



# Overview of the United States Sheep and Goat Industry

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## General

This report takes a graphical look at the sheep and goat sector of United States agriculture over the past quarter century (1987-2011) drawing on statistics published from NASS's annual sheep and goat program and the *2007 Census of Agriculture*.

According to the *2007 Census of Agriculture*, value of sales for the sheep and goat sector of United States agriculture increased 30 percent over the sales figure from the 2002 census. During 2007, sales of sheep and goats and their products in the United States totaled \$704.9 million. These sales accounted for 0.2 percent of all agricultural products sold in the United States during 2007. The largest increases in sales were seen in California (+\$19.5 million), Iowa (+\$16.8 million), Texas (+\$13.6 million) and Colorado (+\$12.3 million). Weld County in Colorado was the largest single county in terms of sheep and goat sales during 2007, with \$60.9 million, or 8.6 percent of the total United States sales.

Map 1 on page 5 shows a dot density map of sheep and lamb inventory for the United States on December 31, 2007. The maps on pages 14 and 15 (Maps 2-5) show inventory on December 31, 2007 for all goats, Angora goats, milk goats, and meat and other goats.

## Sheep

The sheep industry has a long history in the United States. One of the few multi-purpose animals raised in the United States, sheep are still bred for both meat and wool production, while some producers raise sheep for milking. With declining wool demand and production, mainly due to the development and acceptance of man-made synthetic fibers, some producers have shifted their efforts to raising hair sheep, which require little or no shearing, while still producing high-quality carcasses. One important aspect of the sheep industry that often goes without mention is their value in grazing vegetation. Sheep help prevent wildfires by eating grass and brush that fuel these fires. They also help control invasive and noxious weeds on public and private lands throughout the nation.

The number of sheep operations in the United States on December 31, 2010 was 81,000 according to the *Farms, Land in Farms, and Livestock Operations* report published in February 2011. Graph 1 on page 5 shows the number of sheep operations in the United States over the past quarter century. A break in the data series for sheep operations is shown between 2006 and 2007, indicating a change in methodology for measuring the number of farm operations including livestock operations. The *2007 Census of Agriculture* estimated a greater number of farms in the lowest value of sales categories. This was due to extensive list building efforts and changes in methodology that allowed NASS to capture more of the small farms with less than \$10,000 in value of agricultural sales. Additionally, 2007 was a year of relatively high commodity prices. As the value of farm commodities increased, more very small operations were able to meet the \$1,000 value of sales threshold to qualify as a farm. Graph 2 (which also shows a break in the number of operations data series) displays the average number of sheep per operation since 1987. Graph 3 shows the percent of operations with breeding animals by size group for 2000 and 2010, and Graph 4 shows the percent of breeding inventory by size group for the same years.

Sheep numbers have shown a steady decline since peaking at 56.2 million in 1942. There have been many cycles throughout the past 100 years. At the beginning of the 20<sup>th</sup> century, sheep numbers were just above 48 million head. By 1940, those numbers had grown to just over 52 million head. Inventory numbers fell following World War II, declining to

fewer than 30 million head for the first time in 1950. During the 1950's, sheep numbers generally leveled off before showing some modest growth late in the decade and into 1960. During the 1960's, sheep numbers fell each year and were just over 21 million head at the end of the decade. The decline continued throughout the 1970's. By 1979, inventories had slipped to just over 12 million. The 1980's started off with sheep inventories showing growth in the first three years, followed by four years of decline. By the end of the 1980's, sheep numbers had fallen just below 11 million head. The decline continued in the 1990's, and in 1994, inventory dipped below 10 million head for the first time. From the start of the 20<sup>th</sup> century to the end, sheep numbers declined 86 percent.

Sheep inventory for the past 25 years is shown in Graph 5 on page 7. In 2005, sheep inventory increased for the first time since 1990, and sheep inventory increased in consecutive years (2005 and 2006) for the first time since 1987 and 1988. This modest growth in sheep numbers can be attributed to the USDA Farm Service Agency's Ewe Lamb Replacement and Retention Payment Program. Dry conditions in the major sheep states during the time of the program limited the number of ewe lamb replacements producers could hold back to help rebuild the breeding flock. Since the end of the program, sheep numbers have continued to decline, although the pace of decline has slowed compared with earlier decades. On January 1, 2011, total sheep and lamb inventory in the United States was estimated to be 5.5 million head.

Graph 6 illustrates how ewes have maintained a fairly consistent portion of the breeding herd since 1987 and Graph 7 shows the makeup of ewes, replacement lambs and rams in proportion to all breeding sheep. Graph 8 shows that even as ewe numbers have fallen over the years, lambing rates (lambs per 100 ewes one year and older) have shown a slight upward trend. This could be due to several factors such as improved genetics or weather.

In conjunction with declining inventory numbers, wool production in the United States has declined 64 percent since 1987. Graph 9 shows this decline in wool production along with the market year average price received by producers for their wool. Sheep and lamb market year average prices (Graph 10) and inventory values (Graph 11) illustrate how much the price and value per head of sheep and lambs has increased during the past 25 years. United States lamb prices in 2010 were nearly \$50.00 per hundred weight (cwt) higher than in 1987, and 2010 prices for both sheep and lambs were the highest in history.

Total slaughter of sheep and lambs, which includes federally inspected slaughter from the Food Safety and Inspection Service (FSIS), non-federally inspected slaughter, and on-farm slaughter for home consumption, has declined 52 percent since 1987 (Graph 12). The late 1980's and early 1990's were a period of increasing slaughter numbers in conjunction with increasing inventory numbers during that same period. Since 1992, however, total slaughter numbers have been on the decline. During 2010, 2.6 million sheep and lambs were slaughtered in the United States. A graph showing sheep and lamb gross income and cash receipts (Graph 15) illustrates fairly constant numbers over the past 25 years, ranging from 400 million to 650 million dollars. Although sheep numbers have declined, prices per hundred weight (Graph 10) and slaughter weights (Graph 13) have trended upward over this period, holding gross income around \$500 million.

The supply and disposition of sheep and lambs is also impacted by international trade, although to a much lesser degree than for cattle and hogs. The United States has been a net exporter of live sheep over the past two decades, with the majority of these exports going to Canada and Mexico. The United States imports very small numbers of live sheep, with most imports over the past 25 years coming from Canada and Mexico (Graph 16).

Despite the large decreases in inventory over the past 25 years, there are reasons to be optimistic about the future of the sheep industry. Even though sheep numbers have shown a general decline during the past two decades, in recent years the declines have been less drastic and there have even been some periods of growth (Graph 5), and sheep and lamb prices are currently strong compared to any time in history. Sheep are ideal for operations with a small acreage. Most operations in the United States raise fewer than 100 head (Graph 2). Growth of the industry will rely on these smaller operations growing and continuing to introduce more people to the industry while at the same time tapping into local niche markets for lamb and mutton, wool, and dairy products.

## Goats

Like sheep, goats are desirable for operations with limited acreage looking to raise livestock and produce fiber, dairy, or meat products. Typically, goats are easier to manage and less costly to raise than many livestock species. Goat statistics are still relatively new to NASS, with the first ever full scale goat survey (outside of the agricultural census) conducted in January 2005. This report takes a graphical look at these estimates, along with data from the *2007 Census of Agriculture*, starting on page 14.

As of December 31, 2010, there were approximately 152,000 goat operations in the United States (Graph 17). Angora goat operations totaled 6,000, milk goat operations totaled 31,000, while meat and other goat operations were estimated at 128,000. The number of goats per operation averaged around 20 head for all goat operations. The average number of goats per operation by type of goat can be seen in Graph 18.

NASS has conducted its annual goat survey for 7 years. Between 2005 and 2008, the number of goats expanded by 3 to 5 percent per year. The *2007 Census of Agriculture* showed an increase of 24 percent in total goat inventory over the 2002 census. This expansion in goat numbers can be attributed to the rapid growth of ethnic groups in the United States in which goat meat is widely consumed. The tobacco buyout program is another reason for the growth in the goat industry. Some states offered incentives for tobacco farmers to move into other areas of production agriculture. The Southeast, where the majority of tobacco is grown, saw the largest growth in goat numbers. However, in 2009, goat inventory numbers in the United States began to decline, more than likely due to the slowdown in the economy and the higher price of input costs. Graph 19 shows goat inventory estimates by type of goat from 1989 to 2011 for Angora goats, and from 2005 to 2011 for milk, meat and other, and all goats.

Prior to 2005, Angora goat estimates were limited to inventory for three to five states (Arizona, New Mexico, Michigan, Oklahoma, and Texas) depending on the year. In Graph 19, the decline of Angora inventory since 1989 is evident. Angora goats totaled almost two million head in 1989 but fell to 172,000 head on January 1, 2011. Mohair production (Graph 21) decreased from over 17 million pounds in 1988 to below 1.09 million pounds in 2010. Outside of Arizona, New Mexico, and Texas, there are relatively few Angora goats in the United States. On January 1, 2011, Angora goats accounted for 6 percent of the United States goat herd (Graph 24).

A bright spot for the goat industry can be seen on Graph 19, which shows that even during the economic downturn milk goat inventory numbers have continued to increase. January 1, 2011 milk goat inventory of 360,000 head represents a 24 percent increase in milk goats over the number from the *2002 Census of Agriculture* and an 8 percent increase over the 2007 census. On January 1, 2011, milk goats accounted for 12 percent of goats in the United States (Graph 24).

Meat and other goats made up 82 percent of all goats in the country on January 1, 2011 (Graph 24). Until 2009, meat and other goats had the fastest growth of the three types of goats, growing 3-5 percent each year from 2005 to 2008 before starting to decline slightly in 2009 (Graph 19).

Graph 20 shows the all goat kidding rate, does, and kid crop from 2005 through 2010. During this period, the kidding rate ranged from around 103 kids per 100 does to 105 kids per 100 does. In general, the United States Angora goat kidding rate is the lowest for the three types of goats and the milk goat kidding rate is the highest. In 2010 the Angora kidding rate was 71 kids per 100 does, the milk goat kidding rate was 116 kids per 100 does, and the meat and other goat kidding rate was 103 kids per 100 does.

Graph 22 shows the annual number of goats slaughtered under federal inspection (FSIS) from 1988 to 2010. In 2006, NASS also began publishing the number of goats slaughtered by non-federally inspected plants. Graph 22 shows the data from 2006 to 2010. Much like all goat inventory, the graph shows a period of general growth in slaughter numbers throughout the last two decades. Graph 23 shows the live goat imports and exports for the United States. Although live goat exports have been declining over the last two decades, the United States continues to be a net exporter of live goats.

Before the economic downturn, goat numbers showed no signs of slowing down. With the United States population becoming more diverse each year, the outlook for continued growth in the goat industry is favorable and will be needed to meet domestic demand.

## Statistical Methodology: Sheep and Goats

**Survey Procedures:** The January *Sheep and Goat* report is based on a probability survey. A probability survey assumes that everyone in the target population has a positive probability of being selected. These probabilities do not have to be equal but they must be known and used in the sample selection and survey estimation process. Because a sample is used in the survey process, sampling errors are associated with the numbers. However, since the probabilities of selection are known, sampling errors can be calculated to determine levels of precision. In other words, it allows an objective evaluation of the reliability of a statistic.

The sampling universe for the sheep and goat survey is all operations with at least one head of sheep or goats. A sample of sheep and goat producers from the list frame maintained by NASS is supplemented by a sample of area frame tracts to ensure complete coverage. Sampling procedures ensure that all sheep and goat producers, regardless of size, have a chance to be included in the survey. Large producers are sampled more heavily than small operations.

A random sample of roughly 23,000 United States producers is surveyed during the first half of January to provide data for the January *Sheep and Goat* report. Data is collected by mail, telephone and face-to-face personal interviews. Operators are asked to report inventories as of the first of the month. Usable reports for the January survey average over 80 percent.

