

# Economic Analysis of Animal Agriculture 2004-2014

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## *SOUTH CAROLINA*

**A Report for  
United Soybean Board**



**September 2015**



Bridging Your Research Needs.

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## South Carolina Executive Summary

The use of soybean meal as a key feed ingredient is an important part of South Carolina'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 South Carolina. The success of South Carolina animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of South Carolina during 2014 animal agriculture contributed:

- \$3.1 billion in economic output
- 20,354 jobs
- \$538.6 million in earnings
- \$147.2 million in income taxes paid at local, state, and federal levels
- \$43.3 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in South Carolina increased economic output by over \$479.4 million, boosted household earnings by \$82.4 million, contributed 3,009 additional jobs and paid \$22.5 million in additional tax revenues.

South Carolina's animal agriculture consumed about 334.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (271.4 thousand tons)
- Egg-Laying Hens (22.4 thousand tons)
- Hogs (16.2 thousand tons)

This report examines animal agriculture in South Carolina 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 South Carolina, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of South Carolina and beyond.

## South Carolina Economic Impact of Animal Agriculture

Animal agriculture is an integral part of South Carolina's economy. In 2014, South Carolina's animal agriculture contributed the following to the economy:

- About \$3.1 billion in economic output
- \$538.6 million in household earnings
- 20,354 jobs
- \$147.2 million in income taxes

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

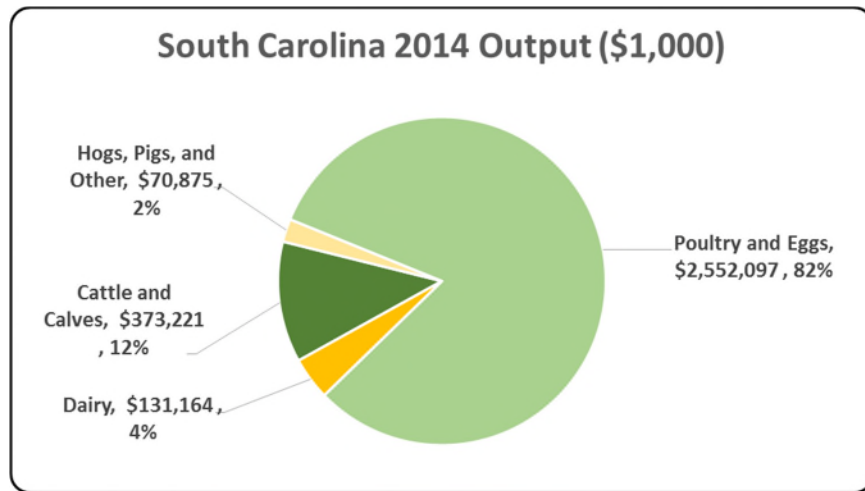
- Increased economic output by \$479.4 million
- Boosted household earnings by \$82.4 million
- Added 3,009 jobs
- Paid an additional \$22.5 million in income taxes

Below is a table which demonstrates this decade of change.

Measure	2014	Change 2004-2014	% Change 2004-2014
Output (\$1,000)	\$ 3,127,358	\$ 479,358	18.10%
Earnings (\$1,000)	\$ 538,607	\$ 82,408	18.06%
Employment (Jobs)	20,354	3,009	17.35%
Income Taxes Paid (\$1,000)	\$ 147,201	\$ 22,522	18.06%
Property Taxes Paid in 2012 (\$1,000)	\$ 43,314		

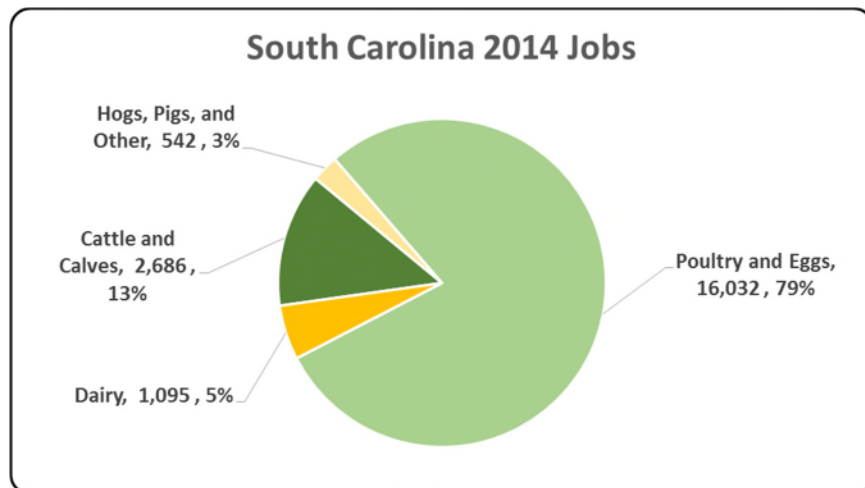
### South Carolina Output

“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 South Carolina economy. Animal agriculture’s impact on South Carolina total economic output is about \$3.1 billion.



