

Economic Analysis of Animal Agriculture 2005-2015

GEORGIA

**A Report for
United Soybean Board**



September 2016



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Georgia Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Georgia's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in the State of Georgia. The success of Georgia animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the State of Georgia during 2015 animal agriculture contributed:

- \$15.8 billion in economic output
- 71,134 jobs
- \$3.5 billion in earnings
- \$921.4 million in income taxes paid at local, state, and federal levels
- \$131.7 million in the form of property taxes

Plus, from 2005-2015 animal agriculture in Georgia has increased economic output by over \$3.4 billion, boosted household earnings by \$757.0 million, contributed 15,398 additional jobs and paid \$199.3 million in additional tax revenues.

Georgia's animal agriculture consumed almost 2.0 million tons of soybean meal in 2015. This soybean meal was fed primarily to:

- Broilers (1.9 million tons)
- Egg-Laying Hens (80.0 thousand tons)
- Hogs (31.3 thousand tons)

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

Georgia Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Georgia's economy. In 2015, Georgia's animal agriculture contributed the following to the economy:

- About \$15.8 billion in economic output
- \$3.5 billion in household earnings
- 71,134 jobs
- \$921.4 million in income taxes

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

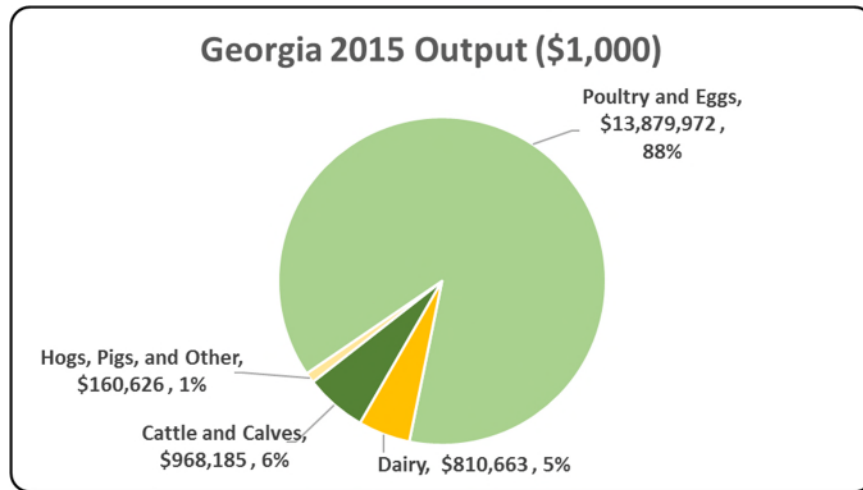
- Increased economic output by \$3.4 billion
- Boosted household earnings by \$757.0 million
- Added 15,398 jobs
- Paid an additional \$199.3 million in income taxes

Below is a table which demonstrates this decade of change.

Measure	2015	Change 2005-2015	% Change 2005-2015
Output (\$1,000)	\$ 15,819,447	\$ 3,426,845	27.65%
Earnings (\$1,000)	\$ 3,499,528	\$ 756,960	27.60%
Employment (Jobs)	71,134	15,398	27.63%
Income Taxes Paid (\$1,000)	\$ 921,426	\$ 199,308	27.60%
Property Taxes Paid in 2012 (\$1,000)	\$ 131,712		

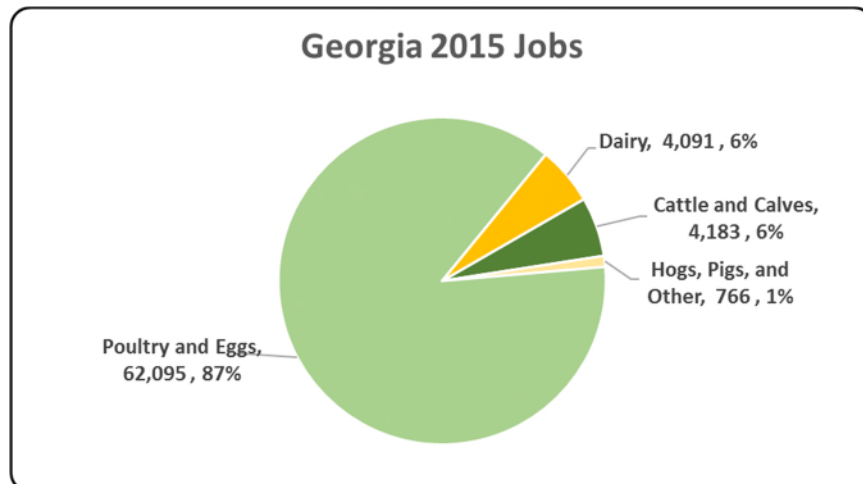
Georgia Output

“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 Georgia economy. Animal agriculture’s impact on Georgia total economic output is about \$15.8 billion.



