2019 Illinois Agricultural Economic Contribution Study

Prepared for:

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Executive Summary

Despite recent struggles in the agriculture industry, Illinois continues to rely on a thriving agriculture industry. Specific areas such as livestock and other agricultural processing have continued to see growth in Illinois, however the economic contribution of the crop production industry in Illinois has declined slightly since 2015. Overall, agriculture and related industries support about 6% of Illinois jobs.

This study is based on a combination of the 2017 Census of Agriculture, USDA/NASS datasets, and the IMPLAN modeling system. This analysis is patterned after the Illinois Agriculture Economic Contribution Study completed in 2015 which allows us to analyze change over time.

Key Findings

In 2017, agriculture and related industries in Illinois are estimated to contribute:

- **$51.1 billion** in total value-added
  - Total value-added increased slightly from $48.4 billion in the 2015 study.
- **482,545 jobs** which represents about **6%** of total Illinois jobs
  - Total ag-related jobs have increased from 432,831 in 2015.
- **$137.6 billion** in output (sales)
  - Total output has increased from $120.9 billion in 2015.
- **$29.9 billion** in household income
  - Household income increased slightly from $28.8 billion in the 2015 study.

Of the **$51.1 billion** in total value-added and **482,545 jobs** from the agriculture industry and related economic activity:

- Crop production and related industries contributed:
  - **$20.2 billion** in value-added
  - **193,585 jobs** which has declined slightly from 197,353 in the 2015 study.
- Livestock production and related industries contributed:
  - **$7.9 billion** in value-added
  - **91,005 jobs** which has increased from 52,124 in the 2015 study.
- Other agriculture and related industries contributed:
  - **$23.0 billion** in value-added
  - **197,955 jobs** which has increased slightly from 183,354 in the 2015 study.

Background

This Illinois Agriculture Economic Contribution Study quantifies agriculture and its related industries and its contribution to the economy. This study relies heavily on the 2017 data from the IMPLAN modeling system, the USDA 2017 Census of Agriculture, and other USDA/NASS datasets. This study is patterned after similar studies completed by Decision Innovation Solutions for Illinois in 2015, Iowa in 2009, 2014 and 2019, South Dakota in 2014 and 2019, and Alabama in 2016.

Illinois Agriculture

Illinois continues to be a leading state in the agriculture industry ranking #2 in the nation for the sale of crops, and more specifically the sale of grains and oilseeds. Illinois is also ranked #4 in the nation for sales of hogs and pigs[1].

Additionally, according to the 2017 Census of Agriculture, Illinois shows the diversity in their agriculture industry by ranking in the top twenty nationally in total sales for several categories:

- Nursery, greenhouse, floriculture, sod (#12)
- Cultivated Christmas trees, short rotation woody crops (#13)
- Tobacco (#15)
- Cattle and calves (#19)

Table 1, Historical Illinois USDA Census of Agriculture Data

	2017	2012	2007	2002	1997
Number of Illinois farms	72,651	75,087	76,860	73,027	79,112
Average Illinois farm size (acres)	372	359	348	374	350
Market Value (per farm)					
Land and Buildings ($)	$2,705,291	$2,261,778	$1,321,080	$913,251	$736,255
Machinery and equipment ($)	$220,485	$203,192	$136,609	$102,242	$86,662
Farm products sold ($)	$234,133	$228,895	$173,421	$105,115	$109,146
Livestock Inventory					
Cattle and calves	1,130,993	1,127,630	1,231,105	1,359,010	1,512,898
Beef cows	394,667	343,972	429,111	422,694	474,009
Milk cows	93,341	98,849	99,677	114,101	127,526
Hogs and pigs	5,258,119	4,630,796	4,298,716	4,094,706	4,677,231
Laying chickens	5,470,158	4,327,311	5,285,583	3,290,313	3,540,056
Broilers	198,518	115,927	108,932	26,537	53,279
Turkeys	819,364	739,660	845,971	959,732	1,089,796
Cattle and calves sold	725,018	835,912	894,593	917,251	1,007,769
Hogs and pigs sold	16,883,477	13,121,384	13,196,581	11,178,721	9,390,266
Production (bushels)					
Corn for grain	2,187,782,071	1,253,283,049	2,248,664,947	1,418,566,127	1,372,414,201
Oats for grain	1,258,247	1,540,579	1,500,658	2,839,874	5,029,761
Soybeans	599,908,475	371,337,854	353,741,105	438,990,297	417,919,609
Wheat	35,755,318	40,543,253	47,291,213	27,923,042	54,005,189

