

Economic Analysis of Animal Agriculture 2005-2015

NEW JERSEY

A Report for
United Soybean Board



September 2016



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New Jersey Executive Summary

The use of soybean meal as a key feed ingredient is a small part of New Jersey's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in the State of New Jersey. For example, in the State of New Jersey during 2015 animal agriculture contributed:

- \$199.5 million in economic output
- 1,198 jobs
- \$42.7 million in earnings
- \$11.1 million in income taxes paid at local, state, and federal levels
- \$55.3 million in the form of property taxes

New Jersey's animal agriculture consumed almost 16,900 tons of soybean meal in 2015. This soybean meal was fed primarily to:

- Companion Animals (6,600 tons)
- Turkeys (3,800 tons)
- Egg-Laying Hens (2,800 tons)

This report examines animal agriculture in New Jersey 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 Jersey, many opportunities and challenges will arise. It is expected that animal agriculture will continue to be a minor contributor to the economic well-being of the people of New Jersey and beyond.

New Jersey Economic Impact of Animal Agriculture

Animal agriculture is a small part of New Jersey’s economy. In 2015, New Jersey’s animal agriculture contributed the following to the economy:

- About \$199.5 million in economic output
- \$42.7 million in household earnings
- 1,198 jobs
- \$11.1 million in income taxes

During the last decade contractions in New Jersey’s animal agriculture has:

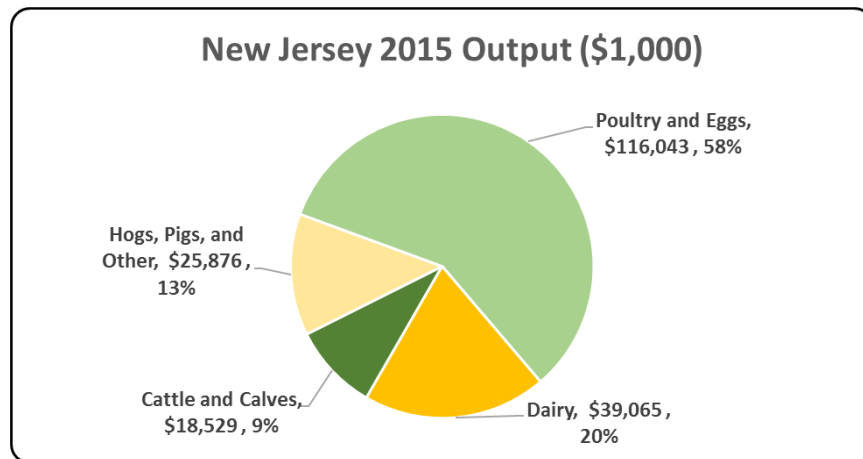
- Decreased economic output by \$30.2 million
- Reduced household earnings by \$6.4 million
- Shrunk by 146 jobs
- Paid \$1.7 million less in income taxes

Below is a table which demonstrates this decade of change.

Measure	2015	Change 2005-2015	% Change 2005-2015
Output (\$1,000)	\$ 199,512	\$ (30,222)	-13.16%
Earnings (\$1,000)	\$ 42,691	\$ (6,435)	-13.10%
Employment (Jobs)	1,198	(146)	-10.84%
Income Taxes Paid (\$1,000)	\$ 11,057	\$ (1,667)	-13.10%
Property Taxes Paid in 2012 (\$1,000)	\$ 55,277		

