

Economic Analysis of Animal Agriculture 2005-2015

UTAH

**A Report for
United Soybean Board**



September 2016



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11107 Aurora Ave

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Utah Executive Summary

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

- \$2.7 billion in economic output
- 19,492 jobs
- \$606.0 million in earnings
- \$153.5 million in income taxes paid at local, state, and federal levels
- \$34.0 million in the form of property taxes

Plus, from 2005-2015 animal agriculture in Utah has increased economic output by over \$657.1 million, boosted household earnings by \$145.8 million, contributed 4,362 additional jobs and paid \$36.9 million in additional tax revenues.

Utah's animal agriculture consumed almost 148.6 thousand tons of soybean meal in 2015. This soybean meal was fed primarily to:

- Hogs (67.8 thousand tons)
- Turkeys (30.5 thousand tons)
- Egg-Laying Hens (28.2 thousand tons)

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

Utah Economic Impact of Animal Agriculture

Animal agriculture is an important part of Utah’s economy. In 2015, Utah’s animal agriculture contributed the following to the economy:

- About \$2.7 billion in economic output
- \$606.0 million in household earnings
- 19,492 jobs
- \$153.5 million in income taxes

And the animal agriculture sector has shown growth during challenging economic times. During the last decade Utah’s animal agriculture has:

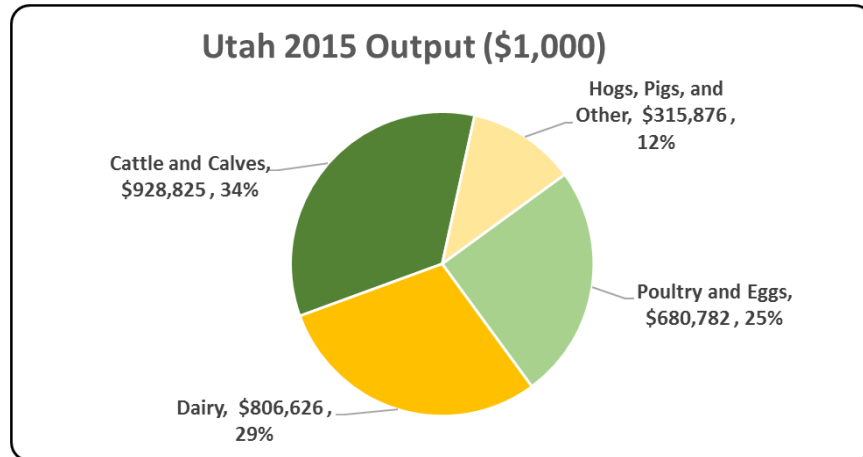
- Increased economic output by \$657.1 million
- Boosted household earnings by \$145.8 million
- Added 4,362 jobs
- Paid an additional \$36.9 million in income taxes

Below is a table which demonstrates this decade of change.

Measure	2015	Change 2005-2015	% Change 2005-2015
Output (\$1,000)	\$ 2,732,109	\$ 657,071	31.67%
Earnings (\$1,000)	\$ 605,981	\$ 145,818	31.69%
Employment (Jobs)	19,492	4,362	28.83%
Income Taxes Paid (\$1,000)	\$ 153,495	\$ 36,936	31.69%
Property Taxes Paid in 2012 (\$1,000)	\$ 33,965		

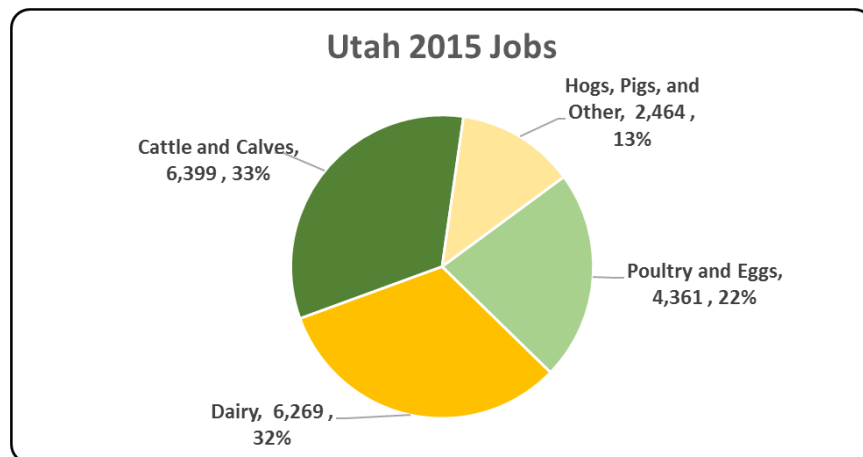
Utah Output

“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 Utah economy. Animal agriculture’s impact on Utah total economic output is about \$2.7 billion.



