Economic Analysis of Animal Agriculture 2004-2014

ALASKA

A Report for

United Soybean Board

September 2015

Decision Innovation Solutions, LLC

3315 109th St. Suite B

Urbandale, IA 50322

www.decision-innovation.com

Contents

Alaska Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Alaska's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor of animal agriculture's success in Alaska. In the state of Alaska during 2014 animal agriculture contributed:

- $21.8 million in economic output
- 90 jobs
- $3.1 million in earnings
- $0.6 million in income taxes paid at local, state, and federal levels
- $1.3 million in the form of property taxes

Alaska's animal agriculture consumed about 2,300 tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Turkeys (1,300 tons)
- Companion Animals (600 tons)
- Egg-Laying Hens (200 tons)

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

Alaska Economic Impact of Animal Agriculture

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

- About $21.8 million in economic output
- $3.1 million in household earnings
- 90 jobs
- $0.6 million in income taxes

During the last decade contractions in Alaska's animal agriculture has:

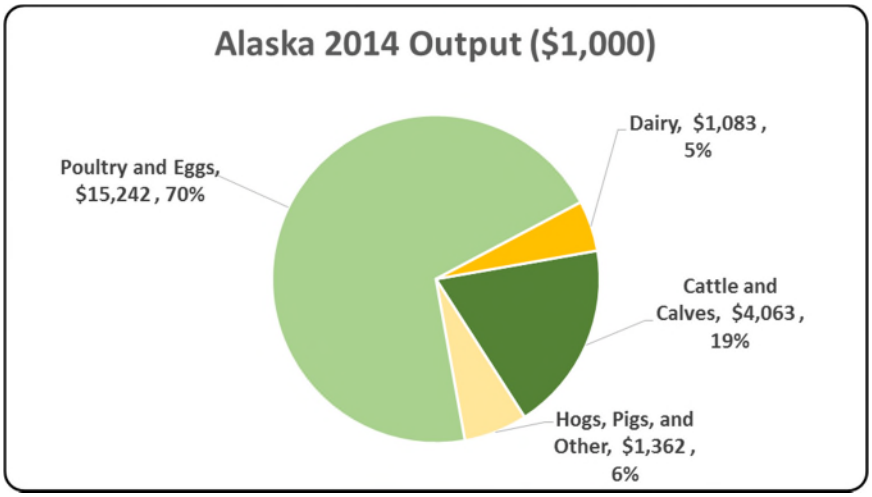
- Decreased economic output by $1.0 million
- Reduced household earnings by $200,000
- Shrunk by 10 jobs
- Paid $39,000 less in income taxes

Below is a table which demonstrates this decade of change.

Measure		2014		Change 2004-2014	% Change 2004-2014
Output ($1,000)	$	21,750	$	(1,039)	-4.56%
Earnings ($1,000)	$	3,133	$	(194)	-5.83%
Employment (Jobs)		90		(10)	-10.28%
Income Taxes Paid ($1,000)	$	637	$	(39)	-5.83%
Property Taxes Paid in 2012 ($1,000)	$	1,345			