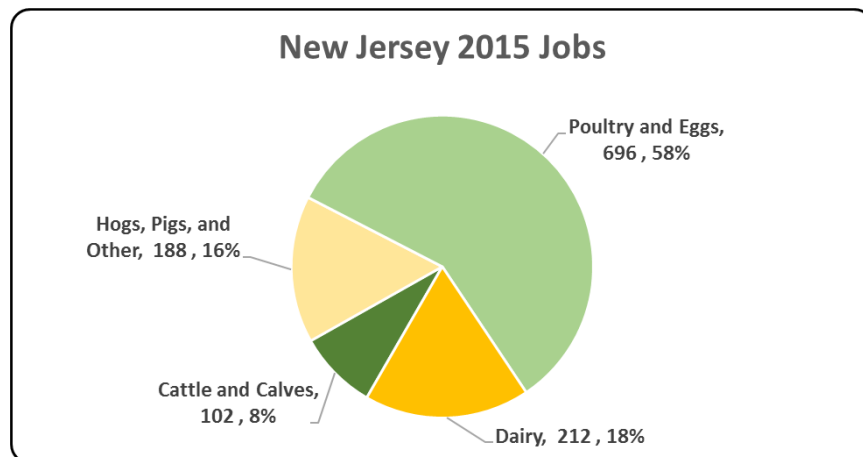
New Jersey Output

“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 Jersey economy. Animal agriculture’s impact on New Jersey total economic output is about \$199.5 million.



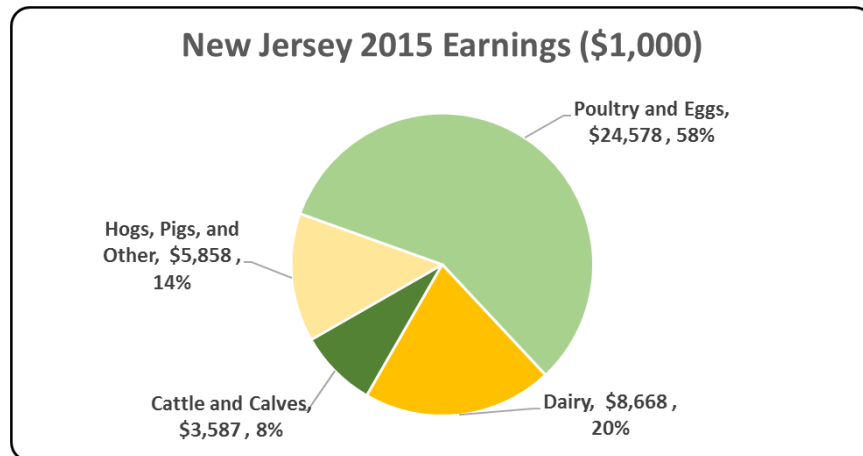
New Jersey Jobs

“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 Jersey in terms of animal agriculture jobs. As shown, animal agriculture contributes about 1,198 jobs within and outside of animal agriculture.



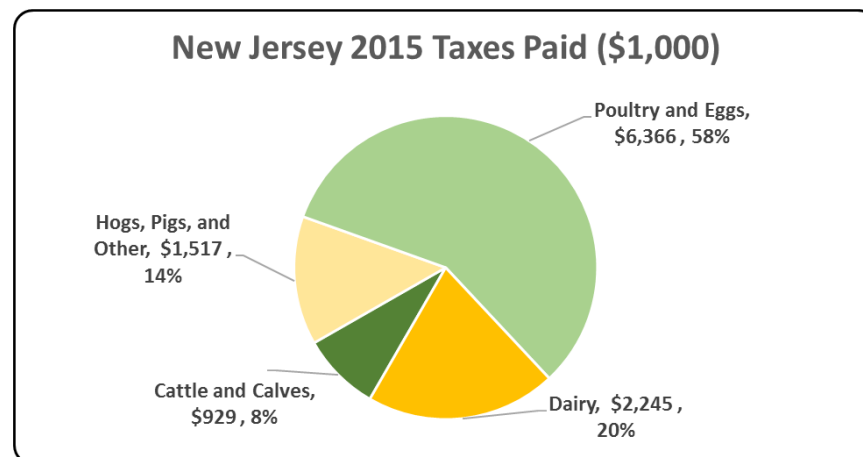
New Jersey Earnings

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 Jersey economy in terms of earnings. New Jersey’s animal agriculture contributed about \$42.7 million to household earnings in 2015.



