

Economic Analysis of Animal Agriculture 2005-2015

NEW HAMPSHIRE

**A Report for
United Soybean Board**



September 2016



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11107 Aurora Ave

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New Hampshire Executive Summary

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

- \$239.3 million in economic output
- 1,114 jobs
- \$51.0 million in earnings
- \$12.9 million in income taxes paid at local, state, and federal levels
- \$23.6 million in the form of property taxes

Plus, from 2005-2015 animal agriculture in New Hampshire has increased economic output by over \$69.8 million, boosted household earnings by \$14.4 million, contributed 296 additional jobs and paid \$3.6 million in additional tax revenues.

New Hampshire's animal agriculture consumed almost 15,100 tons of soybean meal in 2015. This soybean meal was fed primarily to:

- Turkeys (8,100 tons)
- Egg-Laying Hens (2,700 tons)
- Dairy Cows (2,300 tons)

This report examines animal agriculture in New Hampshire 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 New Hampshire, many opportunities and challenges will arise. It is expected that animal agriculture will continue to be a minor contributor to the economic well-being of the people of New Hampshire and beyond.

New Hampshire Economic Impact of Animal Agriculture

Animal agriculture is a small part of New Hampshire's economy. In 2015, New Hampshire's animal agriculture contributed the following to the economy:

- About \$239.3 million in economic output
- \$51.0 million in household earnings
- 1,114 jobs
- \$12.9 million in income taxes

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

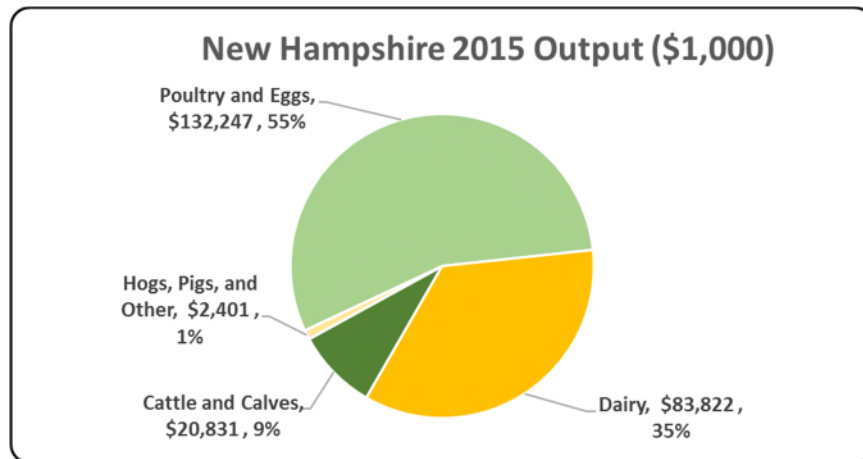
- Increased economic output by \$69.8 million
- Boosted household earnings by \$14.4 million
- Added 296 jobs
- Paid an additional \$3.6 million in income taxes

Below is a table which demonstrates this decade of change.

Measure	2015	Change 2005-2015	% Change 2005-2015
Output (\$1,000)	\$ 239,301	\$ 69,751	41.14%
Earnings (\$1,000)	\$ 50,975	\$ 14,397	39.36%
Employment (Jobs)	1,114	296	36.11%
Income Taxes Paid (\$1,000)	\$ 12,912	\$ 3,647	39.36%
Property Taxes Paid in 2012 (\$1,000)	\$ 23,589		

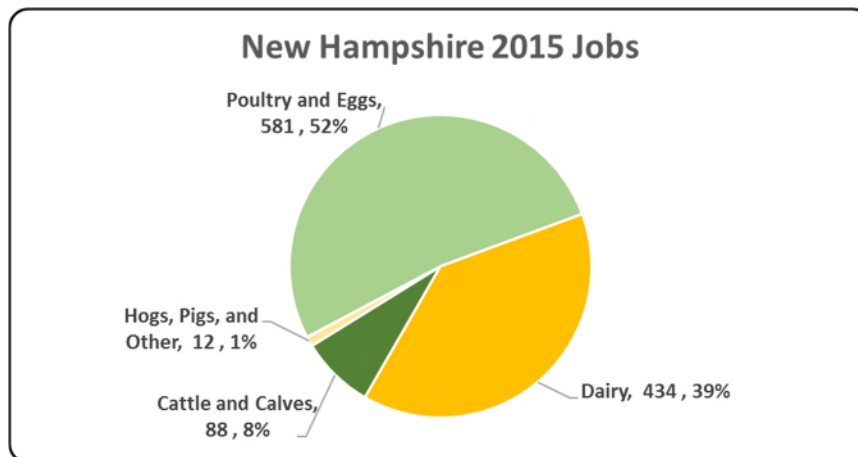
New Hampshire Output

“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 New Hampshire economy. Animal agriculture’s impact on New Hampshire total economic output is about \$239.3 million.



