

Economic Analysis of Animal Agriculture 2005-2015

NEW YORK

**A Report for
United Soybean Board**



September 2016



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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 the State of 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 2015 animal agriculture contributed:

- \$5.6 billion in economic output
- 33,113 jobs
- \$1.2 billion in earnings
- \$312.1 million in income taxes paid at local, state, and federal levels
- \$208.9 million in the form of property taxes

Plus, from 2005-2015 animal agriculture in New York has increased economic output by over \$1.0 billion, boosted household earnings by \$204.1 million, contributed 5,725 additional jobs and paid \$54.7 million in additional tax revenues.

New York's animal agriculture consumed almost 291.1 thousand tons of soybean meal in 2015. This soybean meal was fed primarily to:

- Dairy Cows (196.4 thousand tons)
- Egg-Laying Hens (30.0 thousand tons)
- Turkeys (22.4 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. It is expected that animal agriculture will continue to be a 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 2015, New York's animal agriculture contributed the following to the economy:

- About \$5.6 billion in economic output
- \$1.2 billion in household earnings
- 33,113 jobs
- \$312.1 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:

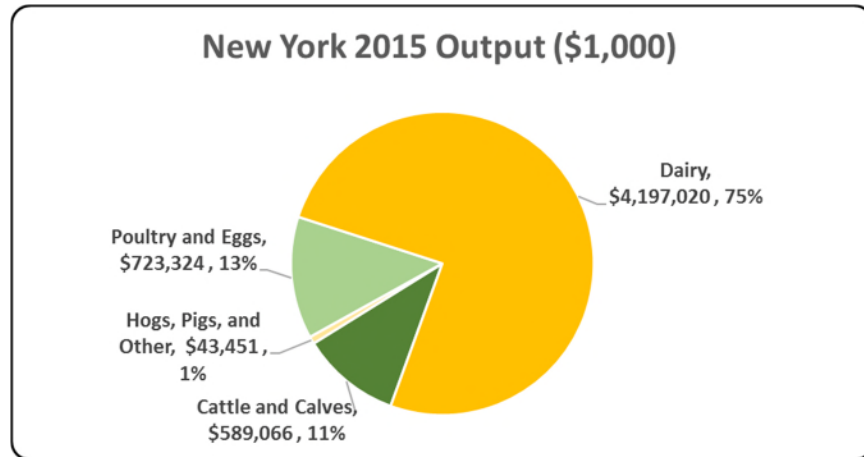
- Increased economic output by \$1.0 billion
- Boosted household earnings by \$204.1 million
- Added 5,725 jobs
- Paid an additional \$54.7 million in income taxes

Below is a table which demonstrates this decade of change.

Measure	2015	Change 2005-2015	% Change 2005-2015
Output (\$1,000)	\$ 5,552,862	\$ 1,011,245	22.27%
Earnings (\$1,000)	\$ 1,165,323	\$ 204,143	21.24%
Employment (Jobs)	33,113	5,725	20.90%
Income Taxes Paid (\$1,000)	\$ 312,073	\$ 54,669	21.24%
Property Taxes Paid in 2012 (\$1,000)	\$ 208,852		

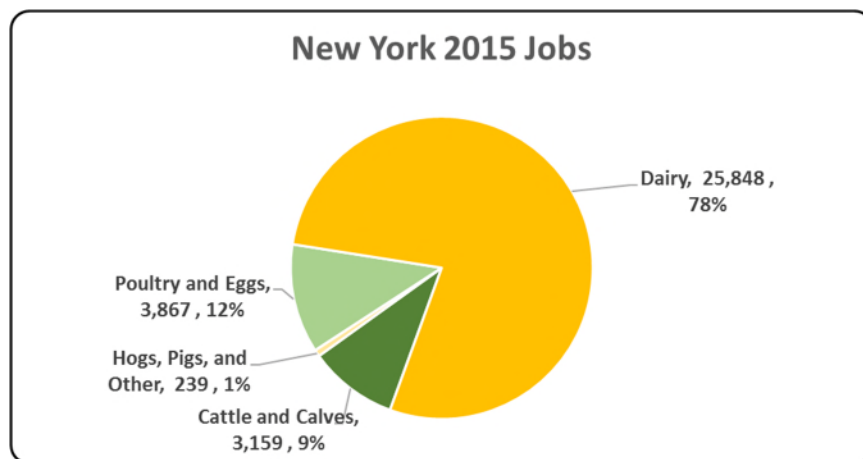
New York Output

“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 \$5.6 billion.



