Economic Analysis of Animal Agriculture 2004-2014

NEVADA

A Report for

United Soybean Board

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Contents

Nevada Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Nevada's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Nevada. The success of Nevada animal agriculture in turn has an impact on the rest of the state and regional economies. For example, in the state of Nevada during 2014 animal agriculture contributed:

- $881.6 million in economic output
- 5,577 jobs
- $144.7 million in earnings
- $29.4 million in income taxes paid at local, state, and federal levels
- $17.9 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Nevada increased economic output by over $310.9 million, boosted household earnings by $51.4 million, contributed 1,959 additional jobs and paid $10.4 million in additional tax revenues.

Nevada's animal agriculture consumed about 14.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (3.6 thousand tons)
- Companion Animals (3.6 thousand tons)
- Turkeys (2.7 thousand tons)

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

Nevada Economic Impact of Animal Agriculture

Animal agriculture is a modest part of Nevada's economy. In 2014, Nevada's animal agriculture contributed the following to the economy:

- About $881.6 million in economic output
- $144.7 million in household earnings
- 5,577 jobs
- $29.4 million in income taxes

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

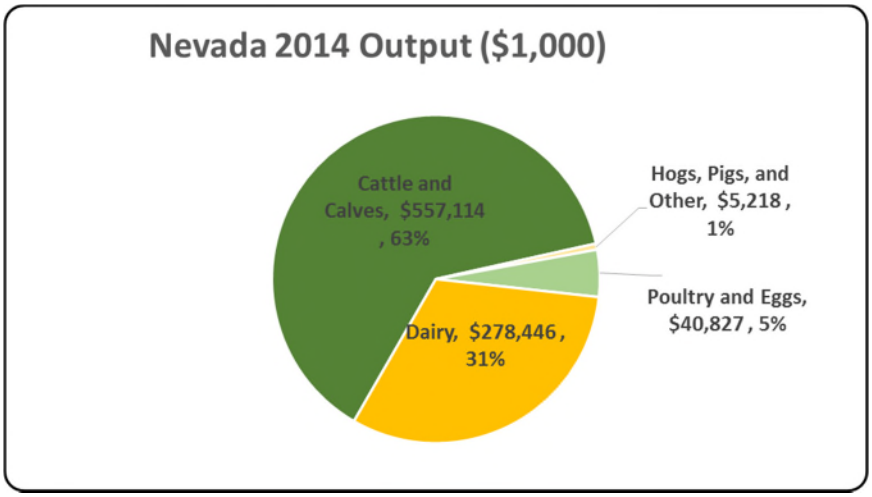
- Increased economic output by $310.9 million
- Boosted household earnings by $51.4 million
- Added 1,959 jobs
- Paid an additional $10.4 million in income taxes

Below is a table which demonstrates this decade of change.

Measure	2014	Change 2004-2014	% Change 2004-2014
Output ($1,000)	$ 881,606	$ 310,855	54.46%
Earnings ($1,000)	$ 144,671	$ 51,370	55.06%
Employment (Jobs)	5,577	1,959	54.16%
Income Taxes Paid ($1,000)	$ 29,412	$ 10,444	55.06%
Property Taxes Paid in 2012 ($1,000)	$ 17,948		

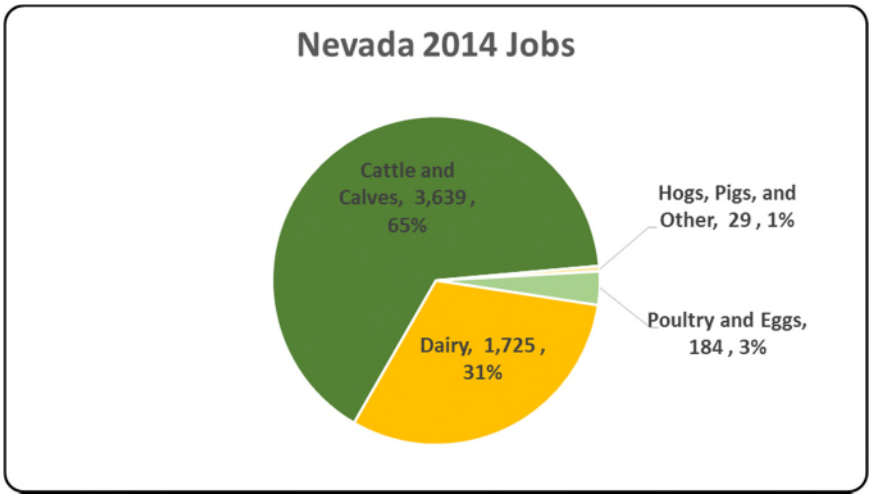
Nevada Output

"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 Nevada economy. Animal agriculture's impact on Nevada total economic output is about $881.6 million.



