

Economic Analysis of Animal Agriculture 2004-2014

NEW YORK

**A Report for
United Soybean Board**



September 2015



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New York Executive Summary

The use of soybean meal as a key feed ingredient is a moderate part of New York's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in New York. The success of New York animal agriculture in turn has a reasonable impact on the rest of the state and regional economies. For example, in the state of New York during 2014 animal agriculture contributed:

- \$6.9 billion in economic output
- 37,792 jobs
- \$1.2 billion in earnings
- \$310.7 million in income taxes paid at local, state, and federal levels
- \$208.9 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in New York increased economic output by over \$2.3 billion, boosted household earnings by \$384.2 million, contributed 12,494 additional jobs and paid \$102.9 million in additional tax revenues.

New York's animal agriculture consumed about 289.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (195.4 thousand tons)
- Egg-Laying Hens (29.9 thousand tons)
- Turkeys (22.8 thousand tons)

This report examines animal agriculture in New York over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in New York, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a minor contributor to the economic well-being of the people of New York and beyond.

New York Economic Impact of Animal Agriculture

Animal agriculture is a small part of New York's economy. In 2014, New York's animal agriculture contributed the following to the economy:

- About \$6.9 billion in economic output
- \$1.2 billion in household earnings
- 37,792 jobs
- \$310.7 million in income taxes

And the animal agriculture sector has shown growth during challenging economic times. During the last decade New York's animal agriculture has:

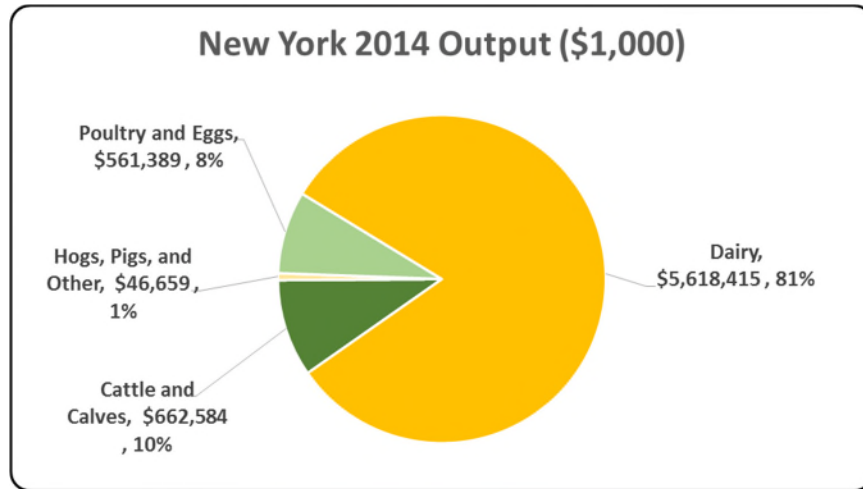
- Increased economic output by \$2.3 billion
- Boosted household earnings by \$384.2 million
- Added 12,494 jobs
- Paid an additional \$102.9 million in income taxes

Below is a table which demonstrates this decade of change.

Measure	2014	Change 2004-2014	% Change 2004-2014
Output (\$1,000)	\$ 6,889,047	\$ 2,301,887	50.18%
Earnings (\$1,000)	\$ 1,160,016	\$ 384,220	49.53%
Employment (Jobs)	37,792	12,494	49.39%
Income Taxes Paid (\$1,000)	\$ 310,652	\$ 102,894	49.53%
Property Taxes Paid in 2012 (\$1,000)	\$ 208,852		

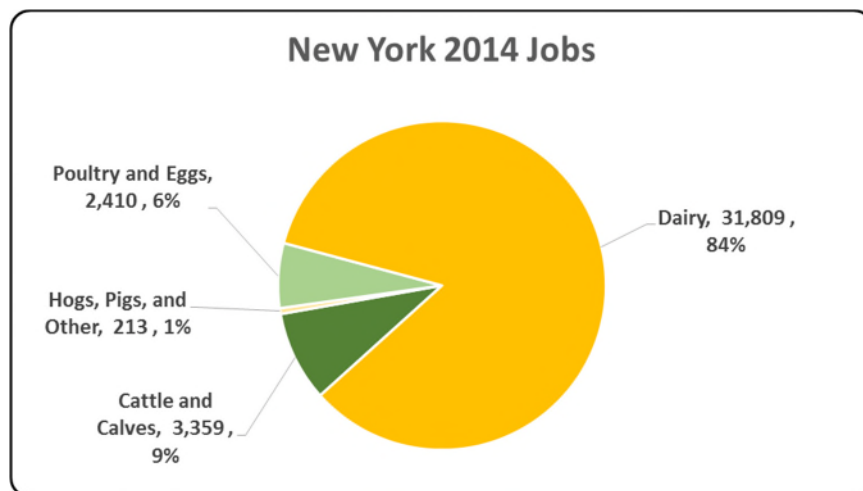
New York Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the New York economy. Animal agriculture’s impact on New York total economic output is about \$6.9 billion.



