



# Overview of the United States Dairy Industry

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## Large Operations Increase Share of Inventory and Milk Production

The dairy industry in the United States has undergone significant structural change over the past eight years. Total milk cow operations have declined significantly, while the number of large operations has increased. This report compares 2009 production year data to the 2001 data released in the *U.S. Dairy Herd Structure* report, published in September 2002. Changes in milk cow operation size groups will be discussed, along with trends in the all milk price and the milk-feed ratio.

The number of milk cow operations continues to decline in the United States. There were 65,000 milk cow operations in 2009 compared to 97,460 in 2001, a decline of 33 percent. Despite the large decrease in milk cow operations during this time period, both milk production and milk cow numbers have been on the rise. Milk production increased 15 percent, from 165,332 million pounds in 2001 to 189,320 million pounds in 2009. Milk cow inventory showed a smaller increase of 1 percent, from 9.10 million head in 2001 to 9.20 million head in 2009.

The milk cow operation estimates as illustrated in Graphs 1 through 3 show a break in the series from 2006 to 2007. In preparation for the 2007 Census of Agriculture, NASS exerted extensive efforts to build a comprehensive list of producers, which allowed NASS to capture more limited-resource and small farms. The break in the series reflects the fact that newer information for years prior to 2007 was not available to make revisions.

Although the overall number of milk cow operations has declined since 2001, the number of operations with 500 or more head of milk cows has increased. Since 2001, the number of operations with 500 or more head increased by 20 percent, from 2,795 to 3,350 in 2009 (Graph 1). The largest size group, places with 2,000 or more head, showed the greatest percentage change from 2001, increasing from 325 places in 2001 to 740 in 2009, a gain of 128 percent (Graph 2). While larger operations were growing in number, smaller operations declined in number. Places with less than 500 head went from 94,665 in 2001 to 61,650 in 2009, a decline of over 33,000 operations, or 35 percent (Graph 3).

As large operations have become more numerous, the share of inventory accounted for by large operations has also increased. In 2009, operations with 500 or more head accounted for 56 percent of total milk cow inventory compared with only 35 percent in 2001. Operations with 2,000 or more head accounted for 30 percent of inventory in 2009, up from only 12 percent in 2001. Places with less than 500 head accounted for 44 percent of total milk cow inventory in 2009, down from 65 percent in 2001 (Graph 4).

As with inventory, the share of milk production accounted for by large operations has steadily increased. Operations with 500 or more head accounted for nearly 60 percent of all milk produced in 2009, up from 39 percent in 2001. Production on places with 2,000 or more head has increased from only 13 percent in 2001 to 31 percent of total milk production in 2009. Smaller operations continue to produce a smaller share of production. Places with less than 500 head accounted for nearly 41 percent of milk production in 2009, down from 61 percent in 2001 (Graph 5).

Production per cow on both larger and smaller operations continues to increase as lower producing cows are culled from herds and less efficient operations exit the industry. The Cooperatives Working Together (CWT) program, which was developed by the National Milk Producers Federation (NMPF), was implemented in 2003. Since the inception of CWT, nearly a half million milk cows were removed from production and slaughtered through 2009. This program may have hastened the process of culling poorer producing cows from the dairy herd, thus helping to raise the average milk production per cow.

The annual average rate of milk production per cow for operations with more than 500 head rose from 20,342 pounds in 2001 to 22,019 pounds in 2009, an increase of 8 percent. Milk per cow for operations with less than 500 head increased 10 percent, from 16,989 pounds in 2001 to 18,769 in 2009 (Graph 6). However, despite the increase in milk per cow, total production in the less than 500 size group has declined 24 percent during this period, as milk cow operations decreased 35 percent and inventory declined 31 percent. A strong increase in milk production from operations with 500 or more head (up 74 percent) more than offset the production decline from operations with less than 500 cows, resulting in an overall production increase (Graph 7). The increased production from operations with 500 or more head is due to the increase in number of operations, greater share of inventory, and increased milk production per cow.

Milk production continues to move to the western half of the United States, primarily from the southeastern and northeastern States. Looking at 2009 production, States showing the largest increases compared to 2001 were California, Idaho and Texas (Graph 8). The only northeastern State with a production increase was New York. Production has also migrated to the upper mid-west, with Wisconsin, Michigan, and Ohio showing the largest increases in that region. States with the largest declines in production were Kentucky, Tennessee, and Missouri. The ten largest milk producing states accounted for nearly 74 percent of the total production of milk in the United States in 2009 (Graph 9).

For most States, the increase in production was due to an increase in milk cow inventory and greater milk production per cow. For example, California, the leading milk producing State, produced 39,512 million pounds in 2009, up 19 percent from 2001. The increase in production was due to a 13 percent increase in the number of milk cows and a 5 percent increase in average milk per cow. Wisconsin, the second largest milk producing State, produced 25,239 million pounds in 2009, up 14 percent from 2001. The production increase in Wisconsin was a result of a 17 percent increase in milk produced per cow, which more than offset a 3 percent decrease in milk cow numbers. The three States with the largest production increases compared to 2001 (California, Idaho, and Texas) had inventory increases of 207,000 head, 184,000 head, and 97,000 head, respectively (Graph 10).