New Jersey Taxes Paid by Animal Agriculture

New Jersey’s animal agriculture is also a source of tax revenue. In 2015, the state’s animal agriculture industry paid about \$11.1 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$55.3 million in property taxes paid by all of New Jersey agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



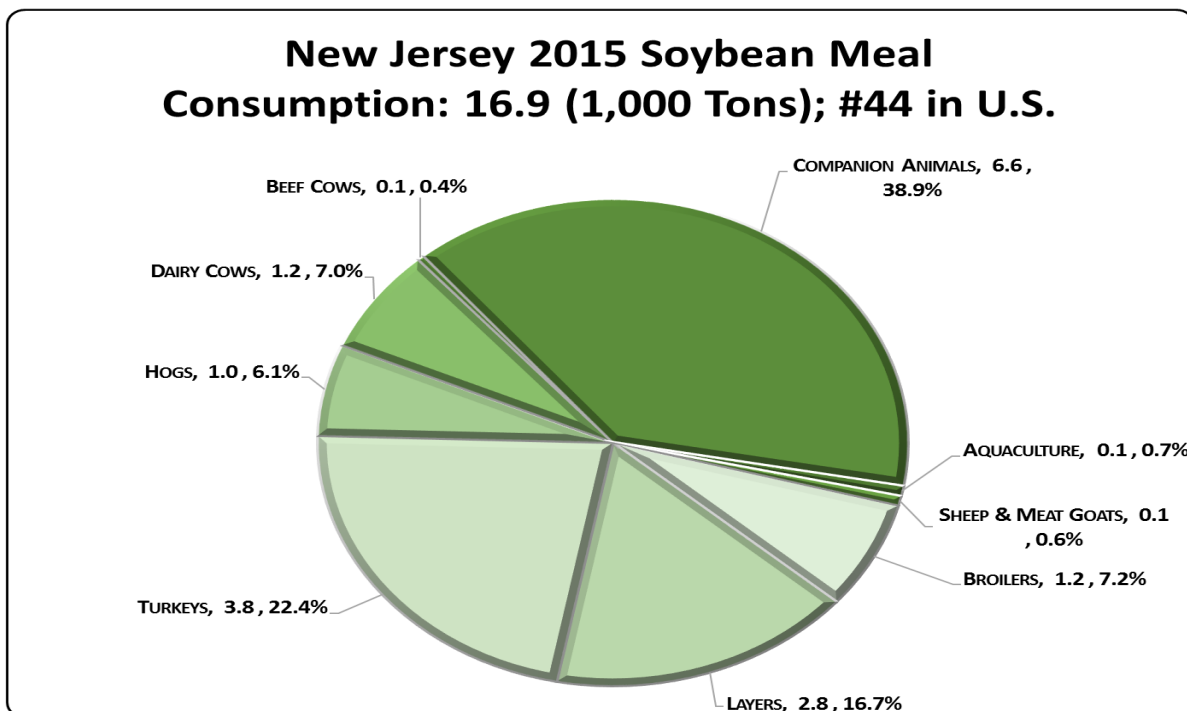
New Jersey Animal Agriculture Soybean Meal Consumption

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 Jersey’s animal agriculture consumed almost 16.9 thousand tons of soybean meal in 2015, placing the state as #44 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:

- Companion Animals (6.6 thousand tons)
- Turkeys (3.8 thousand tons)
- Egg-Laying Hens (2.8 thousand tons)

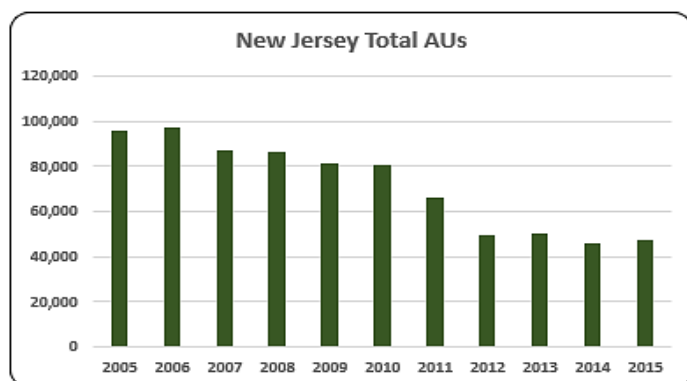
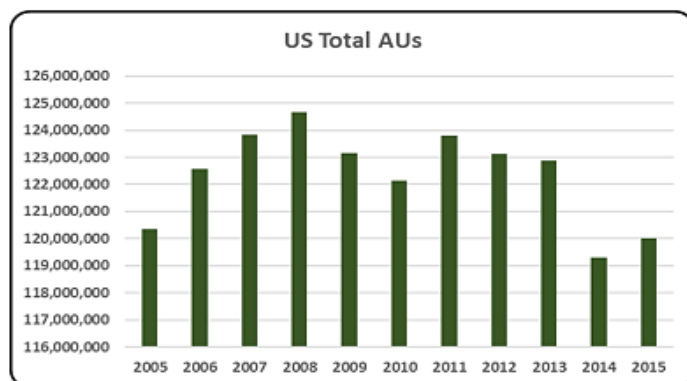


