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Updating the ERS Farm Typology

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Updating the ERS Farm Typology

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Abstract

The USDA's Economic Research Service (ERS) farm typology was originally developed to classify farms into relatively homogeneous groups based on their gross farm sales, the primary occupation of their operators, and whether the farms are family farms. Nearly 15 years have passed since ERS first released its farm typology; in this report, we update it to reflect commodity price inflation and the shift of production to larger farms. We also make a technical change, switching the measure of farm size from gross farm sales to gross cash farm income (GCFI), the total revenue received by a farm business in a given year. After the price adjustment, small farms are defined as those with GCFI less than \$350,000, up from the original \$250,000 cutoff. To adjust for the upward shift in production, two groups are added to the typology for farms with GCFI of \$1 million or more, and a midsize group is added for farms with GCFI between \$350,000 and \$999,999.

Keywords: classifying farms, family farms, farm businesses, farm operators, farm operator household income, farm size, farm structure, farm typology, large farms, large-scale farms, midsize farms, million-dollar farms, small farms

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Summary

What Is the Issue?

The USDA’s Economic Research Service (ERS) originally developed a farm typology that sorted farms into seven homogenous groups for reporting and research purposes. Over the years, it has been used extensively in ERS publications and USDA analyses to help clarify the distributional impacts of policy, market, and technological developments.

Nearly 15 years have passed since ERS first released its farm typology. In this report, we update it for two recent trends: commodity price inflation and a shift in production to farms with sales of \$1 million or more. The original farm typology based its groups (in part) on the level of gross farm sales. Since then, inflation in commodity prices—for farm products as well as for farm inputs like feed, fuels, and fertilizers—has increased sales and expenses for farms even when they have had no change in production, shifting some farms into different typology groups solely because of price increases. Adjusting sales for price changes corrects for these shifts.

Meanwhile, shifts of production to million-dollar farms increase the need for information about farms at the upper end of the sales spectrum. We also introduce a technical change in the measurement of farm business size, shifting from gross farm sales to gross cash farm income (GCFI), a better measure of farm revenue given the prevalence of production contracts in livestock production.

Comparing the original and revised typologies

Farm type	Operator’s primary occupation ¹	Original typology <i>Farm size measured by gross farm sales</i>	Revised typology <i>Farm size measured by GCFI²</i>
Small family farms³	Varies	Less than \$250,000	Less than \$350,000
Retirement farms	Retired	Less than \$250,000	Less than \$350,000
Off-farm occupation farms ⁴	Nonfarm	Less than \$250,000	Less than \$350,000
Farming-occupation farms:			
Low-sales	Farming	Less than \$100,000	Less than \$150,000
Moderate-sales ⁵	Farming	\$100,000- \$249,999	\$150,000-\$349,999
Midsized family farms³	Not a criterion	Category not used	\$350,000-\$999,999
Large-scale family farms³	Not a criterion	\$250,000 or more	\$1,000,000 or more
Large farms	Not a criterion	\$250,000-\$500,000	\$1,000,000-\$4,999,999
Very large farms	Not a criterion	\$500,000 or more	\$5,000,000 or more
Nonfamily farms³	Not a criterion	Not a criterion	Not a criterion

¹Occupation at which the operator spent 50 percent or more of his or her work time.

²Gross cash farm income.

³Family farms include any farm where the majority of the business is owned by the operator and individuals related to the operator. Nonfamily farms do not meet that criterion.

⁴Formerly residential/lifestyle farms.

⁵Formerly medium-sales farms.

What Are the Study Findings?

The earliest versions of the typology were based on data from a 1995 USDA survey. Between that year and 2010, the Producer Price Index (PPI) for farm products increased by 41 percent. The revised typology adjusts for this price inflation by increasing the cutoff between small and larger scale farms from \$250,000 to \$350,000 and by increasing the upper bound on low-sales farms from \$100,000 to \$150,000. To address the shift in production, we add two sales classes for farms with sales of at least \$1 million—sales of \$1,000,000 to \$4,999,999 and sales of \$5 million or more.

GCFI focuses on the revenue actually received by the farm business and includes the farm's sales of crops and livestock, receipts of Government payments, and other farm-related income. Gross farm sales differs from GCFI by excluding other farm-related income and by including items that are not revenue to the farm: the value of production accruing to share landlords and production contractors, as well as Government payments accruing to landlords.

The difference between gross farm sales and GCFI is pronounced for farms with livestock production contracts. Contract growers provide labor, capital, and utilities. Contractors, who provide feed as well as young animals to be raised by the growers, pay growers a fee for their services, which is a fraction of gross farm sales. The share of farms with production contracts classified as small farms increases from 26 percent when using gross farm sales to 77 percent when using GCFI.

The revised typology moderately increases the share of farms classified as small. Raising the small-farm cutoff moves 46,400 formerly large-scale farms with sales from \$250,000 to \$349,999 into various small-farm groups. In addition, shifting the measure of farm size to GCFI adds another 17,900 farms to the small-farm categories. As a result, the small-farm share of all farms increases from 88 percent to 91 percent. Roughly 2 percentage points of the 3-percentage-point increase results from raising the small-farm cutoff, and another 1 percentage point results from the shift to GCFI.

The increase in the small-farm share of production is more substantial. The small-farm share of U.S. production increases from 16 percent under the original typology to 29 percent under the revised typology. Five percentage points of the 13-percentage-point increase result from updating the small-farm cutoff for commodity price inflation. The remaining 8 percentage points result from the shift to GCFI as the measure of farm size. Using GCFI in the revised typology moves \$22 billion of production to small family farms, virtually all of it associated with production contracts.

How Was the Study Conducted?

Data in this report are from the Agricultural Resource Management Survey (ARMS) for 1996 to 2010 and the 1995 Farm Costs and Returns Survey, a predecessor to ARMS. ARMS is an annual sample survey designed and conducted by ERS and USDA's National Agricultural Statistics Service.

What's included?

Item	Gross farm sales	Gross cash farm income
Revenue to the farm from:		
Crop and livestock sales	Yes	Yes
Government payments	Yes	Yes
Other farm-related income ¹	No	Yes
Value of production accruing to:		
Share landlords	Yes	No
Contractors	Yes	No
Landlord receipt of		
Government payments	Yes	No

¹Receipts from custom work, machine hire, livestock grazing fees, timber sales, outdoor recreation, production contract fees, etc.

Introduction

USDA's Economic Research Service (ERS) developed its farm typology in 1998. It sorts farms into seven groups based on annual farm sales, the primary occupation of the principal operator, and whether or not the farm is a family farm. Broad descriptions of U.S. farms based on national averages obscure variations among different sizes and types of farms. The ERS typology sorts farms into more homogeneous groups for reporting and evaluation purposes. The most recent version of the original typology identifies four groups of small family farms: retirement, residential/lifestyle, farming occupation/low-sales, and farming-occupation/medium-sales (see box, "Original Farm Typology"). That version also includes large family farms, very large family farms, and nonfamily farms. The typology originally included an additional small-farm category called limited-resource farms, but it was subsequently dropped, as explained later.

The typology has been used extensively in ERS publications—including the last five editions of the *Family Farm Report*—and in various journal articles and conference papers prepared by analysts at ERS, academia, and elsewhere. A widely used ERS Web tool also provides detailed farm financial and structural data for the types of farms laid out by the typology (see <http://www.ers.usda.gov/data-products/arms-farm-financial-and-crop-production-practices/tailored-reports.aspx>).

The ERS farm typology is not the only way to classify farms for analyses. USDA's National Agricultural Statistics Service (NASS) published its own modified version of the farm typology in the 2007 Census of Agriculture (USDA, NASS, 2009, pp. 234-261). The census also provides further reporting with classifications based on acreage, market value of agricultural products sold, and farm specialization.

Some ERS analyses also sort farms into sales classes and do not use the family farm and occupational categories featured in the typology. For example, an ERS study of million-dollar farms grouped all farms with sales less than \$250,000 into one category and focused on larger farms, particularly those with sales of \$1,000,000 to \$4,999,999 and those with sales of \$5,000,000 or more (Hoppe et al., 2008). Another ERS study focused on small farms, using five sales classes for farm with less than \$250,000 in sales (Hoppe et al, 2010).

In another approach to classifying farms, university and ERS researchers developed a farm household typology using cluster analysis (Briggeman et al., 2007). They formed groups of farm households considering—among other characteristics—how both the principal operator and spouse allocated work time between farming and off-farm work.

There are different ways to classify and report farm statistics because users need different types of information. The ERS farm typology provides one useful approach to farm classification, based on (1) a transparent and measurable definition of a family farm, (2) a sales-based approach to sorting by farm size, and (3) the principle that occupation can be an informative way to further sort small farms. ERS has already changed the typology to take account of changes in survey methods and user needs. The substantial increase in commodity prices since 2007 spurred this current evaluation and revision.

Original Farm Typology	
<p>The farm typology focuses on the “family farm,” or any farm where the majority of the business is owned by the operator and individuals related to the operator, including relatives who do not live in the operator’s household. The USDA defines a farm as any place that produced and sold—or normally would have produced and sold—at least \$1,000 of agricultural products during a given year.</p>	
<p>Small family farms (gross sales less than \$250,000)</p>	<p>Large-scale family farms (gross sales of \$250,000 or more)</p>
<p>Retirement farms. Small farms whose operators report they are retired, although they continue to farm on a small scale.</p> <p>Residential/lifestyle farms. Small farms whose operators report a primary occupation¹ other than farming. The category also includes a small number of farms whose operators are not in the labor force.</p> <p>Farming-occupation farms. Small family farms whose operators report farming as their primary occupation.¹</p> <ul style="list-style-type: none"> • Low-sales farms. Gross sales less than \$100,000. • Medium-sales farms. Gross sales between \$100,000 and \$249,999. 	<p>Large family farms. Farms with gross sales between \$250,000 and \$499,999.</p> <p>Very large family farms. Farms with gross sales of \$500,000 or more.</p>
	<p>Nonfamily farms</p>
	<p>Any farm where the operator and persons related to the operator do not own a majority of the business.</p>
<p>Note: There also is a three-category version of the typology, the <i>collapsed farm typology</i>. It consists of residence farms (retirement and residential/lifestyle farms), intermediate farms (low- and medium-sales farms), and commercial farms (large, very large, and nonfamily farms). ¹Occupation at which the operator spent 50 percent or more of his or her work time.</p>	

Enough time has passed—nearly 15 years—since the release of the farm typology for ERS to re-examine and update its original classification scheme, particularly since it is sales-based and sensitive to price changes. This report explains the update. Specifically, we update the typology to accommodate two recent trends: commodity price inflation and a shift in production to farms with sales of \$1 million or more. After updating for these trends, we introduce a technical change in the measurement of farm size, shifting from gross farm sales to gross cash farm income (GCFI). (See box, “Measuring Farm Size.”)