Over the last decade, the United States average annual all milk price has fluctuated between \$12.18 to \$19.21 per cwt (Graph 11). Since 2005, the general trend in the annual milk-feed ratio has been down due in large part to increased feed costs, although low milk prices in 2006 and 2009 were a major factor (Graph 11). The price of corn increased by 110 percent from 2005 to 2007, while the price of alfalfa hay increased by 59 percent from 2005 to 2008 (Graph 12). Corn, alfalfa hay, and soybeans are common ingredients of a typical dairy ration. Corn and alfalfa hay are the primary feed items used to calculate the milk-feed ratio, while soybeans are a smaller component of the ratio calculation. The milk-feed ratio is the pounds of 16 percent protein mixed dairy feed equal in value to one pound of whole milk. In other words, the milk-feed ratio is an indicator of the quantity of 16 percent mixed dairy feed that can be purchased with a pound of milk. The milk-feed ratio is considered an indicator of the profitability of milk production. If the ratio is equal to 3.0 or greater, it is generally considered profitable to buy feed and produce milk. The last time the annual milk-feed ratio was at 3.0 or greater was in 2005. In 2007 and 2008, despite an all milk price that reached historically high levels, the milk-feed ratio still remained below 3.0 because of high feed prices (Graph 12). The milk-feed ratio dropped again in 2009, despite lower feed prices. The decline in the milk-feed ratio was primarily due to a 30 percent drop in the all milk price from 2008 to 2009.

Since 2001, the overall trend in the United States dairy industry has been toward more large operations (places with 500 or more head of milk cows) that have a greater share of total milk cow inventory and a greater share of total milk production. In 2009, operations with 500 or more head accounted for 5 percent of the total milk cow operations, 56 percent of the milk cows, and 60 percent of the milk production. Contrast this with 2001, when large operations only accounted for 3 percent of operations, 35 percent of milk cows, and 39 percent of production. The most dramatic increases occurred in the largest size group (places with 2000 or more head of milk cows). These operations increased from only .3 percent of the operations, 12 percent of the milk cows, and 13 percent of milk production in 2001 to 1 percent of the operations, 30 percent of the milk cows, and 31 percent of the milk production in 2009. Milk production continues to shift to the western half of the United States., although the upper mid-west region has experienced greater milk production also. The milk-feed ratio, an indicator of the profitability of milk production, has been on a general downward trend since 2005 due to a combination of higher feed prices and lower milk prices.

## Statistical Methodology

**Survey Procedures:** The monthly *Milk Production* reports are based primarily on the monthly and quarterly milk production surveys, while the biannual *Cattle* reports are based on the January and July Cattle surveys. The milk production and cattle surveys are probability surveys. A probability survey assumes 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.

Data collected on the milk production and cattle surveys were obtained from a sample of producers. Large producers were sampled more heavily than small operations. Individual States maintain a list of all known milk and cattle producers and information on the size of their herd. States use all known sources of producers to ensure that their lists are as complete as possible.

All known milk producers are the target population for the monthly and quarterly milk production surveys, while all known cattle producers are the target population for the January and July cattle surveys. The sampling universe for the Milk Production surveys is all operations with at least one milk cow. For the cattle surveys, the sampling universe is all operations with at least one head of cattle. To ensure complete coverage on the cattle surveys, a sample of cattle operations from the list frame maintained by NASS is supplemented by a sample of area tracts. The milk production survey is a list frame only survey.

The milk production survey is conducted on a quarterly basis in all 50 states in January, April, July, and October. In 8 states, the survey is conducted on a monthly basis. The remaining 15 states that set monthly estimates rely on administrative data in the months when a survey is not conducted. The cattle survey is conducted in 49 states in January and in 48 states in July.

**Estimation Procedures:** Estimates of milk production and percent of production by inventory size group are based primarily on the monthly or quarterly milk production surveys. However, in addition to survey data, state and federal administrative data are used, where feasible, to estimate milk production. Data used to determine milk cow inventory and operations estimates, operations by inventory size group, and percent of inventory by size group were obtained primarily from the January and July cattle surveys and milk production surveys. State field offices prepare these estimates by using a combination of survey indications, historic trends, and any available administrative data. Individual State estimates are reviewed by the Agricultural Statistics Board for reasonableness.

**Published Estimates:** The monthly *Milk Production* report contains estimates of average milk cows, milk production, and milk produced per cow for the 23 major milk producing states and the United States. Estimates of average milk cows and milk production are published for all 50 states in the January, April, July, and October *Milk Production* reports. Annual average milk cows, annual milk production, and milk produced per cow, as well as revisions to the prior two years' monthly and quarterly milk cow and production estimates, are published in the February *Milk Production* report. January 1 and July 1 milk cow inventory estimates are published in the biannual *Cattle* reports, typically published in January and July. Estimates are published for all 50 states in the January report; United States only estimates are published in July. Estimates of milk cow operations, size groups, percent of inventory, and percent of production are published in the February *Farms, Land in Farms, and Livestock Operations* report. The milk cow operations and size group estimates are only published at the United States level.

**Revision Policy:** Milk production, rate per cow, and number of cows are subject to revision the following month for monthly States or the following quarter for the quarterly States. Normally, Federal Market Order sales and other administrative data are the main basis for revisions. However, data for all orders are not available in time for this revision. Estimates are again subject to revisions in February each year based on additional administrative data. In the event that additional changes are necessary, a third revision is possible in February the following year. Estimates are again reviewed after data from the five-year Census of Agriculture are available. No revisions are made after that date.

