Poultry Production in the United States

The term "poultry" refers to domesticated fowl raised for meat or eggs. In the Agricultural Resource Management Study (ARMS, formerly known as Farm Costs and Returns Survey (FCRS)—see box), poultry includes chickens, turkeys, ducks, geese, emus, ostriches, and game birds. Most poultry operations raise only one species of poultry for a single purpose. Farms will keep hens to produce eggs for human consumption or for breeding purposes. Some raise "starter" pullets—baby female chicks raised to adult size for laying hens. Others concentrate on raising chickens or turkeys for meat production.

Background

In 1915, a poultry enterprise was found on most farms and in the yards of many homes of rural and small town families (table 1). Flocks were small and used for the production of household consumption of eggs and some local retail egg sales. Chicken meat was considered a byproduct of the egg enterprise, although turkeys, ducks, and geese were raised for meat. Reporting during this era concentrated on the number of chickens more than 4 months of age, a practice that would exclude broilers or fryers which are now sold at 6 to 8 weeks (U.S. Dept. of Commerce, 1954).

Table 1—Declining number of farms with chickens, increasing cash receipts, 1910-92

Year	Farms with chickens*	Cash receipts for chickens and broilers**
	Percent	$Million
1910	87.7	127
1920	90.5	317
1925	86.4	306
1930	85.4	333
1935	85.6	235
1940	84.5	268
1945	83.6	1,004
1950	78.3	946
1954	71.4	1,000
1959	58.5	1,045
1964	38.3	1,070
1969	18.5	1,531
1974	15.2	2,456
1978	14.9	3,715
1982	10.6	4,873
1987	8.3	6,177
1992	5.6	9,176

*Before 1969, only farms with chickens 4 months or older were counted. In 1969, the definition was changed to chickens 3 months and older, and broilers were counted separately. The percentages reported here include broilers in 1969 and following years. No turkeys, ducks, or geese are included. Only chickens on farms were counted. In the early years, many families raised chickens in their backyards. **Includes all chickens sold for meat 1910-59. After 1959, includes only broilers.
Source: U.S. Department of Agriculture's 1954, 1964, 1969, 1978, 1992 U.S. Agricultural Censuses, and Steele 1990.

Producing eggs was not considered a commercial endeavor until mid-century, mainly due to problems of disease and lack of technology to identify unfertilized eggs. In the late 1940s, a set of new conditions emerged in the technological, market, and policy areas of broiler production that significantly lowered production costs and allowed for increased sales (Reimund, Martin, and Moore, 1981). These changes substantially altered the production processes and the size of flocks. Some insight into the size of flocks at mid-century is found in Stewart (1946) who classified flocks according to the income they produced. Small flocks with 10 to 50 chickens were called "backyard" flocks and produced eggs and meat for the family. Larger flocks of 50 to 100 were used for "pin-money" (spending money for the family) as well as eggs and meat for the table. Commercial flocks were substantially larger, with 400 layers or more. According to Manchester (1954), most transactions were based on regular but informal (handshake) relationships.

In the 1940s, agricultural research brought new technologies to the poultry industry. Included were the introduction of new breeds for meat, better nutrition and disease control, better management of confined poultry, processes that correctly sexed chicks, and the candling of eggs. These practices introduced U.S. farmers to the possibilities of raising broilers and fryers for commercial consumption. Chicken flocks grew, and Fink (1986) reports that in 1974, testimony before a U.S. House Subcommittee showed that a medium-size farm would have 100,000 hens (U.S. House of Representatives, 1974:25). Today, large hatcheries have flocks as large as 350,000 hens or more.

As the poultry industry changed, providing chicken meat to compete with beef and pork, Americans' eating habits changed. In the 1940s the average American ate less than 20 pounds of poultry (boneless weight) per year— mostly surplus roosters and pullets raised for marketing as young birds and fowl sold from egg-producing flocks. Production and consumption, therefore, were highly seasonal (Lasley et al., 1988). The industry concentrated on providing consumers with a constant product stream of chickens grown for meat rather than their egg-laying abilities. By 1995, the per capita consumption of poultry by Americans was 63 pounds. Most of the increase in poultry consumption was in broilers, and this segment

Data Sources and Coverage

Data for this report come from USDA's Agricultural Resource Management Study (ARMS). Formerly known as the Farm Costs and Returns Survey (FCRS), this report uses data from the 1995 questionnaire. ARMS is composed of several questionnaire versions (for technical documentation, see Morehart, Johnson, and Banker, 1992). All versions include the same core group of questions related to farm income, expenses, and operator characteristics. USDA administers the survey each spring in the 48 contiguous States through personal enumeration. Usable sample data in 1995 were obtained for 8,784 farm and ranch businesses.

