

# Economic Analysis of Animal Agriculture 2005-2015

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## *CALIFORNIA*

**A Report for  
United Soybean Board**



**September 2016**



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## California Executive Summary

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

- \$19.6 billion in economic output
- 89,423 jobs
- \$4.5 billion in earnings
- \$1.3 billion in income taxes paid at local, state, and federal levels
- \$827.6 million in the form of property taxes

Plus, from 2005-2015 animal agriculture in California has increased economic output by over \$2.4 billion, boosted household earnings by \$505.2 million, contributed 9,594 additional jobs and paid \$149.7 million in additional tax revenues.

California's animal agriculture consumed almost 648.8 thousand tons of soybean meal in 2015. This soybean meal was fed primarily to:

- Dairy Cows (227.7 thousand tons)
- Broilers (165.9 thousand tons)
- Turkeys (97.5 thousand tons)

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

## California Economic Impact of Animal Agriculture

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

- About \$19.6 billion in economic output
- \$4.5 billion in household earnings
- 89,423 jobs
- \$1.3 billion in income taxes

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

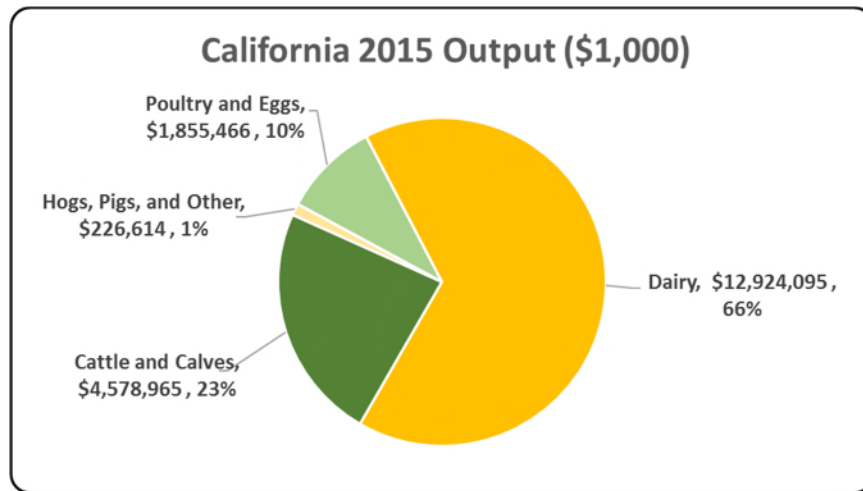
- Increased economic output by \$2.4 billion
- Boosted household earnings by \$505.2 million
- Added 9,594 jobs
- Paid an additional \$149.7 million in income taxes

Below is a table which demonstrates this decade of change.

Measure	2015	Change 2005-2015	% Change 2005-2015
Output (\$1,000)	\$ 19,585,141	\$ 2,395,540	13.94%
Earnings (\$1,000)	\$ 4,518,775	\$ 505,246	12.59%
Employment (Jobs)	89,423	9,594	12.02%
Income Taxes Paid (\$1,000)	\$ 1,338,913	\$ 149,705	12.59%
Property Taxes Paid in 2012 (\$1,000)	\$ 827,587		

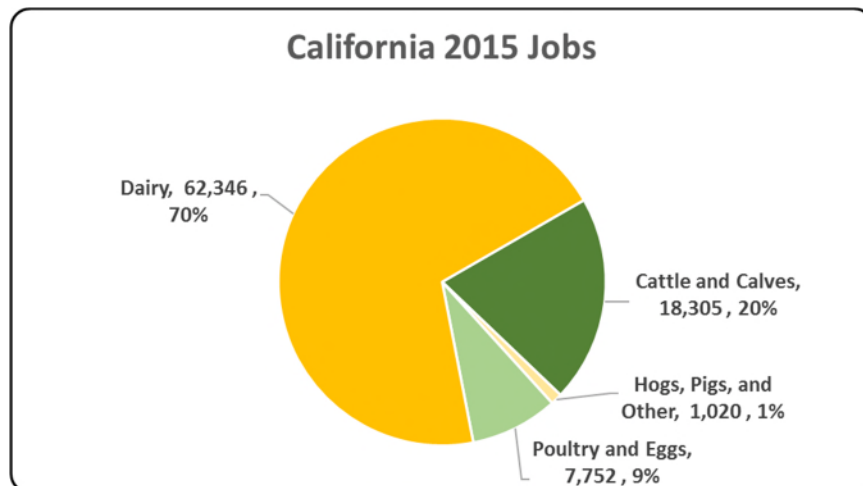
### California Output

“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 California economy. Animal agriculture’s impact on California total economic output is about \$19.6 billion.