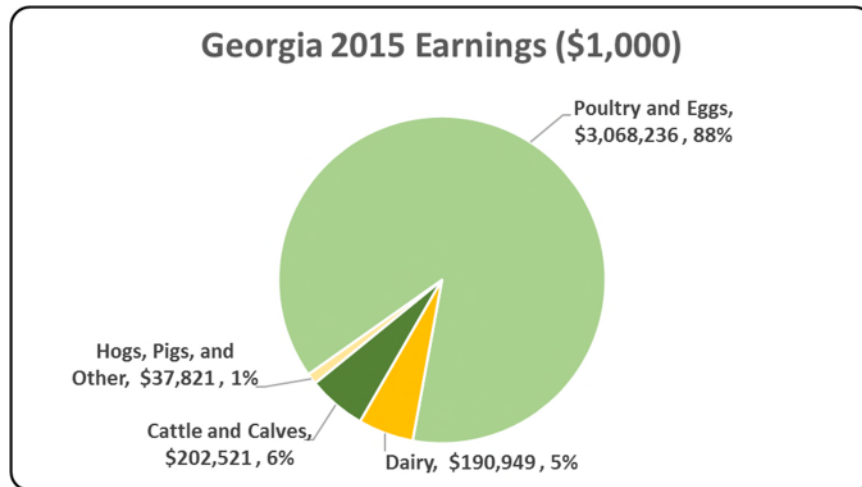
Georgia Jobs

“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 Georgia in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Georgia total jobs, contributing 71,134 jobs within and outside of animal agriculture.



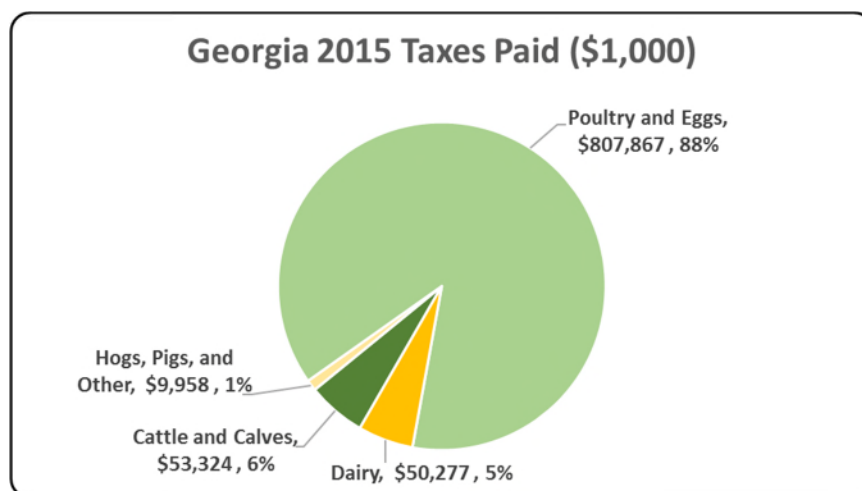
Georgia Earnings

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 Georgia economy in terms of earnings. Georgia's animal agriculture contributed about \$3.5 billion to household earnings in 2015.