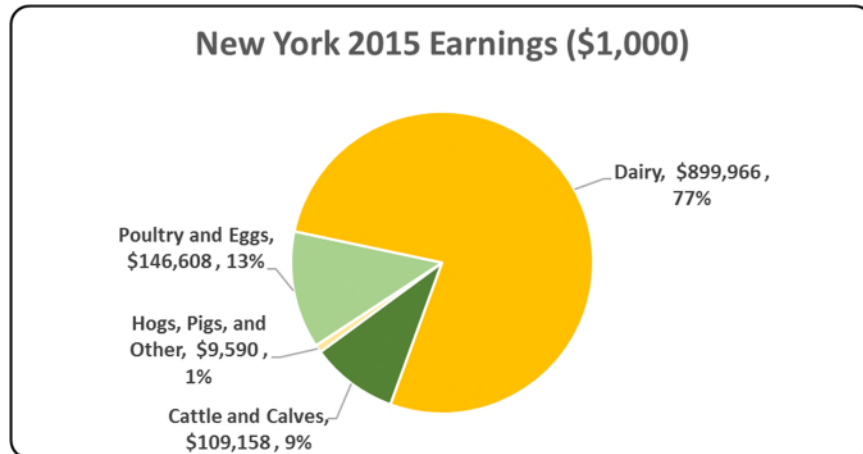
New York Jobs

“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 33,113 jobs within and outside of animal agriculture.



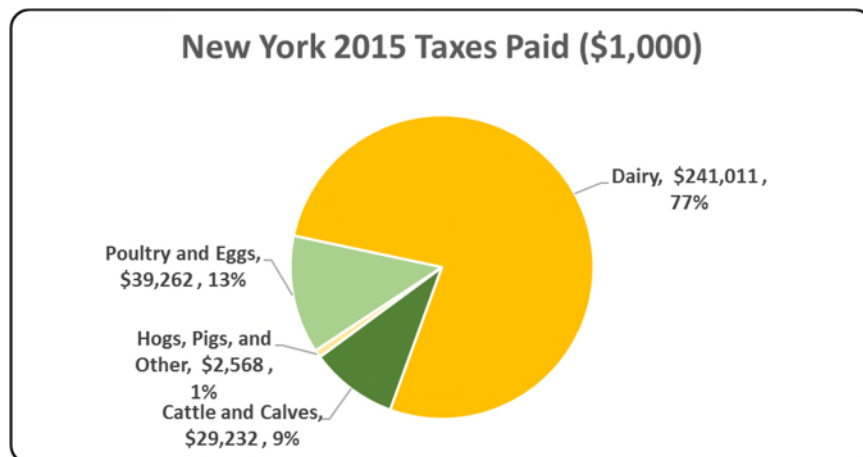
New York Earnings

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 2015.



New York Taxes Paid by Animal Agriculture

New York’s animal agriculture is also a source of tax revenue. In 2015, the state’s animal agriculture industry paid about \$312.1 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.