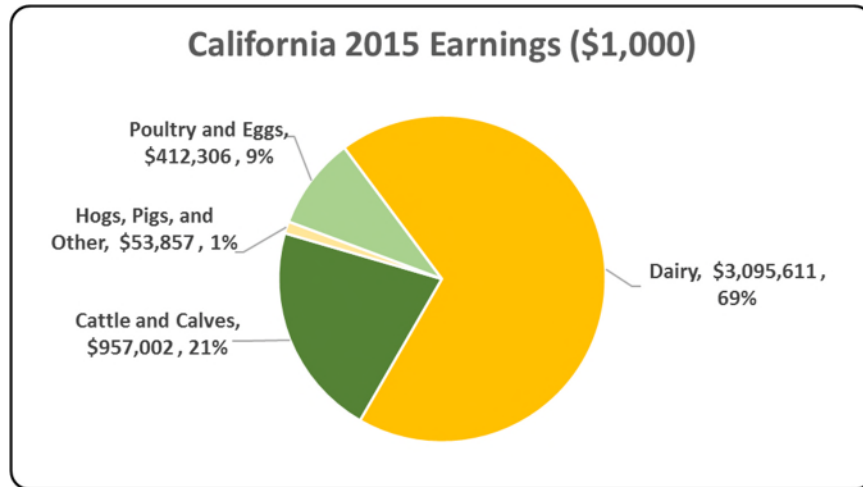
### California Jobs

“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 California in terms of animal agriculture jobs. As shown, animal agriculture contributes 89,423 jobs within and outside of animal agriculture.



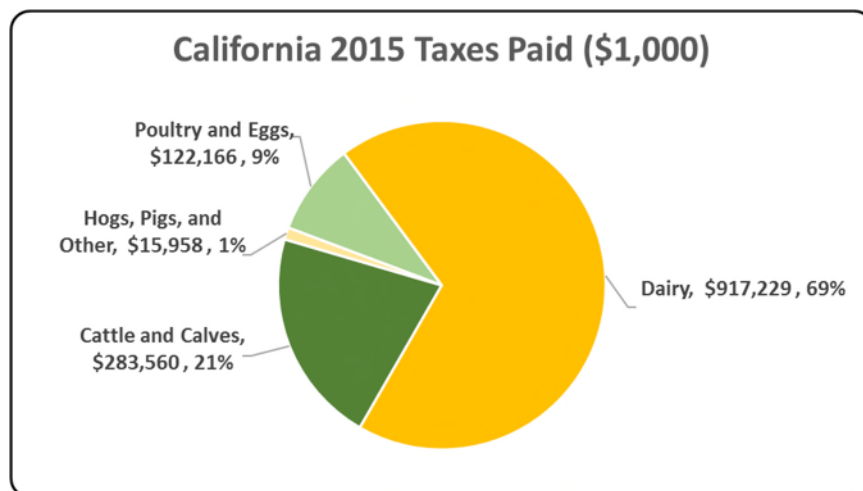
### California Earnings

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 California economy in terms of earnings. California's animal agriculture contributed about \$4.5 billion to household earnings in 2015.



### California Taxes Paid by Animal Agriculture

California's animal agriculture is also a significant source of tax revenue. In 2015, the state's animal agriculture industry paid about \$1.3 billion in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$827.6 million in property taxes paid by all of California agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