Georgia Taxes Paid by Animal Agriculture

Georgia's animal agriculture is also a significant source of tax revenue. In 2015, the state's animal agriculture industry paid about \$921.4 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$131.7 million in property taxes paid by all of Georgia agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



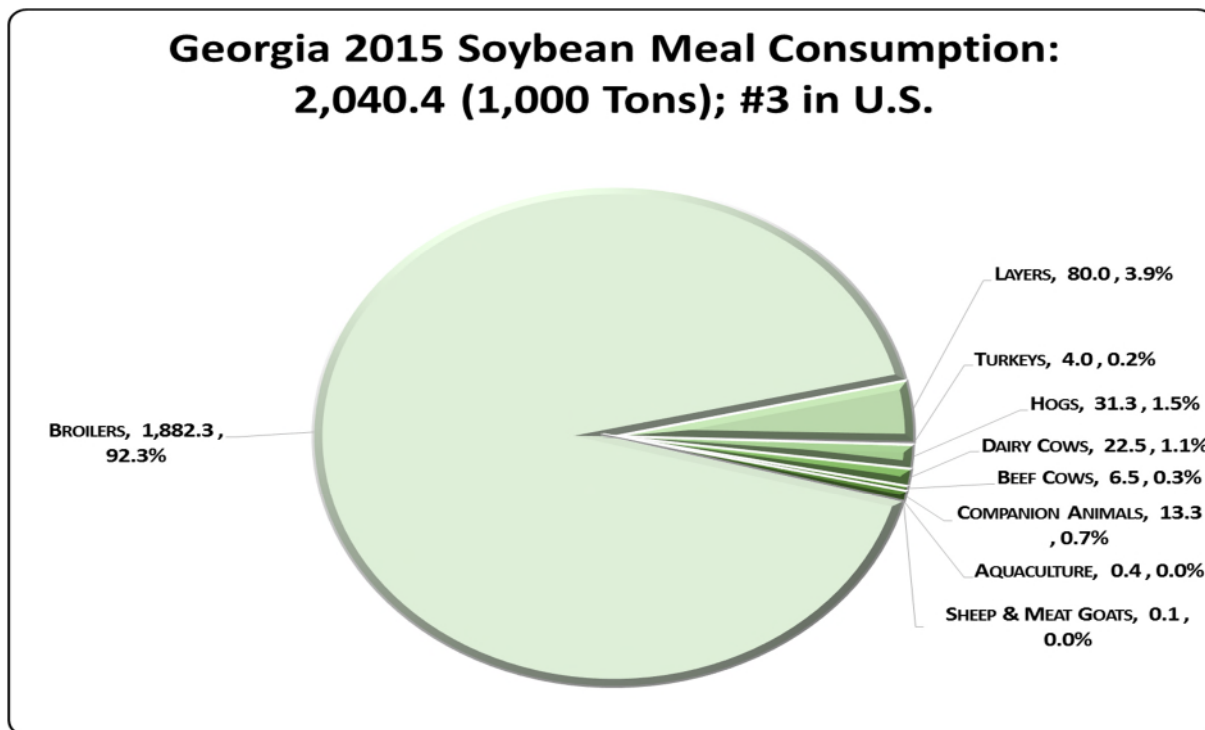
Georgia Animal Agriculture Soybean Meal Consumption

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.

Georgia's animal agriculture consumed almost 2.0 million tons of soybean meal in 2015, placing the state as #3 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:

- Broilers (1.9 million tons)
- Egg-Laying Hens (80.0 thousand tons)
- Hogs (31.3 thousand tons)

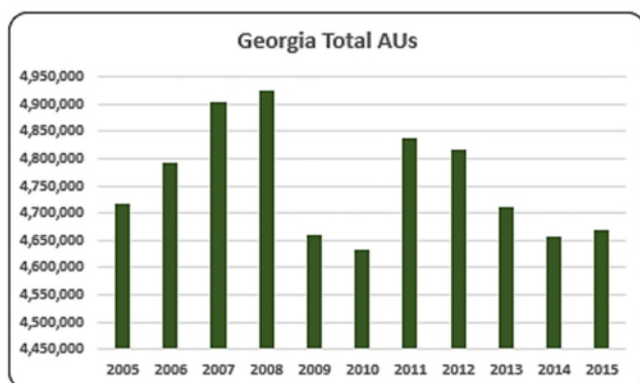
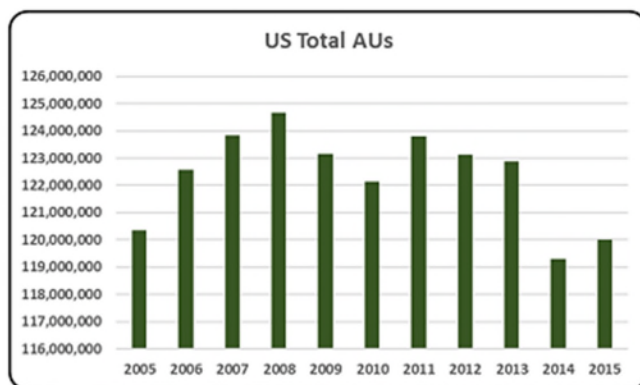