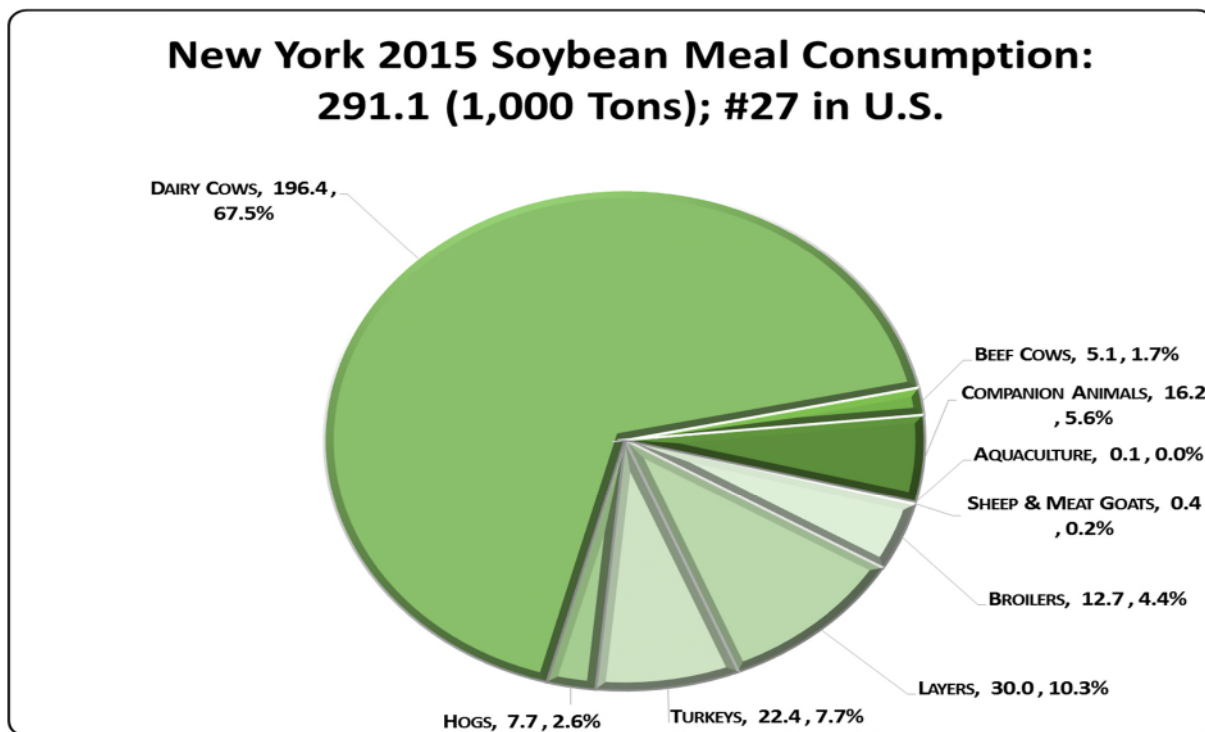
New York Animal Agriculture Soybean Meal Consumption

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 2014-15 soybean marketing year by up to sixteen specific animal species has been estimated.

New York's animal agriculture consumed almost 291.1 thousand tons of soybean meal in 2015, 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 (196.4 thousand tons)
- Egg-Laying Hens (30.0 thousand tons)
- Turkeys (22.4 thousand tons)

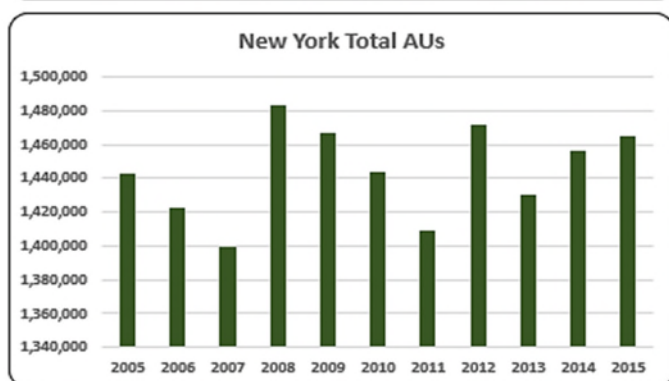
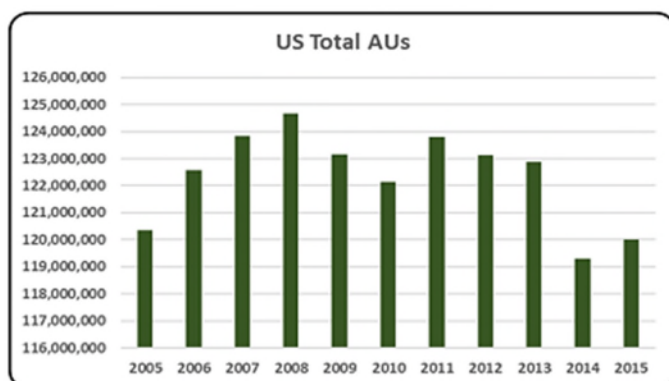