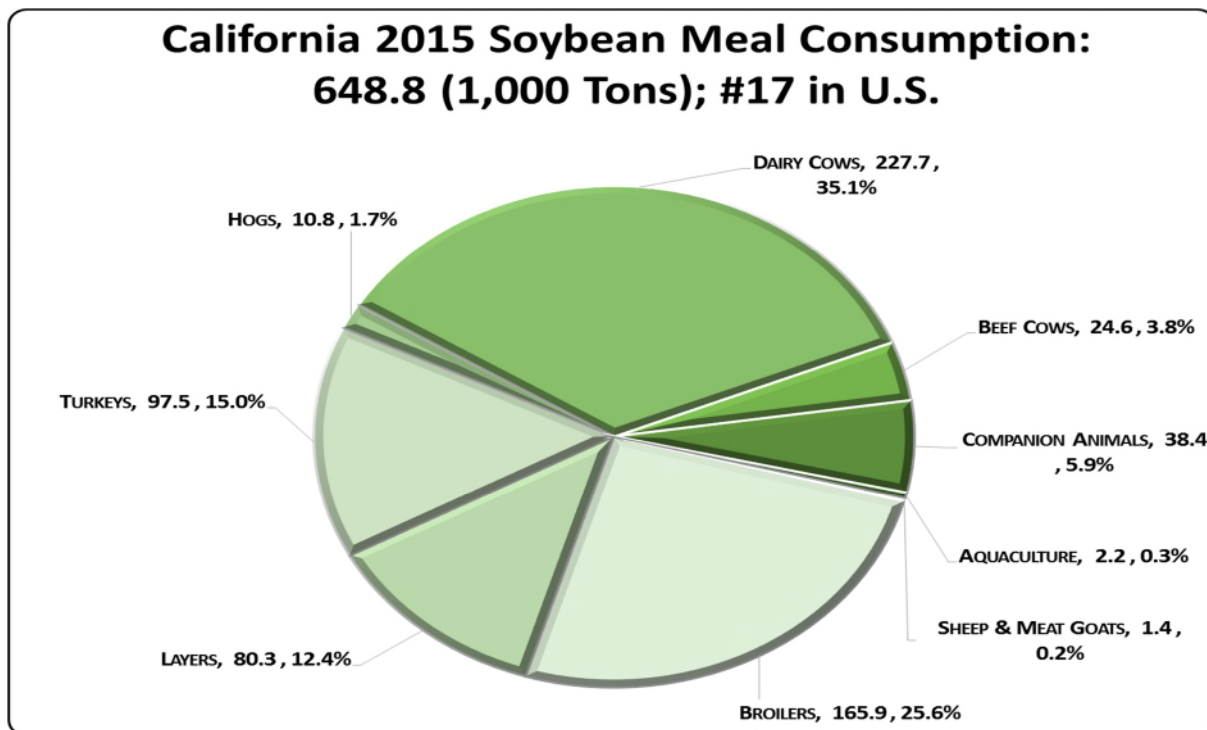
### California Animal Agriculture Soybean Meal Consumption

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.

California’s animal agriculture consumed almost 648.8 thousand tons of soybean meal in 2015, placing the state as #17 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 (227.7 thousand tons)
- Broilers (165.9 thousand tons)
- Turkeys (97.5 thousand tons)

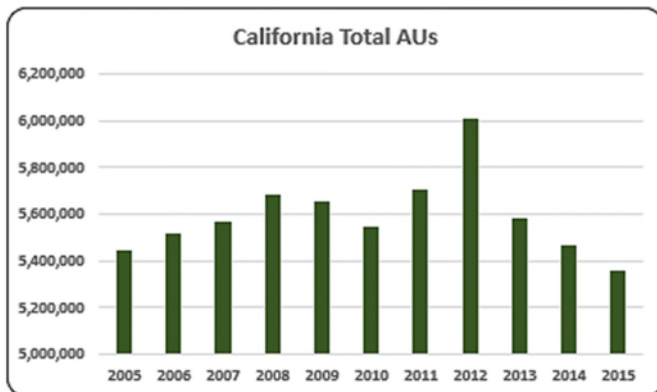
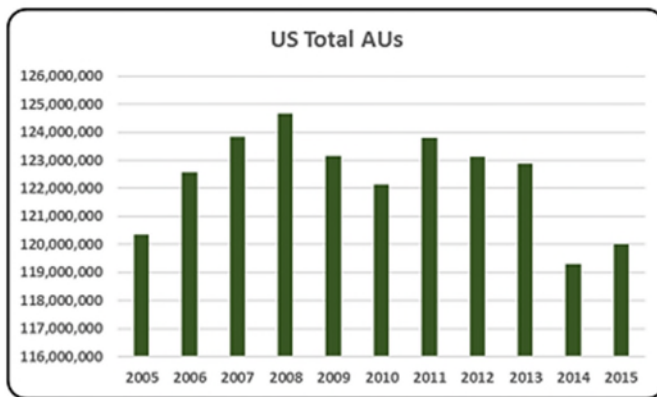


### California Animal Unit (AU) Trends

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 California. 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 California and to give perspective on California’s contribution to the nation’s animal agriculture industry and beyond.