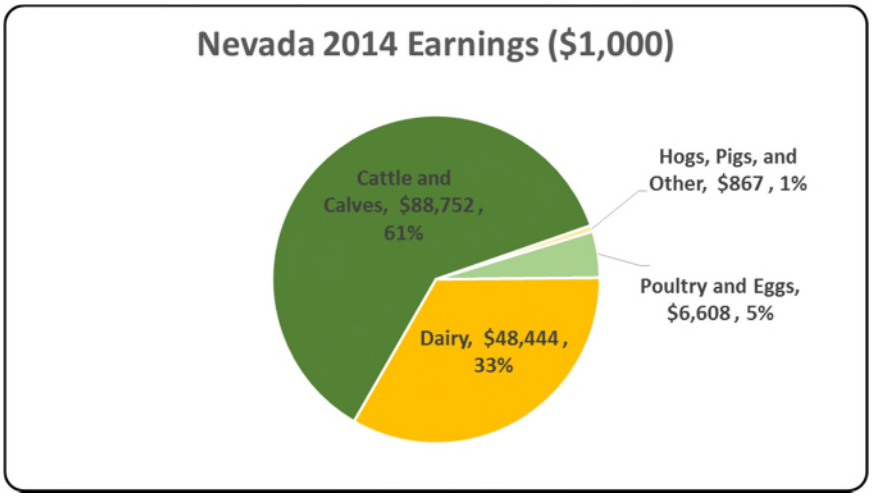
Nevada Jobs

"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 Nevada in terms of animal agriculture jobs. As shown, animal agriculture contributes about 5,577 jobs within and outside of animal agriculture.



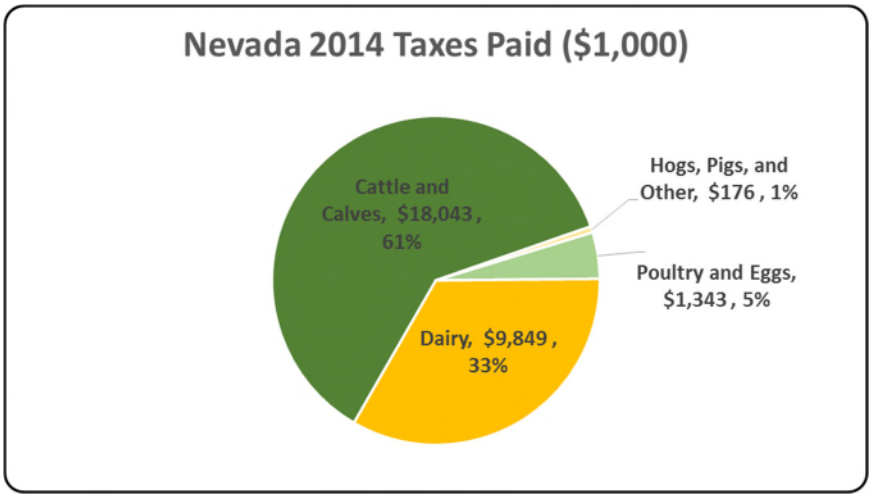
Nevada Earnings

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 Nevada economy in terms of earnings. Nevada's animal agriculture contributed about $144.7 million to household earnings in 2014.



