4	35.8	51.6

Source: USDA, NASS *Milk Production*, monthly issues (through 2004); USDA, NASS F*arms, Land in Farms and Livestock Operations* (after 2004).

But structural change is not simply a matter of regional differences. Large farms' share of milk production is increasing in every major dairy State. According to newspaper reports, over 40 large farms, each with 1,000-5,000 cows, were built in Michigan, Ohio, and Indiana between 1998 and 2006. Farms with upwards of 1,000 head are also appearing in other traditional dairy States in the East and Midwest, either through the expansion of longstanding family operations or through new construction with investor financing.[3]

[3]See Dao (2005), Henry (2004), and Martin (2005) for articles on the construction of large dairies in the Indiana-Michigan-Ohio area; Martin (2004) for Wisconsin; or Gullickson (2006) for Pennsylvania.