New Jersey Animal Unit (AU) Trends

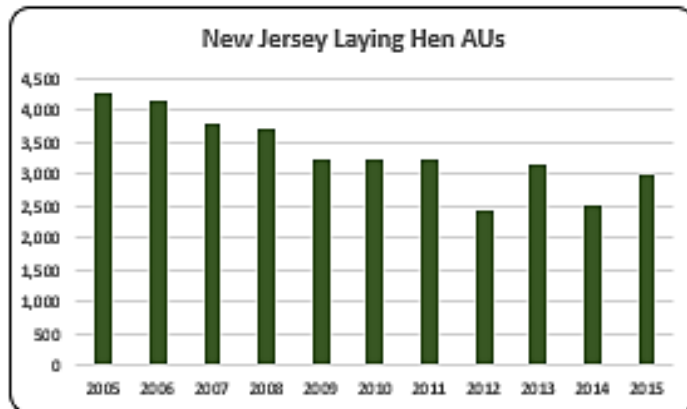
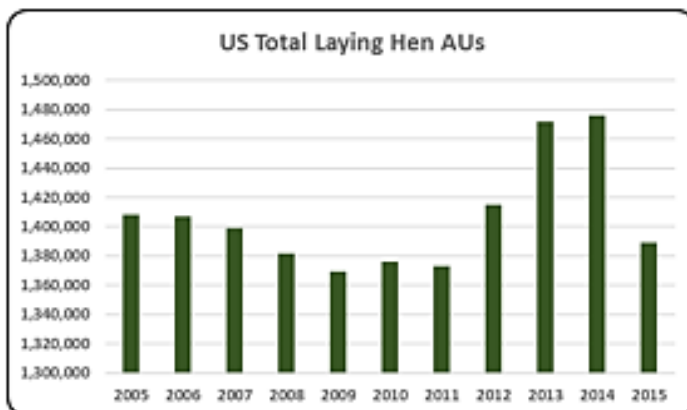
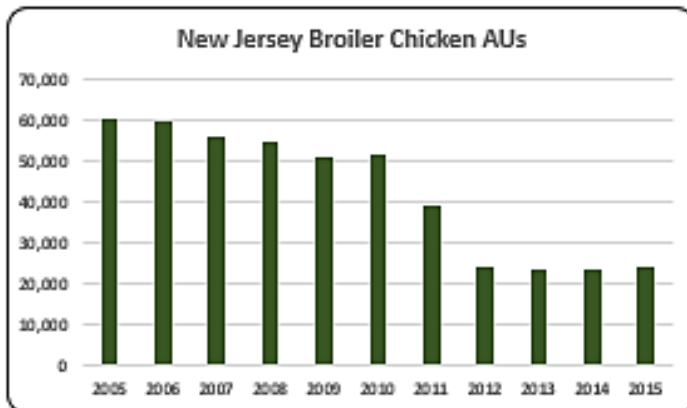
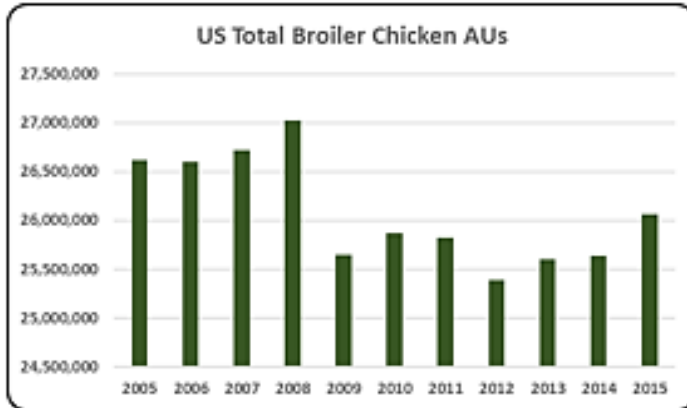
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of New Jersey. Due to this reality, using a single year as a measure of the presence and strength of a sector can 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 Jersey and to give perspective on New Jersey'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 Jersey, the largest three segments of animal agriculture in terms of AUs during 2015 were: Broilers (24,290 AUs), Dairy Cows (9,800 AUs), and Beef Cows (7,815 AUs). Total animal units in New Jersey during 2015 were 47,205 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.
- Only 0.04% (47,205) of all AUs in 2015 were in New Jersey and animal production declined 51% throughout the decade.

