

Kansas Economic Analysis of Animal Agriculture: 2012-2022

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Prepared For:



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Kansas Executive Summary

The use of SBM as a key feed ingredient is an important part of Kansas 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 Kansas. The success of Kansas animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the State of Kansas during 2022 animal agriculture contributed:

- \$21.5 billion in economic output
- 87,924 jobs
- \$4.4 billion in earnings
- \$1.1 billion in income taxes paid at local, state, and federal levels
- \$323.8 million in the form of property taxes

Kansas's animal agriculture consumed almost 386.9 thousand tons of SBM in 2022. This SBM was fed primarily to:

- Dairy Cows (164.8 thousand tons)
- Hogs (155.2 thousand tons)
- Beef Cows (43.1 thousand tons)

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

Kansas Economic Impact of Animal Agriculture

Animal agriculture is an important part of Kansas’s economy. In 2022, Kansas’s animal agriculture contributed the following to the economy:

- About \$21.5 billion in economic output
- \$4.4 billion in household earnings
- 87,924 jobs
- \$1.1 billion in income taxes

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

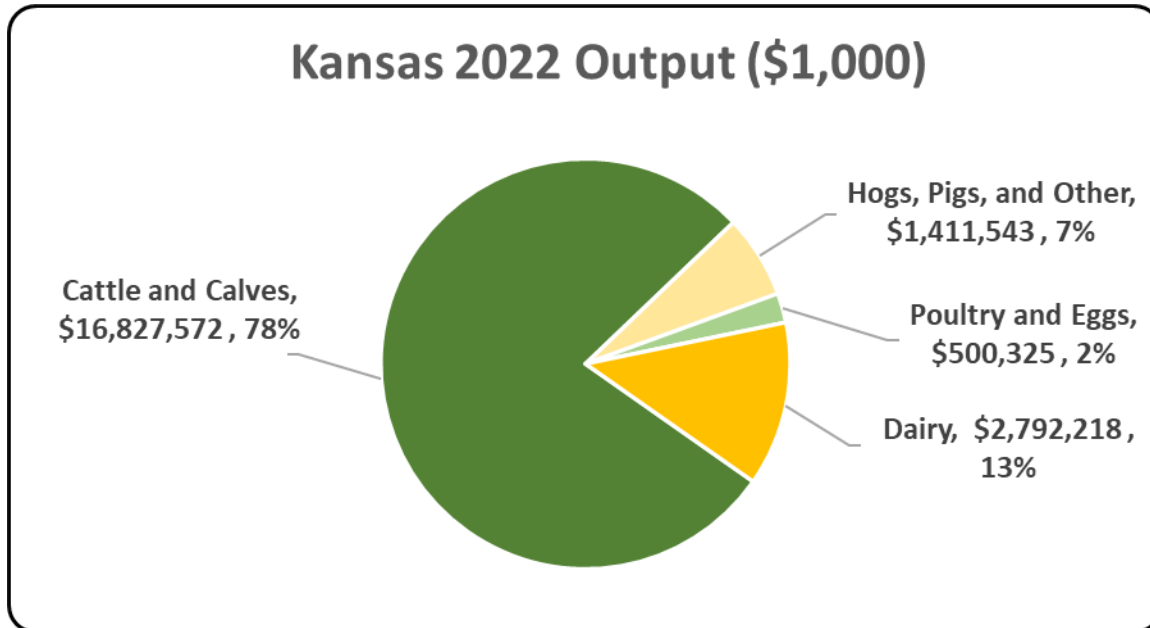
- Increased economic output by \$3.3 billion
- Boosted household earnings by \$663.0 million
- Added 13,226 jobs
- Paid \$163.1 million more in income taxes

Below is a table which demonstrates this decade of change.

Measure	2022	Change 2012-2022	% Change 2012-2022
Output (\$1,000)	\$ 21,531,658	\$ 3,310,019	18.17%
Earnings (\$1,000)	\$ 4,360,044	\$ 663,008	17.93%
Employment (Jobs)	87,924	13,226	17.71%
Income Taxes Paid (\$1,000)	\$ 1,072,571	\$ 163,100	17.93%
Property Taxes Paid in 2017 (\$1,000)	\$ 323,821		

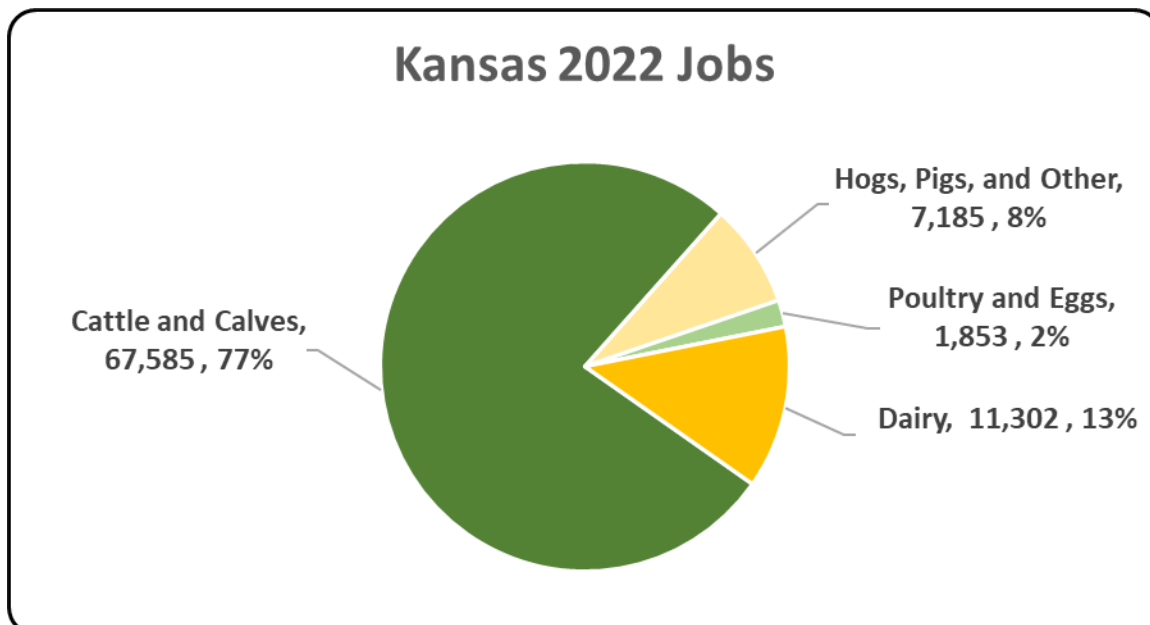
Kansas Output

“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 Kansas economy. Animal agriculture’s impact on Kansas total economic output is about \$21.5 billion.