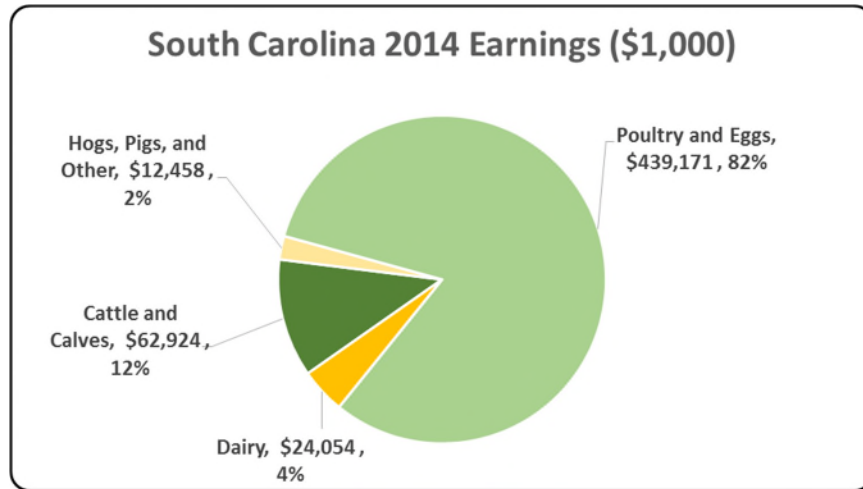
### South Carolina Jobs

“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 South Carolina in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to South Carolina total jobs, contributing 20,354 jobs within and outside of animal agriculture.



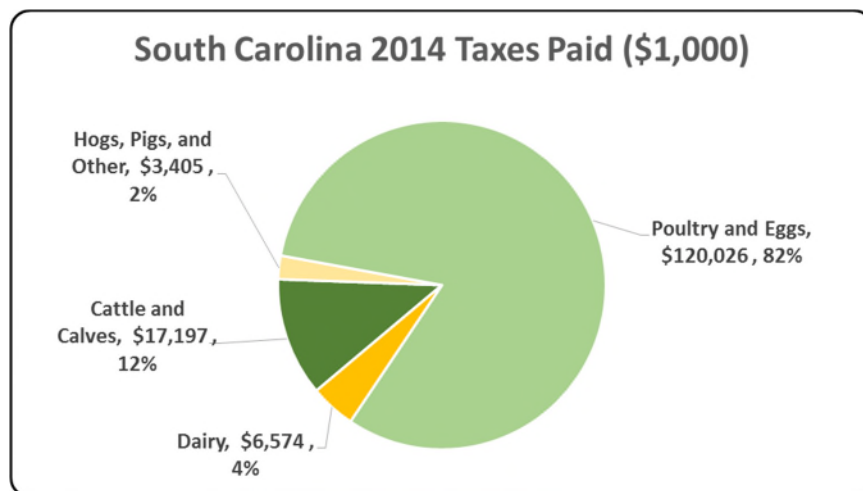
### South Carolina Earnings

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 South Carolina economy in terms of earnings. South Carolina's animal agriculture contributed about \$538.6 million to household earnings in 2014.



### South Carolina Taxes Paid by Animal Agriculture

South Carolina's animal agriculture is also a significant source of tax revenue. In 2014, the state's animal agriculture industry paid about \$147.2 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$43.3 million in property taxes paid by all of South Carolina agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



