

# Economic Analysis of Animal Agriculture 2005-2015

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*WISCONSIN*

**A Report for  
United Soybean Board**



**September 2016**



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## Contents

Contents .....	2
Wisconsin Executive Summary .....	3
Wisconsin Economic Impact of Animal Agriculture.....	4
Wisconsin Output.....	5
Wisconsin Jobs .....	5
Wisconsin Earnings.....	6
Wisconsin Taxes Paid by Animal Agriculture .....	6
Wisconsin Animal Agriculture Soybean Meal Consumption .....	7
Wisconsin Animal Unit (AU) Trends.....	8
Wisconsin Additional Information and Methodology .....	12
Wisconsin Multipliers.....	13
Appendix .....	14

## Wisconsin Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Wisconsin'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 Wisconsin. The success of Wisconsin animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the State of Wisconsin during 2015 animal agriculture contributed:

- \$17.8 billion in economic output
- 106,098 jobs
- \$4.0 billion in earnings
- \$1.1 billion in income taxes paid at local, state, and federal levels
- \$311.2 million in the form of property taxes

Plus, from 2005-2015 animal agriculture in Wisconsin has increased economic output by over \$4.5 billion, boosted household earnings by \$985.7 million, contributed 25,861 additional jobs and paid \$264.5 million in additional tax revenues.

Wisconsin's animal agriculture consumed almost 710.3 thousand tons of soybean meal in 2015. This soybean meal was fed primarily to:

- Dairy Cows (487.8 thousand tons)
- Beef Cows (69.8 thousand tons)
- Broilers (63.2 thousand tons)

This report examines animal agriculture in Wisconsin 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 Wisconsin, 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 Wisconsin and beyond.

## Wisconsin Economic Impact of Animal Agriculture

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

- About \$17.8 billion in economic output
- \$4.0 billion in household earnings
- 106,098 jobs
- \$1.1 billion in income taxes

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

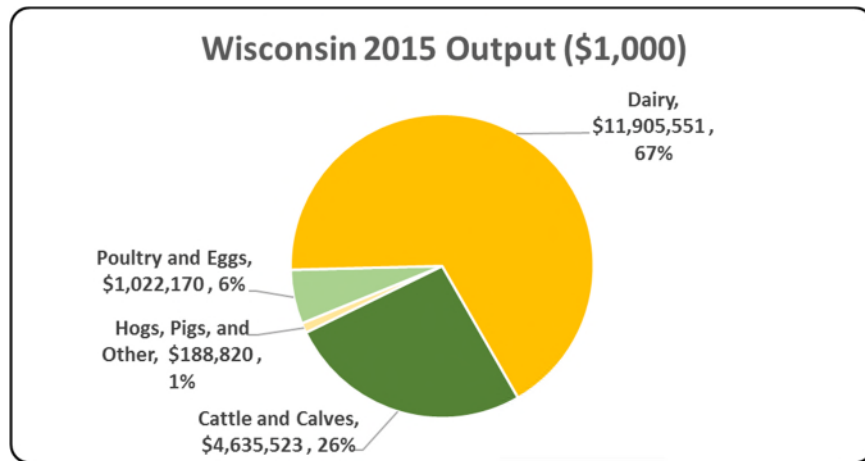
- Increased economic output by \$4.5 billion
- Boosted household earnings by \$985.7 million
- Added 25,861 jobs
- Paid an additional \$264.5 million in income taxes

Below is a table which demonstrates this decade of change.

Measure	2015	Change 2005-2015	% Change 2005-2015
Output (\$1,000)	\$ 17,752,065	\$ 4,513,725	34.10%
Earnings (\$1,000)	\$ 3,982,304	\$ 985,742	32.90%
Employment (Jobs)	106,098	25,861	32.23%
Income Taxes Paid (\$1,000)	\$ 1,068,452	\$ 264,474	32.90%
Property Taxes Paid in 2012 (\$1,000)	\$ 311,228		