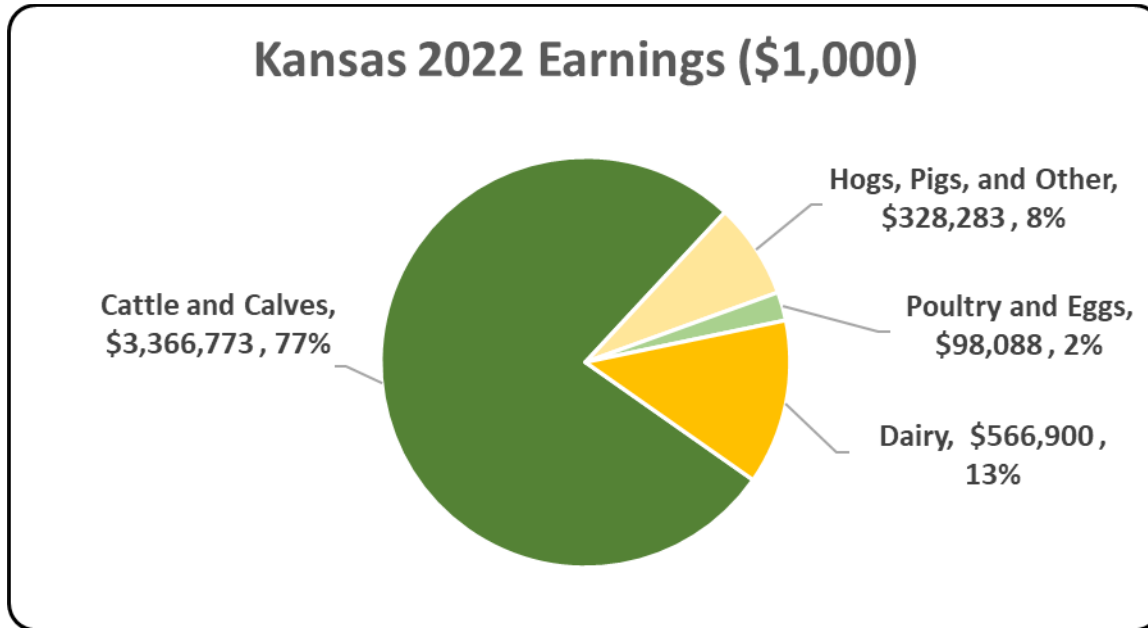
Kansas Jobs

“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 Kansas in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Kansas total jobs, contributing 87,924 jobs within and outside of animal agriculture.



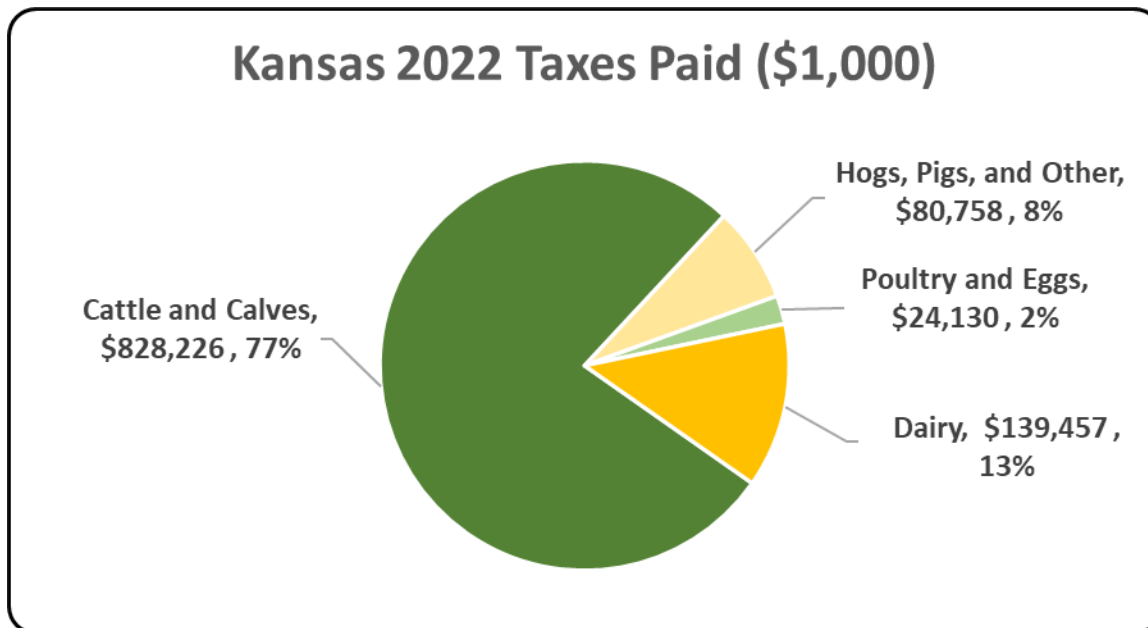
Kansas Earnings

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 Kansas economy in terms of earnings. Kansas's animal agriculture contributed about \$4.4 billion to household earnings in 2022.



Kansas Taxes Paid by Animal Agriculture

Kansas's animal agriculture is also a significant source of tax revenue. In 2022, the state's animal agriculture industry paid about \$1.1 billion in income taxes at local, state, and federal levels. The 2017 Census of Agriculture estimated \$323.8 million in property taxes paid by all of Kansas agriculture during 2017. Estimates of income taxes paid by animal agriculture are shown in the following chart.