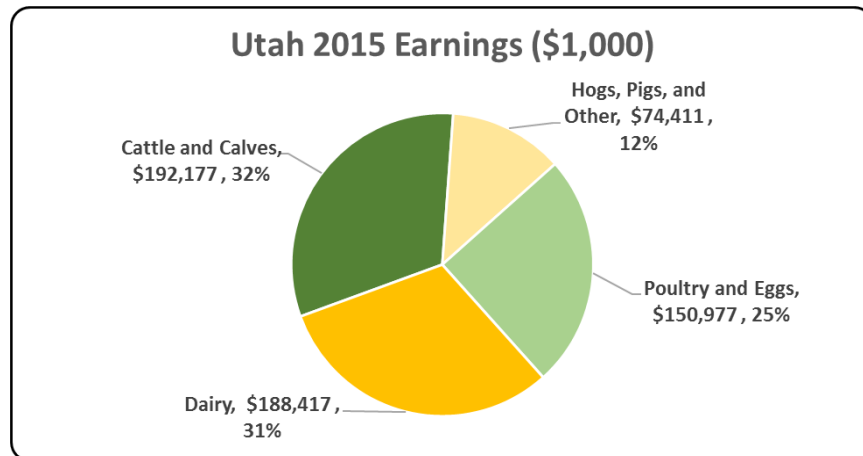
Utah Jobs

“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 Utah in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Utah total jobs, contributing 19,492 jobs within and outside of animal agriculture.



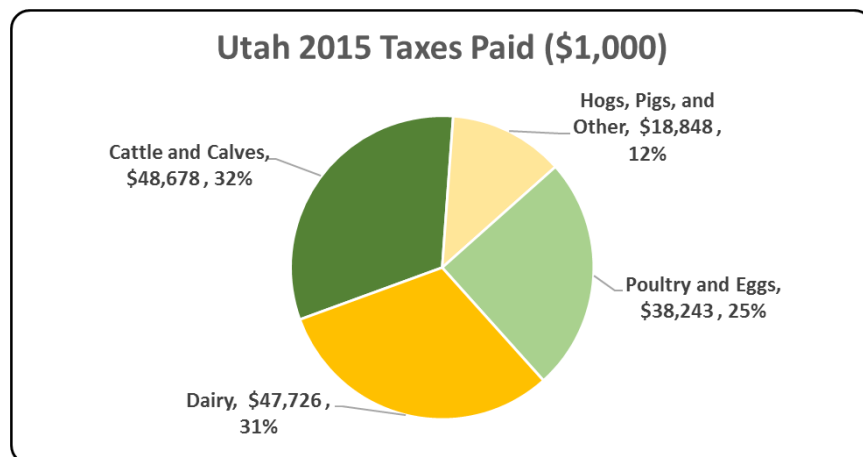
Utah Earnings

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 Utah economy in terms of earnings. Utah’s animal agriculture contributed about \$606.0 million to household earnings in 2015.



Utah Taxes Paid by Animal Agriculture

Utah’s animal agriculture is also a source of tax revenue. In 2015, the state’s animal agriculture industry paid about \$153.5 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$34.0 million in property taxes paid by all of Utah agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



