

# Economic Analysis of Animal Agriculture 2004-2014

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## *RHODE ISLAND*

A Report for  
United Soybean Board



September 2015



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## Rhode Island Executive Summary

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

- \$53.7 million in economic output
- 267 jobs
- \$8.6 million in earnings
- \$2.2 million in income taxes paid at local, state, and federal levels
- \$7.4 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Rhode Island increased economic output by over \$30.9 million, boosted household earnings by \$4.9 million, contributed 158 additional jobs and paid \$1.2 million in additional tax revenues.

Rhode Island's animal agriculture consumed about 4,000 tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Turkeys (2,200 tons)
- Companion Animals (800 tons)
- Egg-Laying Hens (600 tons)

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

## Rhode Island Economic Impact of Animal Agriculture

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

- About \$53.7 million in economic output
- \$8.6 million in household earnings
- 267 jobs
- \$2.2 million in income taxes

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

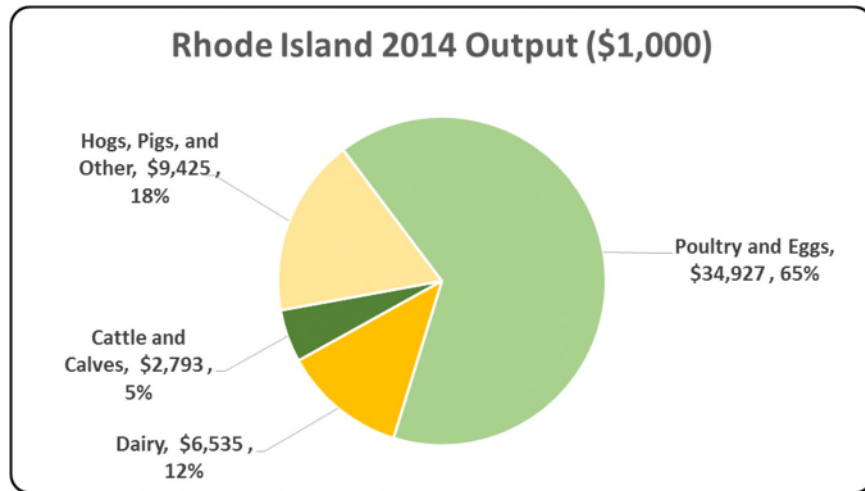
- Increased economic output by \$30.9 million
- Boosted household earnings by \$4.9 million
- Added 158 jobs
- Paid an additional \$1.2 million in income taxes

Below is a table which demonstrates this decade of change.

Measure	2014	Change 2004-2014	% Change 2004-2014
Output (\$1,000)	\$ 53,681	\$ 30,912	135.76%
Earnings (\$1,000)	\$ 8,578	\$ 4,911	133.92%
Employment (Jobs)	267	158	144.97%
Income Taxes Paid (\$1,000)	\$ 2,151	\$ 1,232	133.92%
Property Taxes Paid in 2012 (\$1,000)	\$ 7,365		

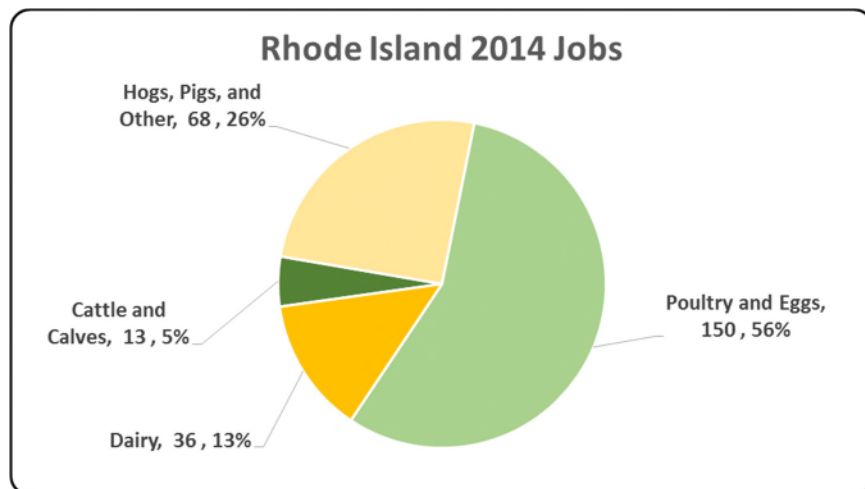
### Rhode Island Output

“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 Rhode Island economy. Animal agriculture’s impact on Rhode Island total economic output is about \$53.7 million.