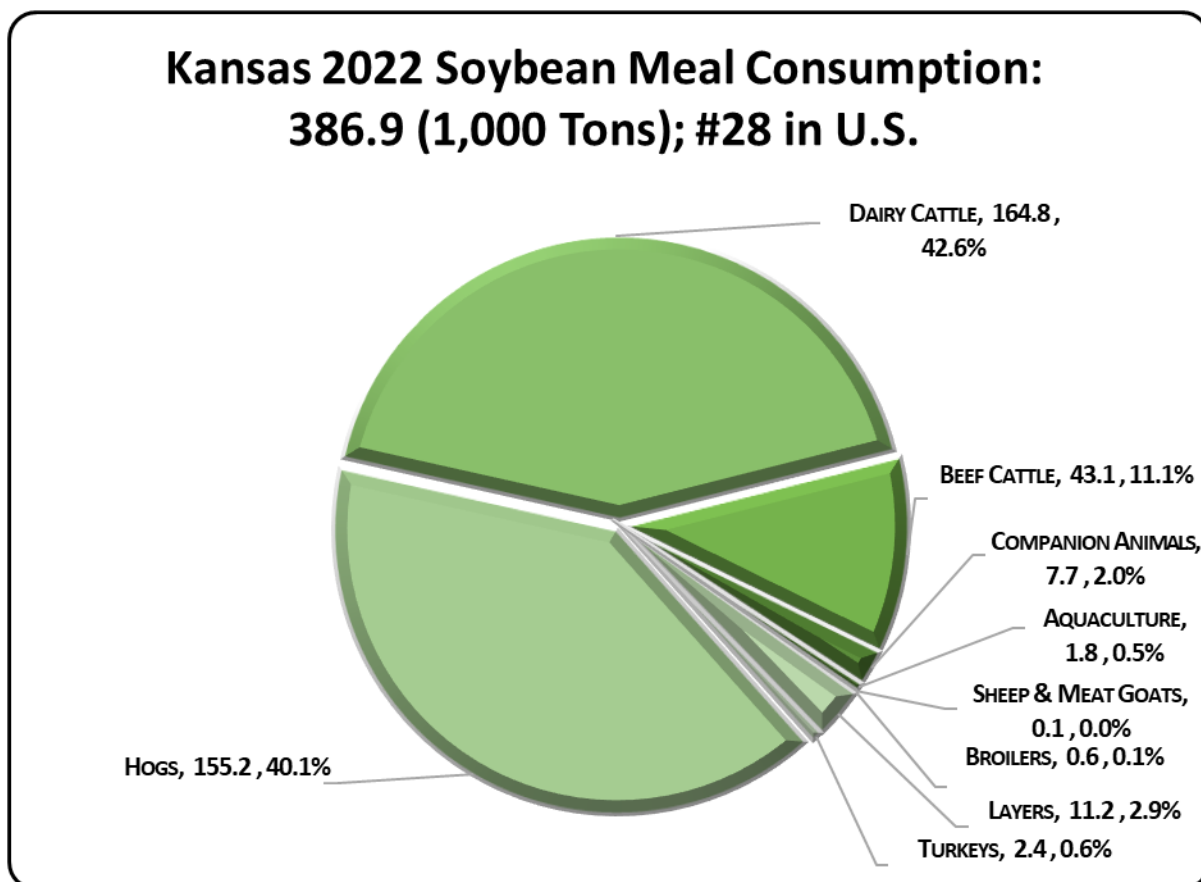
Kansas Animal Agriculture Soybean Meal Consumption

The choice to use SBM 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 SBM (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 SBM usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of SBM used during the 2021-22 soybean marketing year by up to sixteen specific animal species has been estimated.

Kansas’s animal agriculture consumed almost 386.9 thousand tons of SBM in 2022, placing the state as 28 in the nation in terms of SBM consumption (see figure below). Additionally, animal agriculture in Kansas consumed 94.2 thousand tons of soy hulls. The three segments of animal agriculture that led the state in estimated SBM consumption are:

1. Dairy Cows (164.8 thousand tons)
2. Hogs (155.2 thousand tons)
3. Beef Cows (43.1 thousand tons)

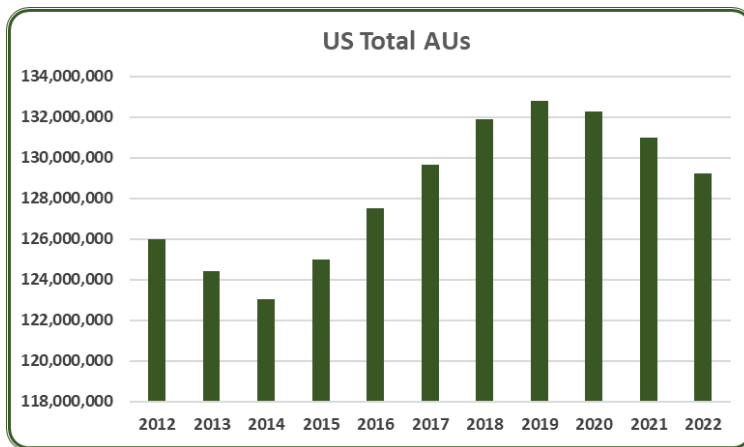


Kansas Animal Unit (AU) Trends

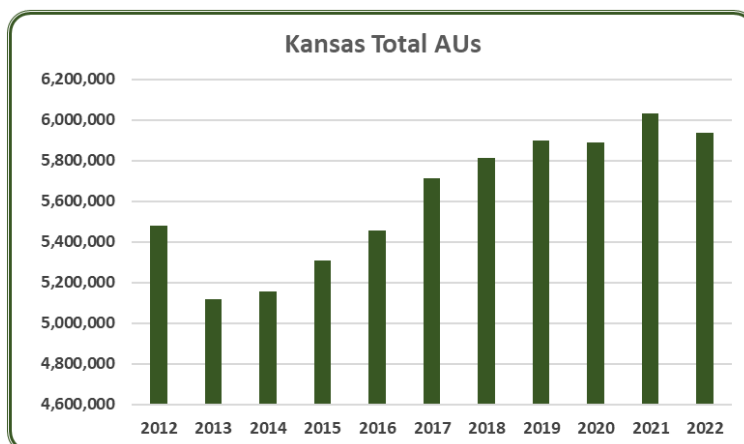
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the U.S. and abroad have an impact on the size of animal agriculture in the state of Kansas. Due to this reality, using a single year to measure a sector’s presence and strength can be misleading. The use 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 Kansas and to give perspective on Kansas’s contribution to the nation’s animal agriculture industry and beyond.