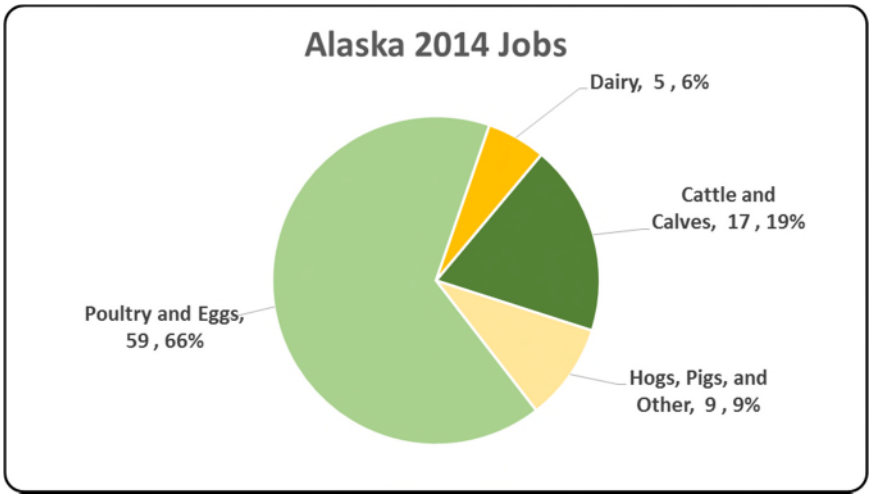
Alaska Output

"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 Alaska economy. Animal agriculture's impact on Alaska total economic output is about $21.8 million.



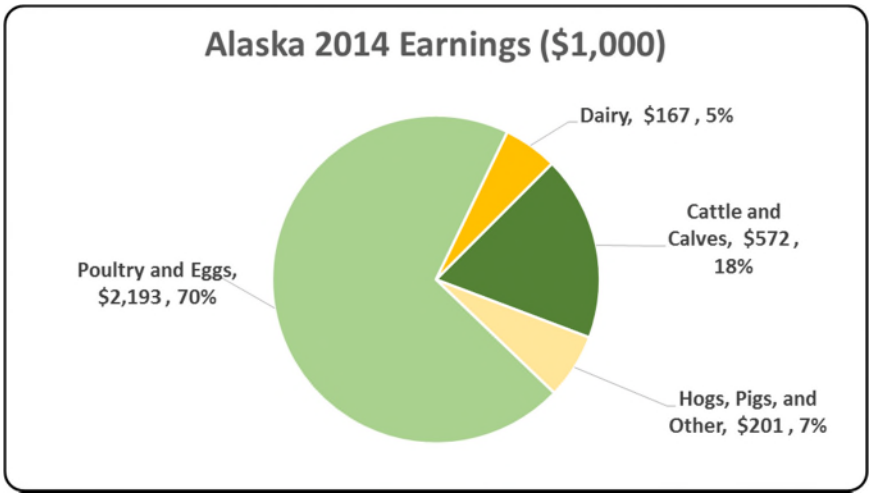
Alaska Jobs

"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 Alaska in terms of animal agriculture jobs. As shown, animal agriculture contributes about 90 jobs within and outside of animal agriculture.



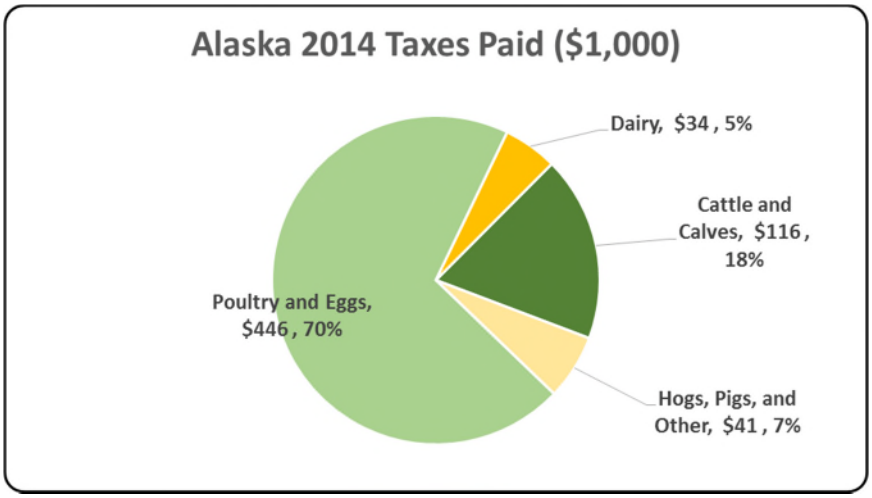
Alaska Earnings

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 Alaska economy in terms of earnings. Alaska's animal agriculture contributed about $3.1 million to household earnings in 2014.