Nevada Taxes Paid by Animal Agriculture

Nevada's animal agriculture is also a source of tax revenue. In 2014, the state's animal agriculture industry paid about $29.4 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated $17.9 million in property taxes paid by all of Nevada agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



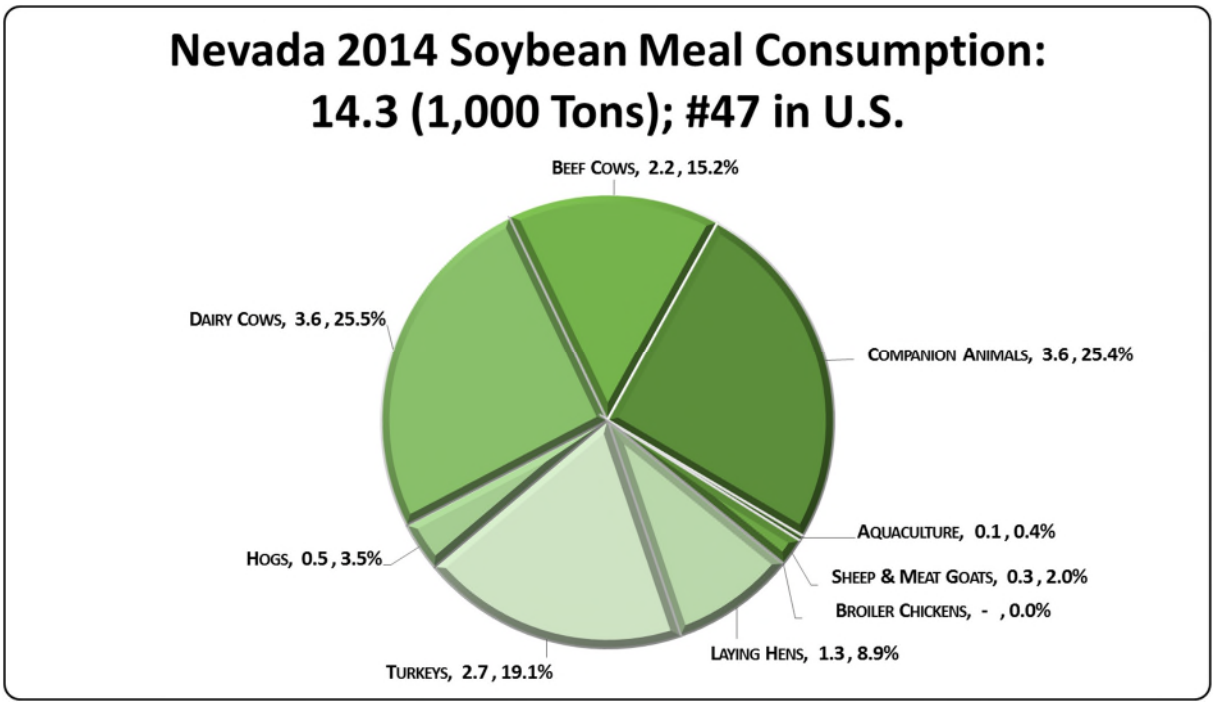
Nevada Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Nevada's animal agriculture consumed almost 14.3 thousand tons of soybean meal in 2014, placing the state as #47 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 (3.6 thousand tons)
- Companion Animals (3.6 thousand tons)
- Turkeys (2.7 thousand tons)

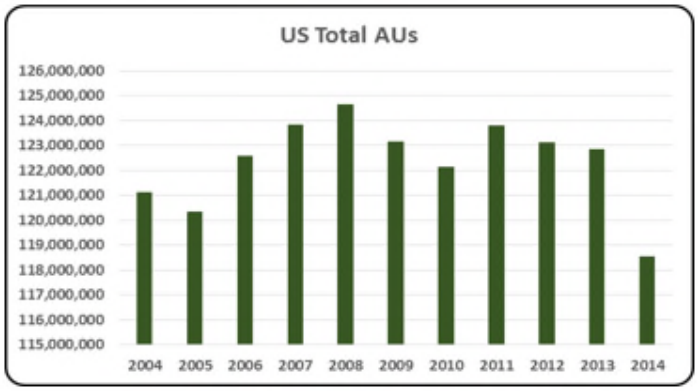


Nevada Animal Unit (AU) Trends

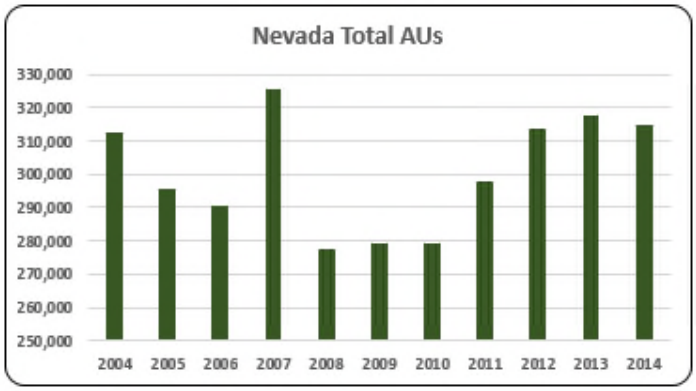
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Nevada. Due to this reality, using a single year as a measure of the presence and strength of a sector can be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