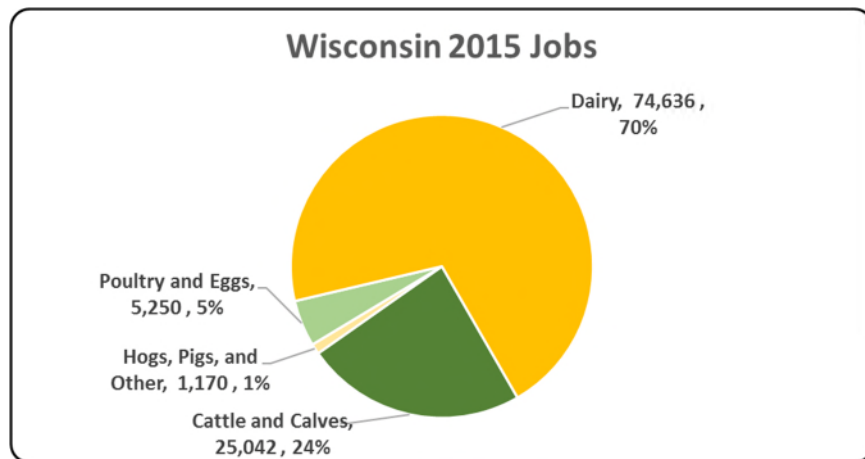
### Wisconsin Output

“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 Wisconsin economy. Animal agriculture’s impact on Wisconsin total economic output is about \$17.8 billion.



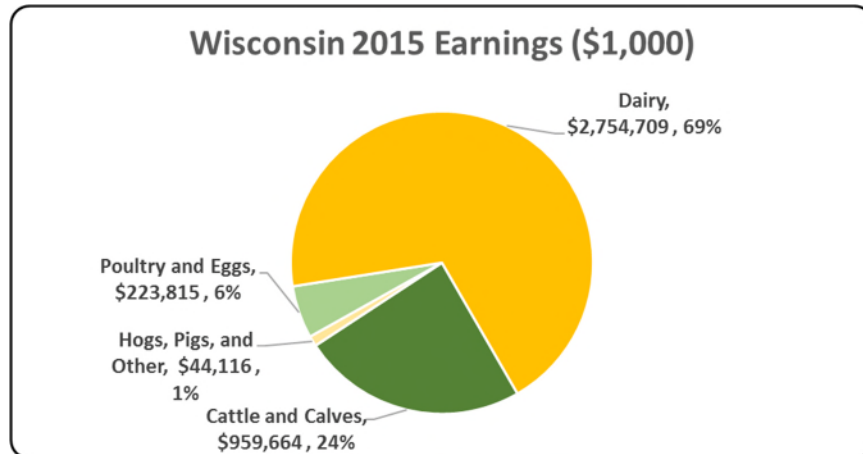
### Wisconsin Jobs

“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 Wisconsin in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Wisconsin total jobs, contributing 106,098 jobs within and outside of animal agriculture.



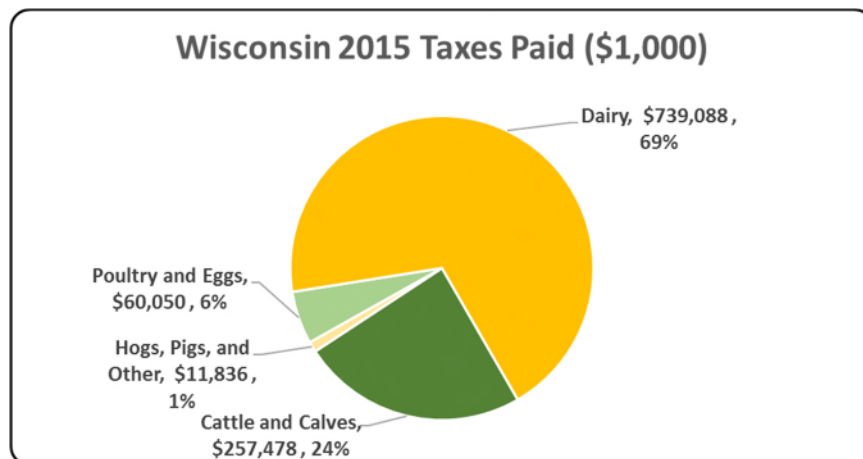
### Wisconsin Earnings

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 Wisconsin economy in terms of earnings. Wisconsin’s animal agriculture contributed about \$4.0 billion to household earnings in 2015.