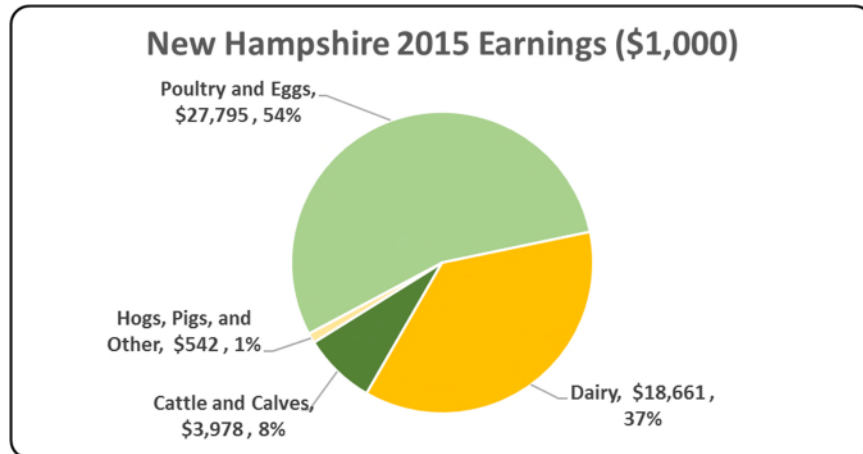
New Hampshire Jobs

“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 New Hampshire in terms of animal agriculture jobs. As shown, animal agriculture contributes about 1,114 jobs within and outside of animal agriculture.



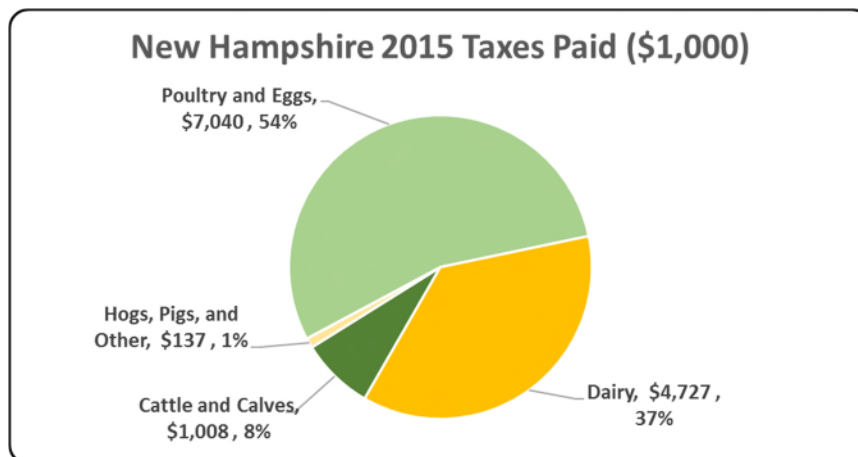
New Hampshire Earnings

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 New Hampshire economy in terms of earnings. New Hampshire’s animal agriculture contributed about \$51.0 million to household earnings in 2015.



New Hampshire Taxes Paid by Animal Agriculture

New Hampshire’s animal agriculture is also a source of tax revenue. In 2015, the state’s animal agriculture industry paid about \$12.9 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$23.6 million in property taxes paid by all of New Hampshire agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