Farm and Operator Household Data

Farm and operator household data in this report come from two annual farm surveys:

- Phase III of the Agricultural Resource Management Survey (ARMS) for 1996 through 2010.
- The Farm Costs and Returns Survey (FCRS) for 1995. The FCRS was a predecessor to ARMS.

ARMS is jointly designed and conducted by ERS and NASS. For more information about ARMS and FCRS, see *ARMS Farm Financial and Crop Production Practices* at: <http://www.ers.usda.gov/data-products/arms-farm-financial-and-crop-production-practices.aspx>.

Measuring Farm Size

Farm size is most commonly measured by acreage operated or by sales. Farm sales is a better measure of economic activity because it reflects the use of all inputs—labor, structures, equipment, and intermediate inputs—and not simply land. Farmland varies in quality, can be farmed at various levels of activity, and can produce a variety of products. Thus, output and sales per acre vary widely.

There are several ways to measure sales, however, and the choice among them matters (Hoppe et al., 2010, pp. 2-4). We consider two measures in this report:

- **Gross farm sales.** The gross market value of the agricultural products sold or removed from a farm, regardless of who receives payment for the products. It is the sum of the revenue received by the farm for crop and livestock sales, the share of production received by any share landlords, the revenue received by production contractors for their products raised on the farm, and all Government payments received by the farm and its landlords.
- **Gross cash farm income (GCFI).** GCFI focuses on the revenue actually received by the farm business. It is calculated as the sum of the farm's crop and livestock sales, Government payments received by the farm, and other farm-related income including fee payments from contractors.

The two measures can differ substantially for farms with production contracts, primarily used in livestock production—particularly in hog and poultry production. In such contracts, a contractor, often called the integrator, provides piglets or chicks, feed, and veterinary services to a farmer, who provides labor, housing, and utilities and raises the animals to maturity. The integrator owns the animals and removes them from the farm for sale or shipment to the integrator's processing plant. The integrator pays the grower a fee for the grower's services; the fee is usually a fraction of the value of the animals and reflects costs borne by the grower. For example, total U.S. contract fees amounted to 11 percent of the total value of U.S. contract production for broilers and 9 percent for hogs in 2010. Feed—the largest production expense—is produced off the farm and provided to the grower by the integrator.

The gross farm sales for a contract hog or poultry operation reflects the value of the animals being removed from the farm, often in excess of \$1 million. But the actual revenue received by the farm—the fee for its services—is much less than gross farm sales. As a result, gross farm sales will usually greatly exceed GCFI for farms with production contracts.

GCFI includes some receipts that are not included in gross farm sales, and therefore GCFI will exceed gross farm sales for some farms. Specifically, GCFI includes farm-related income, such as rentals of land and equipment, income from the provision of custom services (like harvesting or spraying), and income from agricultural tourism (like hunting fees or farm tours).

We chose 1995 as our initial year because the earliest analyses using the typology were based on FCRS data for that year. We use 2010 as our terminal year because the 2010 ARMS data were the most current available when this report was produced. Most of the discussion focuses on 2010, but we also compare 2010 with 1995. In some cases, we examine the whole period from 1995 to 2010.

Earlier Changes in the Farm Typology

Two earlier changes were introduced after the original typology was developed (Hoppe and Banker, 2010, p. 2). First, until 2005, ERS used ARMS information on business organization to classify family farms as those organized as sole proprietorships, partnerships, or family corporations. Nonfamily farms included farms organized as cooperatives or nonfamily corporations, farms held in estates or trusts, and farms with a hired manager. Some of these terms caused ambiguities for respondents, so in 2005 ERS introduced new ARMS questions that allowed a family farm to be identified simply as any farm where the majority of the farm business was owned by the operator and relatives of the operator.

Second, limited-resource farms were dropped as a separate category from the typology in 2005. The USDA-wide definition of limited-resource farms is based on low gross farm sales and low operator household income in both the current year and in the previous year. The definition of limited-resource farms is inconsistent with the definitions of the other groups, which focus on sales class and the operator's occupation in the current year.¹ Although limited-resource farms have been dropped from the typology, ERS still analyzes them and reports on them separately, and will continue to do so (Hoppe and Banker, 2010, pp. 40-45 and 48).

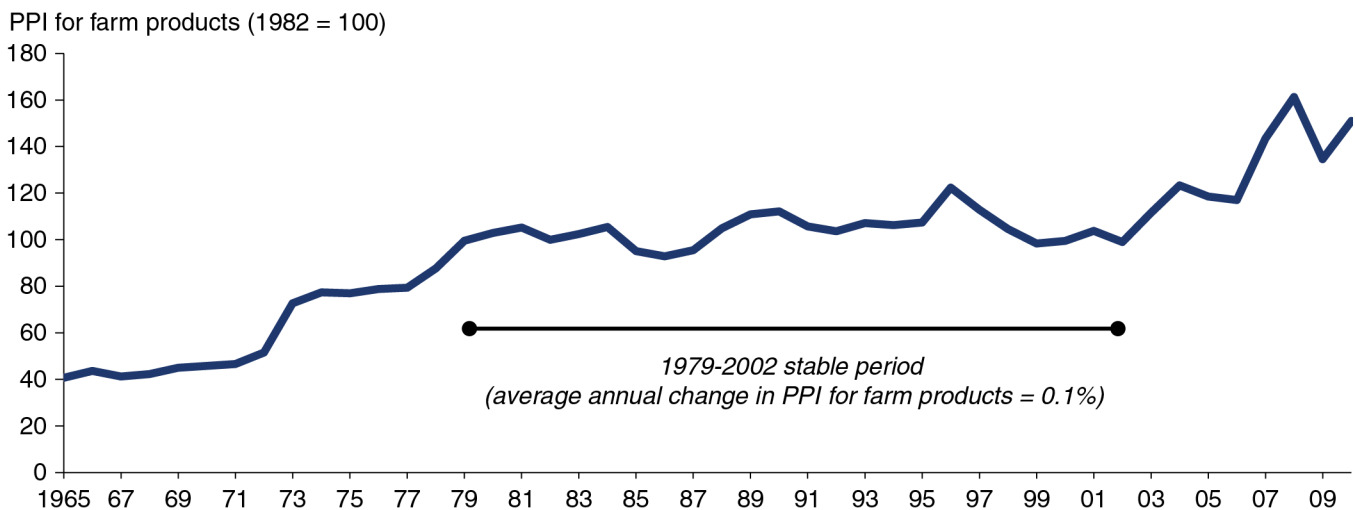
¹ The USDA-wide definition was incorporated into the typology in the 2003 ARMS. Prior to that time, limited-resource farms were identified on the basis of low levels of household income, sales, and farm assets (Hoppe and Banker, 2010, pp. 40-42).

Addressing Recent Trends

We now examine the two recent trends in agriculture that have not been addressed in previous adjustments to the farm typology. First, prices received by farmers increased by 41 percent between 1995 and 2010, with most of the increase occurring after 2002 (fig. 1). Inflation in commodity prices—for farm products and for inputs, such as feed, fuels, and fertilizers—can increase gross farm sales and expenses for a farm, even when no change occurs in production. As a result, a family farm might move from the original small-farm category (gross farm sales less than \$250,000) in 1 year to the large-farm category the next year without any increase in actual production. Over a longer period, persistent increases in commodity prices can move many farms into larger farm categories, without any changes in production or farm practices. Periodically adjusting for such inflation over time, when using sales-based size measures, provides more consistent size categories.

Second, production has been shifting to larger farms, and by building more detail into the large-scale categories in the typology, we can better capture the implications of this shift. Farms with gross farm sales of \$1 million or more have grown rapidly in number and increased their share of production, even when sales are adjusted for price inflation and measured in 2010 dollars. Between 1995 and 2010, the number of these “million-dollar farms” and their value of production grew by 60

Figure 1
Producer Price Index (PPI) for farm products, 1965-2010
The PPI for farm products stabilized from 1979 to 2002



Source: Compiled by the Economic Research Service from Bureau of Labor Statistics data (U.S. Executive Office of the President, 2012, pp. 396-397).

percent and 64 percent, respectively (table 1).² Except for farms with sales between \$500,000 and \$999,999, no other sales class grew as rapidly in number and production. By 2010, million-dollar farms accounted for 52 percent of the sales of agricultural products—up from 39 percent in 1995—although their share of U.S. farms was just over 2 percent.

Table 1
Farms and value of production by constant dollar sales class,¹ 1995 and 2010

Constant dollar sales class (2010 dollars ¹)	Year				Change, 1995 to 2010
	1995		2010		
	<i>Number of farms</i>	<i>Percent of farms</i>	<i>Number of farms</i>	<i>Percent of farms</i>	<i>Percent change</i>
Farms by sales class:					
Less than \$10,000	901,281	43.6	1,306,521	59.6	45.0
\$10,000 to \$99,999	727,322	35.2	514,042	23.4	-29.3
\$100,000 to \$249,999	242,645	11.7	146,788	6.7	-39.5
\$250,000 to \$499,999	116,785	5.6	99,179	4.5	-15.1
\$500,000 to \$999,999	48,897	2.4	76,569	3.5	56.6
\$1,000,000 or more	31,068	1.5	49,675	2.2	59.9
\$1,000,000 to \$4,999,999	28,316	1.4	44,732	2.0	58.0
\$5,000,000 or more	2,752	0.1	4,943	0.2	79.6
All farms	2,068,000	100.0	2,192,774	100.0	6.0
	<i>Mil. 2010 dollars¹</i>	<i>Percent of production</i>	<i>Mil. 2010 dollars¹</i>	<i>Percent of production</i>	<i>Percent change</i>
Value of production by sales class:					
Less than \$10,000	3,426	1.5	3,973	1.4	16.0
\$10,000 to \$99,999	26,783	11.5	19,373	6.8	-27.7
\$100,000 to \$249,999	40,012	17.2	24,187	8.4	-39.6
\$250,000 to \$499,999	39,502	17.0	36,691	12.8	-7.1
\$500,000 to \$999,999	33,198	14.2	54,498	19.0	64.2
\$1,000,000 or more	90,064	38.7	148,031	51.6	64.4
\$1,000,000 to \$4,999,999	50,964	21.9	90,560	31.6	77.7
\$5,000,000 or more	39,100	16.8	57,471	20.0	47.0
All farms	232,986	100.0	286,753	100.0	23.1

Note: Sales class is based on gross farm sales.