### Wisconsin Taxes Paid by Animal Agriculture

Wisconsin’s animal agriculture is also a significant source of tax revenue. In 2015, the state’s animal agriculture industry paid about \$1.1 billion in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$311.2 million in property taxes paid by all of Wisconsin agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



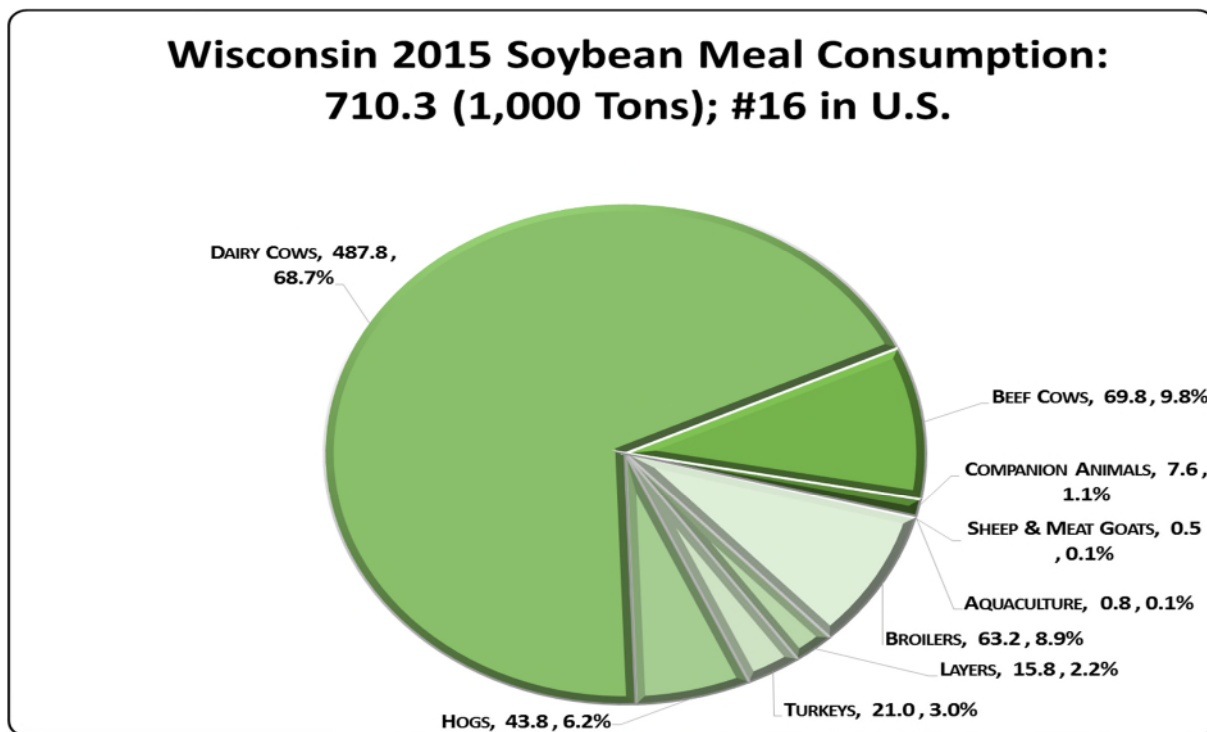
### Wisconsin Animal Agriculture Soybean Meal Consumption

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.

Wisconsin’s animal agriculture consumed almost 710.3 thousand tons of soybean meal in 2015, placing the state as #16 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (487.8 thousand tons)
- Beef Cows (69.8 thousand tons)
- Broilers (63.2 thousand tons)

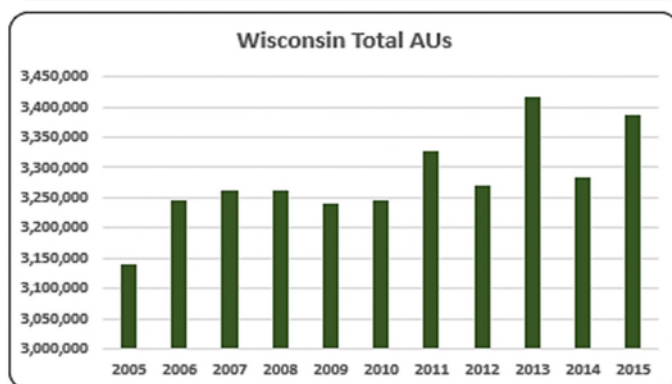
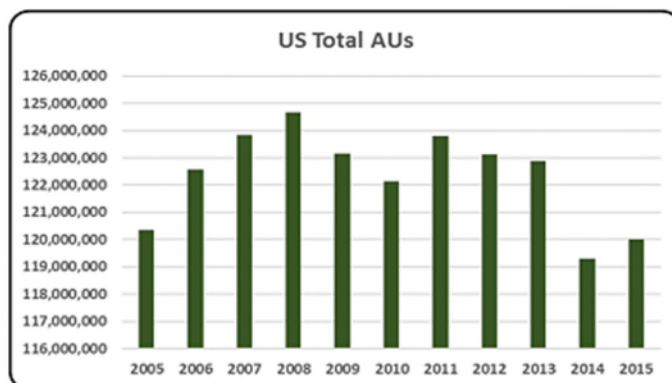


## Wisconsin Animal Unit (AU) Trends

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 Wisconsin. 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 Wisconsin and to give perspective on Wisconsin's contribution to the nation's animal agriculture industry and beyond.