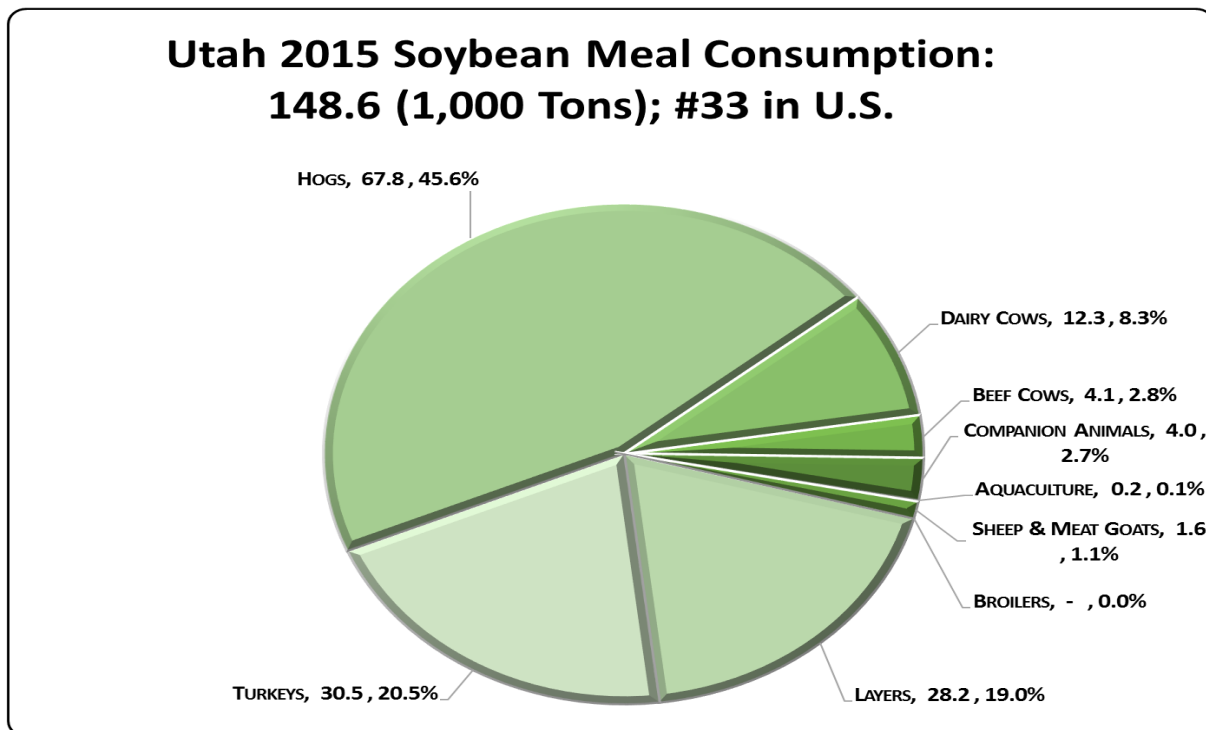
Utah Animal Agriculture Soybean Meal Consumption

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.

Utah’s animal agriculture consumed almost 148.6 thousand tons of soybean meal in 2015, placing the state as #33 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:

- Hogs (67.8 thousand tons)
- Turkeys (30.5 thousand tons)
- Egg-Laying Hens (28.2 thousand tons)

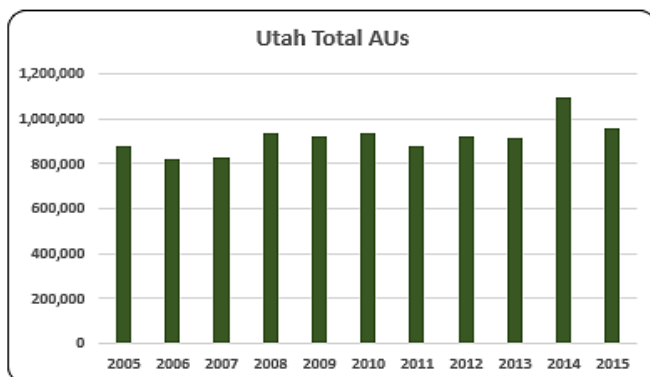
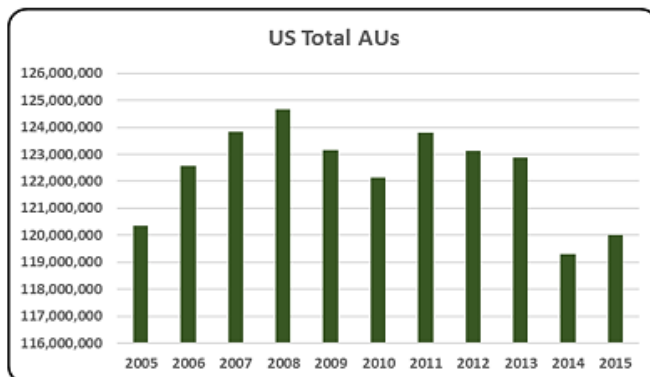