¹Sales class and value of production are expressed in 2010 dollars, using the Producer Price Index (PPI) for farm products to adjust for price changes. Both family and nonfamily farms are distributed among the sales classes.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1995 Farm Costs and Returns Survey and 2010 Agricultural Resource Management Survey.

²The value of production measures the value of commodities produced in a given year whether or not they were sold that year. It is calculated by multiplying the amount of each commodity produced by the market price of the commodity. It includes the farm, production contractor, and landlord shares of commodities produced. To avoid double counting, value of production excludes the value of crops grown to feed livestock on the same farm. For more information, see Hoppe et al. (2010, p. 3).

Price Changes

In the original farm typology, three sales levels were used to create the size categories, and they have never been adjusted for price inflation:

- **\$100,000.** This is the dividing line between low-sales farms (gross farm sales less than \$100,000) and medium-sales farms (gross farm sales of \$100,000 to \$249,999) in the original typology. Selection of the \$100,000 cutoff was somewhat arbitrary, but the characteristics of farms with sales less than \$250,000 do differ by sales class. For example, low-sales farms are more often operated by older farmers than is true of medium-sales farms. They also are more likely to specialize in beef cattle and less likely to specialize in cash grains than medium-sales farmers (Hoppe and Banker, 2010).
- **\$250,000.** Earlier research at ERS by Reimund et al. (1986, p. 1-2) established this level of sales to differentiate between large family farms and smaller family farms. Analyses performed by ERS for the National Commission on Small Farms (NCSF)—based on 1995 price and sales data—also determined that sales near \$250,000 were necessary to generate net cash income near the mean income for all U.S. households, which was \$44,900 in 1995 (USDA, NCSF, 1998, p. 28-29; U.S. Department of Commerce, Bureau of the Census, 2012b). Using a 20-percent gross cash margin³ and applying it to the \$250,000 cutoff results in \$50,000 of net cash income, reasonably close to U.S. mean household income at that time.
- **\$500,000.** Sales of \$500,000 divide large farms (gross farm sales between \$250,000 and \$499,999) from very large farms (gross farm sales of \$500,000 or more) in the original typology, as used in Reimund et al. (1986), cited earlier. Sample size was also a consideration in selecting this cutoff. The sample in 1995 was only 8,800 records, compared with 21,600 in 2010. Selecting the \$500,000 cutoff ensured an adequate sample of very large farms.

Adjusting the three cutoffs for price inflation is straightforward. The Producer Price Index for farm products (farm PPI) rose 41 percent from 1995 to 2010, and we adjusted the original cutoffs accordingly. The new cutoffs are the adjusted cutoffs rounded to the nearest \$25,000. The new \$350,000 small-farm cutoff can be interpreted as roughly the same physical production generating \$250,000 of sales in 1995, but valued using 2010 prices for farm products.

Original cutoffs (1995 prices)	Adjusted cutoffs (2010 prices)	New cutoffs used to revise the typology
\$100,000	\$140,596	\$150,000
\$250,000	\$351,490	\$350,000
\$500,000	\$702,980	\$700,000

³As used here: Gross cash margin = 100% (net cash farm income ÷ GCFI). The margin increases with sales. For example, the margin was 20 percent for farms with gross farm sales of \$50,000 to \$250,000 in 1995 and 22 percent for farms with sales of \$250,000 or more (USDA, NCSF, 1998, p. 29). By 2010, it was 22 percent for farms with sales of \$50,000 to \$249,999 and 27 percent for farms with sales of at least \$250,000. The gross cash margin for all farms fluctuated from 15 to 24 percent between 1995 and 2010. It averaged 20 percent over the 16-year period.

The first two new cutoffs (\$150,000 and \$350,000) are actually used in the final form of the revised typology. The third cutoff (\$700,000) is only used in an intermediate step while constructing the revised typology, as discussed later.

While the net cash income generated by a given level of farm sales varies by the commodities produced, \$350,000 of gross farms sales in 2010 generates net cash income near the mean income for all U.S. households that year, just as \$250,000 did in 1995. Applying the 20-percent gross cash margin to \$350,000 yields \$70,000—only 4 percent higher than the \$67,400 mean income for all U.S. households in 2010 (U.S. Department of Commerce, Bureau of the Census, 2012b).

Shift to Larger Farms

The simplest way to address the shift to larger farms is adding one or more categories to the classification for farms with sales of \$1 million or more. Sales at that level are a reasonable indicator of the upper end of the farm size distribution. For example, 37 percent of farmers chose gross farm sales of \$1 million as the point at which a midsize farm becomes a large farm, according to a survey by the magazine *Successful Farming* (Tevis, 2012). Other frequent responses were \$500,000 (17 percent) and \$250,000 (14 percent).

Million-dollar farms can be divided further into two groups, those with sales of \$1 million to \$4,999,999 and those with sales of \$5 million or more. Farms with sales of \$5 million or more represent *really* large farms by current standards.

Applying the New Cutoffs and Adding New Categories

We now apply the new cutoffs to generate an updated version of the ERS typology. The first step is presented in the top panel (step 1) of table 2. The procedure is straightforward:

- The new \$150,000 cutoff replaces the original \$100,000 cutoff between low-sales and medium-sales small farms.
- The new small-farm cutoff (\$350,000) replaces the original cutoff (\$250,000).
- The new \$700,000 cutoff replaces the original \$500,000 cutoff between large and very large farms in this intermediate step.

New Categories

Note that the very large group tops out at \$999,999 due to the introduction of two new categories of million-dollar farms—group 1 for those with gross farm sales of \$1 million to \$4,999,999 and group 2 for those with gross farm sales of \$5 million or more. These groups have already been used by ERS in *Million-Dollar Farms in the New Century* (Hoppe et al., 2008) and by NASS in its annual *Farm Production Expenditures* summary (USDA, NASS, 2011b).

The sample size for family farms with sales of \$5 million or more is rather thin—only 338 observations in 2010. The ERS and NASS reports cited in the preceding paragraph considered both family farms and nonfamily farms, so their sample sizes for \$5-million farms were larger, 412 for Hoppe et al. (2008) and 457 for USDA, NASS (2011b).⁴ We intend to use the two groups of million-dollar farms in the new typology, but may need to reconsider the \$5-million cutoff—and substitute a lower one—if sample sizes fall in the future. In practice, that concern will be lessened if production continues to shift to larger farms and the number of million-dollar farms continues to grow (see table 1).

Combining and Renaming the Categories

The typology in the top panel (step 1) of table 2 has nine categories, compared with seven categories in the original typology. The number of categories could be reduced to eight by merging large farms (sales of \$350,000 to \$699,999) and very large farms (sales of \$700,000 to \$999,999) in step 1 of table 2 into a single category, midsize farms, in step 2.⁵ This merged group includes all family farms with sales between \$350,000 and \$999,999 and accounts for 6 percent of farms and 26 percent of production. Creating the midsize group allows us to apply the term “large” to farms with sales of \$1 million to \$4,999,999 and “very large” to farms with sales of \$5 million or more. Large-scale farms now include large and very large farms under the new definitions, or any farm with sales of \$1 million or more.

⁴Hoppe et al. (2008) used 2006 ARMS data while USDA, NASS (2011b) used 2010 ARMS data.

⁵The first version of the original typology—which included limited-resource farms—also had eight categories.

Table 2

Revising the farm typology, 2010

Type of farm	Includes farms with gross farm sales of...	Sample size	Distribution of...		
			Farms	Farms	Value of production
			Number	Percent of U.S. total	
Step 1—Applying New Cutoffs					
Small farms:					
Retirement	Less than \$350,000	1,932	364,639	16.6	1.3
Residential/lifestyle	Less than \$350,000	4,808	953,151	43.5	4.9
Farming-occupation:					
Low-sales	Less than \$150,000	5,133	557,107	25.4	6.3
Medium-sales	\$150,000 to \$349,999	2,541	100,489	4.6	8.5
Large-scale farms:					
Large	\$350,000 to \$699,999	2,412	88,076	4.0	15.4
Very large	\$700,000 to \$999,999	1,068	35,671	1.6	10.4
Million-dollar farms: ¹					
Group 1	\$1,000,000 to \$4,999,999	2,429	40,456	1.8	28.2
Group 2	\$5,000,000 or more	338	3,473	0.2	12.7
Nonfamily	No sales criterion	917	49,711	2.3	12.3
Total		21,578	2,192,774	100.0	100.0
Step 2—Combining Large and Very Large Farms from Step 1 & Renaming					
Small farms:					
Retirement	Less than \$350,000	1,932	364,639	16.6	1.3
Off-farm occupation ²	Less than \$350,000	4,808	953,151	43.5	4.9
Farming-occupation:					
Low-sales	Less than \$150,000	5,133	557,107	25.4	6.3
Moderate-sales ³	\$150,000 to \$349,999	2,541	100,489	4.6	8.5
Midsize⁴	\$350,000 to \$999,999	3,480	123,748	5.6	25.8
Large-scale farms:					
Large ⁵	\$1,000,000 to \$4,999,999	2,429	40,456	1.8	28.2
Very large ⁶	\$5,000,000 or more	338	3,473	0.2	12.7
Nonfamily	No sales criterion	917	49,711	2.3	12.3
Total		21,578	2,192,774	100.0	100.0

¹The number of million-dollar farms in table 2 (43,929) is 5,746 less than the corresponding number in table 1 (49,675). The difference occurs because the tables treat nonfamily farms differently. Table 2 places nonfamily farms in a separate group while table 1 distributes them among the various sales classes. Differences between the tables for smaller farms are not obvious because the two tables use different sales classes for farms with sales less than \$1 million.

²Residential/lifestyle farms from step 1.

³Medium-sales farms from step 1.

⁴Formed by combining large and very large farms from step 1.

⁵Group 1 million-dollar farms in step 1.

⁶Group 2 million-dollar farms in step 1.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2010 Agricultural Resource Management Survey.

The residential/lifestyle group was renamed “off-farm occupation” in the updated typology. The term “residential/lifestyle” was originally selected because many of the operators on these farms view their farms largely as an avocation or a place to live where they can enjoy a rural lifestyle (Hoppe, 2001, p. 49). These operators typically do not rely on their farms for a substantial share of their income, since their main occupation is something other than farming.

On the other hand, a large majority of all farms—even commercially oriented farms—could be considered residential, since operators generally live on their farms. Also, beginning farmers in the group may look at their farms as more than a residence or lifestyle, but still need an off-farm job, at least in the short run. Other farmers in the group may receive most of their income from off-farm activities, but supplement it with income or home consumption from the farm. Giving these farms an off-farm-occupation label is more accurate and focuses on a characteristic they have in common.

Finally, the small-farm, medium-sales category was renamed “moderate-sales.” “Medium” and “midsize” sound similar, which could lead to readers confusing the medium-sales and midsize categories. Substituting “moderate” for “medium” should reduce potential confusion.