The target population of ARMS is operators associated with farm businesses representing agricultural production in the United States (excluding Alaska and Hawaii). A farm is defined as an establishment that sold or normally would have sold at least $1,000 worth of agricultural products during the year. Farms can be legally organized as proprietorships, partnerships, family corporations, nonfamily corporations, or cooperatives.

Data are collected from only one operator per farm. Operators are variously referred to as farmers, producers, or growers. The primary farm operator is the one who makes most of the day-to-day management decisions. This one-farm, one-operator survey design gives us good financial information for the farming business and farm operator's household, but limits information about income and equity-sharing when more than one operator is involved. Others, such as contractors, share-rent landlords, and partners or shareholders, provide inputs to the farm and receive income from production. ARMS does not include information on these entities, except as they relate to the farm business.

ARMS is a probability survey. Probability surveys are designed on the premise that every unit in the population has a known probability of being selected. An expansion factor, or weight, is established for each reporting unit (sample) which allows ARMS to expand to the USDA official number of farms.

Estimates based on an expanded sample differ from those based on a complete enumeration (as in the Census of Agriculture). Differences in these estimates relate to sampling and nonsampling errors. Sampling errors are usually random and can be measured by a standard error statistic; the larger the standard error, the lower the reliability of the estimate. The relative standard error (RSE) is expressed as a percentage and found by dividing the standard error of the estimate by the value of the estimate. For some estimates, the RSE is sufficiently large to make the estimate unreliable; these instances have been marked in the tables. For other items, sample size is not sufficient for statistical reliability or does not meet legal disclosure requirements, and the estimate is not provided.

Evaluation of coverage by comparison to the Census of Agriculture is precluded by the difference in reporting years (1992 for the Census of Agriculture and 1995 for ARMS). The only alternative source of national estimates is USDA's official farm sector income data. Data for this series are obtained from a variety of survey and administrative sources. The sector estimate of cash receipts for poultry and eggs in 1995 was $19.1 billion, compared with an ARMS-based estimated value of production of $14.5 billion. Some differences in the estimates result from differences in measurement tools for the sector and at the farm business level by the survey, and from enumeration as described above.

is expected to continue to increase from 49 pounds in 1995 to 64 pounds in 2005. The increase in chicken meat consumption led to the disappearance of the market for chickens not specifically grown for meat. By the mid-1980s, large operations specializing in contract production of broilers year-round clearly had market advantage.

The poultry industry offers a vivid example of how various agricultural sectors are interrelated and dependent on one another (see Lasley, Henson, and Jones, 1985). All segments of the industry (farmers, processors, hatcheries, geneticists, nutritionists, veterinarians, suppliers, marketing firms, and consumers) have combined to transform the industry from a minor sideline enterprise into a complex agribusiness. The use of white meat in new products and health issues have been major factors in the industry's ability to expand the market and change the production process to get the new products. In the early 1990s, the popularity of restaurant appetizers such as "buffalo wings" (chicken wings in a spicy sauce) caused the industry to scramble to meet the demand by consumers, restaurants, and convenience food processors. The shift in consumer tastes for chicken products is partly the result of convenience, packaging, and marketing of prepared or semi-prepared chicken meat products. Coupled with the new technologies to produce birds for meat, this new consumer demand coincided with the change of poultry being produced on independent farms to broilers being produced under contract (Lasley, 1983).

"Broilers" is the industry name for young chickens raised for meat. Most of the early commercial market for broilers was led by independents financed by feed dealers who extended them credit. Typically, birds were sold by auction. Dealer credit quickly evolved into a share contract because of the great risk of loss on one or more of the four lots of broilers that most growers could produce in a year (Manchester, forthcoming). By the 1960s, integrators (mostly feed dealers with their contract growers) bought or built slaughter plants, or produced broilers on their own farms, or both. Integrators and processors soon came under common ownership.