Like 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.

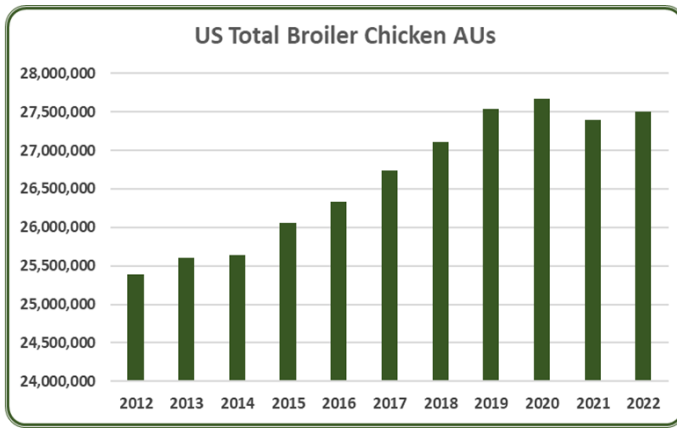
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Kansas, the largest three segments of animal agriculture in terms of AUs during 2022 were: Beef Cattle (5.15 million AUs), Dairy Cattle (431,636 AUs), and Hogs (297,331 AUs). Total AUs in Kansas during 2022 were 5.94 million AUs.



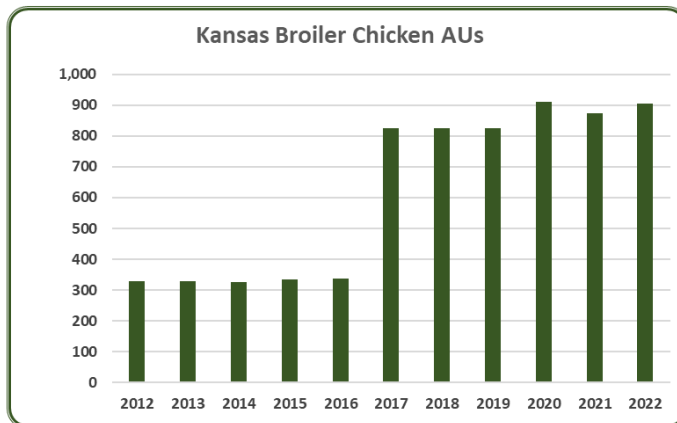
- In 2022, total AUs in the U.S. decreased by 1.4% to 129.2 million, continuing a downward trend that started in 2019. Nine out of the ten animal groups tracked saw a decrease, with the exception being broilers. Over 70% of the total decrease in AUs is due to lower beef cattle inventories.



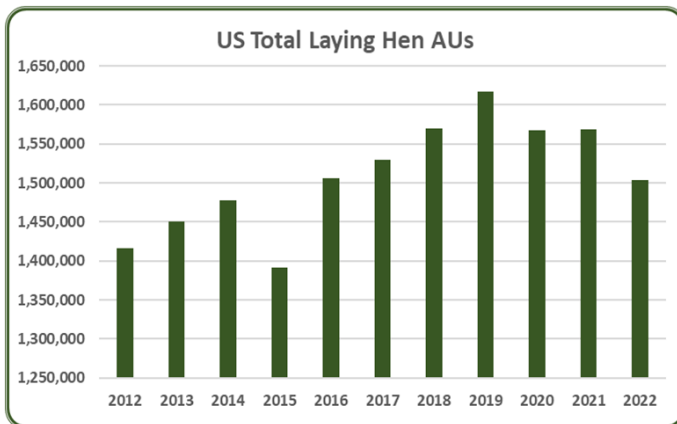
- In 2022, Kansas had 5.94 million total AUs, a 1.6% decrease from 2021. From 2012 to 2022, the average number of total AUs in Kansas was 5.62 million AUs. Since 2012, total AUs in Kansas have increased by 8.3%.



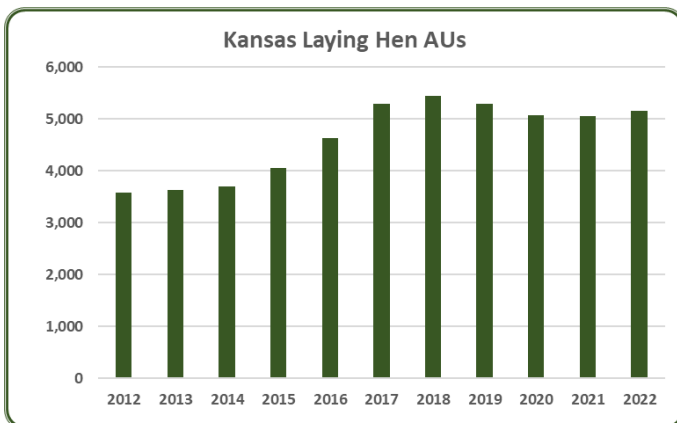
- From 2012 to 2022, broiler chicken AUs averaged 26.6 million across the U.S. Broiler AUs trended up and peaked in 2020 at 27.6 million. Broiler AUs are up 0.4% from 2021 and were the only animal group tracked here that increased compared to last year. Broilers make up about 21% of U.S. AUs.



