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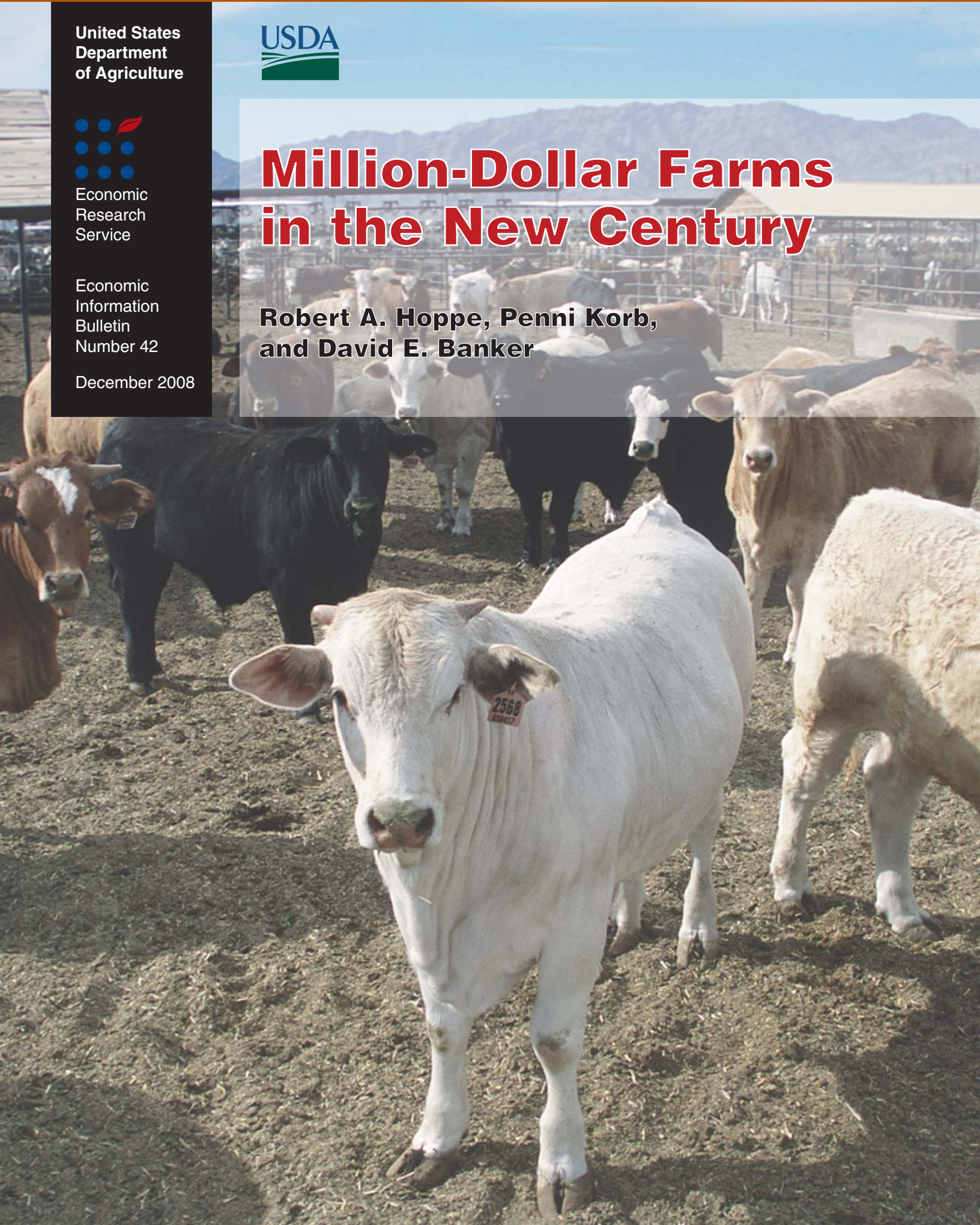
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Million-Dollar Farms in the New Century

Robert A. Hoppe, Penni Korb,
and David E. Banker



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A Report from the Economic Research Service

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Million-Dollar Farms in the New Century

Robert A. Hoppe, Penni Korb, and David E. Banker

Abstract

Million-dollar farms—those with annual sales of at least \$1 million—accounted for about half of U.S. farm sales in 2002, up from a fourth in 1982 (with sales measured in constant 2002 dollars). By 2006, million-dollar farms, accounting for 2 percent of all U.S. farms, dominated U.S. production of high-value crops, milk, hogs, poultry, and beef. The shift to million-dollar farms is likely to continue because they tend to be more profitable than smaller farms, giving them a competitive advantage. Most million-dollar farms (84 percent) are family farms, that is, the farm operator and relatives of the operator own the business. The million-dollar farms organized as nonfamily corporations tend to have no more than 10 stockholders.

Keywords: Contracting, family farms, farm businesses, farm financial performance, farm-operator household income, farm operators, farm structure, farm type, million-dollar farms

Acknowledgments

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Summary

Small farms (those with annual sales less than \$250,000) represent a large majority of U.S. farms (92 percent), but account for a relatively small share of total farm production (23 percent). This report examines the other end of the size spectrum, where a large percentage of farm production occurs, specifically on “million-dollar farms” whose annual sales total \$1 million or more. The 35,100 million-dollar farms reported in 2006—2 percent of all U.S. farms—accounted for 48 percent of the sales of U.S. agricultural products.

What Is the Issue?

Understanding million-dollar farms is especially important because of the large and growing share of U.S. food and fiber they produce. This report examines the growth of production from million-dollar farms since the 1980s. It lays out the current role of million-dollar farms in U.S. commercial agriculture, including their share of farms, their production of specific commodities, and their receipt of Government payments.

What Did the Study Find?

Major shifts occurred in the distribution of gross farm sales between the 1982 and 2002 Censuses of Agriculture, with sales measured in constant 2002 dollars. Farms with sales of \$1 million or more doubled their share of total U.S. farm sales from 23 percent in 1982 to 48 percent in 2002. Some of these million-dollar farms are relatively recent entrants to farming, while others existed as far back as 1978.

The shift in production to million-dollar farms is likely to continue.

Average operating profit margins increase with sales, reflecting economies of size in farming. As a result, million-dollar farms—and farms growing to that size—have a competitive advantage relative to smaller farms. The shift in production may eventually slow, however, once million-dollar farms’ shares of the commodities most amenable to large-scale production reach their upper limits.

Million-dollar farms do not have market power. The shift in farm production to million-dollar farms reflects a long-term concentration of farm production on fewer farms that has been underway since the beginning of the 20th century. However, there are still too many million-dollar farms—just over 35,000—for any single farm to dominate agriculture or the production of specific commodities.

Million-dollar farms receive a small share of Government payments.

Most Government payments are commodity-related or targeted at current or past production of specific commodities, largely feed and food grains, cotton, and oilseeds. Relatively few million-dollar farms—particularly those with sales of \$5 million or more—specialize in crops covered by commodity programs. As a result, million-dollar farms received only 16 percent of U.S. Government payments in 2006, a small share compared with their 48-percent

share of gross sales, although disproportionately large compared with their 2-percent share of all farms.

Million-dollar farms have more operators than farms with lower sales.

The number of operators per farm averaged 1.5 for all farms in 2006, but 2.1 for all million-dollar farms and 2.6 for \$5-million farms. Multiple-operator farms accounted for 66 percent of million-dollar farms, substantially more than the 46-percent share for farms in general. Multiple-generation farms—those with at least 20 years' difference between the ages of the oldest and youngest operators—made up a larger share of million-dollar farms (23 percent) than any other sales class.

Most million-dollar farms are family operations. Eighty-four percent of the million-dollar farms in 2006 operated as family farms—defined as any farm where the majority of the business is owned by the operator (or the principal operator on multiple-operator farms) and individuals related to the operator. Only 7 percent of million-dollar farms were organized as nonfamily corporations, generally with no more than 10 stockholders. The situation was similar for farms with sales of \$5 million or more, although a smaller share (64 percent) was classified as family operations and a larger share (21 percent) as nonfamily corporations. The operators and spouses on million-dollar farms, however, provided only 10 percent of the farms' labor, compared with 39 percent for farms with sales between \$500,000 and \$999,999.

Million-dollar farms account for most contract production. Thirty-nine percent of U.S. farm production came from farms with production or marketing contracts in 2006, and million-dollar farms accounted for about 62 percent of this contract production. Sixty-three percent of million-dollar farms used contracts, and about half of their production—mostly livestock—was under contract. Note that farms with production contracts only receive a fee from contractors, and only the fee—rather than sales—is included in their gross cash income. Measuring size by gross cash income rather than sales would reduce the number of million-dollar farms among some specializations, such as poultry farms.

Million-dollar farms also served as contractors. Approximately 5,400 farms reported contracting livestock production (including poultry) out to other farms. The share of farms contracting livestock production out was highest for \$5-million farms at 12 percent.

How Was the Study Conducted?

Most of the data in this report are from the 2006 Agricultural Resource Management Survey (ARMS). The ARMS is a detailed, annual survey of farm businesses and associated households conducted jointly by the U.S. Department of Agriculture's Economic Research Service (ERS) and National Agricultural Statistics Service (NASS). The report also uses data from the last five censuses of agriculture to follow the shift in production to million-dollar farms. Finally, the 2002 Census of Agriculture Longitudinal File—which links records for individual farms from the last six censuses—traces the history of today's million-dollar farms.

Introduction

Between 1982 and 2002, the number of large farms—those selling at least \$250,000 in farm products, measured in constant 2002 dollars—nearly doubled. The number of farms with sales of \$1 million or more grew even faster, tripling over the same period, even after adjustments for inflation are considered. By 2006, 35,100 “million-dollar farms” accounted for 48 percent of U.S. agricultural sales. These farms use different management and marketing strategies than smaller farms. Half of their production occurs under marketing or production contracts, and two-thirds have more than one operator, generally not the spouse of the principal operator. Nevertheless, most million-dollar farms are family farms. Sixteen percent are classified as nonfamily farms.

This report examines data from the last five censuses of agriculture to follow the shift in production to million-dollar farms. We also used the 2002 Census of Agriculture Longitudinal File—which links records for individual farms from the last six censuses—to trace the history of million-dollar farms. Some million-dollar farms are relatively recent entrants to farming, while others go back as far as 1978.

Most of the data in this report are from the 2006 Agricultural Resource Management Survey (ARMS). The ARMS is a detailed, annual survey of farm business and associated households conducted jointly by the U.S. Department of Agriculture’s Economic Research Service (ERS) and National Agricultural Statistics Service (NASS).¹ Using ARMS data, the report presents a detailed examination of million-dollar farms, focusing on their:

- Share of farms, farm production, and Government payments;
- Specialization, farm size, and tenure;
- Business organization, including relatively new limited liability companies (LLCs);
- Operator characteristics, including the number of operators per farm;
- Farm business and farm household finances; and
- Farm business arrangements, including the use of hired labor and contracting.

Both the census and ARMS data used here were collected prior to the recent volatility in grain prices. The specializations of million-dollar farms may have changed somewhat as grain prices spiked and then fell in 2007 and 2008. For example, there may be more cash grain farms and slightly fewer livestock farms. It is unlikely that recent volatility in grain prices affected the overall conclusions of the report, the shift in production to larger farms, or the basic characteristics of million-dollar farms.

Recent ERS research on farm structure has focused on small farms, defined as those with sales less than \$250,000 (USDA, National Commission on Small Farms, 1998). While most U.S. farms are small farms (92 percent, as of 2006), they account for only 23 percent of total U.S. farm production. This report examines the other end of the size spectrum, where a very large

¹Differences between ARMS-based estimates are generally stressed in this report only when the estimates are significantly different at the 95-percent confidence level or more.

percentage of production occurs. Farms can sell a million dollars of products with a variety of enterprises, some of which do not require large amounts of farmland. For examples of million-dollar farms, see the box below.

A Million Dollars in Sales

A variety of farm enterprises can generate \$1 million in sales if they operate on a large enough scale. Some examples for different parts of the country are presented here. Estimates of the amount of crops and livestock necessary to generate \$1 million of sales in 2005 are based on yields, livestock weights, milk production, and prices—generally reported at the State level—from *Agricultural Statistics 2007* (USDA, NASS, 2007).