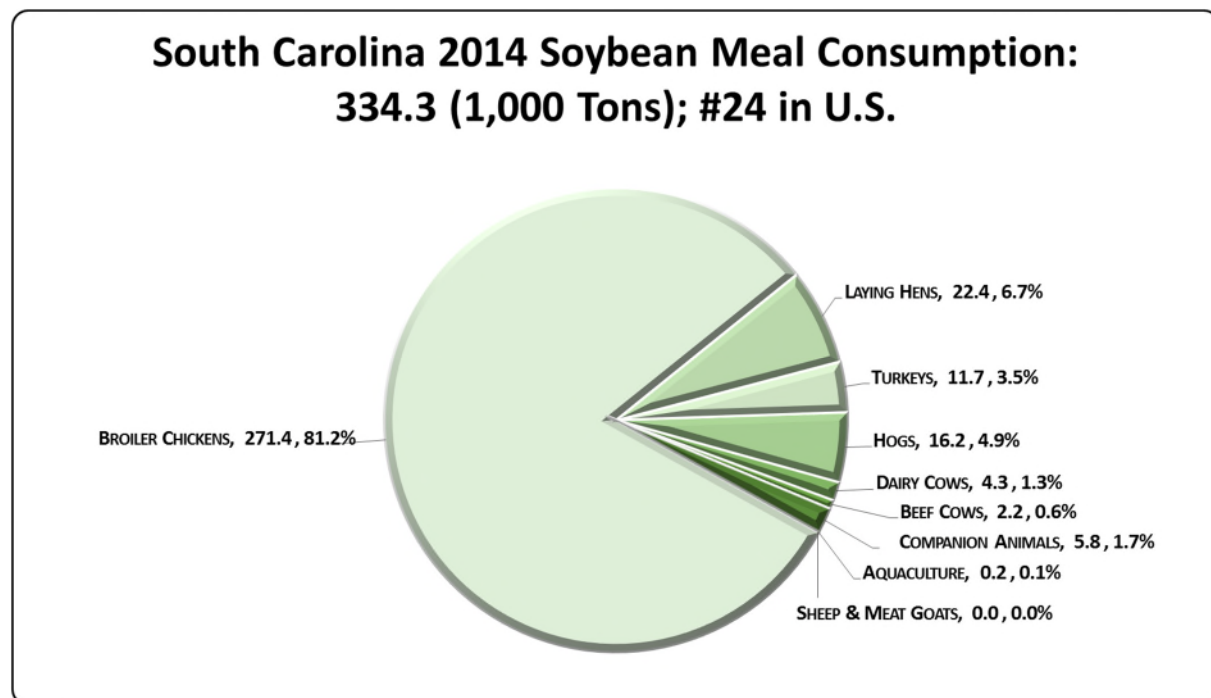
### South Carolina Animal Agriculture Soybean Meal Consumption

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.

South Carolina’s animal agriculture consumed almost 334.3 thousand tons of soybean meal in 2014, placing the state as #24 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:

1. Broilers (271.4 thousand tons)
2. Egg-Laying Hens (22.4 thousand tons)
3. Hogs (16.2 thousand tons)

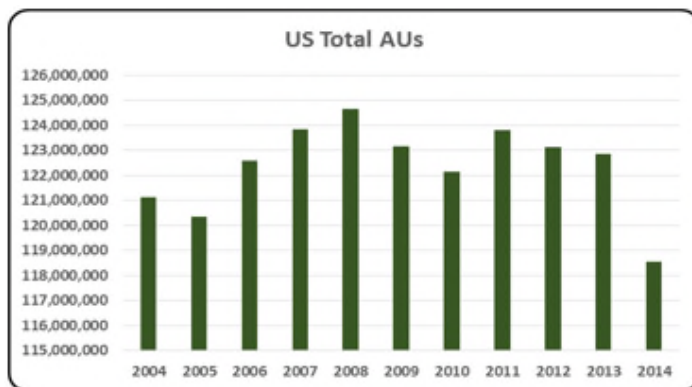


### South Carolina Animal Unit (AU) Trends

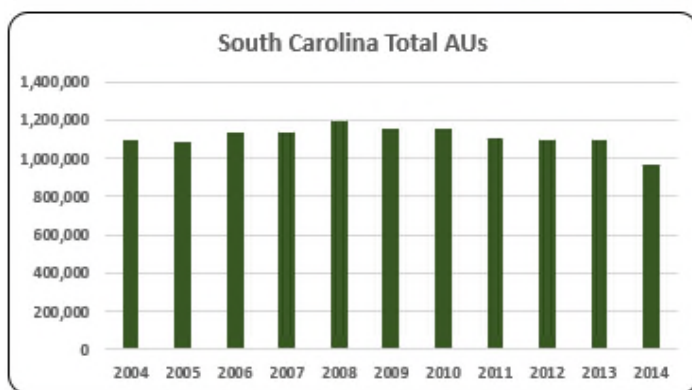
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of South Carolina. Due to this reality, using a single year as a measure of the presence and strength of a sector 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 South Carolina and to give perspective on South Carolina’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 South Carolina, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (698.8 thousand AUs), Beef Cows (169.2 thousand AUs), and Hogs (39.7 thousand AUs). Total animal units in South Carolina during 2014 were 967.9 thousand AUs.

