

Nebraska Economic Analysis of Animal Agriculture: 2011-2021

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Prepared For:



Prepared By:



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Nebraska Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Nebraska 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 Nebraska. The success of Nebraska animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Nebraska during 2021 animal agriculture contributed:

- \$19.1 billion in economic output
- 81,327 jobs
- \$4.1 billion in earnings
- \$1.0 billion in income taxes paid at local, state, and federal levels
- \$686.5 million in the form of property taxes

Nebraska's animal agriculture consumed almost 453.3 thousand tons of soybean meal in 2021. This soybean meal was fed primarily to:

- Hogs (312.6 thousand tons)
- Egg-Laying Hens (62.0 thousand tons)
- Beef Cows (28.7 thousand tons)

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

Nebraska Economic Impact of Animal Agriculture

Animal agriculture is an important part of Nebraska’s economy. In 2021, Nebraska’s animal agriculture contributed the following to the economy:

- About \$19.0 billion in economic output
- \$4.1 billion in household earnings
- 81,327 jobs
- \$1.0 billion in income taxes

And the animal agriculture sector has shown some change during challenging economic times. During the last decade Nebraska’s animal agriculture has:

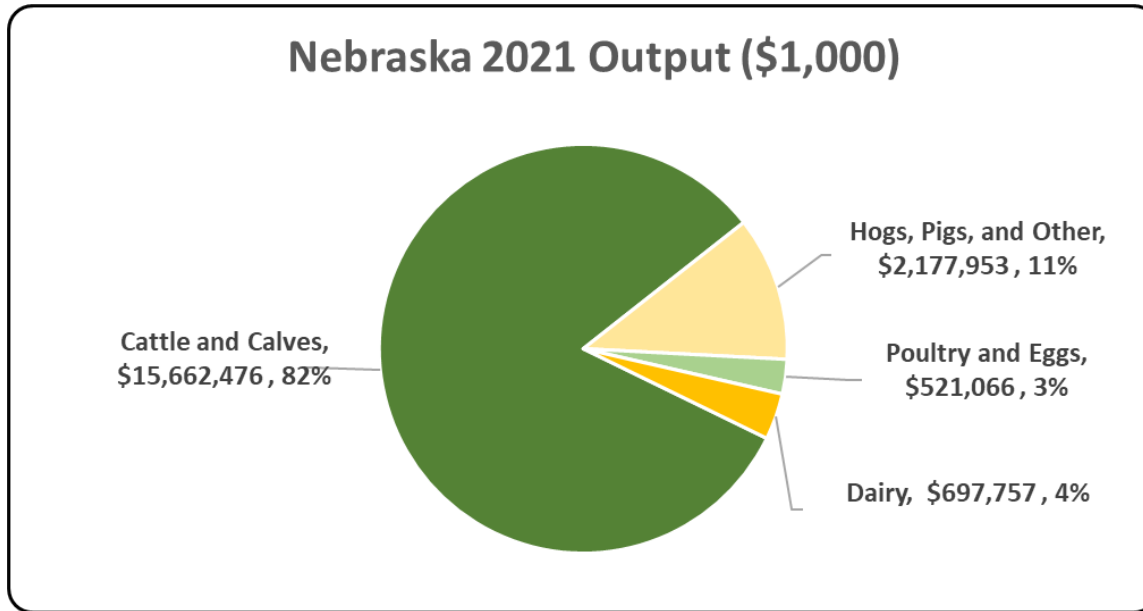
- Decreased economic output by \$240.0 million
- Reduced household earnings by \$47.9 million
- Lost 921 jobs
- Paid \$11.9 million less in income taxes

Below is a table which demonstrates this decade of change.

Measure	2021	Change 2011-2021	% Change 2011-2021
Output (\$1,000)	\$ 19,059,252	\$ (239,970)	-1.24%
Earnings (\$1,000)	\$ 4,089,483	\$ (47,907)	-1.16%
Employment (Jobs)	81,327	(921)	-1.12%
Income Taxes Paid (\$1,000)	\$ 1,016,237	\$ (11,905)	-1.16%
Property Taxes Paid in 2017 (\$1,000)	\$ 686,485		

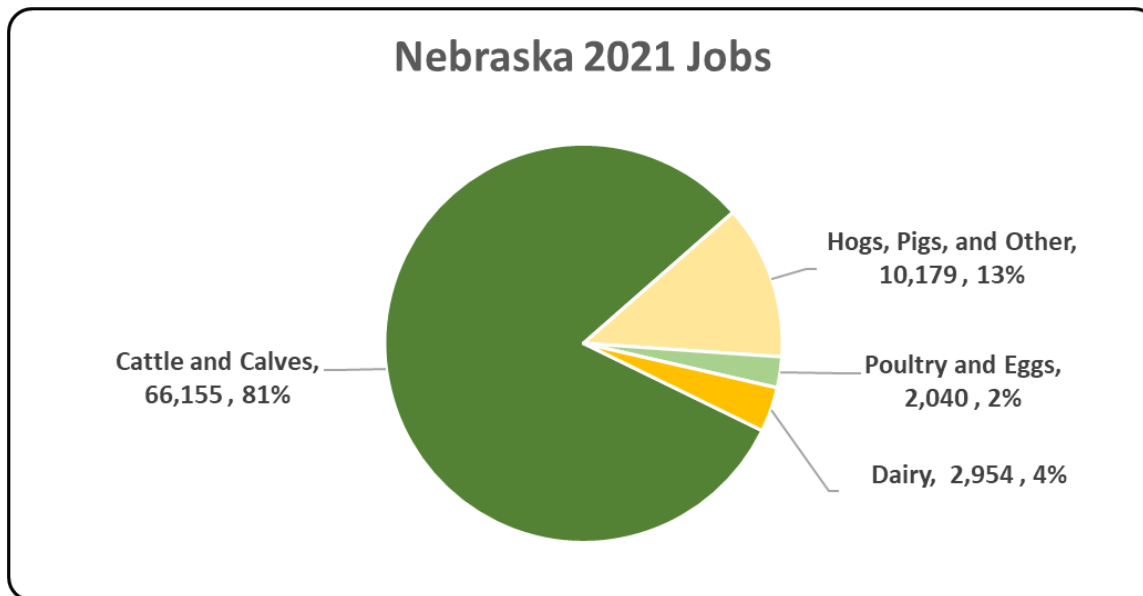
Nebraska Output

“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 figure illustrates the impact of animal agriculture to the Nebraska economy. Animal agriculture’s impact on Nebraska total economic output is about \$19.1 billion.