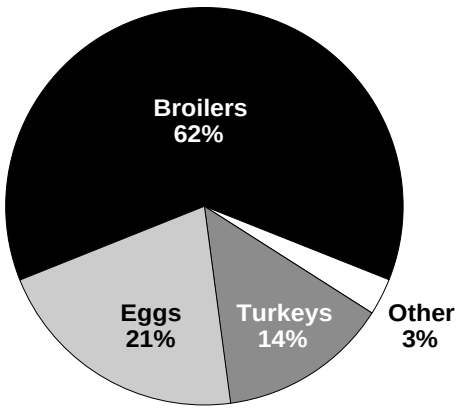
The poultry industry currently produces more than 7 billion chickens per year. Including chickens, eggs, turkeys and other poultry and poultry products, the official U.S. Department of Agriculture (USDA) estimate of cash receipts in 1995 was $19.1 billion, or about 10 percent of total receipts for all commodities. Following cattle and calves, dairy products, corn, and soybeans, broilers were the fifth leading source of farm sector cash receipts in 1995. Nearly 97 percent of poultry cash receipts are accounted for by chickens raised for broilers, chicken eggs, and turkeys (figure 1). Broilers are the single largest commodity in the poultry group, accounting for $11.8 billion or about 62 percent of the cash receipts for poultry products.

Characteristics of Farms Producing Poultry and Eggs

Based on the USDA survey, 49,716 farms produced poultry or eggs valued at $14.5 billion in 1995.[1] Poultry and egg production represented about 9 percent of the total value of all commodities produced and about 17 percent of the value of livestock products. Until mid-century, chickens were raised on most farms and in many backyards, but today, poultry production is concentrated on farms in the eastern half of the United States. Nearly 83 percent of U.S. farms producing poultry are found in the Northeast, Appalachian, Southeast, Delta, and Corn Belt regions (figure 2). Four regions (Northeast, Appalachian, Delta, and Southeast) accounted for nearly 70 percent of the total value of U.S. poultry and egg production in 1995. About 29 percent of all farms are in these regions; they produce 25 percent of the value of agri-

[1] Compared with Census of Agriculture information, ARMS significantly undercounts the number of farms with poultry and egg production.