Changes in the Classification of Individual Farms

Changing from the original to the updated typology affects the number of farms in the various farm types. Among the small-farm groups, the only meaningful changes occur in the low-sales and moderate-sales groups. The number of low-sales farms increases by about 9 percent after the update, the result of the reclassification of former medium-sales farms with sales between \$100,000 and \$149,999. The number of moderate-sales farms, however, actually declines by 7 percent because the loss of former medium-sales farms to the low-sales group is larger than the gain of formerly large farms with gross sales between \$250,000 and \$349,999.

The new large and very large farm types have relatively few farms, reflecting the high level of the groups' sales criterion. Midsize farms combine substantial shares of the farms formerly classified as large or very large.

Table 3 sorts farms by their places in the original and updated typologies and shows specifically how many farms are reclassified by the update. The row for all farms at the top of the table shows the number of farms in each group in the original typology. The all-farms column at the right side of the table shows the number of farms in each group in the updated typology. Individual cells sort farms by their position in both the original and updated typologies.

Small Family Farms

The numbers of retirement and off-farm occupation farms are affected very little by the update. The number of retirement farms grows by 944, from 363,695 under the original typology to 364,639 under the update, while the number of off-farm occupation farms grows by 5,728, from 947,423 to 953,151 (table 3). In both cases, the increase is less than 1 percent, because there are few farms with gross sales between \$250,000 and \$349,999—classified as large farms under the original typology—whose operator is retired or reports a nonfarm occupation.

In contrast, the number of low-sales farms increases by 9 percent, growing from 510,072 under the original typology to 557,107 under the update. The increase results from a shift of 47,035 farms with sales of \$100,000 to \$149,999 from the former medium-sales group to the low-sales group.

The number of moderate-sales farms actually falls by 7 percent, from 107,804 medium-sales farms under the original definition to 100,489 moderate-sales farms under the update. The loss of former medium-sales farms to the low-sales group (47,035) outweighs the moderate-sales group's gain from the large farm group (39,720).

The Remaining Family Farms

A comparison of the size of the remaining farm types in the original and updated ERS typologies is difficult because the number of groups increases in the updated typology. Also, the bulk of the former large and very large farms end up in the midsize group in the updated typology. We can, however, show which groups in the original typology contributed to a given group in the updated typology.

Table 3

Distribution of farms by the original and updated farm typologies, 2010

Updated typology ¹	Includes farms with gross farm sales of...	Original typology							
		Small farms				Large-scale farms			
		Retire- ment	Residential/ lifestyle	Farming-occupation		Large	Very large	Non- family	All farms
				Low- sales	Medium- sales				
<i>Number</i>									
All farms		363,695	947,423	510,072	107,804	96,433	117,637	49,711	2,192,774
Small farms:									
Retirement	Less than \$350,000	363,695				944			364,639
Off-farm occupation ²	Less than \$350,000		947,423			5,728			953,151
Farming-occupation:									
Low-sales	Less than \$150,000			510,072	47,035				557,107
Moderate-sales ³	\$150,000 to \$349,999				60,768	39,720			100,489
Midsize	\$350,000 to \$999,999					50,040	73,707		123,748
Large-scale farms:									
Large	\$1,000,000 to \$4,999,999						40,456		40,456
Very large	\$5,000,000 or more						3,473		3,473
Nonfamily	No sales criterion							49,711	49,711

¹Updated for commodity price changes and shift of production to larger farms, from step 2 of table 2.

²Formerly residential/lifestyle farms.

³Formerly medium-sales farms.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2010 Agricultural Resource Management Survey.

The revisions classify 123,748 farms as midsize. The midsize category consists of large-scale farms under the original typology that did not move to a small-farm category because of price adjustments nor move into one of the groups with sales of \$1 million or more. Most of the midsize farms—73,707 farms—were formerly classified as very large farms with sales between \$500,000 and \$999,999. Another 50,040 farms were formerly classified as large farms with sales between \$350,000 and \$499,999 under the original typology.

The remaining very large farms from the original typology—all with sales of \$1 million or more—form the large and very large farm groups in the updated typology. These groups have relatively few farms, 40,456 and 3,473, respectively, in the updated typology. The very large group in the updated typology (gross farm sales of \$5 million or more) is much more exclusive than the group with the same name in the original typology (gross farm sales of \$500,000 or more).

Shifting to Gross Cash Farm Income

Up to this point, we have measured farm size using sales classes based on gross farm sales, which measures the value of commodities leaving a farm, regardless of who has a claim on those commodities. It is the sum of the farm's crop and livestock sales, the share of production received by any share landlords and production contractors, and all Government payments received by the farm and its landlords.

Components of gross cash farm sales and gross cash farm income		
Item	Gross farm sales	Gross cash farm income
Revenue to the farm from:		
Crop and livestock sales	Yes	Yes
Government payments	Yes	Yes
Other farm-related income ¹	No	Yes
Value of production accruing to:		
Share landlords	Yes	No
Contractors	Yes	No
Landlord receipt of Government payments	Yes	No

¹Receipts from custom work, machine hire, livestock grazing fees, timber sales, outdoor recreation, production contract fees, etc.

Defining Gross Cash Farm Income

Gross cash farm income (GCFI), an alternative measure of farm sales, focuses on the revenue actually received by the farm. GCFI is calculated as the sum of the farm's crop and livestock sales, Government payments, and other farm-related income. Landlords' and contractors' shares of production are excluded from GCFI—as is the landlords' share of Government payments—because these items are not revenue to the farm business.

The value of gross farm sales is a reasonable measure of the value of commodities leaving a farm. The farm operator, however, does not have access to gross farm sales accruing to landlords or production contractors. If a farmer has a production contract to produce broilers, he or she can use the fee received from the contractor to pay bills. Receipts from the disposal of the broilers—on the other hand—belong to the contractor and are not available to the farm business to cover expenses and generate net income. If the focus is on revenues received by *farm businesses* that can be spent as necessary, GCFI is a better indicator of farm size than gross farm sales.

The difference between GCFI and gross sales can be large for some farms. For example, broiler producers with production contracts generally receive contract fees (a component of GCFI) that are far less than the value of the birds removed (a component of gross sales). A broiler operation with four houses typically would deliver \$1.1 million of broilers—its gross farm sales—to its contractor (see box, “A Four-House Broiler Operation”). The operation's GCFI is only \$175,000, including fees for contract production. The contractor provides the grower with feed, chicks, and veterinary services, while the grower provides labor, utilities, and housing.

Since feed is by far the largest share of broiler production costs, the grower’s services account for only a fraction of the costs of producing broilers, and the grower’s fees therefore are only a fraction of the value of the broilers. The fee is revenue to the producer, but the broilers belong to the contractor.

A Four-House Broiler Operation

To show how a farm could be classified as small or large depending on how sales are measured, consider a contract broiler operation with four broiler houses—the average for broiler producers in the United States. An average operation delivers about 460,000 birds in a year and is paid contract fees of around \$152,000. The value of those birds—the operation’s gross farm sales—is about \$1.1 million. From the \$1.1 million, the contractor covers the value of the feed and chicks delivered to the operation as well as the fees for services provided by the operation. A typical broiler farm has some activities aside from poultry, but it is still quite specialized, and contract fees amount to most of its gross cash farm income (GCFI) of \$175,000. In term of GCFI, assets, total household income, and operator’s hours worked on the farm, broiler operations are similar to other small farms with GCFI between \$150,000 and \$200,000, but much smaller than other farms with gross sales between \$800,000 and \$1,200,000.

Do we classify this farm as a large farm because of its production—which it does not own and cannot sell—or do we classify it as a moderate-sales farm because its GCFI is between \$150,000 and \$349,999? For use in the farm typology, GCFI is a better indicator of the size of the farm business than gross farm sales because it focuses on the revenue actually received by the *farm business* that can be used by the farm business. Income that the farm household receives from the farm is also derived from GCFI, and level of household income was a criterion when selecting the original small-farm cutoff.

Characteristics of contract broiler farms and selected other farms, 2011

Item	Type of operation		
	Contract broiler growers, four broiler houses	No poultry, GCFI from \$150,000 to \$200,000	No poultry, gross farm sales from \$800,000 to \$1,200,000
	<i>Median values</i>		
GCFI	\$175,000	\$170,700	\$928,505
Gross farm sales	\$1.09 million	\$169,950	\$914,673
Farm assets	\$1.10 million	\$1.13 million	\$2.98 million
Total operator household income	\$69,000	\$84,414	\$189,299
Total off-farm income	\$27,500	\$27,500	\$29,296
Farm work by principal operator	42 hours (all/ 30 hours (broilers))	50 hours	57 hours
	<i>Number</i>		
Observations	415	721	1,122

GCFI = Gross cash farm income.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2011 Agricultural Resource Management Survey.

The estimates presented are based on data from the recently released 2011 ARMS, which included a version (version 4) focused specifically on broiler producers. For purposes of classification by the typology, we assume the broiler operation is a family farm.

The four-house broiler operation would be classified as a large farm using gross farm sales, but as a moderate-sales small farm using GCFI as the measure of sales because its GCFI falls in the \$150,000-to-\$349,999 range that defines the category. In addition, the broiler operation is similar to other farms with GCFI between \$150,000 and \$200,000 in terms of farm assets, household income, and operator's hours devoted to farming.

For most family farms (66 percent), farm sales and GCFI were equal in 2010 (table 4). These farms (1) have no production contracts, (2) do not share production or Government payments with landlords, and (3) do not receive other farm-related income. In this case, gross farm sales and GCFI are calculated exactly the same way: the sum of the farm's crop sales, livestock sales, and Government payments. On another 27 percent of family farms, GCFI was greater than gross farm sales, due to the receipt of other farm-related income. Gross farm sales can be larger than GCFI for farms with production contracts or for farms sharing production or Government payments with landlords. Farms with gross farm sales larger than GCFI, however, amounted to only 9 percent of family farms in 2010.

Effects of Using Gross Cash Farm Income

Using GCFI instead of gross farm sales to measure size has little impact on the overall share of U.S. farms classified as small. Ninety-one percent of U.S. farms are classified as small family farms using GCFI for the cutoff versus 90 percent using gross farm sales (fig. 2). The largest impacts of using GCFI instead of gross farm sales occur among poultry farms and—to a lesser extent—hog farms. Although 55 percent of poultry farms are classified as small using gross farm sales, the share increases to 94 percent using GCFI. Similarly, the small-farm share for hog farms increases from 65 to 78 percent.

In addition, using GCFI rather than gross farm sales greatly increases the number of farms with contracts classified as small. The share of contract producers classified as small triples from 26 percent to 77 percent when GCFI is used to measure farm size (table 4).