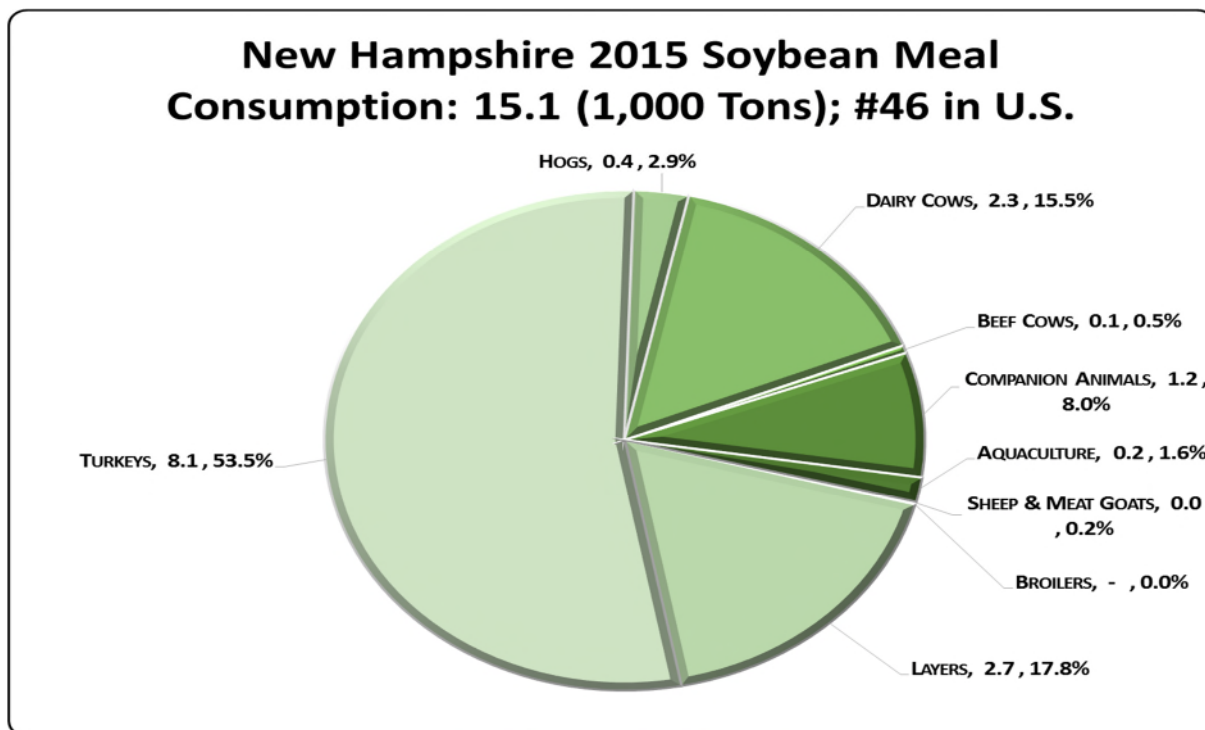
New Hampshire Animal Agriculture Soybean Meal Consumption

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

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2014-15 soybean marketing year by up to sixteen specific animal species has been estimated.

New Hampshire's animal agriculture consumed almost 15.1 thousand tons of soybean meal in 2015, placing the state as #46 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 (8.1 thousand tons)
- Egg-Laying Hens (2.7 thousand tons)
- Dairy Cows (2.3 thousand tons)

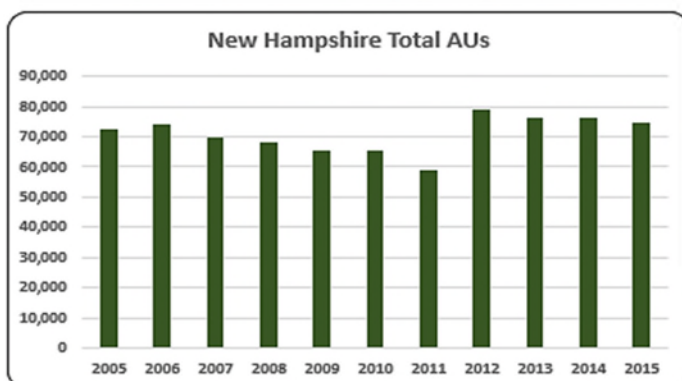
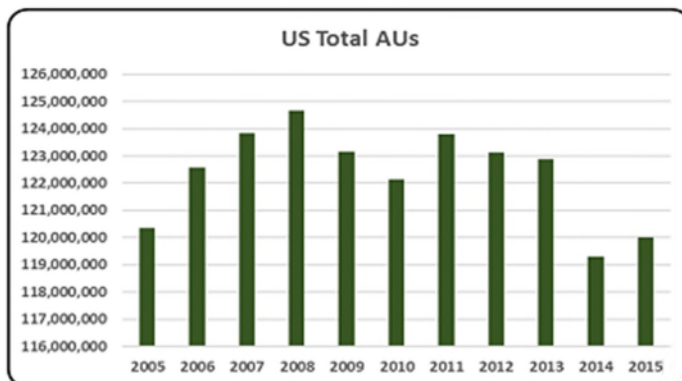