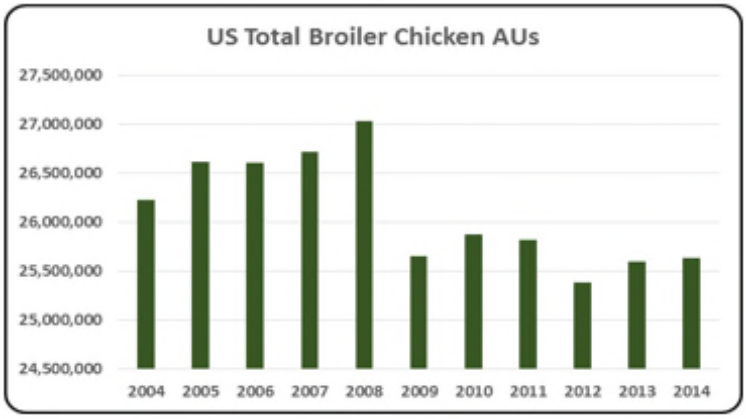
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Nevada, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (260.3 thousand AUs), Dairy Cows (40.6 thousand AUs), and Broilers (7.8 thousand AUs). Total animal units in Nevada during 2014 were 315 thousand AUs.



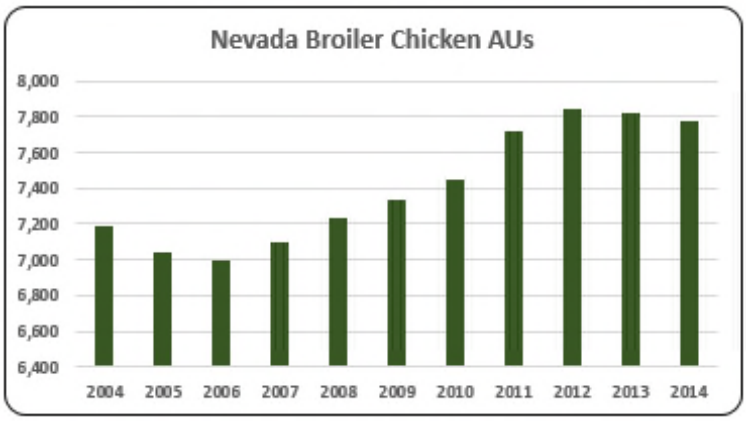
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



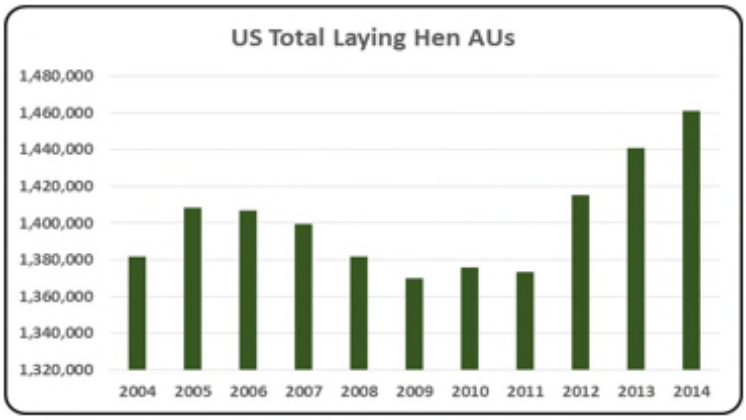
- All (315,048) AUs in Nevada in 2014 represented only 0.27% of all AUs in the U.S. 2007 was a record year with 325,589 AUs. Beef cow production is the main animal production in the state.