Approximately 17,900 farms—less than 1 percent of all farms—move from the midsize and large-scale categories to small-farm categories in the updated typology based on GCFI (table 5). The only small-farm category to increase substantially is moderate-sales farms, by about 10 percent. Of course, if the number of small farms increases, the number of midsize and large-scale farms declines by an equal amount. The rates of decline are fairly large, ranging from 9 to 16 percent, depending on the group.

The 17,900 farms estimated to change their status from midsize or large-scale to small under the revised typology, however, is a net estimate with two components:

- **The movement of 30,300 farms from midsize and large-scale groups to small-farm groups.** The gross farm sales of these farms amounts to \$350,000 or more, but their GCFI is less than that amount. Three-fourths of these farms have production contracts, largely specializing in poultry or hogs.

- **The movement—in the opposite direction—of 12,400 farms from small-farm groups to midsize and large-scale groups.** The gross farm sales of these farms amounts to less than \$350,000 but their GCFI is at least that high, due to the receipt of significant other farm-related income.

Another 42,800 farms move from one category to another, but the difference between GCFI and gross farm sales is not large enough to change their classification from a small farm to a midsize or large-scale farm (or vice versa).

Table 4

Comparing gross farm sales and GCFI for family farms with and without production contracts, 2010

Item	Farms without production contracts	Farms with production contracts	All family farms
<i>Number</i>			
Total farms and households	2,099,430	43,633	2,143,063
<i>Percent of farms</i>			
Gross farm sales compared with GCFI:			
Gross farm sales and GCFI are equal	66.1	0.0	64.8
Gross farm sales is larger	6.8	96.6	8.6
GCFI is larger	27.1	3.4	26.6
Total	100.0	100.0	100.0
Ratio of GCFI to gross farm sales ¹	106.9	33.3	92.8
Share of production under a production contract	0.0	83.4	16.9
Gross farm sales less than \$350,000	93.6	25.5	92.2
GCFI less than \$350,000	93.3	77.3	93.0
Farms by specialization:			
Cash grain	14.2	7.5	14.1
Other field crops	24.4	d	24.0
High-value crops ²	6.6	d	6.5
Beef	31.2	12.7	30.8
Hogs	0.9	20.0	1.3
Poultry	1.0	52.8	2.1
Dairy	2.2	1.5	2.2
Other livestock	19.5	d	19.1
Total	100.0	100.0	100.0

Note: This table includes only family farms, because no size criterion is used to identify nonfamily farms. GCFI = Gross cash farm income.

d = Data suppressed due to insufficient observations.

¹Total GCFI for a given group divided by total gross farm sales for the group, expressed as a percentage.

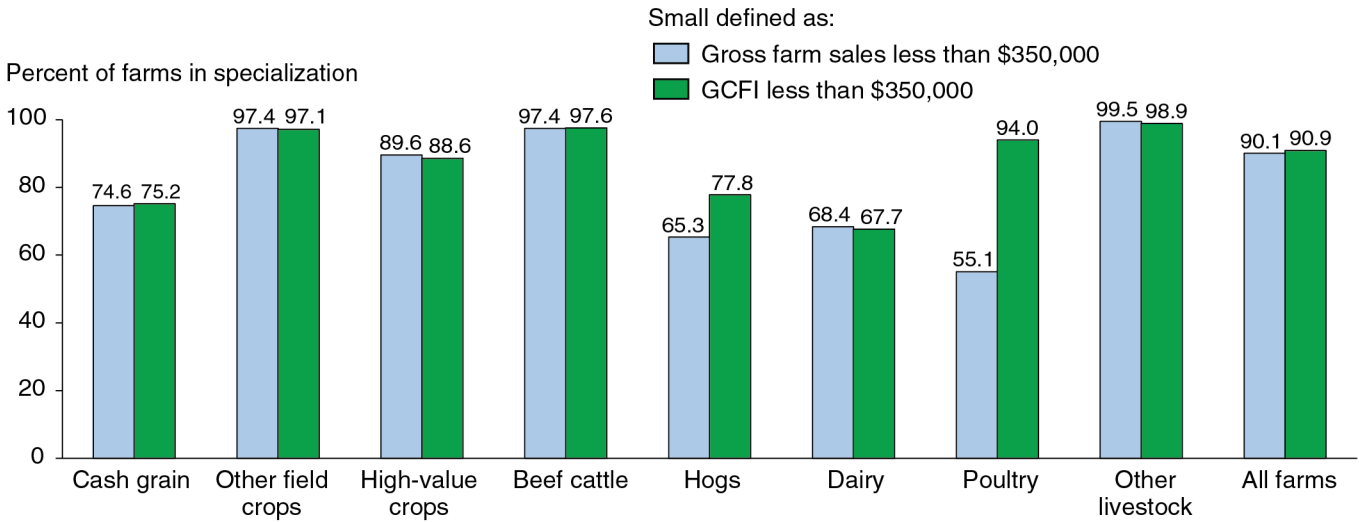
²Vegetables, fruits and tree nuts, and nursery and greenhouse products.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2010 Agricultural Resource Management Survey.

Figure 2

Small family farms under two definitions, by commodity specialization, 2010

Using GCFI increases the small-farm share of poultry and hog farms



GCFI = Gross cash farm income.

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

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2010 Agricultural Resource Management Survey.

Table 5

Farms by the updated farm typology based on two size measures, 2010

Type of farm	Updated typology ¹		Change ²	Rate of change
	Based on gross farm sales	Based on GCFI		
	-----Number-----			
Total farms	2,192,774	2,192,774	0	0.0
Small farms	1,975,386	1,993,266	17,880	0.9
Retirement	364,639	364,829	190	0.1
Off-farm occupation	953,151	955,625	2,474	0.3
Low-sales	557,107	561,871	4,764	0.9
Moderate-sales	100,489	110,941	10,452	10.4
Midsized farms	123,748	112,817	-10,931	-8.8
Large-scale farms	43,929	36,979	-6,950	-15.8
Large	40,456	33,823	-6,633	-16.4
Very large	3,473	3,156	-317	-9.1
Nonfamily	49,711	49,711	0	0.0

GCFI = Gross cash farm income.

¹Updated for commodity price changes and shift of production to larger farms.

²Column 2 minus column 1.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2010 Agricultural Resource Management Survey.

Results: The Revised Farm Typology

So far we have adjusted sales cutoffs to account for increases in commodity prices, added new typology categories to reflect the shift in production to larger farms, and changed the measure of farm size from gross farm sales to GCFI. The revised farm typology incorporates all these elements and is summarized in table 6, which also summarizes differences between the original and revised typologies. The next step is to examine the effects of these changes on the distribution of farms and production and on estimates of household income.⁶

Table 6
Comparing the original and revised typologies

Farm type	Operator's primary occupation ¹	Farm size	
		Original typology	Revised typology
		<i>Farm size measured by gross farm sales</i>	<i>Farm size measured by GCFI</i>
Small farms²	Varies	Less than \$250,000	Less than \$350,000
Retirement farms	Retired	Less than \$250,000	Less than \$350,000
Off-farm occupation farms ³	Nonfarm	Less than \$250,000	Less than \$350,000
Farm occupation farms:			
Low-sales	Farming	Less than \$100,000	Less than \$150,000
Moderate-sales ⁴	Farming	\$100,000- \$249,999	\$150,000-\$349,999
Midsize family farms²	Not a criterion	Category not used	\$350,000-\$999,999
Large-scale family farms²	Not a criterion	\$250,000 or more	\$1,000,000 or more
Large farms	Not a criterion	\$250,000- \$500,000	\$1,000,000-\$4,999,999
Very large farms	Not a criterion	\$500,000 or more	\$5,000,000 or more
Nonfamily farms²	Not a criterion	Not a criterion	Not a criterion

¹Occupation at which the operator spent 50 percent or more of his or her work time.

²Family farms include any farm where the majority of the business is owned by the operator and individuals related to the operator. Nonfamily farms do not meet that criterion.

³Formerly residential/lifestyle farms.

⁴Formerly medium-sales farms.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2010 Agricultural Resource Management Survey.

Changes in the Distribution of Farms and Value of Production

Revising the typology alters the distribution of farms between the small-farm and other farm groups in 2010. The share of farms classified as small increases by 3 percentage points—from 88 percent to 91 percent—after the revisions. In contrast,

⁶Whether GCFI can be approximated from information collected by the census of agriculture is a relevant question, if the revised typology is to be applied to the census. Inconsistencies between the census and ARMS affecting the calculation of GCFI appear to be relatively minor. See "Appendix: Calculating GCFI from the Census of Agriculture."

the small-farm share of production increases from 16 percent under the original typology to 29 percent in the revised typology.

Table 7 compares the distribution of farms and value of production in 2010 under the original typology and the revised typology. All four types of small farms are shown, because most of the farms in each revised type are in the same type under the original typology. To make comparisons over time, we include a column for 1995. We do not adjust the cutoffs used prior to 2010 for price inflation, but use the nominal-dollar cutoffs in effect since the creation of the original typology. This helps us to gauge the effects of price inflation through comparisons with the revised typology, since the revised typology does use cutoffs adjusted for price changes.

Revisions to the original large-scale family farms categories result in a midsize group in addition to the original large and very large groups. As a result, the original and revised typologies are not comparable once the \$350,000 cutoff is exceeded. We can, however, examine midsize and large-scale farms as a whole in table 7, rather than as individual farm types.

Distribution of Farms

In 2010, small family farms accounted for 91 percent of all farms under the revised typology, or 3 percentage points more than under the original typology (table 7). The 3-percentage-point increase comes from two sources: 2 percentage points from updating for commodity price inflation and another 1 percentage point from shifting to GCFI. Low-sales farms also increase their share of farms by 2 percentage points under the revised typology, reflecting the 9-percent increase in the number of low-sales farms after raising the \$100,000 cutoff to \$150,000. Other differences between the original and revised typologies for small farms are minor.

Although the revised typology increased the low-sales share of all farms, a larger share of farms was classified as low-sales in 1995 (29 percent) than in 2010 under the original typology (23 percent) or under the revised typology (26 percent). Among small farms, only the off-farm occupation group increased its share of farms meaningfully over the 1995-2010 period.

The midsize and large-scale share of farms declines by 3 percentage points under the revised versions of the typology—the mirror image of the increase in small farms. This reflects:

- Reclassification of 46,400 formerly large farms with sales between \$250,000 and \$349,999 that were moved into various small-farm groups by the revised typology based on the higher sales cutoff.
- The net movement of 17,900 farms to small-farm groups when using GCFI instead of gross farm sales.

Nonetheless, the share of all farms in the midsize and large-scale categories is about 1 percentage point higher in 2010 using the revised typology than it was in 1995 using the original typology.