[1] https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Illinois/cp99017.pdf

Illinois accounts for 4% of all U.S. agriculture sales, with 81% coming from crops such as corn, soybeans, wheat and forage, and 20% from livestock. In the livestock category, 10% of sales are hogs and pigs, 5% are cattle and calves, 2% from milk and other dairy products, and 1% from poultry and egg production.

Table 2, Illinois Farm Sales by Source

	2017	% of 2017 Total	2012	% of 2012 Total	2007	% of 2007 Total	2002	% of 2002 Total
Total Sales ($1000)	$17,009,971	100%	$17,187,052	100%	$13,329,107	100%	$7,676,239	100%
Average Per Farm	$234,133		$228,895		$173,421		$105,115	
Grains, Oilseeds, Dry Beans, and Dry Peas ($1000)	$13,843,743	81.4%	$14,144,740	82.3%	$10,876,415	81.6%	$5,871,542	76.5%
Livestock, Poultry, and Their Products ($1000)	$3,166,229	18.6%	$3,042,312	17.7%	$2,452,692	18.4%	$1,804,697	23.5%
Poultry and Eggs ($1000)	$199,924	1.2%	$136,876	0.8%	$163,507	1.2%	$83,807	1.1%
Cattle and Calves ($1000)	$826,851	4.9%	$984,466	5.7%	$808,487	6.1%	$624,976	8.1%
Milk & Other Dairy Products from Cows ($1000)	$350,038	2.1%	$347,339	2.0%	$340,336	2.6%	$226,761	3.0%
Hogs and Pigs ($1000)	$1,739,444	10.2%	$1,519,514	8.8%	$1,105,271	8.3%	$844,360	11.0%
Sheep, Goats, and Their Products ($1000)	$12,513	0.1%	$10,716	0.1%	$6,523	0.0%	$3,591	0.0%
Other Animals and Their Products ($1000)	$13,232	0.1%	$13,338	0.1%	$7,807	0.1%	$3,594	0.0%

Illinois Farm Demographics

The largest age group category on Illinois farms is 55 to 64 years representing 29% of all primary producers. Less than 7% of primary producers in Illinois are age 35 and younger, while 38% are 65 and older.