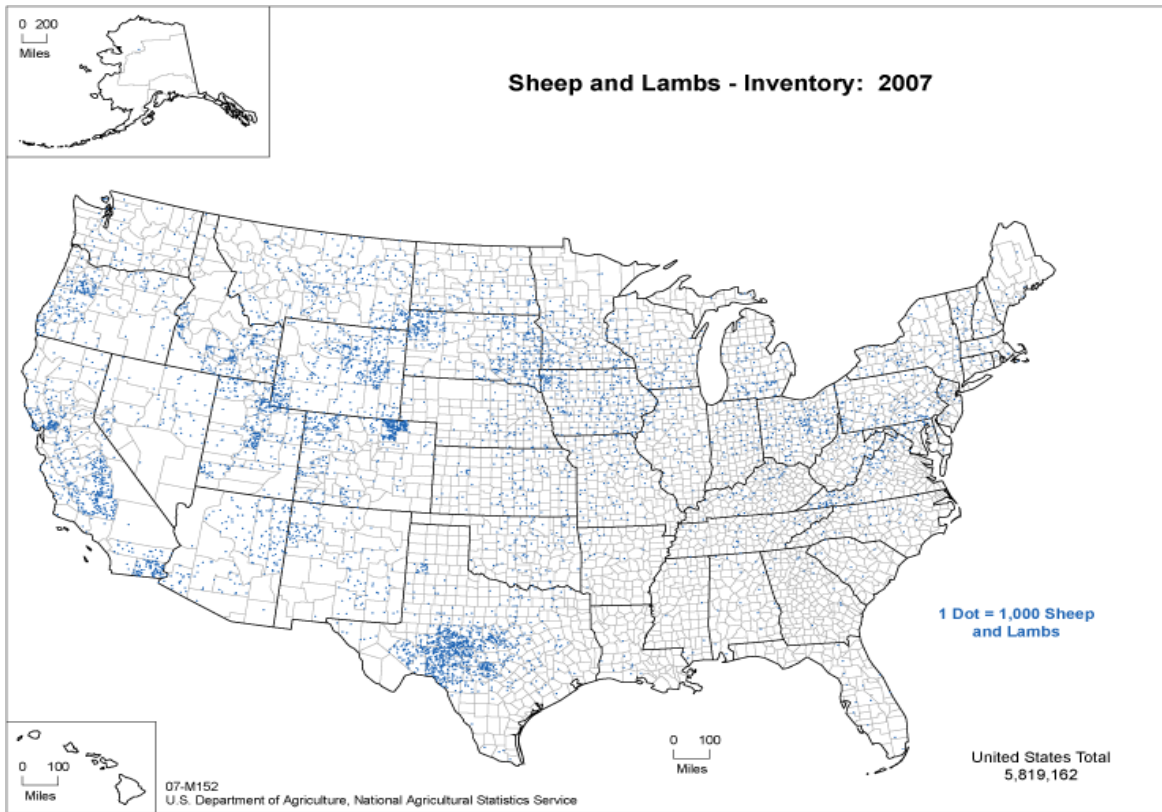
**Estimation Procedures:** The sheep and goat estimates are prepared by the Agricultural Statistics Board after reviewing recommendations and analysis submitted by each State field office. National and State survey data are reviewed for reasonableness with each other and with estimates from the previous year using a balance sheet. The balance sheet begins with the previous inventory estimate, adds to it estimates of births and imports, and subtracts estimates of slaughter, exports, and deaths. The indicated ending inventory level is compared to the Agricultural Statistics Board estimate for reasonableness.

**Estimates Published:** The January *Sheep and Goat* report includes estimates of United States and State level sheep and goat inventory by class, number of lambs and kids born during the previous year, and wool and mohair production and value for the previous year. Annual estimates of the number of United States sheep and goat operations are published in the February *Farms, Land in Farms, and Livestock Operations* report. State level operation estimates are published in conjunction with the Census of Agriculture every five years.

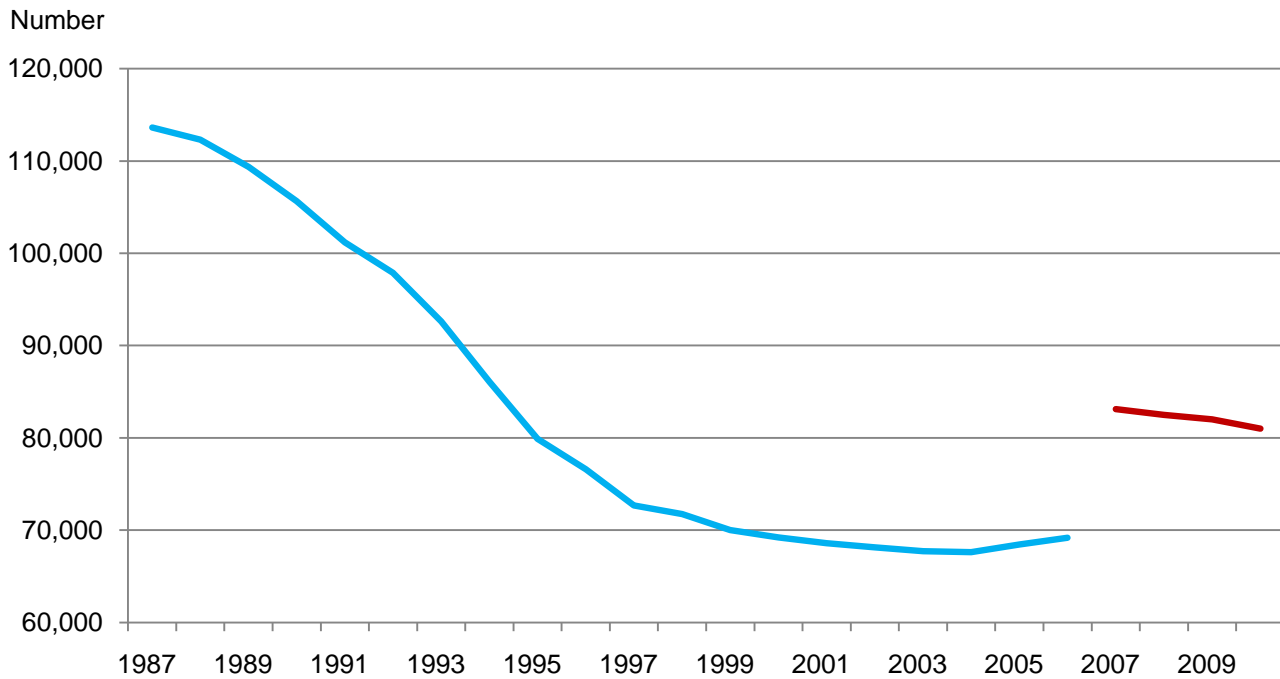
**Revision Policy:** Revisions to previous estimates are made to improve year to year and item to item relationships. Estimates for the previous year are subject to revision when current estimates are made. The reviews are primarily based on livestock slaughter and additional foreign trade and survey data. Estimates for the previous five years are also reviewed after data from the Census of Agriculture are available. No revisions will be made after that date.

**Reliability:** To assist users in evaluating the reliability of estimates, the "Root Mean Square Error" is shown for selected items in each report. The "Root Mean Square Error" is a statistical measure based on past performance and is computed using the differences between first and latest estimates. The "Root Mean Square Error" for January and July sheep inventory estimates over the past 10 years is 0.8 percent. This means that chances are 2 out of 3 that the final estimate will not be above or below the preliminary estimate by more than 0.8 percent. Chances are 9 out of 10 that the difference will not exceed 1.4 percent.

# Map 1. 2007 Census of Agriculture – Sheep and Lamb Inventory

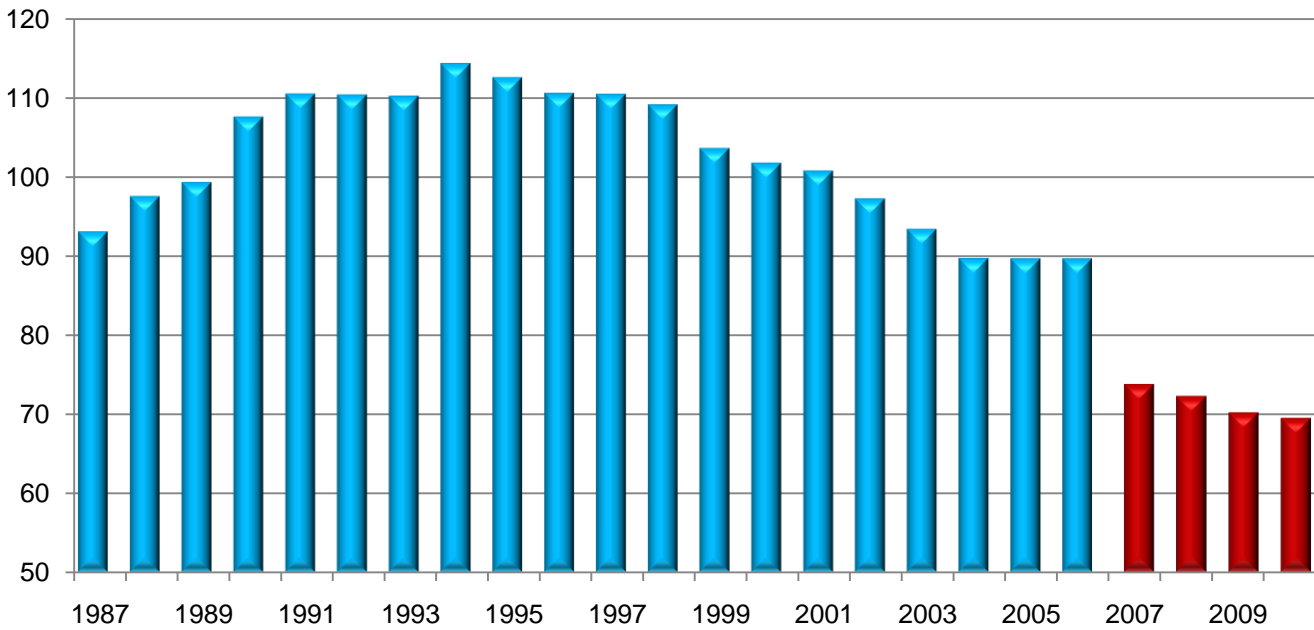


## Graph 1. Number of Sheep Operations - United States



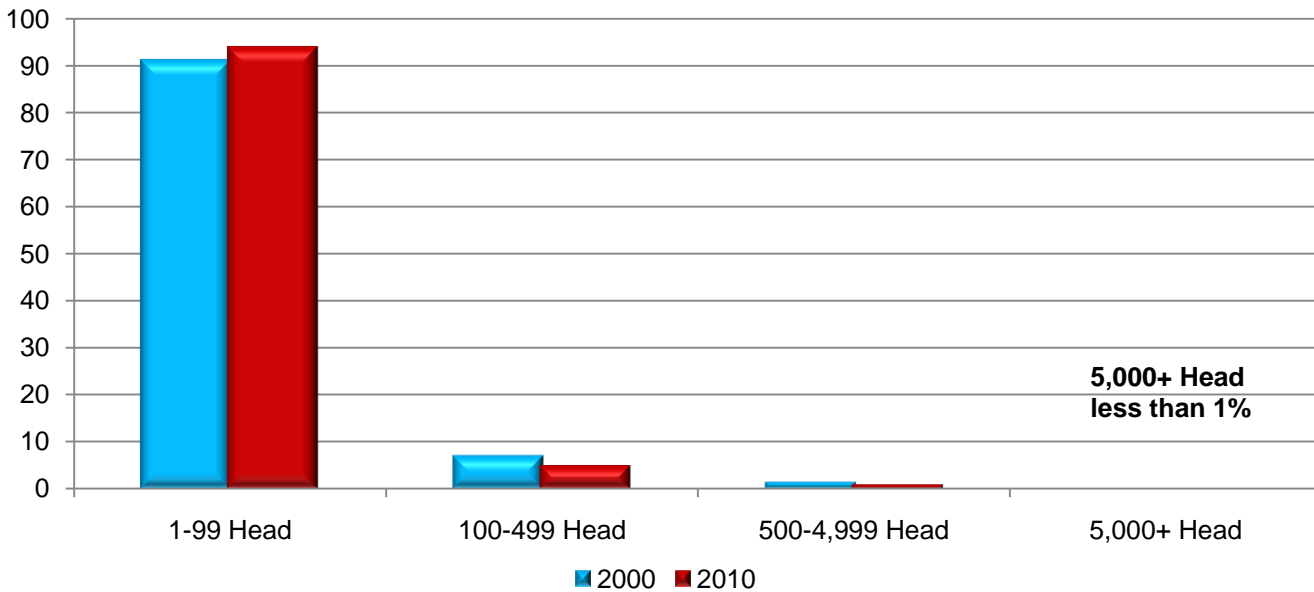
**Graph 2. Average Number of Sheep per Operation - United States**

