

Economic Analysis of Animal Agriculture 2005-2015

IDAHO

**A Report for
United Soybean Board**



September 2016



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Idaho Executive Summary

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

- \$9.5 billion in economic output
- 45,124 jobs
- \$2.1 billion in earnings
- \$576.9 million in income taxes paid at local, state, and federal levels
- \$78.9 million in the form of property taxes

Plus, from 2005-2015 animal agriculture in Idaho has increased economic output by \$3.0 billion, boosted household earnings by \$651.5 million, contributed 14,088 additional jobs and paid \$180.7 million in additional tax revenues.

Idaho's animal agriculture consumed almost 109.6 thousand tons of soybean meal in 2015. This soybean meal was fed primarily to:

- Dairy Cows (74.6 thousand tons)
- Beef Cows (9.7 thousand tons)
- Turkeys (6.9 thousand tons)

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

Idaho Economic Impact of Animal Agriculture

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

- About \$9.5 billion in economic output
- \$2.1 billion in household earnings
- 45,124 jobs
- \$576.9 million in income taxes

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

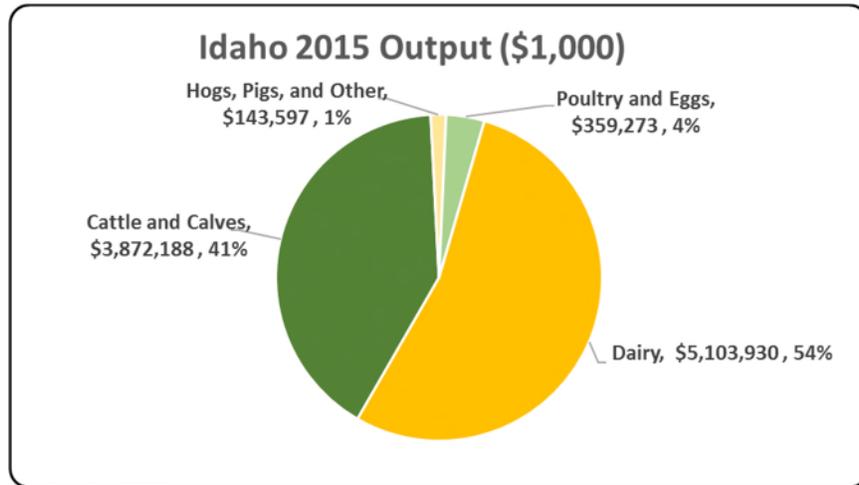
- Increased economic output by \$3.0 billion
- Boosted household earnings by \$651.5 million
- Added 14,088 jobs
- Paid an additional \$180.7 million in income taxes

Below is a table which demonstrates this decade of change.

Measure	2015	Change 2005-2015	% Change 2005-2015
Output (\$1,000)	\$ 9,478,988	\$ 2,999,486	46.29%
Earnings (\$1,000)	\$ 2,080,465	\$ 651,505	45.59%
Employment (Jobs)	45,124	14,088	45.39%
Income Taxes Paid (\$1,000)	\$ 576,913	\$ 180,662	45.59%
Property Taxes Paid in 2012 (\$1,000)	\$ 78,925		

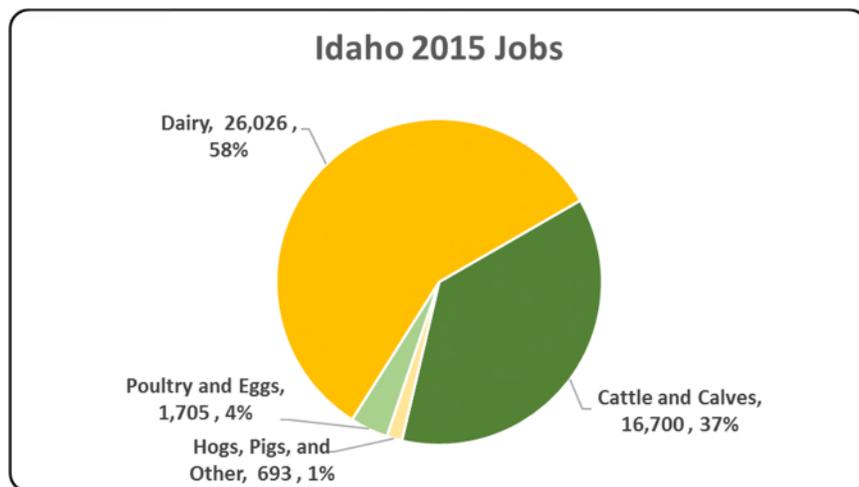
Idaho Output

“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 Idaho economy. Animal agriculture’s impact on Idaho total economic output is about \$9.5 billion.