New Hampshire Animal Unit (AU) Trends

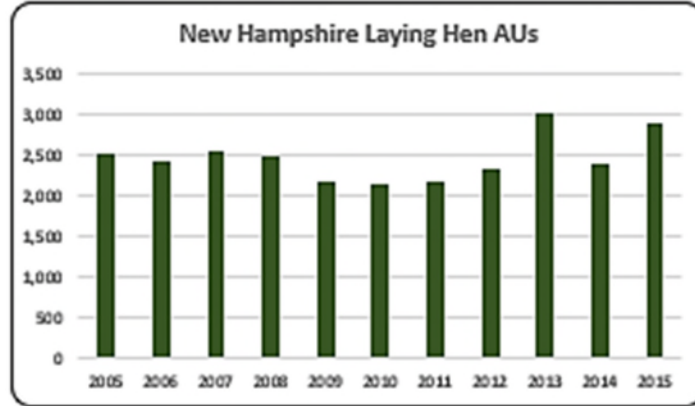
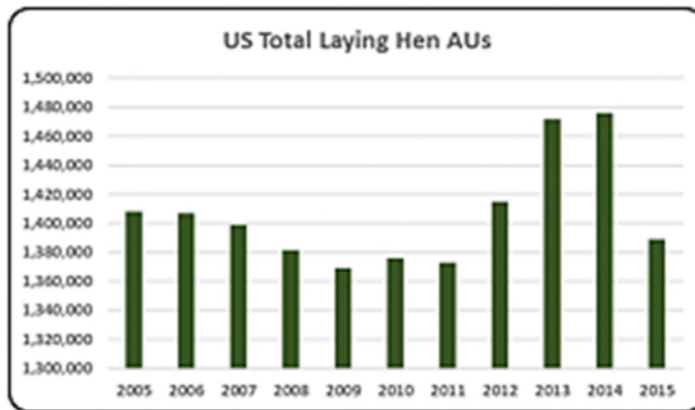
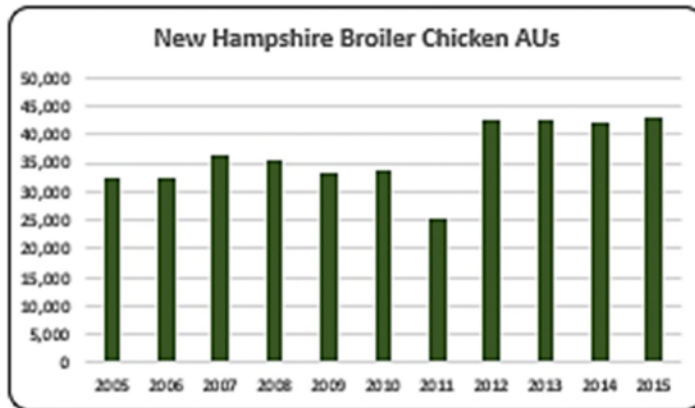
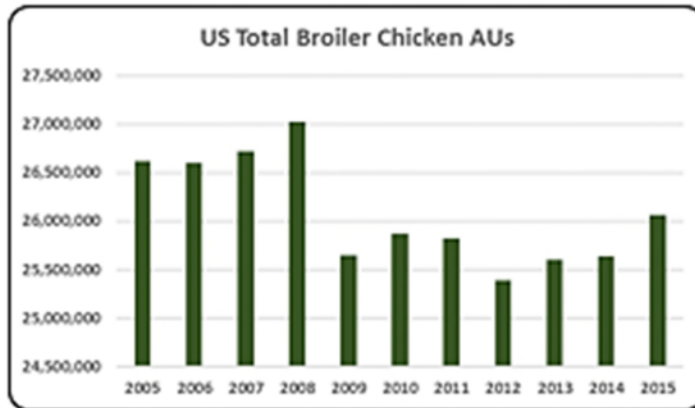
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of New Hampshire. Due to this reality, using a single year as a measure of the presence and strength of a sector 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 New Hampshire and to give perspective on New Hampshire'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 New Hampshire, the largest three segments of animal agriculture in terms of AUs during 2015 were: Broilers (43,203 AUs), Dairy Cows (19,600 AUs), and Beef Cows (7,950 AUs). Total animal units in New Hampshire during 2015 were 74,503 AUs.