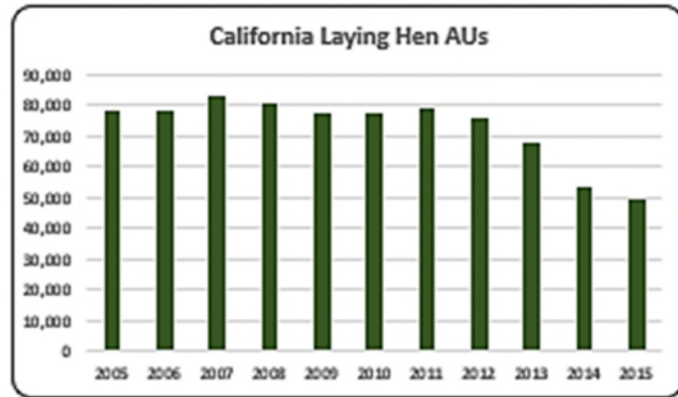
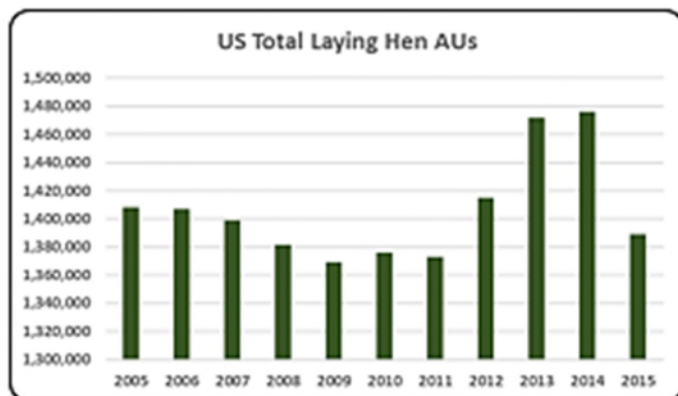
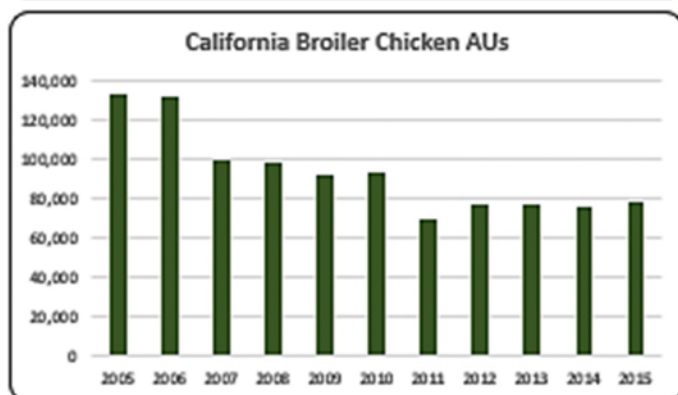
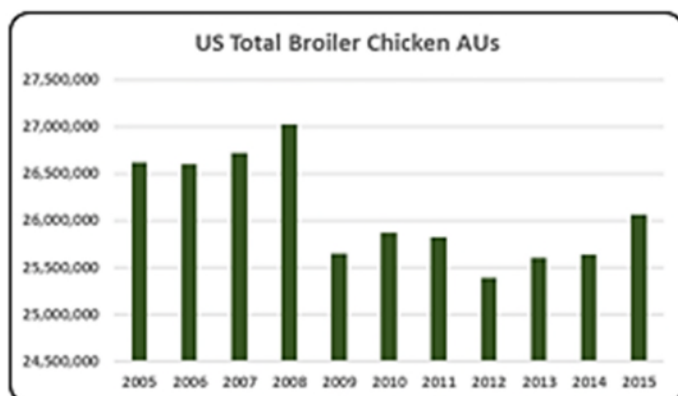
Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

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 California, the largest three segments of animal agriculture in terms of AUs during 2015 were: Beef Cows (2.5 million AUs), Dairy Cows (2.5 million AUs), and Turkeys (170,996 AUs). Total animal units in California during 2015 were almost 5.4 million AUs.