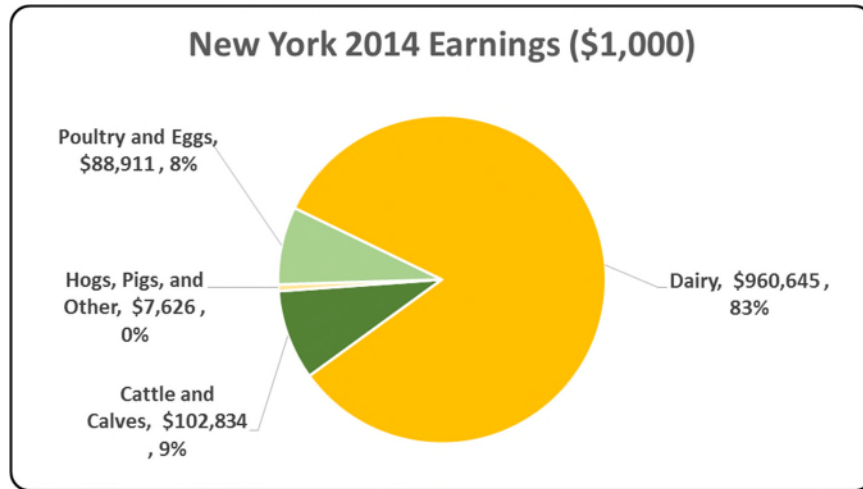
New York Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to New York in terms of animal agriculture jobs. As shown, animal agriculture contributes about 37,792 jobs within and outside of animal agriculture.



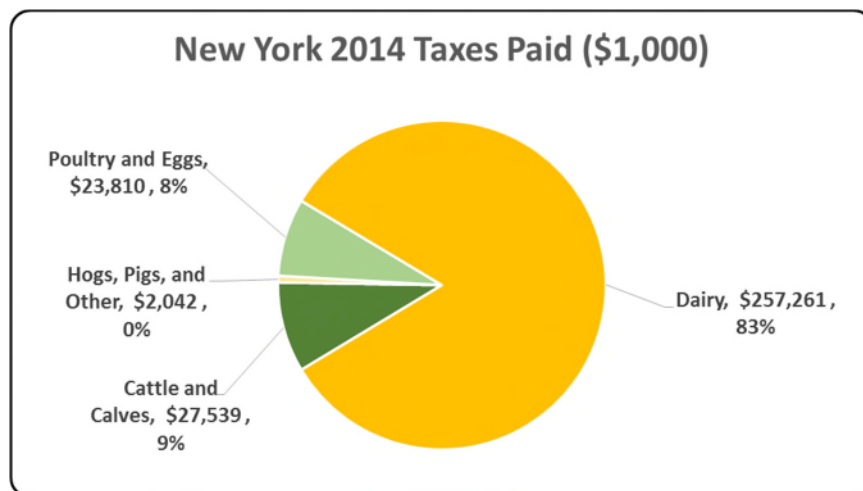
New York Earnings

Earnings includes wages and salaries plus proprietors' income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the New York economy in terms of earnings. New York's animal agriculture contributed about \$1.2 billion to household earnings in 2014.