Number

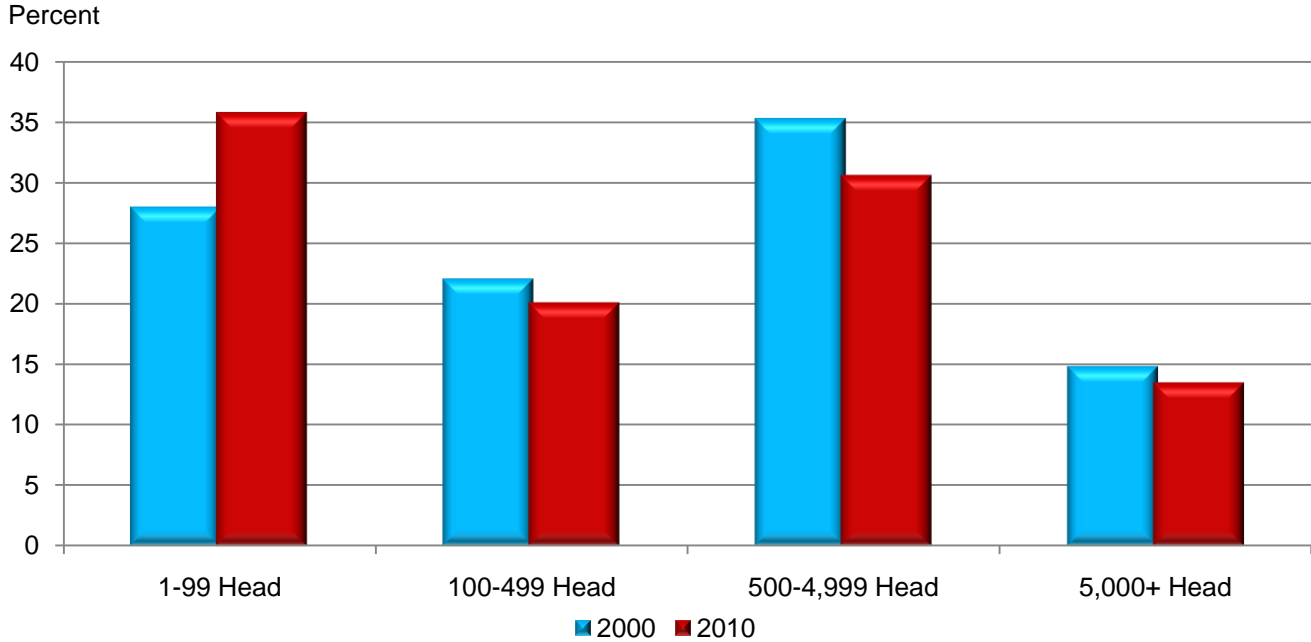


**Graph 3. Sheep Operations with Breeding Animals, Percent by Size Group - United States**

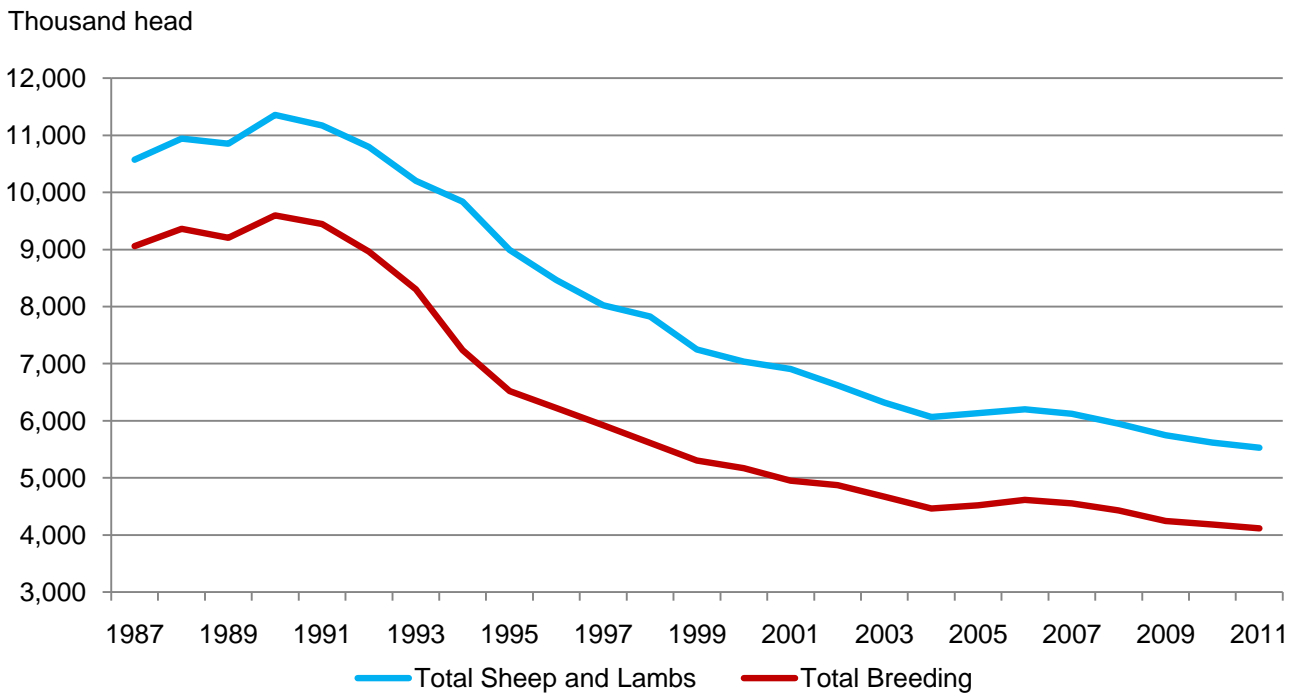
Percent



**Graph 4. Breeding Sheep and Lamb Inventory by Size Group - United States**

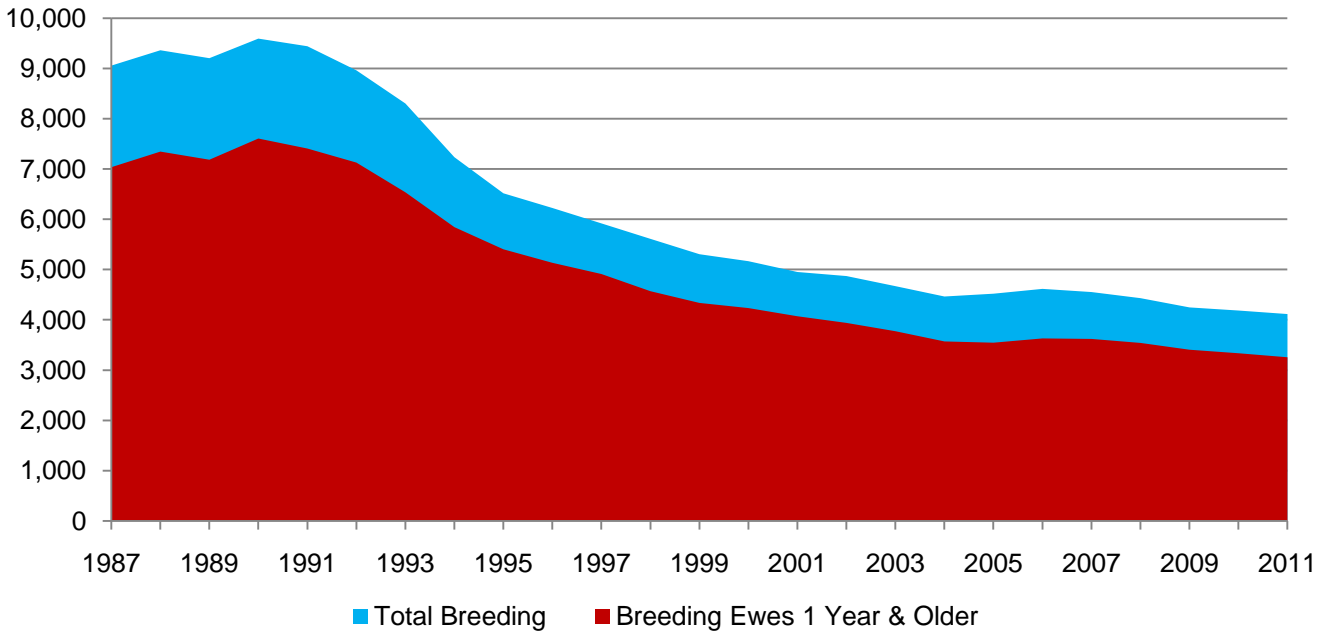


**Graph 5. January 1 Sheep and Lamb Inventory - United States**



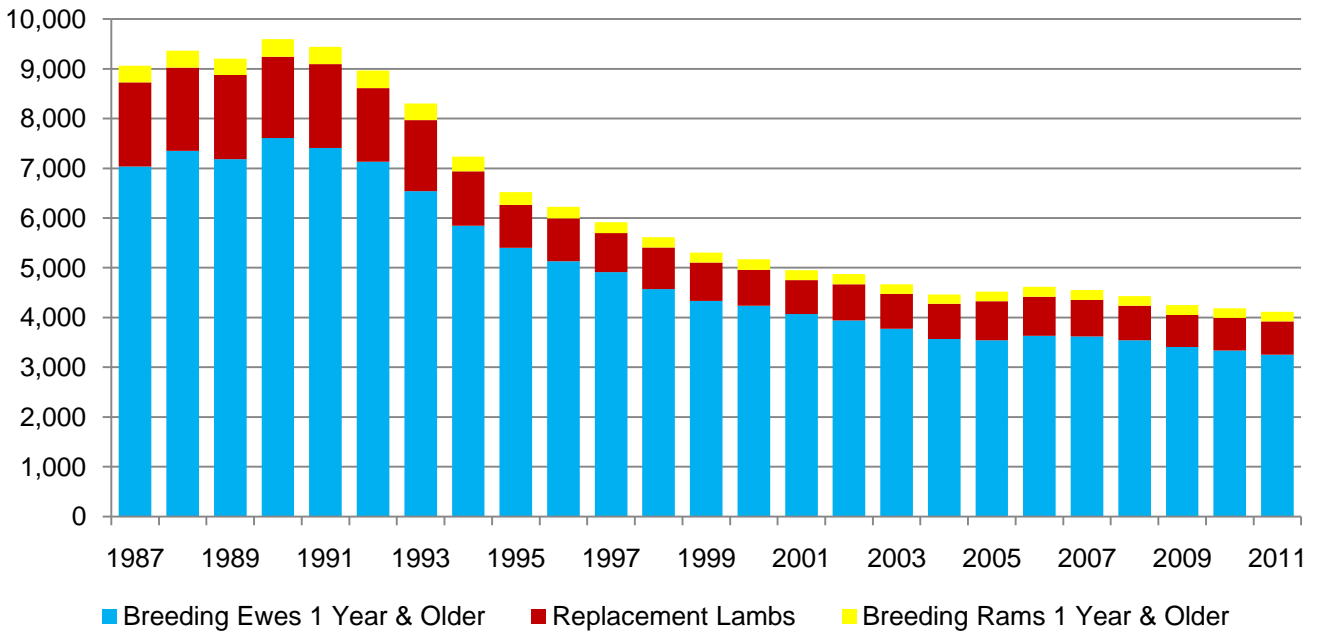
**Graph 6. January 1 Breeding Sheep and Lamb Inventory - United States**