New York Animal Unit (AU) Trends

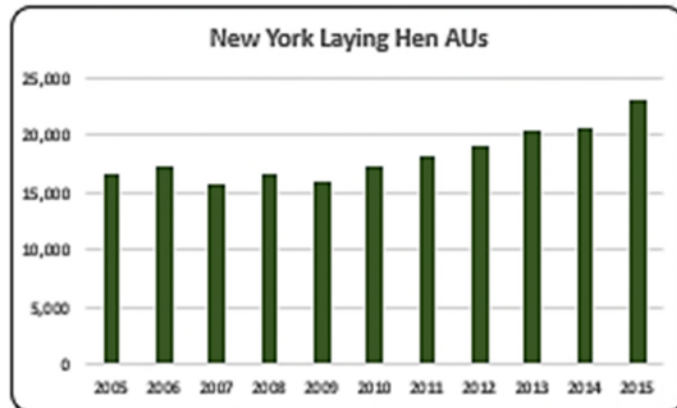
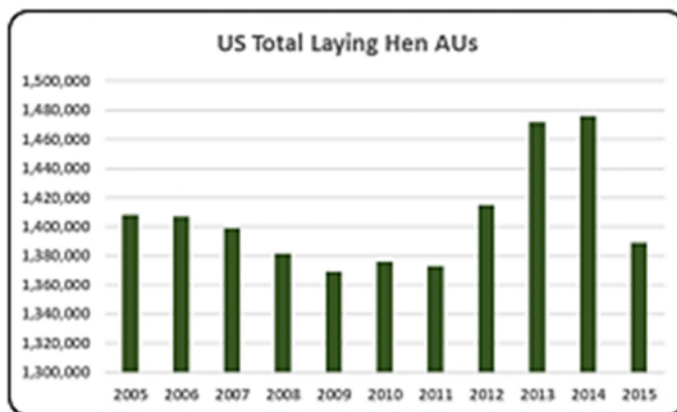
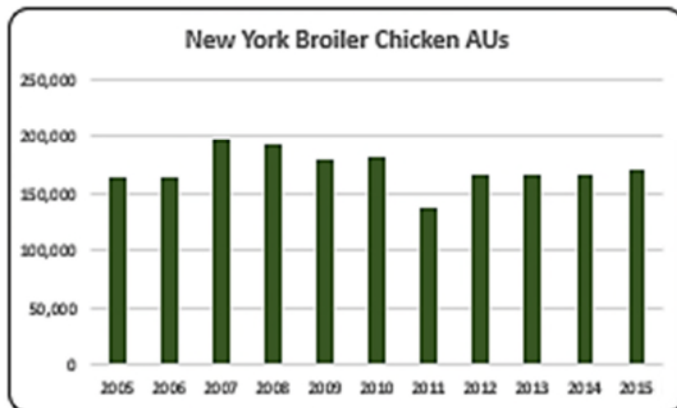
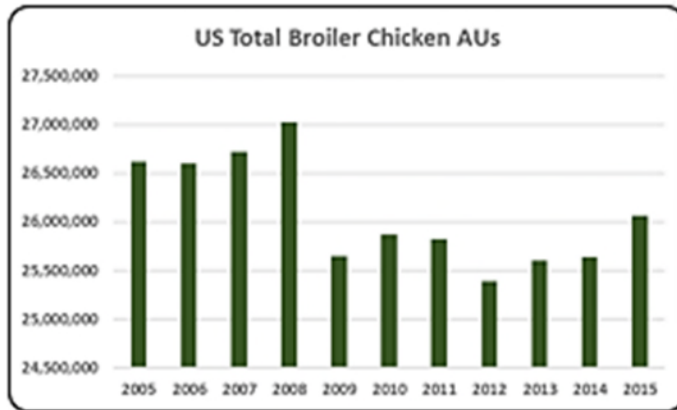
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of New York. Due to this reality, using a single year as a measure of the presence and strength of a sector can 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.