New York Taxes Paid by Animal Agriculture

New York's animal agriculture is also a source of tax revenue. In 2014, the state's animal agriculture industry paid about \$310.7 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$208.9 million in property taxes paid by all of New York agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



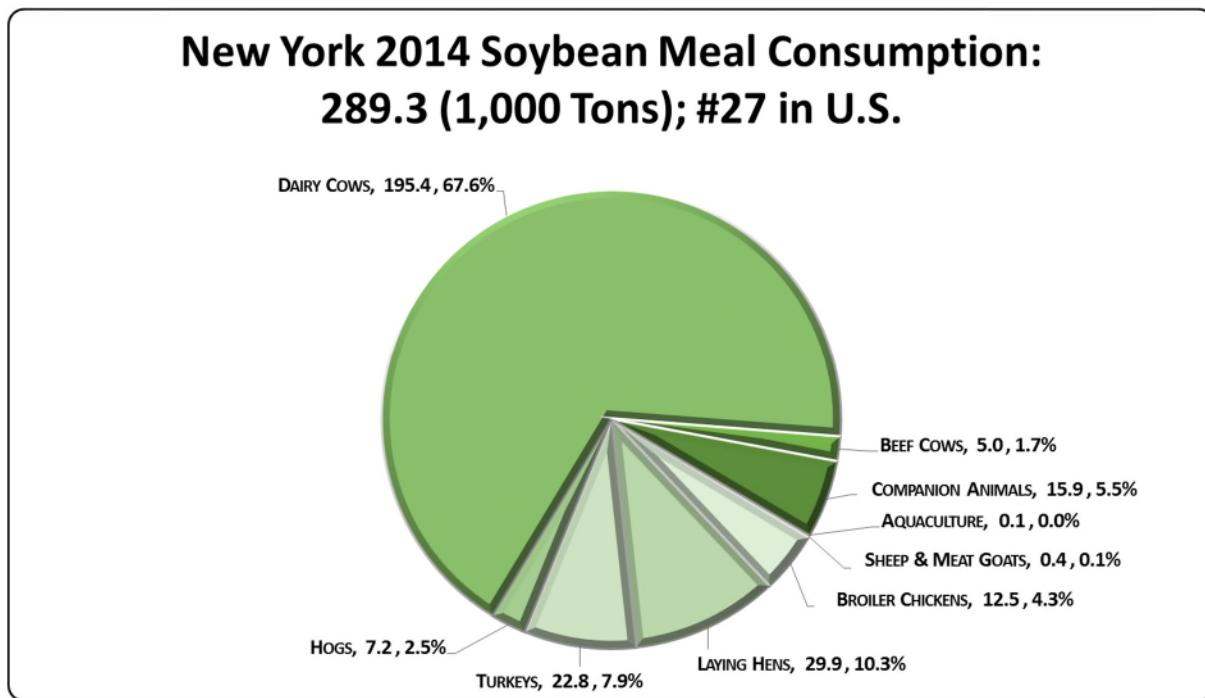
New York Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

New York’s animal agriculture consumed almost 289.3 thousand tons of soybean meal in 2014, placing the state as #27 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (195.4 thousand tons)
- Egg-Laying Hens (29.9 thousand tons)
- Turkeys (22.8 thousand tons)

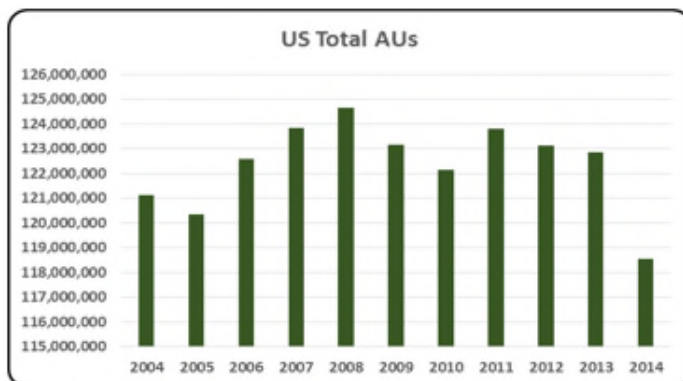


New York Animal Unit (AU) Trends

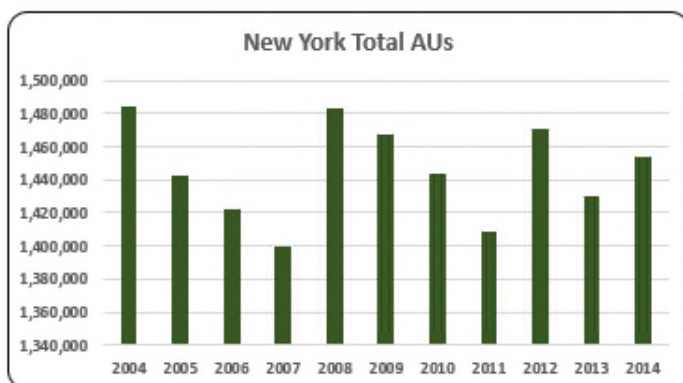
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of New York. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to New York and to give perspective on New York's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