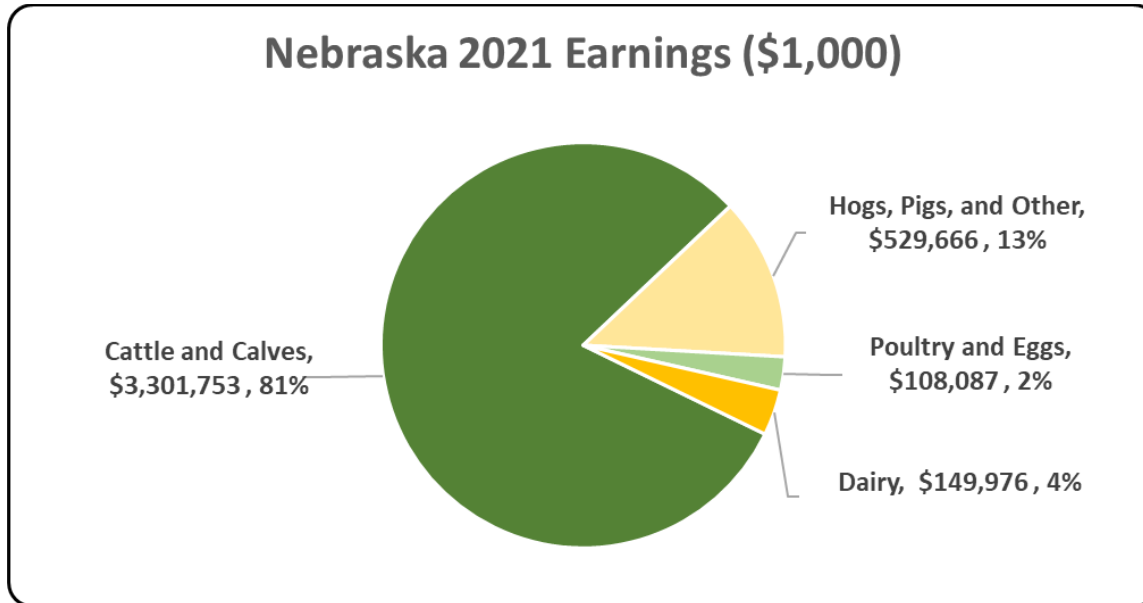
Nebraska Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The figure illustrates the contribution to Nebraska in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Nebraska total jobs, contributing 81,327 jobs within and outside of animal agriculture.



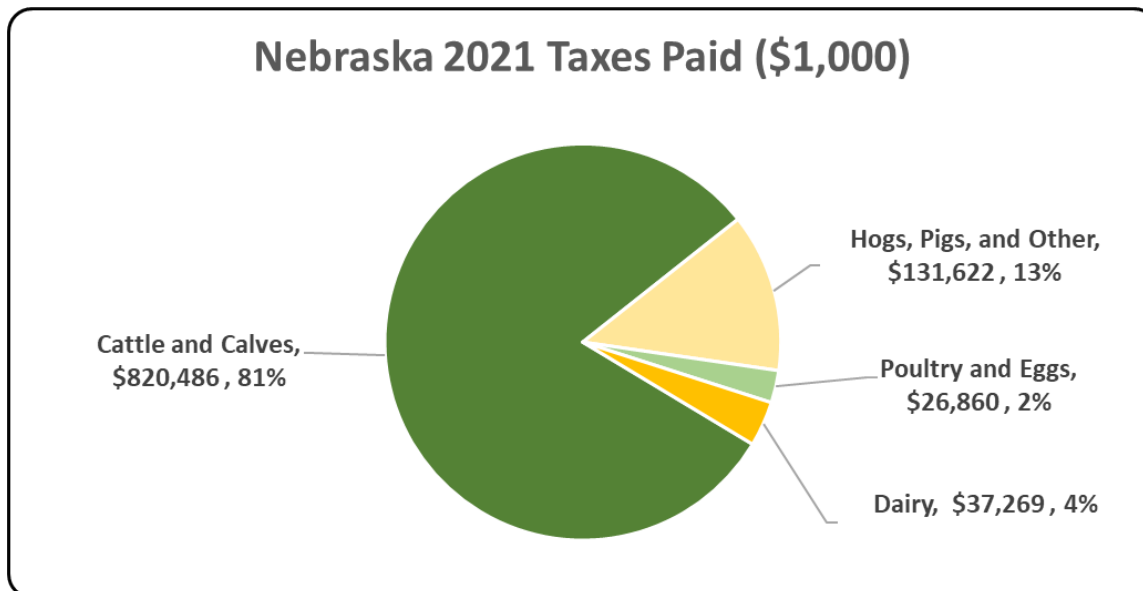
Nebraska Earnings

Earnings includes wages and salaries plus proprietors' income, which is the net earnings of sole-proprietors and partnerships. The figure illustrates the impact of animal agriculture to the Nebraska economy in terms of earnings. Nebraska's animal agriculture contributed about \$4.1 billion to household earnings in 2021.



Nebraska Taxes Paid by Animal Agriculture

Nebraska's animal agriculture is also a significant source of tax revenue. In 2021, the state's animal agriculture industry paid about \$1.0 billion in income taxes at local, state, and federal levels. Plus, the 2017 Census of Agriculture estimated \$686.5 million in property taxes paid by all of Nebraska agriculture during 2017. Estimates of income taxes paid by animal agriculture are shown in the following chart.