Iowa corn and soybean farm, with a feedlot	Mississippi cotton and soybean farm	Arkansas broiler farm																																
<p>Most of this farm's sales came from corn and soybeans, but it also supports a feedlot. The corn and soybeans shown below exclude any crops grown to feed the cattle.</p> <table border="1"> <thead> <tr> <th colspan="2">Sales (dollars)</th> </tr> </thead> <tbody> <tr> <td>Corn</td> <td></td> </tr> <tr> <td>1,120 acres</td> <td>375,894</td> </tr> <tr> <td>Soybeans</td> <td></td> </tr> <tr> <td>800 acres</td> <td>237,720</td> </tr> <tr> <td>Fed cattle</td> <td></td> </tr> <tr> <td>400 head</td> <td>448,656</td> </tr> <tr> <td>Total sales</td> <td>1,062,270</td> </tr> </tbody> </table>	Sales (dollars)		Corn		1,120 acres	375,894	Soybeans		800 acres	237,720	Fed cattle		400 head	448,656	Total sales	1,062,270	<p>Upland cotton (and cotton seed) accounted for more than 80 percent of the sales of this farm. However, the farm also harvested 960 acres planted to soybeans.</p> <table border="1"> <thead> <tr> <th colspan="2">Sales (dollars)</th> </tr> </thead> <tbody> <tr> <td>Cotton</td> <td></td> </tr> <tr> <td>2,080 acres</td> <td>823,678</td> </tr> <tr> <td>Cotton seed</td> <td></td> </tr> <tr> <td>1,265 tons from the land in cotton</td> <td>106,276</td> </tr> <tr> <td>Soybeans</td> <td></td> </tr> <tr> <td>960 acres</td> <td>198,326</td> </tr> <tr> <td>Total sales</td> <td>1,128,280</td> </tr> </tbody> </table>	Sales (dollars)		Cotton		2,080 acres	823,678	Cotton seed		1,265 tons from the land in cotton	106,276	Soybeans		960 acres	198,326	Total sales	1,128,280	<p>To generate just over \$1 million in sales, this farm produced 475,000 broilers under production contracts.</p> <p>The broilers are actually owned by the contractor, who also provides specific inputs, such as feed. The farm operator receives a fee for his or her services provided. Thus, the gross revenue of the farm—largely the fees received—is much lower than the \$1 million in sales, which includes the value of the birds removed by the contractor (Hoppe et al., 2007).</p>
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North Carolina hog farm	Wisconsin dairy farm	California specialty crops																																
<p>Very large hog farms are a relatively recent development in North Carolina. Their introduction was facilitated by the use of contracts (McBride and Key, 2003).</p> <p>To generate \$1 million in sales, the farm—a finish-only operation—produces 8,000 hogs weighing 256 pounds, the State average. No other farm enterprises are included in this example, since hogs account for 92 percent of sales of North Carolina hog farms, according to the 2002 Census of Agriculture.</p>	<p>A Wisconsin dairy farm milking 400 cows would generate slightly more than \$1 million, calculated from average production and price estimates for the State.</p> <p>This example assumes no other farm products are sold, although feed for the cows could also be grown.</p> <p>According to the 2002 Census of Agriculture, 353 million-dollar dairy farms existed in Wisconsin. They accounted for 52 percent of all million-dollar farms in the State and 9 percent of million-dollar dairy farms in the United States.</p>	<p>California's specialization in high-value specialty crops dates back to the late 1800s (Cochrane, 1993). These examples show that even small acreages of specialty crops can generate sales of \$1 million.</p> <table border="1"> <thead> <tr> <th></th> <th>Acres needed for sales of \$1 million</th> </tr> </thead> <tbody> <tr> <td>Head lettuce</td> <td>170</td> </tr> <tr> <td>Fresh tomatoes</td> <td>125</td> </tr> <tr> <td>Celery</td> <td>120</td> </tr> <tr> <td>Strawberries</td> <td>35</td> </tr> </tbody> </table>		Acres needed for sales of \$1 million	Head lettuce	170	Fresh tomatoes	125	Celery	120	Strawberries	35																						
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Longrun Trends

Dramatic shifts have occurred in the distribution of gross farm sales since 1982. Farms with sales of \$250,000 or more (in 2002 dollars) steadily increased their share of total sales from 47 percent in 1982 to 76 percent in 2002 (fig. 1). Farms with sales of \$1 million to \$4,999,999 and farms with sales of \$5 million or more each doubled their share of sales between 1982 and 2002. Each of these sales classes accounted for nearly a fourth of agricultural sales by 2002.² Farms with sales just under \$1 million—those selling \$500,000 to \$999,999—were the only other group to increase its share of sales over the period.

Number of Million-Dollar Farms

The number of million-dollar farms—less than 2 percent of U.S. farms in each census—tripled between 1982 and 2002 (table 1). The rate of increase for other large farms was not as high, but their numbers increased as well, especially those in the \$500,000-\$999,999 sales class.

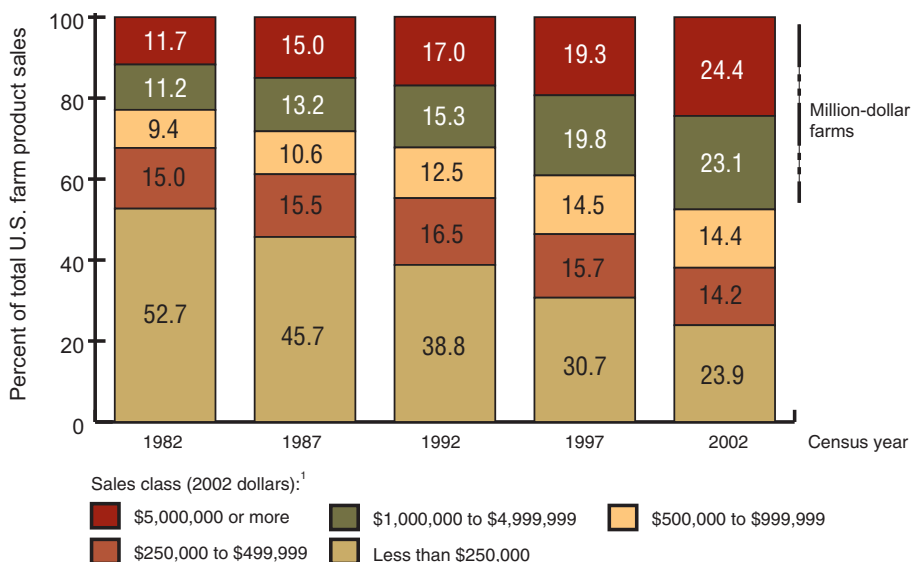
The number of small farms declined, with the exception of “point farms” or farms with sales less than \$1,000 that might normally have sales that high and satisfy the criteria to be counted as a farm.³ Much of the increase in point farms, however, was due to an adjustment for undercoverage in the census farm count instituted in the 2002 census, which had the largest impact on farms near the \$1,000 cut-off in farm definition (Allen, 2004; USDA, NASS, 2004). Adjusting the 1982 count of point farms for undercoverage, using

²Sales are defined here to include the gross market value of agricultural products sold or removed from farms, before taxes and production expenses (USDA, NASS, 2002). Government payments are excluded from sales in figure 1, since data on these payments were not collected prior to the 1987 census.

³The U.S. Department of Agriculture defines a farm as any place that produced and sold or normally would have produced and sold \$1,000 worth of agricultural products during the year. If a place did not have \$1,000 in sales, a “point system” assigns values for acres of various crops and head of livestock to estimate normal sales. “Point farms” are farms with less than \$1,000 in sales but earn points worth at least \$1,000. See “What is the Definition of a Farm?” on the NASS website at: http://www.agcensus.usda.gov/Help/FAQs/2002_Census/index.asp#1.

Figure 1

Distribution of gross farm sales, by constant-dollar sales class,¹ 1982-2002
Million-dollar farms' share of sales increased from 23 percent in 1982 to 48 percent in 2002



Note: Items may not add to totals due to rounding.

¹Sales class is expressed in constant 2002 dollars, using the Producer Price Index for farm products to adjust for price changes.

Source: USDA, Economic Research Service, compiled from census of agriculture data.

Table 1

Number of farms, by constant-dollar sales class (2002 dollars),¹ 1982-2002

Sales class ¹	Census year					Change, 1982-2002
	1982	1987	1992	1997	2002	
	<i>Number of farms</i>					<i>Percent</i>
Total farms	2,240,976	2,087,759	1,925,300	1,911,859	2,128,982	-5.0
Small farms (sales less than \$250,000)	2,156,057	1,989,883	1,807,605	1,775,875	1,976,646	-8.3
Point farms ²	254,097	235,562	212,580	277,248	570,919	124.7
Other farms	1,901,960	1,754,321	1,595,025	1,498,627	1,405,727	-26.1
Large farms	84,919	97,876	117,695	135,984	152,336	79.4
\$250,000-\$499,999	57,691	64,195	74,354	78,330	81,694	41.6
\$500,000-\$999,999	18,242	22,058	28,583	36,469	41,969	130.1
Million-dollar farms	8,986	11,623	14,758	21,185	28,673	219.1
\$1,000,000- \$4,999,999	7,942	10,220	13,026	18,834	25,335	219.0
\$5,000,000 or more	1,044	1,403	1,732	2,351	3,338	219.7

¹Sales class is expressed in constant 2002 dollars, using the Producer Price Index for farm products to adjust for price changes. Point farms, however, are defined here in current dollars—rather than constant dollars—because they are identified in each census based on constant dollars.

²Point farms have sales of less than \$1,000 (current dollars), but are still considered farms because they would be expected to normally sell at least \$1,000 of agricultural products. In the 1997 and 2002 censuses, point farms included any establishments where sales of agricultural products and Government payments were less than \$1,000. In this table, however, point farms are defined consistently from 1982 to 2002 as farms with sales less than \$1,000, with no consideration of Government payments.

Source: USDA, Economic Research Service, compiled from census of agriculture data.

published adjustment factors (U.S. Department of Commerce, 1985), reduced the 1982-2002 growth in point farms from 125 percent to 60 percent.

The History of Million-Dollar Farms

Census data—specifically the 2002 Census of Agriculture Longitudinal File—can be used to examine the history of million-dollar farms that existed in 2002. The longitudinal file links together the 1978, 1982, 1987, 1992, 1997, and 2002 Censuses of Agriculture, allowing analysts to track individual farms over the 24-year period.

Note that the census longitudinal file is not truly longitudinal. Rather than identifying farms and following them as time progresses, the longitudinal file links data collected in the past for another purpose: the agricultural census, which has its own issues regarding nonresponse and undercoverage. Because the census of agriculture was not designed to track businesses over time, errors linking records in the longitudinal file may lead to an overstatement of exits and entrances and an understatement of farms that remain in business. For more information about the Longitudinal File and its limitations, see, “Appendix: The 2002 Census of Agriculture Longitudinal File.”

Table 2

Business age of farms, 2002

	Distribution of farms by business age							Total
	All farms	Less than 5 years ¹	5 to 9 years ²	10 to 14 years ³	15 to 19 years ⁴	20 to 23 years ⁵	24 years or more ⁶	
	<i>Number</i>	<i>Percent</i>						
Total farms	2,128,982	36.8	22.1	11.0	8.2	5.5	16.3	100.0
Small farms (sales less than \$250,000)	1,976,646	38.0	22.3	10.8	7.8	5.2	15.9	100.0
Point farms ⁷	570,919	53.8	22.7	8.0	4.9	2.9	7.7	100.0
Other farms	1,405,727	31.6	22.1	11.9	9.1	6.2	19.2	100.0
Large farms	152,336	21.8	20.3	14.3	13.1	9.0	21.5	100.0
\$250,000-\$499,999	81,694	20.7	18.9	13.9	13.2	9.5	23.8	100.0
\$500,000-\$999,999	41,969	21.6	20.8	14.9	13.4	9.1	20.3	100.0
Million-dollar farms	28,673	25.1	23.4	14.6	12.6	7.6	16.6	100.0
\$1,000,000-\$4,999,999	25,335	24.4	23.4	14.8	12.8	7.9	16.8	100.0
\$5,000,000 or more	3,338	30.6	24.0	13.7	11.1	6.1	14.6	100.0

Note: Items may not add to totals due to rounding.

¹First appeared in the 2002 census. Entered between 1998 and 2002.

²First appeared in the 1997 census. Entered between 1993 and 1997.

³First appeared in the 1992 census. Entered between 1988 and 1992.

⁴First appeared in the 1987 census. Entered between 1983 and 1987.

⁵First appeared in the 1982 census. Entered between 1979 and 1982.

⁶First appeared in the 1978 census. Entered in 1978 or earlier.

⁷Point farms have sales of less than \$1,000 (current dollars), but are still considered farms because they would be expected to normally sell at least \$1,000 of agricultural products.

Source: USDA, Economic Research Service, compiled from 2002 Census of Agriculture Longitudinal File.

Business Age

Million-dollar farms are younger than other large farms (table 2).⁴ Only 17 percent of all million-dollar farms have an estimated business age of at least 24 years, compared with 22 percent for large farms in general, a 5-percentage-point difference. At the other end of the business-age continuum, 25 percent of million-dollar farms are new establishments, estimated to be less than 5 years old, compared with 22 percent of all large farms. In addition, \$5-million farms are even newer to the industry.

It may seem surprising that 25 percent of all million-dollar farms and 30 percent of \$5-million farms that existed in 2002 could have entered farming no earlier than 1998 and still have sales at those levels. The large share of farms entering no earlier than 1998 may partially reflect difficulties linking census records over time. Nevertheless, earlier analyses of longitudinal data based on the census of agriculture established that farming—like other businesses—has high turnover, with thousands of businesses entering and leaving the sector each year (Hoppe and Korb, 2006; MacDonald et al., 2007).

⁴Constant-dollar sales classes cannot be prepared before 1982 due to incomplete census records for individual farms. A computer file with individual farm observations is available for the 1978 Census of Agriculture, but these observations cannot be weighted to U.S. totals (Hoppe and Korb, 2006) and were excluded from figure 1 and table 1. Data for 1978 were included in table 2, however, because it was not necessary to weight 1978 observations to U.S. totals to determine the business age of farms existing in 2002.

Not all new million-dollar farms are startups, however. The census counts multiple locations of a farm business as individual farms, if the locations are operated separately or if they are located in different counties or States (USDA, NASS, 2007). Thus, if a large broiler farm (or integrator) expands by adding houses at a different location that operates as a separate business—perhaps with a new partner—the new location is counted as an entry. Two existing large farms could also combine to form a million-dollar farm.