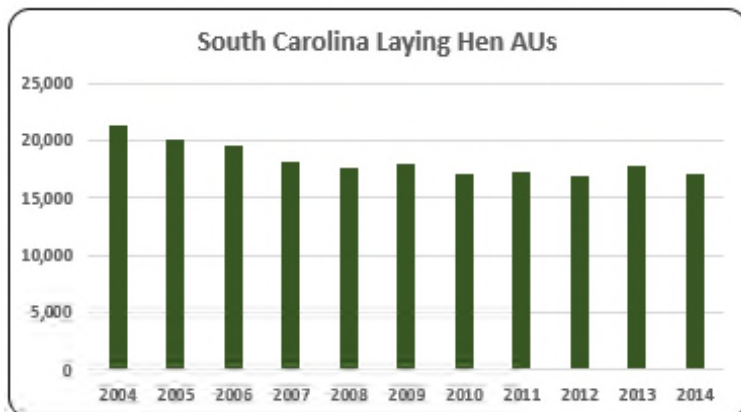
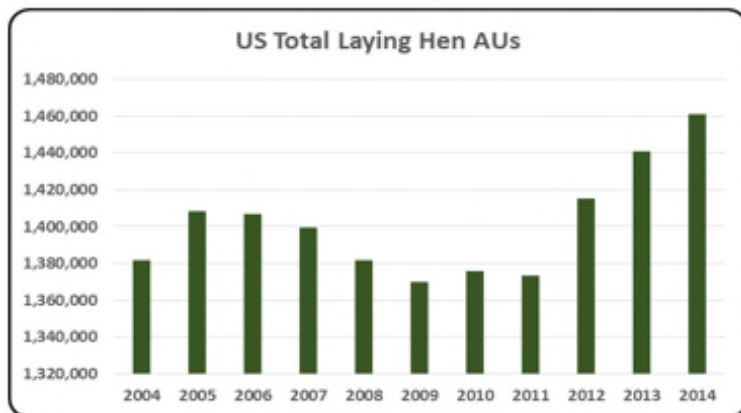
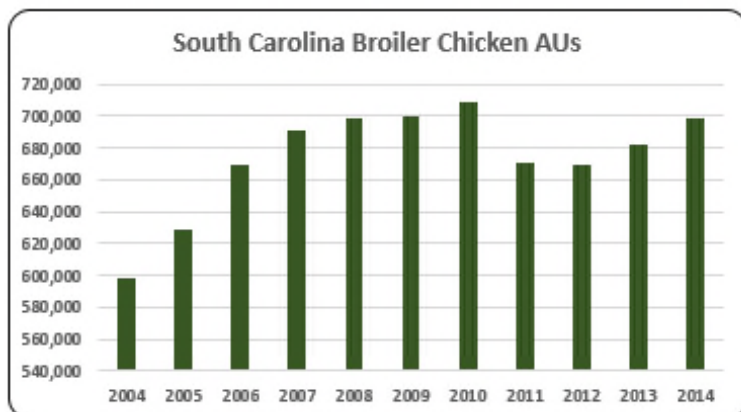
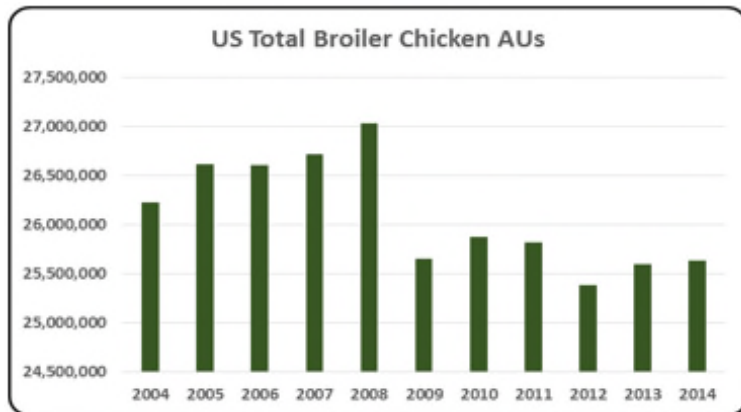


- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- Animal production in South Carolina fell 11.9% to 967,857 AUs in 2014 year-over-year. There was an 11.6% AU decline during last decade.