Alaska Taxes Paid by Animal Agriculture

Alaska's animal agriculture is not a significant source of tax revenue. In 2014, the state's animal agriculture industry paid about $600,000 in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated $1.3 million in property taxes paid by all of Alaska agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



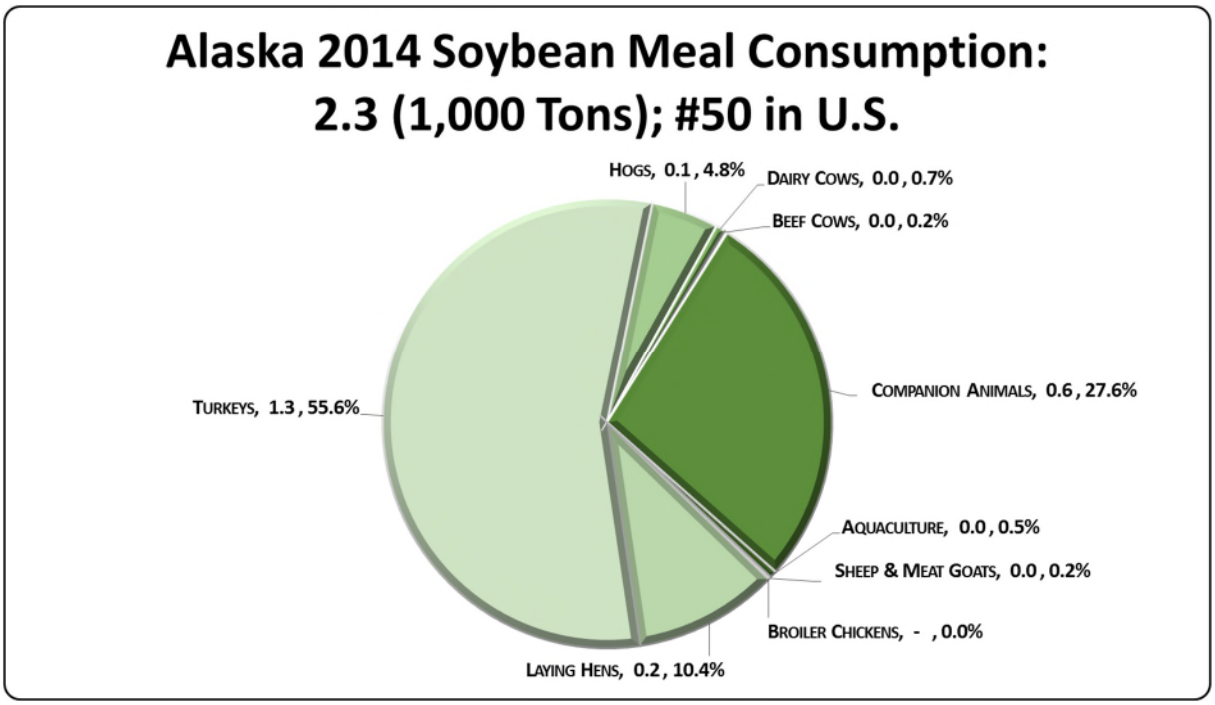
Alaska Animal Agriculture Soybean Meal Consumption

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.

Alaska's animal agriculture consumed almost 2,300 tons of soybean meal in 2014, placing the state as #50 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:

- Turkeys (1,300 tons)
- Companion Animals (600 tons)
- Egg-Laying Hens (200 tons)