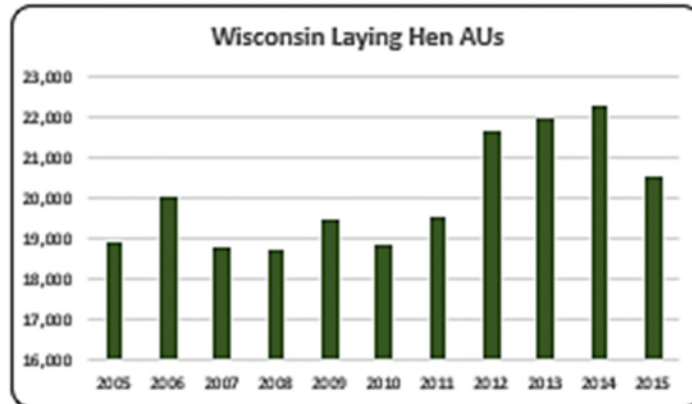
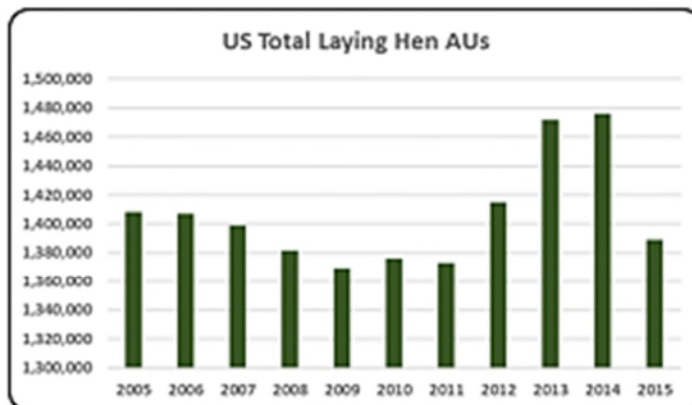
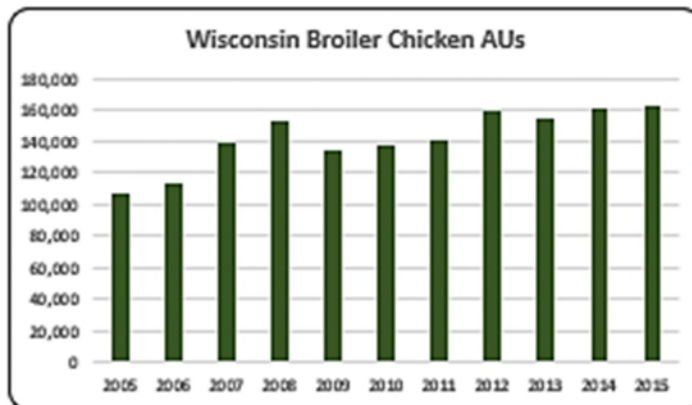
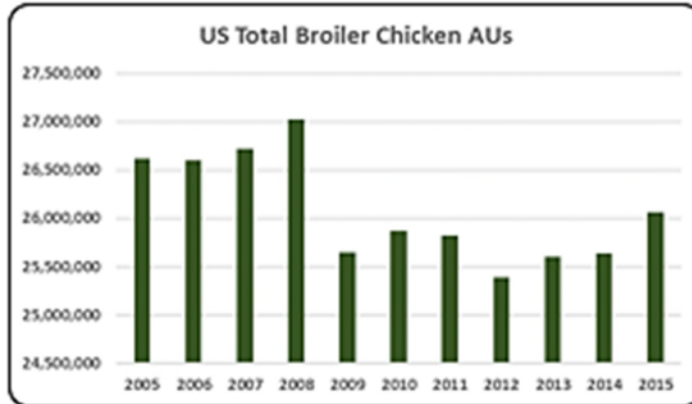
Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

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 Wisconsin, the largest three segments of animal agriculture in terms of AUs during 2015 were: Dairy Cows (1.78 million AUs), Beef Cows (1.26 million AUs), and Broilers (162,001 AUs). Total animal units in Wisconsin during 2015 were 3.4 million AUs.