The organization of new million-dollar farms suggests that they often draw on resources from more than one individual, since sole proprietorships are uncommon among these farms. For example, only 18 percent of \$5-million entrants were organized as sole proprietorships. Another 27 percent were organized as partnerships, virtually all of them formal partnerships (registered under State law). Fifty-three percent were incorporated, either as family corporations (66 percent of new corporations) or as nonfamily corporations (34 percent). Approximately 59 percent of the new nonfamily corporations had more than 10 stockholders, as did 18 percent of the family corporations.

Following Farms Back Through Time

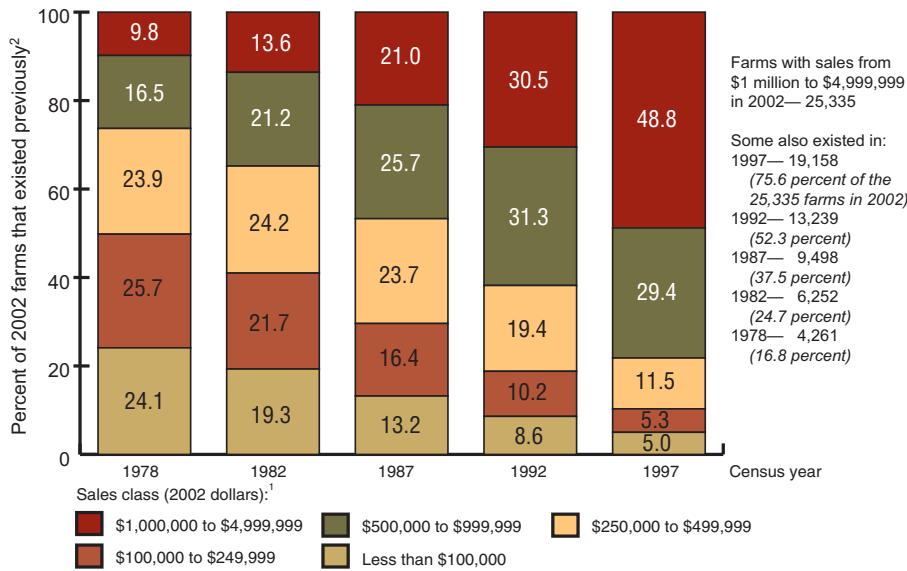
It is possible to trace the history of individual farms. Figures 2 and 3 distribute farms in each of the million-dollar sales classes in 2002 by their constant-dollar sales for the previous census years. Forty-nine percent of farms with gross sales between \$1 million and \$4,999,999 in 2002 that also existed in 1997 had sales in the same range in 1997. The percentage dropped as we looked further back in time (fig. 2). Only 10 percent of the farms from 2002 that existed in 1978 had sales of at least \$1 million that year, while 50 percent had less than \$250,000 in sales.

In contrast, most farms that existed in previous years with sales of \$5 million or more in 2002 had at least \$1 million in gross sales in the earlier years (fig. 3). The smaller million-dollar farms (sales from \$1 million to \$4,999,999) that existed before 2002 appear to have grown into the \$1-million class over time, while most \$5-million farms sold at least a million dollars of products from the beginning.

Figure 2

Farms with sales of \$1 million to \$4,999,999 in 2002, by constant-dollar sales class,¹ 1978-1997

The share with sales of \$1 million or more falls off rapidly in earlier years



Note: Items may not add to totals due to rounding.

¹Sales class is expressed in constant 2002 dollars, using the Producer Price Index for farm products.

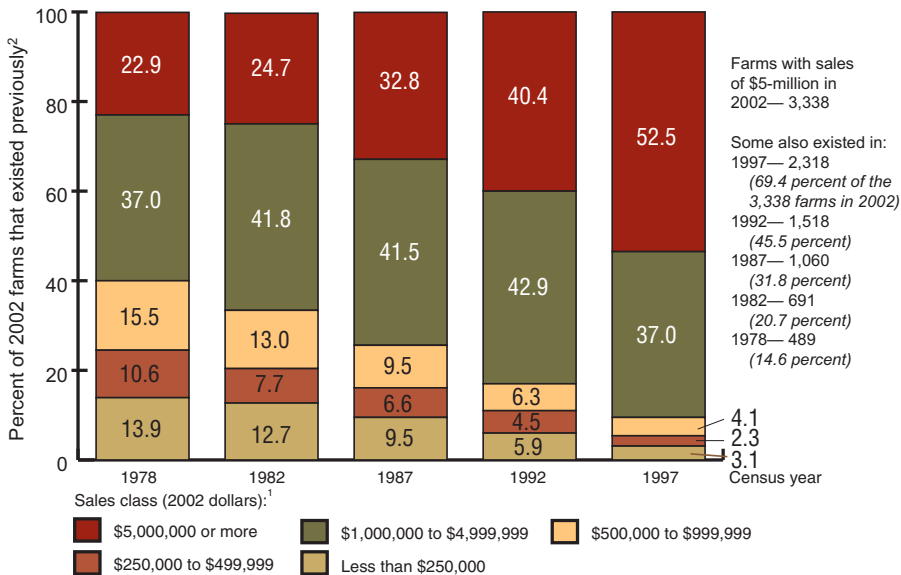
²Distributions are based on the number of farms in 2002 that also existed in previous years. For example, the first bar shows the distribution of the 4,261 farms in 2002 that also existed in 1978.

Source: USDA, Economic Research Service, compiled from the 2002 Census of Agriculture Longitudinal File.

Figure 3

Farms with sales of \$5 million or more in 2002, by constant-dollar sales class,¹ 1978-1997

Most \$5-million farms had sales of at least \$1 million in earlier years



Note: Items may not add to totals due to rounding.

¹Sales class is expressed in constant 2002 dollars, using the Producer Price Index for farm products.

²Distributions are based on the number of farms in 2002 that also existed in previous years. For example, the first bar shows the distribution of the 489 farms in 2002 that also existed in 1978.

Source: USDA, Economic Research Service, compiled from the 2002 Census of Agriculture Longitudinal File.

Shift to ARMS Data

The rest of this report uses ARMS data rather than census data, since ARMS provides more recent and more detailed information. The census and ARMS provided similar estimates of the number of million-dollar farms. The ARMS count of million-dollar farms in 2002 was close to the census count, especially for farms with gross sales between \$1 million and \$4,999,999 (table 3). The census has traditionally done a better job covering the largest farms (Banker and MacDonald, 2005), because of intensive efforts to get responses from large or unique operations (USDA, NASS, 2004). By 2006, the ARMS count of million-dollar farms was 35,100. However, the difference between the 2002 and 2006 ARMS estimates was not statistically significant.⁵

Table 3
Number of million-dollar farms, by sales class and data source, 2002

Sales class	2002 census	2002 ARMS	2002 ARMS/ 2002 census
	<i>Number</i>		<i>Percent</i>
Million-dollar farms	28,673	27,202	94.9
\$1,000,000 to 4,999,999	25,335	*25,211	99.5
\$5,000,000 or more	3,338	1,991	59.6

* = standard error is between 25 and 50 percent of the estimate.

Source: 2002 Census of Agriculture and 2002 Agricultural Resource Management Survey, Phase III.

⁵Gross farm sales in ARMS include Government payments received by the farm and its share landlords. We did not remove these payments from ARMS sales—to be consistent with the measure of sales used in the census data—because we wanted to examine the receipt of Government payments among million-dollar farms. Removing Government payments from sales would have reduced the ARMS count of million-dollar farms by only 5 percent in 2006.

Share of Farms, Gross Farm Sales, and Government Payments

Like the 2002 Census of Agriculture, ARMS data show million-dollar farms making up a disproportionately large share of gross farm sales, given their small share of farms. Million-dollar farms made up 2 percent of all U.S. farms in 2006 and held 13 percent of farm assets (including land), but reported 48 percent of farm product sales (fig. 4).

Government Payments

Million-dollar farms receive only 16 percent of U.S. Government payments to farmers (table 4), which is small compared with their 48-percent share of sales. Most Government payments are commodity-related or targeted at current or past production of specific commodities, largely feed and food grains, cotton, and oilseeds (see box, “Farm Program Payments”). Receipt of commodity-related payments historically has been proportional to harvested acres of program crops. Million-dollar farms, particularly those with sales of \$5 million or more, harvest a small share of the acres supporting these crops. Thirty-five percent of million-dollar farms (including 53 percent of \$5-million farms) receive no Government payments at all compared with the 21- or 27-percent share for other large-farm sales classes.

Individual Commodities

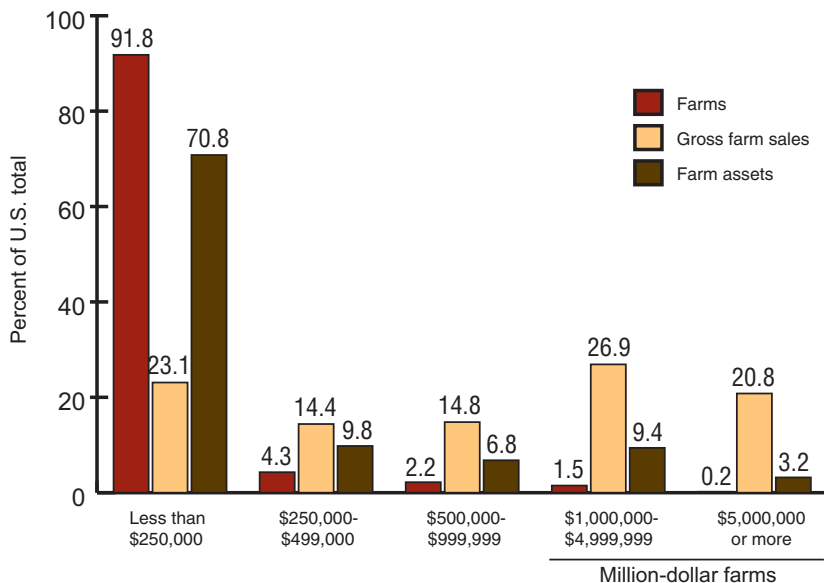
Million-dollar farms also accounted for a 48-percent share of the value of production, a measure similar to sales that excludes the effects of inventory change on sales.⁶ As shown in figure 5, million-dollar farms account for even

⁶The value of production measures crops and livestock produced in a given year and excludes the effects of inventory changes (unlike gross farm sales). It is calculated by multiplying the quantity of commodities grown by the price of the commodity. In some cases, quantities are not available from ARMS, and cash sales are used as a proxy for price multiplied by the quantity. These cases generally involve perishable commodities, such as high-value crops, livestock, and livestock products sold without a contract. Sales from inventory are less of an issue for perishable commodities. Note that the value of production excludes the value of crops grown to feed livestock on the same farm.

Figure 4

Distribution of farms, gross farm sales, and farm assets, by sales class, 2006

Million-dollar farms account for 2 percent of farms, but 48 percent of sales



Note: Items may not add to totals due to rounding.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

Table 4

Distribution of Government payments and harvested acres of program crops, by sales class, 2006

Item				\$1,000,000 or more			All farms
	Less than \$250,000	\$250,000- \$499,999	\$500,000- \$999,999	All	\$1,000,000- \$4,999,999	\$5,000,000 or more	
<i>Number</i>							
Total farms	1,912,457	90,239	45,857	35,121	31,145	3,976	2,083,674
<i>Percent of farms in sales class</i>							
Payments received:							
None	60.1	21.0	26.8	35.4	33.2	52.5	57.3
Only conservation ¹	9.5	1.3	2.0	3.1	3.2	1.9	8.9
Only commodity-related ¹	23.9	53.4	47.2	43.5	44.4	36.4	26.0
Both types of payments	6.5	24.3	23.9	18.1	19.2	9.2	7.9
All farms	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>Percent of U.S. total</i>							
Government payments	46.6	20.5	16.7	16.2	14.3	1.9	100.0
Conservation ¹	78.5	9.5	6.2	5.7	4.8	0.9	100.0
Commodity-related ¹	38.8	23.2	19.2	18.8	16.6	2.2	100.0
Harvested acres of program crops ²	36.2	26.6	20.4	16.8	15.5	1.3	100.0

Note: Items may not add to totals due to rounding.

¹For definitions of conservation program payments and commodity-related payments, see box below.

²Corn, cotton, peanuts, rice, sorghum, soybeans, tobacco, barley, oats, wheat, canola, and other oilseeds.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

Farm Program Payments

The payments covered by the 2006 Agricultural Resource Management Survey (ARMS) can be sorted into two major categories.

1. **Commodity-related:** Direct payments, countercyclical payments, loan deficiency payments, marketing loan gains, net value of commodity certificates, milk income loss contract payments, agricultural disaster payments, and any other State, Federal, and local payments.
2. **Conservation:** Payments from the Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP), Wetlands Reserve Program (WRP), Environmental Quality Incentives Program (EQIP), and Conservation Security Program (CSP).

Since ARMS contacts only farm operators, the survey excludes farm program payments made to people who do not farm, mainly nonoperator landlords.

more of the value of production for particular commodities: high-value crops (72 percent), dairy products (59 percent), hogs (58 percent), poultry (55 percent), and beef (52 percent). The larger five-million-dollar farms alone account for 41 percent of the sales of high-value crops, 35 percent of the sales of beef cattle, and 27 percent of milk production. According to the 2002 Census of Agriculture, a large share of million-dollar beef farms are feedlots: 44 percent of farms with sales between \$1 million and \$4,999,999 and 83 percent for farms with sales of \$5 million or more.