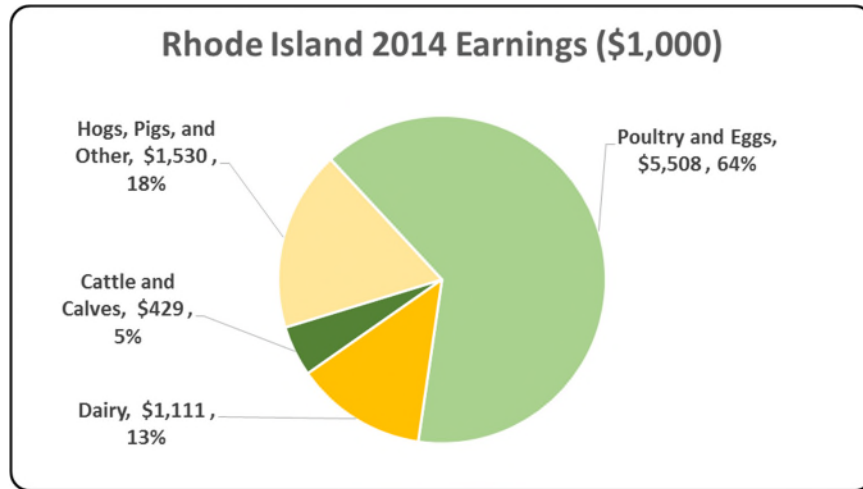
### Rhode Island Jobs

“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 Rhode Island in terms of animal agriculture jobs. As shown, animal agriculture contributes about 267 jobs within and outside of animal agriculture.



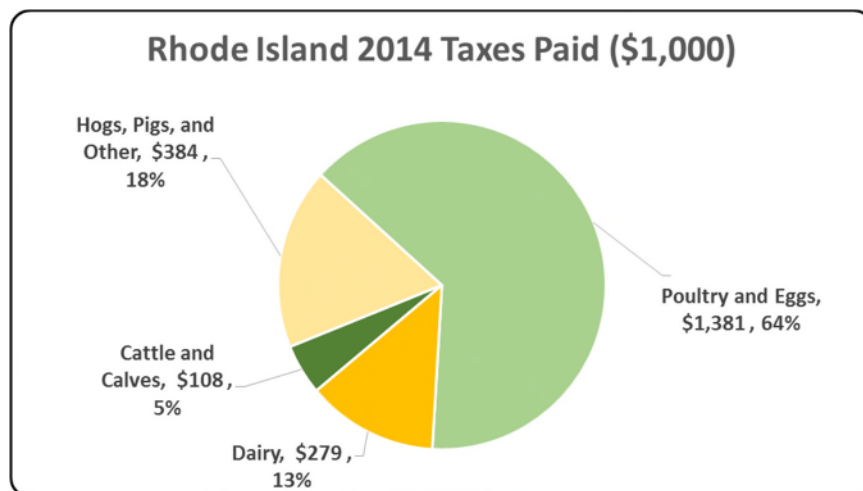
### Rhode Island Earnings

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 Rhode Island economy in terms of earnings. Rhode Island's animal agriculture contributed about \$8.6 million to household earnings in 2014.



### Rhode Island Taxes Paid by Animal Agriculture

Rhode Island's animal agriculture is also a small source of tax revenue. In 2014, the state's animal agriculture industry paid about \$2.2 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$7.4 million in property taxes paid by all of Rhode Island agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