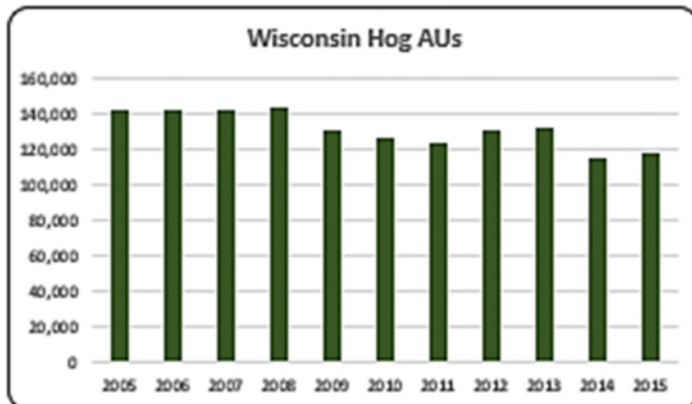
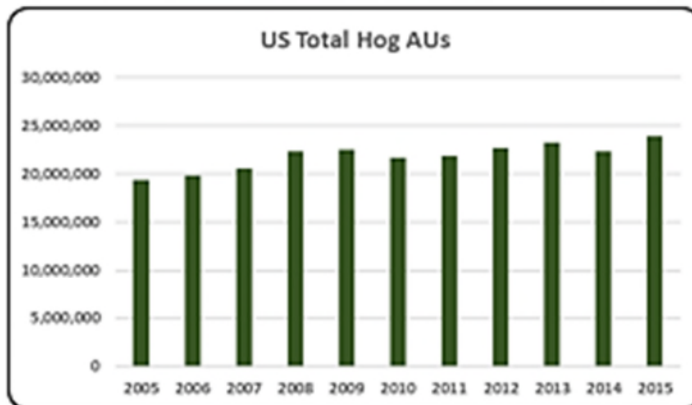
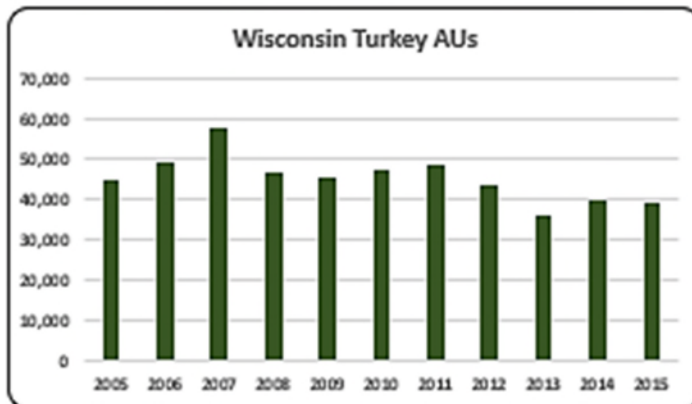
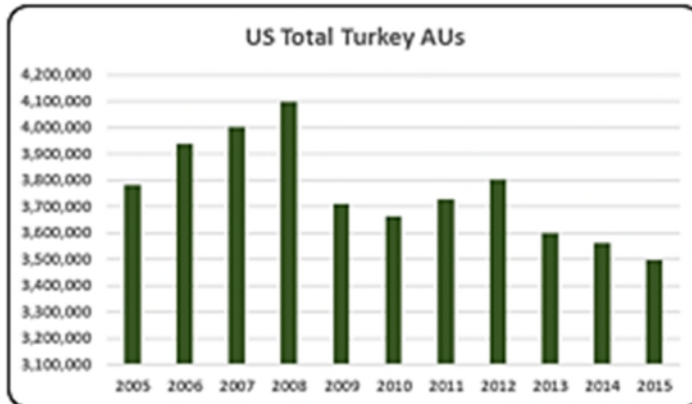


- Overall U.S. total AUs have varied from 2005 to 2015. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2005-15 time period, total AUs in the nation peaked in 2008.
- There were 3.4 million AUs in Wisconsin in 2015 representing about 2.82% of all AUs in the U.S. AUs increased 3% in 2015 relative to 2005 (3.1 million AUs).





- 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).
- On average, there were 141,667 broiler AUs in Wisconsin from 2005 to 2015. Broiler AUs in 2015 (162,001 broiler AUs) rose 51% compared to 2005 (106,958 broiler AUs).
- 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 was the smallest animal production in Wisconsin during last decade with only 0.61% (20,546 layer AUs) of the total animal production in 2015.