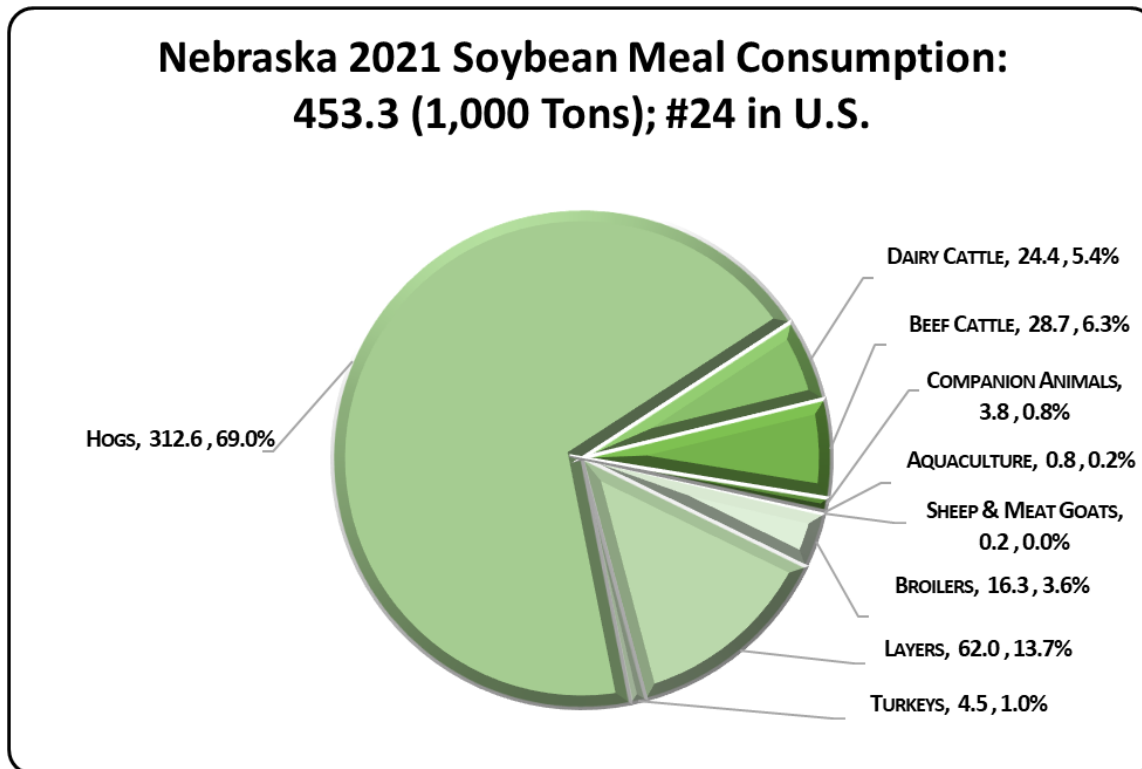
Nebraska Animal Agriculture Soybean Meal Consumption

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 2020-21 soybean marketing year by up to sixteen specific animal species has been estimated.

Nebraska’s animal agriculture consumed almost 453.3 thousand tons of soybean meal in 2021, placing the state as number 24 in the nation in terms of soybean meal consumption (see figure below). Additionally, animal agriculture in Nebraska consumed 55.8 thousand tons in soy hulls. The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

1. Hogs (312.6 thousand tons)
2. Egg-Laying Hens (62.0 thousand tons)
3. Beef Cows (28.7 thousand tons)

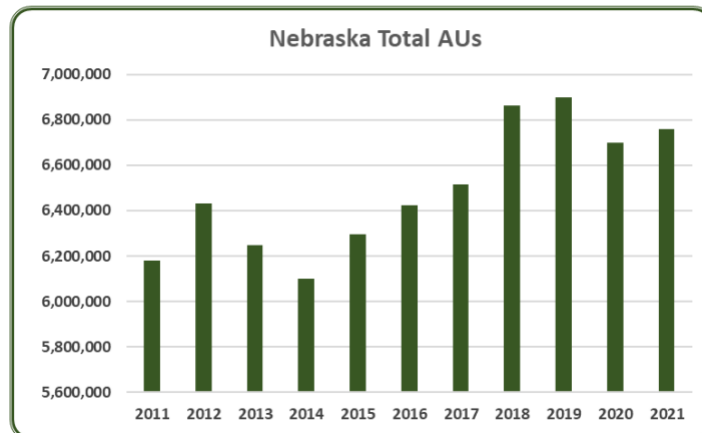
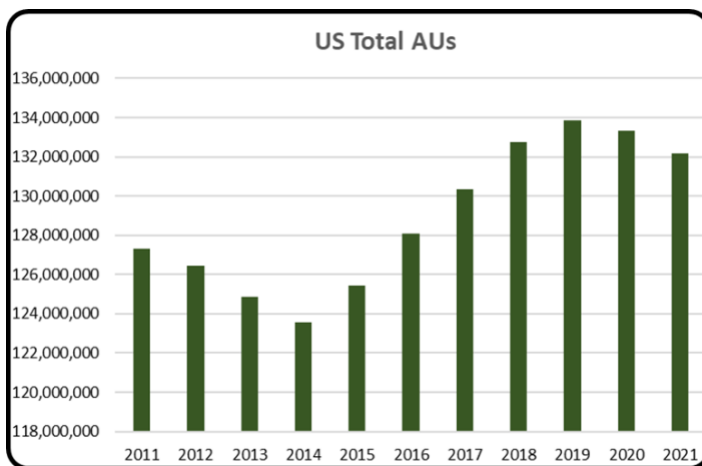