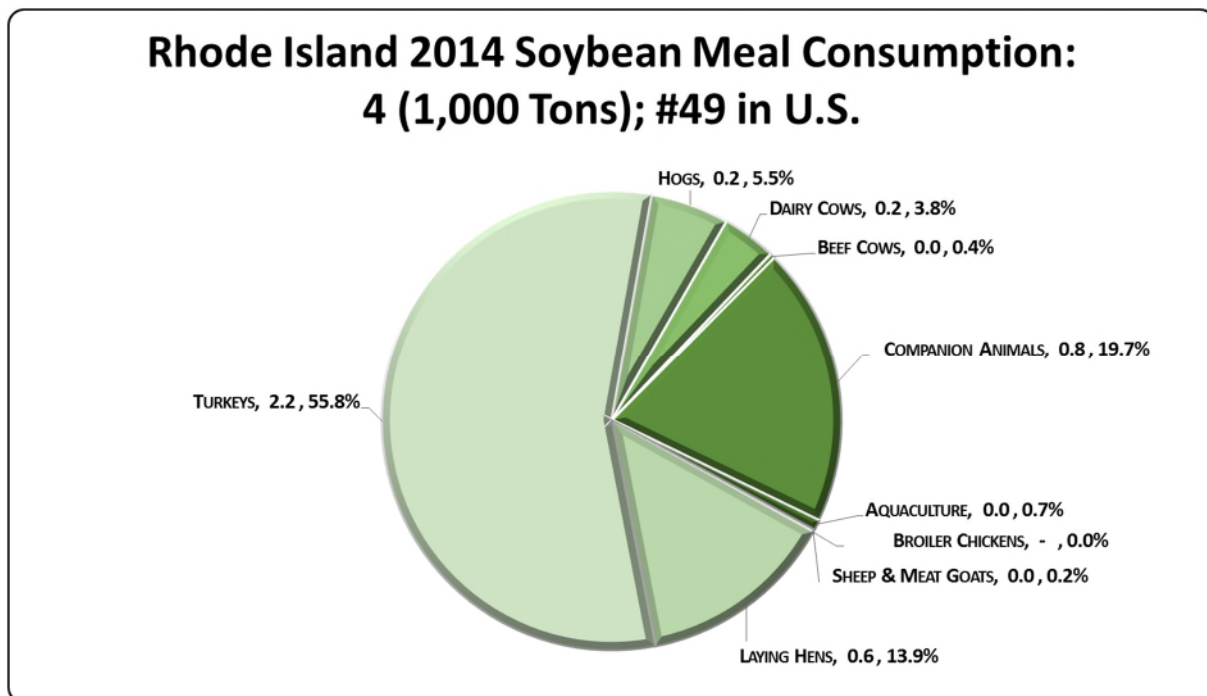
### Rhode Island Animal Agriculture Soybean Meal Consumption

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.

Rhode Island’s animal agriculture consumed almost 4,000 tons of soybean meal in 2014, placing the state as #49 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:

- Turkeys (2,200 tons)
- Companion Animals (800 tons)
- Egg-Laying Hens (600 tons)

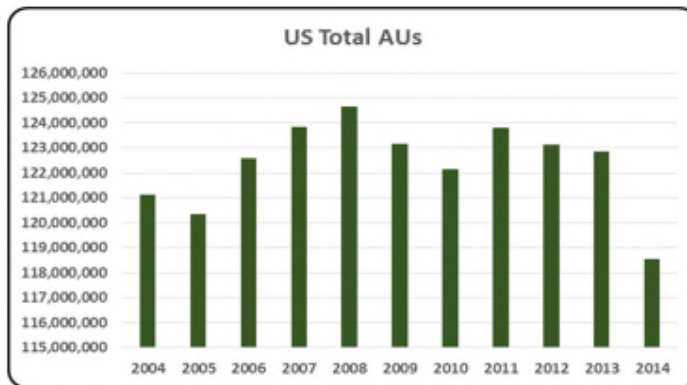


### Rhode Island Animal Unit (AU) Trends

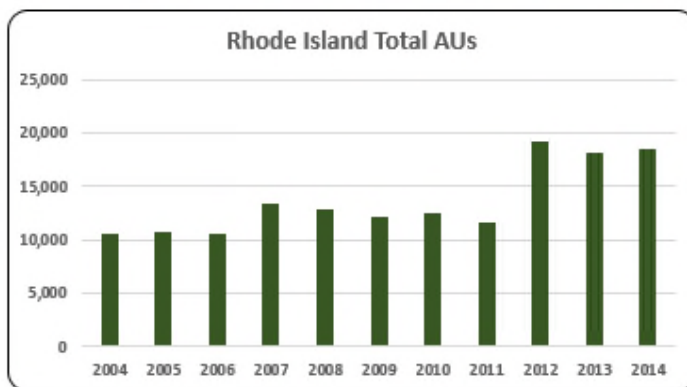
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Rhode Island. Due to this reality, using a single year as a measure of the presence and strength of a sector 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 Rhode Island and to give perspective on Rhode Island’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 Rhode Island, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (10.3 thousand AUs), Turkeys (4.0 thousand AUs), and Beef Cows (1.9 thousand AUs). Total animal units in Rhode Island during 2014 were 18.5 thousand AUs.