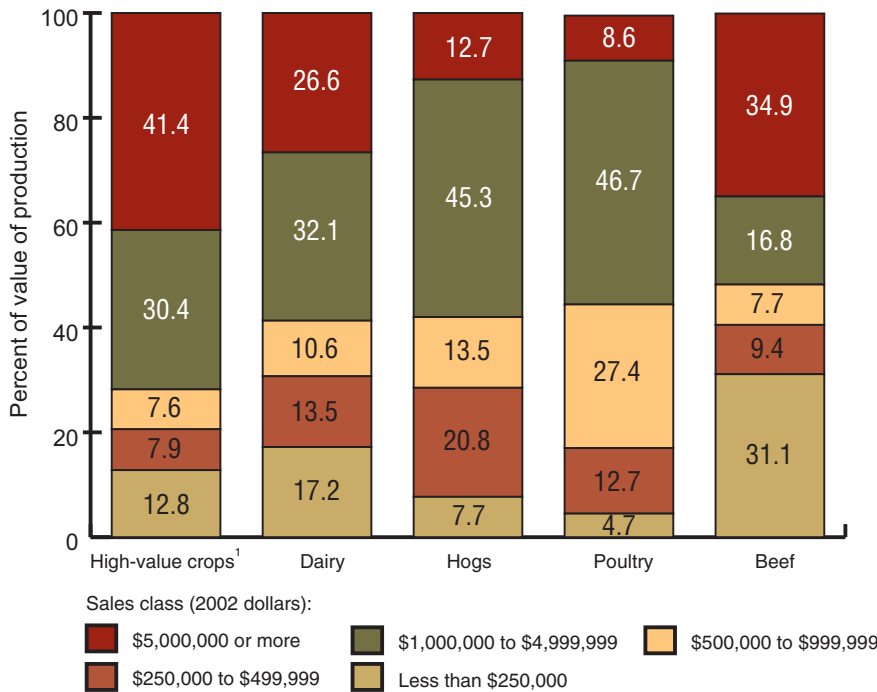
The large share of dairy, beef, hog, and poultry production by million-dollar farms reflects the movement of livestock production from an open environment to climate-controlled buildings, which makes production less dependent on the weather. Other technologies—disease control, handling, transportation, and nutrition—have increased the number of production cycles per year. These technological advancements helped standardize production, making it easier for farms to operate on a large scale (Allen and Lueck, 1998).

High-value crops—other than some horticultural specialties—are generally produced outdoors, like other crops. Other characteristics of these crops, however, make their production more routine, encouraging large-scale farming (Allen and Lueck, 1998). High-value crops are often irrigated, which reduces the variability of harvest. These crops may require a large amount of labor relative to other crops, but the labor is applied in a restricted area, which makes it easier to supervise. In areas like California, several plantings and harvests of vegetables may occur in a year, which means labor can be used on a more constant basis.

Figure 5

Distribution of the value of production for selected commodities, 2006

Million-dollar farms sell most of several commodities



Note: Items may not add to totals due to rounding.

¹Vegetables, fruits and tree nuts, and nursery and greenhouse products.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

Specialization, Farm Size, and Tenure

Due to the large share of specific commodities sold by million-dollar farms, they obviously specialize in different commodities than other large farms. Million-dollar farms specialize less in cash grains, but more in high-value crops and hogs, than farms in either of the other large-farm sales classes (table 5). Other major specializations for million-dollar farms include beef, dairy, and poultry. Million-dollar farms also account for a relatively large percentage of the farms in some specializations (fig. 6). Six percent of farms specializing in high-value crops sell at least \$1 million of products, as do 8 percent of dairy farms, 13 percent of cotton farms, 15 percent of hog farms, and 17 percent of poultry farms.

Farms with more than \$5 million in sales have concentrated on three specializations—high-value crops, beef, and dairy—which account for 82 percent of the farms in this sales class (table 5). The prevalence of these specializations

Table 5
Farm specialization, by sales class, 2006

Item				\$1,000,000 or more			All farms
	Less than \$250,000	\$250,000-\$499,999	\$500,000-\$999,999	All	\$1,000,000-\$4,999,999	\$5,000,000 or more	
	<i>Number</i>						
Total farms	1,912,457	90,239	45,857	35,121	31,145	3,976	2,083,674
	<i>Percent</i>						
Commodity specialization: ¹							
Cash grain ²	11.0	42.0	34.8	13.7	15.3	d	12.9
Cotton	0.2	3.6	5.8	4.2	4.6	d	0.6
Other field crops ³	25.8	5.0	8.3	6.2	6.8	d	24.2
High-value crops ⁴	5.4	9.2	9.0	20.2	18.3	34.9	5.9
Beef	35.7	14.1	10.8	15.0	13.7	25.1	33.9
Hogs	0.6	3.9	4.6	8.2	8.6	d	0.9
Dairy	2.0	12.6	9.5	13.8	12.9	21.5	2.8
Poultry	0.8	7.3	15.4	17.0	18.5	5.3	1.7
Other livestock ⁵	18.5	2.3	1.7	1.6	1.2	d	17.1
All farms	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Items may not add to totals due to rounding.

d = data suppressed due to insufficient observations.

¹Commodity that accounts for at least half of the farm's value of production.

²Includes wheat, corn, soybeans, grain sorghum, rice, and general cash grains, where no single cash grain accounts for the majority of production.

³Tobacco, peanuts, sugar beets, sugar cane, corn for silage, sorghum for silage, hay, canola, and general crops, where no single crop accounts for the majority of production. Also includes farms with all cropland in the Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP), and Wetlands Reserve Program (WRP).

⁴Vegetables, fruits and tree nuts, and nursery and greenhouse products.

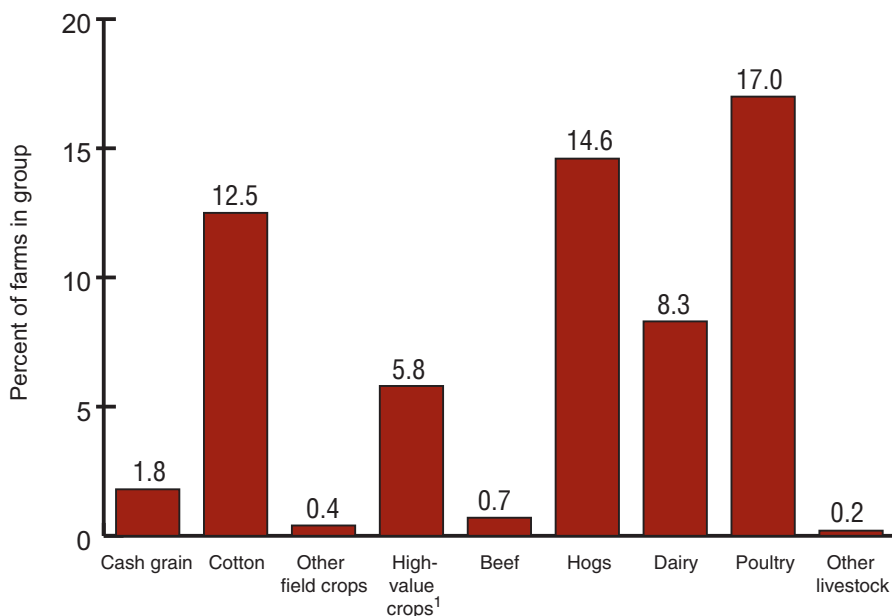
⁵Includes sheep, lambs, wool, goats, goats' milk, mohair, horses, ponies, mules, donkeys, bees, honey, aquaculture, mink, rabbits, other fur-bearing animals, bison, deer, elk, llamas, etc. Also includes farms where no single livestock species accounts for the majority of production.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

Figure 6

Share of farms with sales of \$1 million or more, by specialization, 2006

Million-dollar farms make up a large percentage of poultry, hog, cotton, dairy, and high-value crop farms



¹Vegetables, fruits and tree nuts, and nursery and greenhouse products.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

among \$5-million farms suggests major economies of scale in the production of high-value crops, finished beef cattle, and milk even when sales pass \$5 million.

Farm Size

As one might have anticipated, average acreage operated increases with sales volume. Average farm size increases from 281 acres for farms with sales less than \$250,000 to 3,400 acres for all million-dollar farms (table 6). Average acreage increases as sales increase from the \$1,000,000-\$4,999,999 level to \$5 million or more, but this increase is not statistically significant.

Average acreage operated is not the best indicator of the size of a typical farm in a group, because a few high-acreage farms in a particular group can raise the average well above the acreage operated on most farms. Median acreage operated—the midpoint of the distribution of farms by acres operated—is a better indicator of farm size. In the case of million-dollar farms, average acres operated greatly exceeds median acres operated because of a few extensive cattle ranches.

A different pattern between acreage and sales class emerges if medians are used. Median acres operated increases with sales until the \$1-million level. The median for million-dollar farms is approximately 200 acres less than the corresponding estimate for farms with sales between \$500,000 and \$999,999. A larger share of million-dollar farms specialize in relatively low-acreage

Table 6

Farm acreage and tenure, by sales class, 2006

Item	\$1,000,000 or more						All farms
	Less than \$25,000	\$250,000- \$499,999	\$500,000- \$999,999	All	\$1,000,000- \$4,999,999	\$5,000,000 or more	
	<i>Number</i>						
Total farms	1,912,457	90,239	45,857	35,121	31,145	3,976	2,083,674
	<i>Percent of U.S. total</i>						
Acres of farmland:							
Owned	68.7	11.4	7.9	12.1	10.7	1.4	100.0
Operated	59.6	16.0	11.0	13.4	11.7	1.6	100.0
	<i>Acres per farm</i>						
Average (mean) acres operated	281	1,602	2,168	3,430	3,398	3,682	432
Owned	203	712	968	1,946	1,933	2,052	271
Rented in	106	915	1,230	1,532	1,505	*1,743	190
Rented out	28	*25	30	48	39	*114	29
Median acres operated ¹	84	825	1,258	1,045	1,064	983	100
	<i>Percent of group</i>						
Tenure:							
Full owner	66.3	18.4	21.4	30.1	28.6	42.0	62.7
Part owner	27.8	70.5	65.8	56.3	58.6	38.2	31.0
Tenant ²	5.8	11.1	12.8	13.6	12.8	19.7	6.3
All farms	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Items may not add to totals due to rounding.

* = standard error is between 25 and 50 percent of the estimate.

¹Midpoint of the distribution of farms by acres operated. Half the farms in a group operate more acres than the median, while the other half operate fewer acres than the median.

²Farms that rent all the land they operate. Also includes farms owning less than 1 percent of the land they operate.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

commodities (high-value crops, hogs, and dairy) than farms with sales just under \$1 million, whose main specialization is cash grain, a high-acreage commodity.

Tenure

Renting is commonly used to control land without the debt and commitment of capital associated with land ownership. Full ownership of the land farmed is common among small farms but is less common among large farms, where a greater share of farms rent, either as part owners or tenants. Depending on the sales class, 20 to 30 percent of farms with sales greater than \$250,000—including million-dollar farms considered as a whole—own all the land they farm.

Farms with sales greater than \$5 million, however, are an exception: 42 percent are full owners. These full-owners farm a median of 460 acres or half the 980-acre median for all \$5-million farms. Eighty percent of these \$5-million full owners specialize in beef, dairy, or high-value crops. Feedlots and dairy farms do not require large acreages if most of the feed is bought rather than grown. As pointed out earlier in the box, “A Million Dollars in Sales,” specialty crops can generate high revenue on a small acreage.

Business Organization

Most U.S. farms (92 percent) are sole proprietorships, but the share of farms organized as such declines with sales (table 7). For farms with \$1 million or more in sales, only 45 percent of farms are sole proprietorships. Million-dollar farms are more commonly organized as partnerships or corporations than are smaller farms, and these forms of organization account for 64 percent of gross sales from million-dollar farms. C-corporations and S-corporations are most prevalent among farms with sales of \$5 million or more. Fifty-one percent of \$5-million farms are incorporated compared with only 31 percent of the smaller million-dollar farm.

U.S. farms are seldom part of a larger firm, such as a company that processes farm products. Even among smaller million-dollar farms—those with sales less than \$5 million—only 3 percent report that they are a subsidiary of another company. Ten percent of \$5-million farms, however, are part of larger companies.⁷ About 82 percent of these \$5-million subsidiaries specialize in either high-value crops or beef.

Limited liability companies (LLCs) are a relatively new form of organization allowed under State law (U.S. Department of the Treasury, Internal Revenue Service, 2008). LLCs provide business owners with limited liability for debts and actions of the business, management flexibility, and pass-through taxation. LLCs are not common among lower-sales farms and do not exceed 10 percent of farms until sales reach \$1 million. They are most common among farms with sales of \$5 million or more, 27 percent of which are LLCs.

Ninety-seven percent of all farms are “family farms,” where the majority of the business is owned by the operator and the operator’s relatives (see box, “What Is a Family Farm?”). Proportionally fewer million-dollar farms are family operations, but 84 percent are still family-operated and these family farms account for 73 percent of the gross sales from million-dollar farms. Family farms make up a smaller share of all farms and production once sales pass \$5 million. Nevertheless, most \$5-million farms are still family farms.