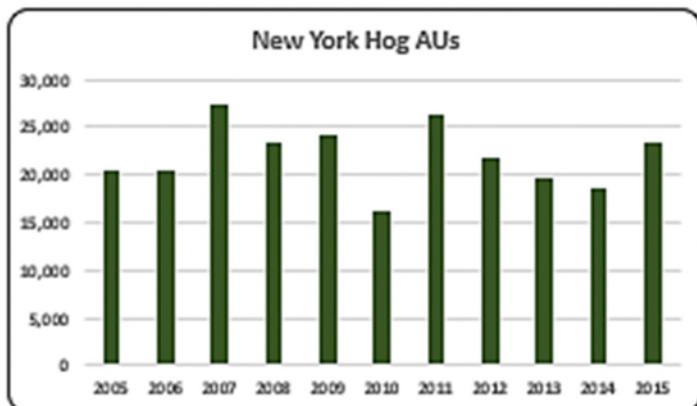
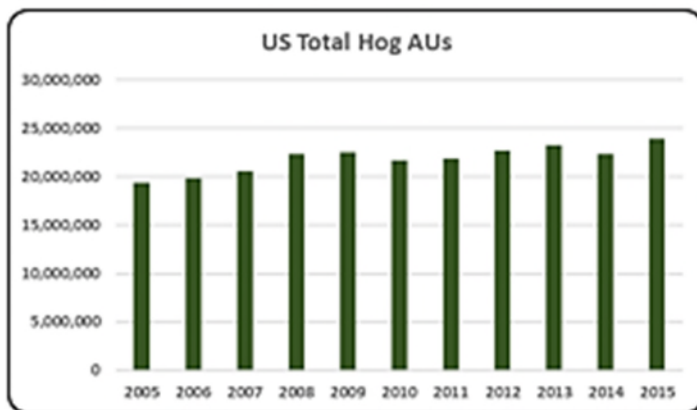
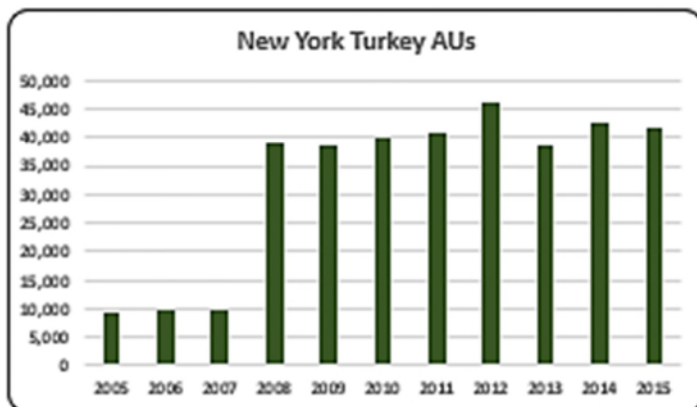
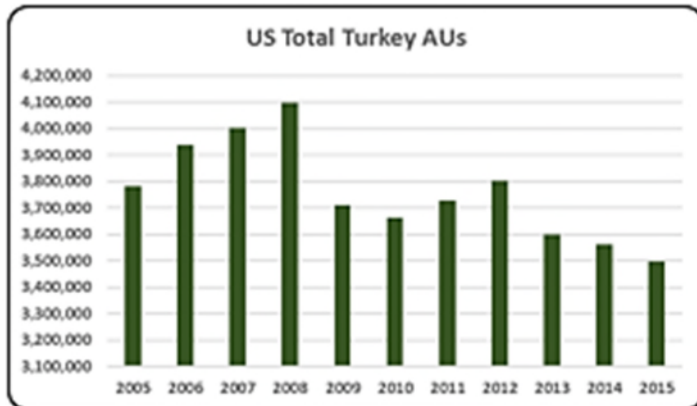
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In New York, the largest three segments of animal agriculture in terms of AUs during 2015 were: Dairy Cows (861,000 AUs), Beef Cows (346,035 AUs), and Broilers (169,475 AUs). Total animal units in New York during 2015 were 1.46 million AUs.