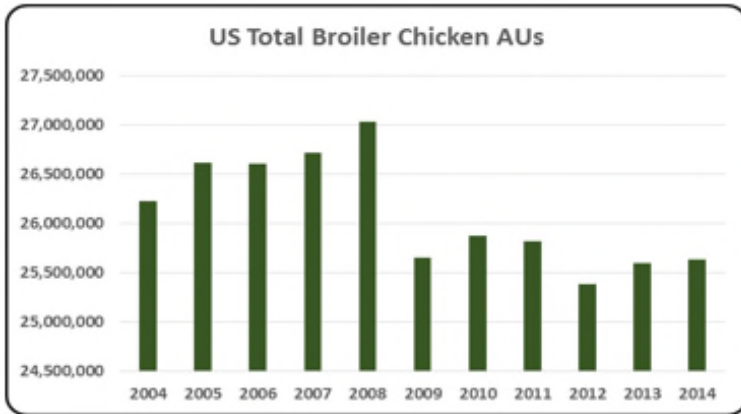


- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.

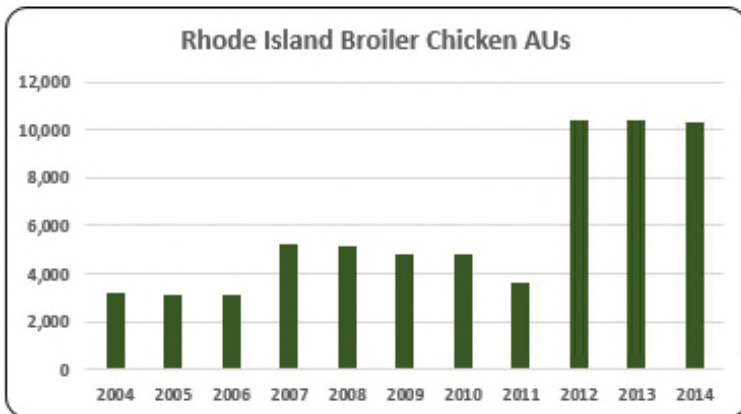


- Rhode Island has a very little animal production contributing only 0.02% (18,542) of all AUs in the U.S. in 2014.

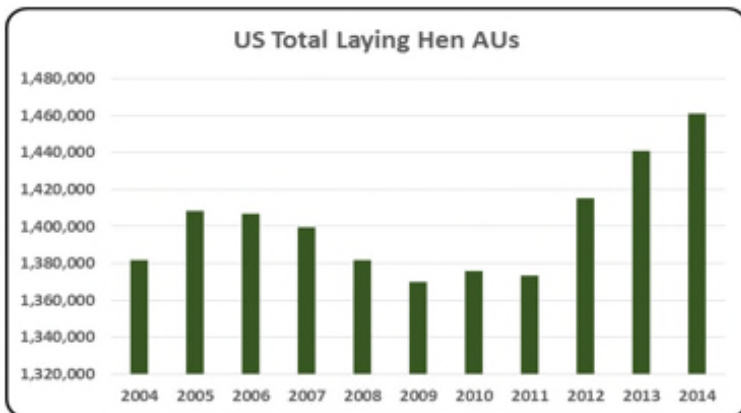




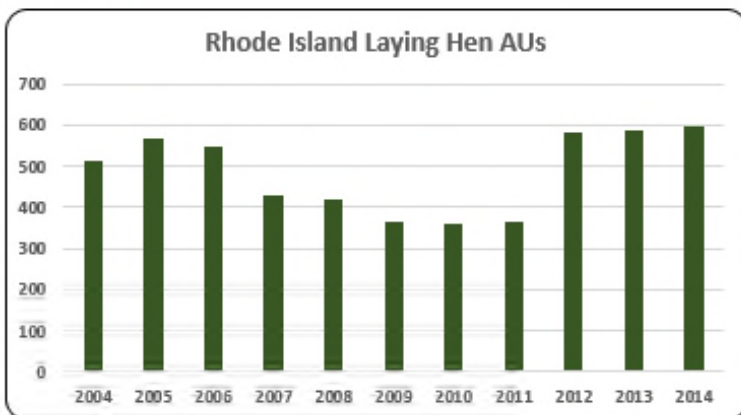
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