Nebraska Animal Unit (AU) Trends

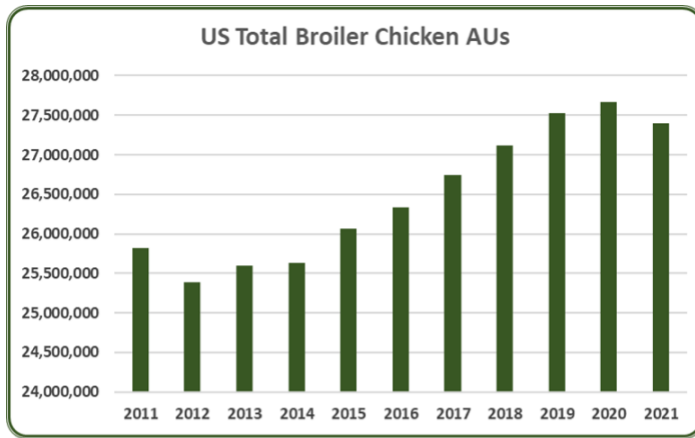
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the state of Nebraska. Due to this reality, using a single year as a measure of the presence and strength of a sector can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

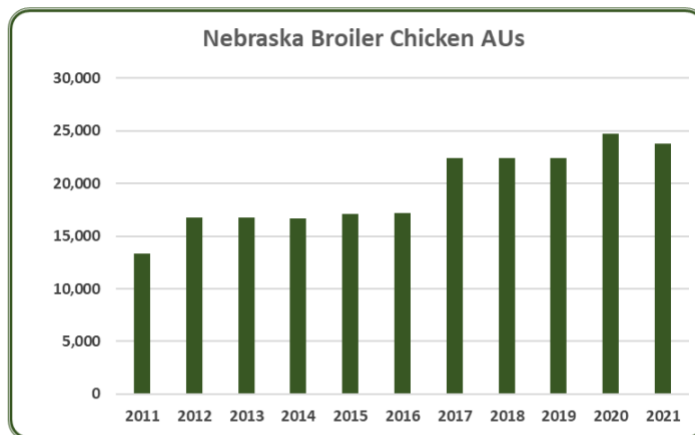
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Nebraska, the largest three segments of animal agriculture in terms of AUs during 2021 were: Beef Cattle (6.00 million AUs), Hogs (516,644 AUs), and Dairy Cattle (129,878 AUs). Total animal units in Nebraska during 2021 were 6.76 million AUs.



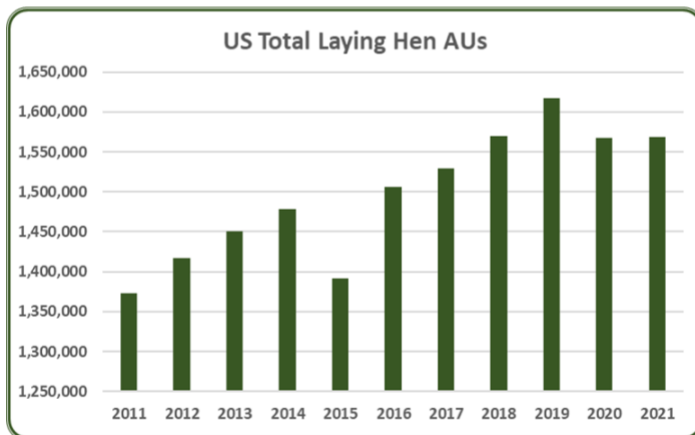
- In 2021, total AUs in the U.S. decreased by 0.87% to 132 million. Eight out of the ten commodities followed saw a decrease, with four seeing a decrease of over 100,000 AUs. Total AUs were lowest in 2013 and 2014 and peaked in 2019. There has been a downward trend in total AUs since 2019.
- In 2021, Nebraska had 6.76 million total AUs, a 0.92% increase from 2020. This was primarily due to an increase in beef cattle AUs. From 2011 to 2021, the average number of total AUs in Nebraska was 6.49 million AUs. Since 2011, total AUs in Nebraska have increased by 9.36%.



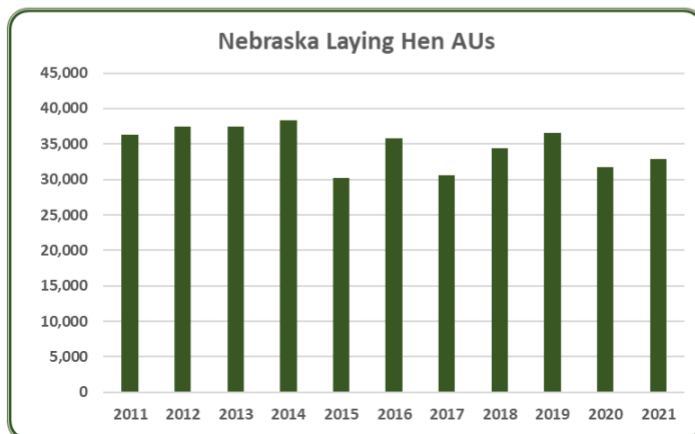
- U.S. broiler production is concentrated in the southern states – Georgia being the largest producer. On average, from 2011 to 2021, broiler chicken AUs were 26.5 million across the U.S. From 2020 and 2021 there was a 0.99% decrease (274,200) in broiler chicken AUs –Alabama, Delaware, and Maryland, were the largest contributors to this decrease.