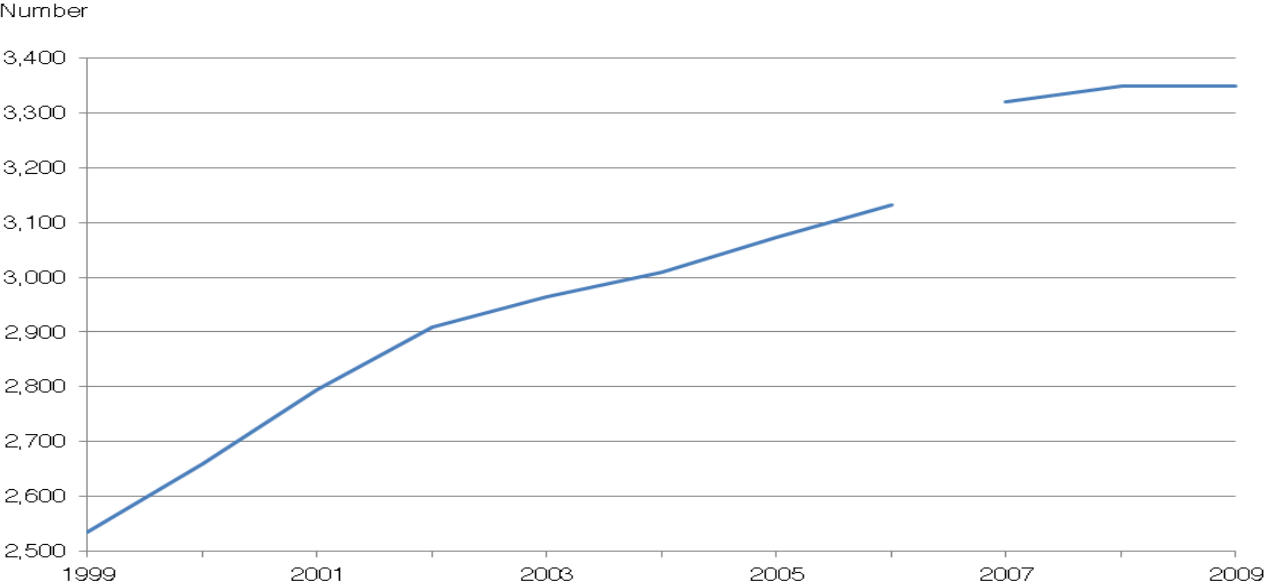
Revisions to the January 1 and July 1 milk cow inventories are made to improve year to year and item to item relationships. Estimates for the previous year are subject to revision when current estimates are made. The reviews are primarily based on livestock slaughter and additional foreign trade and survey data. Estimates will also be reviewed after data from the five-year Census of Agriculture are available. No revisions will be made after that date.

Milk cow operations, size groups, percent of inventory, and percent of production are subject to revision the following year and following review of the five-year Census of Agriculture. The basis for revision must be supported by additional data which directly affects the level of the estimate.

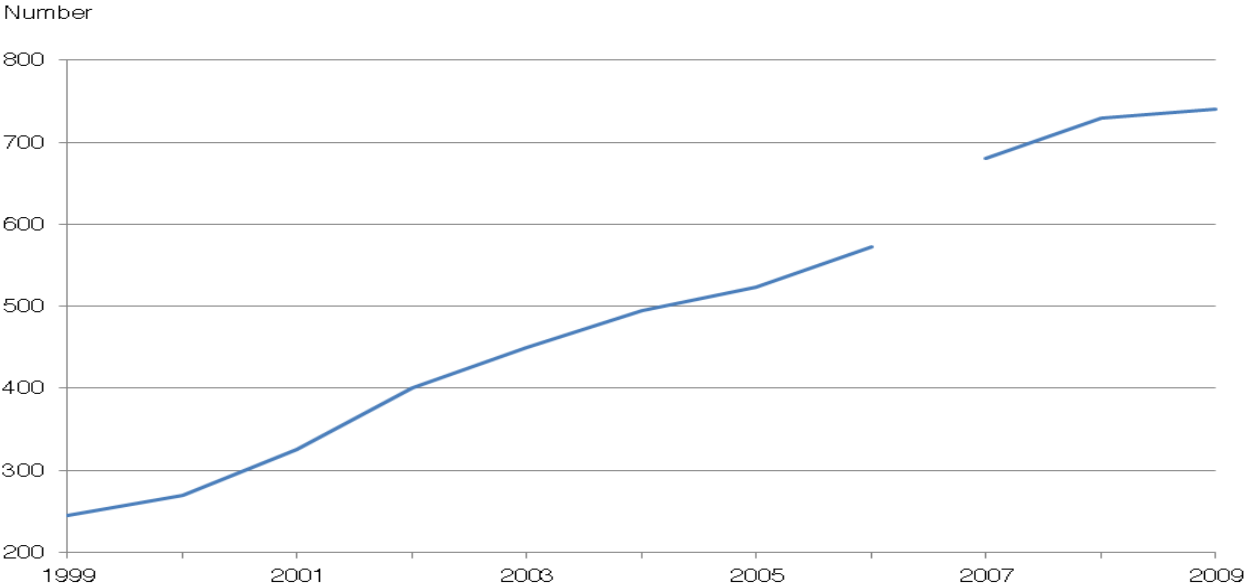
*Note:*

This special release is only available on the NASS website at: [www.nass.usda.gov](http://www.nass.usda.gov)