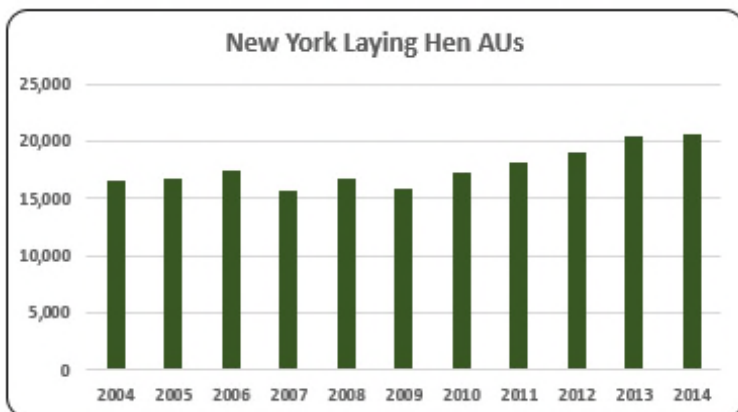
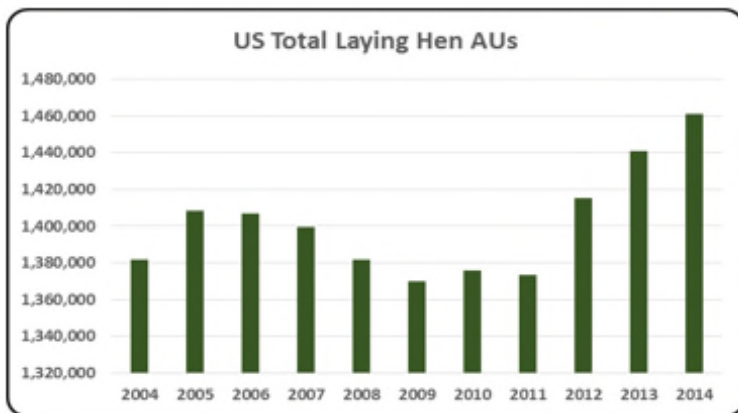
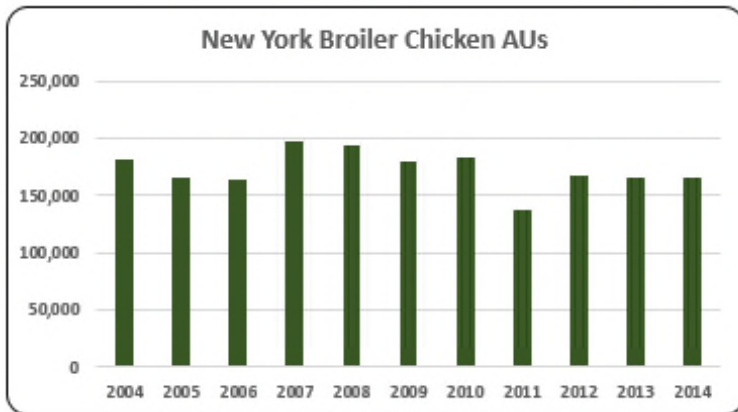
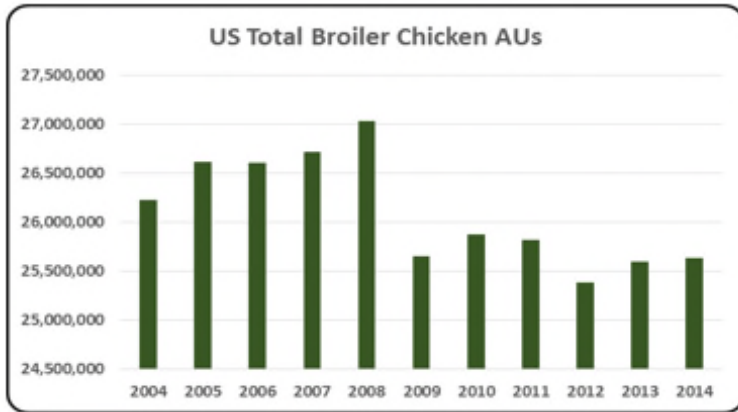
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In New York, the largest three segments of animal agriculture in terms of AUs during 2014 were: Dairy Cows (861.0 thousand AUs), Beef Cows (347.9 thousand AUs), and Broilers (165.2 thousand AUs). Total animal units in New York during 2014 were 1,453.6 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- Animal production in New York widely fluctuated during 2004 to 2014 from a record high of 1,484.8 thousand AUs in 2004 to record low of 1,399.2 thousand in 2007. Animal production in 2014 increased 1.6% to 1,453.6 year-over-year.