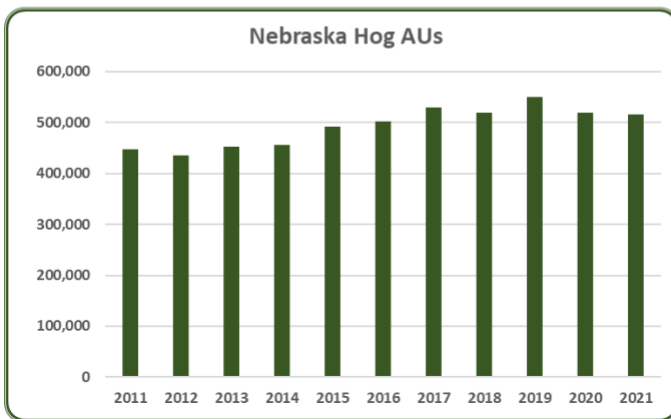
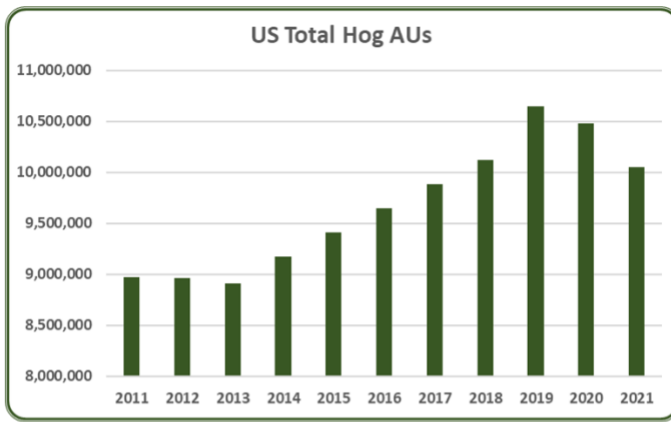
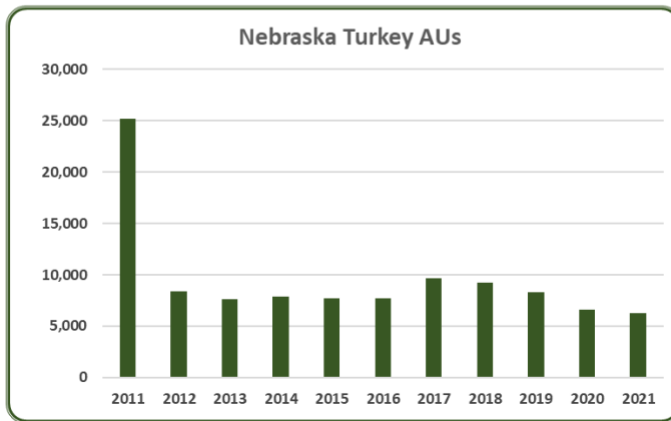
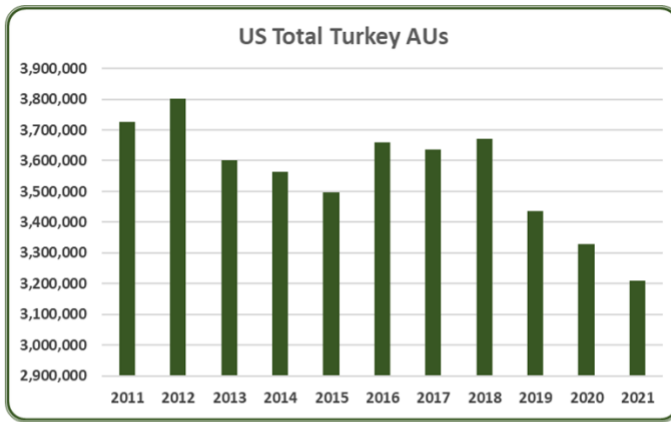
- In 2021, Nebraska had 23,769 broiler AUs, a 3.86% decrease from 2020. Broilers accounted for 0.35% of the total AUs (6.76 million) in Nebraska. From 2011 to 2021, the average number of broiler AUs in Nebraska was 19,404. Since 2011, broiler AUs have increased by 78.7%.



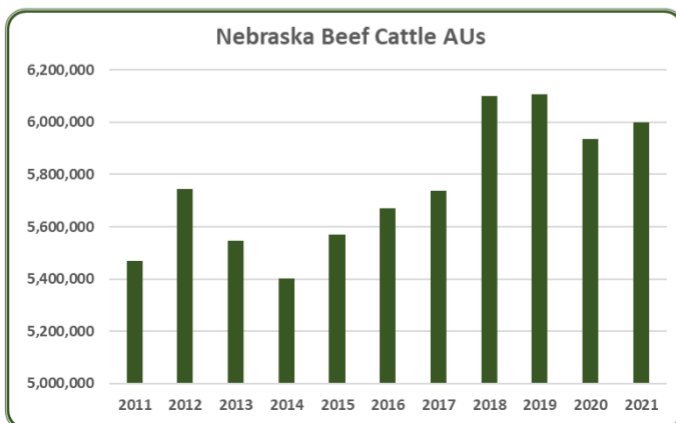
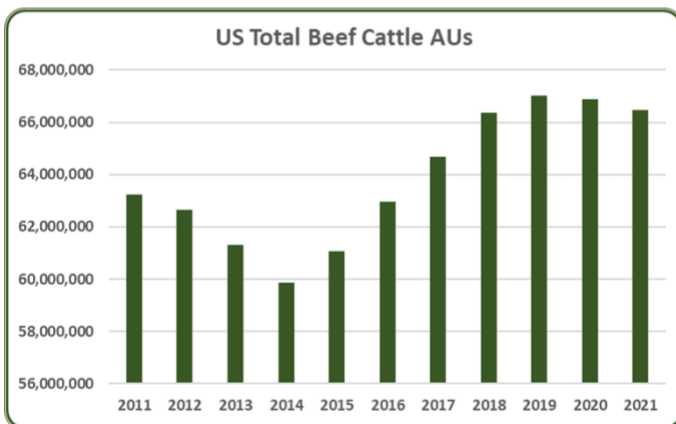
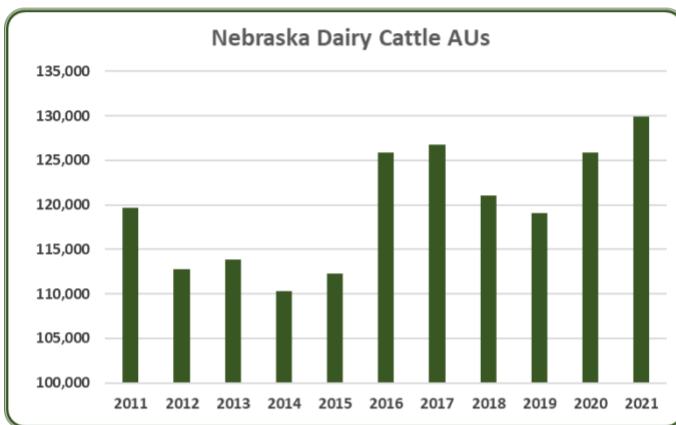
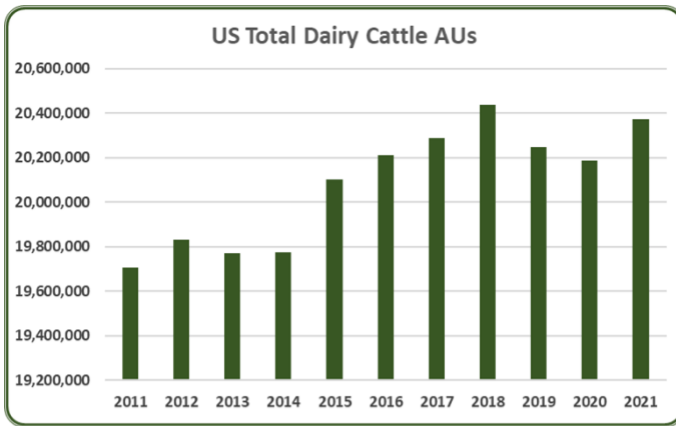
- From 2011 to 2021, U.S. layer AUs averaged 1.5 million. In 2021, layer AUs were 1.57 million, a 1.19% increase from the year before. Despite nationwide increase, 38 states experienced a decrease in layer AUs compared to last year.