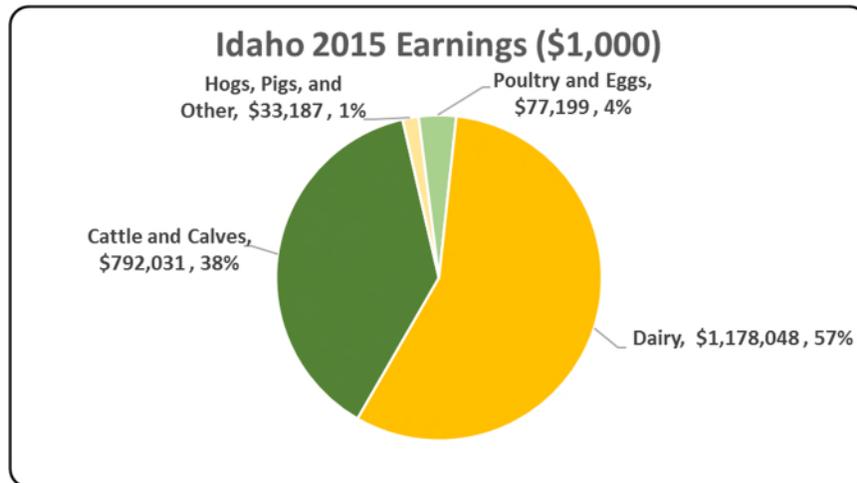
Idaho Jobs

“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 Idaho in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Idaho total jobs, contributing 45,124 jobs within and outside of animal agriculture.



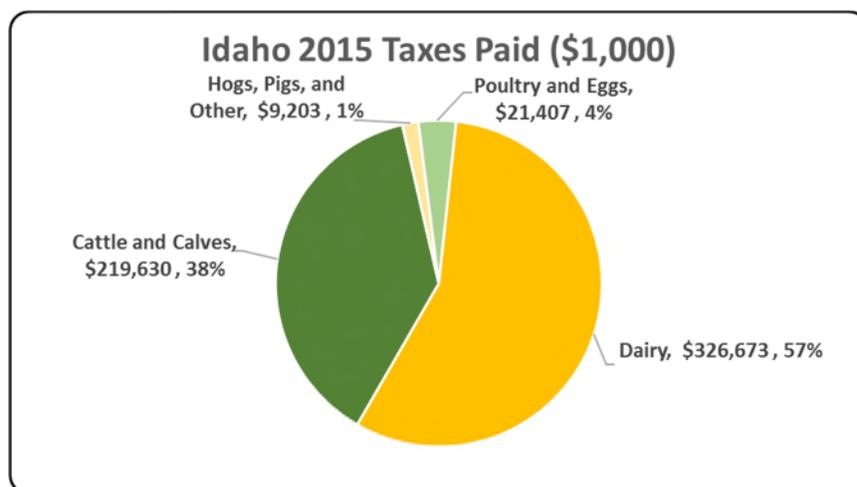
Idaho Earnings

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 Idaho economy in terms of earnings. Idaho’s animal agriculture contributed about \$2.1 billion to household earnings in 2015.



Idaho Taxes Paid by Animal Agriculture

Idaho’s animal agriculture is also a significant source of tax revenue. In 2015, the state’s animal agriculture industry paid about \$576.9 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$78.9 million in property taxes paid by all of Idaho agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