- Overall U.S. total AUs have varied from 2005 to 2015. 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 2005-15 time period, total AUs in the nation peaked in 2008.
- Animal production in New York widely fluctuated during 2005 to 2015 from a record high of 1.48 million AUs in 2008 to record low of 1.4 million in 2007. Animal production in 2015 increased 1% to 1.46 million year-over-year.



- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2005 to 2015, broiler chicken AUs were about 26.0 million. In 2015, AUs rebounded 3% from the low AUs numbers in 2012 (25.4 million AUs).
- Broiler production in 2015 (169,475 broiler AUs) represented 11.6% of all animal production. Broiler production decreased 3% during 2005 to 2015.
- On average, the layer AUs during 2005-2015 were 1.4 million. In 2015 layer AUs were 1.3 million, down 6% from the 2014 decade high (1.4 million AUs). This drastic decrease in 2015 was due to the losses in major egg laying states from the avian influenza outbreak.
- The average number of layer AUs from 2005 to 2015 was 18,266. Layer production in 2015 reached a record high of 23,340 layer AUs.

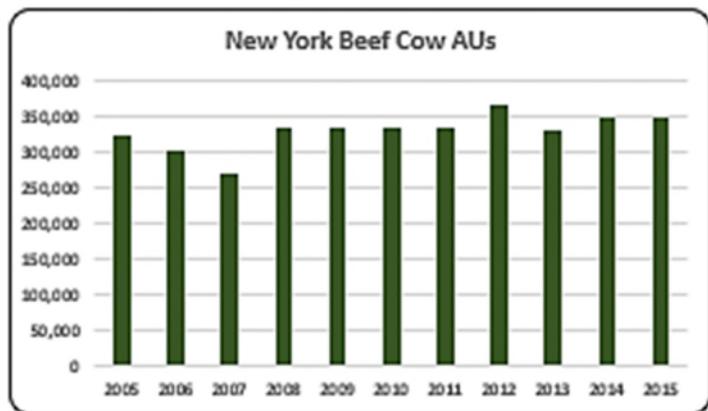
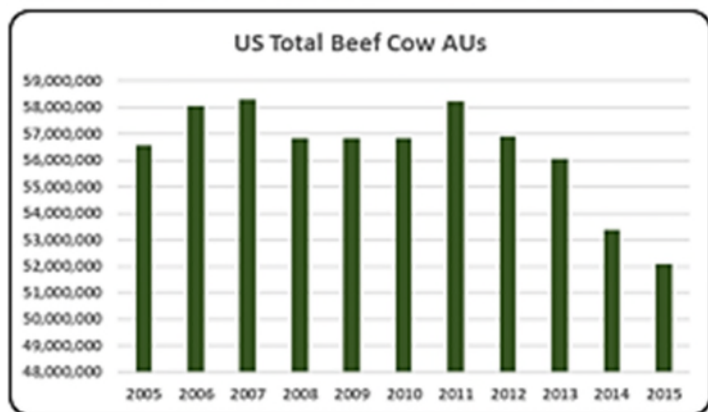
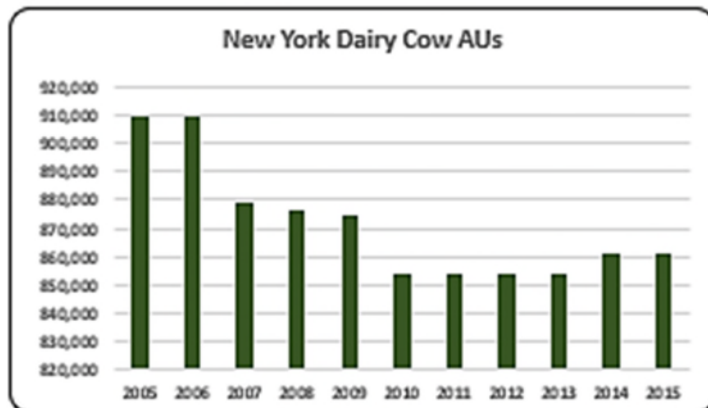
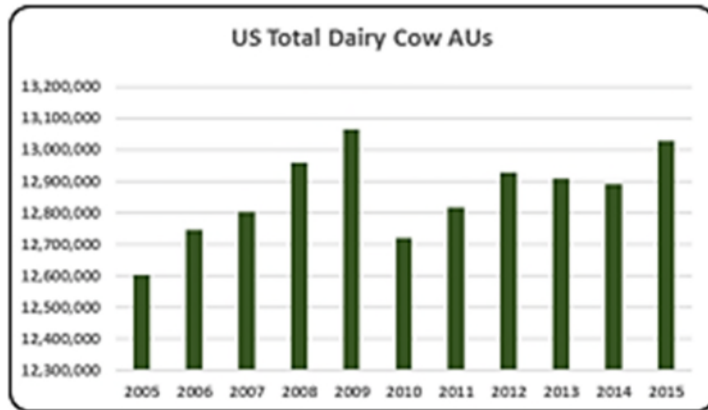