Table 7

Farms and the value of production by the original and revised farm typology, 1995 and 2010

Type of farm	Typology			Change in distribution from revisions		
	Original		Revised, 2010	Share from		
	1995	2010		Total ¹	Update ²	Using GCFI
	(Column 1)	(Column 2)	(Column 3)			
	<i>Number</i>					
Total farms	2,068,000	2,192,774	2,192,774	na	na	na
	<i>Percent of U.S. total</i>			<i>Percent change</i>		
Distribution of farms:						
Small farms	92.9	88.0	90.9	2.9	2.1	0.8
Retirement	16.2	16.6	16.6	0.0	0.0	0.0
Off-farm occupation ³	38.3	43.2	43.6	0.4	0.3	0.1
Farming-occupation:						
Low-sales	29.1	23.3	25.6	2.3	2.1	0.2
Moderate-sales ⁴	9.3	4.9	5.1	0.2	-0.3	0.5
Midsize and large-scale farms	5.6	9.8	6.8	-3.0	-2.2	-0.8
Nonfamily	1.5	2.3	2.3	0.0	0.0	0.0
Total	100.0	100.0	100.0	0.0	0.0	0.0
Distribution of the value of production:						
Small farms	38.4	16.0	28.6	12.6	4.9	7.7
Retirement	1.6	1.2	1.6	0.4	0.1	0.3
Off-farm occupation ³	6.1	4.3	6.3	2.0	0.6	1.4
Farming-occupation:						
Low-sales	12.1	4.1	8.6	4.5	2.2	2.3
Moderate-sales ⁴	18.7	6.5	12.1	5.6	2.0	3.6
Midsize and large-scale farms	47.1	71.6	59.1	-12.5	-4.9	-7.6
Nonfamily	14.5	12.3	12.3	0.0	0.0	0.0
Total	100.0	100.0	100.0	0.0	0.0	0.0

GCFI = Gross cash farm income.

na = Not applicable.

¹Column 3 minus column 2.²Updated cutoffs for commodity price changes.³Residential/lifestyle in the original typology.⁴Medium-sales in the original typology.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1995 Farm Costs and Returns Survey and 2010 Agricultural Resource Management Survey.

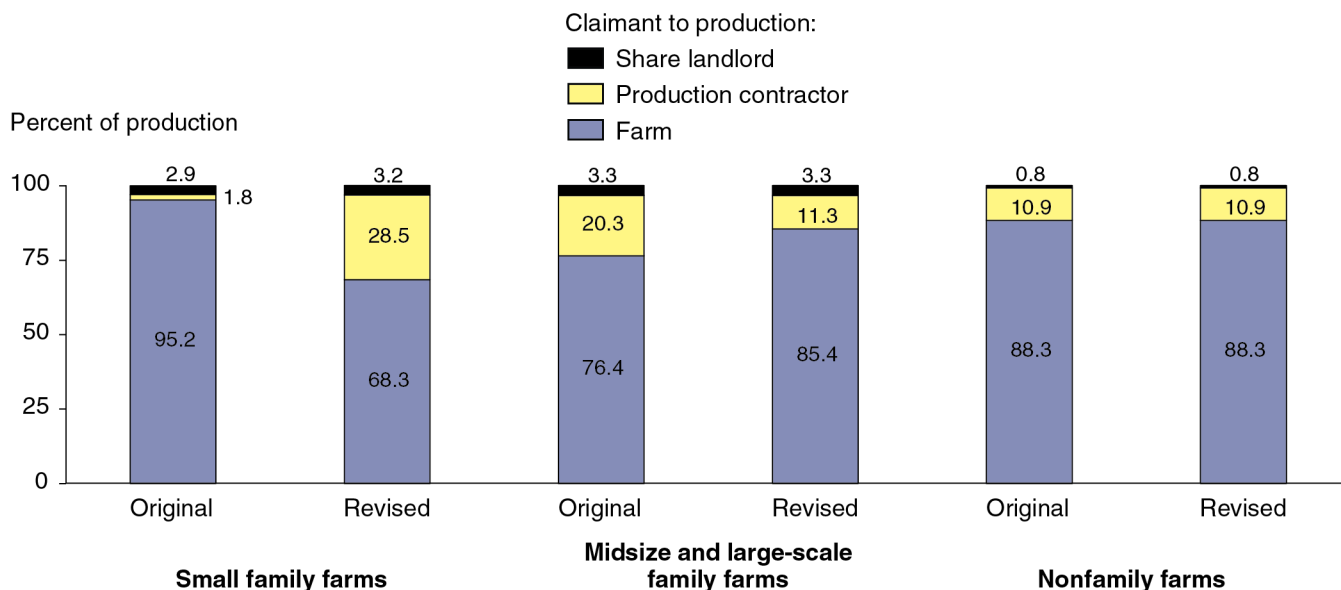
Distribution of Production

Small farms’ share of the value of production increases by 13 percentage points, from 16 percent under the current typology to 29 percent under the revised typology (table 7). The midsize and large-scale farms’ share decreases by the same amount. Most of the increase in the small-farm share occurs in the low-sales and moderate-sales groups, which increase their shares of the value of production by 5 and 6 percentage points, respectively.

About 5 percentage points of the 13-percentage-point increase in small farms’ share of production results from updating the cutoffs for commodity price inflation. Shifting from gross farm sales to GCFI increases the small-farm share by another 8 percentage points, with most of the increase occurring on low- and moderate-sales farms. This increase in the small-farm share of production reflects the net reclassification of 17,900 midsize or large-scale farms to small-farm groups. Many farms with contracts to produce poultry or hogs—classified as midsize or large-scale by gross value of sales—are reclassified as small when we use GCFI. These farms are more appropriately classed as small given the revenue and net incomes they receive as well as the fact that many of their operators also hold off-farm jobs (MacDonald, 2008, pp. 23-24).

Using GCFI in the revised typology moves \$22 billion of production to small family farms, mostly from formerly large-scale family farms, and virtually all of this shift is associated with production contracts. The distribution of production by those with claims on the production—i.e., farms, share landlords, and production contractors—is also affected on small farms, with contractors’ share increasing from 2 percent under the original typology to 29 percent under the revised typology (fig. 3).

Figure 3
Value of production by claimant and by the original and revised typologies, 2010
Production contractors’ share increases for small family farms under the revised typology



Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2010 Agricultural Resource Management Survey.

Small farms’ 29-percent share of production under the revised typology is not high by historical standards (fig. 4). Their share has trended downward from 35-40 percent in the mid-1990s to 16-17 percent from 2007 to 2010, before the introduction of the revised typology. This downward trend reflects the shift of production from small farms to larger farms as well as a lack of price adjustments in the typology. Farms near the \$250,000 cutoff moved out of the small-farm category when prices increased, taking their value of production with them.

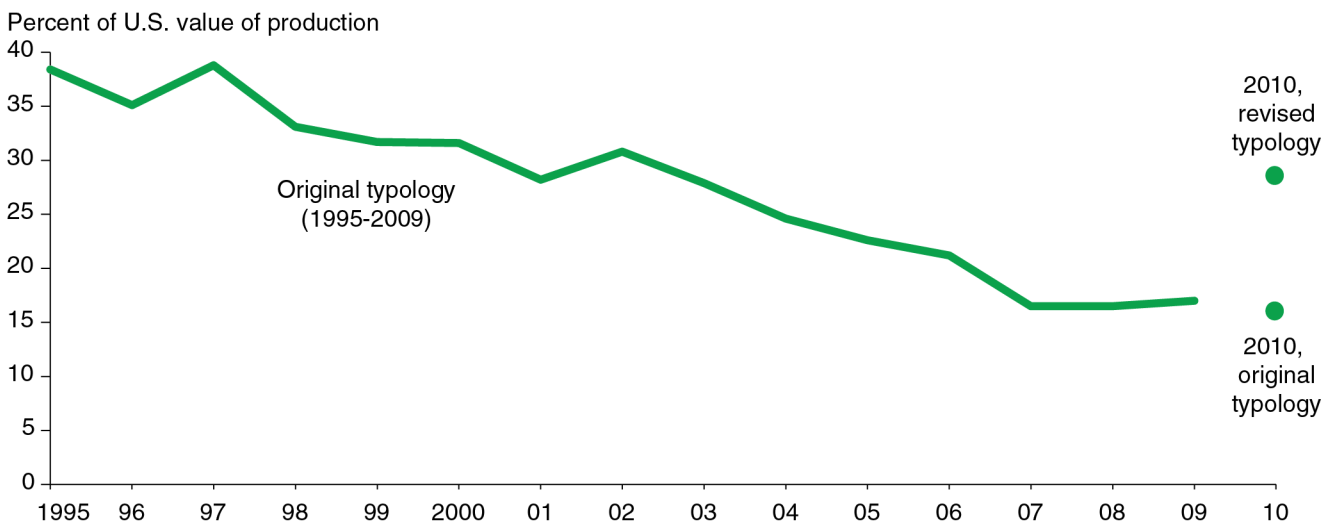
Changes in Household Income

Inflation-adjusted median operator household income (see box, “Defining Operator Household Income”) is higher for each typology group in 2010 than in 1995, under both the original and revised typologies (table 8). In aggregate, farm operator households experienced a 23-percent increase in their inflation-adjusted income over that span, with some variation by type of farm. In contrast, inflation-adjusted income for all U.S. households increased by only 1 percent from 1995 to 2010.

Median income for operator households is similar in 2010 under the original typology and the revised typology, with two exceptions. Households operating moderate-sales farms or midsize and large-scale farms have higher incomes under the revised typology than under the original one.

Under the revised typology, the moderate-sales group gains 39,700 formerly large farms with sales between \$250,000 and \$349,999 while losing 47,000 smaller farms with sales between \$100,000 and \$149,999. In addition, measuring size with GCFI moves another 10,500 larger farms into the group. As a result, the average size of moderate-sales farms increases, which is associated with higher operator household income from farm sources.

Figure 4
Small-farm share of U.S. value of production, 1995-2010
Small farms’ share of production trended downwards



GCFI = Gross cash farm income.

Note: Cutoffs used in the classification are measured in current dollars.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1995 Farm Costs and Returns Survey and 1996-2010 Agricultural Resource Management Survey.