Georgia Animal Unit (AU) Trends

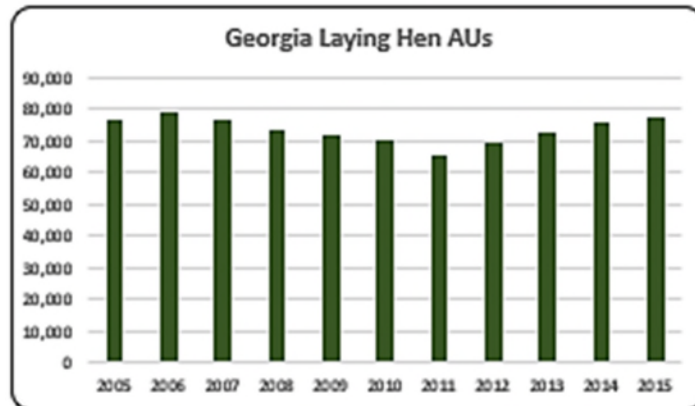
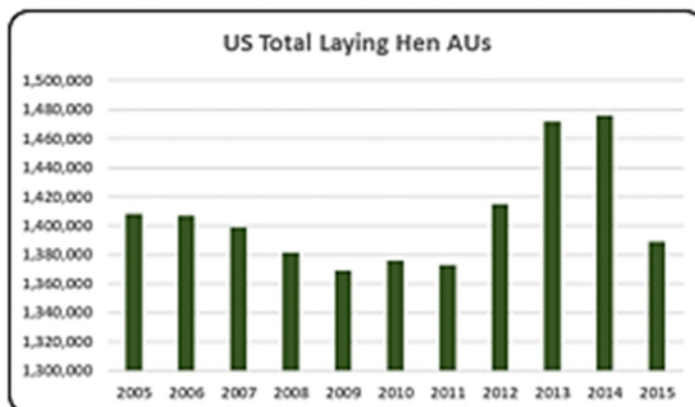
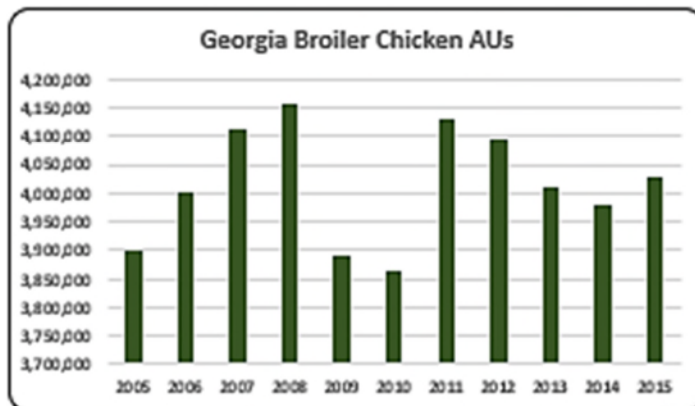
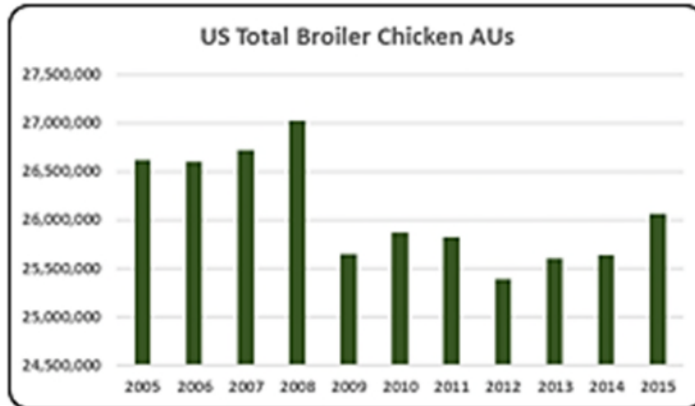
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Georgia. Due to this reality, using a single year as a measure of the presence and strength of a sector can be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