Utah Animal Unit (AU) Trends

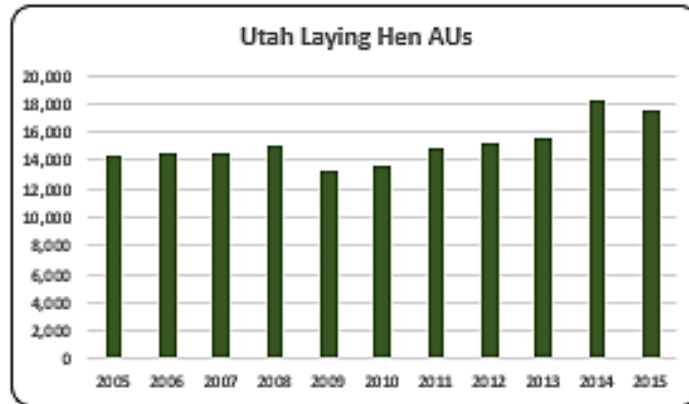
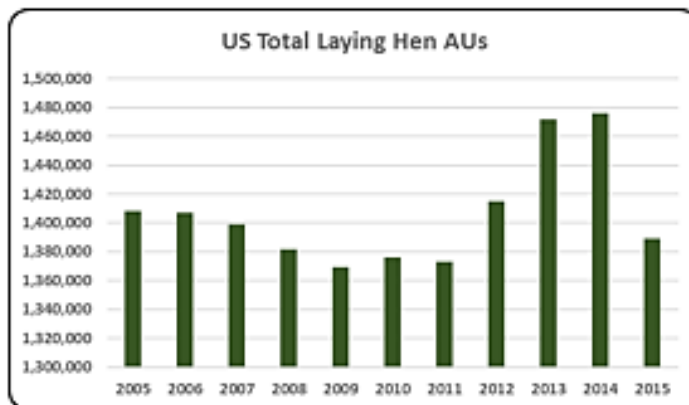
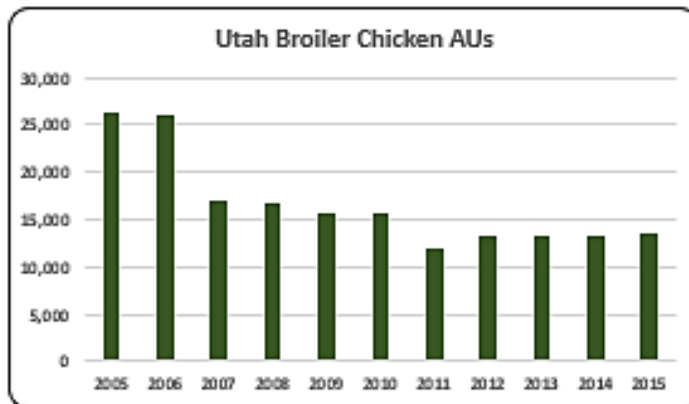
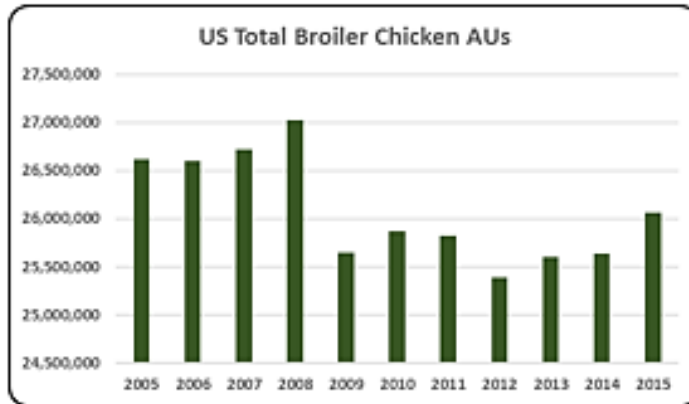
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Utah. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading.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