- In 2015 turkey AUs were the lowest of the decade at 3.5 million, decreasing 15% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade. The most recent contributor to this decline has been avian influenza.

- Turkey production represented 2.8% (41,705) of animal production in 2015. Turkey AUs in 2012 climbed to a record high of 46,286 turkey AUs.

- On average from 2005 to 2015, hog AUs were about 21.8 million. Hog AUs in 2015 increased 24% to 23.9 million AUs compared to the decade low in 2005 (19.4 million AUs). Despite the fluctuation in AUs, the pork supply was relatively stable.

- Hog production increased 14% since the start of the decade. The average number of hog AUs was 21,960 from 2005 to 2015.



- From 2005 to 2015 dairy cow AUs averaged 12.8 million. In 2015, dairy cow AUs (13.0 million) finally reached near the 2009 high of 13.1 million AUs. Milk supplies have steadily risen.
- The leading animal production in New York is dairy cow production with 58.8% of all AUs in the state in 2015. The average dairy cow AUs for the 2005 to 2015 decade was 871,691.
- From 2005 to 2015 beef cow AUs averaged 56.3 million. In 2015 beef cow AUs decreased to 52.0 million, the lowest of the decade. States that traditionally raise a lot of cattle like Texas and Oklahoma continue to work through the lingering effects of the drought of the last several years.
- The second largest animal production in New York during 2005-2015 was beef cow production. Beef cow AUs represent 23.6% (346,035) production in the state of New York. 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 2005-2015 time period
- Soybean meal usage by animal species during the 2014/15 soybean marketing year
- Animal Unit (AU) trends from 2005-2015

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 2005-2015 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 2014-15 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, \$1.41 to \$1.64 million in total economic activity, \$0.27 to \$0.35 in household wages and 8 to 10 additional jobs are generated in the economy at large.

	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	\$ 1.433	\$ 0.266	7.7
	Hogs, Pigs, and Other	\$ 1.411	\$ 0.311	7.7
	Poultry and Eggs	\$ 1.601	\$ 0.324	8.6
	Dairy	\$ 1.636	\$ 0.351	10.1