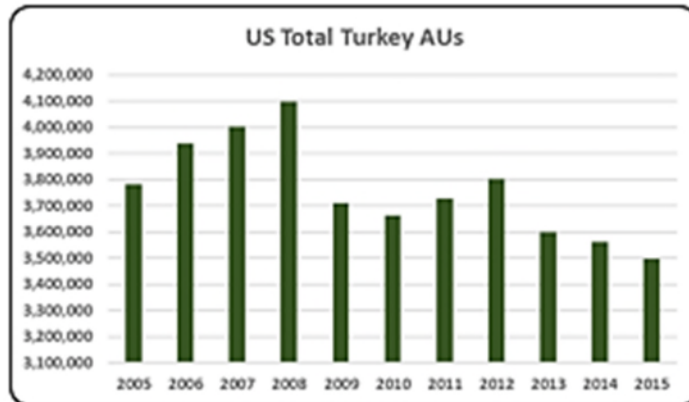
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Georgia, the largest three segments of animal agriculture in terms of AUs during 2015 were: Broilers (4.0 million AUs), Beef Cows (342,600 AUs), and Dairy Cows (113,400 AUs). Total animal units in Georgia during 2015 were 4.67 million AUs.



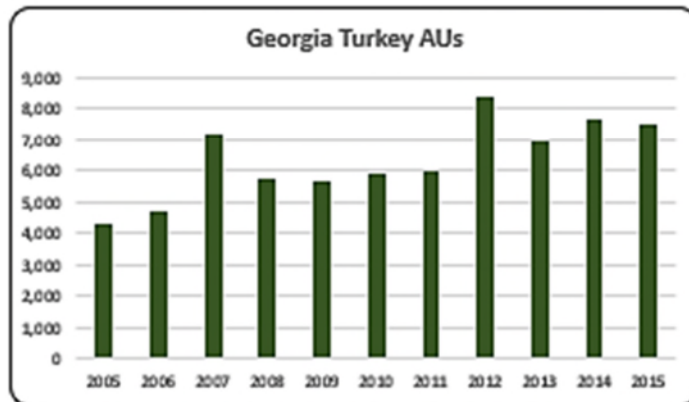
- Overall U.S. total AUs have varied from 2005 to 2015. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2005-15 time period, total AUs in the nation peaked in 2008.
- 2015 total AUs in Georgia were 4.67 million comprising about 3.9% of all AUs in the U.S. As a number one broiler producer in the country, Georgia's 2015 broiler AUs represented 15.5% of the U.S. total.



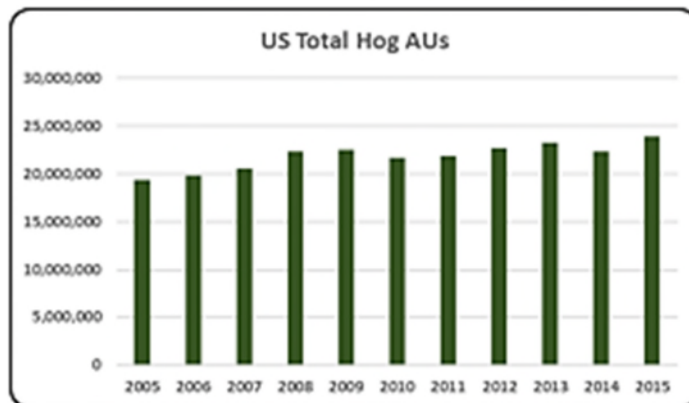
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2005 to 2015, broiler chicken AUs were about 26.0 million. In 2015, AUs rebounded 3% from the low AUs numbers in 2012 (25.4 million AUs).
- In 2015, broiler AUs accounted for about 86.2% (4.0 million) of all AUs in Georgia. Broiler AUs started to decline in 2009 but recovered in 2011 then declined for several years until 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 AUs have climbed since 2011, and in 2015 layer AUs increased to 77,504 relative to the previous year.