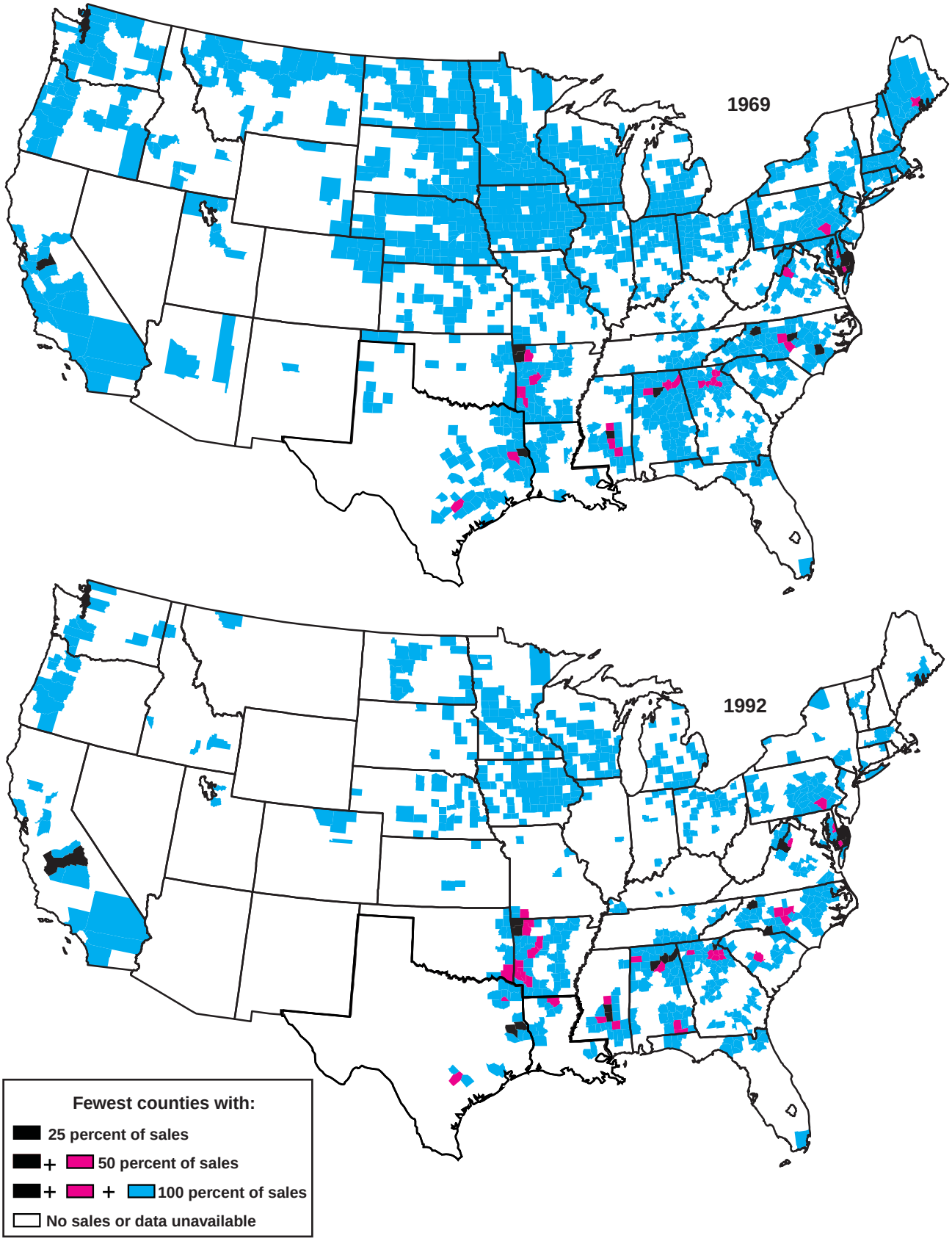
Figure 1
Distribution of poultry cash receipts, 1995



Source: Sector estimates from ERS Internet homepage (http://www.econ.ag.gov/Briefing/fbe)

Figure 2

Concentration of broiler sales, 1969 and 1992



Source: Compiled by ERS using census of agriculture data

cultural production. Poultry operations are, on average, smaller in the Corn Belt. This region represents 26 percent of all farms producing poultry or eggs, but accounts for only 4 percent of the total value of poultry production.

Traditionally, farm products were produced close to the source of inputs or close to consumers, and chickens were raised on almost every farm in the country. Since mid-century, however, poultry production has shifted to the South, with turkeys and eggs following broilers.

According to Lasley, Henson, and Jones (1985), changes in costs and relative profitability have led to interregional shifts and concentration in poultry production. First, because of transportation and packaging improvements, formerly dispersed commodities can be produced in specific locations, then moved far from the point of production or processing. Second, raising poultry may be attractive to Southern farmers because, as Lasley (1983) indicates, the region may have the comparative advantage of climate, low-priced land and less-productive soils, and areas that lack alternative uses for land and labor. Climate may heavily contribute to the location of producers (Lasley, 1983). Birds are susceptible to extremes in temperature and require access to plenty of water. Thus, they can be housed less expensively in the warmer parts of the country, although they require cooling during the summer months. Low-cost feed ingredients gave the Midwest an early lead in poultry production, but many Midwestern poultry farmers found it more profitable to devote their resources to enterprises other than poultry. In addition, Midwestern farmers, now specializing in corn, soybeans, and hogs, may have seen a different choice of commodities as more stable because of government programs for grains. Finally, poultry production in the South may be an attractive economic alternative, given fewer off-farm employment opportunities than in the Midwestern States.

During the regional shift of production, these newer poultry production areas began using direct ownership and contract growers, whereas independent growers who coordinated their sales through marketing contracts were more prevalent in the Midwest. Contractors have substantial investments in hatcheries, feed mills, and processing facilities. To reduce transportation costs for chicks, feed, and broilers, grower facilities cluster around contractor facilities (Lasley et al., 1988). In addition, birds do not travel well, so having farms close to the primary processor reduces losses in transit (figure 3). The close coordination of marketing with specialized complexes, complete with a well-developed infrastructure of local support services, now provides a competitive advantage for the southern regions of the United States.