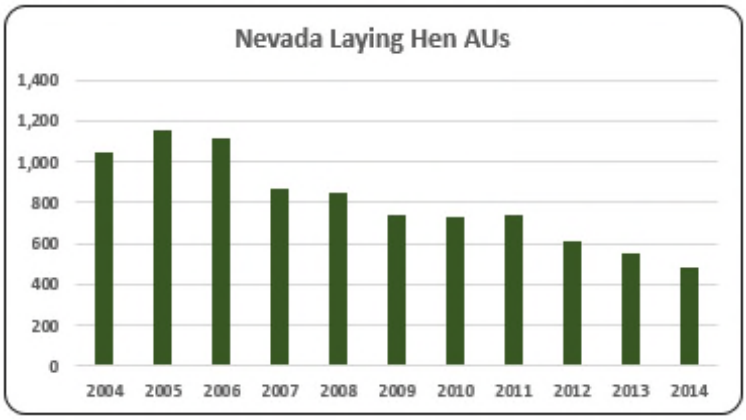
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



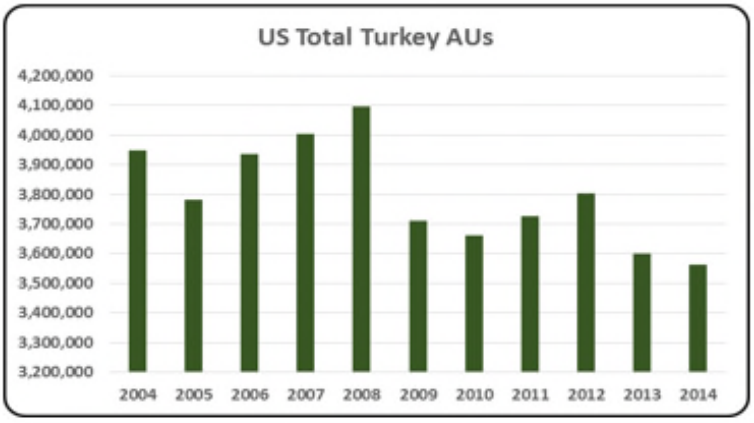
- There were 7,772 broiler AUs in 2014, declining less than 1% year-over-year. Overall there has been an upward trend in broiler production the state of Nevada, and broiler production increased 8.1% from a decade ago.



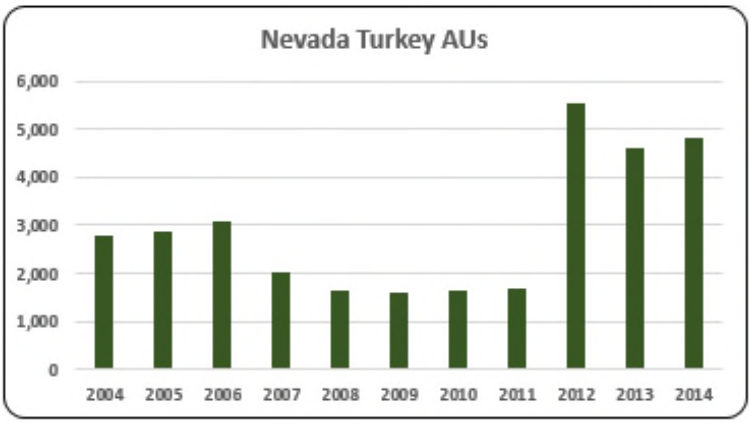
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



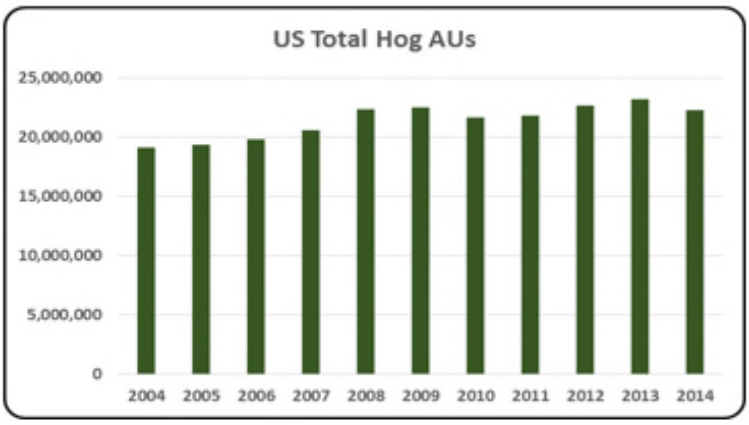
- Only 0.2% (485 layer AUs) of animal production was from layer production in 2014. Layer production decreased 54% since 2004 (1,048 layer AUs).