Nearly half of the nonfamily million-dollar farms are also nonfamily corporations (fig. 7). These nonfamily corporations, however, are not large, publicly held companies; 89 percent had no more than 10 stockholders. Even nonfamily farm corporations with sales of at least \$5 million usually had fewer than 10 stockholders.

⁷The difference between the 3-percent estimate for smaller million-dollar farms and the 10-percent estimate for \$5-million farms is statistically significant only at the 90 percent level.

Table 7

Business organization of farms, by sales class, 2006

Item				\$1,000,000 or more			All farms
	Less than \$250,000	\$250,000- \$499,999	\$500,000- \$999,999	All	\$1,000,000- \$4,999,999	\$5,000,000 or more	
<i>Number</i>							
Total farms	1,912,457	90,239	45,857	35,121	31,145	3,976	2,083,674
<i>Percent of group</i>							
Farms by business organization:							
Sole proprietorship ¹	93.6	76.4	67.9	45.4	48.3	22.6	91.5
Legal partnership ²	3.2	11.6	13.0	22.2	22.1	22.9	4.1
C-corporation ³	0.7	6.0	9.2	15.1	14.3	21.4	1.3
S-corporation ³	1.3	5.3	8.9	15.9	14.2	29.4	1.9
Other ⁴	1.2	0.8	1.1	1.4	1.0	3.8	1.2
All farms	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gross farm sales by business organization:							
Sole proprietorship ¹	86.9	75.6	67.1	33.8	44.5	20.0	57.0
Legal partnership ²	6.2	11.7	13.5	24.7	23.5	26.1	16.9
C-corporation ³	2.1	6.4	9.4	18.7	14.7	23.9	11.7
S-corporation ³	3.1	5.5	8.9	20.7	15.9	26.9	12.7
Other ⁴	1.7	0.7	1.1	2.1	1.3	3.1	1.6
All sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Farm is part of larger firm or corporation: ⁵							
Share of farms	1.4	d	d	3.8	3.1	*10.4	1.4
Share of gross farm sales	0.9	d	d	*8.3	3.4	*15.6	4.3
Limited liability company: ⁶							
Share of farms	2.1	5.8	7.7	14.5	13.0	26.9	2.6
Share of gross farm sales	3.6	5.7	7.7	21.6	14.4	31.0	13.1
Family farm: ⁷							
Share of farms	97.5	95.5	92.2	84.3	86.8	64.3	97.1
Share of gross farm sales	94.9	95.4	92.1	72.9	85.0	57.1	84.0

Note: Items may not add to totals due to rounding.

d = data suppressed due to insufficient observations.

* = standard error is between 25 and 50 percent of the estimate.

¹Includes informal partnerships, such as those between spouses.

²Includes only partnerships registered under State law.

³A C-corporation is legally separate and distinct from its owners, shareholders, or stockholders. The corporation is formed by filing articles of incorporation. An S-corporation—or small business corporation—provides the benefits of incorporation while being taxed like a partnership or sole proprietorship.

⁴Estates, trusts, cooperatives, and grazing associations.

⁵Excludes contractual arrangements with totally separate firms. From version 1 of the 2006 ARMS.

⁶Limited liability companies (LLCs) are also reported in the more traditional categories above (proprietorships, partnerships, etc.), which LLCs use when paying taxes.

⁷Any farm where the majority of the business is owned by the operator and individuals related to the operator.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

What Is a Family Farm?

There is no hard and fast definition of “family farm.” The ideal definition would allow for changes in the way operators structure their farm businesses as they respond to changes in technology, the marketplace, and policies, but still capture the general concept of a family farm in which a family maintains majority control and ownership.

The definition of family farm used by the Economic Research Service (ERS) has changed over time. The current definition, as used in this report, includes any farm where the majority of the business is owned by the operator—or the principal operator on multi-operator farms—and individuals related to the operator by blood or marriage, including relatives who do not live in the operator’s household. In 2006, 97 percent of farms in the Agricultural Resource Management Survey (ARMS) were classified as family farms under this definition.

Prior to the adoption of the current definition, all farms were family farms, unless they were organized as cooperatives or nonfamily corporations, held in estates or trusts, or operated by a hired manager. ARMS typically classified 98 percent of farms as family farms using this definition.

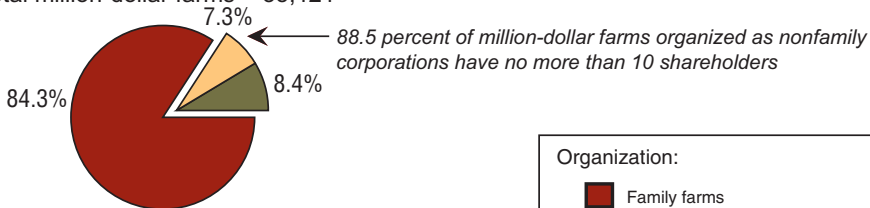
For more information, see “Family Farm” in the ERS briefing room on Farm Household Economics and Well-Being at: <http://www.ers.usda.gov/Briefing/WellBeing/glossary.htm#familyfarm>.

Figure 7

Organization of million-dollar farms, 2006

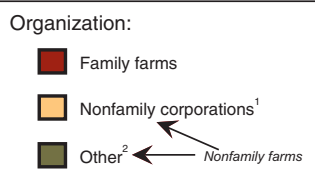
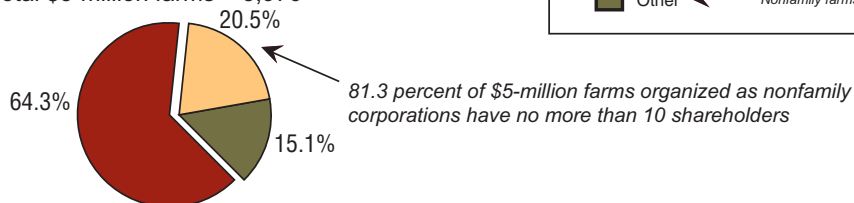
Most million-dollar farms are family farms...

Total million-dollar farms = 35,121



...even those with sales of \$5 million or more

Total \$5-million farms = 3,976



Note: Items may not add to totals due to rounding.

¹Corporations where the operator and their relatives do not have a majority ownership interest.

²Estates, trusts, cooperatives, grazing associations, and any unincorporated farm businesses where the operators and their families do not hold a majority ownership interest.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III. (Number of shareholders from version 1.)

Operator Characteristics

Every farm has at least one operator, or a farmer who makes day-to-day decisions about the farm business. Some farms—particularly larger ones—have more than one operator who makes decisions. In such cases, one operator is designated as the principal operator, the one most responsible for running the farm, and the others are secondary operators. The count of principal operators also includes sole operators on single-operator farms.

Principal Operators

Principal operators of million-dollar farms are similar to their counterparts on other large farms. The average age of operators in the large-farm sales classes falls between 51 and 53 years, with no statistically significant differences among sales classes (table 8). Similarly, most operators of million-dollar farms—like the operators of other large farms—report that their primary occupation is farming.

Table 8

Age, education, and occupation of principal operators, by sales class, 2006

Item				\$1,000,000 or more			All farms
	Less than \$250,000	\$250,000-\$499,999	\$500,000-\$999,999	All	\$1,000,000-\$4,999,999	\$5,000,000 or more	
	<i>Number</i>						
Total principal operators	1,912,457	90,239	45,857	35,121	31,145	3,976	2,083,674
	<i>Years</i>						
Average age	57	53	52	52	53	51	57
	<i>Percent of group</i>						
Age:							
Younger than 35 years	4.2	8.1	6.3	6.1	5.6	*10.1	4.5
35 to 44 years	11.1	16.5	17.0	17.1	17.4	15.2	11.6
45 to 54 years	26.5	31.3	36.5	35.5	34.8	40.4	27.0
55 to 64 years	29.0	28.1	25.7	27.3	27.7	24.7	28.9
65 years or older	29.2	16.0	14.6	13.9	14.5	*9.7	28.1
All principal operators	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Operator is retired	21.5	3.0	3.0	1.9	2.1	0.8	20.0
Occupation:							
Farm or ranch work	39.0	91.5	95.7	96.4	96.2	98.4	43.5
Work other than farming	48.6	7.9	4.0	3.1	d	d	45.1
Not in the paid workforce	12.4	0.5	0.3	0.5	d	d	11.4
All principal operators	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Education:							
Less than high school diploma	10.5	4.8	4.5	4.6	4.9	1.5	10.0
High school diploma	41.9	37.4	38.2	39.1	37.9	48.0	41.6
Some college	22.7	27.8	28.8	25.4	26.5	17.1	23.1
College graduate and beyond	25.0	30.1	28.4	31.0	30.7	33.3	25.4
All principal operators	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Items may not add to totals due to rounding.

d = data suppressed due to insufficient observations.

* = standard error is between 25 and 50 percent of the estimate.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

The share of large-farm operators who graduated from college ranges between 28 and 33 percent for each sales class. One major difference in educational attainment exists between operators of \$5-million farms and other large farms. Forty-eight percent of the operators of \$5-million farms reported a high-school diploma (but no college), 10 or 11 percentage points more than operators of other large farms. Operators of \$5-million farms may rely more on experience over formal education than operators of other large farms.

The largest differences in demographic characteristics occur between large and small farms, not among the various large-farm sales classes. For example, 29 percent of small-farm operators are at least 65 years old, compared with 10 to 16 percent of large-farm operators; and 39 percent of small-farm operators report farming as their primary occupation, compared with nearly all large-farm operators.

Secondary Operators

In addition to principal farm operators, secondary operators work on approximately 950,500 multiple-operator farms (table 9). The number of operators per farm increases with farm size, because commercial-size farms often require more management and labor than one individual can provide. The number of operators per farm reaches 2.1 operators—on average—for million-dollar farms as a whole and peaks at 2.6 operators for farms with sales greater than \$5 million. Multiple-operator farms account for a 66-percent share of million-dollar farms.

About 6 percent of all farms (and 14 percent of multiple-operator farms) are multiple-generation farms, with at least 20 years' age difference between the oldest and youngest operators. Multiple-generation farms make up a larger share of million-dollar farms (23 percent) than any other sales class (fig. 8), probably because million-dollar farms have a large enough business to support the financial needs of more than one generation.

Because farms are generally family businesses, one would expect family members to serve as secondary operators. In fact, 75 percent of all secondary operators on small farms are spouses (table 9). Although the share of large farms where the spouse is an operator is fairly constant—roughly 30 percent of farms until sales reach \$5 million—the spousal share of secondary operators declines as sales increase and secondary operators other than spouses are added. For all million-dollar farms, only 26 percent of secondary operators are spouses.

Spouses work as operators on only 11 percent of \$5-million farms and make up a 7-percent share of secondary operators in that sales class. Five-million-dollar farms are less likely to be family farms than other farms—as discussed earlier—which means that the farms are not closely held by the operators and their households. As a result, there may be less financial incentive for their household members to participate in the farm business. In addition, farms with sales of \$5 million—family or nonfamily—may require more time from secondary operators than spouses can provide.

Table 9

Multiple-operator farms, by sales class, 2006

Item				\$1,000,000 or more			All farms
	Less than \$250,000	\$250,000- \$499,999	\$500,000- \$999,999	All	\$1,000,000- \$4,999,999	\$5,000,000 or more	
<i>Number</i>							
Total operators ¹	2,838,076	147,857	78,400	72,932	62,426	10,506	3,137,264
Principal operators ²	1,912,457	90,239	45,857	35,121	31,145	3,976	2,083,674
Secondary operators	925,619	57,618	32,543	37,811	31,281	6,530	1,053,590
Spouses	698,139	28,319	14,533	9,639	9,195	443	750,630
Other	227,479	29,299	18,010	28,172	22,086	6,086	302,960
<i>Percent of farms</i>							
Spouse is an operator ³	36.5	31.4	31.7	27.4	29.5	11.2	36.0
<i>Percent of secondary operators</i>							
Spousal share of secondary operators	75.4	49.1	44.7	25.5	29.4	*6.8	71.2
<i>Number</i>							
Operators (principal and secondary) per farm	1.5	1.6	1.7	2.1	2.0	2.6	1.5
<i>Percent of farms</i>							
Farms by number of operators:							
One	55.3	47.6	44.9	33.6	33.5	34.5	54.4
Two	41.6	42.7	43.5	43.6	44.8	33.6	41.7
Three	2.5	8.2	8.5	15.0	14.8	16.1	3.1
Four or more	0.5	1.5	3.1	7.8	6.8	15.8	0.8
All farms	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>Number</i>							
Multiple-operator farms ⁴	854,704	47,260	25,264	23,304	20,698	2,606	950,533
<i>Percent</i>							
Multiple-operator farms' share of:							
All farms	44.7	52.4	55.1	66.4	66.5	65.5	45.6
Gross farm sales	46.1	52.7	55.4	64.9	66.6	62.8	57.4

Note: Items may not add to totals due to rounding.

* = standard error is between 25 and 50 percent of the estimate.

¹The Agricultural Resource Management Survey counts all operators—principal and secondary—and asks for detailed information on up to three operators.

²The number of principal operators equals the number of farms. Each farm has one principal operator.

³Calculated for farms with or without a spouse present.