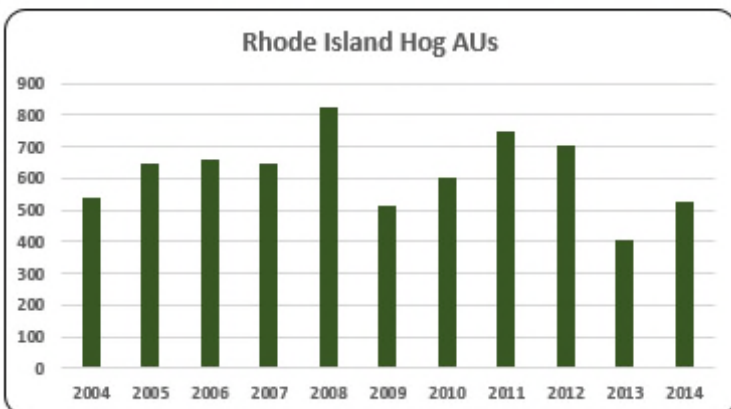
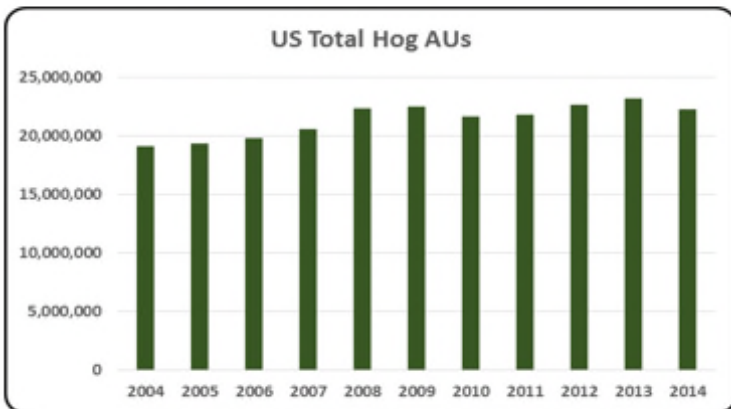
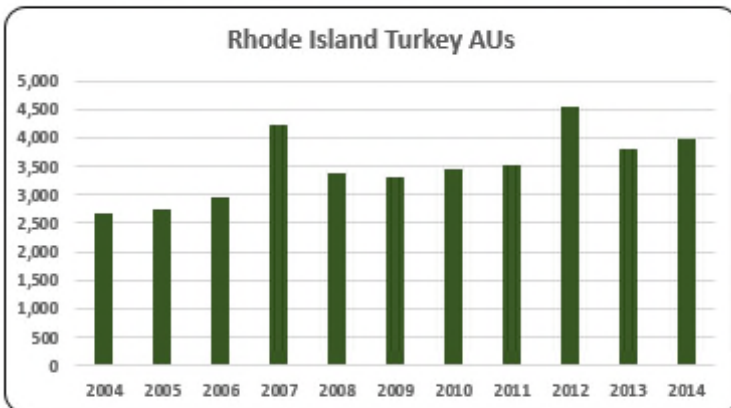
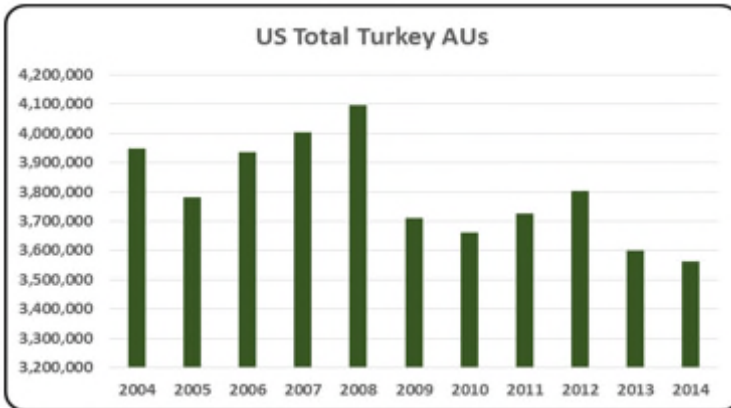
- Broiler production is the largest animal production in Rhode Island with 55.6% of all animal production in the state in 2014. There were 10,303 broiler AUs in the state in 2014.