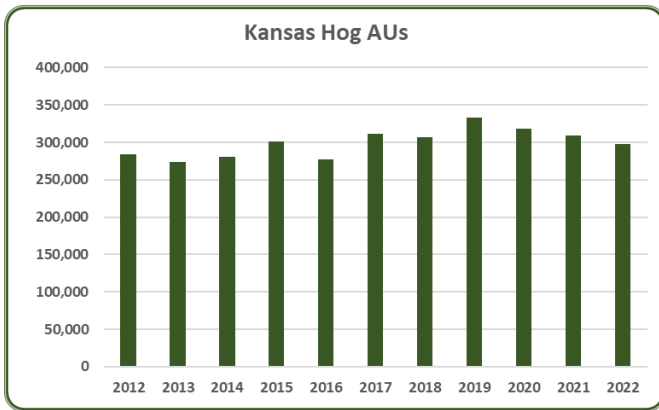
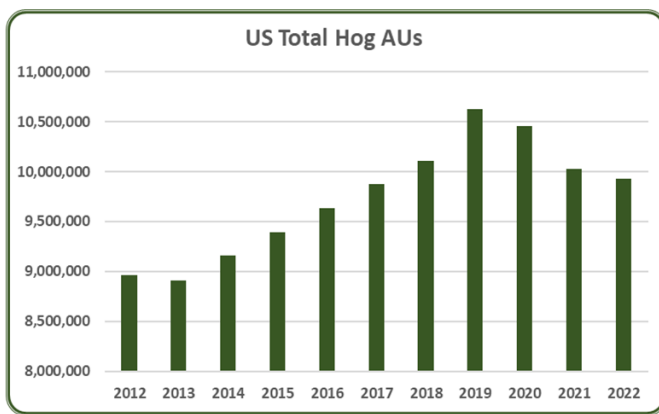
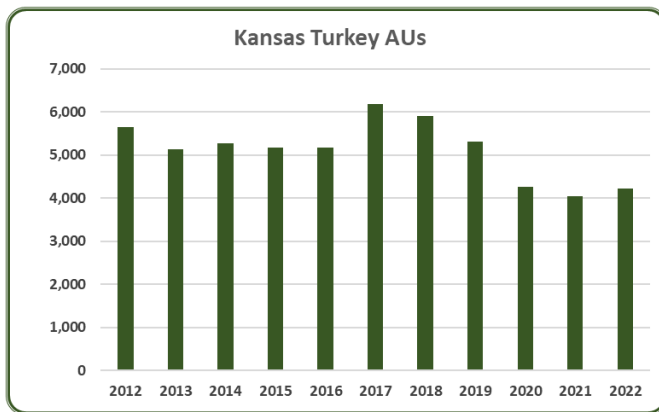
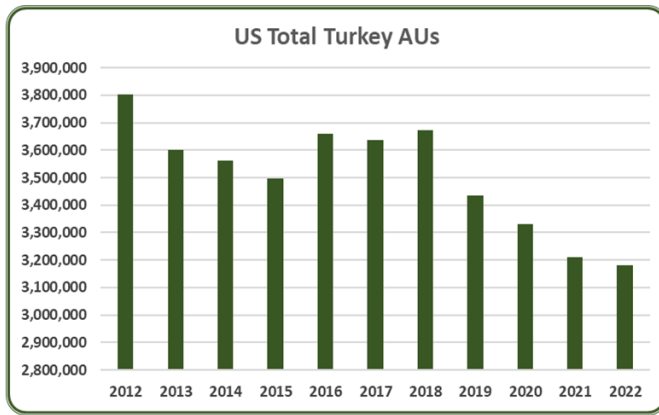
- In 2022, Kansas had 904 broiler AUs, a 3.3% increase from 2021. Broilers accounted for less than 0.05% of the total AUs (5.94 million) in Kansas. From 2012 to 2022, the average number of broiler AUs in Kansas was 620 AUs. Since 2012, broiler AUs have increased by 174%.



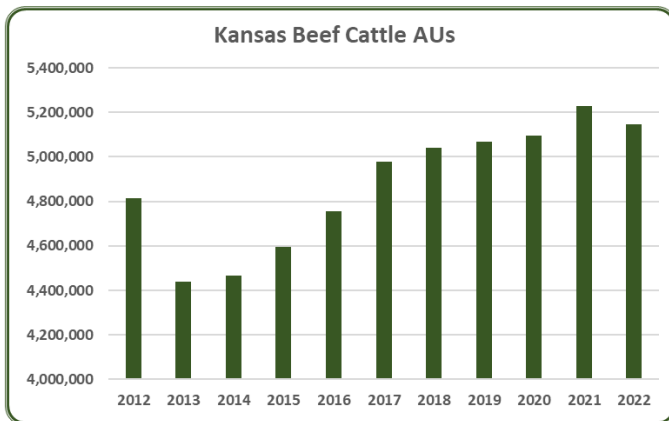
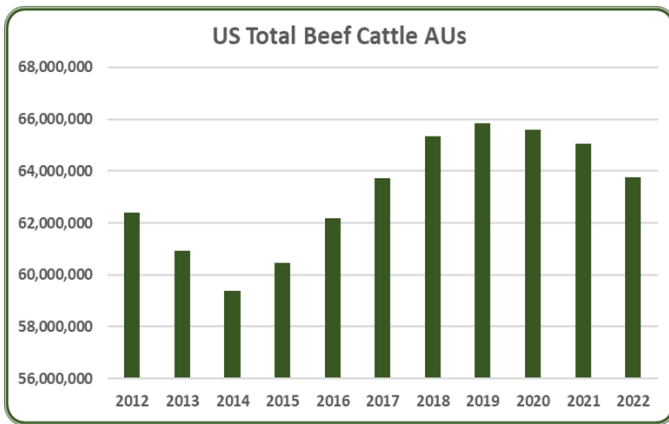
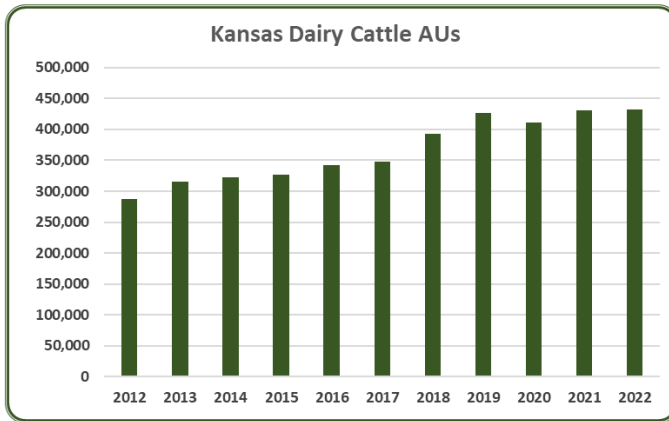
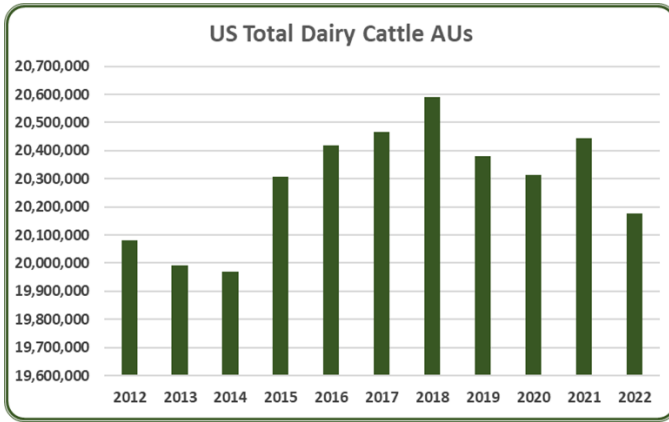
- From 2012 to 2022, U.S. layer AUs averaged 1.51 million. In 2022, layer AUs were 1.50 million, a 4.2% decrease from 2021. The 2022-23 Highly Pathogenic Avian Influenza (HPAI) outbreak contributed to this past year's decrease in layer AUs. Layers make up about 1% of U.S. AUs so large changes in layer AUs do not have a large impact on total AUs.