Appendix

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Animal Units (AUs)	Beef Cattle AUs	321,825	301,575	270,600	333,600	333,600	333,600	331,950	363,450	331,350	347,925	346,035
	Hog and Pig AUs	20,490	20,490	27,285	23,280	24,120	16,305	26,295	21,705	19,725	18,525	23,340
	Broiler AUs	164,703	163,591	196,873	193,803	180,192	182,615	137,602	166,736	166,154	165,210	169,475
	Turkey AUs	9,349	9,502	9,513	39,196	38,394	39,991	40,705	46,286	38,611	42,625	41,705
	Egg Layer AUs	16,668	17,376	15,684	16,660	15,904	17,340	18,116	19,046	20,472	20,632	23,032
	Dairy AUs	910,000	910,000	879,200	876,400	875,000	854,000	854,000	854,000	854,000	861,000	861,000
	Total Animal Units	1,443,035	1,422,534	1,399,155	1,482,939	1,467,209	1,443,852	1,408,668	1,471,224	1,430,312	1,455,917	1,464,587
Value of Production (\$1,000)	Cattle and Calves (\$1,000)	\$ 160,535	\$ 144,013	\$ 95,331	\$ 104,390	\$ 127,438	\$ 166,544	\$ 259,842	\$ 305,678	\$ 334,031	\$ 424,407	\$ 410,986
	Hogs and Pigs (\$1,000)	\$ 12,248	\$ 11,754	\$ 10,784	\$ 9,508	\$ 8,708	\$ 11,264	\$ 18,669	\$ 16,818	\$ 16,325	\$ 20,977	\$ 19,482
	Broilers (\$1,000)	\$ 138,406	\$ 107,222	\$ 151,936	\$ 155,223	\$ 133,925	\$ 139,956	\$ 122,530	\$ 166,138	\$ 202,436	\$ 212,371	\$ 185,275
	Turkeys (\$1,000)	\$ 37,618	\$ 41,321	\$ 45,020	\$ 48,135	\$ 43,840	\$ 55,165	\$ 61,356	\$ 75,808	\$ 60,025	\$ 67,919	\$ 72,322
	Eggs (\$1,000)	\$ 34,671	\$ 39,246	\$ 73,945	\$ 96,871	\$ 66,428	\$ 66,177	\$ 82,740	\$ 93,883	\$ 107,145	\$ 133,207	\$ 194,339
	Milk (\$1,000)	\$ 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	\$ 3,487,420	\$ 2,566,200
	Other	\$ 11,938	\$ 11,507	\$ 11,065	\$ 11,143	\$ 11,161	\$ 11,988	\$ 11,396	\$ 11,376	\$ 11,356	\$ 11,335	\$ 11,315
	Sheep and Lambs (\$1,000)	\$ 3,025	\$ 2,772	\$ 2,507	\$ 2,763	\$ 2,959	\$ 3,964	\$ 3,550	\$ 3,707	\$ 3,865	\$ 4,022	\$ 4,179
	Aquaculture (\$1,000)	\$ 8,913	\$ 8,735	\$ 8,558	\$ 8,380	\$ 8,202	\$ 8,024	\$ 7,847	\$ 7,669	\$ 7,491	\$ 7,313	\$ 7,136
	Total (\$1,000)	\$ 2,315,818	\$ 1,969,094	\$ 2,772,371	\$ 2,812,214	\$ 2,081,164	\$ 2,663,156	\$ 3,303,865	\$ 3,228,561	\$ 3,585,474	\$ 4,357,636	\$ 3,459,919

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)	<i>n/a</i>	5,796	4,657	5,449
		\$1,000	<i>n/a</i>	50,639	49,526	72,677
	Other livestock and poultry purchased	(Farms)	<i>n/a</i>	5,053	5,103	6,538
		\$1,000	<i>n/a</i>	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)
2015 Animal Agriculture	Cattle and Calves	\$ 589,066	\$ 109,158	3,159	\$ 29,232
	Hogs, Pigs, and Other	\$ 43,451	\$ 9,590	239	\$ 2,568
	Poultry and Eggs	\$ 723,324	\$ 146,608	3,867	\$ 39,262
	Dairy	\$ 4,197,020	\$ 899,966	25,848	\$ 241,011
	Total	\$ 5,552,862	\$ 1,165,323	33,113	\$ 312,073
Change from 2005 to 2015	Cattle and Calves	\$ 309,822	\$ 57,412	1,662	\$ 15,375
	Hogs, Pigs, and Other	\$ 2,038	\$ 450	11	\$ 120
	Poultry and Eggs	\$ 314,076	\$ 63,659	1,679	\$ 17,048
	Dairy	\$ 385,309	\$ 82,622	2,373	\$ 22,126
	Total	\$ 1,011,245	\$ 204,143	5,725	\$ 54,669
RIMS II Multipliers	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)	
	Cattle and Calves	\$ 1.433	\$ 0.266	7.7	
	Hogs, Pigs, and Other	\$ 1.411	\$ 0.311	7.7	
	Poultry and Eggs	\$ 1.601	\$ 0.324	8.6	
	Dairy	\$ 1.636	\$ 0.351	10.1	
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.