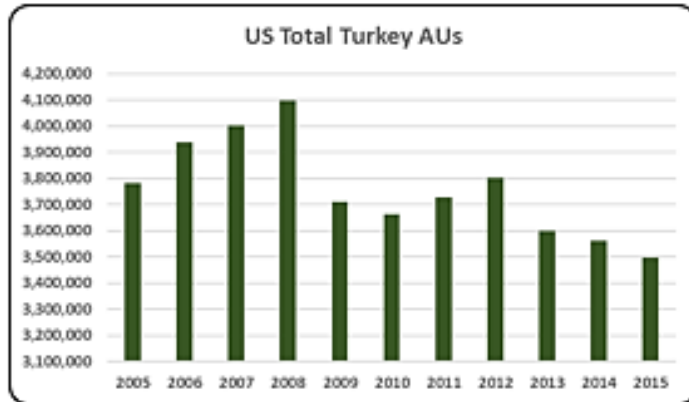
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Utah, the largest three segments of animal agriculture in terms of AUs during 2015 were: Beef Cows (550,800 AUs), Hogs (188,325 AUs), and Dairy Cows (134,400 AUs). Total animal units in Utah during 2015 were 958,199 AUs.



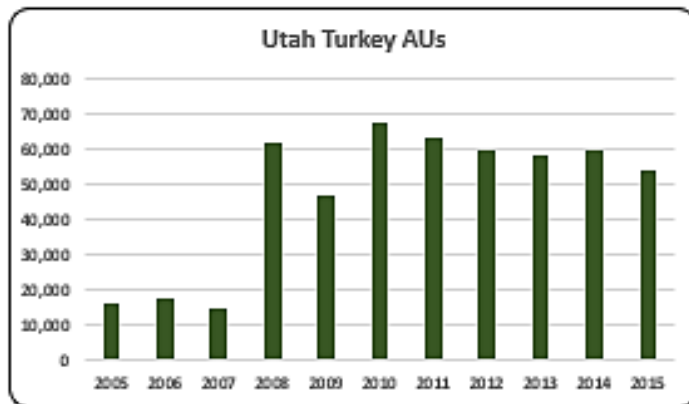
- Overall U.S. total AUs have varied from 2005 to 2015. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2005-15 time period, total AUs in the nation peaked in 2008.
- Less than 1% (958,199 AUs) of animal production in the U.S. was in Utah in 2015. Animal production in Utah in 2015 was 12% down from the animal production a decade earlier (1.1 million AUs).



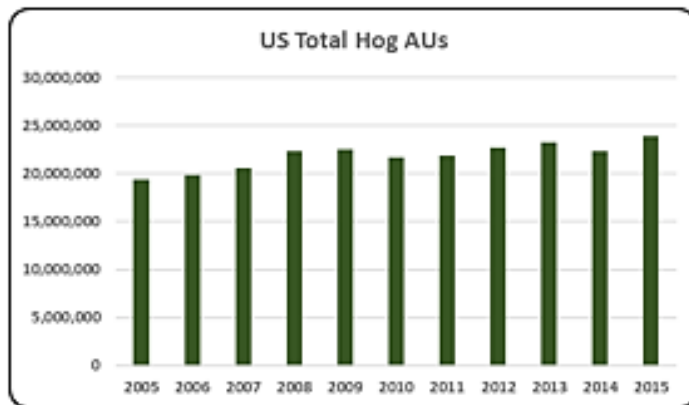
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2005 to 2015, broiler chicken AUs were about 26.0 million. In 2015, AUs rebounded 3% from the low AUs numbers in 2012 (25.4 million AUs).
- Only 1.4% (13,536 broiler AUs) of all animal production in Utah in 2015 was concentrated in broiler production. Broiler production in 2005 (26,212 broiler AUs) was 48% below 2015 broiler production.
- 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.
- Utah layer production was only 1.84% (17,609 layer AUs) of all animal production in 2015. Layer production in 2015 was 23% higher than a decade earlier (14,321 layer AUs).