- In 2022, Kansas had 5,147 layer AUs, a 1.9% increase from 2021. Layers accounted for 0.1% of the total AUs (5.94 million) in Kansas. From 2012 to 2022, the average number of layer AUs in Kansas was 4,624 AUs. Since 2012, layer AUs have increased by 43.9%.



- In 2022, turkey AUs were at 3.18 million, a 0.9% drop from the previous year. This drop is surprisingly low considering the industry battled HPAI for most of 2022. Turkey AUs have been trending down since 2018. Turkey AUs represent about 2% of U.S. AUs, so like layers, large changes in turkey AUs do not cause large changes in total AUs.
- In 2022, Kansas had 4,220 turkey AUs, a 4.3% increase from 2021. Turkeys accounted for 0.1% of the total AUs (5.94 million) in Kansas. From 2012 to 2022, the average number of turkey AUs in Kansas was 5,120 AUs. Since 2012, turkey AUs have decreased by 25.3%.
- In 2022, hog AUs totaled 9.93 million, a 1.0% drop from the previous year. From 2012 to 2022, hog AUs averaged 9.73 million. Hog AUs have been trending down since 2019 when they peaked at 10.62 million AUs. Hogs make up 7.70% of all AUs within the U.S.
- In 2022, Kansas had 297,331 hog AUs, a 3.9% decrease from 2021. Hogs accounted for 5% of the total AUs (5.94 million) in Kansas. From 2012 to 2022, the average number of hog AUs in Kansas was 299,468 AUs. Since 2012, hog AUs have increased by 4.7%.

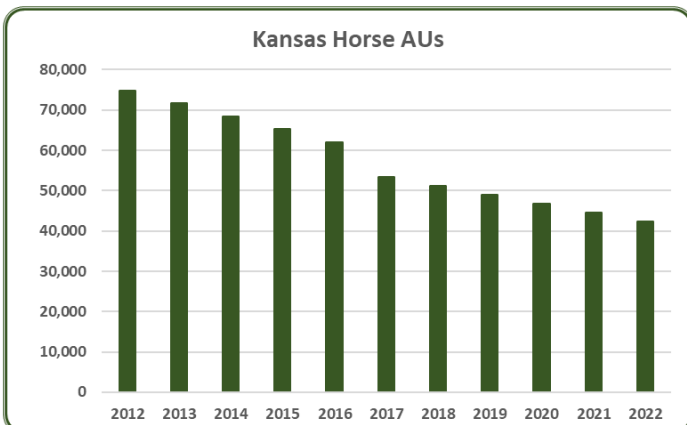
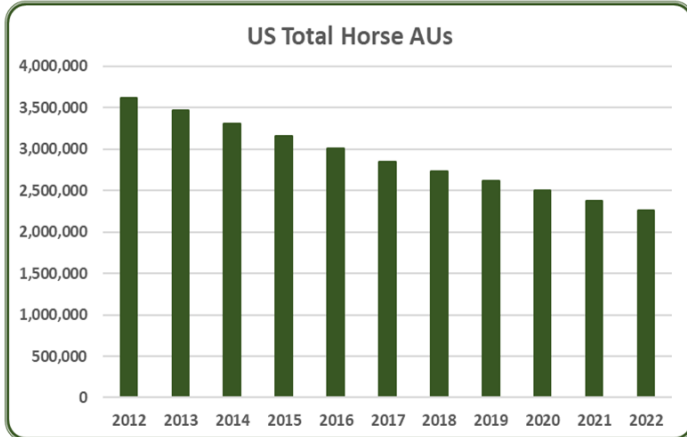
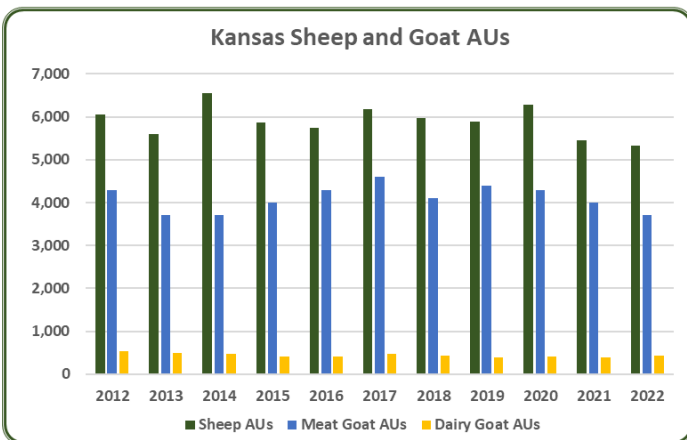
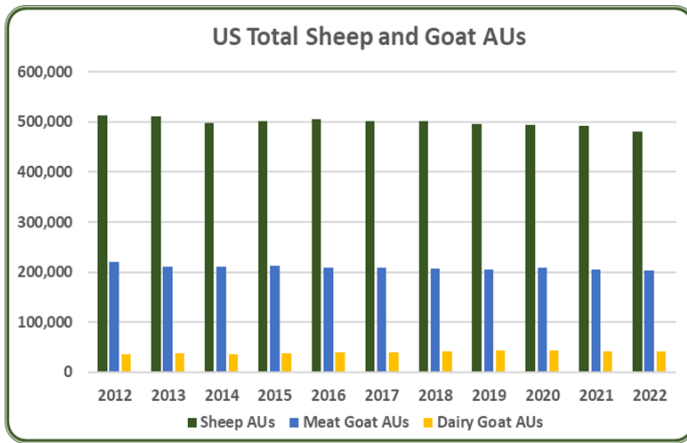