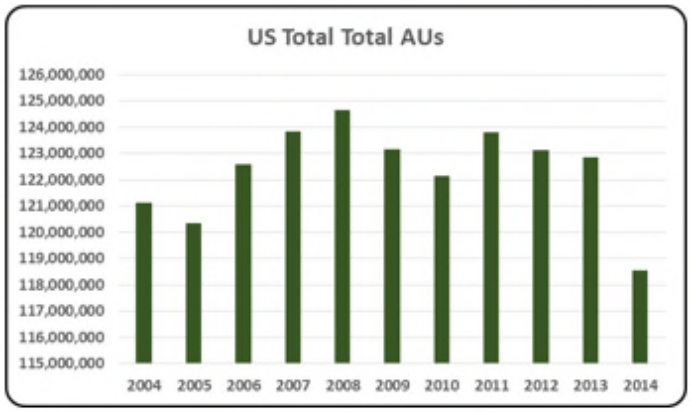


Alaska Animal Unit (AU) Trends

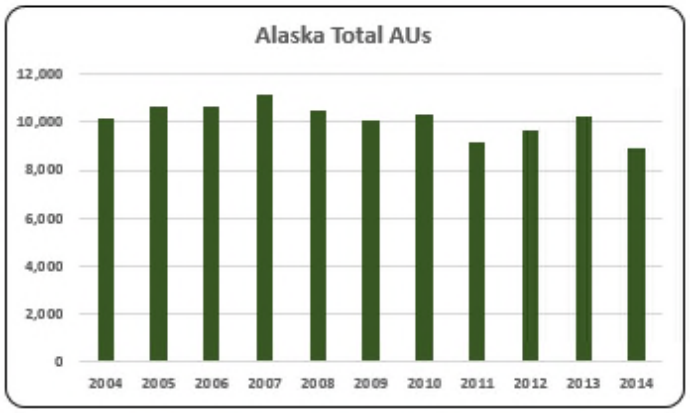
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Alaska. Due to this reality, using a single year as a measure of the presence and strength of a sector can be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

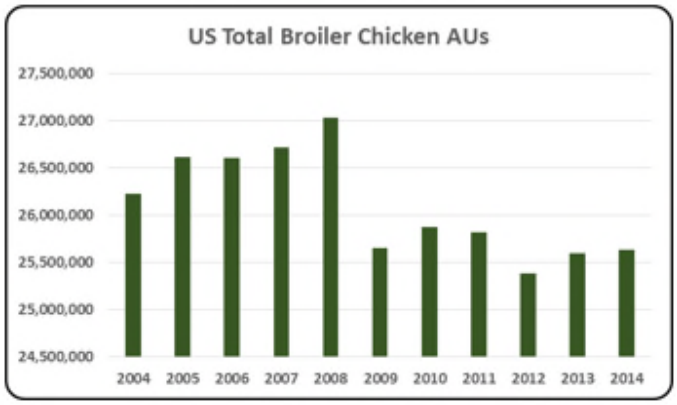
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Alaska, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (4.2 thousand AUs), Turkeys (2.3 thousand AUs), and Beef Cows (1.6 thousand AUs). Total animal units in Alaska during 2014 were 8.9 thousand AUs.



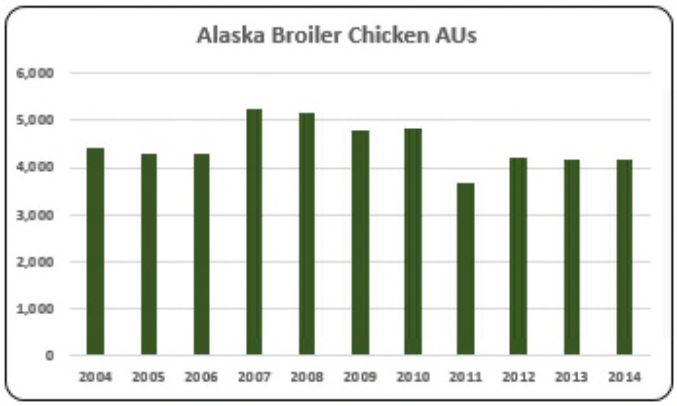
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



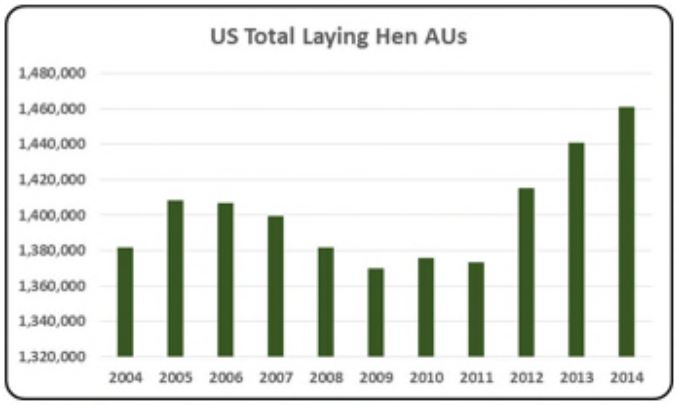
- Alaska is one of the few states with very low animal production. There were 8,932 AUs in 2014 for all species included in this study, and the average AUs from 2004 to 2014 was 10,139.