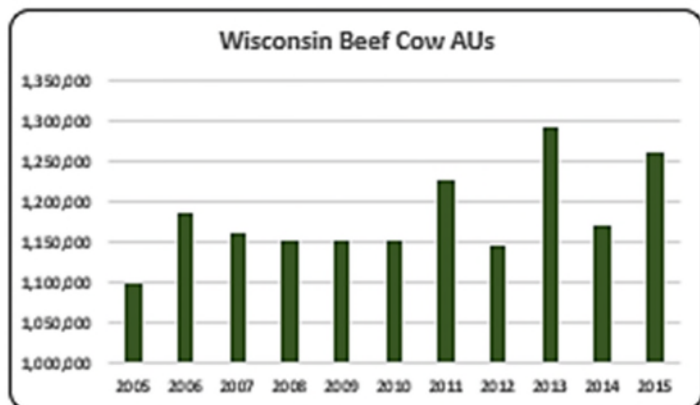
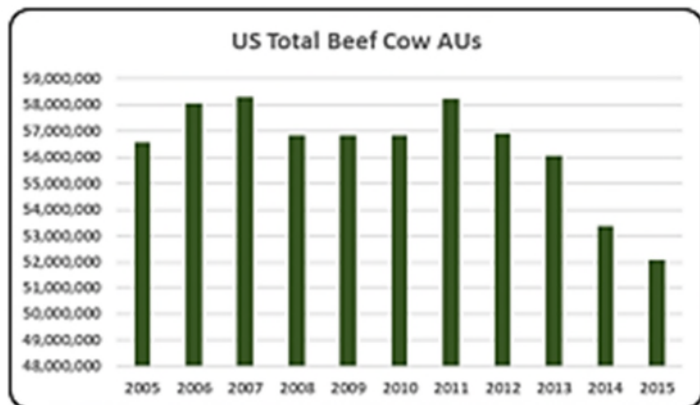
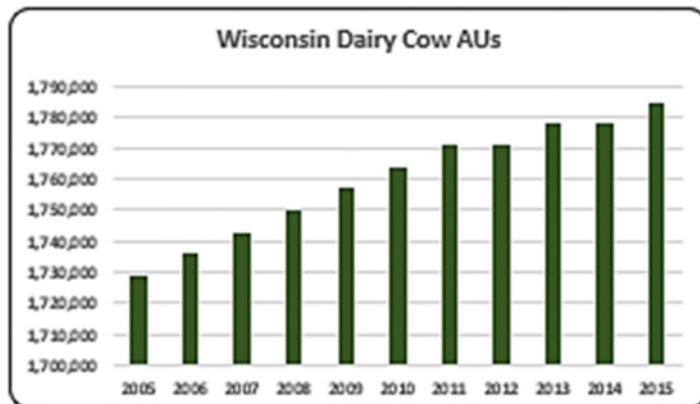
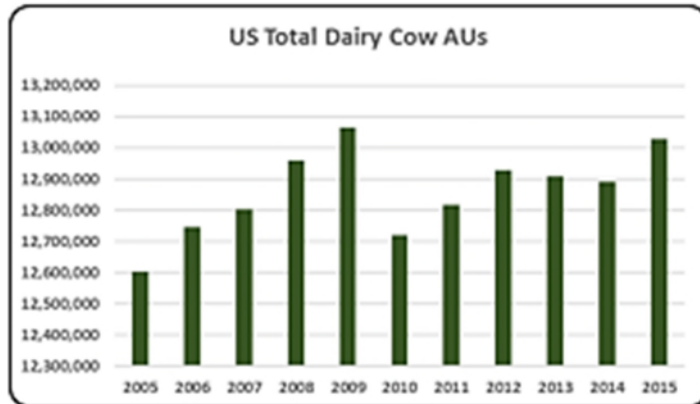


- In 2015 turkey AUs were the lowest of the decade at 3.5 million, decreasing 15% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade. The most recent contributor to this decline has been avian influenza.

- There were 45,206 turkey AUs on average during the last decade. 2015 turkey AUs (39,068) declined 13% from 2005 turkey AUs (44,888).

- 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 Wisconsin in 2015 reported in at 118,050 hog AUs. The average number of hog AUs throughout the decade was 131,426.



- 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.

- As the second largest dairy cow producer in the country, Wisconsin accounted for 13.70% (1.78 million dairy AUs) of all dairy cows in the U.S. 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.