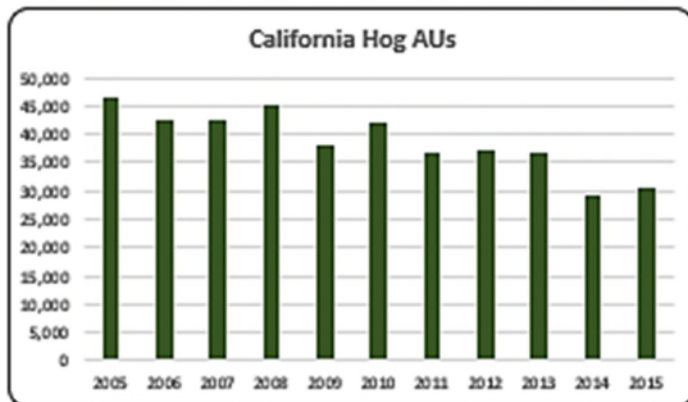
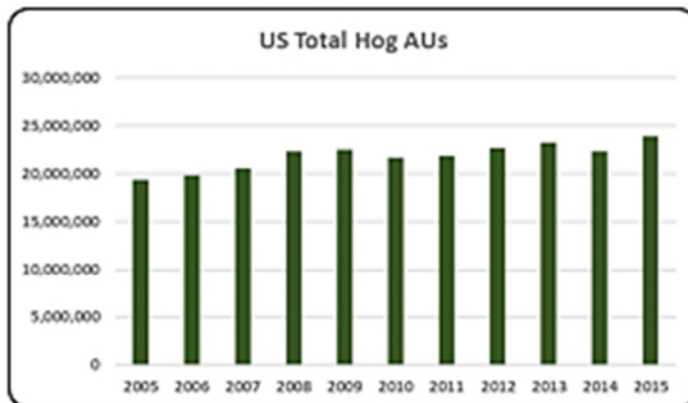
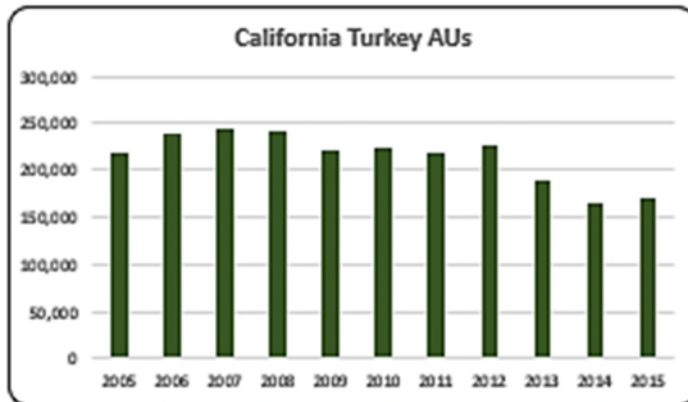
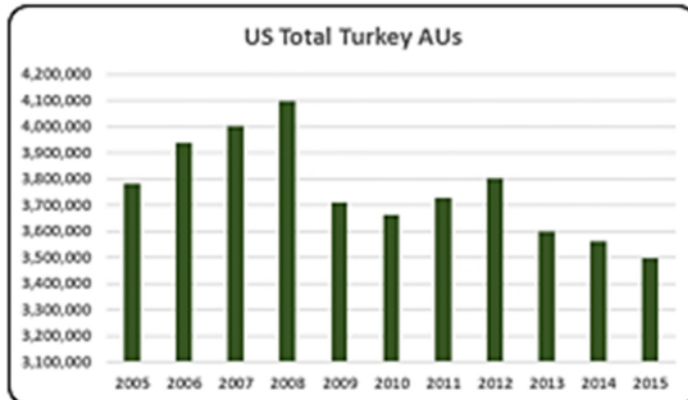


- Overall U.S. total AUs have varied from 2005 to 2015. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2005-15 time period, total AUs in the nation peaked in 2008.
- California’s total AUs in 2015 reached a level of nearly 5.4 million. From 2005 to 2015 AUs in California averaged 5.6 million.