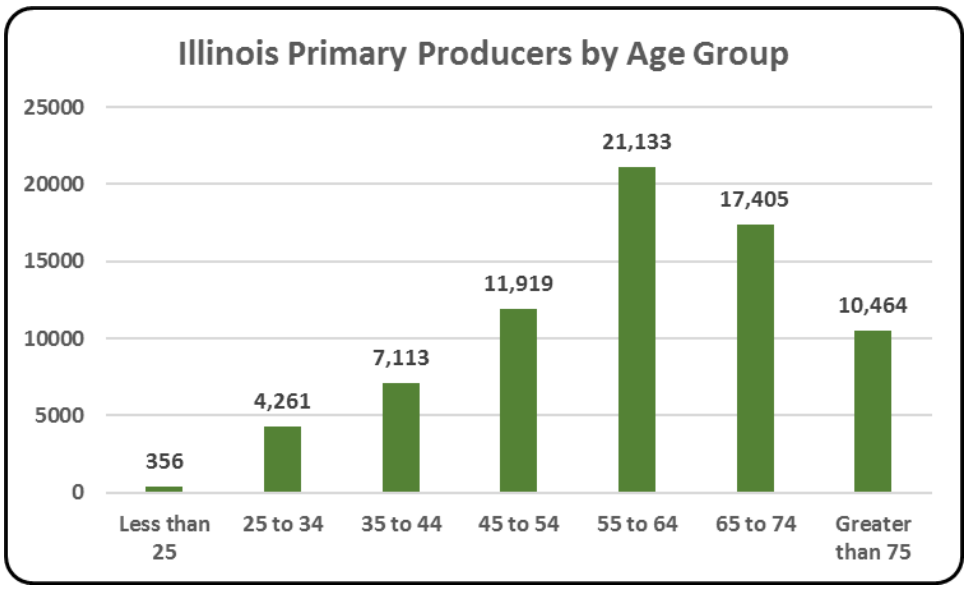

Figure 1, Illinois Primary Producers by Age Group

As shown in Figure 2, 85% of farm operations in Illinois are held by individuals and families. The next highest cateoriges of ownership are partnerships (6%) and family held corporations (5%), while non-family held corporations make up less than 1% of Illinois farm operations.

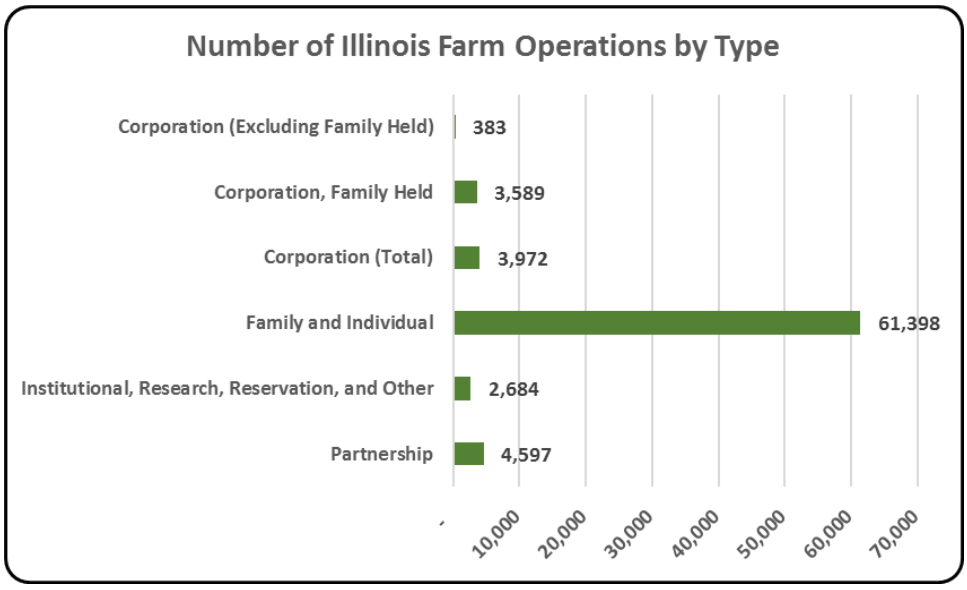

Figure 2, Number of Illinois Farm Operations by Type

The most common farm size in Illinois is the 10 to 49-acre range with 17,901 farms. While there are a large amount of smaller hobby size farms, farms larger in size make up the majority of farm sales in the state.