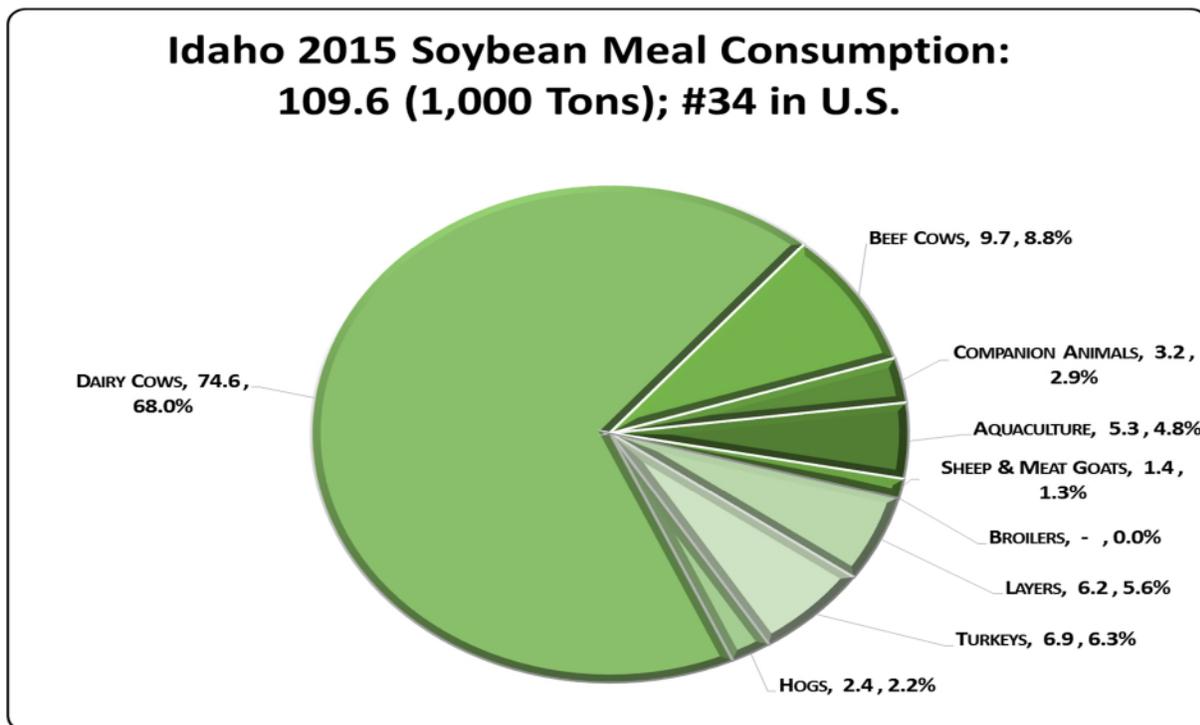
Idaho Animal Agriculture Soybean Meal Consumption

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.

Idaho’s animal agriculture consumed almost 109.6 thousand tons of soybean meal in 2015, placing the state as #34 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 (74.6 thousand tons)
- Beef Cows (9.7 thousand tons)
- Turkeys (6.9 thousand tons)

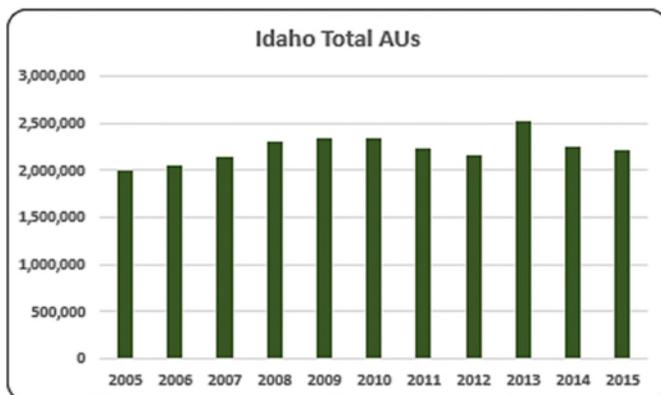
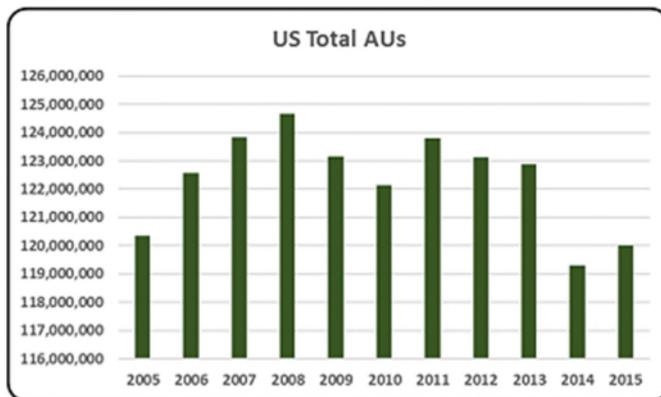