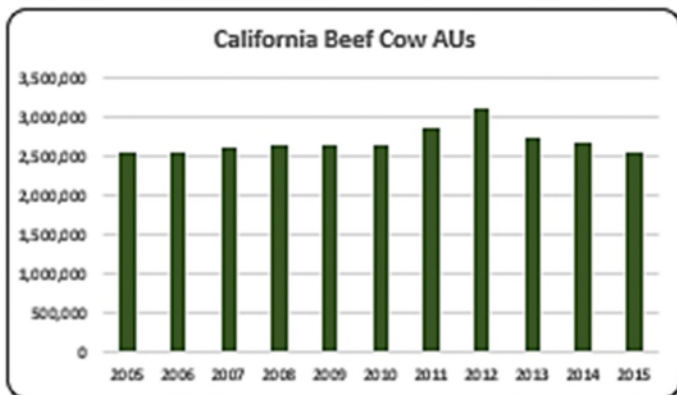
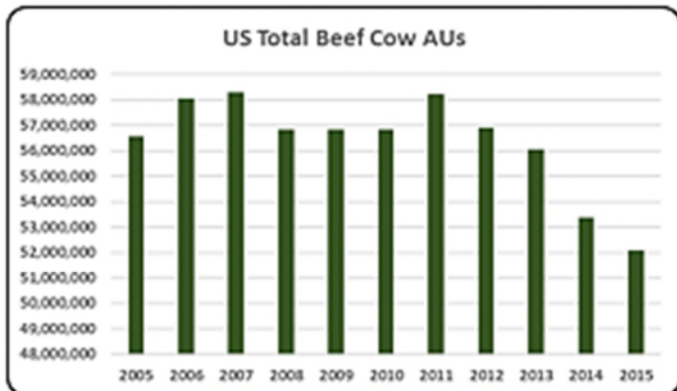
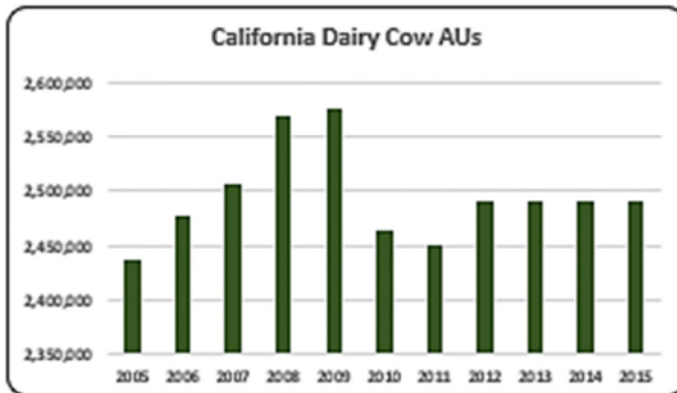
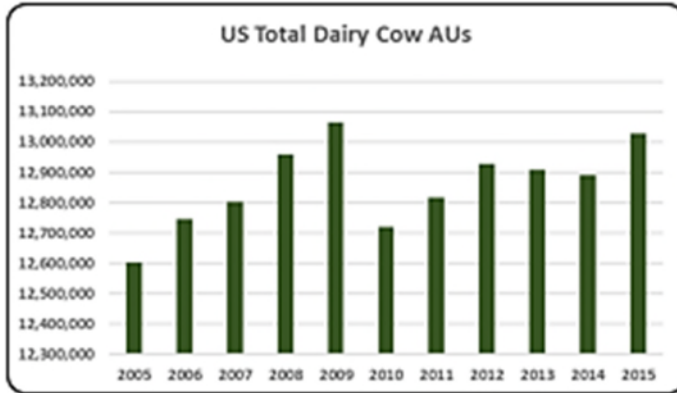




- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2005 to 2015, broiler chicken AUs were about 26.0 million. In 2015, AUs rebounded 3% from the low AUs numbers in 2012 (25.4 million AUs).
- Over the last decade there were, on average, 92,957 broiler AUs in California. Overall, broiler numbers in California declined since 2006, but broiler AUs over the last four years has been steady at about 76,873 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.
- In 2015, there were 49,217 layer AUs in California. Layer AUs have consistently decreased since 2005 (78,304 AUs) to 2015 (49,217).



- 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 170,996 turkey AUs in California in 2015. Turkey AUs have increased this past year since their drop in 2014 (163,882).
- 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.
- California’s hog AUs dwindled 34% to 30,600 AUs, and these were the lowest of the decade. In contrast, 2005 hog AUs (46,350) were the highest of the period.



- 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.
- California had 19.1% (nearly 2.5 million) of all dairy cow AUs in the U.S. in 2015; however, California’s dairy cow AUs in 2015 (2.49 million) were lower than in 2008-2009 (2.57 million).
- 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.
- California’s beef cow AUs in 2015 reported in at 2.5 million animal units. Beef cow AUs averaged in at 2.6 million AUs from the 2005-2015 decade.