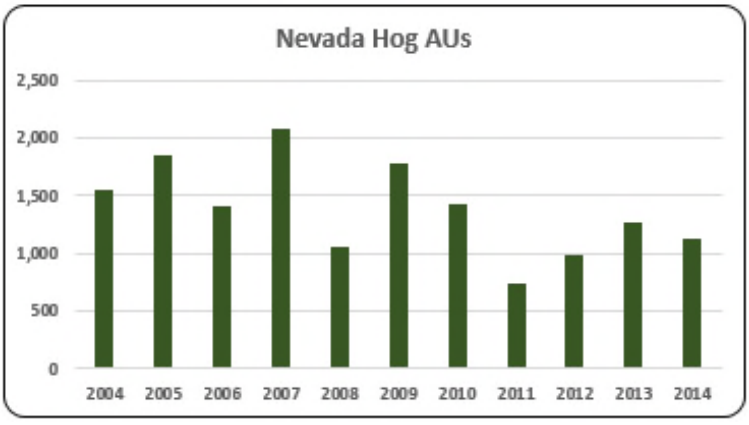
- From 2004 to 2014, the U.S. accounted for 50% of the world's turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.



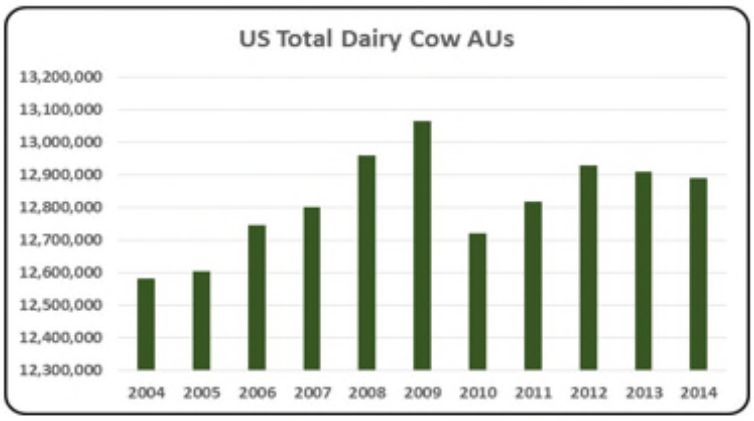
- Turkey production was less than 2% (4,816 turkey AUs) of total animal production in the state in 2014. However, turkey production in 2014 rose 74% relative to production in 2004. Turkey numbers were 13% below record high production in 2012 (5,528).



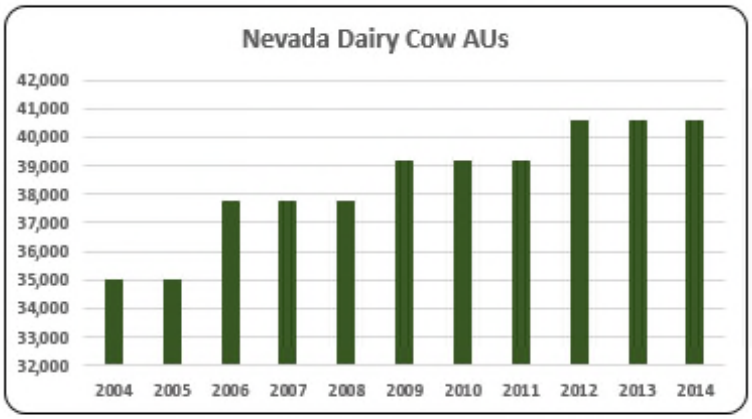
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.



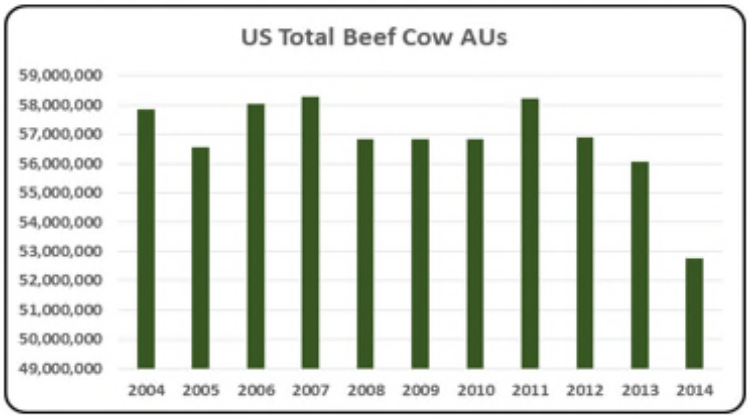
- Hog production in Nevada was irregular during 2004 to 2014, but the general trend has been negative. Hog AUs was 1,125 in 2014.