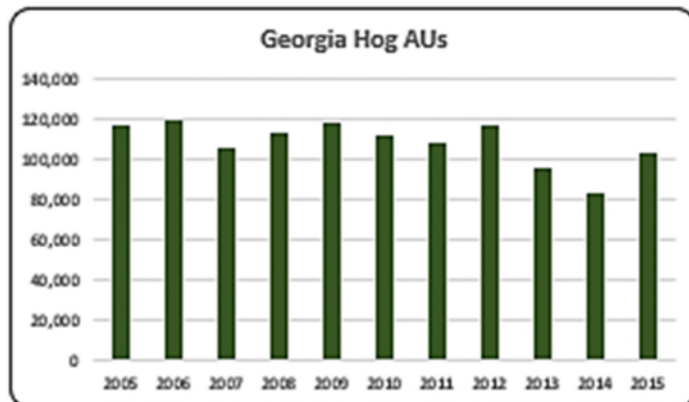
- In 2015 turkey AUs were the lowest of the decade at 3.5 million, decreasing 15% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade. The most recent contributor to this decline has been avian influenza.



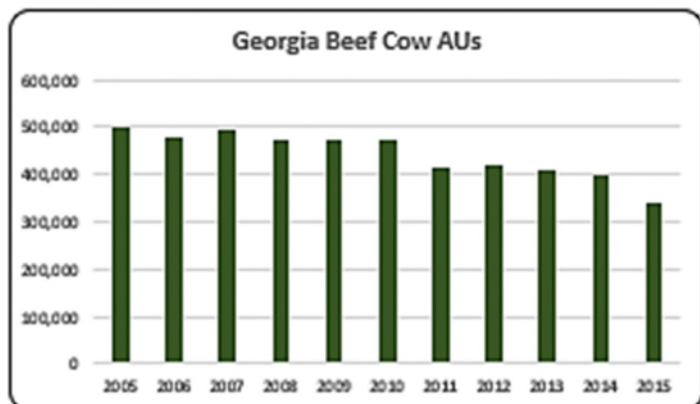
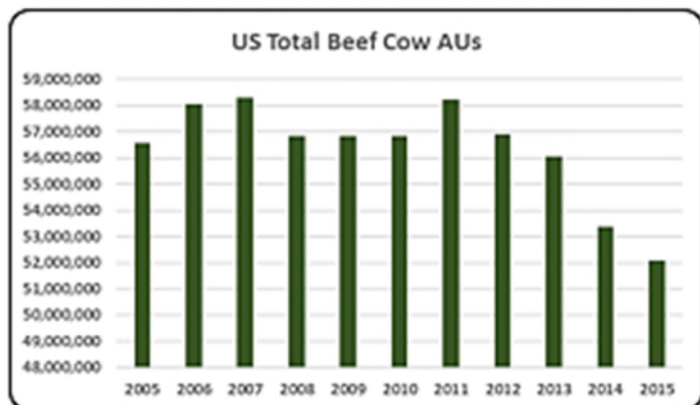
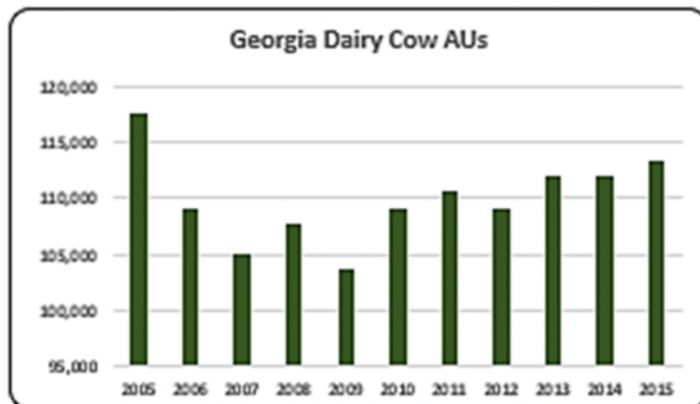
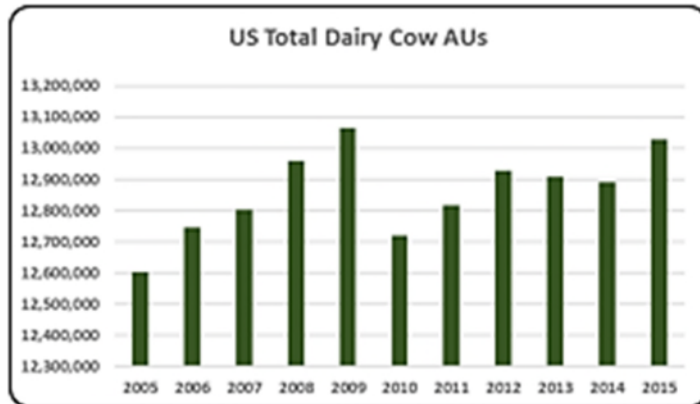
- Georgia’s turkey industry is the smallest of all animal sectors reporting in at 7,521 of all AUs in the state in 2015.