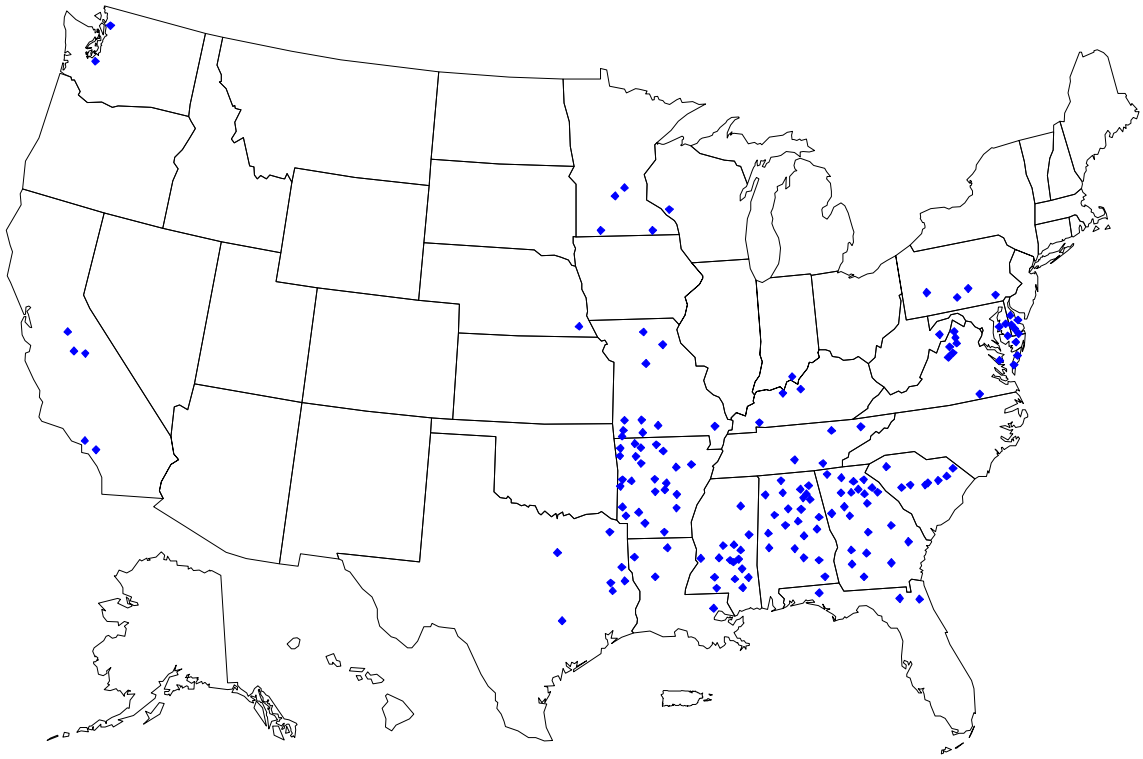
Poultry production is concentrated on large farms. By numbers, smaller farms— those with gross sales of $100,000 or less— were the majority (more than 54 percent) of farms delivering poultry or eggs in 1995 (table 2), but they produced just 12 percent of the value of production. By contrast, the 3 percent of the top poultry producers, those with sales of $1,000,000 or more, dominated production, accounting for one-third of the total value of poultry and egg production.

Poultry farms are highly specialized with respect to the commodities they produce. Table 3 indicates that 75 percent of the total value of poultry and egg production occurs on farms producing either poultry or eggs alone, or poultry or eggs plus one additional commodity. On average, the additional commodity accounted for less than 1 percent of the total value of commodity production on those farms. Farms producing up to two other commodities besides poultry and eggs accounted for 94 percent of the total value of poultry and eggs, and the other commodities amounted to less than 4 percent of their total value of production. Other commodities on farms producing poultry and eggs included cattle, hogs, dairy products, corn, soybeans, and hay.