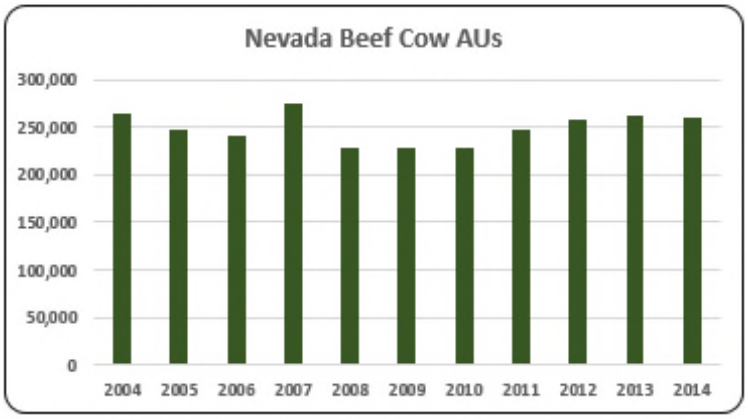
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Overall dairy cow production increased throughout the decade from 35,000 dairy cow AUs in 2004 to 40,600 dairy cow AUs in 2014. Production has been steady at 40,600 dairy cow AUs since 2012.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- There were 260,250 beef cow AUs in Nevada in 2014, which declined less than 1% from the previous year. 2007 was a record year with 275,700 dairy cow AUs.

Nevada Additional Information and Methodology

Animal agriculture is a moderate part of Nevada's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned Decision Innovation Solutions, an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Nevada, of interest is the degree to which the industry impacts the Nevada economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Nevada 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 Nevada's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Nevada which have occurred. As shown in this state report, Nevada 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 Nevada. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Nevada 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 Nevada'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 Nevada, $1.401 to $1.925 million in total economic activity, $0.227 to $0.307 in household wages and 6 to 13 additional jobs are generated in the economy at large.

	Animal Type	Output($)	Earnings ($)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	$ 1.9246	$ 0.3066	12.6
	Hogs, Pigs, and Other	$ 1.4829	$ 0.2465	8.3
	Poultry and Eggs	$ 1.4012	$ 0.2268	6.3
	Dairy	$ 1.6272	$ 0.2831	10.1

Appendix

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Animal Units (AUs)	Beef Cattle AUs	264,900	247,650	240,150	275,700	228,750	228,750	228,750	247,950	258,150	262,650	260,250
	Hog and Pig AUs	1,545	1,845	1,410	2,085	1,050	1,770	1,425	735	990	1,260	1,125
	Broiler AUs	7,193	7,042	6,994	7,099	7,232	7,333	7,449	7,723	7,844	7,817	7,772
	Turkey AUs	2,781	2,852	3,099	2,037	1,628	1,595	1,661	1,691	5,528	4,612	4,816
	Egg Layer AUs	1,048	1,154	1,113	869	844	738	733	738	614	549	485
	Dairy AUs	35,000	35,000	37,800	37,800	37,800	39,200	39,200	39,200	40,600	40,600	40,600
	Total Animal Units	**312,467**	**295,543**	**290,567**	**325,589**	**277,304**	**279,385**	**279,218**	**298,036**	**313,726**	**317,488**	**315,048**
Value of Production ($1,000)	Cattle and Calves ($1,000)	$ 159,252	$ 166,197	$ 151,803	$ 149,348	$ 156,432	$ 148,730	$ 171,771	$ 205,595	$ 220,560	$ 230,963	$ 289,470
	Hogs and Pigs ($1,000)	$ 958	$ 1,029	$ 834	$ 1,220	$ 681	$ 992	$ 957	$ 725	$ 772	$ 936	$ 1,073
	Broilers ($1,000)	$ 6,050	$ 5,731	$ 4,429	$ 4,959	$ 5,463	$ 5,902	$ 6,372	$ 7,089	$ 7,814	$ 9,520	$ 9,986
	Turkeys ($1,000)	$ 2,580	$ 2,736	$ 3,234	$ 2,349	$ 2,199	$ 1,475	$ 1,976	$ 2,216	$ 8,018	$ 5,280	$ 8,840
	Eggs ($1,000)	$ 6,161	$ 3,730	$ 4,135	$ 6,788	$ 8,180	$ 5,822	$ 6,391	$ 7,007	$ 7,859	$ 8,879	$ 10,310
	Milk ($1,000)	$ 75,841	$ 78,590	$ 68,000	$ 100,646	$ 94,471	$ 69,882	$ 112,216	$ 137,862	$ 125,685	$ 129,717	$ 171,120
	Other	$ 2,273	$ 2,604	$ 1,730	$ 2,169	$ 2,086	$ 2,280	$ 2,628	$ 2,363	$ 2,391	$ 2,419	$ 2,446
	Sheep and Lambs ($1,000)	$ 2,273	$ 2,604	$ 1,730	$ 2,169	$ 2,086	$ 2,280	$ 2,628	$ 2,363	$ 2,391	$ 2,419	$ 2,446
	Aquaculture ($1,000)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total ($1,000)	**$ 253,116**	**$ 260,617**	**$ 234,165**	**$ 267,479**	**$ 269,512**	**$ 235,083**	**$ 302,311**	**$ 362,857**	**$ 373,099**	**$ 387,713**	**$ 493,246**