Defining Operator Household Income

Operator household income measures the income available to the household of the principal operator. It includes any income received by household members. As measured in the Agricultural Resource Management Survey (ARMS), it has three components:

- 1. Farm business income.** In the case of unincorporated businesses and S-corporations, the household's farm business income is calculated as its share of net cash income generated by the farm. Net cash income is gross cash income—the sum of the sales of commodities, other miscellaneous farm-related income, and Government payments—less cash expenses and depreciation.¹ The household of the principal operator does not necessarily receive all the business income generated by its farm. For example, business income may be shared with partners or relatives who hold an interest in the farm. In the case of C-corporations, farm business income is the dividends paid to household members. Wages paid to the operator by farms organized as S- or C-corporations are also included in farm business income.
- 2. Income from other farming activities.** This component consists of net income from a farm other than the one being surveyed, wages paid to household members other than the operator, and net income from farmland rental.
- 3. Off-farm income.** Off-farm income can come from earned sources—such as wages, salaries, and self-employment income—or from unearned sources, such as interest, dividends, and transfer payments, such as social security.

Income received from farming is the sum of the first two components.

¹Depreciation is not a cash expense, but it is deducted to be consistent with accounting conventions used in the Current Population Survey (CPS). The CPS is the source of official income statistics for the United States.

Households operating moderate-sales farms also receive a much larger share of their income from farming under the revised typology—49 percent versus 35 percent under the original typology. Historically, households operating medium-sales farms—the predecessors to moderate-sales farms—received 40 to 50 percent of their income from farming most years prior to 2006 (fig. 5). The farm PPI jumped upward after 2006 (see fig. 1), which moved medium-sales farms just under the \$250,000 cutoff into the large-scale group when their sales—measured in nominal dollars—exceeded \$250,000. As a result, the share of income from farming fell, since the remaining farms in the moderate-sales group in the revised typology were smaller in terms of physical production.

Adjusting the cutoffs for price inflation under the revised typology puts many of those farms back into the moderate-sales group (the equivalent to medium-sales farms in the original typology). This, in turn, helps raise farming's share of operator household income back to its pre-2006 level. Switching from gross farm sales to GCFI also increases the share of income from farming, but only marginally (not shown separately).

Table 8
**Operator household income by the original and revised farm typologies,
 1995 and 2010**

Type of farm	Original typology		Revised typology,
	1995	2010	2010
	<i>Number</i>		
Total operator households and family farms	2,036,810	2,143,063	2,143,063
	<i>2010 dollars per household¹</i>		
Median operator household income	43,938	54,162	54,162
Small farms	42,786	51,194	51,522
Retirement	33,785	37,907	38,080
Off-farm occupation ²	56,421	69,806	70,107
Farming-occupation:			
Low-sales	27,494	40,684	40,933
Moderate-sales ³	50,086	60,455	75,757
Midsize and large-scale farms	98,580	117,758	160,045
Median income, all U.S. households	48,766	49,445	49,445
	<i>Percent of total household income</i>		
Share of income from farming ⁴	10.6	13.9	13.9
Small farms	-0.8	-2.6	-1.3
Retirement	4.1	1.9	1.7
Off-farm occupation ²	-9.3	-5.7	-5.7
Farming-occupation:			
Low-sales	-4.5	-6.4	-5.7
Moderate-sales ³	46.3	35.2	49.2
Midsize and large-scale farms	76.5	72.8	76.8

GCFI = Gross cash farm income.

Note: Operator household income is calculated only for family farms.

¹Household income is expressed in 2010 dollars, using the Consumer Price Index, all urban consumers (CPI-U) to adjust for price changes.

²Residential/lifestyle in the original typology.

³Medium-sales in the original typology.

⁴Income from farming is the sum of farm business income and income from other farm activities (see box, "Defining Operator Household Income," p. 24). The share of income from farming is negative if the household experienced a loss farming.

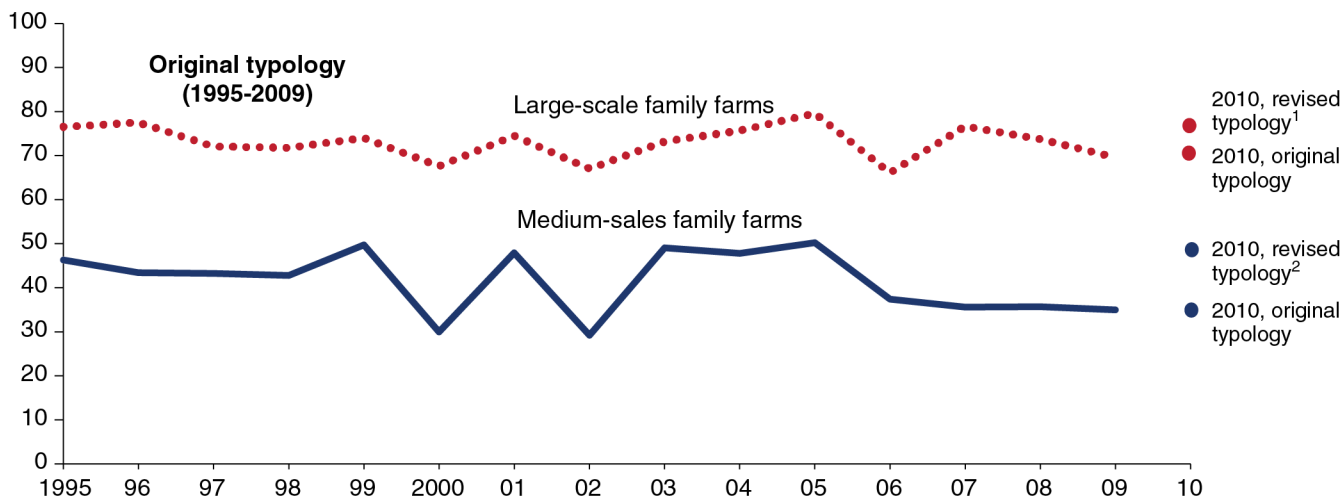
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1995 Farm Costs and Returns Survey and 2010 Agricultural Resource Management Survey for farm households. U.S. Census Bureau, Current Population Survey for all U.S. households.

Figure 5

Share of household income from farming by selected farm types, 1995-2010

Farming accounted for only about a third of household income on medium-sales farms between 2006 and 2010

Percent of farm household income



GCFI = Gross cash farm income.

Note: Cutoffs used in the original typology prior to 2010 are measured in current dollars.

¹Midsized and large-scale family farms in the revised typology.

²Moderate-sales family farms in the revised typology.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1995 Farm Costs and Returns Survey and 1996-2010 Agricultural Resource Management Survey.

The increased median household income for midsize and large-scale farms (table 8) also reflects the reclassification of farms. Under the revised typology, the former large-scale group loses its smallest farms—46,400 farms with sales between \$250,000 and \$349,999—and experiences a net loss of 17,900 farms (mostly farms with production contracts) after the switch from gross farm sales to GCFI. The remaining midsize and large-scale farms are larger, generating more farm-related household income. Nevertheless, the share of income from farming for households operating these farms remained in the longstanding 66- to 80-percent range (fig. 5).

Effects on Midsize and Large-Scale Farms

Although the midsize and large-scale categories in the revised typology are not directly comparable with any categories in the original category, we can classify farms in earlier years according to the revised typology. When doing this, we also adjust the cutoffs for price changes, using the farm PPI. This allows us to examine shifts in the value of production to larger farms, similar to those shown in table 1.

Changes in the Distribution of Farms and Production

Differences in the distribution of farms were modest (table 9). The 1995 and 2010 estimates of the midsize, large, and very large shares of all farms differ by no more than 1 percentage point. This reflects the small number of midsize and large-scale farms, which total 106,600 in 1995 and 149,800 in 2010.

Changes in the distribution of production were more pronounced. Midsize farms' share of production increased by 6 percentage points between 1995 and 2010. Increases for the large and very large farms were 8 and 5 percentage points, respectively. These changes are consistent with the production shifts presented in table 1.

Changes in Household Income

Inflation-adjusted median household income was higher in 2010 than in 1995 for midsize farms under the revised typology, but this was not true for the large-scale categories (table 10). Median household income was about the same both years for large family farms and about 9 percent lower in 2010 for very large farms. The smaller increases for large-scale farms may reflect specialization in commodities that did poorly in 2010. In addition, households that operate large-scale farms would not benefit as much from growth of off-farm income as households operating smaller farms. The share of total income from farming was fairly constant for a given category—69 percent in both years for midsize farms, 86 percent in 1995 and 83 percent in 2010 for large farms, and 94 and 96 percent, respectively, for very large farms.

Table 9

Farms and their value of production by the revised typology, 1995 and 2010

Type of farm	Revised typology ¹		Change in distribution ²
	1995	2010	
	<i>Number</i>		
Total farms	2,068,000	2,192,774	na
	<i>Percent of U.S. total</i>		
Distribution of farms:			
Small farms	93.3	90.9	-2.4
Midsized farms	4.1	5.1	1.0
Large-scale farms	1.0	1.7	0.7
Large	0.9	1.5	0.6
Very large	0.1	0.1	0.0
Nonfamily	1.5	2.3	0.8
Total	100.0	100.0	0.0
Distribution of the value of production:			
Small farms	44.8	28.6	-16.2
Midsized farms	19.3	24.8	5.5
Large-scale farms	21.4	34.3	12.9
Large	14.5	22.8	8.3
Very large	6.9	11.6	4.7
Nonfamily	14.5	12.3	-2.2
Total	100.0	100.0	0.0

GCFI = Gross cash farm income.

na = Not applicable.

¹GCFI in 1995 was converted to 2010 dollars using the Producer Price Index (PPI) for farm products.

²Column 2 minus column 1.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1995 Farm Costs and Returns Survey and 2010 Agricultural Resource Management Survey.

Table 10

Operator household income by the revised typology, 1995 and 2010

Type of farm	Revised typology ¹		Change in income, 1995 to 2010
	1995	2010	
	<i>Number</i>		
Total operator households and family farms	2,036,810	2,143,063	na
	<i>2010 dollars per household</i>		<i>% change</i>
Median operator household income ²	43,938	54,162	23.3
Small farms	42,733	51,522	20.6
Midsized farms	111,047	146,450	31.9
Large-scale farms	276,227	269,774	-2.3
Large	256,203	255,643	-0.2
Very large	854,046	776,936	-9.0
Median income, all U.S. households	48,766	49,445	1.4
	<i>Percent of total household income</i>		
Share of income from farming ³	10.6	13.9	na
Small farms	-2.1	-1.3	na
Midsized farms	68.6	68.8	na
Large-scale farms	87.7	86.7	na
Large	85.7	83.3	na
Very large	93.7	95.8	na

GCFI = Gross cash farm income.

Note: Operator household income is calculated only for family farms.

na = Not applicable.

¹GCFI in 1995 was converted to 2010 dollars using the Producer Price Index (PPI) for farm products.

²Household income is expressed in 2010 dollars, using the Consumer Price Index, all urban consumers (CPI-U) to adjust for price changes.