- From 2012 to 2022, dairy cattle AUs averaged 20.29 million. The herd was also relatively steady, fluctuating between 19.9-20.6 million AUs during that time. In 2022, dairy cattle AUs totaled 20.18 million, down 1.3% from 2021. Dairy cattle represented about 16% of all U.S. AUs.

- In 2022, Kansas had 431,636 dairy cattle AUs, a 0.3% increase from 2021. Dairy cattle accounted for 7.3% of the total AUs (5.94 million) in Kansas. From 2012 to 2022, the average number of dairy cattle AUs in Kansas was 366,861 AUs. Since 2012, dairy cattle AUs have increased by 50.2%.

- From 2012 to 2022, beef cattle AUs averaged 63.9 million. In 2022 beef cattle AUs totaled 63.93 million, down 2% from last year, as beef cattle continued through a contraction phase in the cattle cycle which started in 2019. Beef AUs represent almost 50% of U.S. AUs, so changes in beef cattle AUs have large effects on total AUs.

- In 2022, Kansas had 5.15 million beef cattle AUs, a 1.6% decrease from 2021. Beef cattle accounted for 86.7% of the total AUs (5.94 million) in Kansas. From 2012 to 2022, the average number of beef cattle AUs in Kansas was 4.88 million AUs. Since 2012, beef cattle AUs have increased by 6.9%.



- Sheep, meat goats, and dairy goats account for less than 0.6% of U.S. total AUs. Over the past decade, sheep AUs averaged 500,000, meat goat AUs averaged 209,000 and dairy goat AUs averaged 40,000. Sheep and meat goat AUs have trended down while dairy goats trended up until 2019, then leveled off.

- In 2022, Kansas had a combined 9,460 sheep, meat goat, and dairy goat AUs, a 4% decrease from 2021. These accounted for 0.2% of the total AUs (5.94 million) in Kansas. Individually, sheep AUs decreased 2.5%, meat goat AUs decreased 7.5% and dairy goat AUs increased 10%. Combined there was a 13.1% decrease in sheep and goat AUs since 2012.

- Horses account for about 2% of U.S. total AUs. From 2012 to 2022, horse AUs averaged 2.90 million. However, a steady downtrend is present and 2022 horse AUs only totaled 2.26 million. U.S. horse AUs have decreased every year from 2012 to 2022, decreasing 37.6% over the entire period.

- In 2022, Kansas had 42,383 horse AUs, a 5% decrease from 2021. Horses accounted for 0.7% of the total AUs (5.94 million) in Kansas. From 2012 to 2022, the average number of horse AUs in Kansas was 57,259 AUs. Since 2012, horse AUs have decreased by 43.4%.

Kansas Additional Information and Methodology

Animal agriculture is an important part of Kansas’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 2012-2022 time period
2. SBM usage by animal species during the 2021/22 soybean marketing year
3. Animal Unit (AU) trends from 2012-2022

Given the long-term presence of animal agriculture in Kansas, of interest is the degree to which the industry impacts the Kansas economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Kansas 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 Kansas’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 2012-2022 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 Kansas which have occurred. As shown in this state report, Kansas 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 SBM in Kansas. Through in-depth conversations with many of the nation’s top nutritionists and researchers, “bottom up” estimates of SBM usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of SBM used during the 2021-22 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.

Kansas 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 Kansas'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 Kansas, \$1.93 to \$3.02 million in total economic activity, \$0.45 to \$0.59 in household wages and 10 to 11 additional jobs are generated in the economy at large.