Ag Census Data Category	Animal Type		1997	2002	2007	2012
Number of Farms by NAICS	Beef cattle ranching and farming (112111)		1,235	1,093	1,067	1,242
	Cattle feedlots (112112)		47	81	20	12
	Dairy cattle and milk production (11212)		41	45	35	26
	Hog and pig farming (1122)		24	27	15	22
	Poultry and egg production (1123)		29	63	64	72
	Sheep and goat farming (1124)		109	157	184	340
	Animal aquaculture and other animal production (1125,1129)		410	640	717	1,177
Value of Sales ($1,000)	Cattle and Calves		135,410	215,054	181,758	241,611
	Hogs and Pigs		700	930	withheld	516
	Poultry and Eggs		178	withheld	withheld	731
	Milk and Other Dairy Products		55,456	62,074	98,526	125,569
	Aquaculture		n/a	withheld	withheld	4,030
	Other (calculated)		13,899	11,201	13,644	18,174
		Total	205,643	289,259	293,928	390,631
Input Purchases	Livestock and poultry purchased	(Farms)	1,015	908	994	1,412
		$1,000	26,424	34,954	4,470	38,987
	Breeding livestock purchased	(Farms)	*n/a*	574	360	943
		$1,000	*n/a*	8,620	1,786	13,345
	Other livestock and poultry purchased	(Farms)	*n/a*	447	768	701
		$1,000	*n/a*	26,335	2,684	25,641
	Feed purchased	(Farms)	1,690	2,062	2,308	3,134
		$1,000	48,969	58,036	30,644	140,663

	Animal Type	Output ($1,000)	Earnings ($1,000)	Employment (Jobs)	Taxes Paid ($1,000)
2014 Animal Agriculture	Cattle and Calves	$ 557,114	$ 88,752	3,639	$ 18,043
	Hogs, Pigs, and Other	$ 5,218	$ 867	29	$ 176
	Poultry and Eggs	$ 40,827	$ 6,608	184	$ 1,343
	Dairy	$ 278,446	$ 48,444	1,725	$ 9,849
	Total	$ 881,606	$ 144,671	5,577	$ 29,412
Change from 2004 to 2014	Cattle and Calves	$ 173,002	$ 27,560	1,130	$ 5,603
	Hogs, Pigs, and Other	$ (786)	$ (131)	(4)	$ (27)
	Poultry and Eggs	$ 14,852	$ 2,404	67	$ 489
	Dairy	$ 123,787	$ 21,536	767	$ 4,378
	Total	$ 310,855	$ 51,370	1,959	$ 10,444

	Animal Type	Output($)	Earnings ($)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	$ 1.9246	$ 0.3066	12.6
	Hogs, Pigs, and Other	$ 1.4829	$ 0.2465	8.3
	Poultry and Eggs	$ 1.4012	$ 0.2268	6.3
	Dairy	$ 1.6272	$ 0.2831	10.1

Tax Rates	Federal effective income tax rate	12.7%
	Federal Social Security tax rate	7.7%
	State Effective Rate	0.0%
	Total	20.3%

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.