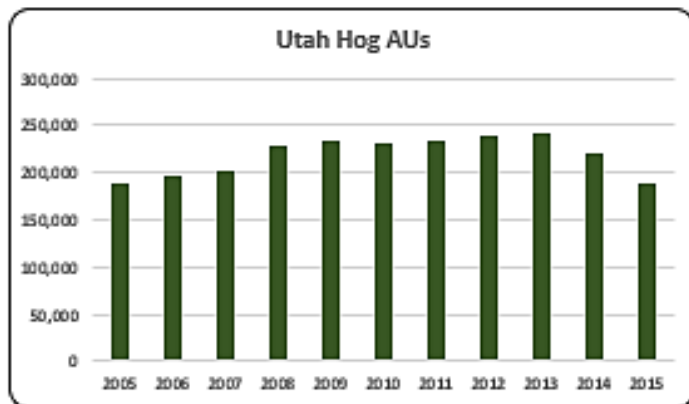
- In 2015 turkey AUs were the lowest of the decade at 3.5 million, decreasing 15% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade. The most recent contributor to this decline has been avian influenza.



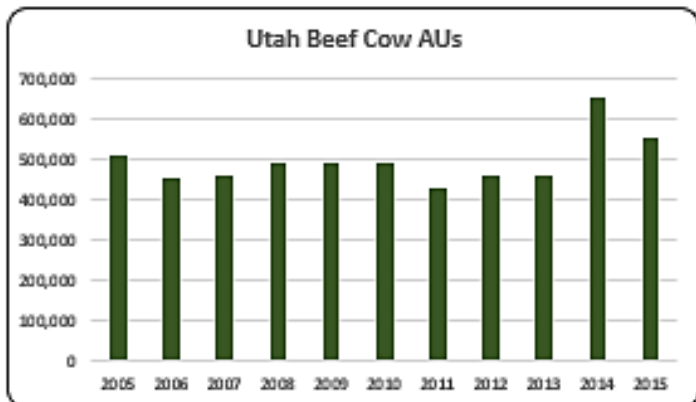
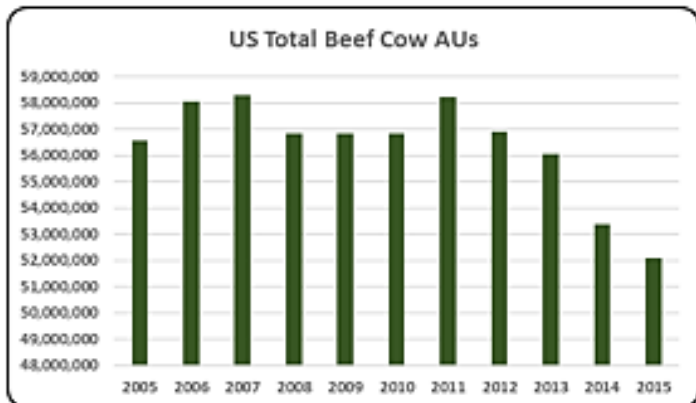
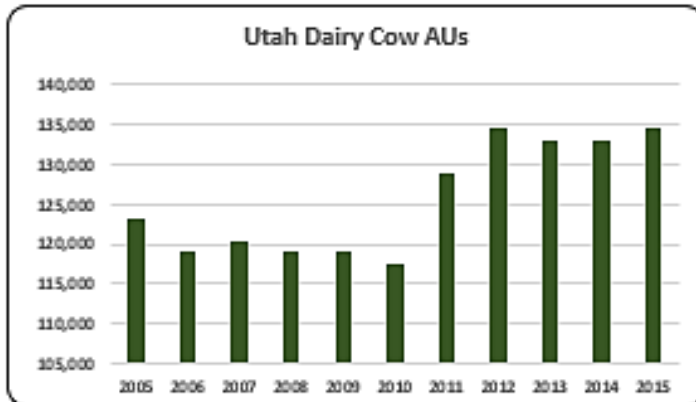
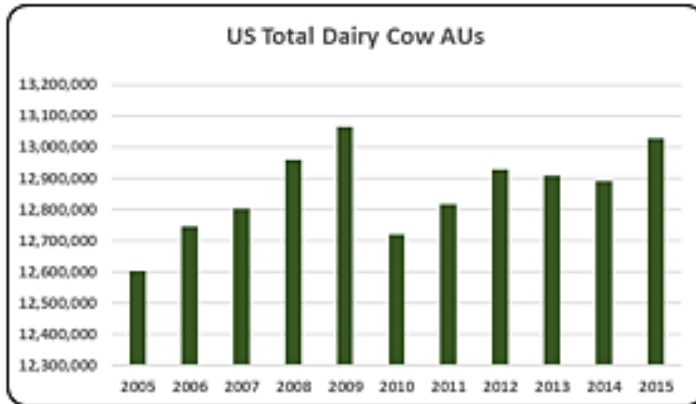
- Turkey production in 2015 (53,529 turkey AUs) was 227% higher than production in 2005 (16,368 turkey AUs).