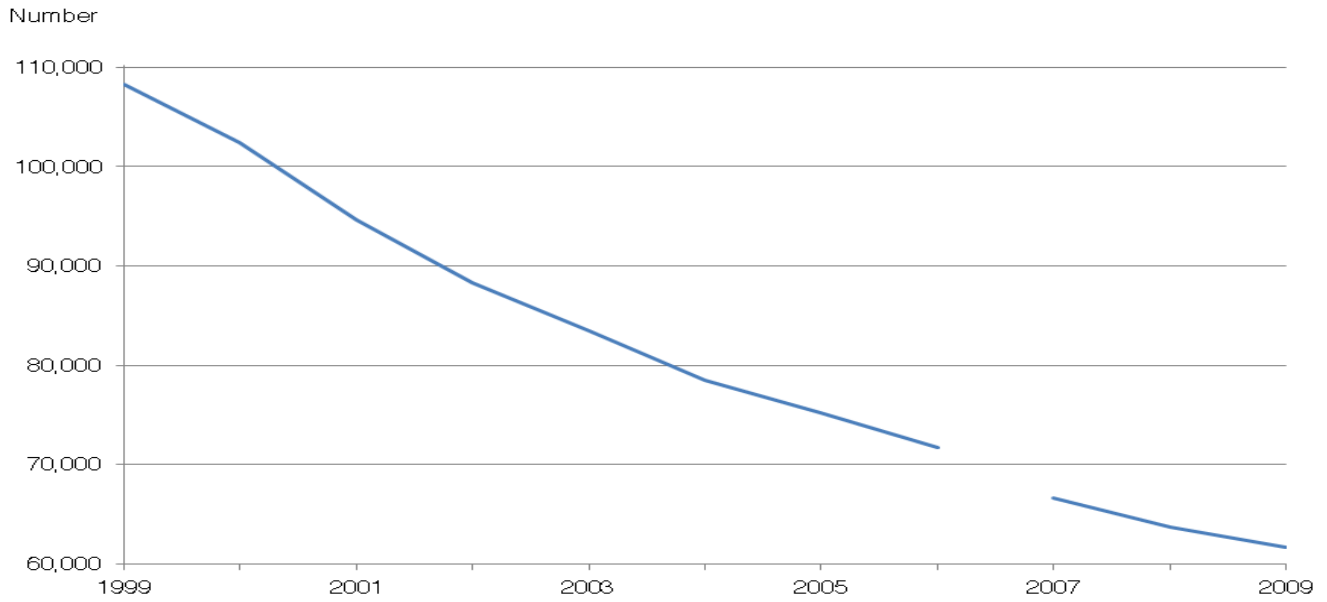
**Graph 1. Dairy Operations 500+ Head - United States**



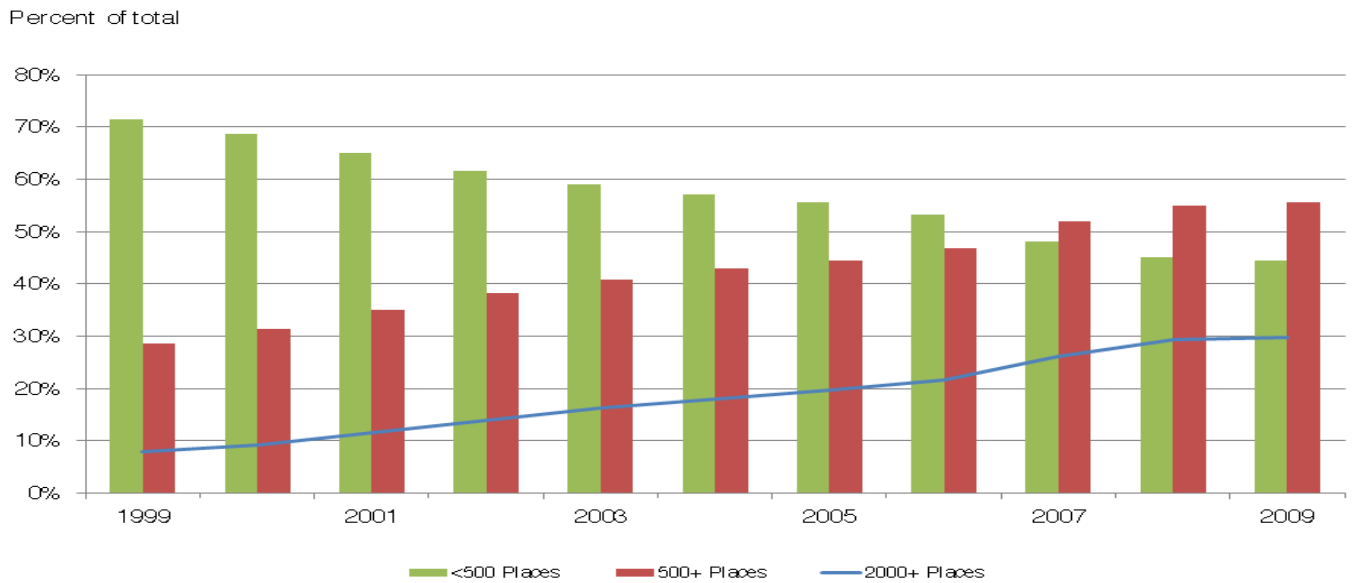
**Graph 2. Dairy Operations 2000+ Head - United States**