Idaho Animal Unit (AU) Trends

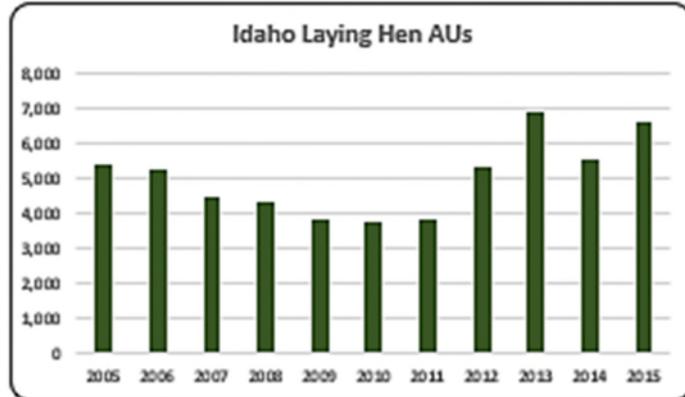
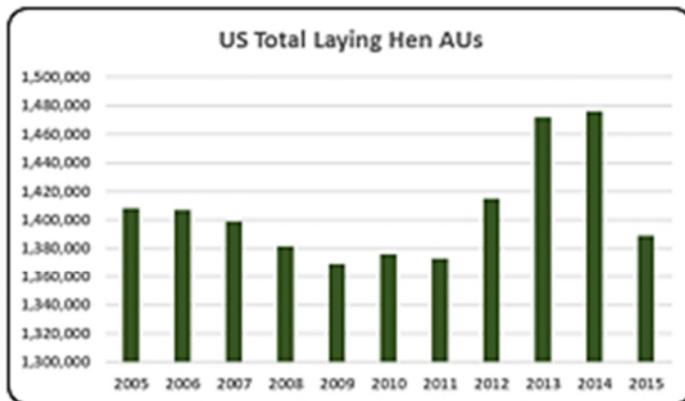
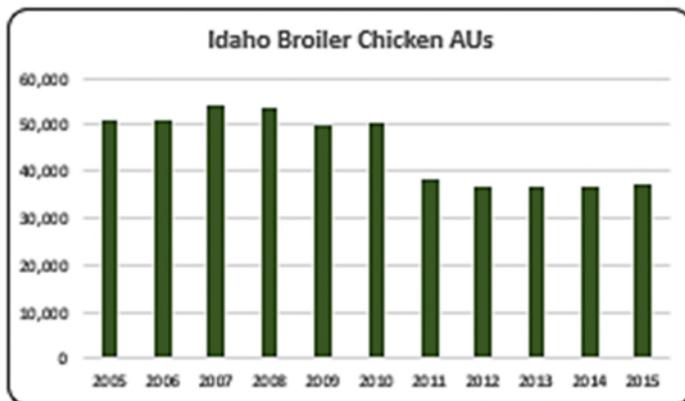
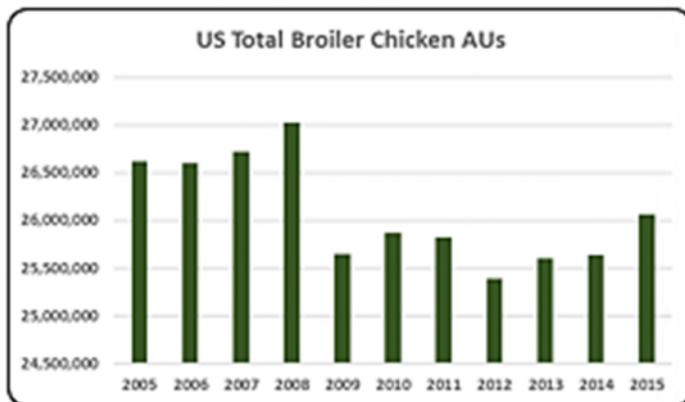
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Idaho. Due to this reality, using a single year as a measure of the presence and strength of a sector can be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