- Overall U.S. total AUs have varied from 2005 to 2015. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2005-15 time period, total AUs in the nation peaked in 2008.
- Animal production in New Hampshire is very small representing only 0.06% (74,503 AUs) of all animal production in the U.S. in 2015. New Hampshire AUs have increased 3% since 2005.

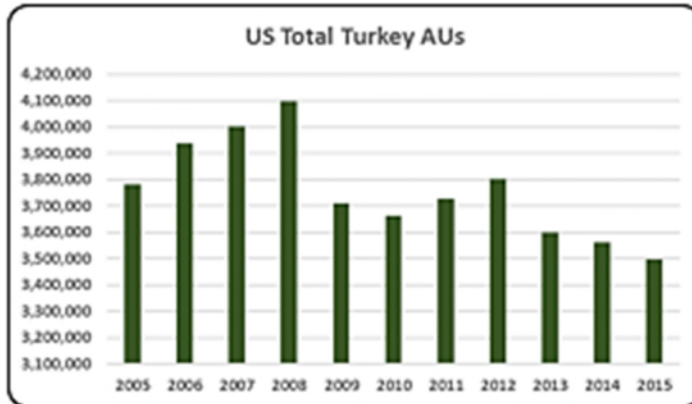


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2005 to 2015, broiler chicken AUs were about 26.0 million. In 2015, AUs rebounded 3% from the low AUs numbers in 2012 (25.4 million AUs).

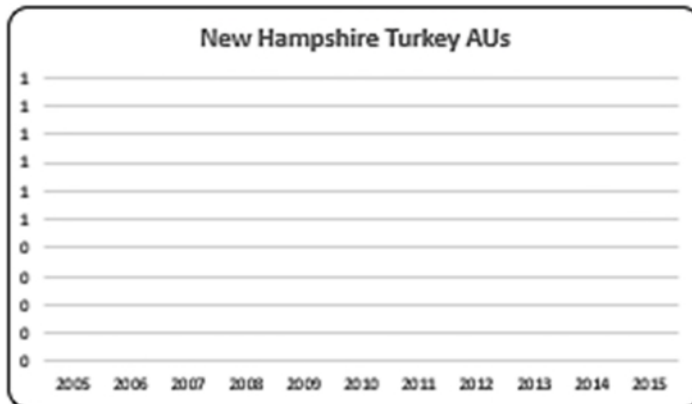
- Fifty eight percent (43,203) of all AUs in the state of New Hampshire were in broiler production in 2015. Broiler production rose 33% in 2015 compared to 2005.

- On average, the layer AUs during 2005-2015 were 1.4 million. In 2015 layer AUs were 1.3 million, down 6% from the 2014 decade high (1.4 million AUs). This drastic decrease in 2015 was due to the losses in major egg laying states from the avian influenza outbreak.

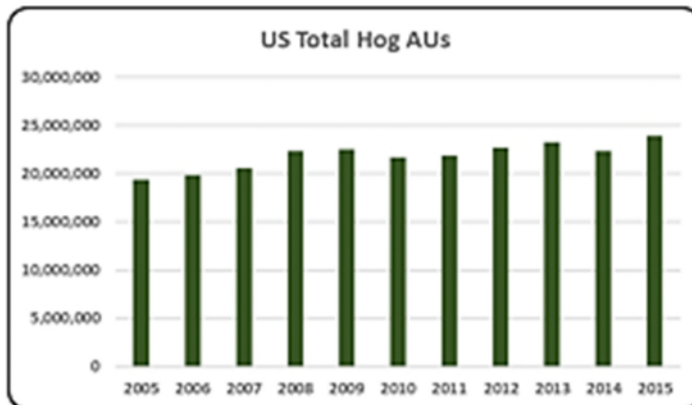
- There were 2,879 layer AUs in 2015 in the state. 2007 was a record year with 2,539 layer AUs.