³Income from farming is the sum of farm business income and income from other farm activities (see box, "Defining Operator Household Income," p. 24). The share of income from farming is negative if the household experienced a loss farming.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1995 Farm Costs and Returns Survey and 2010 Agricultural Resource Management Survey for farm households. U.S. Census Bureau, Current Population Survey for all U.S. households.

Conclusions and Discussion

Updating the ERS typology encompasses raising the income cutoffs, adding categories for million-dollar farms, and changing the farm size measure from gross farm sales to GCFI. These considerations beg the question as to how often the typology will need to be updated in the future.

Raising the Cutoffs and Adding Categories

The effects of revising the ERS typology differ by type of farm. Increasing the small-farm cutoff from \$250,000 to \$350,000 has practically no impact on the number of retirement and off-farm occupation farms. Most farms in these groups have sales so low compared to the original \$250,000 cutoff that increasing the cutoff by another \$100,000 has no effect. In contrast, increasing the boundary between low- and moderate-sales farms from \$100,000 to \$150,000 increases the number of low-sales farms by 9 percent, due to a shift of farms formerly classified as moderate-sales to the low-sales group. The number of moderate-sales farms decreases after the update because gains in the number of farms formerly classified as large are smaller than the losses of farms to the low-sales group. Operators of moderate-sales farms under the revised typology, however, received nearly half of their income from farming in 2010, similar to the share before the recent run-up in commodity prices.

Raising the \$250,000 small-farm cutoff to \$350,000 shifts 46,400 formerly large farms into various small-farm groups. As a result, the small-farm share of farms increases by 2 percentage points and the small-farm share of production increases by 5 percentage points.

The distribution of production will likely continue shifting upward toward larger farms, particularly those with sales of \$1 million or more. Adding categories for million-dollar farms will help in monitoring these shifts. Using two categories of million-dollar farms rather than one category is reasonable because farms with sales of at least \$5 million are markedly different from those with sales between \$1 million and \$4,999,999.

Switching From Gross Farm Sales to GCFI

The overall effects of switching from gross farm sales to GCFI on the small-farm count are small. The net increase in the count of small farms is 17,900, and the small-farm share of all U.S. farms increases by less than 1 percentage point. The switch, however, does make a difference in the distribution of the value of production, increasing the small-farm share by 8 percentage points to 29 percent. The increase is largely due to the production under contract associated with farms reclassified as small.

Whether farm size is measured by gross farm sales or GCFI makes no difference for most farms, because the measures are equal for two-thirds of U.S. farms. The situation is different for farms with substantial discrepancies between gross farm sales and GCFI. When using GCFI to classify farms, there will be cases where small farms have substantial production under contract but low revenues and other

cases where midsize or large-scale farms have substantial revenues from other farm-related income but low production.

Note, however, that discrepancies between GCFI and gross farm sales also exist when using gross farm sales to classify farms. Small-farm businesses with modest receipts from contract fees may be classified as large based on their production under contract, while other farms with substantial other farm-related income may be classified as small based solely on their production of farm commodities.

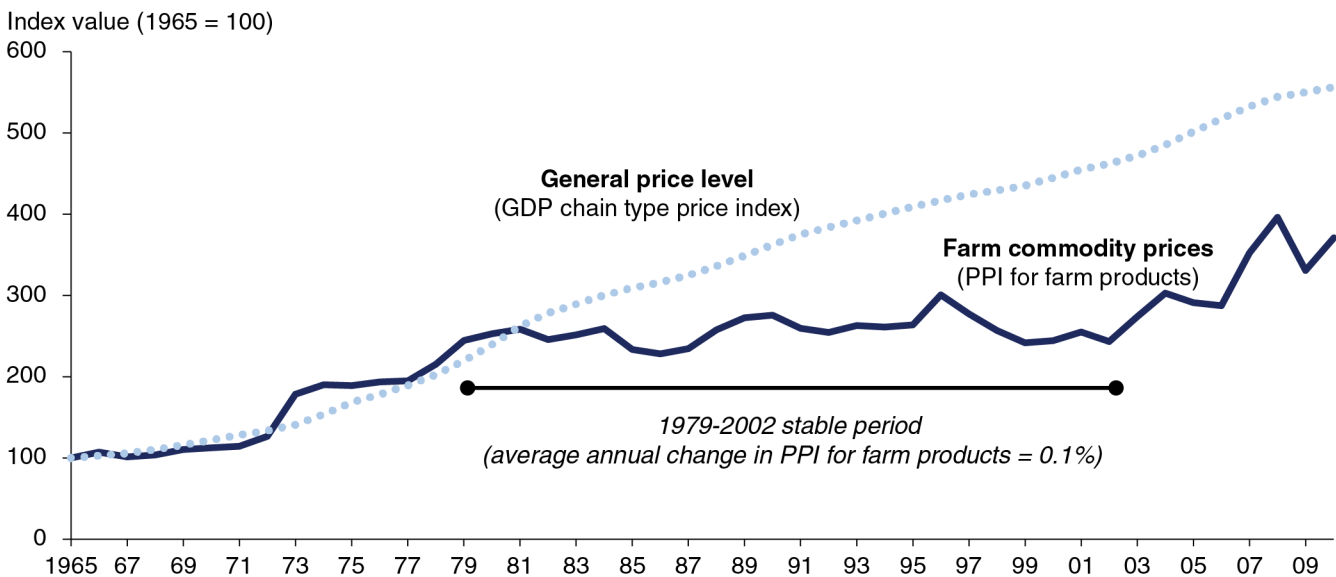
The Next Revision?

We will update the typology again when warranted by changes in commodity prices and farm structure. The cutoffs in the farm typology could be revised annually, since the farm PPI is available each year. Changes in commodity prices, however, differ from changes in the general price level, which affects how frequently it would be advisable to make adjustments based on the farm PPI. Farm commodity prices do not increase as steadily as the general price level (fig. 6).⁷ In addition, there was an extended period from 1979 to 2002 when commodity prices were relatively stable, showing no clear trend. The average annual increase in commodity prices during this period was 0.1 percent, compared with 3.3 percent for the general price level (table 11), although there still were large annual swings in the farm PPI. The subsequent increases in the PPI between 2002 and 2010—which triggered the revisions discussed in this report—averaged 6.1 percent per year, compared with 2.4 percent for the general price level.

Figure 6

Producer Price Index (PPI) for farm products and GDP chain-type price index, 1965-2010

Farm prices increase less steadily than the general price level



Source: Compiled by the Economic Research Service from Bureau of Labor Statistics and Bureau of Economic Analysis data (U.S. Executive Office of the President, 2012, pp. 326-327 and 396-397).

⁷Figure 6 is similar to figure 1, except it adds a line for the GDP chain-type index to measure the general price level. It also uses 1965 as the base year, which facilitates comparing accumulated changes in general and commodity prices.

Table 11

Changes in farm prices and the general price level, various periods

Item	Commodity prices (farm PPI)	General price level (GDP chain-type price index)
	<i>Percent</i>	
Change in index from 1965 to 2010	271.0	456.5
Average annual change	3.3	3.9
Minimum change	-16.6	1.1
Maximum change	40.9	9.5
Change in index from 1979 to 2002	-0.6	110.4
Average annual change	0.1	3.3
Minimum change	-9.9	1.1
Maximum change	14.0	9.4
Change in index from 2002 to 2010	52.5	20.4
Average annual change	6.1	2.4
Minimum change	-16.6	1.1
Maximum change	22.6	3.3

Source: Compiled by the Economic Research Service from Bureau of Labor Statistics and Bureau of Economic Analysis data (U.S. Office of the President, 2012, pp., 326-327 and 396-397).

Given the extended period when commodity prices were relatively stable, annual adjustments in the farm typology should not be necessary. Annual adjustments when the PPI changes only marginally could result in a small changes in the small-farm cutoff—perhaps only \$10,000—that go up one year and down the next. Cutoffs expressed as stable, round numbers are more appropriate for the audiences ERS targets in its publications, simplifying comparisons across years. Periodic adjustments—after several years of substantial price changes in the same direction—are likely to be more appropriate.

The extended period of relatively stable commodities prices may also help explain why historical tables from the census of agriculture typically show the distribution of farms by sales class based on current dollars rather than constant dollars (USDA, NASS, 2009, pp. 7-8). Annual price adjustments make the most sense for items affected by steadily increasing prices. For example, families are classified as poor if their income is less than the applicable poverty threshold, which varies by family size and age of the householder (U.S. Department of Commerce, Bureau of the Census, 2012a). Poverty thresholds are adjusted annually for inflation as measured by the research series of the Consumer Price Index (CPI-U-RS), a price index that consistently trends upward over time, much like the GDP chain-type index. Without the annual adjustments, the purchasing power represented by the poverty thresholds would erode from year to year.

Finally, production is likely to continue to shift to larger and larger farms over time. These changes occur steadily over years, so additional classes at the upper end of the size distribution, if needed, can be added at the same time the cutoffs are adjusted for price changes.

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Appendix: Calculating Gross Cash Farm Income From the Census of Agriculture

In the 2007 Census of Agriculture, NASS published a variation of the ERS farm typology based on the market value of agricultural products sold (USDA, NASS, 2009, pp. B-8 and B-9), which is conceptually related to gross farm sales. Market value of sales differs from gross farm sales in that it excludes Government payments received by farms and their landlords.

When ERS starts to use gross cash farm income (GCFI) rather than gross farm sales in its typology, could the revised typology be replicated from the census? The answer is yes, since the components of GCFI—the farm’s sales of crops and live-stock, Government payments, and other farm income—are collected by the census. Switching from the market value of sales to GCFI, however, would require NASS to introduce a new income concept to census users.

Sales

The census collects the value of sales (see section 21 in the 2007 questionnaire), which is equivalent to crop and livestock sales from ARMS. Both ARMS and the census exclude the value of production going to production contractors from sales. The census includes the landlord share in the sales of each commodity, while ARMS excludes it. The census, however, does ask for the share of total sales going to landlords, which could be subtracted from total sales to be more consistent with ARMS. One relatively minor inconsistency between ARMS and the census remains: ARMS measures sales net of marketing charges, but the census makes no deduction for these charges.⁸

Government Payments and Other Farm-Related Income

The census also collects information on Government payments (sections 4 and 24) and other farm-related income (section 25), both of which are necessary to calculate GCFI. The census collects information on contract fees separately in the section on production contracts (section 20). Whether the receipt of Government payments excludes payments to landlords is unclear from census publications or the questionnaire.

⁸Operations that sell agricultural commodities typically have some marketing charges, usually deducted by the purchaser from the gross payments to the producer (USDA, NASS, 2011a). Some specific examples include commercial crop drying expenses, refrigeration during storage for perishable products, and check-off fees.