## California Additional Information and Methodology

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

## California 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 California'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 California, \$1.60 to \$2.09 million in total economic activity, \$0.38 to \$0.49 in household wages and 7 to 10 additional jobs are generated in the economy at large.

	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	\$ 1.851	\$ 0.387	7.4
	Hogs, Pigs, and Other	\$ 1.600	\$ 0.380	7.2
	Poultry and Eggs	\$ 2.090	\$ 0.464	8.7
	Dairy	\$ 2.052	\$ 0.492	9.9



## Appendix

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Animal Units (AUs)	Beef Cattle AUs	2,535,750	2,551,950	2,592,750	2,650,500	2,650,500	2,650,500	2,852,250	3,103,050	2,722,650	2,651,850	2,539,350
	Hog and Pig AUs	46,350	42,750	42,750	45,000	37,950	42,000	36,900	37,350	36,600	29,100	30,600
	Broiler AUs	132,232	131,339	99,743	98,188	91,292	92,520	69,714	76,801	76,533	76,098	78,063
	Turkey AUs	218,648	238,306	244,607	241,554	219,798	222,355	219,102	226,420	188,277	163,882	170,996
	Egg Layer AUs	78,304	78,460	82,796	80,580	77,092	77,372	78,876	75,806	67,455	53,096	49,217
	Dairy AUs	2,436,000	2,478,000	2,506,000	2,569,000	2,576,000	2,464,000	2,450,000	2,492,000	2,492,000	2,492,000	2,492,000
	<b>Total Animal Units</b>	<b>5,447,284</b>	<b>5,520,805</b>	<b>5,568,647</b>	<b>5,684,822</b>	<b>5,652,631</b>	<b>5,548,747</b>	<b>5,706,843</b>	<b>6,011,427</b>	<b>5,583,515</b>	<b>5,466,026</b>	<b>5,360,226</b>
Value of Production (\$1,000)	Cattle and Calves (\$1,000)	\$ 1,210,259	\$ 1,173,275	\$ 1,289,346	\$ 1,369,626	\$ 1,097,174	\$ 1,318,469	\$ 2,005,694	\$ 2,319,343	\$ 2,275,348	\$ 2,630,197	\$ 2,473,512
	Hogs and Pigs (\$1,000)	\$ 33,553	\$ 31,409	\$ 32,955	\$ 26,177	\$ 18,979	\$ 23,925	\$ 28,859	\$ 24,991	\$ 21,269	\$ 22,747	\$ 17,104
	Broilers (\$1,000)	\$ 111,119	\$ 86,083	\$ 76,976	\$ 78,642	\$ 67,851	\$ 70,907	\$ 62,078	\$ 76,525	\$ 93,245	\$ 97,821	\$ 85,340
	Turkeys (\$1,000)	\$ 168,546	\$ 195,091	\$ 209,689	\$ 253,379	\$ 193,146	\$ 252,317	\$ 276,417	\$ 295,651	\$ 230,225	\$ 227,909	\$ 274,014
	Eggs (\$1,000)	\$ 181,655	\$ 212,889	\$ 346,426	\$ 440,438	\$ 319,805	\$ 367,788	\$ 387,522	\$ 392,950	\$ 382,690	\$ 422,607	\$ 528,471
	Milk (\$1,000)	\$ 5,228,909	\$ 4,496,514	\$ 7,343,282	\$ 6,930,345	\$ 4,539,929	\$ 5,932,557	\$ 7,687,055	\$ 6,905,525	\$ 7,624,109	\$ 9,365,387	\$ 6,298,292
	Other	\$ 110,067	\$ 103,964	\$ 100,841	\$ 100,670	\$ 106,821	\$ 124,046	\$ 115,564	\$ 117,801	\$ 120,038	\$ 122,275	\$ 124,512
	Sheep and Lambs (\$1,000)	\$ 40,460	\$ 32,610	\$ 27,740	\$ 25,822	\$ 30,226	\$ 45,704	\$ 35,475	\$ 35,965	\$ 36,455	\$ 36,945	\$ 37,435
	Aquaculture (\$1,000)	\$ 69,607	\$ 71,354	\$ 73,101	\$ 74,848	\$ 76,595	\$ 78,342	\$ 80,089	\$ 81,836	\$ 83,583	\$ 85,330	\$ 87,077
	<b>Total (\$1,000)</b>	<b>\$ 7,044,108</b>	<b>\$ 6,299,226</b>	<b>\$ 9,399,515</b>	<b>\$ 9,199,277</b>	<b>\$ 6,343,705</b>	<b>\$ 8,090,008</b>	<b>\$ 10,563,189</b>	<b>\$ 10,132,787</b>	<b>\$ 10,746,924</b>	<b>\$ 12,888,943</b>	<b>\$ 9,801,246</b>