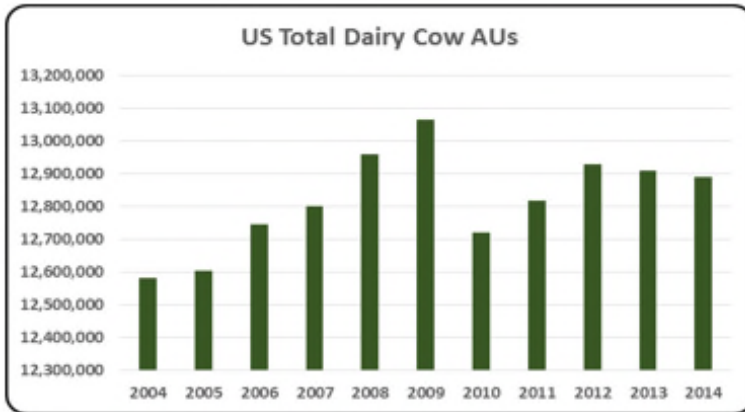
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



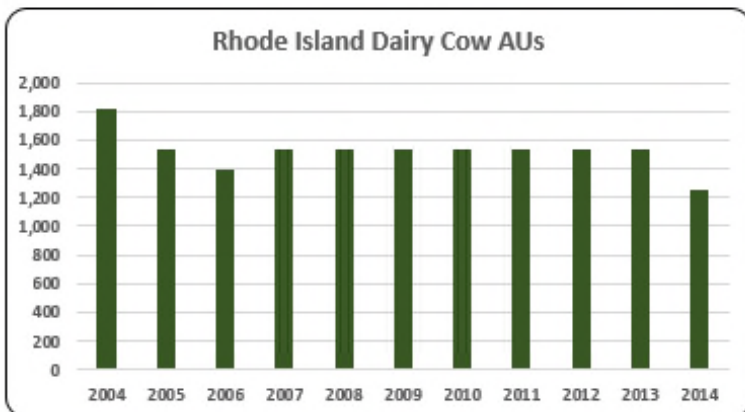
- There were 598 layer AUs in Rhode Island in 2014. Production increased 16% from 2004 to 2014.



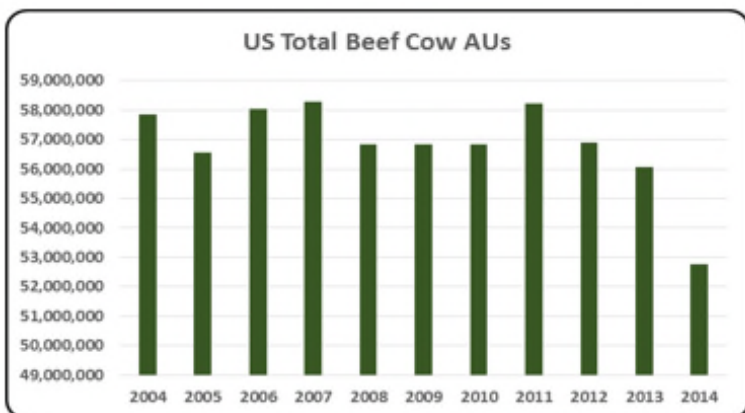
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- On average, there were 3,505 turkey AUs from 2004 to 2014. Similar to broiler production, 2012 was also a record year for turkey production with 4,553 turkey AUs.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production was the smallest animal production in the state with an average of 619 hog AUs during last decade.