- Beef cow production made up 37.24% (1.26 million beef cow AUs) of all animal production in Wisconsin in 2015. Beef cow production in 2015 fell 2% compared to 2013.

## Wisconsin Additional Information and Methodology

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

### Wisconsin 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 Wisconsin’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 Wisconsin, \$1.72 to \$2.71 million in total economic activity, \$0.40 to \$0.59 in household wages and 11 to 14 additional jobs are generated in the economy at large.

	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	\$ 2.409	\$ 0.499	13.0
	Hogs, Pigs, and Other	\$ 1.716	\$ 0.401	10.6
	Poultry and Eggs	\$ 2.712	\$ 0.594	13.9
	Dairy	\$ 2.304	\$ 0.533	14.4

## Appendix

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
<b>Animal Units (AUs)</b>	Beef Cattle AUs	1,097,550	1,185,150	1,162,350	1,152,000	1,152,000	1,152,000	1,225,185	1,144,635	1,292,595	1,169,790	1,260,540
	Hog and Pig AUs	142,200	142,365	141,510	143,700	130,845	126,165	124,050	130,350	132,150	114,300	118,050
	Broiler AUs	106,958	112,822	139,112	152,442	134,762	136,841	139,710	159,006	154,190	160,495	162,001
	Turkey AUs	44,888	48,775	57,966	46,334	45,385	47,274	48,117	43,359	36,170	39,930	39,068
	Egg Layer AUs	18,928	20,048	18,780	18,728	19,444	18,880	19,512	21,629	21,971	22,263	20,546
	Dairy AUs	1,729,000	1,736,000	1,743,000	1,750,000	1,757,000	1,764,000	1,771,000	1,771,000	1,778,000	1,778,000	1,785,000
	<b>Total Animal Units</b>	<b>3,139,524</b>	<b>3,245,160</b>	<b>3,262,718</b>	<b>3,263,204</b>	<b>3,239,437</b>	<b>3,245,160</b>	<b>3,327,575</b>	<b>3,269,980</b>	<b>3,415,075</b>	<b>3,284,778</b>	<b>3,385,204</b>
<b>Value of Production (\$1,000)</b>	Cattle and Calves (\$1,000)	\$ 855,031	\$ 846,927	\$ 819,104	\$ 778,254	\$ 708,203	\$ 860,662	\$ 1,164,319	\$ 1,292,043	\$ 1,443,995	\$ 1,918,114	\$ 1,924,332
	Hogs and Pigs (\$1,000)	\$ 112,235	\$ 105,652	\$ 108,595	\$ 107,923	\$ 90,766	\$ 110,277	\$ 135,219	\$ 122,921	\$ 128,999	\$ 122,235	\$ 97,095
	Broilers (\$1,000)	\$ 70,268	\$ 62,345	\$ 91,530	\$ 99,866	\$ 87,927	\$ 95,243	\$ 89,643	\$ 111,100	\$ 130,809	\$ 142,879	\$ 121,803
	Turkeys (\$1,000)	\$ 42,639	\$ 50,409	\$ 65,930	\$ 56,901	\$ 51,824	\$ 65,211	\$ 72,530	\$ 71,014	\$ 56,230	\$ 63,624	\$ 67,749
	Eggs (\$1,000)	\$ 39,702	\$ 45,323	\$ 89,263	\$ 102,910	\$ 78,301	\$ 78,316	\$ 85,397	\$ 101,214	\$ 115,879	\$ 129,992	\$ 187,368
	Milk (\$1,000)	\$ 3,567,096	\$ 3,111,934	\$ 4,647,440	\$ 4,625,208	\$ 3,306,309	\$ 4,191,635	\$ 5,289,774	\$ 5,281,456	\$ 5,597,116	\$ 6,809,775	\$ 5,167,340
	Other	\$ 13,732	\$ 11,960	\$ 12,248	\$ 11,634	\$ 12,012	\$ 14,129	\$ 12,772	\$ 12,815	\$ 12,859	\$ 12,903	\$ 12,946
	Sheep and Lambs (\$1,000)	\$ 6,707	\$ 5,150	\$ 5,653	\$ 5,255	\$ 5,848	\$ 8,180	\$ 7,038	\$ 7,297	\$ 7,556	\$ 7,815	\$ 8,074
	Aquaculture (\$1,000)	\$ 7,025	\$ 6,810	\$ 6,595	\$ 6,379	\$ 6,164	\$ 5,949	\$ 5,734	\$ 5,518	\$ 5,303	\$ 5,088	\$ 4,873
	<b>Total (\$1,000)</b>	<b>\$ 4,700,703</b>	<b>\$ 4,234,550</b>	<b>\$ 5,834,109</b>	<b>\$ 5,782,696</b>	<b>\$ 4,335,342</b>	<b>\$ 5,415,473</b>	<b>\$ 6,849,654</b>	<b>\$ 6,992,564</b>	<b>\$ 7,485,887</b>	<b>\$ 9,199,522</b>	<b>\$ 7,578,634</b>