Thousand head



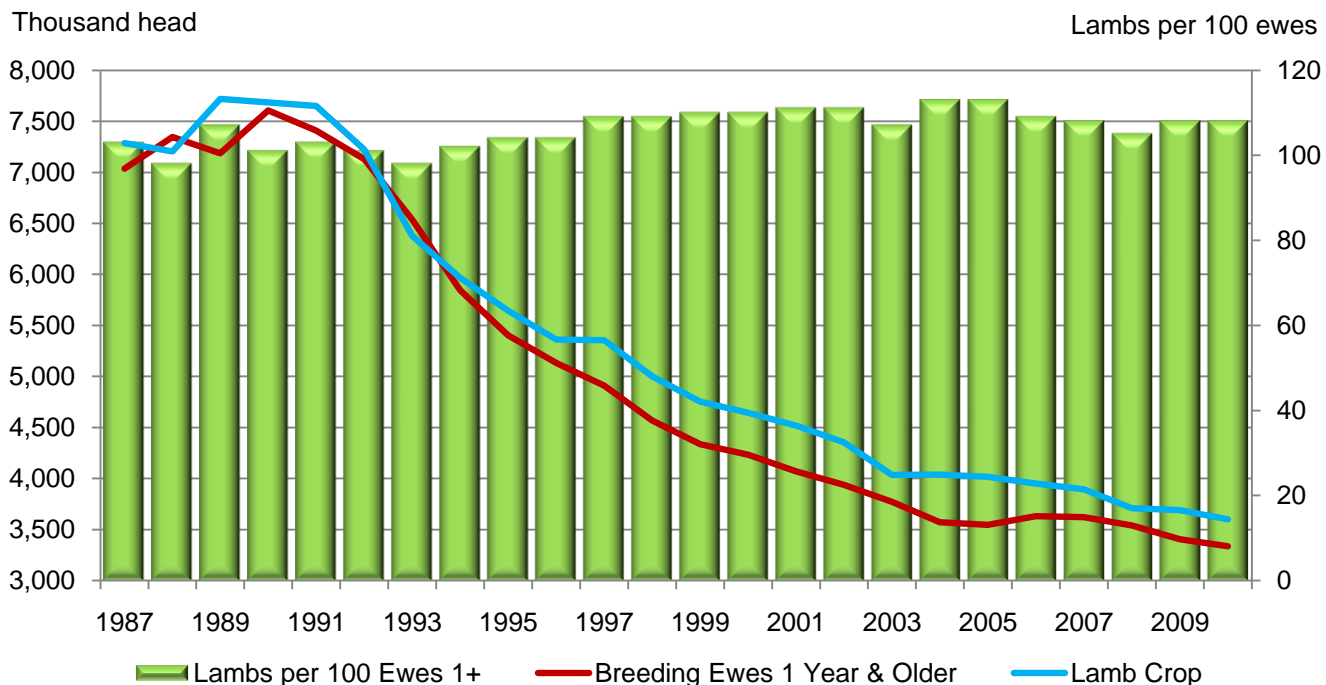
**Graph 7. January 1 Breeding Sheep and Lamb Inventory - United States**