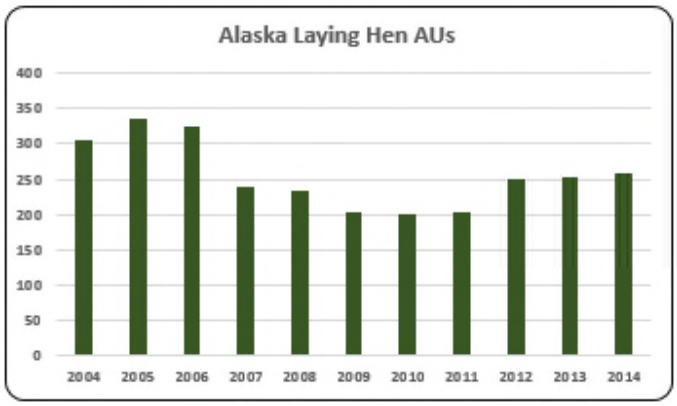
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



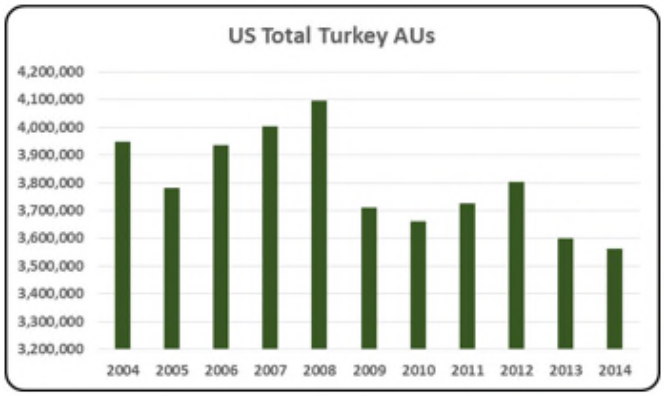
- Forty six percent (4,157) of all animal units in Alaska were in the broiler industry. The average broiler AUs during the decade was 4,470.



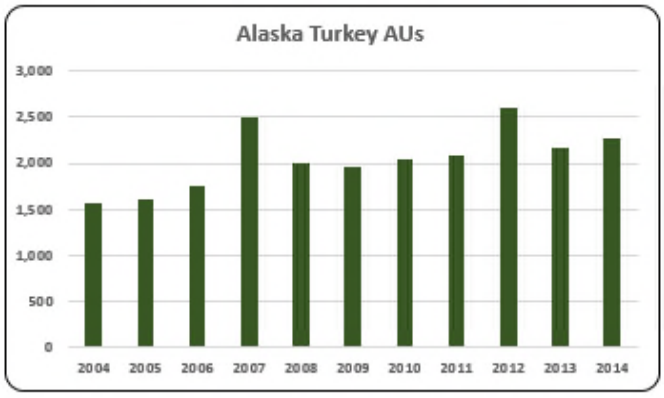
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



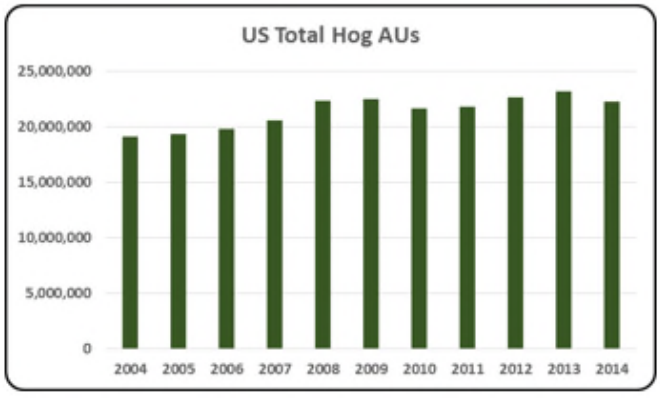
- Layer AUs in 2014 was equal to 258, representing 0.02% of all layers in the U.S during that year. On average there were only 255 layers from 2004 to 2014.