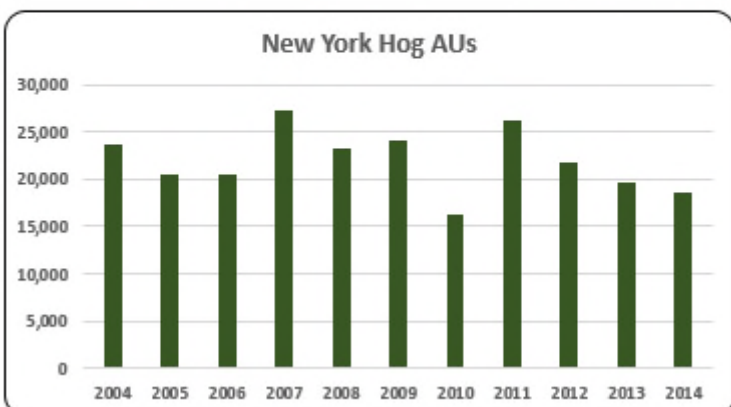
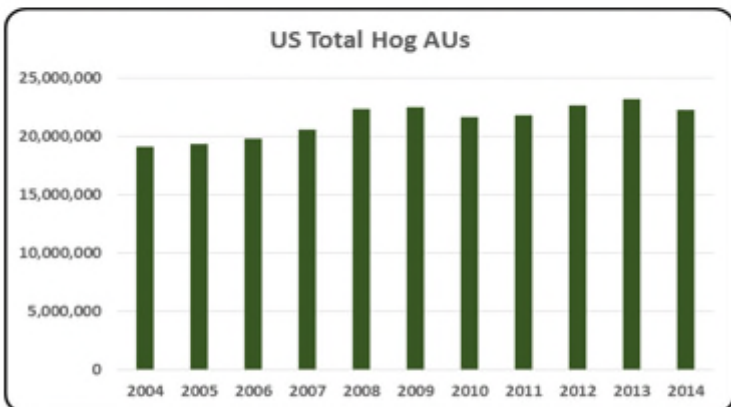
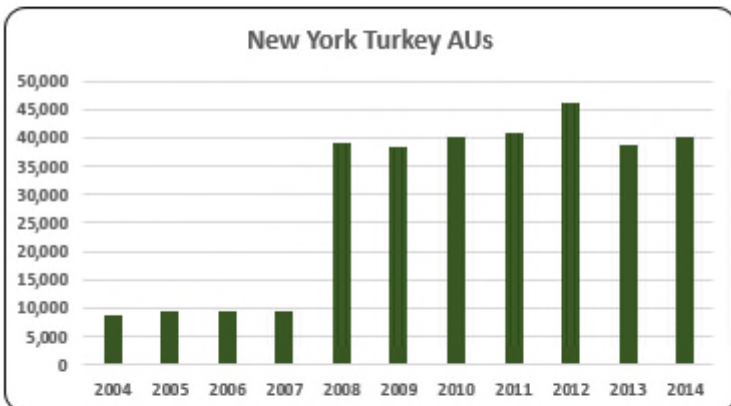
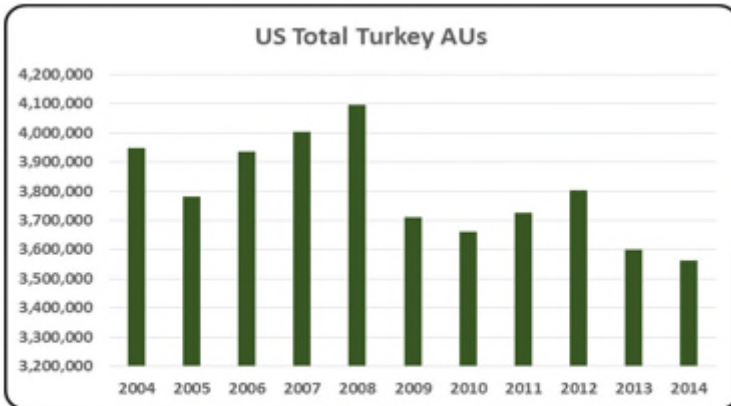