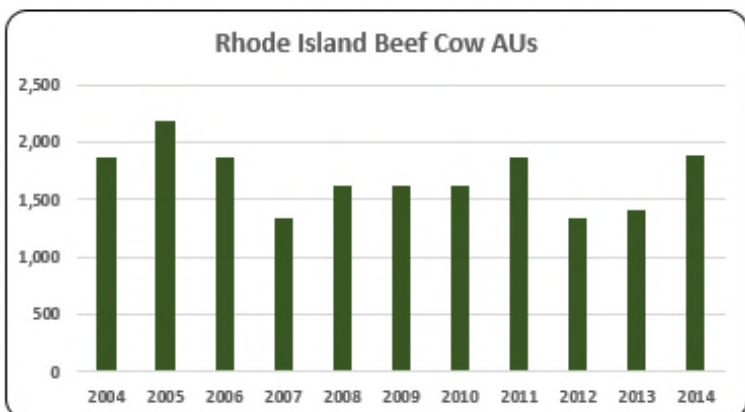
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy production declined 30.8% from 2004 to 2014. On average there were 1,527 dairy cow AUs in the last decade.



- 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.



- Ten percent (1,890) of all Rhode Island AUs were in the beef cow production in 2014. Beef cow AUs grew 1.6% in the last decade.

## Rhode Island Additional Information and Methodology

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

## Rhode Island 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 Rhode Island'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 Rhode Island, \$1.369 to \$1.448 million in total economic activity, \$0.220 to \$0.246 in household wages and 6 to 10 additional jobs are generated in the economy at large.

	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	\$ 1.4339	\$ 0.2202	6.7
	Hogs, Pigs, and Other	\$ 1.3694	\$ 0.2223	9.9
	Poultry and Eggs	\$ 1.3950	\$ 0.2200	6.0
	Dairy	\$ 1.4477	\$ 0.2461	7.9

### Appendix

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
<b>Animal Units (AUs)</b>	Beef Cattle AUs	1,860	2,190	1,860	1,335	1,620	1,620	1,620	1,860	1,335	1,410	1,890
	Hog and Pig AUs	540	645	660	645	825	510	600	750	705	405	525
	Broiler AUs	3,197	3,130	3,109	5,227	5,145	4,784	4,848	3,653	10,398	10,362	10,303
	Turkey AUs	2,660	2,728	2,964	4,230	3,381	3,312	3,450	3,511	4,553	3,798	3,966
	Egg Layer AUs	514	567	547	429	417	364	362	364	579	588	598
	Dairy AUs	1,820	1,540	1,400	1,540	1,540	1,540	1,540	1,540	1,540	1,540	1,260
	<b>Total Animal Units</b>	<b>10,591</b>	<b>10,799</b>	<b>10,540</b>	<b>13,405</b>	<b>12,928</b>	<b>12,130</b>	<b>12,420</b>	<b>11,678</b>	<b>19,110</b>	<b>18,103</b>	<b>18,542</b>
<b>Value of Production (\$1,000)</b>	Cattle and Calves (\$1,000)	\$ 909	\$ 927	\$ 1,037	\$ 911	\$ 834	\$ 738	\$ 706	\$ 1,029	\$ 1,452	\$ 1,512	\$ 1,948
	Hogs and Pigs (\$1,000)	\$ 374	\$ 406	\$ 341	\$ 266	\$ 289	\$ 176	\$ 275	\$ 364	\$ 368	\$ 361	\$ 537
	Broilers (\$1,000)	\$ 2,689	\$ 2,547	\$ 1,968	\$ 3,932	\$ 4,047	\$ 3,505	\$ 3,689	\$ 3,251	\$ 10,358	\$ 12,619	\$ 13,238
	Turkeys (\$1,000)	\$ 2,468	\$ 2,617	\$ 3,093	\$ 4,878	\$ 4,567	\$ 3,063	\$ 4,103	\$ 4,602	\$ 6,603	\$ 4,348	\$ 7,280
	Eggs (\$1,000)	\$ 2,701	\$ 1,635	\$ 1,813	\$ 2,975	\$ 3,586	\$ 2,552	\$ 2,801	\$ 3,072	\$ 3,445	\$ 3,892	\$ 4,519
	Milk (\$1,000)	\$ 3,508	\$ 3,142	\$ 2,812	\$ 3,819	\$ 4,000	\$ 2,783	\$ 3,510	\$ 4,314	\$ 3,623	\$ 3,728	\$ 4,514
	Other	\$ 228	\$ 840	\$ 1,452	\$ 2,064	\$ 2,675	\$ 3,287	\$ 3,899	\$ 4,511	\$ 5,122	\$ 5,734	\$ 6,346
	Sheep and Lambs (\$1,000)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Aquaculture (\$1,000)	\$ 228	\$ 840	\$ 1,452	\$ 2,064	\$ 2,675	\$ 3,287	\$ 3,899	\$ 4,511	\$ 5,122	\$ 5,734	\$ 6,346
	<b>Total (\$1,000)</b>	<b>\$ 12,877</b>	<b>\$ 12,114</b>	<b>\$ 12,516</b>	<b>\$ 18,845</b>	<b>\$ 19,997</b>	<b>\$ 16,104</b>	<b>\$ 18,984</b>	<b>\$ 21,142</b>	<b>\$ 30,971</b>	<b>\$ 32,194</b>	<b>\$ 38,382</b>