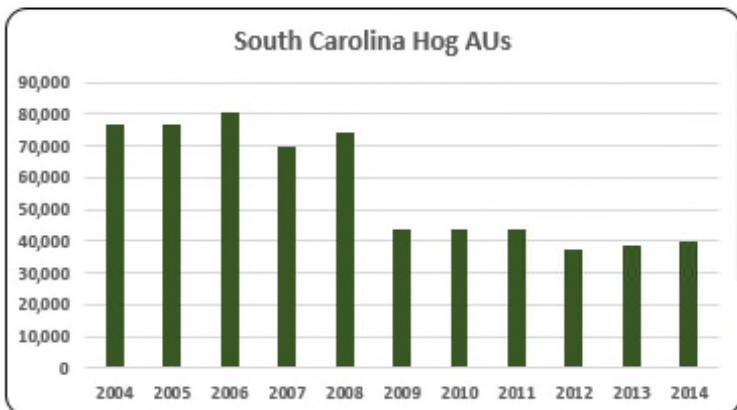
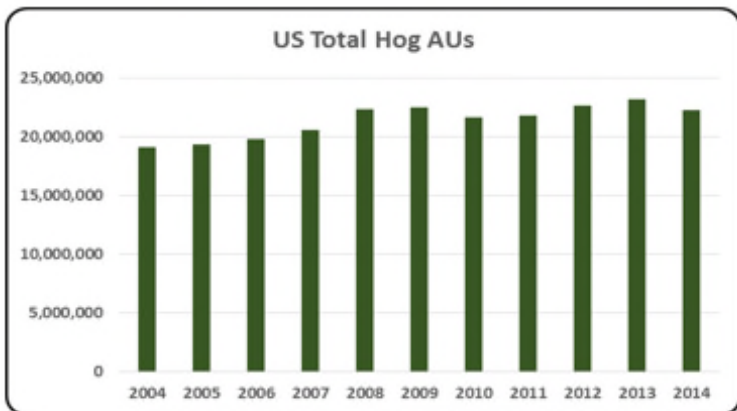
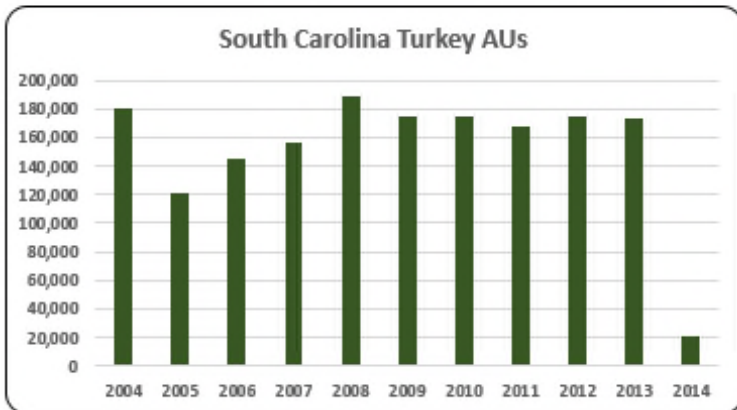
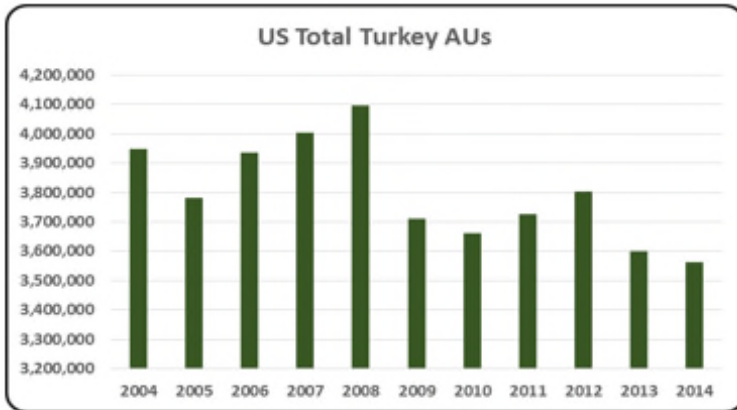