**Graph 3. Dairy Operations <500 Head - United States**

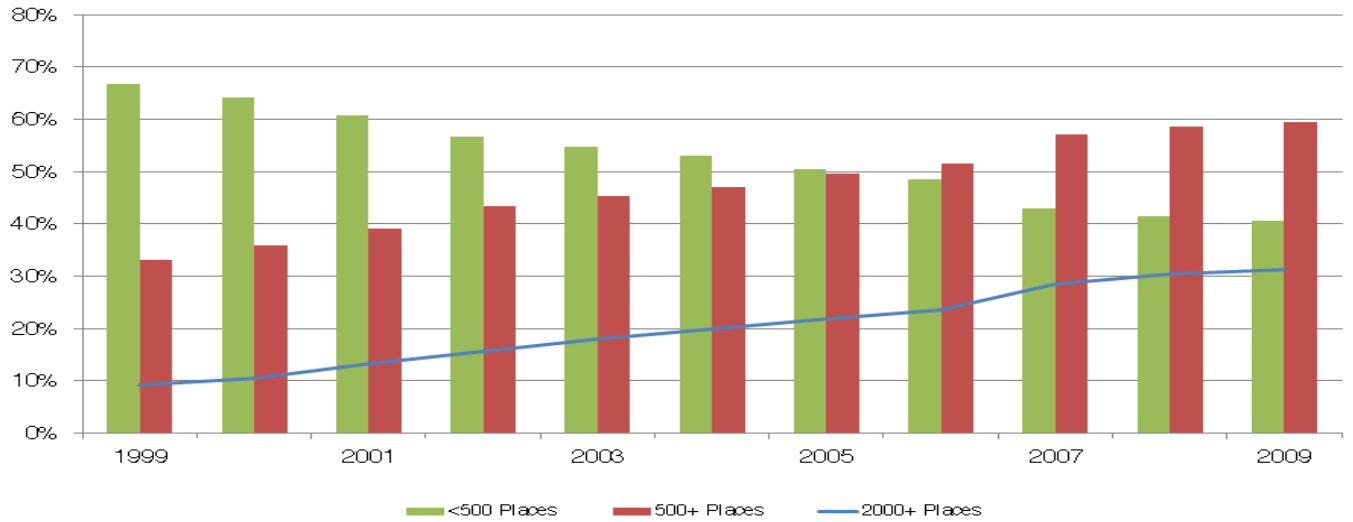


**Graph 4. Milk Cow Inventory Distribution - United States**



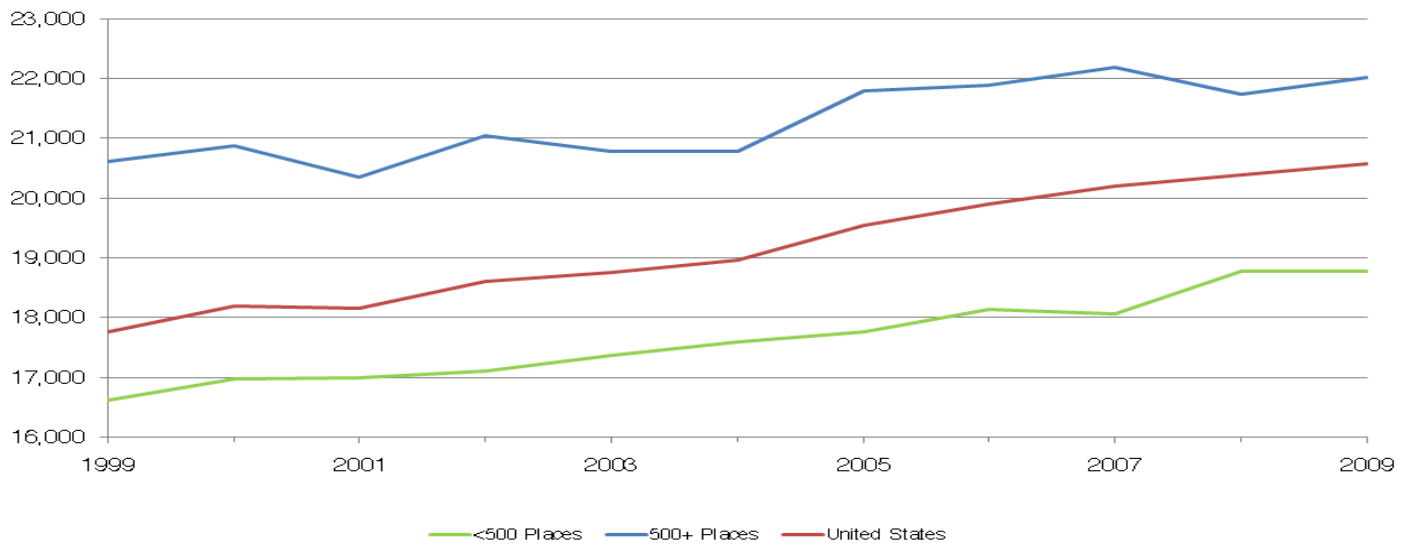
**Graph 5. Milk Production Distribution - United States**