Ag Census Data Category	Animal Type	1997	2002	2007	2012	
Number of Farms by NAICS	Beef cattle ranching and farming (112111)	11,840	11,259	11,153	11,767	
	Cattle feedlots (112112)	528	553	404	156	
	Dairy cattle and milk production (11212)	2,122	2,361	1,839	1,594	
	Hog and pig farming (1122)	522	626	425	446	
	Poultry and egg production (1123)	1,046	914	1,798	1,202	
	Sheep and goat farming (1124)	1,533	2,485	3,041	3,246	
	Animal aquaculture and other animal production (1125,1129)	5,739	10,035	11,096	7,809	
Value of Sales (\$1,000)	Cattle and Calves	1,447,849	1,582,334	2,536,571	3,259,325	
	Hogs and Pigs	41,288	27,488	34,188	51,526	
	Poultry and Eggs	1,195,967	1,017,968	1,536,763	1,663,919	
	Milk and Other Dairy Products	3,184,363	3,739,213	6,569,172	6,945,102	
	Aquaculture	43,509	64,557	102,228	103,016	
	Other (calculated)	165,398	152,891	203,121	175,445	
	<b>Total</b>	<b>6,078,374</b>	<b>6,584,451</b>	<b>10,982,043</b>	<b>12,198,333</b>	
Input Purchases	Livestock and poultry purchased	(Farms) 10,957	10,745	10,881	12,585	
		\$1,000	759,223	949,697	1,264,818	1,254,286
	Breeding livestock purchased	(Farms) <i>n/a</i>	6,070	5,951	6,850	
		\$1,000	<i>n/a</i>	114,594	186,901	255,730
	Other livestock and poultry purchased	(Farms) <i>n/a</i>	6,404	6,356	7,673	
		\$1,000	<i>n/a</i>	835,104	1,077,917	998,556
	Feed purchased	(Farms) 20,385	28,663	29,596	30,014	
	\$1,000	2,588,982	2,494,806	4,274,263	6,069,374	

	Animal Type	Output (\$1,000)	Earnings (\$1,000)	Employment (Jobs)	Taxes Paid (\$1,000)
<b>2015 Animal Agriculture</b>	Cattle and Calves	\$ 4,578,965	\$ 957,002	18,305	\$ 283,560
	Hogs, Pigs, and Other	\$ 226,614	\$ 53,857	1,020	\$ 15,958
	Poultry and Eggs	\$ 1,855,466	\$ 412,306	7,752	\$ 122,166
	Dairy	\$ 12,924,095	\$ 3,095,611	62,346	\$ 917,229
	<b>Total</b>	\$ 19,585,141	\$ 4,518,775	89,423	\$ 1,338,913
<b>Change from 2005 to 2015</b>	Cattle and Calves	\$ 1,859,967	\$ 388,732	7,436	\$ 115,181
	Hogs, Pigs, and Other	\$ (52,297)	\$ (12,429)	(235)	\$ (3,683)
	Poultry and Eggs	\$ 685,415	\$ 152,307	2,864	\$ 45,129
	Dairy	\$ (97,545)	\$ (23,364)	(471)	\$ (6,923)
	<b>Total</b>	\$ 2,395,540	\$ 505,246	9,594	\$ 149,705
	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)	
<b>RIMS II Multipliers</b>	Cattle and Calves	\$ 1.851	\$ 0.387	7.4	
	Hogs, Pigs, and Other	\$ 1.600	\$ 0.380	7.2	
	Poultry and Eggs	\$ 2.090	\$ 0.464	8.7	
	Dairy	\$ 2.052	\$ 0.492	9.9	
<b>Tax Rates</b>	Federal effective income tax rate			12.7%	
	Federal Social Security tax rate			7.7%	
	State Effective Rate			9.3%	
	<b>Total</b>			29.6%	

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.