Table 4 shows that poultry production is not land extensive, and the average farm with poultry and egg production operated 134 acres, compared with more than 400 acres for the average U.S. farm. Approximately 78 percent of farms operated fewer than 180 acres and accounted for 73 percent of total value of poultry and egg production. Poultry growers do not rent much of the land on which they operate their businesses. Over three-fourths (77 percent) of the value of poultry and egg production occurred on the 66 percent of farms that owned all of the acreage they operated. The remaining 34 percent of farms rented in some or all of the land they operated.

Farmers producing poultry were more likely than other farm operators to report their occupations as farming. About half of all U.S. farm operators say that their major occupation is something other than

Figure 3
Locations of major broiler processing/further processing plants



Source: Poultry Digest; internet homepage (http://www.wattnet.com)

farming. On poultry operations, however, 61 percent of operators reported farming as their major occupation. These poultry farmers accounted for 71 percent of the value of poultry and egg production. Another 4 percent of operators reported themselves as hired managers or retired farmers and produced 15 percent of the value of poultry and egg production. The 35 percent of operators who reported their occupations as something other than farming accounted for the remaining 14 percent of the value of production.

Most poultry and egg operations fully employ at least one person. Nearly half the value of poultry products was produced by full-time operators who worked 2,000 hours or more during 1995. An additional 35 percent of the value of poultry and egg production was on farms where the operator worked between 1,000 and 1,999 hours annually. Poultry operators tend to be slightly younger than other U.S. farmers, and their average educational attainment is less.

As on other farms, nearly all (95 percent) poultry farms were organized as legal partnerships or individual operations. These farms accounted for 72 percent of the value of poultry and eggs produced. The remaining 28 percent of the value of poultry and egg production occurred on the 5 percent of farms organized as corporations or cooperatives.

Table 2—Average value of production, contracts, and sales for farms with any poultry or egg production, by sales class, 1995

Item	Gross annual sales				All poultry and egg farms
	Less than $100,000	$100,000-$499,999	$500,000-$999,999	$1,000,000 or more	
			Number		
Farms	27,035	17,065	4,038	1,578	49,716
			Percent		
Percent of farms	54.4	34.3	8.1	3.2	100
			Million dollars and percent		
Value of all commodities produced	**2,000	5,573	3,046	5,087	15,706
Percent of value of production	**12.7	35.5	19.4	32.4	100
Value of poultry and egg production	**1,669	5,216	2,799	4,778	14,463
Cash sales for all products	*358	*456	*442	*2,499	3,755
Percent of cash sales	*9.5	* 12.1	11.8	* 66.6	100
Value of poultry and egg cash sales	**66	NA	NA	*2,009	*2194
Value of all contracts	**1,645	5,194	2,841	2,920	12,599
Percent of value of contracts	** 13.1	41.2	22.5	23.2	100
Value of poultry and egg contracts only	**1,603	5,129	2,768	2,770	12,269
			Dollars/farm		
Average value of production for all commodities	*73,975	326,568	754,461	3,224,528	315,915
Average value of poultry and egg production	**61,728	305,663	693,260	3,029,070	290,907
Average value of cash sales for all products	13,252	26,726	*109,388	*1,584,178	75,532
Average value of poultry and egg cash sales	2,440	NA	NA	*1,273,462	44,121
Average value of all contracts	60,832	304,359	703,510	1,851,216	253,430
Average value of poultry and egg contracts only	59,288	300,535	685,558	1,755,608	246,786

NA=Not available. Rounded percentages may not add to 100. CV=(Standard Error/Estimate)*100. CVs less than 25 are unmarked. *=CV is between 25 and 50. **=CV is between 51 and 75.

Source: U.S. Department of Agriculture's 1995 Agricultural Resource Management Study (previously known as the Farm Costs and Returns Survey).