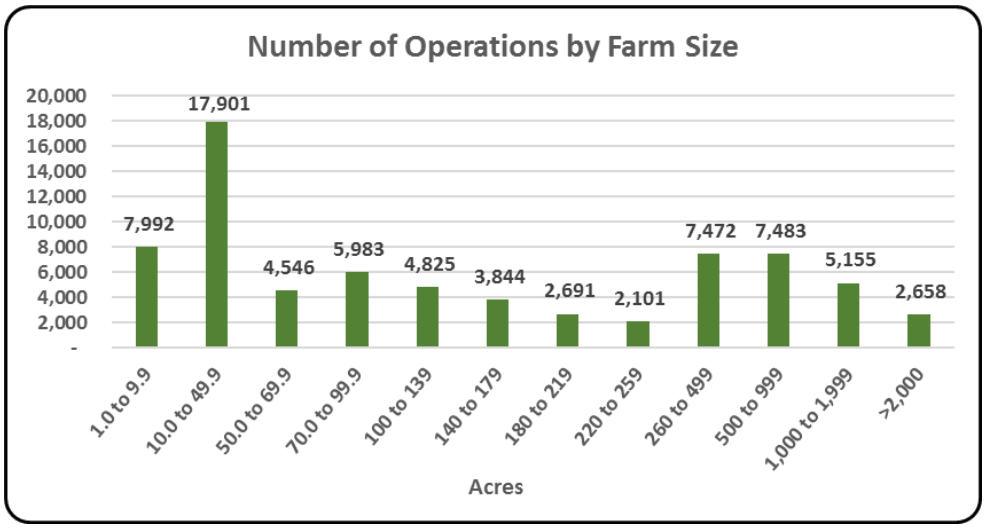

Figure 3, Number of Operations by Farm Size

Methodology

The 2019 Illinois Agriculture Economic Contribution Study was completed with a combination of the 2017 Illinois IMPLAN dataset, data from the USDA 2017 Census of Agriculture and other USDA/NASS sources. The IMPLAN modeling system and Microsoft Excel were used for calculating and tabulating the results of this analysis. Results, shown as 2017 values throughout this report are presented using these common economic modeling terms:

- **Value-Added**
  - Sales (output) minus the cost of inputs
- **Sales (Output)**
  - The broadest measure of economic activity – sometimes referred to as "output"
- **Employment (Jobs)**
  - A measure of job positions without regard to whether they are full-time equivalents
- **Household Income**
  - Income from all sources that accrues to individuals as payment for personal employment (earnings or labor income), payment for ownership interests or capital provision (dividends, interest and rents), or as transfer payments (payments to individuals for which nothing is offered in return)

Defining Agriculture

When completing an economic contribution study, there are generally questions as to what economic activity up and down the value chain should be included for a particular industry. Outlined below is the process used in this study for defining agriculture.

There is usually considerable discussion regarding the blurred lines between production agriculture, processing and retail, and how agriculture should be defined. Agriculture can be defined as: 1) including only farm-level production, 2) including farm-level production, input manufacturing, and food processing, or 3) from the "farm to fork" perspective, which would also include distribution, restaurants and retail.

To strike middle (and defensible) ground between including more than just farm level production and seeking to attribute excess economic activity to the agriculture industry, this analysis includes production agriculture plus the first round of value added to the process. For example, in addition to the production of livestock and poultry, we have also included the industries that process them (i.e., production, processing, slaughtering, and rendering).

Using the above rationale as a guide, the IMPLAN models were created and analyzed using the recommended methodology for a Multi-Industry Contribution Analysis. The IMPLAN modeling system uses more than 20,000 industries and classifies them according to the North American Industry Classification System (NAICS) and groups them into 536 industries. There were 72 IMPLAN sectors identified for this analysis to represent agriculture and related economic activities in the State of Illinois.

Economic Impact Study versus Economic Contribution Study

The term "Economic Impact Study" implies a change has taken place within a local economy. The change in a local economy typically comes from one of the following sources:

- Entrance/departure of a new business or industry
- Expansion/contraction of an existing business or industry

While estimating a change (economic impact study) such as the entrance or departure of industry activity is a worthwhile endeavor in many instances, this is not how the contribution of the agri-food sector in this analysis was estimated. This analysis is an effort to evaluate the structure of existing industries within an existing economy. As a result, shocking the economy to create or eliminate parts of the industry is not appropriate. For that reason, this study is called an "economic contribution analysis"; in other words, we are interested in understanding what Illinois agriculture currently contributes to the overall economy. This is a key difference from what is traditionally termed an "economic impact study". With a contribution analysis, the sum of individual industry estimates will never differ from the total of what actually exists in a given study area.

State Level Results

The 72 IMPLAN sectors identified and present in Illinois for this study were aggregated into three main categories to provide an overview of the economic contribution of these industries. These aggregated industries are:

- Crops
- Livestock
- Other Agriculture

Further details on the industries included in each of these categories are shown in the 'Detailed Results' section of the report and also in Appendix A[2]. Goods and services used by agricultural and forestry industries such as banking and insurance are not specifically included as "agriculture", but they are embedded in the results as required inputs for the agriculture industry.