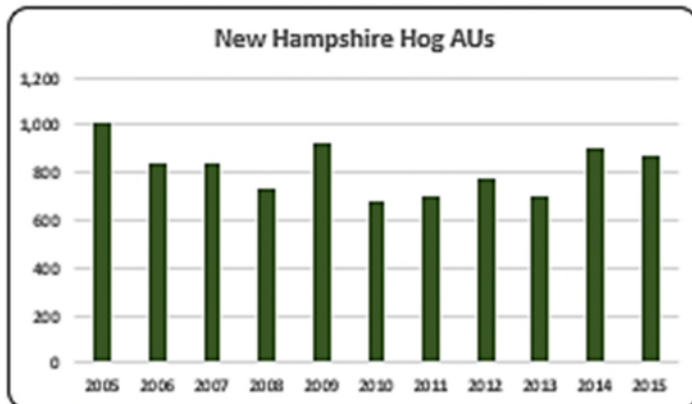
- In 2015 turkey AUs were the lowest of the decade at 3.5 million, decreasing 15% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade. The most recent contributor to this decline has been avian influenza.



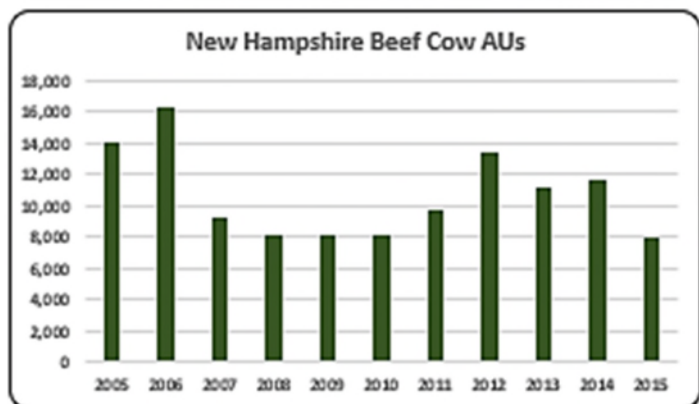
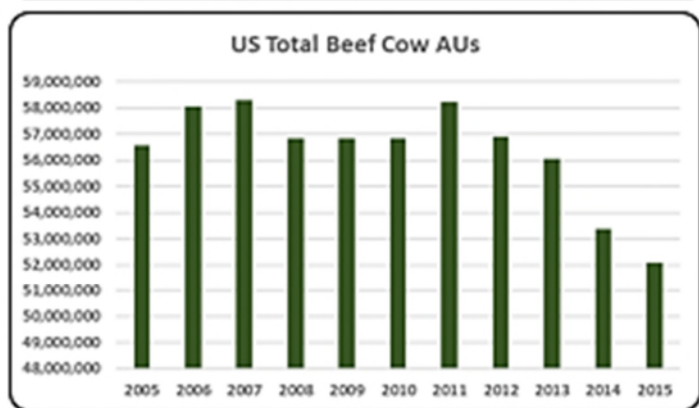
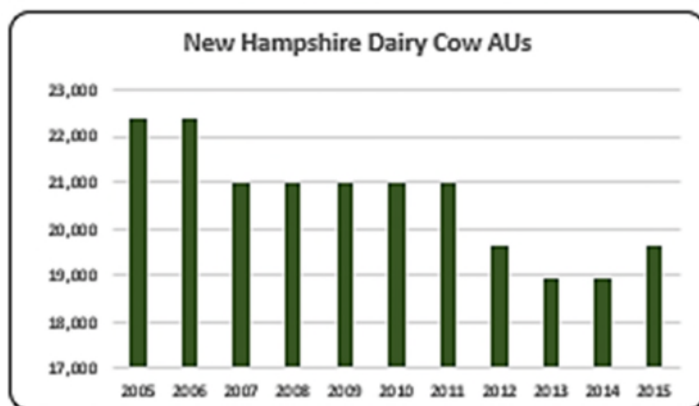
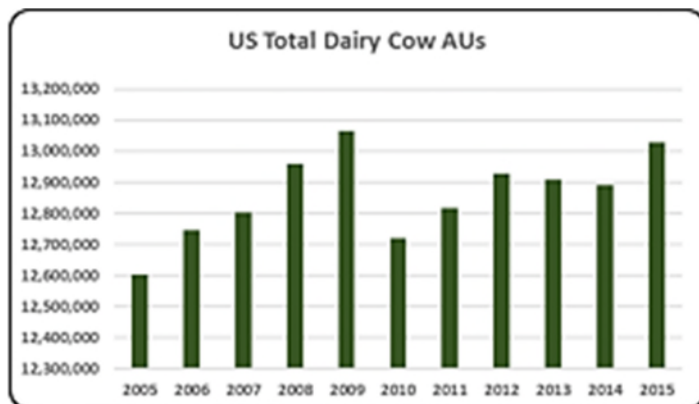
- Turkey production was non-existent in New Hampshire during the last decade.