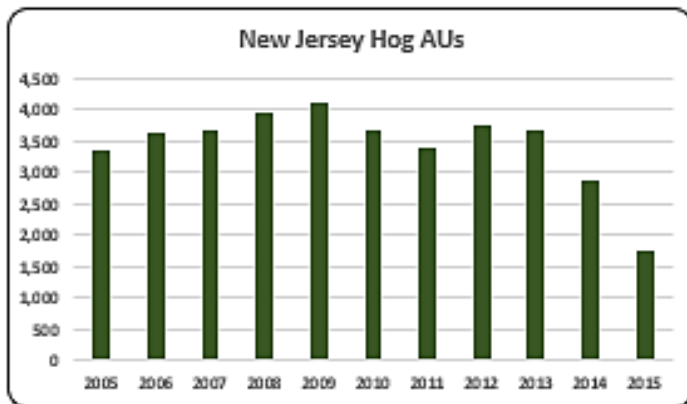
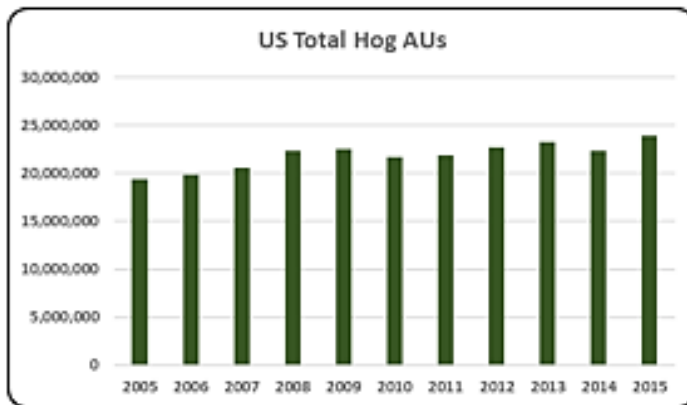
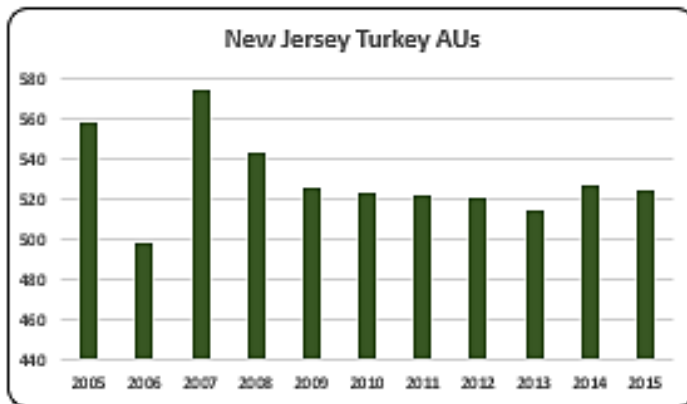
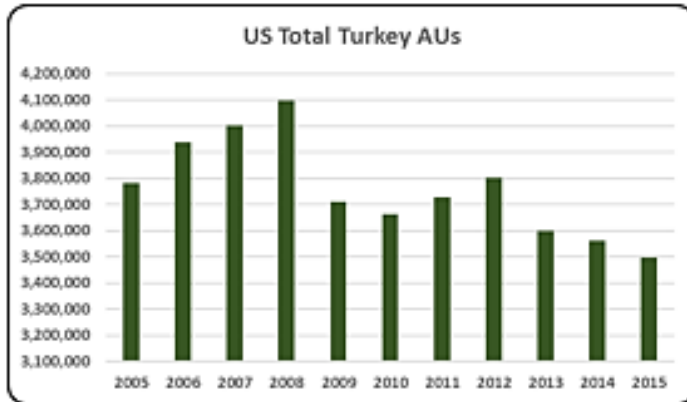


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2005 to 2015, broiler chicken AUs were about 26.0 million. In 2015, AUs rebounded 3% from the low AUs numbers in 2012 (25.4 million AUs).