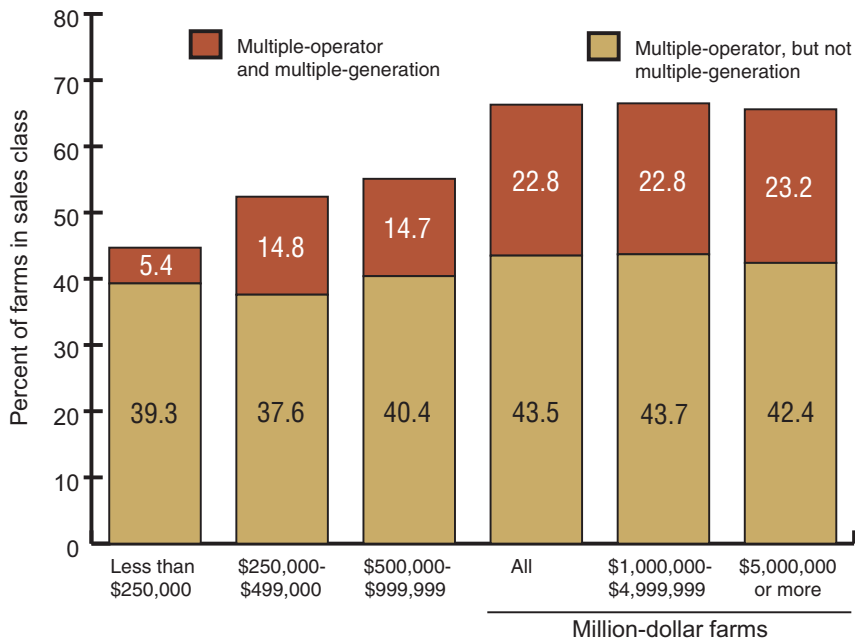
⁴Multiple-operator farms report more than one operator.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

Figure 8

Multiple-operator and multiple-generation farms, by sales class, 2006

Multiple-generation farms are most common among million-dollar farms



Note: Multiple-operator farms are defined as farms with more than one operator. Multiple-generation farms are multiple-operator farms with a difference of at least 20 years between the ages of the youngest and oldest operators.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

Farm and Household Finances

Farm profits are strongly associated with farm size (fig. 9). The three sales classes below \$25,000 operate at a large percentage loss. The profit margin remains negative, although to a lesser degree, until sales reach \$175,000. The average profit margin then increases to 20 percent for million-dollar farms with sales less than \$5 million and peaks at 26 percent for farms with sales of \$5 million or more. The same general pattern—operating profit margin increasing with sales—applies regardless of specialization.

Standard Financial Performance Measures

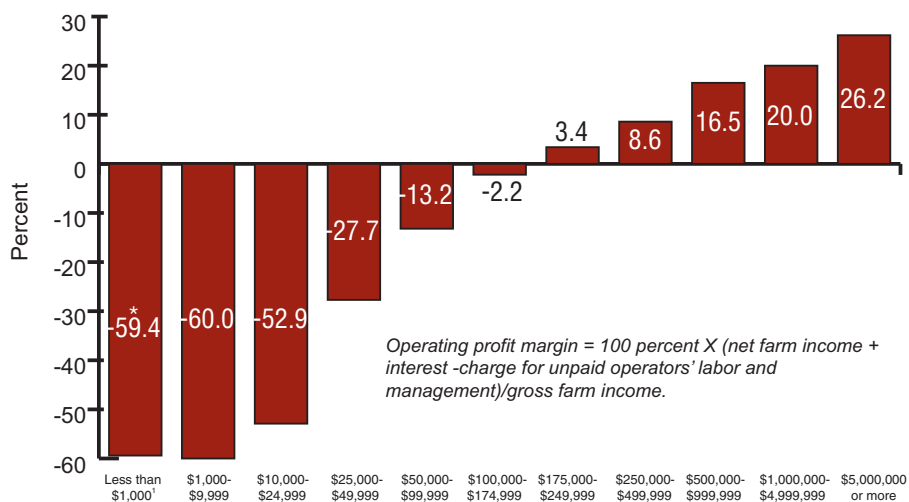
A pattern similar to that for the operating profit margin also appears for other profitability measures, even when fewer sales classes are used (table 10). The rates of return on assets and equity are negative for farms with sales less than \$250,000, but beyond that sales class they are positive, increase with sales, and are highest for million-dollar farms, particularly those with sales of \$5 million or more.

In some respects, however, million-dollar farms are similar to other large farms. The share of farms with positive net farm income is fairly constant among large farms, just under 80 percent, regardless of sales class. The operating expense ratio varies in a fairly narrow range, from 73 to 79 percent once sales exceed \$250,000. The situation is similar for the debt/asset ratio, which ranges from 11 to 15 percent—increasing with sales—for farms in the three sales classes between \$250,000 and \$4,999,999.

Figure 9

Operating profit margin, by sales class, 2006

Operating profit margin increases with sales, once sales pass \$10,000



*= standard error is between 25 and 50 percent of the estimate.

¹Point farms have sales of less than \$1,000, but are still considered farms because they would be expected to normally sell at least \$1,000 of agricultural products.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

Table 10

Selected financial performance measures, by sales class, 2006

Item	\$1,000,000 or more						
	Less than \$250,000	\$250,000- \$499,999	\$500,000- \$999,999	All	\$1,000,000- \$4,999,999	\$5,000,000 or more	All farms
	<i>Number</i>						
Total farms	1,912,457	90,239	45,857	35,121	31,145	3,976	2,083,674
	<i>Percent</i>						
Profitability measures:							
Rate of return on assets ¹	-1.4	1.7	4.3	9.1	6.3	17.6	0.6
Rate of return on equity ²	-1.9	0.9	3.8	9.5	6.0	21.0	0.0
Operating profit margin ³	-23.1	8.6	16.5	22.6	20.0	26.2	4.5
	<i>Dollars per farm</i>						
Income measures:							
Gross cash farm income	31,271	343,069	647,748	2,511,632	1,644,037	9,307,770	100,149
Net farm income	7,801	70,042	150,006	601,502	360,779	2,487,159	23,633
	<i>Percent</i>						
Farms with positive net farm income	63.6	77.7	79.8	78.8	78.7	79.6	64.8
Financial efficiency measure:							
Operating expense ratio ⁴	94.4	79.1	75.7	74.4	75.2	73.3	81.0
	<i>Dollars per farm</i>						
Balance sheet:							
Total assets	662,677	1,951,205	2,663,172	6,420,914	5,400,336	14,415,423	859,563
Total liabilities	36,767	220,368	365,605	1,095,585	783,490	3,540,324	69,803
Net worth	625,909	1,730,837	2,297,566	5,325,329	4,616,846	10,875,100	789,761
	<i>Percent</i>						
Solvency measure:							
Debt/asset ratio ⁵	5.5	11.3	13.7	17.1	14.5	24.6	8.1
Solvency and income measure:							
Financial position: ⁶							
Favorable	61.4	70.8	69.6	64.1	65.3	55.1	62.0
Marginal-income	33.4	17.8	16.2	14.2	14.4	*12.6	32.1
Marginal-solvency	2.2	6.9	10.1	14.7	13.4	24.5	2.8
Vulnerable	2.9	4.5	4.1	7.0	6.9	7.9	3.1
All farms	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Items may not add to 100 due to rounding.

* = standard error is between 25 and 50 percent of the estimate.

¹Return on assets = 100% X (net farm income + interest paid - charge for unpaid operators' labor and management) / total assets.

²Return on equity = 100% X (net farm income - charge for unpaid operators' labor and management) / net worth.

³Operating profit margin = 100% X (net farm income + interest paid - charge for unpaid operators' labor and management) / gross farm income.

⁴Operating expense ratio = 100% X total cash operating expenses / gross cash farm income.

⁵Debt/asset ratio = 100% X total liabilities/total assets.

⁶Financial performance classification based on farm income and debt/asset ratio:

- Favorable: positive net farm income and debt/asset ratio of no more than 40 percent.
- Marginal-income: negative net farm income and debt/asset ratio of no more than 40 percent
- Marginal-solvency: positive net farm income and debt/asset ratio greater than 40 percent.
- Vulnerable: negative net farm income and debt/asset ratio greater than 40 percent.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

The debt/asset ratio, however, is higher for \$5-million farms (25 percent) than for other large farms. The high debt/asset ratio for \$5-million farms is also reflected in the large shares of farms classified as marginally solvent (25 percent) or vulnerable (8 percent). Farms in either of these categories—by definition—have debt/asset ratios greater than 40 percent.⁸

A high debt/asset ratio is not necessarily a problem, however, as long as the rate of return on assets exceeds the interest rate on the funds borrowed. On average, farms with sales greater than \$5 million generate more net cash income per dollar of assets (or net worth) than other farms, and the larger gross cash income can be used to pay interest or reduce loan balances (fig. 10). These farms are taking on more financial risk, but they also employ strategies to manage this risk. For example, about two-thirds of \$5-million farms use marketing or production contracts. In addition, \$5-million farms are more likely than smaller farms to be organized as corporations and LLCs, which means the operators' personal assets are not at risk.

Farm Operator Household Income

The median income for households operating million-dollar farms was high in 2006: approximately \$151,800 per household for those with farm sales between \$1 million and \$4,999,999 and \$572,700 per household for those with sales of \$5 million or more (fig. 11).⁹ In contrast, the median household income was just \$54,800 for all U.S. farm households—as reported in the 2006 ARMS—and \$48,200 for all U.S. households (DeNavas-Walt et al., 2007). The income of million-dollar households came largely from farm sources. Households operating the two groups of million-dollar farms each received a median off-farm income of roughly \$25,000, which is on a par

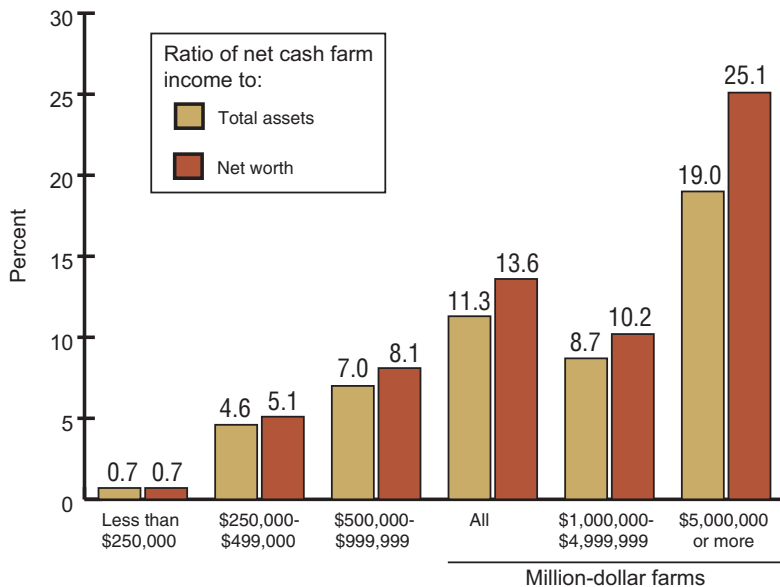
⁸Marginally solvent farms have positive net farm income and a debt/asset ratio greater than 40 percent, while vulnerable farms have negative net farm income and a debt/asset ratio greater than 40 percent. See footnote six of table 10 for more information.

⁹The income estimates discussed in this section are for the household of the principal operator of a farm. Any income received by the households of secondary operators is excluded.

Figure 10

Ratio of net cash farm income to assets and net worth, by sales class, 2006

The ratios are highest for \$5-million farms



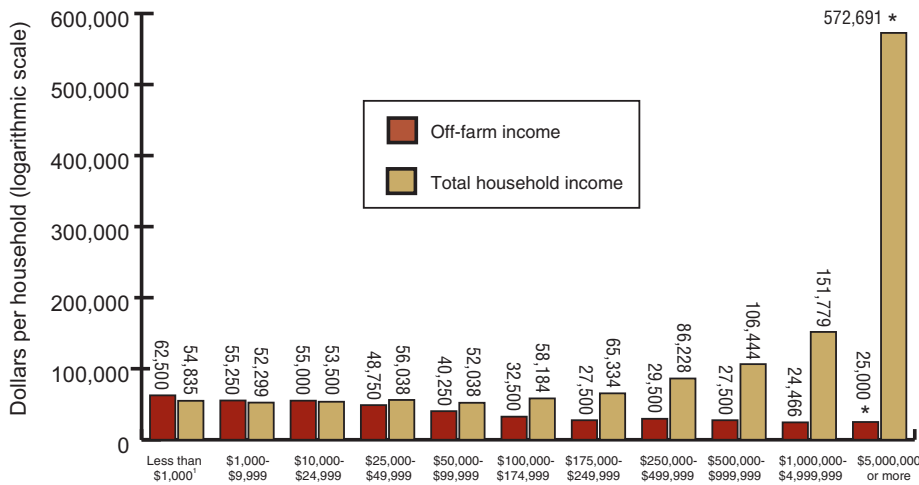
Note: Net cash income was adjusted by adding interest expense back in.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

with other large-farm households, but less than half the \$53,500 median for all U.S. farm households.

Figure 11 explains how farm households selling less than \$175,000 in sales can continue to operate, despite their negative average operating profit margins. Operators of these small farms do not completely exit farming because they have substantial off-farm income—particularly operators of farms with less than \$100,000 in sales—and because they may be farming for reasons other than net income. Among these reasons are the potential for capital gains, losses from farming to write-off against other income for taxation purposes, and a rural lifestyle (Ahearn et al., 2004; Hoppe et al., 2005). Many small farms stay in business as long as the operator households have other sources of income and farm losses are not unduly and persistently large. The \$1,000 sales cutoff in the farm definition means that many small farms are actually rural residences rather than farm businesses.