- On average from 2005 to 2015, hog AUs were about 21.8 million. Hog AUs in 2015 increased 24% to 23.9 million AUs compared to the decade low in 2005 (19.4 million AUs). Despite the fluctuation in AUs, the pork supply was relatively stable.



- Hog AUs represented 1.17% (870) of all animal production in the state of New Hampshire. Hog numbers dropped 13% since 2005.



- From 2005 to 2015 dairy cow AUs averaged 12.8 million. In 2015, dairy cow AUs (13.0 million) finally reached near the 2009 high of 13.1 million AUs. Milk supplies have steadily risen.
- Almost a quarter (19,600) of all AUs in New Hampshire was in dairy cow production in 2015. Dairy cow production has declined 13% since the beginning of the decade.
- From 2005 to 2015 beef cow AUs averaged 56.3 million. In 2015 beef cow AUs decreased to 52.0 million, the lowest of the decade. States that traditionally raise a lot of cattle like Texas and Oklahoma continue to work through the lingering effects of the drought of the last several years.
- 2006 was a record year for beef cow production in New Hampshire with 16,305 beef cow AUs. 2015 beef cow production was only 10.7% (7,950 beef cow AUs) of production in New Hampshire.

New Hampshire Additional Information and Methodology

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

- Economic impact of animal agriculture to local (state) economies during the 2005-2015 time period
- Soybean meal usage by animal species during the 2014/15 soybean marketing year
- Animal Unit (AU) trends from 2005-2015

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

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2005-2015 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in New Hampshire which have occurred. As shown in this state report, New Hampshire 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 New Hampshire. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2014-15 soybean marketing year for up to sixteen specific animal species has been estimated.

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

New Hampshire 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 New Hampshire'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 New Hampshire, \$1.40 to \$1.61 million in total economic activity, \$0.27 to \$0.36 in household wages and 6 to 8 additional jobs are generated in the economy at large.

	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)
RIMS II Multipliers	Cattle and Calves	\$ 1.415	\$ 0.270	6.0
	Hogs, Pigs, and Other	\$ 1.395	\$ 0.315	6.9
	Poultry and Eggs	\$ 1.544	\$ 0.324	6.8
	Dairy	\$ 1.607	\$ 0.358	8.3

Appendix

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Animal Units (AUs)	Beef Cattle AUs	14,115	16,305	9,240	8,175	8,175	8,175	9,660	13,455	11,130	11,670	7,950
	Hog and Pig AUs	1,005	840	840	735	930	675	705	780	705	900	870
	Broiler AUs	32,471	32,252	36,152	35,588	33,088	33,533	25,268	42,505	42,357	42,116	43,203
	Turkey AUs	-	-	-	-	-	-	-	-	-	-	-
	Egg Layer AUs	2,496	2,409	2,539	2,467	2,158	2,143	2,156	2,320	3,003	2,393	2,879
	Dairy AUs	22,400	22,400	21,000	21,000	21,000	21,000	21,000	19,600	18,900	18,900	19,600
	Total Animal Units	72,488	74,206	69,771	67,965	65,351	65,527	58,789	78,660	76,095	75,979	74,503
Value of Production (\$1,000)	Cattle and Calves (\$1,000)	\$ 8,892	\$ 8,587	\$ 8,017	\$ 7,011	\$ 6,928	\$ 5,781	\$ 8,974	\$ 11,065	\$ 10,063	\$ 13,931	\$ 14,727
	Hogs and Pigs (\$1,000)	\$ 389	\$ 279	\$ 304	\$ 242	\$ 386	\$ 262	\$ 248	\$ 815	\$ 665	\$ 945	\$ 730
	Broilers (\$1,000)	\$ 27,287	\$ 21,139	\$ 27,900	\$ 28,503	\$ 24,592	\$ 25,700	\$ 22,500	\$ 42,353	\$ 51,606	\$ 54,138	\$ 47,231
	Turkeys (\$1,000)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Eggs (\$1,000)	\$ 2,391	\$ 2,381	\$ 4,373	\$ 14,354	\$ 10,216	\$ 11,215	\$ 12,296	\$ 13,790	\$ 15,579	\$ 24,938	\$ 38,449
	Milk (\$1,000)	\$ 49,226	\$ 41,606	\$ 60,900	\$ 59,501	\$ 41,020	\$ 52,332	\$ 62,062	\$ 53,900	\$ 58,480	\$ 73,038	\$ 52,170
	Other	\$ 1,054	\$ 1,017	\$ 980	\$ 943	\$ 907	\$ 870	\$ 833	\$ 796	\$ 759	\$ 722	\$ 685
	Sheep and Lambs (\$1,000)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Aquaculture (\$1,000)	\$ 1,054	\$ 1,017	\$ 980	\$ 943	\$ 907	\$ 870	\$ 833	\$ 796	\$ 759	\$ 722	\$ 685
	Total (\$1,000)	\$ 89,239	\$ 75,009	\$ 102,474	\$ 110,555	\$ 84,049	\$ 96,159	\$ 106,913	\$ 122,718	\$ 137,152	\$ 167,712	\$ 153,992