- About 51.5% (24,290) of animal production in New Jersey in 2015 was broiler production. Broiler production substantially decreased (60%) 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.

- Layer production followed the same downward trend as broiler production during last decade from 4,278 layer AUs in 2005 to 3,005 layer AUs in 2015 for a 30% decline in the layer industry in New Jersey.

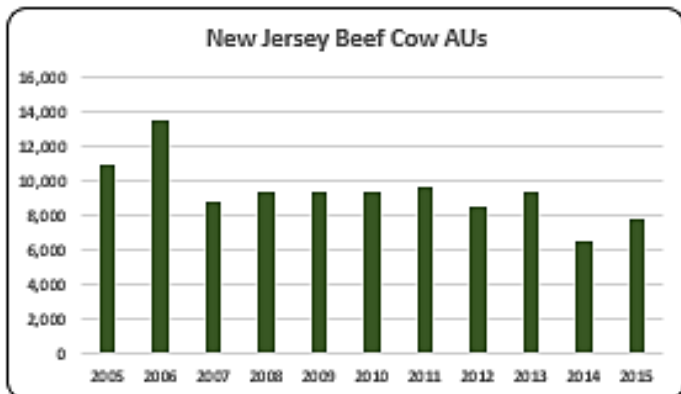
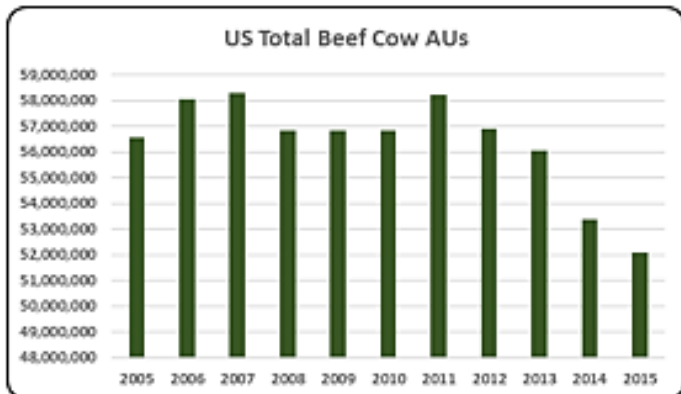
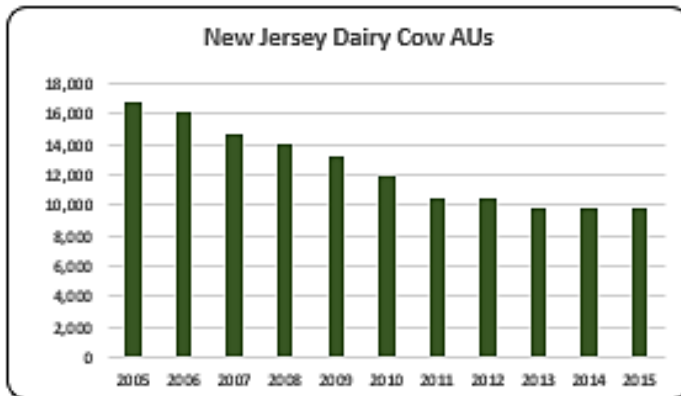
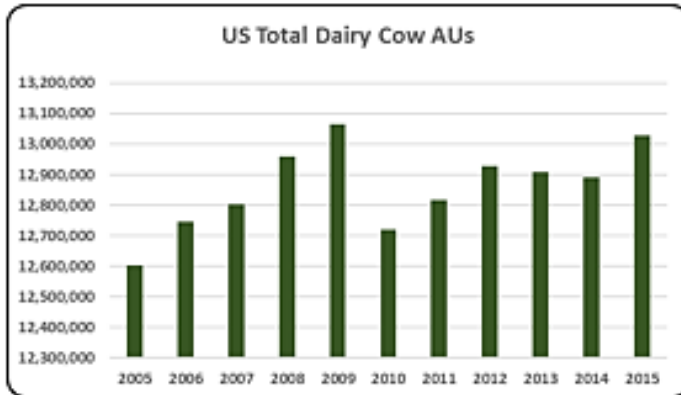


- In 2015 turkey AUs were the lowest of the decade at 3.5 million, decreasing 15% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade. The most recent contributor to this decline has been avian influenza.