Percent of total

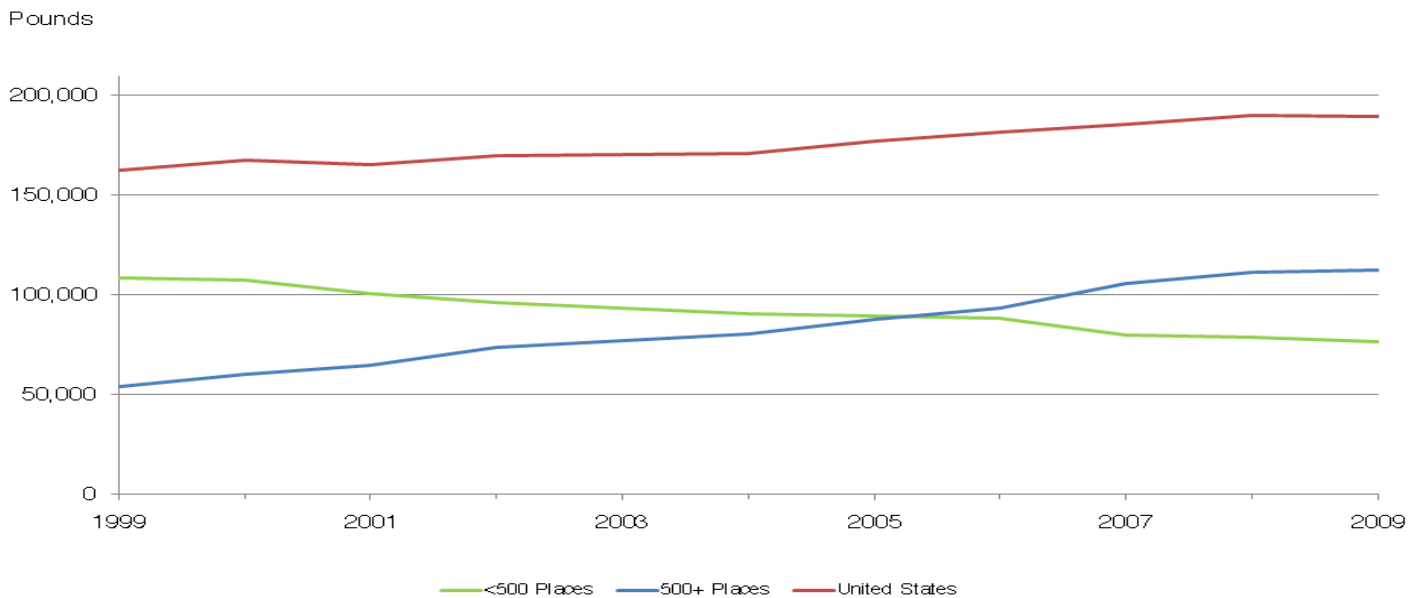


**Graph 6. Milk Production Per Cow - United States**

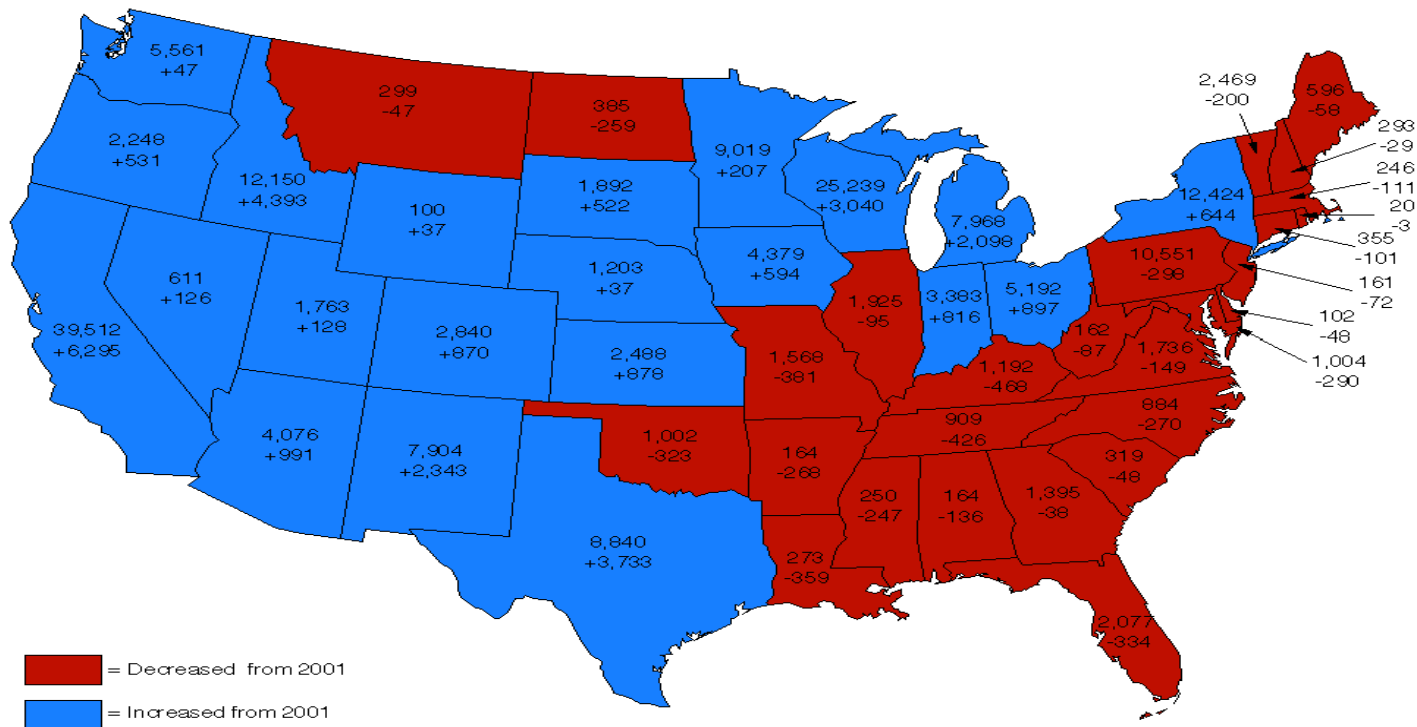
Pounds



**Graph 7. Milk Production - United States**

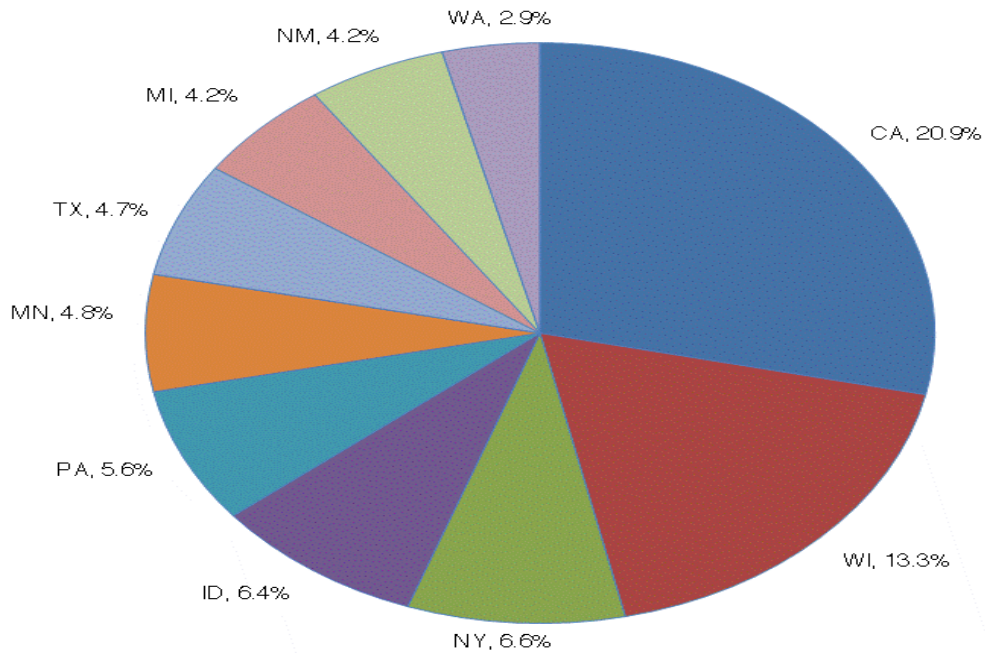


**Graph 8. Milk Production - United States: 2009 and Change from 2001 (million pounds)**

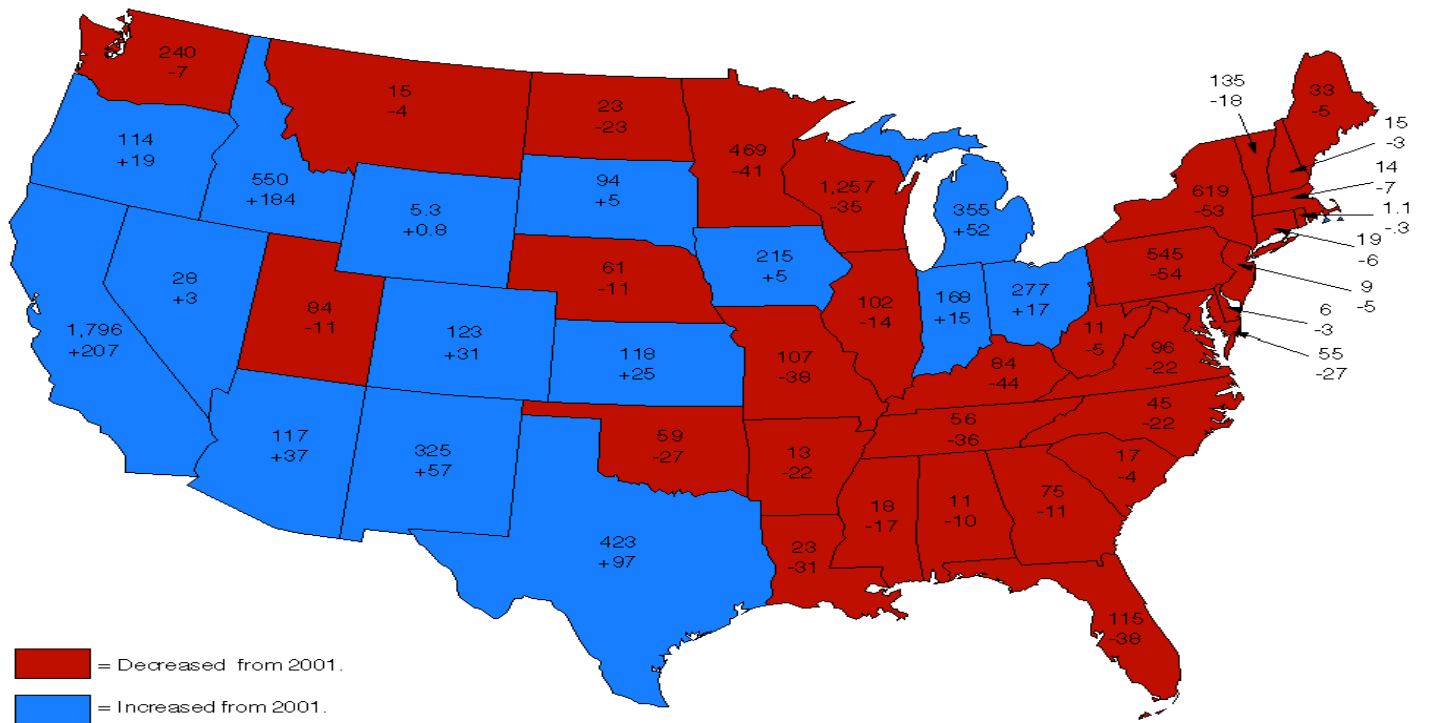




**Graph 9. Percent of United States Milk Production - Top 10 States: 2009**



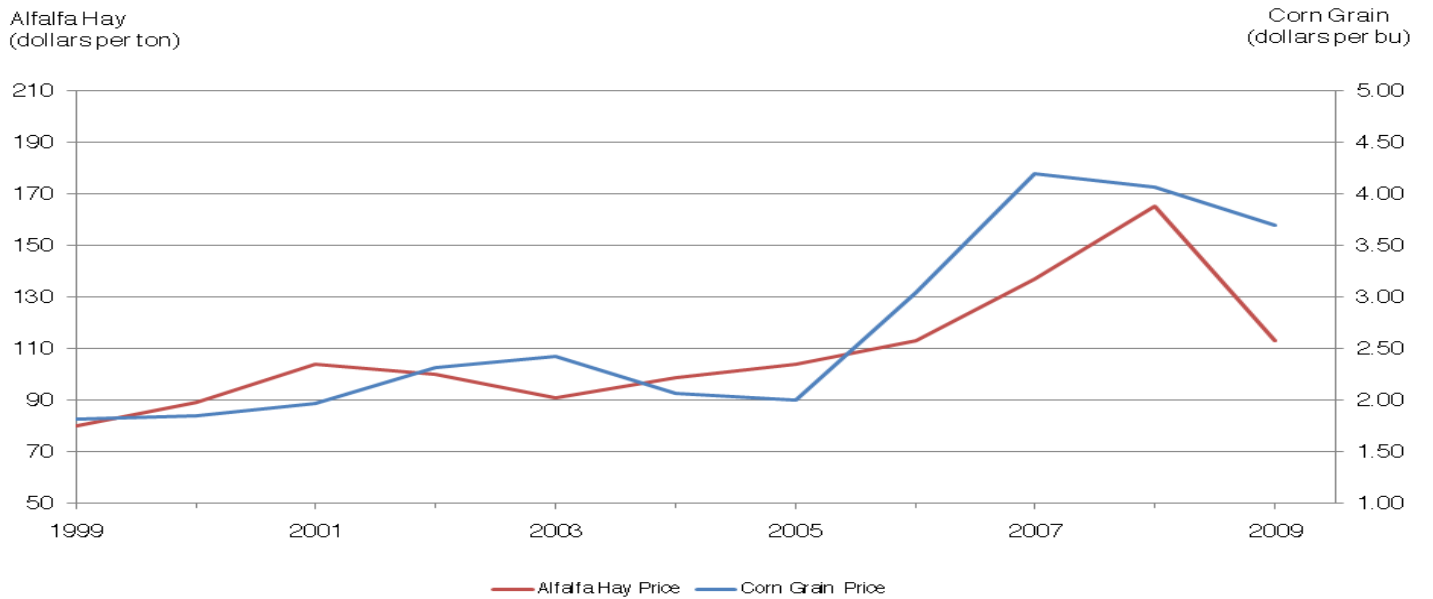
**Graph 10. Milk Cow Inventory - United States: 2009 and Change from 2001 (1,000 head)**



**Graph 11. All Milk Price and Milk-Feed Ratio - United States**



**Graph 12. Alfalfa Hay and Corn Grain Prices - United States**



## 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)

Dan Kerestes, Chief, Livestock Branch .....	(202) 720-3570
Scott Hollis, Head, Livestock Section .....	(202) 690-2424
Vacant – Dairy Products .....	(202) 690-3236
Joe Gaynor – Dairy Products Prices .....	(202) 690-2168
Jason Hardegree – Cattle, Cattle on Feed .....	(202) 720-3040
Sherry Bertramsen – Livestock Slaughter .....	(515) 284-4340
Everett Olbert – Sheep and Goats .....	(202) 720-4751
Mike Miller – Milk Production and Milk Cows .....	(202) 720-3278