- 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 AUs have varied over the years, numbers declined in 2013 (95,175) and 2014 (82,500) but increased again in 2015 (102,450).



- 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 AUs in Georgia were the highest during 2005 (117,600), but since then have ranged from 103,600 in 2009 to 113,400 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.
- Even though beef is the second most important animal sector in the state, there has been a downward trend with a 32% reduction in the number beef cow AUs from 2005 to 2015.

Georgia Additional Information and Methodology

Animal agriculture is an important part of Georgia'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 Georgia, of interest is the degree to which the industry impacts the Georgia economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Georgia 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 Georgia'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 Georgia which have occurred. As shown in this state report, Georgia 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 Georgia. 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.

Georgia 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 Georgia’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 Georgia, \$1.69 to \$2.76 million in total economic activity, \$0.38 to \$0.61 in household wages and 8 to 12 additional jobs are generated in the economy at large.

	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	\$ 1.824	\$ 0.382	7.9
	Hogs, Pigs, and Other	\$ 1.692	\$ 0.398	8.1
	Poultry and Eggs	\$ 2.760	\$ 0.610	12.3
	Dairy	\$ 2.256	\$ 0.531	11.4

Appendix

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Animal Units (AUs)	Beef Cattle AUs	501,450	478,050	496,500	470,700	470,700	470,700	417,000	420,300	411,600	398,100	342,600
	Hog and Pig AUs	116,925	119,475	105,450	112,545	117,300	111,900	107,700	116,700	95,175	82,500	102,450
	Broiler AUs	3,901,167	4,002,665	4,113,958	4,155,154	3,889,866	3,865,378	4,131,825	4,092,980	4,011,338	3,979,927	4,026,271
	Turkey AUs	4,340	4,716	7,207	5,760	5,642	5,877	5,982	8,347	6,963	7,686	7,521
	Egg Layer AUs	76,324	79,164	76,736	73,504	71,520	70,012	65,080	69,613	72,327	76,015	77,504
	Dairy AUs	117,600	109,200	105,000	107,800	103,600	109,200	110,600	109,200	112,000	112,000	113,400
	Total Animal Units	4,717,806	4,793,270	4,904,850	4,925,464	4,658,629	4,633,067	4,838,187	4,817,140	4,709,402	4,656,228	4,669,746
Value of Production (\$1,000)	Cattle and Calves (\$1,000)	\$ 315,397	\$ 282,376	\$ 261,954	\$ 253,379	\$ 249,687	\$ 272,727	\$ 336,853	\$ 382,348	\$ 382,907	\$ 528,610	\$ 530,716
	Hogs and Pigs (\$1,000)	\$ 78,254	\$ 60,835	\$ 52,744	\$ 52,730	\$ 45,534	\$ 43,517	\$ 58,427	\$ 64,807	\$ 55,922	\$ 54,824	\$ 54,533
	Broilers (\$1,000)	\$ 2,903,532	\$ 2,543,688	\$ 3,187,848	\$ 3,435,648	\$ 3,141,601	\$ 3,317,461	\$ 3,408,580	\$ 3,812,750	\$ 4,617,570	\$ 4,808,012	\$ 4,252,137
	Turkeys (\$1,000)	\$ 4,123	\$ 4,874	\$ 8,197	\$ 7,074	\$ 6,443	\$ 8,107	\$ 9,017	\$ 13,670	\$ 10,824	\$ 12,248	\$ 13,042
	Eggs (\$1,000)	\$ 347,680	\$ 368,736	\$ 437,491	\$ 564,244	\$ 468,599	\$ 442,065	\$ 488,812	\$ 532,576	\$ 585,797	\$ 666,920	\$ 763,068
	Milk (\$1,000)	\$ 223,680	\$ 202,176	\$ 283,997	\$ 283,195	\$ 204,400	\$ 256,680	\$ 319,000	\$ 304,669	\$ 338,688	\$ 446,424	\$ 359,400
	Other	\$ 7,502	\$ 10,750	\$ 13,998	\$ 17,245	\$ 20,493	\$ 23,741	\$ 26,989	\$ 30,236	\$ 33,484	\$ 36,732	\$ 39,980
	Sheep and Lambs (\$1,000)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Aquaculture (\$1,000)	\$ 7,502	\$ 10,750	\$ 13,998	\$ 17,245	\$ 20,493	\$ 23,741	\$ 26,989	\$ 30,236	\$ 33,484	\$ 36,732	\$ 39,980
	Total (\$1,000)	\$ 3,880,168	\$ 3,473,435	\$ 4,246,228	\$ 4,613,515	\$ 4,136,757	\$ 4,364,298	\$ 4,647,678	\$ 5,141,056	\$ 6,025,192	\$ 6,553,769	\$ 6,012,875