Thousand head

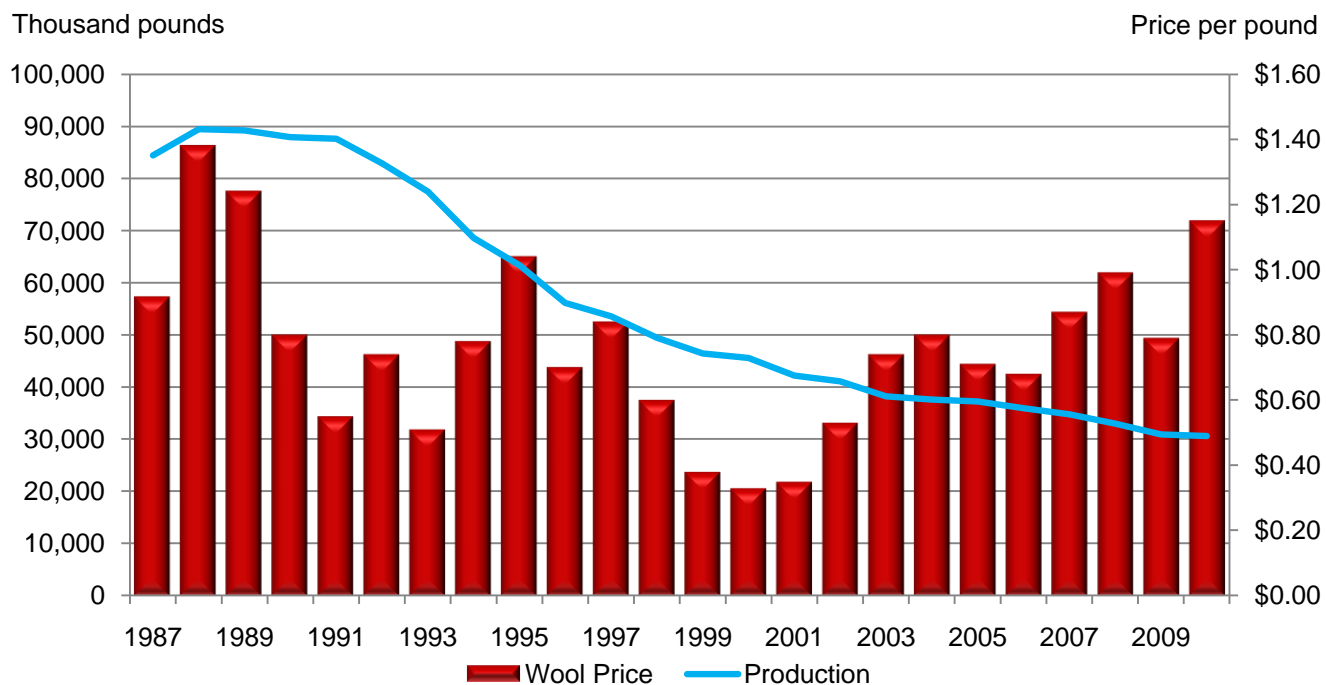




**Graph 8. Ewes, Lamb Crop and Lambing Rate - United States**

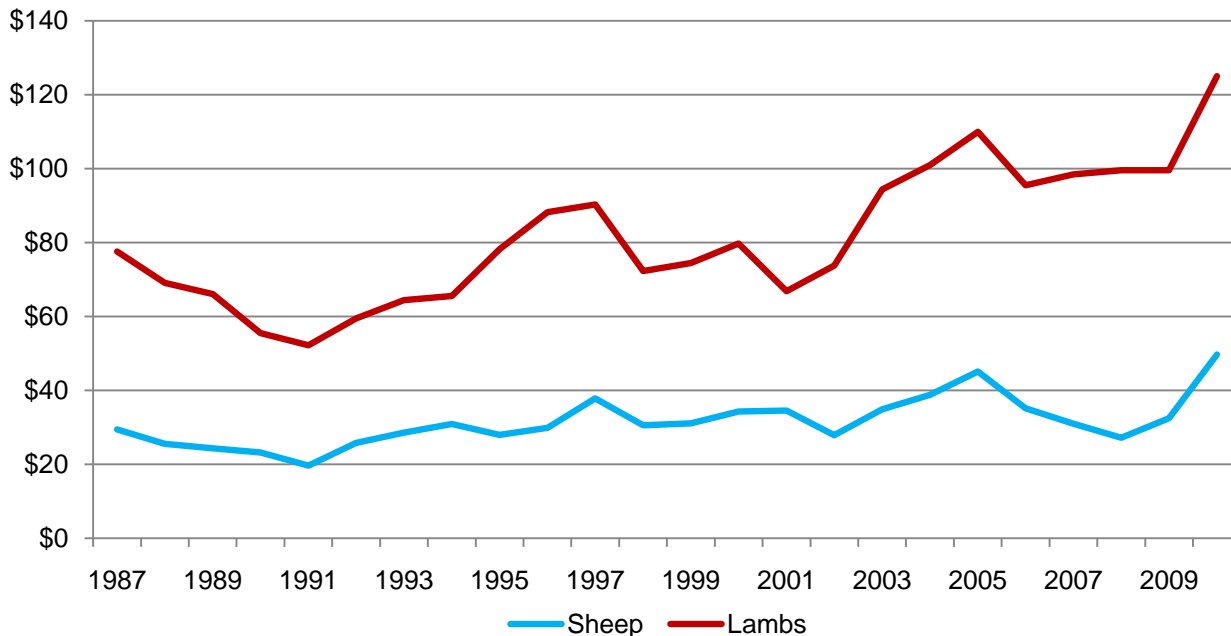


**Graph 9. Wool Price per Pound and Production - United States**



**Graph 10. Sheep and Lamb Prices Received by Farmers - United States**

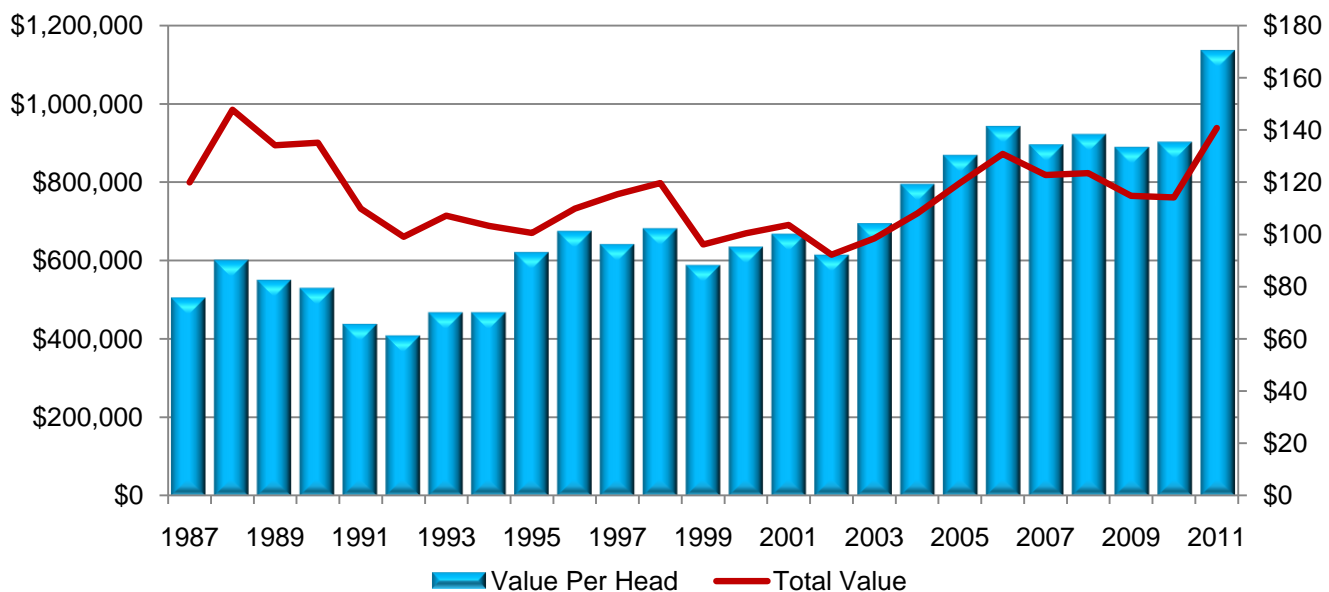
Dollars per cwt



**Graph 11. January 1, Sheep and Lamb Value per Head and Total Inventory Value - United States**

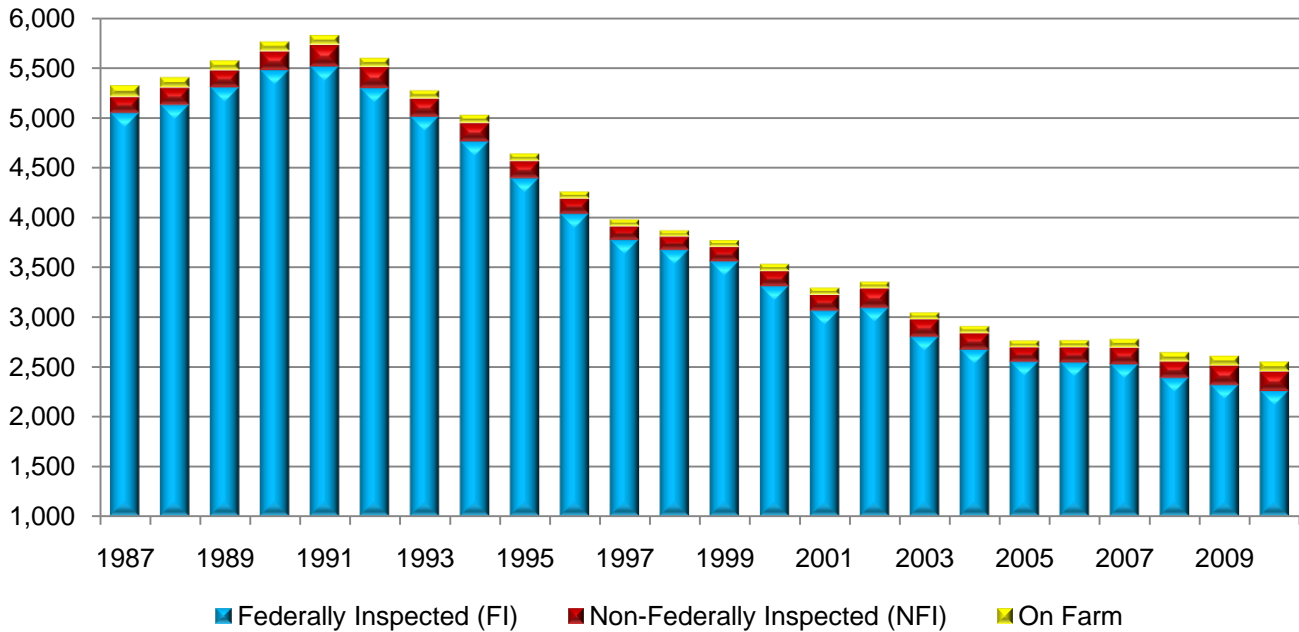
Thousand dollars

Dollars per head



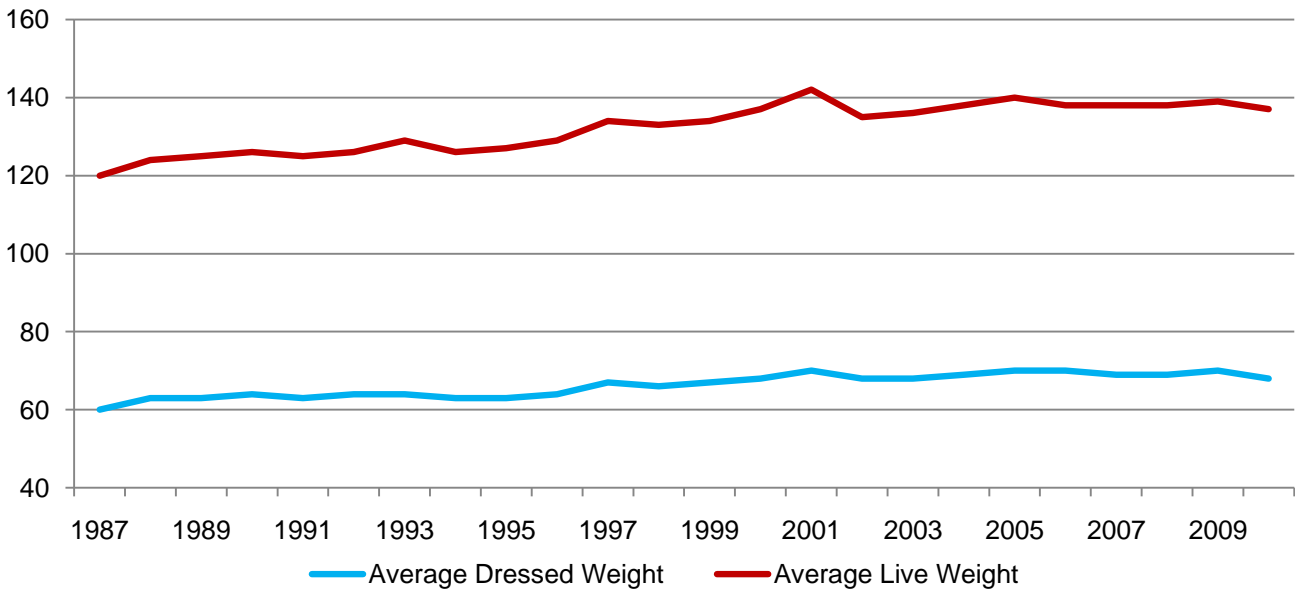
**Graph 12. Sheep and Lamb Slaughter - United States**