- 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.



- There were 188,325 hog AUs in Utah in 2015. Hog AUs decreased 22% from 2013, however hog production in 2015 was 0% higher than ten years earlier (188,250 hog AUs).



- 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.

- There were, on average, 125,618 dairy cow AUs during the 2005-2015 period. The level of dairy cow AUs in 2015 (134,400) was 9% above the level of dairy cow AUs in 2005 (123,200).

- 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.

- About 57.48% of all animal production in Utah in 2015 was concentrated in beef cow production. Beef cow AUs in 2015 (550,800 beef cow AUs) were 8% larger than in 2005 (510,750 beef cow AUs).

Utah Additional Information and Methodology

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

Utah 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 Utah’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 Utah, \$1.74 to \$2.36 million in total economic activity, \$0.41 to \$0.52 in household wages and 14 to 17 additional jobs are generated in the economy at large.

	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	\$ 2.043	\$ 0.423	14.1
	Hogs, Pigs, and Other	\$ 1.736	\$ 0.409	13.5
	Poultry and Eggs	\$ 2.361	\$ 0.524	15.1
	Dairy	\$ 2.135	\$ 0.499	16.6

Appendix

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Animal Units (AUs)	Beef Cattle AUs	510,750	449,850	461,850	492,450	492,450	492,450	425,700	459,825	456,150	650,250	550,800
	Hog and Pig AUs	188,250	195,450	202,200	229,050	233,100	232,350	233,850	240,450	242,475	220,275	188,325
	Broiler AUs	26,212	26,035	16,987	16,722	15,548	15,757	11,873	13,317	13,270	13,195	13,536
	Turkey AUs	16,368	17,785	15,197	61,898	46,890	67,292	62,809	59,892	57,932	59,593	53,529
	Egg Layer AUs	14,321	14,451	14,617	15,069	13,360	13,584	14,848	15,220	15,600	18,249	17,609
	Dairy AUs	123,200	119,000	120,400	119,000	119,000	117,600	128,800	134,400	133,000	133,000	134,400
	Total Animal Units	879,101	822,571	831,250	934,189	920,348	939,032	877,880	923,104	918,427	1,094,563	958,199
Value of Production (\$1,000)	Cattle and Calves (\$1,000)	\$ 351,595	\$ 250,377	\$ 222,428	\$ 194,220	\$ 185,264	\$ 231,323	\$ 272,474	\$ 302,585	\$ 374,285	\$ 488,740	\$ 454,749
	Hogs and Pigs (\$1,000)	\$ 164,344	\$ 139,583	\$ 152,190	\$ 163,240	\$ 153,912	\$ 184,623	\$ 209,304	\$ 192,252	\$ 210,555	\$ 230,964	\$ 161,658
	Broilers (\$1,000)	\$ 22,027	\$ 17,064	\$ 13,110	\$ 13,393	\$ 11,555	\$ 12,076	\$ 10,572	\$ 13,269	\$ 16,168	\$ 16,962	\$ 14,798
	Turkeys (\$1,000)	\$ 15,548	\$ 18,381	\$ 17,284	\$ 61,109	\$ 38,858	\$ 72,159	\$ 69,088	\$ 73,370	\$ 68,569	\$ 71,121	\$ 74,108
	Eggs (\$1,000)	\$ 23,248	\$ 30,727	\$ 52,618	\$ 72,422	\$ 52,470	\$ 64,329	\$ 70,840	\$ 72,537	\$ 81,139	\$ 107,255	\$ 199,439
	Milk (\$1,000)	\$ 245,828	\$ 221,869	\$ 327,348	\$ 322,904	\$ 216,062	\$ 312,174	\$ 403,956	\$ 382,272	\$ 415,545	\$ 517,608	\$ 377,740
	Other	\$ 21,817	\$ 17,332	\$ 16,712	\$ 18,198	\$ 18,003	\$ 22,294	\$ 19,647	\$ 19,815	\$ 19,983	\$ 20,151	\$ 20,319
	Sheep and Lambs (\$1,000)	\$ 21,258	\$ 16,761	\$ 16,129	\$ 17,603	\$ 17,395	\$ 21,674	\$ 19,016	\$ 19,171	\$ 19,327	\$ 19,483	\$ 19,639
	Aquaculture (\$1,000)	\$ 559	\$ 571	\$ 583	\$ 595	\$ 608	\$ 620	\$ 632	\$ 644	\$ 656	\$ 668	\$ 680
	Total (\$1,000)	\$ 844,406	\$ 695,333	\$ 801,690	\$ 845,487	\$ 676,124	\$ 898,978	\$ 1,055,882	\$ 1,056,100	\$ 1,186,245	\$ 1,452,801	\$ 1,302,811