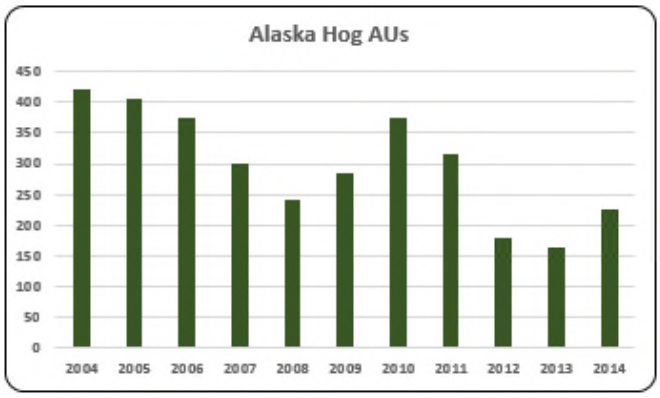
- From 2004 to 2014, the U.S. accounted for 50% of the world's turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.



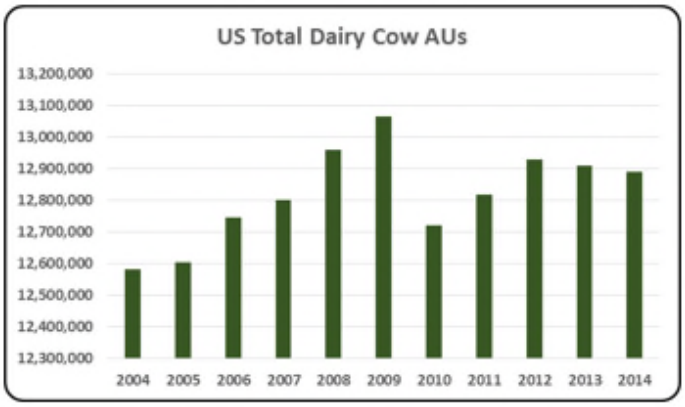
- There were 2,267 turkey AUs in 2014 representing only 0.06% of all turkeys AUs in the U.S. during that year.



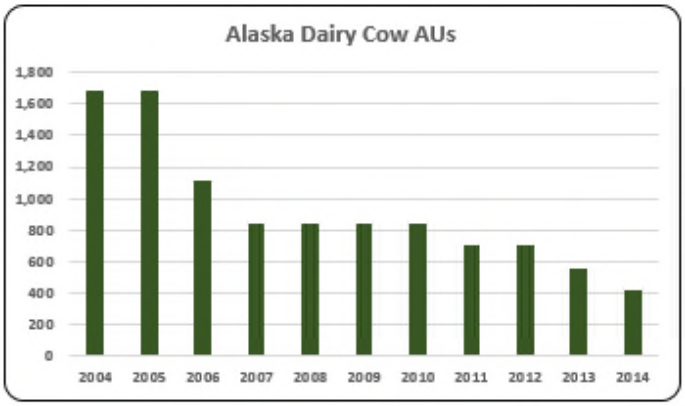
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine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