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

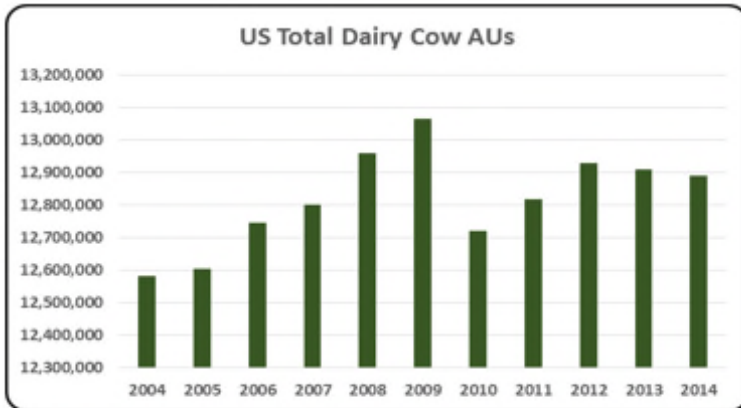
- Broiler production contributed 72% (698,787 broiler AUs) percent of total AUs in the state in 2014. Broiler production increased 16.7% from 2004 to 2014.

- 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).

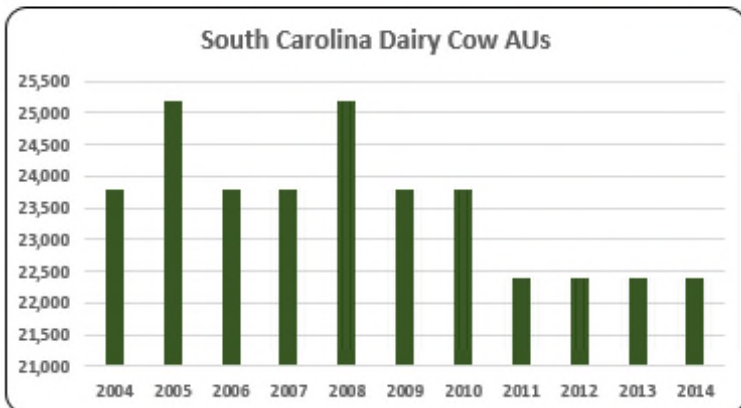
- Layer production represented only 1.77% (17,114 layer AUs) of all animal production in South Carolina in 2014. Layer production in 2014 decreased 20% compared to 2004.



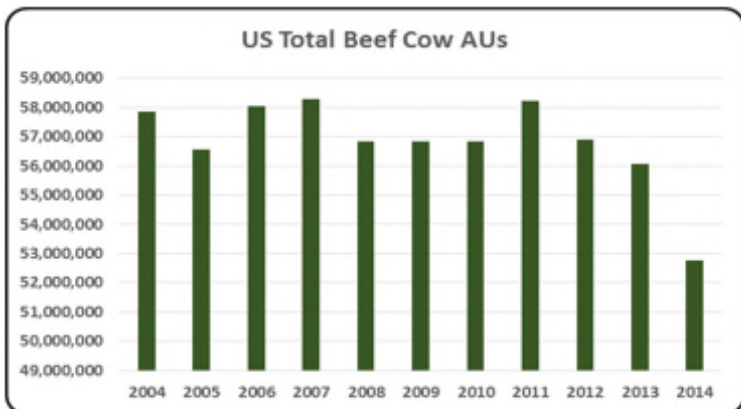
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- 2014 turkey production (20,682 turkey AUs) experienced a large decline (88.5%) compared to the level of production in 2004 (180,000 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.
- The average number of hog AUs from 2004 to 2014 was 56,734. Hog production decreased 48%; from 76,575 hog AUs in 2004 to 39,675 hog AUs in 2014.



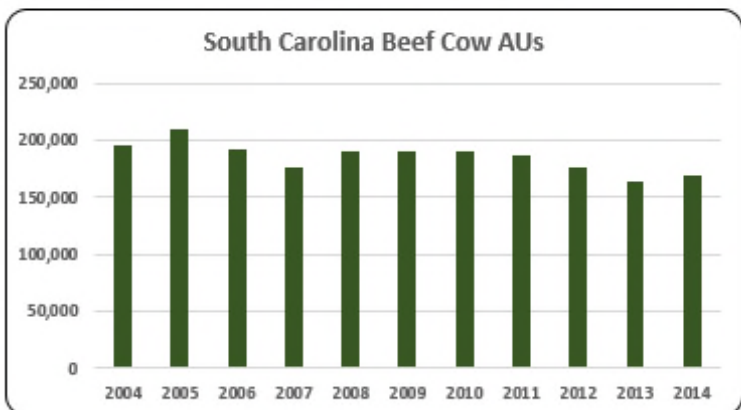
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- From 2011 to 2012 dairy cow AUs held constant. Dairy cow production dropped 6% from 2004 to 2014. South Carolina had record high dairy cow AUs in 2008 with 25,200 dairy cow AUs.