- With only 525 turkey AUs in 2015 and an average of 530 turkey AUs from 2005 to 2015 turkey production is the smallest animal production in New Jersey.

- 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 in 2015 (1,770 hog AUs) represented about 3.7% of all animal production in the state. Hog production in 2015 decreased 43% compared to the record high level in 2009 (4,095 hog AUs).



- 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.
- Dairy cow production in New Jersey consistently decreased from 2005 to 2015, from 16,800 dairy cow AUs in 2005 to 9,800 dairy cow AUs in 2015.
- 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.
- Although beef cow production is the third largest animal production in New Jersey, production declined 29% since 2005. Beef cow AUs were 7,815 in 2015.

New Jersey Additional Information and Methodology

Animal agriculture is a small part of New Jersey'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 Jersey, of interest is the degree to which the industry impacts the New Jersey economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for New Jersey 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 Jersey'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 Jersey which have occurred. As shown in this state report, New Jersey 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 Jersey. 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 Jersey 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 Jersey'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 Jersey, \$1.48 to \$1.75 million in total economic activity, \$0.30 to \$0.39 in household wages and 9 to 11 additional jobs are generated in the economy at large.

	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	\$ 1.551	\$ 0.300	8.5
	Hogs, Pigs, and Other	\$ 1.481	\$ 0.335	10.8
	Poultry and Eggs	\$ 1.654	\$ 0.350	9.9
	Dairy	\$ 1.748	\$ 0.388	9.5

Appendix

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Animal Units (AUs)	Beef Cattle AUs	10,950	13,470	8,730	9,300	9,300	9,300	9,570	8,460	9,405	6,495	7,815
	Hog and Pig AUs	3,360	3,615	3,675	3,960	4,095	3,675	3,405	3,765	3,675	2,880	1,770
	Broiler AUs	60,248	59,841	55,752	54,882	51,028	51,714	38,967	23,898	23,814	23,679	24,290
	Turkey AUs	558	498	574	543	526	524	521	520	514	527	525
	Egg Layer AUs	4,278	4,129	3,806	3,697	3,234	3,213	3,231	2,421	3,134	2,497	3,005
	Dairy AUs	16,800	16,100	14,700	14,000	13,300	11,900	10,500	10,500	9,800	9,800	9,800
	Total Animal Units	96,194	97,652	87,237	86,383	81,483	80,325	66,195	49,563	50,342	45,879	47,205
Value of Production (\$1,000)	Cattle and Calves (\$1,000)	\$ 8,201	\$ 7,923	\$ 6,116	\$ 5,717	\$ 5,014	\$ 5,178	\$ 7,859	\$ 8,734	\$ 7,340	\$ 10,460	\$ 11,948
	Hogs and Pigs (\$1,000)	\$ 227	\$ 412	\$ 415	\$ 376	\$ 426	\$ 554	\$ 716	\$ 581	\$ 372	\$ 262	\$ 486
	Broilers (\$1,000)	\$ 50,628	\$ 39,221	\$ 43,026	\$ 43,957	\$ 37,926	\$ 39,633	\$ 34,699	\$ 23,812	\$ 29,014	\$ 30,438	\$ 26,555
	Turkeys (\$1,000)	\$ 671	\$ 834	\$ 1,236	\$ 1,498	\$ 1,693	\$ 1,980	\$ 2,257	\$ 2,533	\$ 2,765	\$ 3,201	\$ 3,485
	Eggs (\$1,000)	\$ 20,206	\$ 20,267	\$ 33,373	\$ 14,979	\$ 10,661	\$ 11,703	\$ 12,831	\$ 14,390	\$ 16,258	\$ 26,024	\$ 40,123
	Milk (\$1,000)	\$ 29,760	\$ 23,852	\$ 32,928	\$ 31,265	\$ 20,224	\$ 23,520	\$ 28,215	\$ 24,570	\$ 26,162	\$ 31,623	\$ 22,352
	Other	\$ 3,714	\$ 4,979	\$ 6,244	\$ 7,509	\$ 8,775	\$ 10,040	\$ 11,305	\$ 12,570	\$ 13,835	\$ 15,100	\$ 16,365
	Sheep and Lambs (\$1,000)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Aquaculture (\$1,000)	\$ 3,714	\$ 4,979	\$ 6,244	\$ 7,509	\$ 8,775	\$ 10,040	\$ 11,305	\$ 12,570	\$ 13,835	\$ 15,100	\$ 16,365
	Total (\$1,000)	\$ 113,408	\$ 97,488	\$ 123,339	\$ 105,302	\$ 84,718	\$ 92,607	\$ 97,882	\$ 87,190	\$ 95,746	\$ 117,109	\$ 121,315