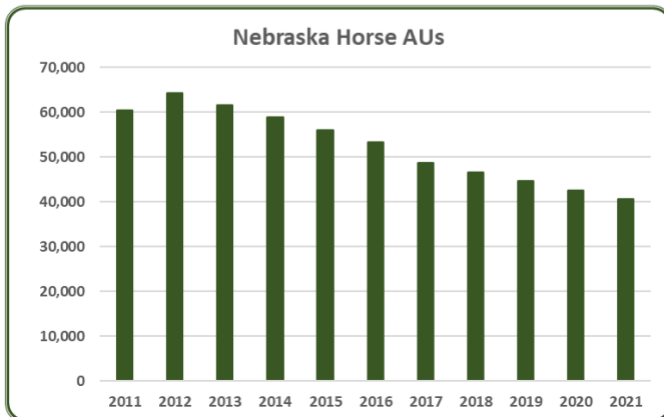
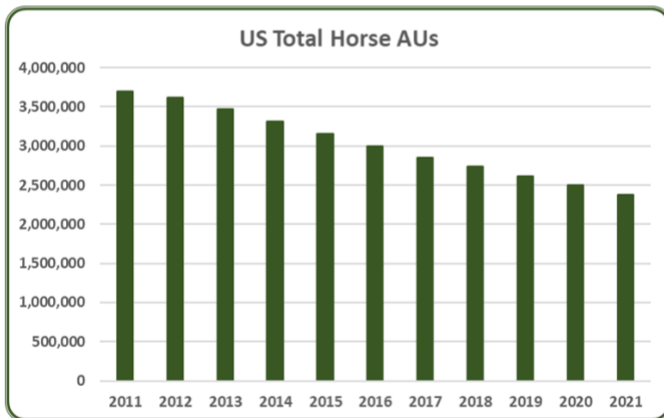
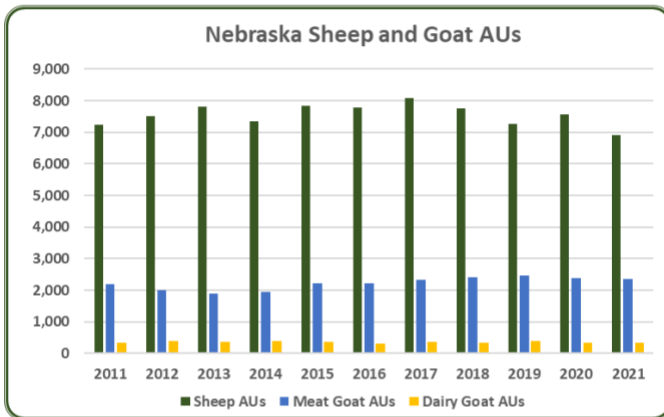
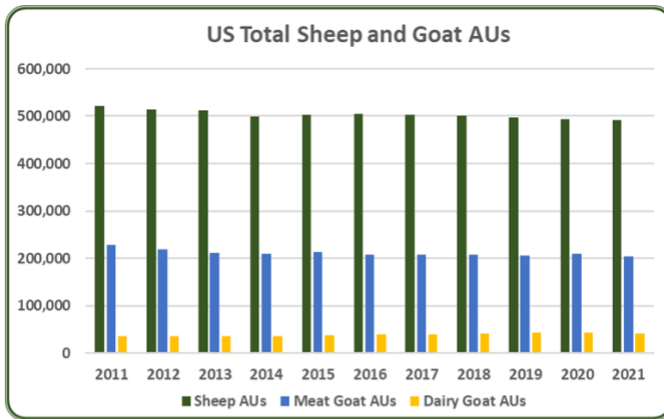
- In 2021, Nebraska had 32,888 layer AUs, a 3.72% increase from 2020. Layers accounted for 0.49% of the total AUs (6.76 million) in Nebraska. From 2011 to 2021, the average number of layer AUs in Nebraska was 34,693. Since 2011, layer AUs have decreased by 9.28%.