Ag Census Data Category	Animal Type	1997	2002	2007	2012	
Number of Farms by NAICS	Beef cattle ranching and farming (112111)	5,309	4,202	5,183	5,231	
	Cattle feedlots (112112)	433	583	415	126	
	Dairy cattle and milk production (11212)	614	464	335	248	
	Hog and pig farming (1122)	114	179	205	199	
	Poultry and egg production (1123)	171	334	359	214	
	Sheep and goat farming (1124)	667	582	895	763	
	Animal aquaculture and other animal production (1125,1129)	1,878	3,482	2,813	3,760	
Value of Sales (\$1,000)	Cattle and Calves	260,758	371,418	347,299	364,214	
	Hogs and Pigs	40,758	153,112	196,595	290,632	
	Poultry and Eggs	68,129	84,178	140,359	140,131	
	Milk and Other Dairy Products	196,448	196,812	292,141	326,364	
	Aquaculture	1,931	5,746	4,074	6,709	
	Other (calculated)	65,219	46,835	62,813	93,368	
	Total	633,243	858,101	1,043,281	1,221,418	
Input Purchases	Livestock and poultry purchased	(Farms)	5,266	5,172	4,826	6,025
		\$1,000	82,463	158,687	132,323	114,862
	Breeding livestock purchased	(Farms)	n/a	2,702	2,864	3,353
		\$1,000	n/a	18,789	31,074	38,315
	Other livestock and poultry purchased	(Farms)	n/a	3,092	2,836	3,566
		\$1,000	n/a	139,898	101,250	76,547
Feed purchased	(Farms)	7,655	9,479	9,214	11,921	
	\$1,000	198,854	244,175	389,568	611,302	

	Animal Type	Output (\$1,000)	Earnings (\$1,000)	Employment (Jobs)	Taxes Paid (\$1,000)
2015 Animal Agriculture	Cattle and Calves	\$ 928,825	\$ 192,177	6,399	\$ 48,678
	Hogs, Pigs, and Other	\$ 315,876	\$ 74,411	2,464	\$ 18,848
	Poultry and Eggs	\$ 680,782	\$ 150,977	4,361	\$ 38,243
	Dairy	\$ 806,626	\$ 188,417	6,269	\$ 47,726
	Total	\$ 2,732,109	\$ 605,981	19,492	\$ 153,495
Change from 2005 to 2015	Cattle and Calves	\$ 57,295	\$ 11,855	395	\$ 3,003
	Hogs, Pigs, and Other	\$ (76,286)	\$ (17,971)	(595)	\$ (4,552)
	Poultry and Eggs	\$ 506,506	\$ 112,328	3,244	\$ 28,453
	Dairy	\$ 169,555	\$ 39,606	1,318	\$ 10,032
	Total	\$ 657,071	\$ 145,818	4,362	\$ 36,936
	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)	
RIMS II Multipliers	Cattle and Calves	\$ 2.043	\$ 0.423	14.1	
	Hogs, Pigs, and Other	\$ 1.736	\$ 0.409	13.5	
	Poultry and Eggs	\$ 2.361	\$ 0.524	15.1	
	Dairy	\$ 2.135	\$ 0.499	16.6	
Tax Rates	Federal effective income tax rate				12.7%
	Federal Social Security tax rate				7.7%
	State Effective Rate				5.0%
	Total				25.3%

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