Ag Census Data Category	Animal Type	1997	2002	2007	2012
Number of Farms by NAICS	Beef cattle ranching and farming (112111)	324	242	328	383
	Cattle feedlots (112112)	32	39	3	1
	Dairy cattle and milk production (11212)	221	191	194	150
	Hog and pig farming (1122)	58	64	62	88
	Poultry and egg production (1123)	61	100	247	224
	Sheep and goat farming (1124)	168	174	257	300
	Animal aquaculture and other animal production (1125,1129)	330	749	864	1,003
Value of Sales (\$1,000)	Cattle and Calves	5,116	5,140	6,743	9,477
	Hogs and Pigs	1,441	withheld	518	846
	Poultry and Eggs	19,311	6,251	15,390	13,488
	Milk and Other Dairy Products	47,597	withheld	59,132	54,798
	Aquaculture	n/a	3,340	3,734	3,376
	Other (calculated)	4,200	46,955	7,067	4,124
	Total	77,665	61,686	92,584	86,109
Input Purchases	Livestock and poultry purchased	(Farms) 706	705	994	1,247
		\$1,000 3,031	1,638	4,470	3,874
	Breeding livestock purchased	(Farms) n/a	227	360	526
		\$1,000 n/a	522	1,786	1,842
	Other livestock and poultry purchased	(Farms) n/a	537	768	989
		\$1,000 n/a	1,116	2,684	2,033
	Feed purchased	(Farms) 1,415	2,010	2,308	2,787
	\$1,000 22,257	20,933	30,644	44,756	

	Animal Type	Output (\$1,000)	Earnings (\$1,000)	Employment (Jobs)	Taxes Paid (\$1,000)
2015 Animal Agriculture	Cattle and Calves	\$ 20,831	\$ 3,978	88	\$ 1,008
	Hogs, Pigs, and Other	\$ 2,401	\$ 542	12	\$ 137
	Poultry and Eggs	\$ 132,247	\$ 27,795	581	\$ 7,040
	Dairy	\$ 83,822	\$ 18,661	434	\$ 4,727
	Total	\$ 239,301	\$ 50,975	1,114	\$ 12,912
Change from 2005 to 2015	Cattle and Calves	\$ 5,567	\$ 1,063	23	\$ 269
	Hogs, Pigs, and Other	\$ (306)	\$ (69)	(2)	\$ (17)
	Poultry and Eggs	\$ 76,655	\$ 16,111	337	\$ 4,081
	Dairy	\$ (12,164)	\$ (2,708)	(63)	\$ (686)
	Total	\$ 69,751	\$ 14,397	296	\$ 3,647
RIMS II Multipliers	Animal Type	Output(\$)	Earnings (\$)	Employment (Jobs)	
	Cattle and Calves	\$ 1.415	\$ 0.270	6.0	
	Hogs, Pigs, and Other	\$ 1.395	\$ 0.315	6.9	
	Poultry and Eggs	\$ 1.544	\$ 0.324	6.8	
	Dairy	\$ 1.607	\$ 0.358	8.3	
Tax Rates	Federal effective income tax rate				12.7%
	Federal Social Security tax rate				7.7%
	State Effective Rate				5.0%
	Total				25.3%

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.