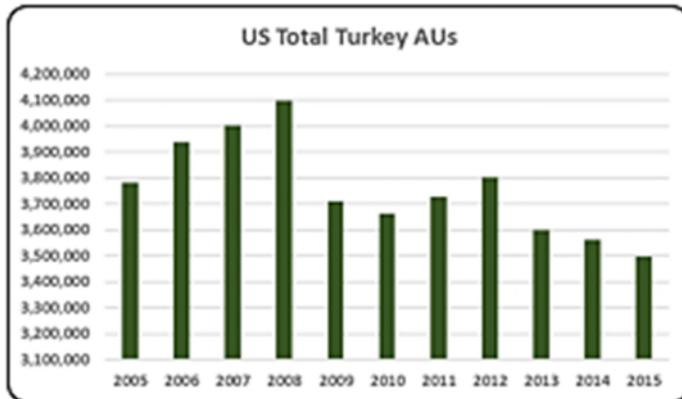
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Idaho, the largest three segments of animal agriculture in terms of AUs during 2015 were: Beef Cows (1.3 million AUs), Dairy Cows (810,600 AUs), and Broilers (37,455 AUs). Total animal units in Idaho during 2015 were 2.2 million AUs.



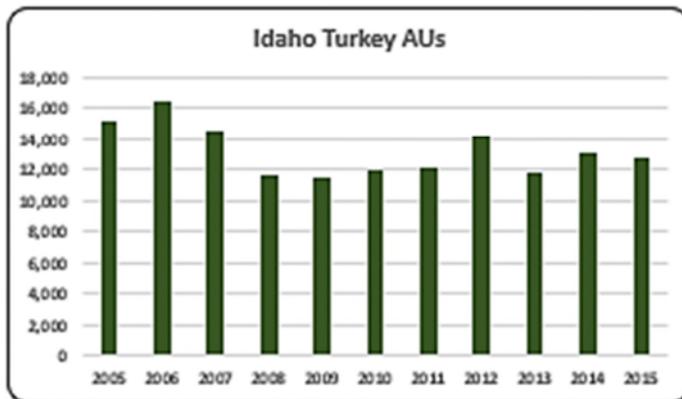
- Overall U.S. total AUs have varied from 2005 to 2015. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2005-15 time period, total AUs in the nation peaked in 2008.
- There were 2.2 million AUs in Idaho in 2015. Beef is the largest animal sector in Idaho with 60.1% of all AUs in the state in 2015.



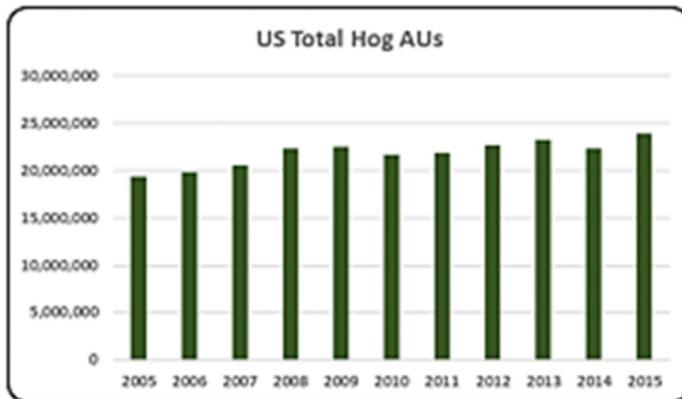
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2005 to 2015, broiler chicken AUs were about 26.0 million. In 2015, AUs rebounded 3% from the low AUs numbers in 2012 (25.4 million AUs).
- There were 37,455 AUs in Idaho that were in the broiler industry. In general, Idaho’s broiler production has declined over this decade.
- 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.
- Idaho’s egg sector is the smallest of all animal production in the state, in 2015 there were 6,610 AUs.



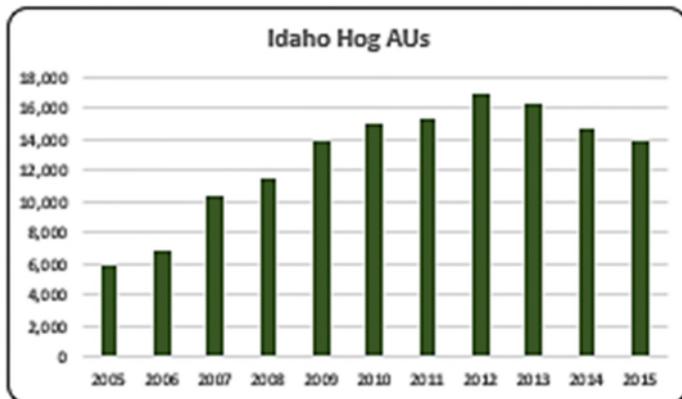
- In 2015 turkey AUs were the lowest of the decade at 3.5 million, decreasing 15% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade. The most recent contributor to this decline has been avian influenza.