Ag Census Data Category	Animal Type	1997	2002	2007	2012	
<b>Number of Farms by NAICS</b>	<b>Beef cattle ranching and farming (112111)</b>	9,469	9,852	11,593	10,241	
	Cattle feedlots (112112)	2,540	3,749	2,485	892	
	<b>Dairy cattle and milk production (11212)</b>	20,958	16,096	13,081	10,401	
	Hog and pig farming (1122)	1,179	759	989	475	
	<b>Poultry and egg production (1123)</b>	466	910	2,297	1,591	
	Sheep and goat farming (1124)	805	1,117	1,501	1,555	
	<b>Animal aquaculture and other animal production (1125,1129)</b>	2,864	6,347	5,816	4,814	
<b>Value of Sales (\$1,000)</b>	<b>Cattle and Calves</b>	702,854	834,895	1,014,553	1,416,881	
	Hogs and Pigs	156,106	79,836	100,309	90,589	
	<b>Poultry and Eggs</b>	242,238	224,968	375,284	465,717	
	<b>Milk and Other Dairy Products</b>	2,800,298	2,651,018	4,573,294	4,952,039	
	Aquaculture	5,226	14,262	14,182	13,847	
	<b>Other (calculated)</b>	132,891	128,225	220,410	192,404	
	<b>Total</b>	4,039,613	3,933,204	6,298,032	7,131,477	
<b>Input Purchases</b>	<b>Livestock and poultry purchased</b>	<b>(Farms)</b>	22,888	21,117	19,948	19,759
		<b>\$1,000</b>	306,830	294,121	356,954	454,402
	<b>Breeding livestock purchased</b>	<b>(Farms)</b>	<i>n/a</i>	12,329	10,799	10,907
		<b>\$1,000</b>	<i>n/a</i>	108,518	139,475	186,105
	<b>Other livestock and poultry purchased</b>	<b>(Farms)</b>	<i>n/a</i>	11,343	11,816	11,748
		<b>\$1,000</b>	<i>n/a</i>	185,603	217,479	268,297
	<b>Feed purchased</b>	<b>(Farms)</b>	39,355	43,074	38,826	39,784
	<b>\$1,000</b>	847,206	785,165	1,091,862	2,066,721	

	Animal Type	Output (\$1,000)	Earnings (\$1,000)	Employment (Jobs)	Taxes Paid (\$1,000)
<b>2015 Animal Agriculture</b>	Cattle and Calves	\$ 4,635,523	\$ 959,664	25,042	\$ 257,478
	Hogs, Pigs, and Other	\$ 188,820	\$ 44,116	1,170	\$ 11,836
	Poultry and Eggs	\$ 1,022,170	\$ 223,815	5,250	\$ 60,050
	Dairy	\$ 11,905,551	\$ 2,754,709	74,636	\$ 739,088
	<b>Total</b>	\$ 17,752,065	\$ 3,982,304	106,098	\$ 1,068,452
<b>Change from 2005 to 2015</b>	Cattle and Calves	\$ 2,135,881	\$ 442,179	11,538	\$ 118,636
	Hogs, Pigs, and Other	\$ (73,497)	\$ (17,172)	(456)	\$ (4,607)
	Poultry and Eggs	\$ 519,908	\$ 113,840	2,670	\$ 30,543
	Dairy	\$ 1,931,433	\$ 446,895	12,108	\$ 119,902
	<b>Total</b>	\$ 4,513,725	\$ 985,742	25,861	\$ 264,474
<b>RIMS II Multipliers</b>	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)	
	Cattle and Calves	\$ 2.409	\$ 0.499	13.0	
	Hogs, Pigs, and Other	\$ 1.716	\$ 0.401	10.6	
	Poultry and Eggs	\$ 2.712	\$ 0.594	13.9	
	Dairy	\$ 2.304	\$ 0.533	14.4	
<b>Tax Rates</b>	Federal effective income tax rate				12.7%
	Federal Social Security tax rate				7.7%
	State Effective Rate				6.5%
	<b>Total</b>				26.8%

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.