State Value-Added

Total value-added refers to the portion of total sales that created additional value from the economic activity in an area and/or industry and is an accurate indicator of the ability of an industry to improve economic prospects in a given area. Total value-added for an industry represents the value of the industry's total sales minus the value of any inputs used in the production process from other industries. Key components of value-added are employee compensation (hired labor) and proprietor's income (self-employed), which is collectively known as 'labor income'.

The agriculture industry and related economic activity add a significant contribution to the Illinois economy with about $51.1 billion in value-added. Of this amount, $23.0 billion comes from Other Agriculture, $20.2 billion from the Crops category, and $7.9 billion from Livestock.

[2] For an example illustrating changes in economic activity from the original study conducted in 2015, please see Appendix C.

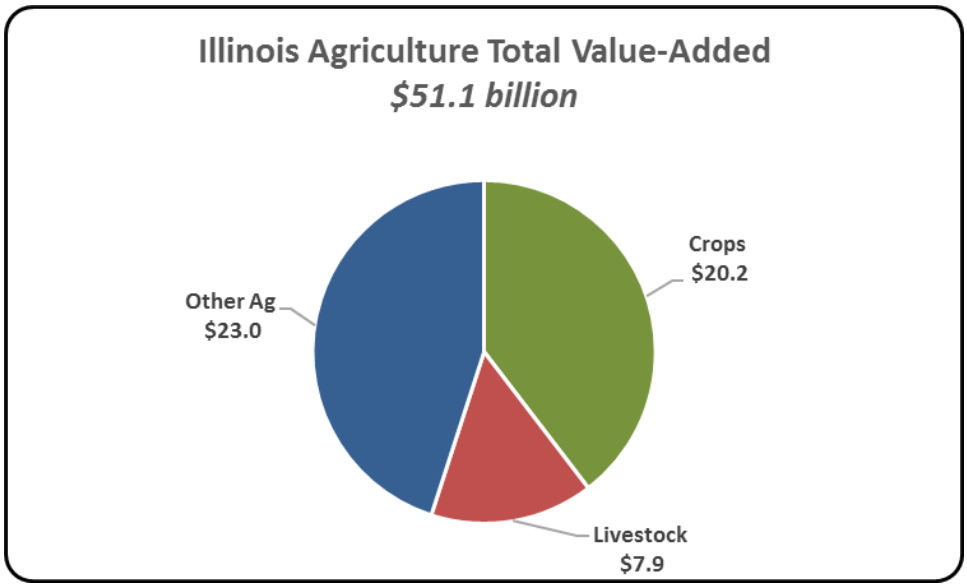

Figure 4, Illinois Agriculture Total Value-Added

State Jobs

The jobs[3] number represents an estimate of the number of positions (jobs) currently filled in an area or industry. The estimates provided here originate from the IMPLAN input-output model. Jobs includes positions whether they are full or part time, so care must be used in making comparisons. "Jobs" does not count positions that are unfilled.

As shown in Figure 5, the agriculture industry and related economic activities in Illinois contribute a sizeable amount of jobs to the economy with about 482,545 jobs. Of this amount, 197,955 jobs come from the Other Agriculture category, 193,585 from Crops, and 91,005 jobs from the Livestock.

[3] Jobs do not refer to the number of people working or to full-time equivalent employment. Jobs can be full or part time, and a single individual can hold multiple jobs. In short, jobs cannot be looked upon as interchangeable or comparable across industries, businesses, or locations.