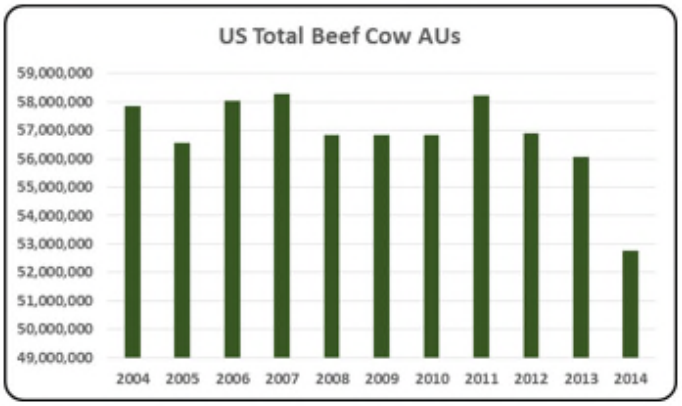
- Hog production in Alaska is minimal with only 225 AUs in 2014.



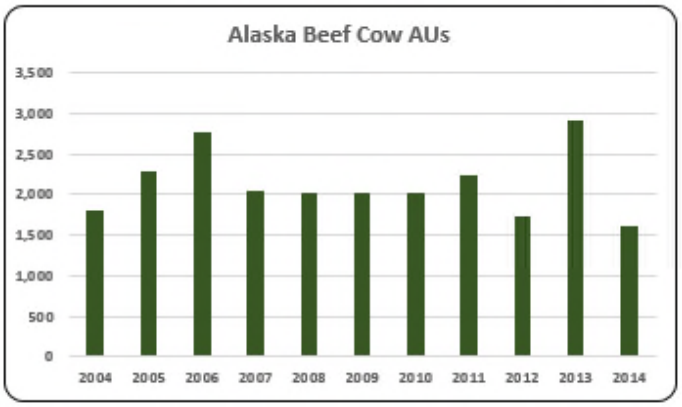
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- The number of dairy cows in the state has consistently decreased since 2004. Dairy cow AUs were 1,680 in 2004 compared to 420 in 2014.



- 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.



- Alaska beef cow AUs averaged 2,134 from 2004 to 2014. Beef cow AUs decreased 45% from previous year's AUs.

Alaska Additional Information and Methodology

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

Alaska 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 Alaska'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 Alaska, $1.331 to $1.426 million in total economic activity, $0.192 to $0.218 in household wages and 5 to 9 additional jobs are generated in the economy at large.

	Animal Type	Output($)	Earnings ($)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	$ 1.4262	$ 0.2007	6.0
	Hogs, Pigs, and Other	$ 1.3594	$ 0.2007	8.7
	Poultry and Eggs	$ 1.3311	$ 0.1915	5.2
	Dairy	$ 1.4124	$ 0.2176	6.9

Appendix

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Animal Units (AUs)	Beef Cattle AUs	1,815	2,295	2,775	2,055	2,010	2,010	2,010	2,250	1,725	2,925	1,605
	Hog and Pig AUs	420	405	375	300	240	285	375	315	180	165	225
	Broiler AUs	4,396	4,303	4,274	5,227	5,145	4,784	4,848	3,653	4,196	4,181	4,157
	Turkey AUs	1,572	1,612	1,752	2,507	2,004	1,963	2,044	2,081	2,602	2,170	2,267
	Egg Layer AUs	306	337	325	239	233	203	202	203	250	254	258
	Dairy AUs	1,680	1,680	1,120	840	840	840	840	700	700	560	420
	Total Animal Units	**10,188**	**10,632**	**10,621**	**11,168**	**10,471**	**10,085**	**10,320**	**9,202**	**9,652**	**10,255**	**8,932**
Value of Production ($1,000)	Cattle and Calves ($1,000)	$ 2,641	$ 3,137	$ 3,621	$ 1,444	$ 1,205	$ 2,162	$ 2,371	$ 2,563	$ 1,620	$ 1,021	$ 2,849
	Hogs and Pigs ($1,000)	$ 441	$ 580	$ 480	$ 421	$ 378	$ 547	$ 586	$ 422	$ 272	$ 261	$ 401
	Broilers ($1,000)	$ 3,697	$ 3,502	$ 2,707	$ 3,932	$ 4,047	$ 3,505	$ 3,689	$ 3,251	$ 4,180	$ 5,092	$ 5,342
	Turkeys ($1,000)	$ 1,458	$ 1,546	$ 1,828	$ 2,891	$ 2,706	$ 1,815	$ 2,431	$ 2,727	$ 3,773	$ 2,485	$ 4,160
	Eggs ($1,000)	$ 1,165	$ 705	$ 782	$ 1,283	$ 1,546	$ 1,100	$ 1,208	$ 1,324	$ 1,485	$ 1,678	$ 1,949
	Milk ($1,000)	$ 3,008	$ 2,754	$ 1,970	$ 2,006	$ 1,699	$ 1,470	$ 1,732	$ 1,670	$ 1,368	$ 704	$ 767
	Other	$ 851	$ 826	$ 801	$ 776	$ 751	$ 726	$ 701	$ 676	$ 651	$ 626	$ 601
	Sheep and Lambs ($1,000)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Aquaculture ($1,000)	$ 851	$ 826	$ 801	$ 776	$ 751	$ 726	$ 701	$ 676	$ 651	$ 626	$ 601
	Total ($1,000)	**$ 13,261**	**$ 13,051**	**$ 12,188**	**$ 12,753**	**$ 12,332**	**$ 11,326**	**$ 12,719**	**$ 12,633**	**$ 13,349**	**$ 11,867**	**$ 16,069**