Thousand head

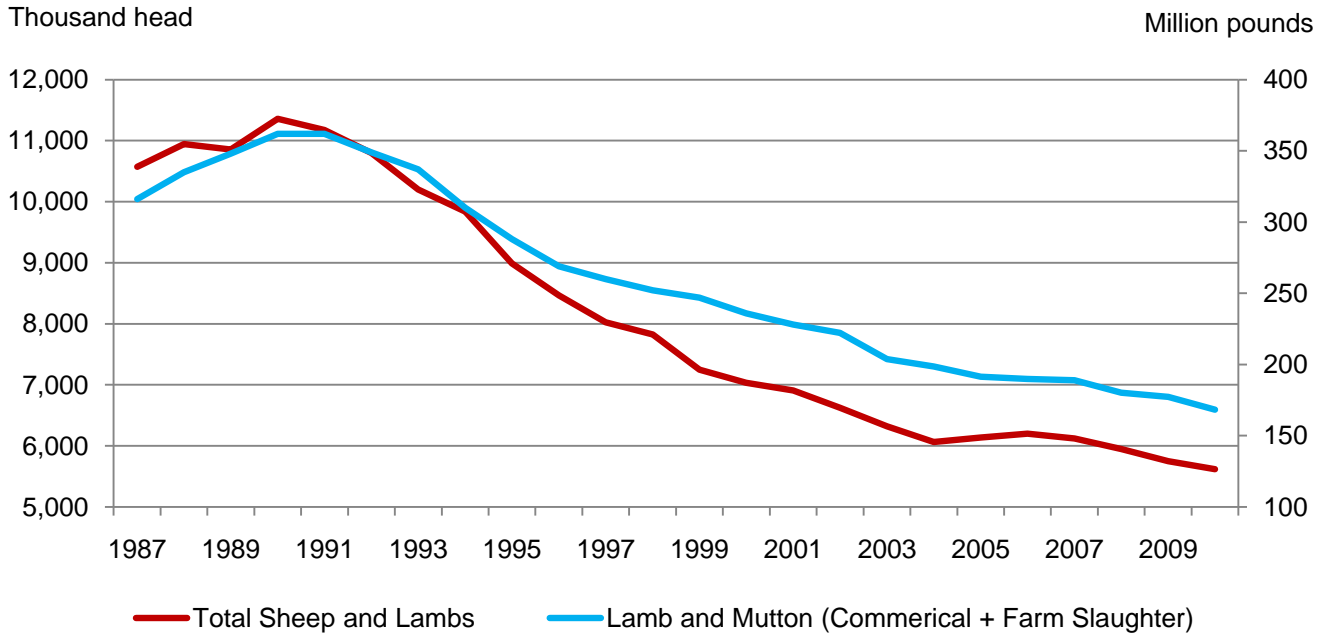


**Graph 13. Sheep and Lamb Average Live and Dressed Weights - United States**

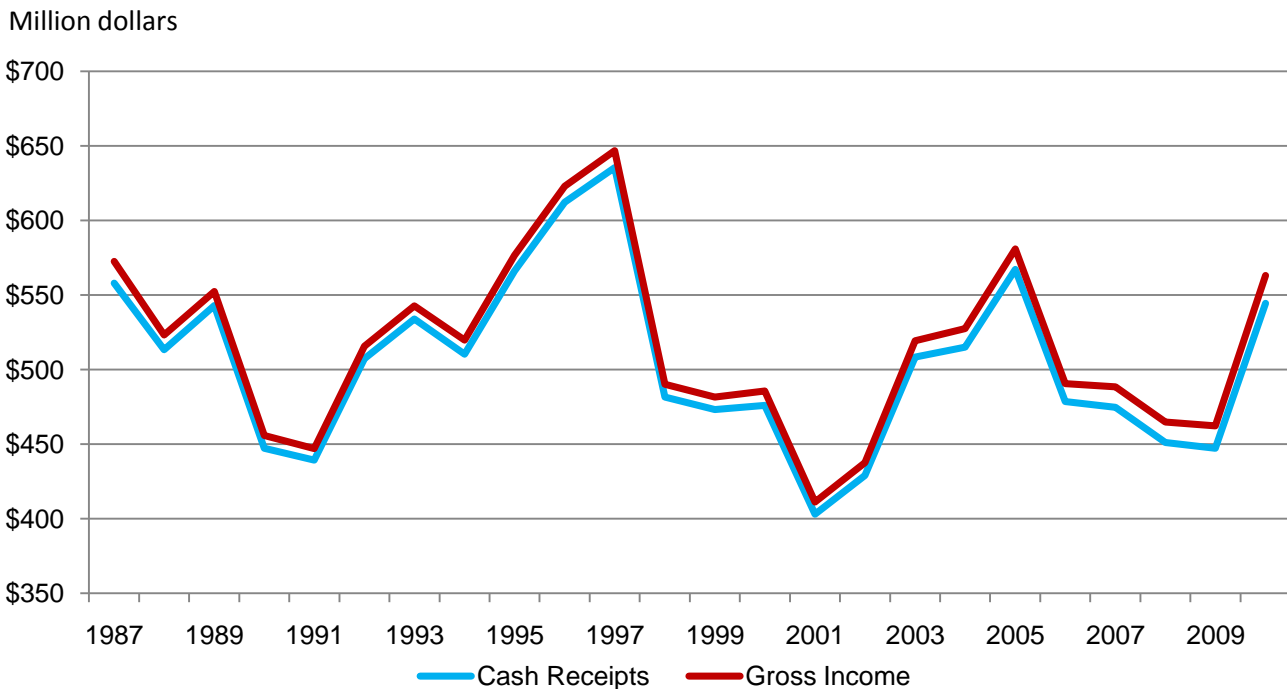
Pounds



**Graph 14. January 1, Sheep and Lamb Inventory and Lamb and Mutton Production - United States**



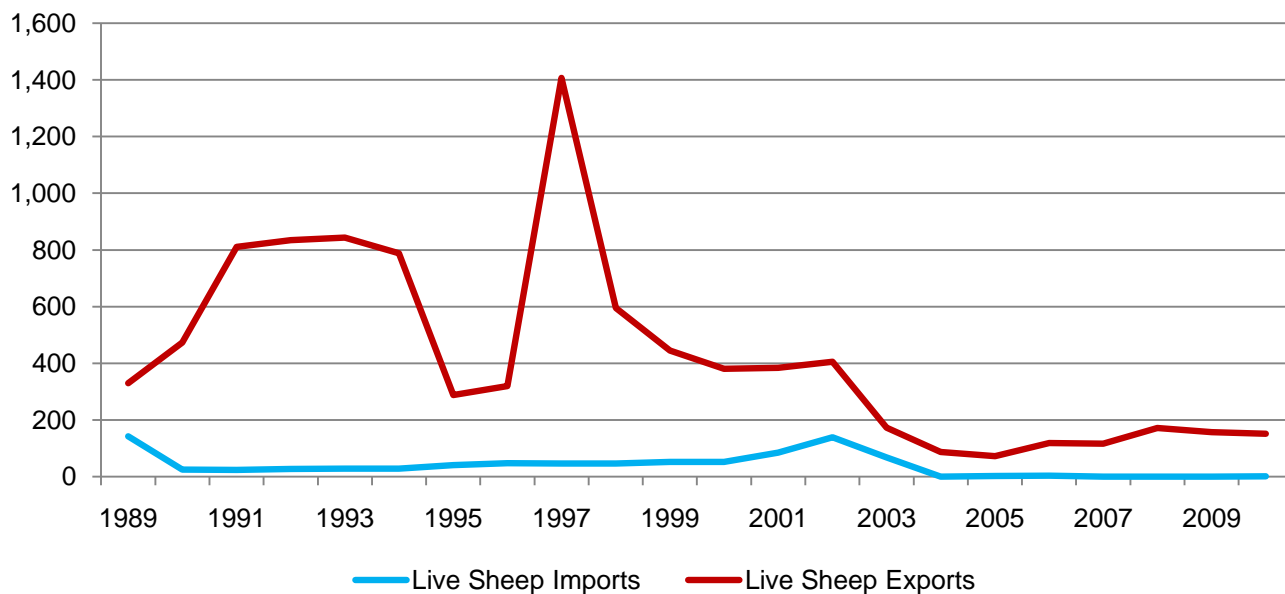
**Graph 15. Cash Receipts and Gross Income from Sheep - United States**



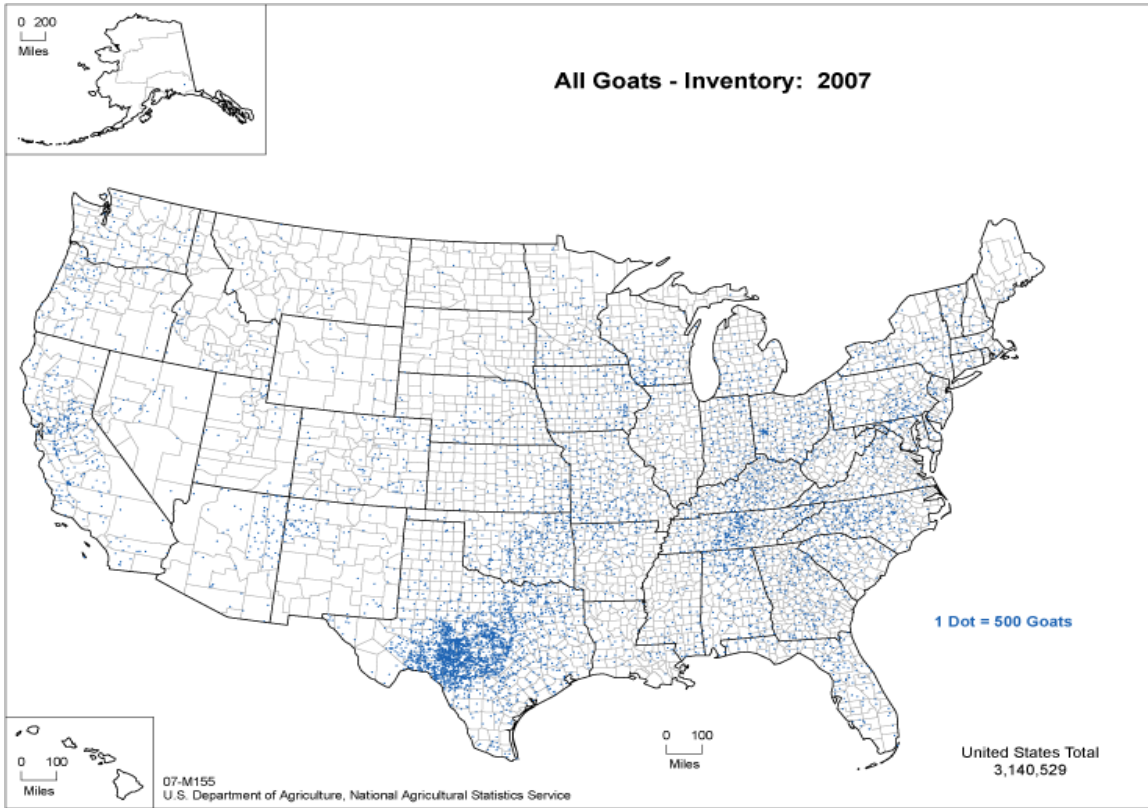
### Graph 16. Live Sheep Imports and Exports - United States

Source: Foreign Agricultural Service and United States Census Bureau

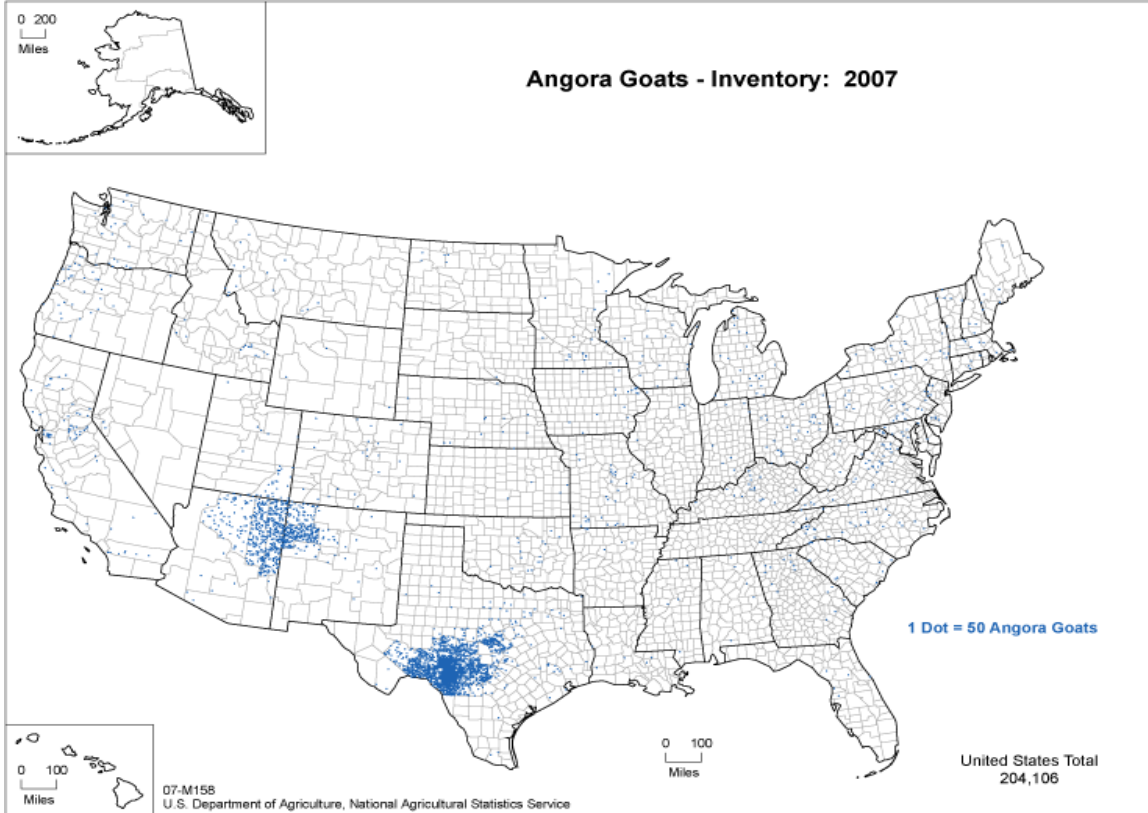
Thousand head



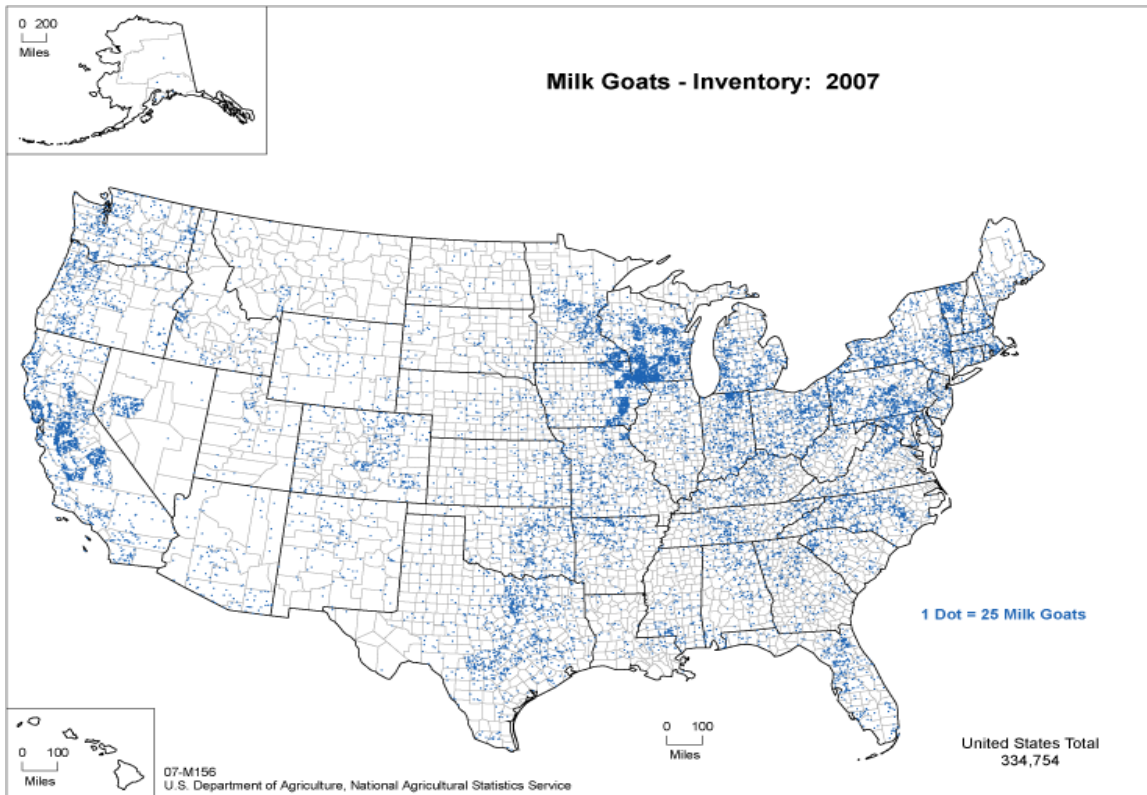
**Map 2. 2007 Census of Agriculture - All Goat Inventory**