Ag Census Data Category	Animal Type	1997	2002	2007	2012	
Number of Farms by NAICS	Beef cattle ranching and farming (112111)	67	78	102	154	
	Cattle feedlots (112112)	18	12	8	7	
	Dairy cattle and milk production (11212)	32	30	34	13	
	Hog and pig farming (1122)	22	20	31	20	
	Poultry and egg production (1123)	21	26	49	88	
	Sheep and goat farming (1124)	24	30	53	54	
	Animal aquaculture and other animal production (1125,1129)	78	148	237	244	
Value of Sales (\$1,000)	Cattle and Calves	778	735	846	1,180	
	Hogs and Pigs	758	227	354	601	
	Poultry and Eggs	2,020	1,766	1,908	2,177	
	Milk and Other Dairy Products	4,875	3,859	4,599	3,902	
	Aquaculture	n/a	863	1,653	1,917	
	Other (calculated)	1,230	958	946	513	
	<b>Total</b>		9,661	8,408	10,306	10,290
Input Purchases	Livestock and poultry purchased	(Farms)	161	169	203	349
		\$1,000	848	730	748	1,023
	Breeding livestock purchased	(Farms)	n/a	75	90	136
		\$1,000	n/a	118	214	314
	Other livestock and poultry purchased	(Farms)	n/a	122	143	287
		\$1,000	n/a	612	534	709
	Feed purchased	(Farms)	271	425	583	693
	\$1,000	2,924	3,121	5,171	6,287	

	Animal Type	Output (\$1,000)	Earnings (\$1,000)	Employment (Jobs)	Taxes Paid (\$1,000)
<b>2014 Animal Agriculture</b>	Cattle and Calves	\$ 2,793	\$ 429	13	\$ 108
	Hogs, Pigs, and Other	\$ 9,425	\$ 1,530	68	\$ 384
	Poultry and Eggs	\$ 34,927	\$ 5,508	150	\$ 1,381
	Dairy	\$ 6,535	\$ 1,111	36	\$ 279
	<b>Total</b>	\$ 53,681	\$ 8,578	267	\$ 2,151
<b>Change from 2004 to 2014</b>	Cattle and Calves	\$ 1,160	\$ 178	5	\$ 45
	Hogs, Pigs, and Other	\$ 8,392	\$ 1,362	61	\$ 342
	Poultry and Eggs	\$ 21,190	\$ 3,342	91	\$ 838
	Dairy	\$ 170	\$ 29	1	\$ 7
	<b>Total</b>	\$ 30,912	\$ 4,911	158	\$ 1,232
<b>RIMS II Multipliers</b>	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)	
	Cattle and Calves	\$ 1.4339	\$ 0.2202	6.7	
	Hogs, Pigs, and Other	\$ 1.3694	\$ 0.2223	9.9	
	Poultry and Eggs	\$ 1.3950	\$ 0.2200	6.0	
	Dairy	\$ 1.4477	\$ 0.2461	7.9	
<b>Tax Rates</b>	Federal effective income tax rate			12.7%	
	Federal Social Security tax rate			7.7%	
	State Effective Rate			4.8%	
	<b>Total</b>			25.1%	

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.