- In 2021, turkey AUs were at 3.2 million, a 3.60% drop from the previous year. Minnesota had the most turkey AUs during 2021 with 18.93% of the total U.S. turkey AUs. Although growth occurred immediately following the 2015 avian influenza outbreak, 2021 AUs reached a decade low – 47 states experienced a decrease in turkey AUs.
- In 2021, Nebraska had 6,303 turkey AUs, a 4.94% decrease from 2020. Turkeys accounted for 0.09% of the total AUs (6.76 million) in Nebraska. From 2011 to 2021, the average number of turkey AUs in Nebraska was 9,508. Since 2011, turkey AUs have decreased by 74.97%.
- From 2011 to 2021, hog AUs increased 19.72% (1.73 million AUs). Hogs make up 7.86% of all animal units within the United States. The decade average for Hog AUs is 9.54 million. In 2021, hog AUs were at 10.48 million, a 1.58% drop from the previous year.
- In 2021, Nebraska had 516,644 hog AUs, a 0.58% decrease from 2020. Hogs accounted for 7.64% of the total AUs (6.76 million) in Nebraska, making it the second largest animal sector in the state. From 2011 to 2021, the average number of hog AUs in Nebraska was 492,726. Since 2011, hog AUs have increased by 15.46%.



- From 2011 to 2021, dairy cattle AUs averaged 20.1 million. In 2021, dairy cattle AUs increased by 0.93% (187,902 AUs) from 2020 – 26 states experienced a decrease in dairy cattle AUs. California, Wisconsin, and Idaho have, respectively, the highest number of dairy cattle AUs.
- In 2021, Nebraska had 129,878 dairy cattle AUs, a 3.2% increase from 2020. Dairy cattle accounted for 1.92% of the total AUs (6.76 million) in Nebraska. From 2011 to 2021, the average number of dairy cattle AUs in Nebraska was 119,763. Since 2011, dairy cattle AUs have increased by 8.52%.
- From 2011 to 2021, beef cattle AUs averaged 63.9 million. Over the past decade beef cattle AUs have increased by 5.13%, but have decreased by 0.60% (402,745 AUs) from last year. Beef AUs have trended upward after a drought occurred in the middle of the ten-year period, still up 11.02% since the recent low in 2014.
- In 2021, Nebraska had 6.00 million beef cattle AUs, a 1.07% increase from 2020. Beef cattle accounted for 88.76% of the total AUs (6.76 million) in Nebraska, making it the largest animal sector in the state. From 2011 to 2021, the average number of beef cattle AUs in Nebraska was 5.75 million. Since 2011, beef cattle AUs have increased by 9.71%. Among all 50 states, Nebraska is ranked second in beef cattle AUs.



- Sheep, meat goats, and dairy goats account for less than 0.56% of U.S. total AUs. Individually, dairy goat AUs increased by 16.67% over the past decade; sheep AUs and meat goat AUs decreased by 5.53% and 10.23%. Combined, there was a 5.88% decrease in AUs – from 784,600 in 2011 to 738,500 in 2021.
- In 2021, Nebraska had a combined 9,629 sheep, meat goat, and dairy goat AUs, a 6.56% decrease from 2020. These account for 0.14% of the total AUs (6.76 million) in Nebraska. Individually, meat goat and dairy goat AUs increased 7.32% and 2.94% respectively while sheep AUs decreased 4.24% since 2011. Combined there was a 1.39% decrease since 2011.
- Horses account for about 1.80% of U.S. total AUs. From 2011 to 2021, horse AUs show a downward trend – from 3.70 million in 2011 to 2.38 million in 2021; a 35.79% decrease. In 2021, all 50 states experienced a decrease in horse AUs.
- In 2021, Nebraska had 40,581 horse AUs, a 4.73% decrease from 2020. Horses accounted for 0.6% of the total AUs (6.76 million) in Nebraska. From 2011 to 2021, the average number of horse AUs in Nebraska was 52,497. Since 2011, horse AUs have decreased by 32.72%.

Nebraska Additional Information and Methodology

Animal agriculture is an important part of Nebraska’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:

1. Economic impact of animal agriculture to local (state) economies during the 2011-2021 time period
2. Soybean meal usage by animal species during the 2020-21 soybean marketing year
3. Animal Unit (AU) trends from 2011-2021

Given the long-term presence of animal agriculture in Nebraska, of interest is the degree to which the industry impacts the Nebraska economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Nebraska 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 Nebraska’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 2011-2021 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 Nebraska which have occurred. As shown in this state report, Nebraska 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 Nebraska. 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 2020-21 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 515.639.2900.

Nebraska 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 Nebraska'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 Nebraska, \$1.88 to \$3.01 million in total economic activity, \$0.46 to \$0.62 in household wages and 9 to 12 additional jobs are generated in the economy at large.