Figure 11
Median income of principal operator households, by sales class, 2006
Total operator household income increases with sales for large farms



Note: A logarithmic scale is used because of the large range in total household income. Farm earnings are not shown, because negative values cannot be plotted on log charts, and farm earnings are negative for the first three sales classes.

*= standard error is between 25 and 50 percent of the estimate.

¹Point farms have sales of less than \$1,000, but are still considered farms because they would be expected to normally sell at least \$1,000 of agricultural products.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

Farm Business Arrangements

Million-dollar farms use a variety of business arrangements that link them to other firms and individuals in order to access or control productive resources. The key to agricultural production is the control of assets, but control can be accomplished through renting land (discussed earlier) and other assets rather than buying them outright. Similarly, farms can use hired/contract labor or custom work rather than family labor. Farms may also link to other firms through marketing or production contracts to sell or remove the commodities they produce. Farm operations can also serve as contractors themselves.

Accessing Resources and Labor

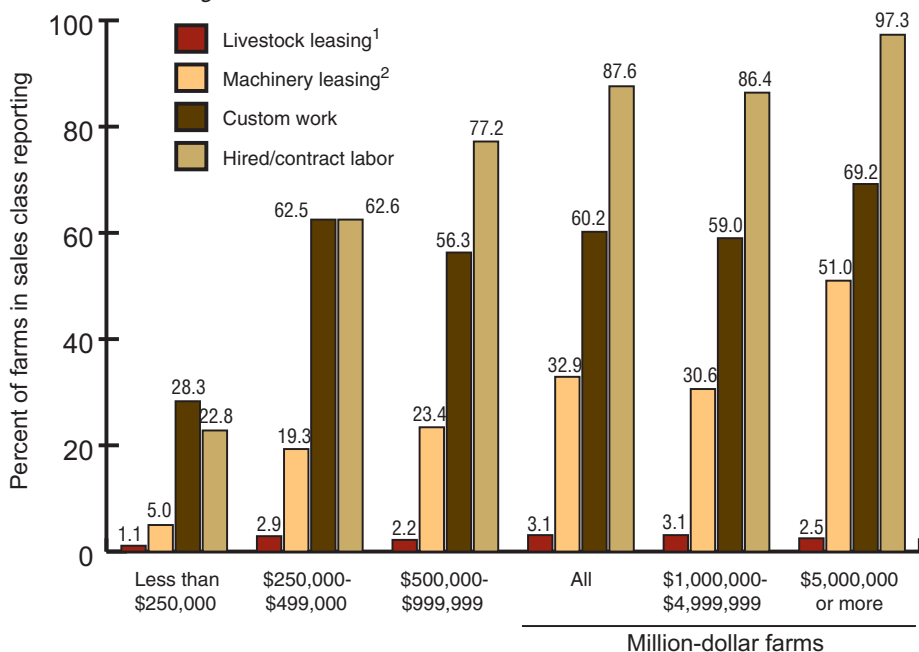
Million-dollar farms often rely on machinery leasing, custom work, and hired/contract labor (fig 12). Thirty-one percent of smaller million-dollar farms rent machinery, and the rental rate increases to 51 percent for farms with sales of at least \$5 million. Fifty-nine percent of farms with sales between \$1 million and \$4,999,999 use custom work, approximately the same share as smaller large farms, but less than the 69-percent share for \$5-million farms.

Farms rent livestock infrequently, regardless of the level of their sales. Farms specializing in dairy or high-value crops rent livestock most often, but their overall rental rates are still low. About 3 percent of all dairy farms rent livestock, and this share does not vary much by sales class. A 4-percent share of

Figure 12

Selected methods of input procurement, by sales class, 2006

Machinery leasing, custom work, and hired/contract labor are most common among farms with sales greater than \$5 million



¹Includes leasing bees for pollination.

²Renting or leasing tractors, vehicles, farm machinery and equipment, and storage structures.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

farms specializing in high-value crops also rent livestock, namely bees for pollination. The share renting bees, however, is more for million-dollar farms and other large farms (around 10 percent) than the 3-percent share for small farms.

Hours of Labor

The use of hired/contract labor increases steeply with sales class, starting at 23 percent of farms with sales less than \$250,000 and reaching 97 percent for \$5-million farms. On average, million-dollar farms use about 36,500 hours of labor per farm per year or 18.2 “annual person equivalents,” where an annual person equivalent is defined as one person working 40 hours per week for 50 weeks (table 11). Most of the labor on million-dollar farms is either hired (72 percent) or contracted (13 percent), with most of the balance provided by principal and secondary operators.¹⁰

Smaller farms use less labor—as one would expect—and the principal operator and spouse account for a larger share of labor hours. Farms in the \$500,000 to \$999,999 sales class use 4.4 annual person equivalents, and principal operators and spouses account for 39 percent of the labor used, compared with just 10 percent on million-dollar farms.

Farms with sales of \$5 million or more use about 68 annual person equivalents of labor, nearly 6 times that used by farms with sales between \$1 million and \$4,999,999. In part, this is simply a reflection of the size of \$5-million farms, since the labor necessary to produce \$100,000 of sales is similar—about .6 annual person equivalents—for both sales classes.

Capital/Labor Ratio

Labor is used in conjunction with assets. The capital used per annual labor equivalent is lower for million-dollar farms than for smaller farms, due largely to a lower value for real estate (fig. 13). The ratio is particularly low for farms with sales of \$5 million or more (\$212,000 per annual labor equivalent).

High-value crop farms account for 60 percent of labor used on million-dollar farms, and these farms dominate the labor statistics for the group. Because high-value crop farms tend to be labor intensive rather than capital intensive compared with other specializations—such as cash grain farms (table 12)—they pull down the capital/labor ratio for all million-dollar farms.

Contracting

Contracting can provide benefits to both producers and contractors (MacDonald and Banker, 2005). Farmers have a guaranteed outlet for their production with known compensation, while contractors get an assured supply of commodities with specified characteristics, delivered in a timely manner. ERS identifies two types of contracts in ARMS:

1. **Production contract:** A legal agreement between a farm operator (contractee) and another person or firm (contractor) to produce a specific type, quantity, and quality of agricultural commodity. The

¹⁰Different versions of the ARMS are conducted each year to collect information useful for specific purposes. All five versions of the 2006 ARMS collected the number of hours worked on farms by the principal operator, the spouse of the principal operator, other operators, and unpaid workers. (ARMS does not differentiate between operators' management and labor hours.) Version 1 of the survey also collected the number of the hours worked by hired laborers. Hours of hired labor on the other versions were estimated by dividing cash wages for hired labor by the State-specific wage rate for farm labor. No versions of the survey collected hours of contract labor, so an estimate was made by dividing contract labor expense by the State wage rate.

Table 11

Sources of farm labor, by sales class, 2006

Item				\$1,000,000 or more			All farms
	Less than \$250,000	\$250,000- \$499,999	\$500,000- \$999,999	All	\$1,000,000- \$4,999,999	\$5,000,000 or more	
	<i>Number</i>						
Total farms	1,912,457	90,239	45,857	35,121	31,145	3,976	2,083,674
	<i>Annual hours per farm</i>						
Mean hours worked	2,231	6,410	8,865	36,494	23,724	136,526	3,135
	<i>Percent of total hours</i>						
Share of total hours worked by:							
Principal operator ¹	57.1	45.5	34.1	8.4	13.0	2.2	45.1
Spouse ¹	14.2	8.3	4.6	1.3	2.1	0.3	10.6
Other operators ¹	4.8	11.2	10.4	5.1	7.3	2.0	5.8
Unpaid workers	5.5	3.5	2.5	0.7	1.1	0.1	4.2
Hired labor	16.6	28.2	41.7	71.8	65.0	81.2	30.0
Contract labor	1.9	3.3	6.7	12.6	11.5	*14.2	4.4
All sources	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	<i>Annual person equivalents per farm</i>						
Total annual person equivalents ²	1.115	3.205	4.432	18.247	11.862	68.263	1.568
	<i>Annual person equivalents² per \$100,000 of gross sales</i>						
Labor per \$100,000 in gross sales	4.187	0.907	0.624	0.608	0.622	0.591	1.480
	<i>Percent of farms</i>						
Farms by annual person equivalents: ²							
Less than 5	98.9	88.2	73.9	40.2	44.2	8.9	96.9
5 to 9.999	0.9	10.2	19.5	24.7	26.0	14.8	2.1
10 to 19.999	d	d	5.4	15.6	15.5	16.2	0.5
20 or more	d	d	1.2	19.5	14.3	60.1	0.5
All farms	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Items may not add to totals due to rounding.

d = data suppressed due to insufficient observations.

* = standard error is between 25 and 50 percent of the estimate.

¹Includes paid and unpaid hours.

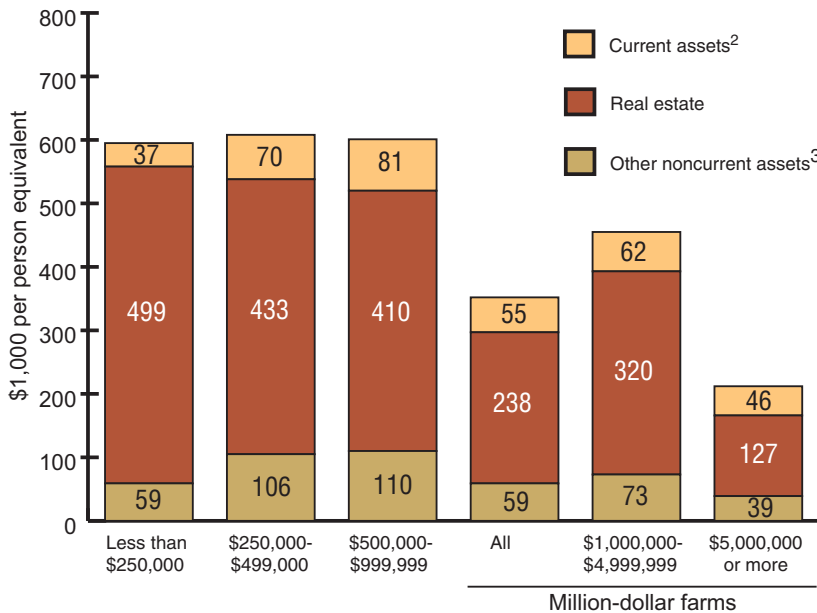
²One annual person equivalent equals 2,000 hours or 50 weeks per year times 40 hours per week.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

Figure 13

Capital/labor ratio,¹ by type of asset and sales class, 2006

The ratio is lowest for million-dollar farms, especially farms with sales of \$5 million or more



¹Farm business assets divided by the number of annual person equivalents.

²Cash, assets that will be converted to cash within a year, and assets that will be used up within a year.

³Assets used in more than one year—other than real estate—such as machinery, equipment, and breeding stock.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

Table 12

Labor and capital on million-dollar farms specializing in cash grains or high-value crops, 2006

Item	Cash grain	High-value crops
	<i>Number</i>	
Number of farms	4,829	7,090
	<i>Acres per farm</i>	
Median acres owned	*700	160
	<i>Annual person equivalents per \$100,000 of sales</i>	
Labor per \$100,000 of sales	0.358	1.363
	<i>Dollars per farm</i>	
Assets per annual person equivalent:	836,333	158,643
Current assets ¹	155,196	26,581
Real estate	509,417	117,718
Other noncurrent assets ²	171,720	14,345

Note: Items may not add to totals due to rounding.

* = standard error is between 25 and 50 percent of the estimate.

¹Mostly inventories.

²Mostly machinery and equipment.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

contractor usually owns the commodity being produced and the farm receives a service fee.¹¹

2. **Marketing contract:** The contractor buys a known quantity and quality of a commodity from a farm for a negotiated price (or pricing mechanism). The farm owns the commodity while it is being produced and receives a price that reflects the value of the commodity.

Contracting is common among million-dollar farms and farms with sales just under \$1 million. Sixty-three percent of million-dollar farms—in both sales classes—have production or marketing contracts, about the same share as farms with sales from \$500,000 to \$1 million, but more than the share for smaller farms (table 13). About half of the value of production on million-dollar farms is under contract, 7 percentage points higher than farms with sales just under \$1 million. Livestock account for 70 percent of production under contract on million-dollar farms.

¹¹For farms with production contracts, only the fees—rather than the value of the commodities removed—are included in gross cash farm income. The value of commodities removed, however, is included in sales. Measuring farm size by gross cash income rather than sales would reduce the number of million-dollar farms among some specializations, such as poultry farms (Hoppe et al., 2007).

Table 13
Farms with contracts, by sales class, 2006

Item				\$1,000,000 or more			All farms
	Less than \$250,000	\$250,000-\$499,999	\$500,000-\$999,999	All	\$1,000,000-\$4,999,999	\$5,000,000 or more	
	<i>Number</i>						
Total farms	1,912,457	90,239	45,857	35,121	31,145	3,976	2,083,674
	<i>Percent of group</i>						
Farms with contracts ¹		6.9	49.8	62.4	62.5	62.5	62.6
Value of production under contract ²		17.5	32.5	42.9	50.0	47.0	53.7
	<i>Percent of U.S. total</i>						
Farms with contracts ¹		58.1	19.7	12.6	9.6	8.5	1.1
Value of production under contract ²		10.2	12.1	15.7	62.1	31.9	30.2
Value of production not under contract		30.9	16.0	13.4	39.8	23.1	16.7
	<i>Percent of group</i>						
Farm acts as contractor ³		d	d	3.3	4.2	*3.2	12.2
	<i>Percent of U.S. total</i>						
Farm acts as contractor ³		d	d	28.2	26.9	18.1	8.9

Note: Items may not add to totals due to rounding.

d = data suppressed due to insufficient observations.