Ag Census Data Category	Animal Type		1997	2002	2007	2012
Number of Farms by NAICS	Beef cattle ranching and farming (112111)		45	31	41	51
	Cattle feedlots (112112)		7	8	4	1
	Dairy cattle and milk production (11212)		12	15	6	6
	Hog and pig farming (1122)		16	13	14	9
	Poultry and egg production (1123)		10	14	32	26
	Sheep and goat farming (1124)		14	11	19	27
	Animal aquaculture and other animal production (1125,1129)		126	137	167	158
Value of Sales ($1,000)	Cattle and Calves		1,639	759	768	1,085
	Hogs and Pigs		320	205	242	338
	Poultry and Eggs		32	104	207	353
	Milk and Other Dairy Products		2,776	3,246	1,487	withheld
	Aquaculture		n/a	20,807	28,540	29,774
	Other (calculated)		3,915	479	1,027	withheld
		Total	8,682	25,600	32,271	31,550
Input Purchases	Livestock and poultry purchased	(Farms)	127	117	118	168
		$1,000	1,291	569	303	569
	Breeding livestock purchased	(Farms)	*n/a*	51	46	46
		$1,000	*n/a*	432	107	250
	Other livestock and poultry purchased	(Farms)	*n/a*	80	86	148
		$1,000	*n/a*	137	196	320
	Feed purchased	(Farms)	234	293	299	364
		$1,000	2,532	4,078	5,096	6,386

	Animal Type	Output ($1,000)	Earnings ($1,000)	Employment (Jobs)	Taxes Paid ($1,000)
2014 Animal Agriculture	Cattle and Calves	$ 4,063	$ 572	17	$ 116
	Hogs, Pigs, and Other	$ 1,362	$ 201	9	$ 41
	Poultry and Eggs	$ 15,242	$ 2,193	59	$ 446
	Dairy	$ 1,083	$ 167	5	$ 34
	Total	$ 21,750	$ 3,133	90	$ 637
Change from 2004 to 2014	Cattle and Calves	$ (657)	$ (92)	(3)	$ (19)
	Hogs, Pigs, and Other	$ (839)	$ (124)	(5)	$ (25)
	Poultry and Eggs	$ 4,698	$ 676	18	$ 137
	Dairy	$ (4,241)	$ (653)	(21)	$ (133)
	Total	$ (1,039)	$ (194)	(10)	$ (39)

	Animal Type	Output($)	Earnings ($)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	$ 1.4262	$ 0.2007	6.0
	Hogs, Pigs, and Other	$ 1.3594	$ 0.2007	8.7
	Poultry and Eggs	$ 1.3311	$ 0.1915	5.2
	Dairy	$ 1.4124	$ 0.2176	6.9

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.