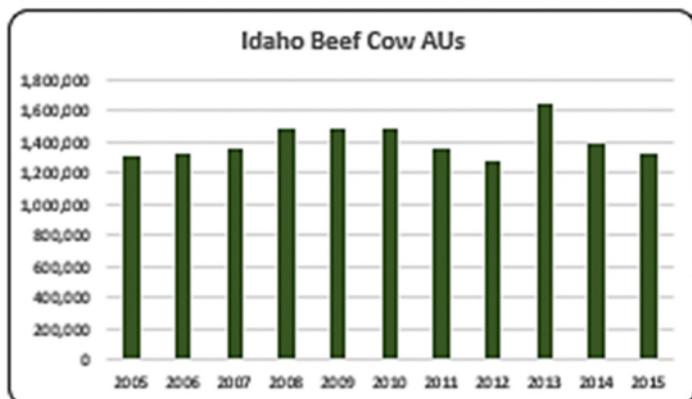
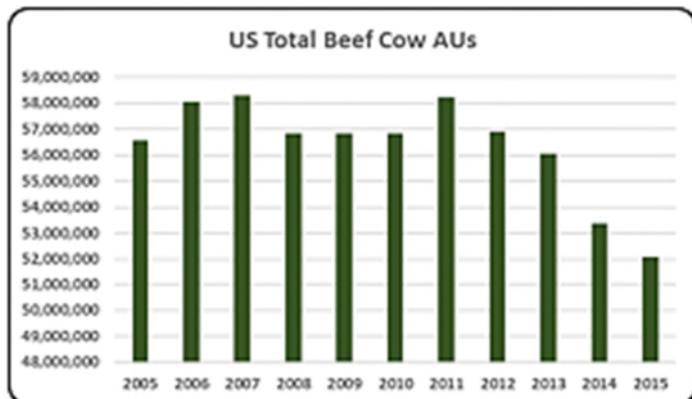
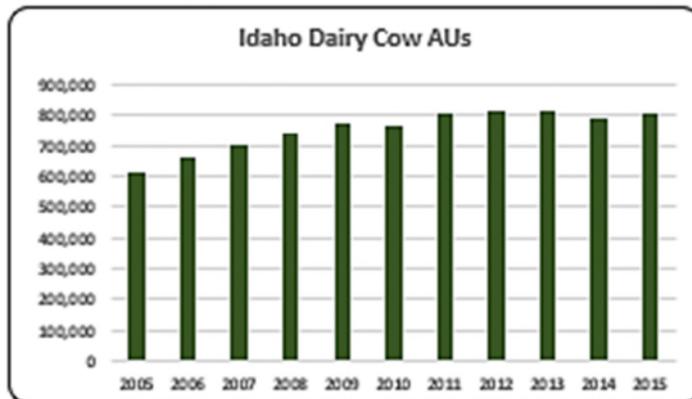
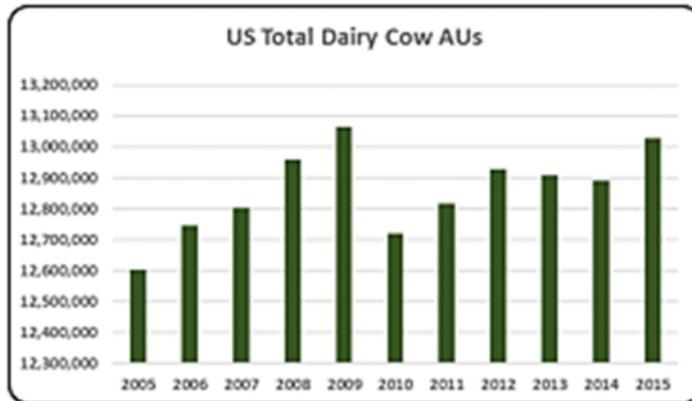
- In 2015, 12,795 AUs in Idaho were turkey AUs. Turkey AUs were 10% below the turkey AUs in 2012.