Table 3—Number of farms and value of production of commodities produced on farms, with any poultry or egg production, by number of commodities on farms, 1995

	Poultry or eggs only	Farms producing poultry or eggs with: One additional commodity	Two additional commodities	Three additional commodities	Four or more additional commodities	All farms producing poultry or eggs
			Number			
Farms	14,280	11,720	*11,792	*6,804	**5,118	49,716
			Percent			
Farms	28.7	23.6	*23.7	*13.7	**10.3	100.0
Total value of production	**45.3**	**24.7**	***20.1**	**5.2**	**4.7**	**100.0**
Livestock production	46.6	25.3	*20.0	4.5	3.5	100.0
Crop production	0.0	*4.3	*24.9	*27.1	*43.7	100.0
			Dollars/farm			
Total value of production	**497,670**	**330,963**	***268,324**	***119,254**	***145,444**	**315,915**
Livestock	497,670	329,262	*258,423	*100,565	*105,364	306,482
Poultry	445,168	272,885	*133,468	**51,901	**54,536	236,579
Eggs	*52,502	*49,226	**100,264	**25,322	**3,838	*54,328
Cattle	0	6,692	*8,842	**2,496	*13,226	5,378
Hogs	0	NA	NA	**7,998	*17,668	*5,203
Dairy	0	0	**6,101	**12,743	*15,487	*4,786
Other livestock	0	NA	NA	NA	609	*208
Crops	0	*1,701	*9,901	**18,689	**40,080	9,434
Corn	0	NA	**802	**5,615	**15,426	*2,582
Cotton	0	0	NA	**651	NA	*269
Hay	0	*204	*987	**418	**3,601	*710
Peanuts	0	NA	**249	**805	NA	*189
Soybeans	0	NA	*916	**5,381	**12,854	*2,369
Tobacco	0	NA	NA	584	**1,123	*653
Other crops	0	** 636	NA	**5,235	**5,584	*2,662

NA=Not available. CV=(Standard Error/Estimate)*100. CVs less than 25 are unmarked. *=CV is between 25 and 50. **=CV is between 50 and 75. Rounded percentages may not add to 100. Source: U.S. Department of Agriculture's 1995 Agricultural Resource Management Study (previously known as the Farm Costs and Returns Survey).

Table 4—Value of production on farms with any poultry production, 1995

Item	Farms	Farms	Total value of poultry production	Poultry value of production	Average value of poultry production
	Number	*Percent*	*$ Million*	*Percent*	*Dollars*
All poultry operations	49,716	100	14,463	100	290,907
Gross annual sales:					
Less than $100,000	27,035	54.4	1,669	11.5	61,728
$100,000 - $499,999	17,065	34.3	5,216	36.1	305,663
$500,000 - $999,999	4,038	8.1	2,799	19.4	693,260
$1,000,000 or more	1,578	3.2	4,778	33.0	3,029,070
Operator occupation:					
Farming	30,415	61.2	10,289	71.1	338,294
Hired farm manager	NA	NA	NA	NA	NA
Other occupation	17,141	34.5	2,065	14.3	120,453
Retired	NA	NA	NA	NA	NA
Operator age:					
34 years or younger	NA	NA	NA	NA	NA
35 - 44 years	13,264	26.7	4,139	28.6	312,076
45 - 54 years	16,900	34	5,239	36.2	309,998
55 - 64 years	11,186	22.5	2,933	20.3	262,224
65 years or older	3,244	6.5	1,208	8.4	372,391
Operator education:					
Some high school or less	12,125	24.4	1,929	13.3	159,089
High school	24,341	49	7,745	53.6	318,186
Some college	8,320	16.7	2,947	20.4	354,269
College	4,930	9.9	1,841	12.7	373,480
Operator hours worked:					
499 hours or less	NA	NA	NA	NA	NA
500 - 999 hours	4,855	9.8	1,213	8.4	249,832
1,000 - 1,999 hours	16,682	33.6	5,021	34.7	300,970
2,000 hours or more	22,817	45.9	6,988	48.3	305,852
Tenure classification:					
Tenant	NA	NA	NA	NA	NA
Part owner	14,334	28.8	3,060	21.2	213,493
Full owner	33,000	66.4	11,066	76.5	335,340
Acres operated:					
49 or fewer acres	23,444	47.2	4,963	34.3	211,703
50 - 179	15,621	31.4	5,664	39.2	362,563
180 - 499	8,504	17.1	2,130	14.7	250,441
500 - 999	1,549	3.1	1,100	7.6	709,817
1,000 or more	NA	NA	NA	NA	NA

NA= not available.

Source: U.S. Department of Agriculture's 1995 Agricultural Resource Management Study (previously known as the Farm Costs and Returns Survey).