Ag Census Data Category	Animal Type	1997	2002	2007	2012	
Number of Farms by NAICS	Beef cattle ranching and farming (112111)	15,967	18,799	15,796	12,858	
	Cattle feedlots (112112)	399	317	313	-	
	Dairy cattle and milk production (11212)	569	527	487	232	
	Hog and pig farming (1122)	760	493	384	247	
	Poultry and egg production (1123)	3,257	3,632	3,860	4,158	
	Sheep and goat farming (1124)	424	1,010	1,544	1,912	
	Animal aquaculture and other animal production (1125,1129)	2,364	6,197	6,301	4,027	
Value of Sales (\$1,000)	Cattle and Calves	234,379	240,070	342,392	403,172	
	Hogs and Pigs	109,855	65,384	68,369	56,386	
	Poultry and Eggs	2,602,734	2,780,214	4,246,765	4,773,837	
	Milk and Other Dairy Products	214,060	212,720	264,423	299,548	
	Aquaculture	2,943	5,310	14,075	26,858	
	Other (calculated)	23,301	28,458	34,572	16,560	
	Total	3,187,272	3,332,156	4,970,596	5,576,361	
Input Purchases	Livestock and poultry purchased	(Farms)	10,408	12,342	10,114	10,995
		\$1,000	396,933	372,108	871,341	927,465
	Breeding livestock purchased	(Farms)	<i>n/a</i>	3,460	4,907	5,728
		\$1,000	<i>n/a</i>	27,615	43,265	99,642
	Other livestock and poultry purchased	(Farms)	<i>n/a</i>	7,172	6,399	6,714
		\$1,000	<i>n/a</i>	344,493	828,076	827,823
	Feed purchased	(Farms)	21,119	32,119	26,287	26,118
	\$1,000	1,427,778	1,365,162	2,121,379	2,913,851	

	Animal Type	Output (\$1,000)	Earnings (\$1,000)	Employment (Jobs)	Taxes Paid (\$1,000)
2015 Animal Agriculture	Cattle and Calves	\$ 968,185	\$ 202,521	4,183	\$ 53,324
	Hogs, Pigs, and Other	\$ 160,626	\$ 37,821	766	\$ 9,958
	Poultry and Eggs	\$ 13,879,972	\$ 3,068,236	62,095	\$ 807,867
	Dairy	\$ 810,663	\$ 190,949	4,091	\$ 50,277
	Total	\$ 15,819,447	\$ 3,499,528	71,134	\$ 921,426
Change from 2005 to 2015	Cattle and Calves	\$ 269,903	\$ 56,457	1,166	\$ 14,865
	Hogs, Pigs, and Other	\$ (15,907)	\$ (3,745)	(76)	\$ (986)
	Poultry and Eggs	\$ 2,974,490	\$ 657,526	13,307	\$ 173,126
	Dairy	\$ 198,359	\$ 46,723	1,001	\$ 12,302
	Total	\$ 3,426,845	\$ 756,960	15,398	\$ 199,308
RIMS II Multipliers	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)	
	Cattle and Calves	\$ 1.824	\$ 0.382	7.9	
	Hogs, Pigs, and Other	\$ 1.692	\$ 0.398	8.1	
	Poultry and Eggs	\$ 2.760	\$ 0.610	12.3	
	Dairy	\$ 2.256	\$ 0.531	11.4	
Tax Rates	Federal effective income tax rate				12.7%
	Federal Social Security tax rate				7.7%
	State Effective Rate				6.0%
	Total				26.3%

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.