Ag Census Data Category	Animal Type	1997	2002	2007	2012	
Number of Farms by NAICS	Beef cattle ranching and farming (112111)	620	657	704	701	
	Cattle feedlots (112112)	202	214	75	9	
	Dairy cattle and milk production (11212)	207	129	123	76	
	Hog and pig farming (1122)	118	133	95	60	
	Poultry and egg production (1123)	188	283	405	455	
	Sheep and goat farming (1124)	318	503	669	630	
	Animal aquaculture and other animal production (1125,1129)	1,180	1,831	1,962	1,611	
Value of Sales (\$1,000)	Cattle and Calves	9,194	7,094	9,559	8,829	
	Hogs and Pigs	4,475	2,313	2,349	1,682	
	Poultry and Eggs	35,856	26,041	33,044	40,081	
	Milk and Other Dairy Products	37,891	29,154	34,091	26,119	
	Aquaculture	n/a	2,223	6,637	12,396	
	Other (calculated)	withheld	25,553	49,553	10,048	
	Total		87,416	92,378	135,233	99,155
Input Purchases	Livestock and poultry purchased	(Farms)	1,671	1,819	1,768	1,876
		\$1,000	10,339	8,265	11,977	14,758
	Breeding livestock purchased	(Farms)	n/a	562	572	621
		\$1,000	n/a	1,971	4,681	4,087
	Other livestock and poultry purchased	(Farms)	n/a	1,397	1,380	1,473
		\$1,000	n/a	6,294	7,296	10,671
	Feed purchased	(Farms)	3,290	4,654	4,669	4,683
	\$1,000	38,309	31,277	41,361	54,047	

	Animal Type	Output (\$1,000)	Earnings (\$1,000)	Employment (Jobs)	Taxes Paid (\$1,000)
2015 Animal Agriculture	Cattle and Calves	\$ 18,529	\$ 3,587	102	\$ 929
	Hogs, Pigs, and Other	\$ 25,876	\$ 5,858	188	\$ 1,517
	Poultry and Eggs	\$ 116,043	\$ 24,578	696	\$ 6,366
	Dairy	\$ 39,065	\$ 8,668	212	\$ 2,245
	Total	\$ 199,512	\$ 42,691	1,198	\$ 11,057
Change from 2005 to 2015	Cattle and Calves	\$ 3,094	\$ 599	17	\$ 155
	Hogs, Pigs, and Other	\$ 18,222	\$ 4,125	133	\$ 1,068
	Poultry and Eggs	\$ (27,482)	\$ (5,821)	(165)	\$ (1,508)
	Dairy	\$ (24,057)	\$ (5,338)	(131)	\$ (1,383)
	Total	\$ (30,222)	\$ (6,435)	(146)	\$ (1,667)
RIMS II Multipliers	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)	
	Cattle and Calves	\$ 1.551	\$ 0.300	8.5	
	Hogs, Pigs, and Other	\$ 1.481	\$ 0.335	10.8	
	Poultry and Eggs	\$ 1.654	\$ 0.350	9.9	
	Dairy	\$ 1.748	\$ 0.388	9.5	
Tax Rates	Federal effective income tax rate			12.7%	
	Federal Social Security tax rate			7.7%	
	State Effective Rate			5.5%	
	Total			25.9%	

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.