- 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.



- About 17.5% (169,200) of AUs in 2014 were beef cow AUs. Beef cow production trended downward during last decade showing a 13.2% reduction.

## South Carolina Additional Information and Methodology

Animal agriculture is an important part of South Carolina'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 South Carolina, of interest is the degree to which the industry impacts the South Carolina economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for South Carolina 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 South Carolina'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 South Carolina which have occurred. As shown in this state report, South Carolina 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 South Carolina. 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](mailto:info@decision-innovation.com) or 515.257.6077.

## South Carolina 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 South Carolina'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 South Carolina, \$1.674 to \$2.093 million in total economic activity, \$0.294 to \$0.360 in household wages and 13 to 15 additional jobs are generated in the economy at large.

	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	\$ 1.8565	\$ 0.3130	13.4
	Hogs, Pigs, and Other	\$ 1.6738	\$ 0.2942	12.8
	Poultry and Eggs	\$ 2.0926	\$ 0.3601	13.1
	Dairy	\$ 1.8338	\$ 0.3363	15.3

## Appendix

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
<b>Animal Units (AUs)</b>	<b>Beef Cattle AUs</b>	194,850	210,000	191,700	176,850	189,450	189,450	189,450	186,600	175,350	164,400	169,200
	<b>Hog and Pig AUs</b>	76,575	76,725	80,475	69,975	74,175	43,875	43,575	43,575	37,125	38,325	39,675
	<b>Broiler AUs</b>	598,705	628,489	668,977	690,855	698,521	699,705	709,217	671,211	669,689	681,380	698,787
	<b>Turkey AUs</b>	180,000	120,634	144,793	157,032	188,714	174,373	174,081	167,978	175,293	173,795	20,682
	<b>Egg Layer AUs</b>	21,328	19,996	19,532	18,216	17,680	17,932	17,080	17,212	16,956	17,754	17,114
	<b>Dairy AUs</b>	23,800	25,200	23,800	23,800	25,200	23,800	23,800	22,400	22,400	22,400	22,400
	<b>Total Animal Units</b>	<b>1,095,258</b>	<b>1,081,043</b>	<b>1,129,277</b>	<b>1,136,728</b>	<b>1,193,740</b>	<b>1,149,135</b>	<b>1,157,203</b>	<b>1,108,976</b>	<b>1,096,813</b>	<b>1,098,054</b>	<b>967,857</b>
<b>Value of Production (\$1,000)</b>	<b>Cattle and Calves (\$1,000)</b>	\$ 148,295	\$ 151,384	\$ 134,558	\$ 128,623	\$ 115,953	\$ 113,488	\$ 131,192	\$ 152,030	\$ 157,102	\$ 139,357	\$ 201,035
	<b>Hogs and Pigs (\$1,000)</b>	\$ 50,790	\$ 53,833	\$ 47,967	\$ 43,174	\$ 44,605	\$ 22,035	\$ 29,016	\$ 31,544	\$ 30,712	\$ 30,992	\$ 37,706
	<b>Broilers (\$1,000)</b>	\$ 521,884	\$ 563,112	\$ 520,960	\$ 665,955	\$ 697,452	\$ 695,508	\$ 750,426	\$ 707,549	\$ 768,650	\$ 963,248	\$ 1,051,560
	<b>Turkeys (\$1,000)</b>	\$ 185,280	\$ 133,472	\$ 177,523	\$ 198,474	\$ 267,400	\$ 220,912	\$ 261,324	\$ 327,837	\$ 355,597	\$ 318,402	\$ 37,962
	<b>Eggs (\$1,000)</b>	\$ 82,772	\$ 62,133	\$ 68,135	\$ 92,809	\$ 104,178	\$ 85,739	\$ 86,243	\$ 101,561	\$ 109,457	\$ 116,175	\$ 130,060
	<b>Milk (\$1,000)</b>	\$ 49,938	\$ 47,808	\$ 42,658	\$ 67,942	\$ 69,230	\$ 51,675	\$ 56,914	\$ 63,612	\$ 57,132	\$ 60,720	\$ 71,526
	<b>Other</b>	\$ 4,788	\$ 4,773	\$ 4,758	\$ 4,743	\$ 4,728	\$ 4,713	\$ 4,698	\$ 4,683	\$ 4,668	\$ 4,653	\$ 4,638
	<b>Sheep and Lambs (\$1,000)</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Aquaculture (\$1,000)</b>	\$ 4,788	\$ 4,773	\$ 4,758	\$ 4,743	\$ 4,728	\$ 4,713	\$ 4,698	\$ 4,683	\$ 4,668	\$ 4,653	\$ 4,638
	<b>Total (\$1,000)</b>	<b>\$ 1,043,747</b>	<b>\$ 1,016,515</b>	<b>\$ 996,559</b>	<b>\$ 1,201,720</b>	<b>\$ 1,303,546</b>	<b>\$ 1,194,070</b>	<b>\$ 1,319,813</b>	<b>\$ 1,388,816</b>	<b>\$ 1,483,318</b>	<b>\$ 1,633,547</b>	<b>\$ 1,534,487</b>