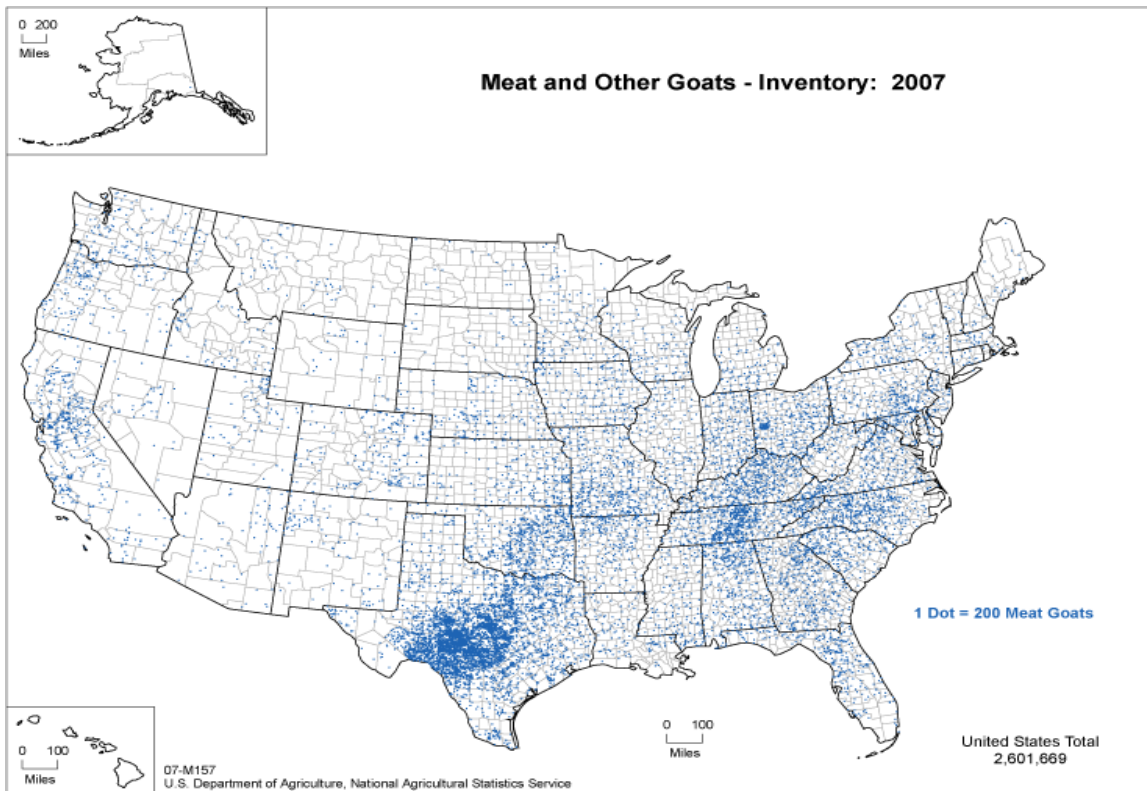
**Map 3. 2007 Census of Agriculture – Angora Goat Inventory**



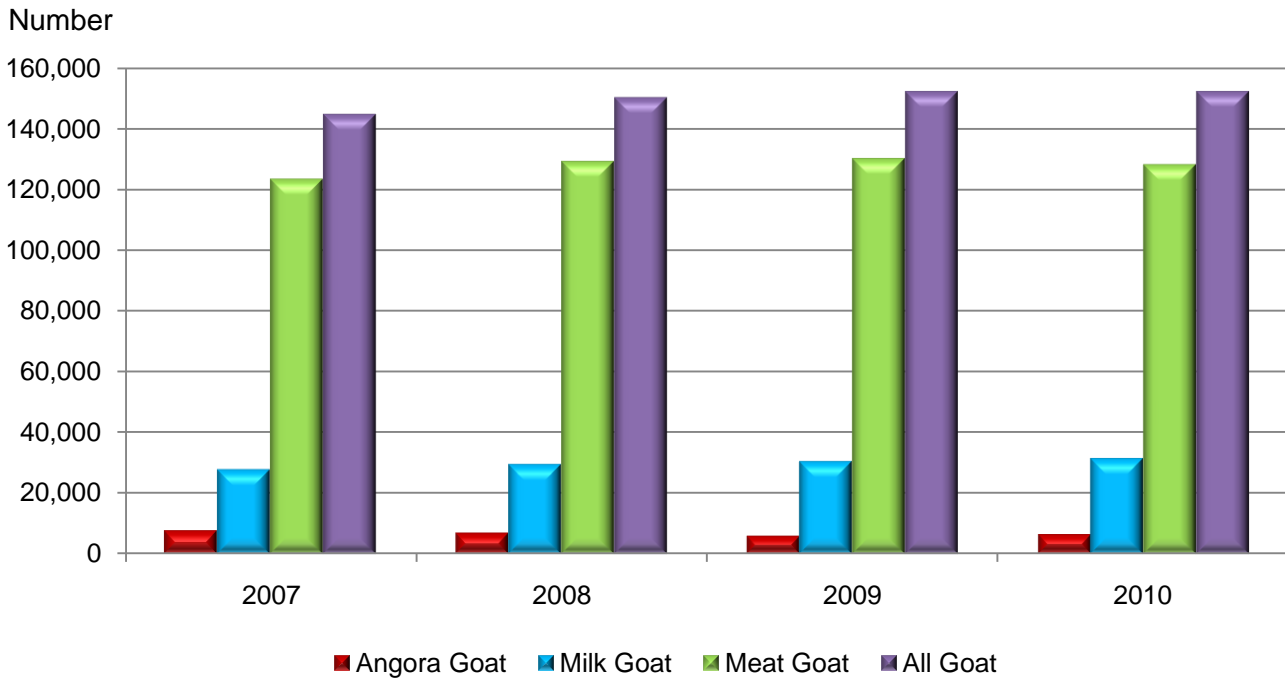
**Map 4. 2007 Census of Agriculture – Milk Goat Inventory**



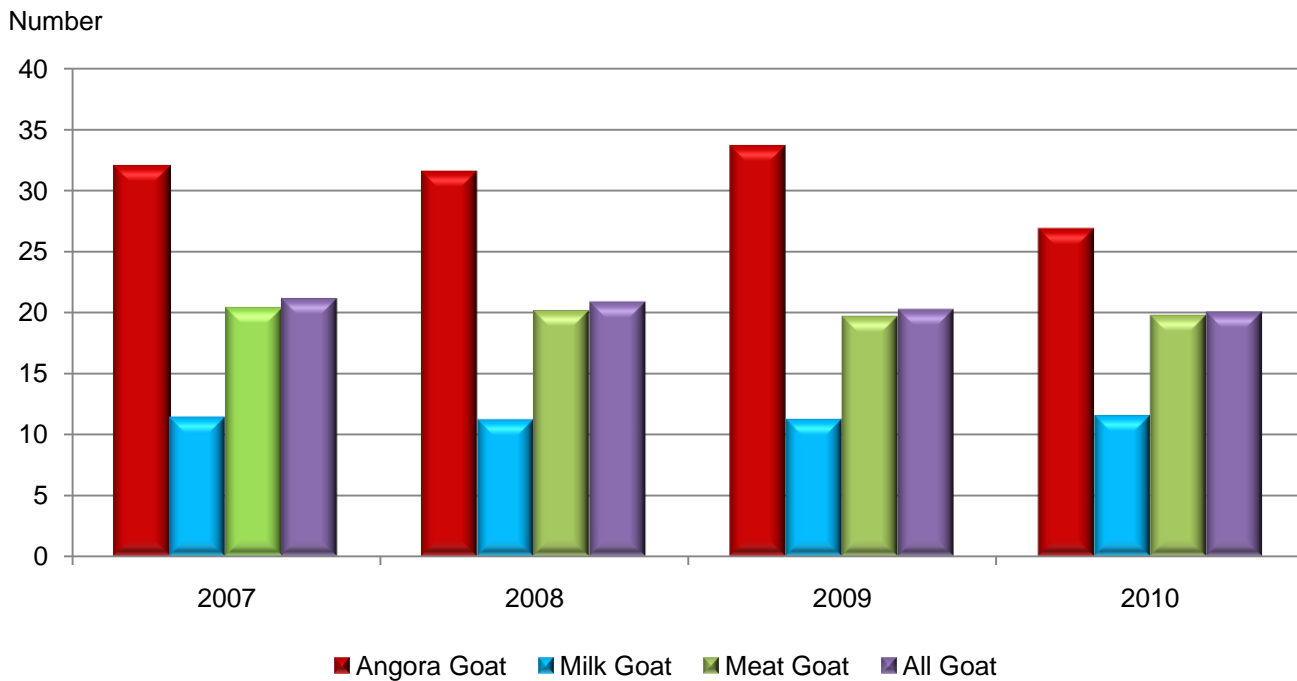
**Map 5. 2007 Census of Agriculture – Meat and Other Goat Inventory**



**Graph 17. Number of Goat Operations by Type - United States**



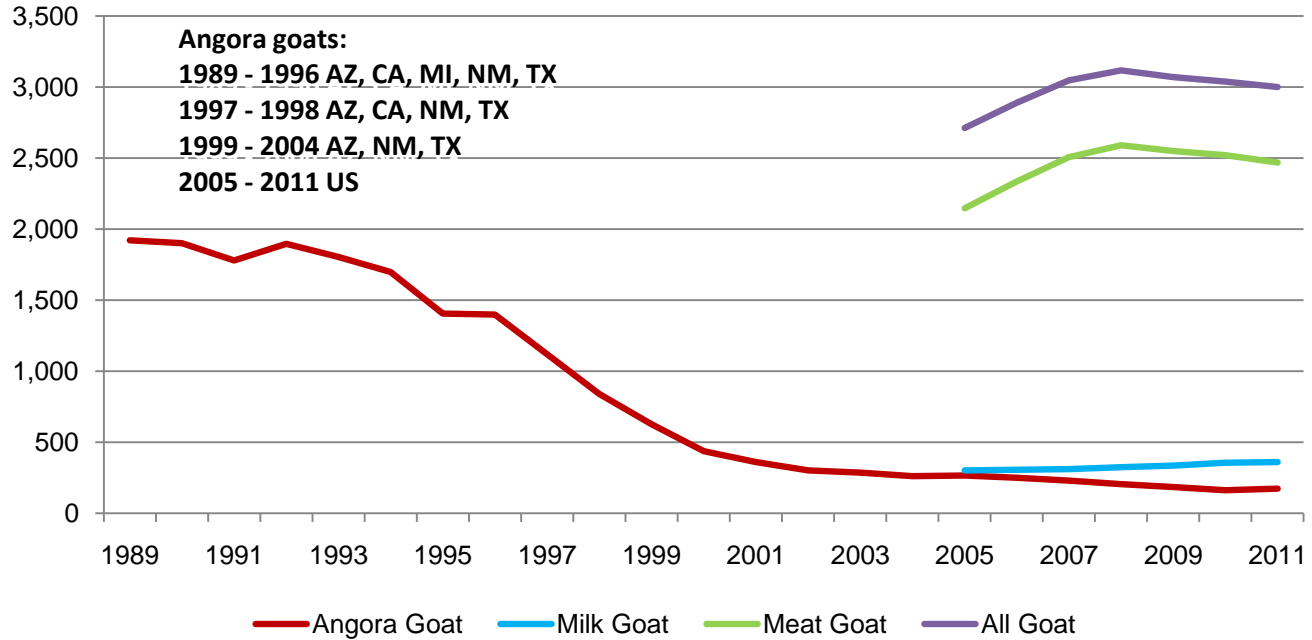
**Graph 18. Average Number of Goats per Operation by Type - United States**