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

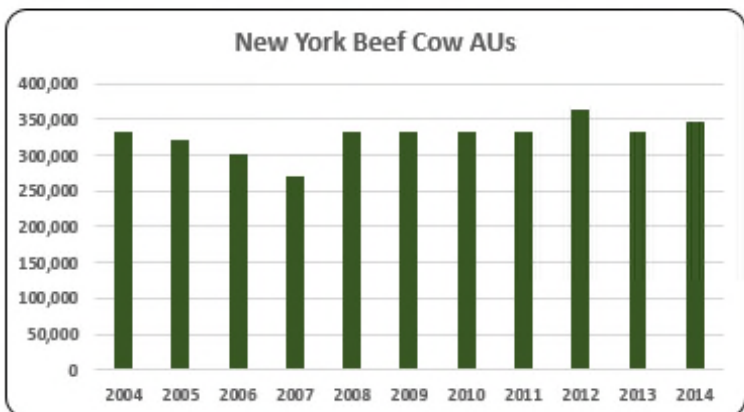
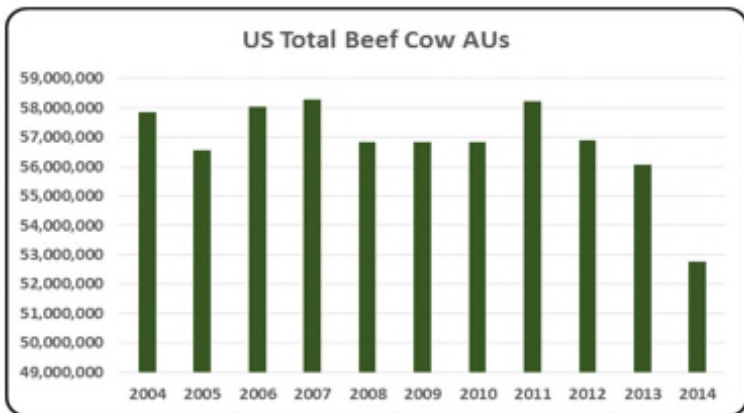
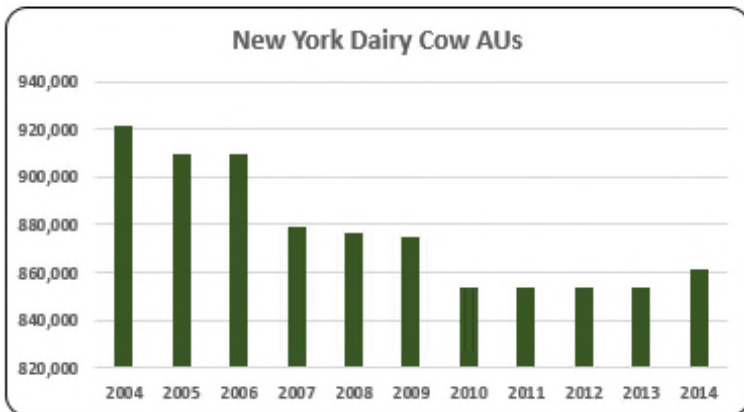
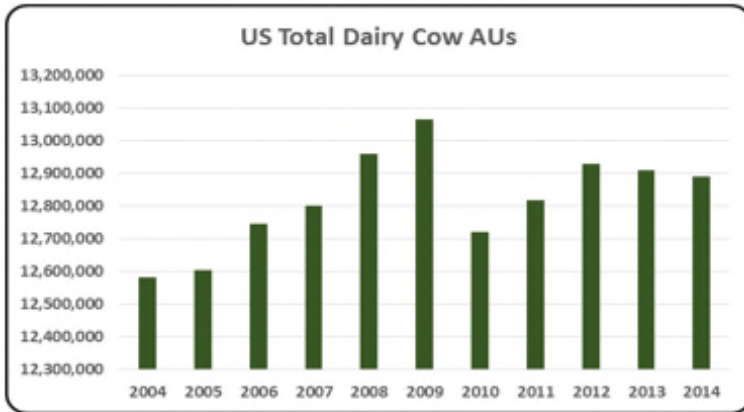
- Broiler production in 2014 (165,210 broiler AUs) represented 11.4% of all animal production. Broiler production decreased 9.1% during 2004 to 2014.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

- The average number of layer AUs from 2004 to 2014 was 17,681. Layer production in 2014 reached a record high of 20,632 layer AUs.



- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production represented 2.8% of animal production in 2014. Turkey AUs in 2014 climbed to a record high of 40,325 turkey AUs.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production declined 22% since the start of the decade. The average number of hog AUs was 21,993 from 2004 to 2014.



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.
- The leading animal production in New York is dairy cow production with 59.23% of all AUs in the state in 2014. However dairy cow numbers declined 7.0% during the 2004 to 2014 period.
- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.
- The second largest animal production in New York during 2004-2014 was beef cow production. Beef cow AUs grew 5.0% to 347,925. 2012 was a record year for beef cow production with 363,450 beef cow AUs.

New York Additional Information and Methodology

Animal agriculture is a moderate part of New York's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in New York, of interest is the degree to which the industry impacts the New York economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for New York animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted New York's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in New York which have occurred. As shown in this state report, New York has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in New York. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

New York Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on New York's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in New York, \$1.460 to \$1.611 million in total economic activity, \$0.239 to \$0.275 in household wages and 7 to 9 additional jobs are generated in the economy at large.

	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	\$ 1.5612	\$ 0.2423	7.9
	Hogs, Pigs, and Other	\$ 1.4604	\$ 0.2387	6.7
	Poultry and Eggs	\$ 1.5640	\$ 0.2477	6.7
	Dairy	\$ 1.6107	\$ 0.2754	9.1

Appendix

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Animal Units (AUs)	Beef Cattle AUs	332,775	321,825	301,575	270,600	333,600	333,600	333,600	331,950	363,450	331,350	347,925
	Hog and Pig AUs	23,700	20,490	20,490	27,285	23,280	24,120	16,305	26,295	21,705	19,725	18,525
	Broiler AUs	181,826	164,703	163,591	196,873	193,803	180,192	182,615	137,602	166,736	166,154	165,210
	Turkey AUs	8,700	9,349	9,502	9,513	39,196	38,394	39,991	40,705	46,286	38,611	40,325
	Egg Layer AUs	16,588	16,668	17,376	15,684	16,660	15,904	17,340	18,116	19,046	20,477	20,632
	Dairy AUs	921,200	910,000	910,000	879,200	876,400	875,000	854,000	854,000	854,000	854,000	861,000
	Total Animal Units	1,484,789	1,443,035	1,422,534	1,399,155	1,482,939	1,467,209	1,443,852	1,408,668	1,471,224	1,430,317	1,453,617
Value of Production (\$1,000)	Cattle and Calves (\$1,000)	\$ 121,275	\$ 160,535	\$ 144,013	\$ 95,331	\$ 104,390	\$ 127,438	\$ 166,544	\$ 259,842	\$ 305,678	\$ 334,031	\$ 424,407
	Hogs and Pigs (\$1,000)	\$ 14,929	\$ 12,248	\$ 11,754	\$ 10,784	\$ 9,508	\$ 8,708	\$ 11,264	\$ 18,669	\$ 16,818	\$ 16,325	\$ 20,977
	Broilers (\$1,000)	\$ 112,592	\$ 134,043	\$ 103,586	\$ 148,105	\$ 152,425	\$ 132,032	\$ 138,968	\$ 122,439	\$ 166,098	\$ 202,349	\$ 212,271
	Turkeys (\$1,000)	\$ 5,911	\$ 6,446	\$ 7,434	\$ 8,108	\$ 8,870	\$ 9,627	\$ 10,385	\$ 11,143	\$ 11,901	\$ 12,659	\$ 13,417
	Eggs (\$1,000)	\$ 59,844	\$ 34,671	\$ 39,246	\$ 73,945	\$ 96,871	\$ 66,428	\$ 66,177	\$ 82,740	\$ 93,883	\$ 107,145	\$ 133,257
	Milk (\$1,000)	\$ 1,957,200	\$ 1,920,402	\$ 1,614,030	\$ 2,384,291	\$ 2,386,944	\$ 1,689,664	\$ 2,212,062	\$ 2,747,332	\$ 2,558,860	\$ 2,854,156	\$ 3,488,182
	Other	\$ 12,136	\$ 11,938	\$ 11,507	\$ 11,065	\$ 11,143	\$ 11,161	\$ 11,988	\$ 11,225	\$ 11,141	\$ 11,057	\$ 10,972
	Sheep and Lambs (\$1,000)	\$ 3,045	\$ 3,025	\$ 2,772	\$ 2,507	\$ 2,763	\$ 2,959	\$ 3,964	\$ 3,379	\$ 3,472	\$ 3,566	\$ 3,659
	Aquaculture (\$1,000)	\$ 9,091	\$ 8,913	\$ 8,735	\$ 8,558	\$ 8,380	\$ 8,202	\$ 8,024	\$ 7,847	\$ 7,669	\$ 7,491	\$ 7,313
	Total (\$1,000)	\$ 2,283,887	\$ 2,280,283	\$ 1,931,570	\$ 2,731,628	\$ 2,770,150	\$ 2,045,058	\$ 2,617,389	\$ 3,253,390	\$ 3,164,379	\$ 3,537,722	\$ 4,303,483