- 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.



- Hogs AUs decreased to 13,805 in 2015. However, hog numbers have increased since 2005.



- 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.
- In 2015 36.6% of all AUs of the state were dairy cow AUs. In 2015 dairy cow AUs increased to 810,600 AUs, the overall the trend in the dairy cow industry has been positive.
- 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.
- There were 1.3 million beef cow AUs in Idaho in 2015 representing 60.11% of all AUs in the state. Beef cow AUs in 2015 were 19% below the record numbers from 2013 (1.64 million).

Idaho Additional Information and Methodology

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

Idaho 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 Idaho’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 Idaho, \$1.67 to \$2.37 million in total economic activity, \$0.38 to \$0.51 in household wages and 8 to 11 additional jobs are generated in the economy at large.

	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	\$ 2.293	\$ 0.469	9.9
	Hogs, Pigs, and Other	\$ 1.665	\$ 0.385	8.0
	Poultry and Eggs	\$ 2.373	\$ 0.510	11.3
	Dairy	\$ 2.165	\$ 0.500	11.0

Appendix

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Animal Units (AUs)	Beef Cattle AUs	1,309,350	1,317,000	1,353,000	1,483,500	1,483,500	1,483,500	1,355,100	1,279,050	1,642,500	1,382,400	1,328,100
	Hog and Pig AUs	5,880	6,915	10,335	11,430	13,935	14,949	15,245	16,888	16,241	14,697	13,805
	Broiler AUs	51,250	50,904	54,445	53,596	49,832	50,502	38,054	36,850	36,721	36,513	37,455
	Turkey AUs	15,128	16,438	14,570	11,646	11,408	11,882	12,094	14,200	11,846	13,077	12,795
	Egg Layer AUs	5,412	5,222	4,483	4,355	3,809	3,784	3,806	5,325	6,895	5,494	6,610
	Dairy AUs	609,000	662,200	702,800	742,000	775,600	770,000	803,600	813,400	812,000	791,000	810,600
	Total Animal Units	1,996,019	2,058,679	2,139,633	2,306,527	2,338,083	2,334,617	2,227,899	2,165,713	2,526,203	2,243,180	2,209,366
Value of Production (\$1,000)	Cattle and Calves (\$1,000)	\$ 867,997	\$ 858,146	\$ 917,671	\$ 917,195	\$ 806,950	\$ 1,020,475	\$ 1,113,672	\$ 1,240,020	\$ 1,384,324	\$ 1,731,000	\$ 1,688,405
	Hogs and Pigs (\$1,000)	\$ 4,541	\$ 5,351	\$ 8,319	\$ 9,513	\$ 10,366	\$ 13,982	\$ 17,589	\$ 19,411	\$ 17,768	\$ 18,486	\$ 13,131
	Broilers (\$1,000)	\$ 43,067	\$ 33,364	\$ 42,018	\$ 42,927	\$ 37,037	\$ 38,705	\$ 33,886	\$ 36,718	\$ 44,740	\$ 46,935	\$ 40,947
	Turkeys (\$1,000)	\$ 14,370	\$ 16,989	\$ 16,572	\$ 14,302	\$ 13,026	\$ 16,391	\$ 18,230	\$ 23,257	\$ 18,415	\$ 20,837	\$ 22,188
	Eggs (\$1,000)	\$ 11,492	\$ 10,844	\$ 13,354	\$ 32,952	\$ 23,453	\$ 25,745	\$ 28,227	\$ 31,656	\$ 35,765	\$ 57,248	\$ 88,265
	Milk (\$1,000)	\$ 1,422,540	\$ 1,286,790	\$ 2,055,722	\$ 2,105,865	\$ 1,433,700	\$ 1,903,177	\$ 2,438,184	\$ 2,426,882	\$ 2,578,752	\$ 3,204,663	\$ 2,357,038
	Other	\$ 58,179	\$ 54,510	\$ 57,164	\$ 58,830	\$ 59,418	\$ 67,764	\$ 65,742	\$ 67,580	\$ 69,418	\$ 71,255	\$ 73,093
	Sheep and Lambs (\$1,000)	\$ 20,494	\$ 15,592	\$ 17,012	\$ 17,445	\$ 16,800	\$ 23,913	\$ 20,658	\$ 21,262	\$ 21,867	\$ 22,471	\$ 23,075
	Aquaculture (\$1,000)	\$ 37,685	\$ 38,918	\$ 40,152	\$ 41,385	\$ 42,618	\$ 43,851	\$ 45,085	\$ 46,318	\$ 47,551	\$ 48,784	\$ 50,018
	Total (\$1,000)	\$ 2,422,186	\$ 2,265,994	\$ 3,110,819	\$ 3,181,583	\$ 2,383,949	\$ 3,086,239	\$ 3,715,531	\$ 3,845,524	\$ 4,149,181	\$ 5,150,425	\$ 4,283,067