Appendix

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
Animal Units (AUs)	Beef Cattle AUs	5,468,705	5,745,143	5,548,053	5,403,429	5,569,059	5,672,212	5,737,064	6,098,547	6,108,303	5,936,179	5,999,471
	Hog and Pig AUs	447,456	435,985	452,499	455,952	492,016	501,295	528,918	520,081	549,473	519,671	516,644
	Broiler AUs	13,301	16,790	16,732	16,637	17,067	17,194	22,404	22,419	22,412	24,723	23,769
	Turkey AUs	25,187	8,419	7,655	7,868	7,714	7,714	9,632	9,195	8,268	6,630	6,303
	Egg Layer AUs	36,252	37,412	37,460	38,288	30,156	35,828	30,640	34,416	36,572	31,708	32,888
	Dairy AUs	119,679	112,789	113,829	110,284	112,317	125,877	126,755	121,030	119,098	125,853	129,878
	Total Animal Units	6,180,658	6,430,754	6,247,884	6,100,964	6,294,808	6,423,751	6,514,788	6,862,813	6,898,877	6,697,668	6,759,163
Value of Production (\$1,000)	Cattle and Calves (\$1,000)	\$ 5,044,827	\$ 5,820,360	\$ 5,881,788	\$ 7,202,202	\$ 7,432,384	\$ 6,330,536	\$ 5,790,521	\$ 5,372,315	\$ 5,415,872	\$ 5,072,233	\$ 6,088,426
	Hogs and Pigs (\$1,000)	\$ 913,304	\$ 842,576	\$ 844,760	\$ 1,006,209	\$ 780,143	\$ 717,838	\$ 801,292	\$ 777,828	\$ 824,908	\$ 702,339	\$ 1,141,512
	Broilers (\$1,000)	\$ 13,635	\$ 14,344	\$ 14,967	\$ 15,168	\$ 14,795	\$ 14,523	\$ 15,015	\$ 14,517	\$ 14,259	\$ 13,924	\$ 12,696
	Turkeys (\$1,000)	\$ 12,938	\$ 17,576	\$ 13,917	\$ 9,712	\$ 10,438	\$ 10,467	\$ 6,752	\$ 2,450	\$ 3,058	\$ 3,440	\$ 4,646
	Eggs (\$1,000)	\$ 169,837	\$ 180,838	\$ 197,262	\$ 240,461	\$ 281,147	\$ 99,773	\$ 130,912	\$ 198,857	\$ 130,434	\$ 153,857	\$ 155,763
	Milk (\$1,000)	\$ 249,849	\$ 232,456	\$ 244,650	\$ 298,750	\$ 232,646	\$ 236,431	\$ 262,808	\$ 233,280	\$ 259,256	\$ 265,720	\$ 263,255
	Other	\$ 11,676	\$ 15,385	\$ 14,415	\$ 16,611	\$ 19,128	\$ 17,484	\$ 18,153	\$ 17,017	\$ 16,313	\$ 16,820	\$ 16,481
	Sheep and Lambs (\$1,000)	\$ 8,383	\$ 11,835	\$ 10,751	\$ 12,833	\$ 15,237	\$ 13,479	\$ 14,035	\$ 12,785	\$ 11,967	\$ 12,361	\$ 11,908
	Aquaculture (\$1,000)	\$ 3,293	\$ 3,550	\$ 3,664	\$ 3,777	\$ 3,891	\$ 4,004	\$ 4,118	\$ 4,232	\$ 4,345	\$ 4,459	\$ 4,572
	Total (\$1,000)	\$ 6,416,065	\$ 7,123,535	\$ 7,211,758	\$ 8,789,112	\$ 8,770,680	\$ 7,427,052	\$ 7,025,453	\$ 6,616,264	\$ 6,664,099	\$ 6,228,332	\$ 7,682,780

Ag Census Data Category	Animal Type	2002	2007	2012	2017
Number of Farms by NAICS	Beef cattle ranching and farming (112111)	12,709	10,775	11,788	11,551
	Cattle feedlots (112112)	2,511	1,534	1,083	1,093
	Dairy cattle and milk production (11212)	507	267	247	204
	Hog and pig farming (1122)	1,302	936	644	587
	Poultry and egg production (1123)	173	489	282	288
	Sheep and goat farming (1124)	464	558	837	854
	Animal aquaculture and other animal production (1125,1129)	2,360	2,489	3,954	2,993
Value of Sales (\$1,000)	Cattle and Calves	5,401,018	7,358,555	10,098,166	10,641,897
	Hogs and Pigs	590,581	923,209	1,085,828	1,489,081
	Poultry and Eggs	142,442	165,265	216,370	194,462
	Milk*			219,724	287,974
	Aquaculture	2,170	3,826	3,550	4,118
	Other (calculated)	30,240	39,789	44,375	54,890
	Total	6,315,392	8,662,710	11,668,013	12,672,422
Input Purchases	Livestock and poultry purchased (Farms)	16,074	13,253	16,094	14,041
	\$1,000	3,211,783	4,066,702	5,117,496	5,745,566
	Breeding livestock purchased (Farms)	9,741	8,516	10,656	9,788
	\$1,000	90,966	175,943	251,297	297,085
	Other livestock and poultry purchased (Farms)	9,173	6,927	8,217	6,543
	\$1,000	3,120,817	3,890,759	4,866,199	5,448,481
Feed purchased	(Farms)	26,376	21,335	28,254	25,191
	\$1,000	1,490,523	2,045,635	3,981,917	3,245,145
<i>* Measurement of milk sales in 2002-2007 are not comparable to 2012-2017.</i>					

	<u>Animal Type</u>	<u>Output (\$1,000)</u>	<u>Earnings (\$1,000)</u>	<u>Employment (Jobs)</u>	<u>Income Taxes Paid (\$1,000)</u>
2021 Animal Agriculture	Cattle and Calves	\$ 15,662,476	\$ 3,301,753	66,155	\$ 820,486
	Hogs, Pigs, and Other	\$ 2,177,953	\$ 529,666	10,179	\$ 131,622
	Poultry and Eggs	\$ 521,066	\$ 108,087	2,040	\$ 26,860
	Dairy	\$ 697,757	\$ 149,976	2,954	\$ 37,269
	Total	\$ 19,059,252	\$ 4,089,483	81,327	\$ 1,016,237

Change from 2011 to 2021	Cattle and Calves	\$ (19,853)	\$ (4,185)	(84)	\$ (1,040)
	Hogs, Pigs, and Other	\$ 75,706	\$ 18,411	354	\$ 4,575
	Poultry and Eggs	\$ (193,352)	\$ (40,108)	(757)	\$ (9,967)
	Dairy	\$ (102,472)	\$ (22,025)	(434)	\$ (5,473)
	Total	\$ (239,970)	\$ (47,907)	(921)	\$ (11,905)

	<u>Animal Type</u>	<u>Output(\$)</u>	<u>Earnings (\$)</u>	<u>Employment (Jobs)</u>
RIMS II Multipliers	Cattle and Calves	\$ 2.57	\$ 0.54	10.9
	Hogs, Pigs, and Other	\$ 1.88	\$ 0.46	8.8
	Poultry and Eggs	\$ 3.01	\$ 0.62	11.8
	Dairy	\$ 2.65	\$ 0.57	11.2

Tax Rates	Federal effective income tax rate	14.0%
	Federal Social Security tax rate	6.2%
	State Effective Rate	4.7%
	Total	24.9%

Sources: 2002, 2007, 2012 and 2017 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax-Rates.org & The Motley Fool.