Ag Census Data Category	Animal Type	1997	2002	2007	2012	
Number of Farms by NAICS	Beef cattle ranching and farming (112111)	7,746	7,638	6,931	5,851	
	Cattle feedlots (112112)	206	282	168	withheld	
	Dairy cattle and milk production (11212)	179	211	102	80	
	Hog and pig farming (1122)	565	436	300	236	
	Poultry and egg production (1123)	711	836	1,226	1,238	
	Sheep and goat farming (1124)	289	491	859	1,100	
	Animal aquaculture and other animal production (1125,1129)	1,511	3,392	3,747	4,157	
Value of Sales (\$1,000)	Cattle and Calves	81,970	76,146	105,282	92,352	
	Hogs and Pigs	68,793	61,589	77,211	93,527	
	Poultry and Eggs	630,540	694,290	1,289,876	1,476,817	
	Milk and Other Dairy Products	54,855	46,240	52,550	56,008	
	Aquaculture	4,630	3,173	4,775	5,138	
	Other (calculated)	n/a	363	24,496	6,263	
	<b>Total</b>		840,788	881,801	1,554,190	1,730,105
Input Purchases	Livestock and poultry purchased	(Farms)	4,480	4,828	4,097	4,977
		\$1,000	88,949	97,058	170,676	209,463
	Breeding livestock purchased	(Farms)	n/a	2,557	1,977	2,355
		\$1,000	n/a	6,302	14,017	19,545
	Other livestock and poultry purchased	(Farms)	n/a	2,654	2,613	3,309
		\$1,000	n/a	90,756	156,659	189,918
	Feed purchased	(Farms)	9,768	13,901	12,517	14,754
	\$1,000	410,005	369,275	761,414	917,181	



	Animal Type	Output (\$1,000)	Earnings (\$1,000)	Employment (Jobs)	Taxes Paid (\$1,000)
<b>2014 Animal Agriculture</b>	Cattle and Calves	\$ 373,221	\$ 62,924	2,686	\$ 17,197
	Hogs, Pigs, and Other	\$ 70,875	\$ 12,458	542	\$ 3,405
	Poultry and Eggs	\$ 2,552,097	\$ 439,171	16,032	\$ 120,026
	Dairy	\$ 131,164	\$ 24,054	1,095	\$ 6,574
	<b>Total</b>	<b>\$ 3,127,358</b>	<b>\$ 538,607</b>	<b>20,354</b>	<b>\$ 147,201</b>
<b>Change from 2004 to 2014</b>	Cattle and Calves	\$ 28,194	\$ 4,753	203	\$ 1,299
	Hogs, Pigs, and Other	\$ (45,709)	\$ (8,034)	(349)	\$ (2,196)
	Poultry and Eggs	\$ 480,475	\$ 82,681	3,018	\$ 22,597
	Dairy	\$ 16,398	\$ 3,007	137	\$ 822
	<b>Total</b>	<b>\$ 479,358</b>	<b>\$ 82,408</b>	<b>3,009</b>	<b>\$ 22,522</b>
	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)	
<b>RIMS II Multipliers</b>	Cattle and Calves	\$ 1.8565	\$ 0.3130	13.4	
	Hogs, Pigs, and Other	\$ 1.6738	\$ 0.2942	12.8	
	Poultry and Eggs	\$ 2.0926	\$ 0.3601	13.1	
	Dairy	\$ 1.8338	\$ 0.3363	15.3	
<b>Tax Rates</b>	Federal effective income tax rate			12.7%	
	Federal Social Security tax rate			7.7%	
	State Effective Rate			7.0%	
	<b>Total</b>			<b>27.3%</b>	

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.