Nick Streff – Hogs and Pigs .....	(202) 720-3106

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- All reports are available electronically, at no cost, on the NASS web site: <http://www.nass.usda.gov>
- Both national and state specific reports are available via a free e-mail subscription. To set-up this free subscription, visit <http://www.nass.usda.gov> and in the “Receive NASS Updates” box under “Receive reports by Email,” click on “National” or “State” to select the reports you would like to receive.
- Printed reports may be purchased from the National Technical Information Service (NTIS) by calling toll-free (800) 999-6779, or (703) 605-6220 if calling from outside the United States or Canada. Accepted methods of payment are Visa, MasterCard, check, or money order.

For more information on NASS surveys and reports, call the NASS Agricultural Statistics Hotline at (800) 727-9540, 7:30 a.m. to 4:00 p.m. ET, or e-mail: [nass@nass.usda.gov](mailto:nass@nass.usda.gov).

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**USDA Data Users' Meeting**  
**Monday October 25, 2010**

**Crowne Plaza Chicago-Metro**  
**Chicago, Illinois 60661**  
**312-829-5000**

The USDA's National Agricultural Statistics Service will be organizing an open forum for data users. The purpose will be to provide updates on pending changes in the various statistical and information programs and seek comments and input from data users. Other USDA agencies to be represented will include the Agricultural Marketing Service, the Economic Research Service, the Foreign Agricultural Service, and the World Agricultural Outlook Board. The Foreign Trade Division from the Census Bureau will also be included in the meeting.

For registration details or additional information for the Data Users' Meeting, see the NASS homepage at <http://www.nass.usda.gov/meeting/> or contact Marie Jordan (NASS) at 202-690-8141 or at [marie\\_jordan@nass.usda.gov](mailto:marie_jordan@nass.usda.gov).

This Data Users' Meeting precedes an Industry Outlook Meeting that will be held at the same location on Tuesday October 26, 2010. The Outlook meeting brings together analysts from various commodity sectors to discuss the outlook situation. For registration details or additional information for the Industry Outlook Meeting, see the Livestock and Marketing Information Center (LMIC) homepage at <http://www.lmic.info/> or contact Erica Rosa 303-236-0461 at [rosa@lmic.info](mailto:rosa@lmic.info) or Laura Lahr 303-236-0464 at [lahr@lmic.info](mailto:lahr@lmic.info).