**Graph 19. January 1 Goat Inventory by Type - United States**

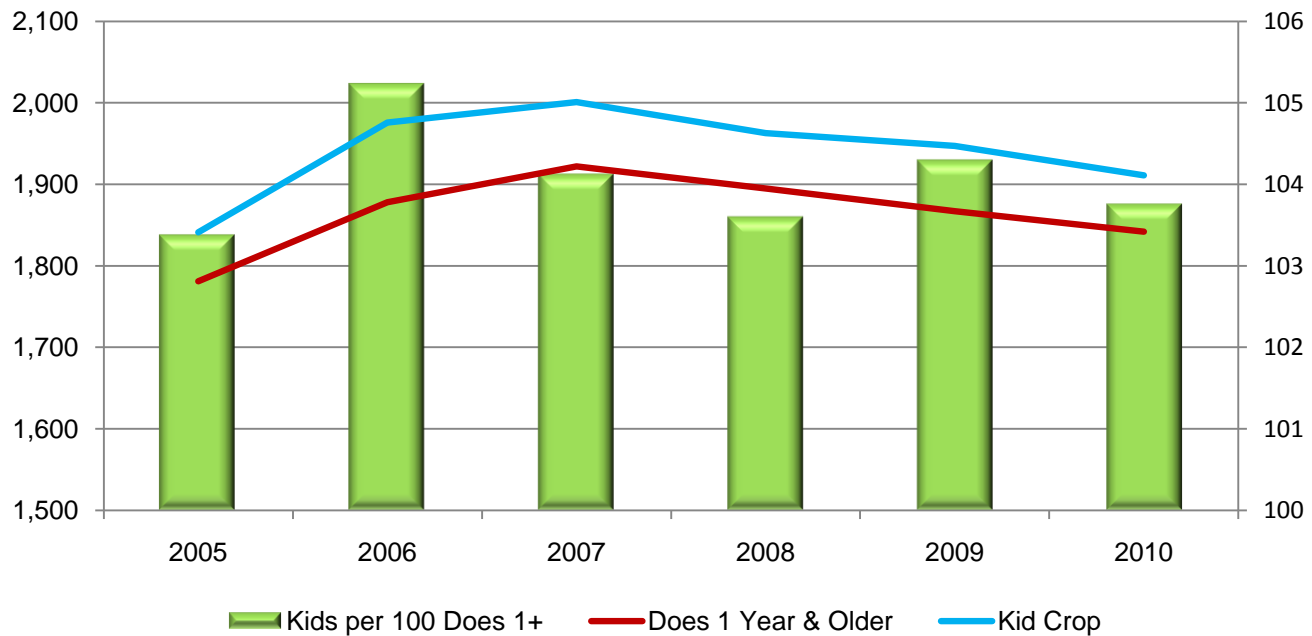
Thousand head



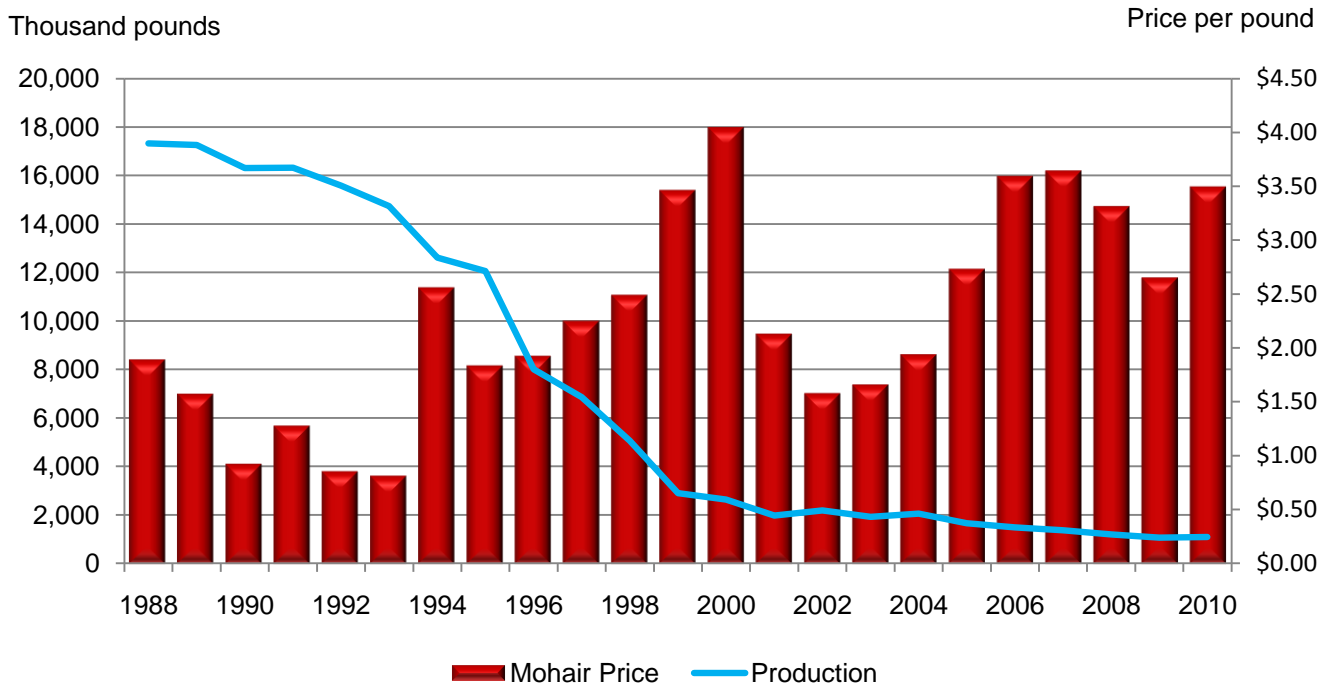
**Graph 20. Does, Kid Crop and Kidding Rate - United States**

Thousand head

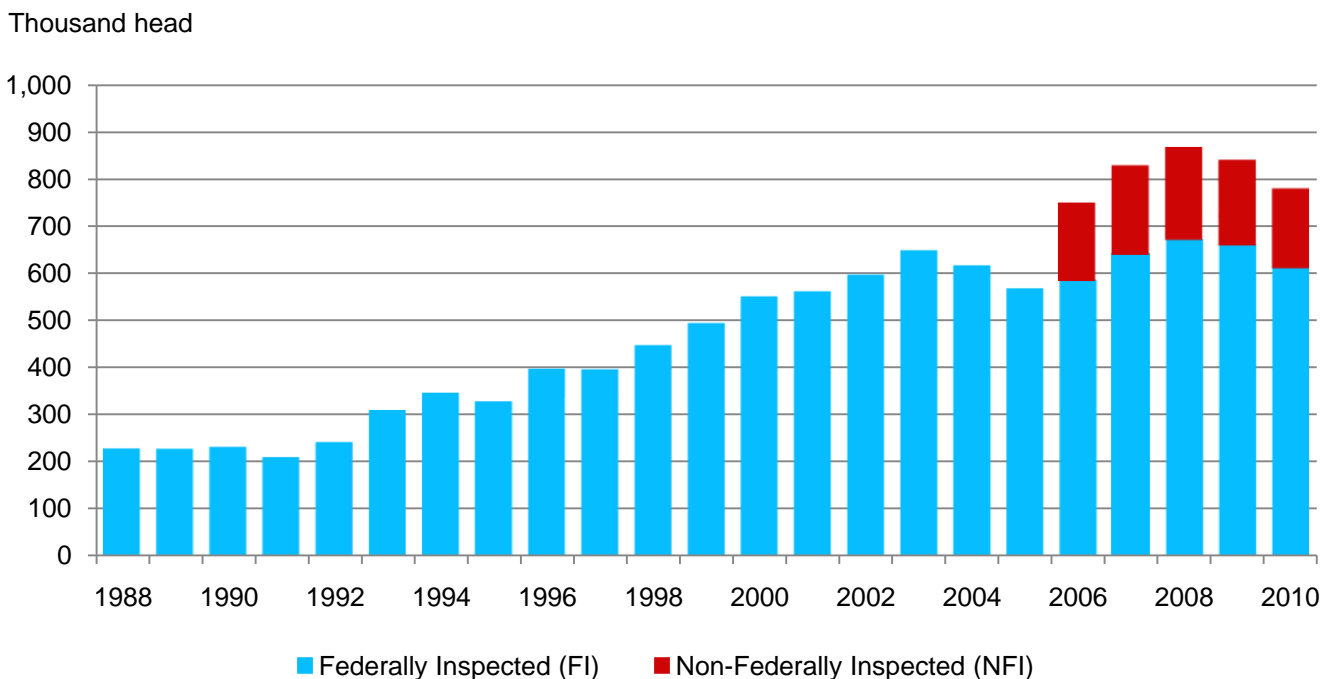
Kids per 100 does



**Graph 21. Mohair Price per Pound and Production - United States**



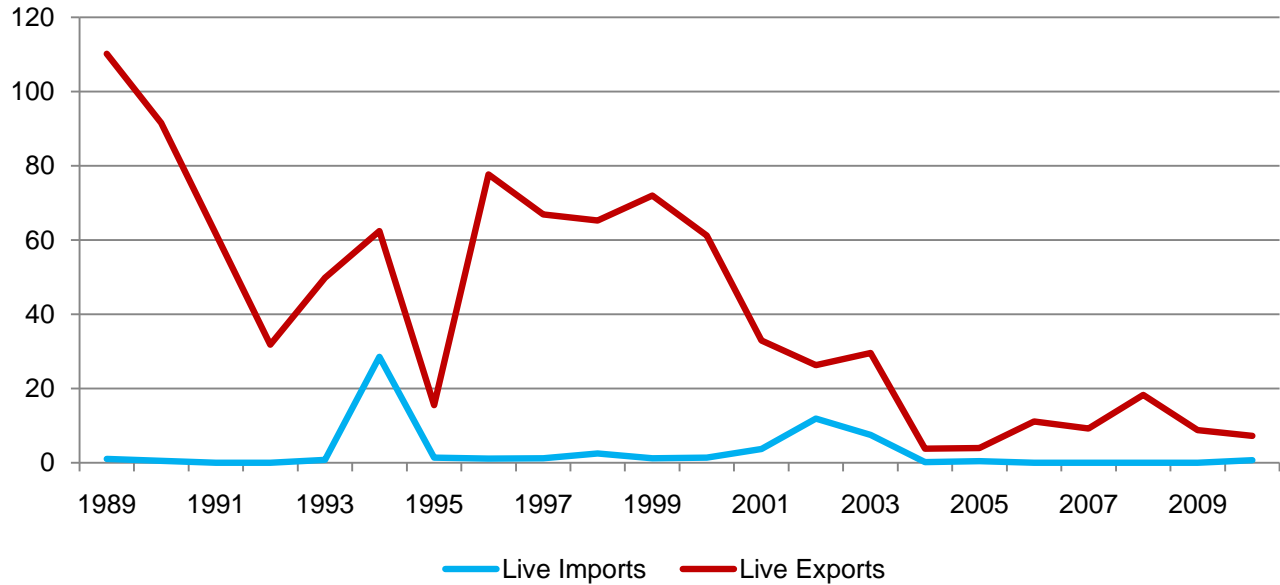
**Graph 22. Goat Slaughter - United States**



### Graph 23. Live Goat Imports and Exports - United States

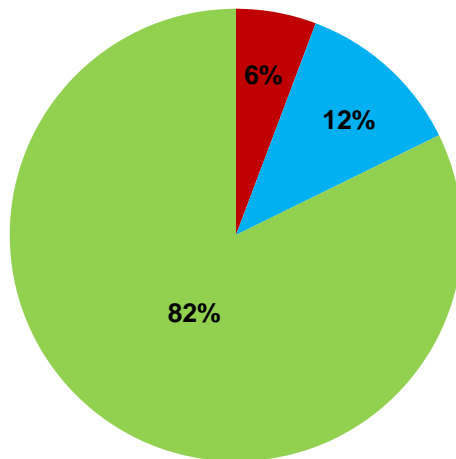
Source: Foreign Agricultural Service and United States Census Bureau

Thousand head



### Graph 24. Distribution of Goat Inventory by Type of Goat - United States

January 1, 2011



■ Angora Goat   ■ Milk Goat   ■ Meat Goat

## Information Contacts

Listed below are the commodity specialists in the Livestock Branch of the National Agricultural Statistics Service to contact for additional information. E-mail inquiries may be sent to [nass@nass.usda.gov](mailto:nass@nass.usda.gov)

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Travis Averill – Dairy Products Prices .....	(202) 690-2168
Sherry Bertramsen – Livestock Slaughter .....	(515) 284-4340
Doug Bounds – Hogs and Pigs .....	(202) 720-3106
Jason Hardegree – Cattle, Cattle on Feed .....	(202) 720-3040
Mike Miller – Milk Production and Milk Cows .....	(202) 720-3278
Everett Olbert – Sheep and Goats .....	(202) 720-4751
Lorie Warren – Dairy Products .....	(202) 690-3236

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