Ag Census Data Category	Animal Type	1997	2002	2007	2012
Number of Farms by NAICS	Beef cattle ranching and farming (112111)	4,821	3,974	4,302	4,453
	Cattle feedlots (112112)	580	1,038	501	143
	Dairy cattle and milk production (11212)	7,852	6,531	5,237	4,694
	Hog and pig farming (1122)	314	363	385	422
	Poultry and egg production (1123)	281	423	1,005	882
	Sheep and goat farming (1124)	696	1,115	1,068	1,120
	Animal aquaculture and other animal production (1125,1129)	2,602	4,976	5,111	5,171
Value of Sales (\$1,000)	Cattle and Calves	216,075	251,121	318,080	449,497
	Hogs and Pigs	15,108	14,005	28,302	38,999
	Poultry and Eggs	87,265	106,620	123,727	144,663
	Milk and Other Dairy Products	1,461,624	1,560,895	2,280,218	2,417,398
	Aquaculture	1,833	15,185	20,417	18,036
	Other (calculated)	82,317	34,880	85,962	39,094
	Total	1,864,222	1,982,706	2,856,706	3,107,687
Input Purchases	Livestock and poultry purchased	(Farms) 9,787	9,678	8,447	10,255
		\$1,000 111,258	122,666	117,208	139,833
	Breeding livestock purchased	(Farms) n/a	5,796	4,657	5,449
		\$1,000 n/a	50,639	49,526	72,677
	Other livestock and poultry purchased	(Farms) n/a	5,053	5,103	6,538
		\$1,000 n/a	72,026	67,683	67,156
	Feed purchased	(Farms) 17,393	22,148	18,994	21,869
	\$1,000 482,735	537,185	695,165	1,007,295	

	Animal Type	Output (\$1,000)	Earnings (\$1,000)	Employment (Jobs)	Taxes Paid (\$1,000)
2014 Animal Agriculture	Cattle and Calves	\$ 662,584	\$ 102,834	3,359	\$ 27,539
	Hogs, Pigs, and Other	\$ 46,659	\$ 7,626	213	\$ 2,042
	Poultry and Eggs	\$ 561,389	\$ 88,911	2,410	\$ 23,810
	Dairy	\$ 5,618,415	\$ 960,645	31,809	\$ 257,261
	Total	\$ 6,889,047	\$ 1,160,016	37,792	\$ 310,652
Change from 2004 to 2014	Cattle and Calves	\$ 425,304	\$ 66,008	2,156	\$ 17,677
	Hogs, Pigs, and Other	\$ (2,876)	\$ (470)	(13)	\$ (126)
	Poultry and Eggs	\$ 211,819	\$ 33,547	909	\$ 8,984
	Dairy	\$ 1,667,640	\$ 285,136	9,442	\$ 76,359
	Total	\$ 2,301,887	\$ 384,220	12,494	\$ 102,894
	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)	
RIMS II Multipliers	Cattle and Calves	\$ 1.5612	\$ 0.2423	7.9	
	Hogs, Pigs, and Other	\$ 1.4604	\$ 0.2387	6.7	
	Poultry and Eggs	\$ 1.5640	\$ 0.2477	6.7	
	Dairy	\$ 1.6107	\$ 0.2754	9.1	
Tax Rates	Federal effective income tax rate			12.7%	
	Federal Social Security tax rate			7.7%	
	State Effective Rate			6.5%	
	Total			26.8%	

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.