Ag Census Data Category	Animal Type	1997	2002	2007	2012	
Number of Farms by NAICS	Beef cattle ranching and farming (112111)	7,697	7,027	7,712	7,505	
	Cattle feedlots (112112)	443	686	517	150	
	Dairy cattle and milk production (11212)	926	748	677	589	
	Hog and pig farming (1122)	180	340	250	217	
	Poultry and egg production (1123)	84	143	267	345	
	Sheep and goat farming (1124)	465	653	835	815	
	Animal aquaculture and other animal production (1125,1129)	2,153	5,345	3,468	3,112	
Value of Sales (\$1,000)	Cattle and Calves	907,428	1,149,407	1,383,742	1,808,929	
	Hogs and Pigs	5,188	3,260	6,757	withheld	
	Poultry and Eggs	15,111	12,636	12,673	49,733	
	Milk and Other Dairy Products	556,225	869,526	1,843,788	2,333,364	
	Aquaculture	35,919	39,840	56,219	52,582	
	Other (calculated)	51,655	46,421	60,797	75,765	
	Total	1,571,526	2,121,090	3,363,976	4,320,373	
Input Purchases	Livestock and poultry purchased	(Farms) 7,820	7,350	6,598	7,669	
		\$1,000	469,600	616,224	584,795	633,046
	Breeding livestock purchased	(Farms) <i>n/a</i>	3,871	3,473	4,155	
		\$1,000	<i>n/a</i>	93,697	128,710	102,481
	Other livestock and poultry purchased	(Farms) <i>n/a</i>	4,439	4,074	4,718	
		\$1,000	<i>n/a</i>	522,527	456,085	530,564
Feed purchased	(Farms)	11,438	14,692	13,075	14,615	
	\$1,000	450,829	646,250	1,137,906	1,921,092	

	Animal Type	Output (\$1,000)	Earnings (\$1,000)	Employment (Jobs)	Taxes Paid (\$1,000)
2015 Animal Agriculture	Cattle and Calves	\$ 3,872,188	\$ 792,031	16,700	\$ 219,630
	Hogs, Pigs, and Other	\$ 143,597	\$ 33,187	693	\$ 9,203
	Poultry and Eggs	\$ 359,273	\$ 77,199	1,705	\$ 21,407
	Dairy	\$ 5,103,930	\$ 1,178,048	26,026	\$ 326,673
	Total	\$ 9,478,988	\$ 2,080,465	45,124	\$ 576,913
Change from 2005 to 2015	Cattle and Calves	\$ 1,456,308	\$ 297,878	6,281	\$ 82,602
	Hogs, Pigs, and Other	\$ 16,831	\$ 3,890	81	\$ 1,079
	Poultry and Eggs	\$ 160,766	\$ 34,545	763	\$ 9,579
	Dairy	\$ 1,365,581	\$ 315,192	6,963	\$ 87,403
	Total	\$ 2,999,486	\$ 651,505	14,088	\$ 180,662
	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)	
RIMS II Multipliers	Cattle and Calves	\$ 2.293	\$ 0.469	9.9	
	Hogs, Pigs, and Other	\$ 1.665	\$ 0.385	8.0	
	Poultry and Eggs	\$ 2.373	\$ 0.510	11.3	
	Dairy	\$ 2.165	\$ 0.500	11.0	
Tax Rates	Federal effective income tax rate				12.7%
	Federal Social Security tax rate				7.7%
	State Effective Rate				7.4%
	Total				27.7%

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.