¹Farms reporting production under production contracts, marketing contracts, or both.

²Includes commodities under production or marketing contracts.

³Another operation grows livestock (including poultry) for the farm under a contract arrangement.

Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey, Phase III.

Although they make up only 10 percent of all farms with contracts, million-dollar farms account for 62 percent of the value of production under contract and a 40-percent share of production not under contract. Two commodities make up 61 percent of this noncontract production on million-dollar farms: high-value crops (37 percent) and beef (24 percent). Cash grain and beef account for most noncontract production—65 to 70 percent, depending on the sales class—on smaller farms.

Farms can also serve as contractors. The 2006 ARMS questionnaire asked if any other any operations produced livestock—including poultry—under a contract arrangement for the farm being interviewed. Less than 1 percent of all U.S. farms reported acting as a contractor, but the percentage was higher as sales approached \$1 million. Three percent of farms in the two sales classes between \$500,000 and \$4,999,999 contracted livestock production to other farms. The share increased to 12 percent for \$5-million farms.

Conclusions and Implications

Three significant implications regarding million-dollar farms can be drawn from the information presented:

1. The shift in production to million-dollar farms is likely to continue. As long as the operating profit margin is proportional to sales class, million-dollar farms will have a competitive advantage. The shift in production may eventually slow, however, once million-dollar farms' shares of the commodities most amenable to large-scale production reach their upper limits.
2. There are still a sufficient number of million-dollar farms to prevent individual farms' domination agriculture or individual commodities. Concentration of production, however, may be a more significant concern when the owners of commodities—which include production contractors—are considered, rather than just the farms producing them.
3. Most million-dollar farms are family operations, although the operator and spouse supply only a small fraction of the labor. Direct ownership of million-dollar farms by nonfarm corporations is infrequent, but such corporations are frequently involved with million-dollar farms through contracting.

Continuing Shift to Million-Dollar Farms

The shift in production to larger farms has gone on for decades and is likely to continue. Million-dollar farms (and farms growing to that size) have a competitive advantage relative to smaller farms, reflecting economies of size in farming.¹² These farms are able to take advantage of the forces that drive the structure of agriculture to a large-scale manufacturing model—identified by Gray and Boehlje (2007)—including technological change, economic/financial innovations (such as outsourcing and multisite production), adapting general business management skills to farming, and coordinating farm production with suppliers and processors.

About three-quarters of current million-dollar farms specialize in five commodities: high-value crops, dairy, hogs, poultry, and beef (specifically feedlots). Million-dollar farms already account for half to three-fourths of the production of each of these commodities, and future shifts in the production of these commodities to million-dollar farms are likely. Eventually, however, some upper limit on the production of each commodity by million-dollar farms will be reached. The upper limit is currently unknown but will probably vary by commodity, and may approach 100 percent in some cases. At that point, any further increases in million-dollar farms' share of total agricultural production will come from producers specializing in other commodities. The positive relationship between the level of sales and operating profit margins applies for all specializations, so the competitive advantage for expanding farms also applies for specializations beyond the five listed.

Future shifts in production to million-dollar farms, however, may not be as dramatic as those seen from 1982 to 2002 once the upper limits are reached

¹²Discussions of economies of scale in dairy and hog production appear in MacDonald et al. (2007) and Key and McBride (2007).

for the five commodities. Other commodities have characteristics that make them less amenable to large-scale production. Grain growers, for example, have only one production cycle per year and highly seasonal use of labor. Million-dollar grain farms existed in 2006, but they accounted for only 2 percent of all cash grain farms, versus 8 percent of dairy farms. In addition, 18 percent of the million-dollar dairies had sales of \$5 million or more, but hardly any million-dollar grain farms sold that much. Shifts in production to million-dollar farms based on commodities less favorable to large-scale production may be more gradual, barring innovations in their production process.

Nevertheless, even if million-dollar farms' share of production slows or stabilizes, there still may be substantial upward shifts in production. As long as economies of scale exist for farms with sales of \$5,000,000 or more, production can shift from the smaller million-dollar farms to those with sales greater than \$5 million. In fact, the rate of growth in farm numbers during the last intercensus period—1997 to 2002—was greater for \$5 million dollar farms (42 percent over the 5-year period) than for farms with sales from \$1 million to \$4,999,999 (35 percent), based on calculations from table 1.

Concentration of Production

The shift in farm production to million-dollar farms reflects a long-term concentration of farm production on fewer farms that has been underway since at least the beginning of the 20th century (Hoppe, 2006). Farm policy debates about farm structure often focus on how soon the largest farms will dominate the production of commodities by commercial agriculture (Stanton, 1993).

Farming is not concentrated when compared with other U.S. industries, including those selling inputs to farmers and those buying farm products. There are still too many million-dollar farms (35,100) for an individual farm to hold much market power and dominate agriculture. Even when individual specializations are examined, production is not dominated by a few farms. Among million-dollar farms, for example, there are 7,100 high-value crop farms, 2,900 hog farms, 4,900 dairy farms, and 6,000 poultry farms.

Nevertheless, concentration may be approaching a level where it becomes a concern for specific commodities. The individual specializations used in ARMS for this analysis may include a variety of commodities, and ARMS data do not allow us to say much about concentration of individual commodities included in the specialization. The high-value crop specialization in particular includes a large number of specialty crops. Data on acres harvested from the 2002 Census of Agriculture suggest that production of some specialty crops occurs on a relatively small number of farms. For example, the 58 largest producers of head lettuce (out of 830 total producers) in 2002—each harvesting at least 1,000 acres of the crop—accounted for 65 percent of the total acreage in head lettuce. As another example, the 77 largest broccoli producers (out of 2,493 total producers)—each with at least 500 harvested acres of the crop—accounted for 69 percent of the total harvested acres.

Concern over the formation of monopolies or oligopolies does not become an issue in other industries until a small number of firms dominate the industry. For example, under the *Horizontal Merger Guidelines*—prepared by the U.S. Department of Justice and the Federal Trade Commission (1997) to evaluate proposed mergers—antitrust concerns would arise if a merger resulted in an industry of only four or five equal-sized firms (Kwoka and White, 2004). The same could be said for four firms accounting for 70 percent of the industry’s production. By these standards, agricultural production is not concentrated, even if the number of farms dominating the production of a particular commodity falls to the point where it is measured in hundreds instead of thousands. Even lettuce and broccoli production would not currently be considered concentrated under the guidelines.

Concentration in agriculture can be more pronounced, however, if *ownership* of the commodity produced is considered, rather than farms producing it. Consider hogs as an example. Farmers will contract with a firm—often a large corporation such as a packing company—to take custody of the contractor’s hogs and feed them out (Key and McBride, 2007). The contractor may own thousands of hogs located on multiple farms. Lawrence and Grimes (2007) estimate that 27 entities marketing (or removing) at least 500,000 hogs per year accounted for 43 percent of U.S. hog sales in 2006. But even in this case, the industry is not highly concentrated by the standards used in antitrust analyses.

The concentration of farm production has not elicited legislation to regulate the market power of farms or processors. However, the concentration of livestock production on fewer farms—dairy, hogs, poultry, and beef in the case of million-dollar farms—raises an environmental issue due to the manure associated with confined livestock production. Federal, State, and local governments have reacted with a variety of regulations (Ribaudo and Gollehon, 2006). The U.S. Environmental Protection Agency (EPA) introduced regulations in 2003 under the Clean Water Act to control the runoff of manure nutrients from the largest livestock feeding operations.

Million-Dollar Farms Are Family Farms

Million-dollar farms are overwhelmingly family operations. Eighty-four percent operate as family farms, and only 7 percent are organized as nonfamily corporations, generally with no more than 10 stockholders. The situation is similar for the largest million-dollar farms—those with sales of \$5 million or more—although a smaller share are classified as family operations (64 percent) and a larger share as nonfamily corporations (21 percent), again generally with no more than 10 stockholders.

Direct ownership of million-dollar farms by large, publicly held nonfarm corporations is negligible, but somewhat more important for larger farms. Only 3 percent of the smaller million-dollar farms, those with sales less than \$5 million, are part of a larger firm or corporation, while 10 percent of \$5-million farms are part of a larger organization. Nevertheless, large nonfarm corporations are more involved in farming by acting as contractors. Some contractors—approximately 5,400 according to ARMS—are also farms.

By 2006, 39 percent of production was under contract and million-dollar farms accounted for 62 percent of contract production. Further growth in contracting is still possible since some commodities—most grains, for example—are still largely sold in cash markets, while other commodities have not completely shifted to contracts (Hoppe et al., 2007). Much of the growth in contracting will occur on million-dollar farms or farms growing to that size. Large processors lower their transactions costs by establishing long-term relationships with large producers that secure a reliable flow of farm products at a volume allowing them to operate near full capacity and achieve economies of scale (MacDonald et al., 2000).

Although million-dollar farms are generally family operations, most of the labor (84 percent) is hired or contracted. The operator and spouse account for only about 10 percent of total labor hours worked. In contrast, the operator and spouse still account for 39 percent of the labor on farms with sales just under \$1 million, in the \$500,000 to \$999,999 sales class. The heavy use of hired/contract labor on million-dollar farms simply reflects the size of the operations. The availability of farm labor, wage rates, and other labor issues is critical to production on these farms. Smaller farms—because they use more family labor—have greater independence from the local farm labor market.

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APPENDIX: The 2002 Census of Agriculture Longitude File

Data from the 2002 Census of Agriculture Longitudinal File are used in this report to trace the history of million-dollar farms that existed as of 2002. The 2002 file was created by updating the 1997 Census of Agriculture Longitudinal File—which contained data from five previous censuses (1978, 1982, 1987, 1992, and 1997)—with data from the 2002 Census of Agriculture. As a result, individual farm businesses can be tracked from 1978 to 2002. This appendix presents a brief overview of the 2002 Census of Agriculture Longitudinal File. For more detailed information about how longitudinal files are built from the census of agriculture, see Hoppe and Korb (2006) and MacDonald et al. (2007).

Linking Censuses of Agriculture

The 2002 longitudinal file links records from each census for individual farms, using an identification number (ID). The ID identifies a farm operation for a particular census and follows the farm operation through subsequent censuses (up to six). Because continuing farm businesses retain the same ID—while new farm businesses receive new ones—a farm's record for each census can be linked. A farm is defined as going out of business when there is no response to the census questionnaire or the questionnaire is returned with a statement that the establishment is no longer operating as a farm. A farm that has gone out of business (or exited) is coded with a zero in the ID variable field for the year of exit. A farm operation whose ID cannot be matched or linked to a previous record would be considered a new business (an entry) and added to the longitudinal file as a new record.

The longitudinal file follows farm businesses, rather than farm operators. Thus, an operation changing hands does not necessarily mean that the original farm went out of business and a new farm appeared on the longitudinal file. For example, a widow or adult child assuming the operation of the farm upon the death of the operator would not count as an exit. Selling the farm to an unrelated operator, who continues the business as a separate entity, is also not an exit. The operator and farm may not exit together. A common example of dual exit, however, occurs when the farm operator stops farming and rents or sells the land to other farmers who incorporate it into existing operations.

Business Age

Business age on the longitudinal file is based on which census the farm first appears. For example, a farm that appears in the 2002 Census of Agriculture may have entered farming as early as 1998 (immediately after the 1997 Census), but no later than 2002. The farms age would be reported as less than 5 years old as of 2002. Using similar logic, five additional age classes were created, one for each of the remaining census used in the longitudinal file. The six age classes used in this report are outlined in appendix table 1.

Limitations of the Data

The longitudinal file is not truly longitudinal, like the University of Michigan's Panel Study of Income Dynamics (PSID), which was designed to follow households over time. Rather than identifying farms and following them as time progresses, the longitudinal file links data collected in the past for another purpose (the agricultural census). Because the census of agriculture is not designed to track businesses over time, errors linking records in the longitudinal file may lead to an overstatement of exits and entrances. Nevertheless, analysis of the 1997 longitudinal file, predecessor to the 2002 file, shows U.S. farm exits are similar to those in other industries and countries (Hoppe and Korb, 2006).

One problem linking observations across multiple censuses is "whole farm nonresponse," when an operator does not respond to a census after numerous attempts. Some farms classified as exits may have been continuing operations that failed to respond to the census questionnaire. Similarly, some farms classified as entries may be continuing operations that did not respond to the previous census. Nonresponse, however, may be less of an issue for million-dollar farms due to intensive efforts to get responses from large or unique operations (USDA, NASS, 2004).

Appendix table 1

Business age classes

Business age class	Census when farm first appears	Year of entry
Less than 5 years	2002	Between 1998 and 2002
5 to 9 years	1997	Between 1993 and 1997
10 to 14 years	1992	Between 1988 and 1992
15 to 19 years	1987	Between 1983 and 1987
20 to 23 years	1982	Between 1979 and 1982
24 years or more	1978	1978 or earlier

Source: Hoppe and Korb (2006) and MacDonald et al. (2007).