Appendix

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Animal Units (AUs)	Beef Cattle AUs	4,815,399	4,438,520	4,466,347	4,595,266	4,754,583	4,978,543	5,039,140	5,067,128	5,094,278	5,230,301	5,146,937
	Hog and Pig AUs	283,937	273,690	280,365	301,271	277,615	311,358	307,038	333,452	318,730	309,360	297,331
	Broiler AUs	330	329	327	335	338	824	825	825	910	875	904
	Turkey AUs	5,649	5,137	5,280	5,176	5,176	6,181	5,901	5,305	4,255	4,045	4,220
	Egg Layer AUs	3,576	3,637	3,690	4,057	4,622	5,283	5,445	5,283	5,077	5,051	5,147
	Dairy AUs	287,416	315,872	322,941	326,883	342,461	347,974	392,492	426,525	410,961	430,311	431,636
	Total Animal Units	5,482,061	5,118,646	5,158,150	5,308,554	5,457,334	5,714,816	5,812,604	5,898,232	5,892,023	6,034,396	5,938,018
Value of Production (\$1,000)	Cattle and Calves (\$1,000)	\$ 4,216,036	\$ 4,167,701	\$ 4,613,606	\$ 4,711,927	\$ 4,589,650	\$ 4,577,652	\$ 4,476,873	\$ 4,655,152	\$ 4,611,289	\$ 5,301,681	\$ 6,291,857
	Hogs and Pigs (\$1,000)	\$ 568,278	\$ 567,739	\$ 608,278	\$ 472,819	\$ 432,851	\$ 504,660	\$ 456,607	\$ 500,500	\$ 394,169	\$ 841,848	\$ 722,288
	Broilers (\$1,000)	\$ 48,896	\$ 59,579	\$ 62,503	\$ 54,528	\$ 48,483	\$ 56,930	\$ 48,504	\$ 42,318	\$ 34,581	\$ 48,639	\$ 77,743
	Turkeys (\$1,000)	\$ 15,091	\$ 11,949	\$ 8,339	\$ 8,962	\$ 8,987	\$ 5,797	\$ 3,253	\$ 4,059	\$ 4,567	\$ 6,169	\$ 12,570
	Eggs (\$1,000)	\$ 37,296	\$ 62,850	\$ 63,559	\$ 106,941	\$ 41,428	\$ 51,595	\$ 87,679	\$ 38,815	\$ 55,322	\$ 49,150	\$ 75,544
	Milk (\$1,000)	\$ 519,080	\$ 592,264	\$ 747,360	\$ 536,744	\$ 532,640	\$ 591,331	\$ 567,324	\$ 668,325	\$ 688,446	\$ 696,660	\$ 1,006,749
	Other	\$ 11,744	\$ 10,081	\$ 10,402	\$ 10,369	\$ 9,590	\$ 9,466	\$ 8,635	\$ 8,501	\$ 7,907	\$ 7,368	\$ 7,229
	Sheep and Lambs (\$1,000)	\$ 6,747	\$ 5,642	\$ 6,522	\$ 7,047	\$ 6,826	\$ 7,260	\$ 6,987	\$ 7,411	\$ 7,376	\$ 7,103	\$ 7,096
	Aquaculture (\$1,000)	\$ 4,997	\$ 4,439	\$ 3,881	\$ 3,322	\$ 2,764	\$ 2,206	\$ 1,648	\$ 1,090	\$ 531	\$ 266	\$ 133
	Total (\$1,000)	\$ 5,416,422	\$ 5,472,163	\$ 6,114,047	\$ 5,902,290	\$ 5,663,629	\$ 5,797,431	\$ 5,648,875	\$ 5,917,671	\$ 5,796,281	\$ 6,951,515	\$ 8,193,981

Ag Census Data Category	Animal Type	2002	2007	2012	2017
Number of Farms by NAICS	Beef cattle ranching and farming (112111)	20,314	18,708	15,991	17,286
	Cattle feedlots (112112)	1,506	894	492	544
	Dairy cattle and milk production (11212)	608	523	398	298
	Hog and pig farming (1122)	634	618	348	292
	Poultry and egg production (1123)	299	691	385	309
	Sheep and goat farming (1124)	497	782	946	1,138
	Animal aquaculture and other animal production (1125,1129)	3,110	3,493	3,484	3,233
Value of Sales (\$1,000)	Cattle and Calves	5,715,204	8,542,872	10,153,087	10,914,404
	Hogs and Pigs	297,505	506,448	697,020	711,689
	Poultry and Eggs	withheld	69,807	88,403	63,415
	Milk*			482,765	591,154
	Aquaculture	745	2,228	4,997	2,206
	Other (calculated)	65,801	28,105	33,581	39,421
	Total	6,327,797	9,525,971	11,459,853	12,322,289
Input Purchases	Livestock and poultry purchased	(Farms) 16,103	15,145	16,190	15,781
		\$1,000 3,554,091	5,192,954	5,440,898	6,312,155
	Breeding livestock purchased	(Farms) 9,506	9,558	10,480	11,056
		\$1,000 60,943	150,517	206,584	252,334
	Other livestock and poultry purchased	(Farms) 8,750	7,797	8,352	7,167
		\$1,000 3,493,148	5,042,438	5,234,314	6,059,820
	Feed purchased	(Farms) 33,531	29,672	32,131	31,845
	\$1,000 1,410,837	2,237,287	4,207,051	3,183,636	
* Measurement of milk sales in 2002-2007 are not comparable to 2012-2017.					

	<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>
2022 Animal Agriculture	Cattle and Calves	\$ 16,827,572	\$ 3,366,773	67,585	\$ 828,226
	Hogs, Pigs, and Other	\$ 1,411,543	\$ 328,283	7,185	\$ 80,758
	Poultry and Eggs	\$ 500,325	\$ 98,088	1,853	\$ 24,130
	Dairy	\$ 2,792,218	\$ 566,900	11,302	\$ 139,457
	Total	\$ 21,531,658	\$ 4,360,044	87,924	\$ 1,072,571

Change from 2012 to 2022	Cattle and Calves	\$ 2,245,786	\$ 449,325	9,020	\$ 110,534
	Hogs, Pigs, and Other	\$ (39,790)	\$ (9,254)	(203)	\$ (2,276)
	Poultry and Eggs	\$ 173,576	\$ 34,029	643	\$ 8,371
	Dairy	\$ 930,447	\$ 188,907	3,766	\$ 46,471
	Total	\$ 3,310,019	\$ 663,008	13,226	\$ 163,100

	<u>Animal Type</u>	<u>Output(\$)</u>	<u>Earnings (\$)</u>	<u>Employment (Jobs)</u>
RIMS II Multipliers	Cattle and Calves	\$ 2.67	\$ 0.54	10.7
	Hogs, Pigs, and Other	\$ 1.93	\$ 0.45	9.8
	Poultry and Eggs	\$ 3.02	\$ 0.59	11.2
	Dairy	\$ 2.77	\$ 0.56	11.2

Tax Rates	Federal effective income tax rate	14.0%
	Federal Social Security tax rate	6.2%
	State Effective Rate	4.4%
	Total	24.6%

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.