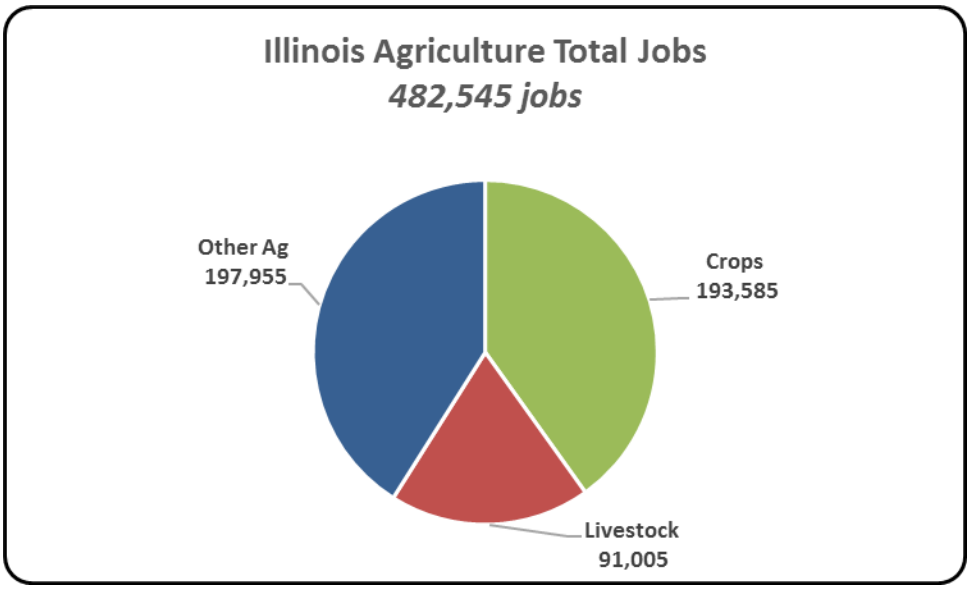

Figure 5, Illinois Agriculture Total Jobs

State Output

Total output (sales) refers to the total value of all production or sales of the identified industries within a study area. This is a total number that does not make deductions for the cost or origination of inputs that were used in the production process, which means that there is some double counting that occurs with this measure of economic activity. Figure 6 illustrates the contribution of agriculture and related industries to Illinois' economy. As shown, Illinois' agriculture industry and related economic activities contribute significantly to the state economy with about $137.6 in total output.

Of this amount, $57.1 billion comes from Other Agriculture, $56.5 billion from Crops, and $24.0 billion from Livestock.

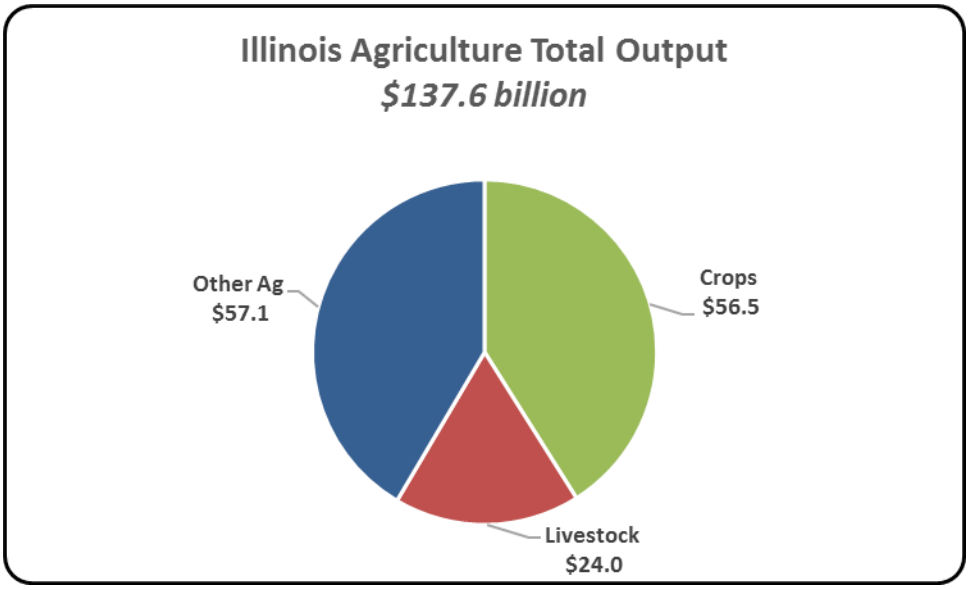

Figure 6, Illinois Agriculture Total Output

State Household Income

Household income is defined as income from all sources that accrues to individuals as payment for personal employment (earnings or labor income), payment for ownership interests or capital provision (dividends, interest and rents), or as transfer payments (payments to individuals for which nothing is offered in return). Figure 7 illustrates the contribution of each of the four categories to Illinois' total household income. As shown, the agriculture industry and related economic activities in Illinois contribute about $29.9 billion in household income to the economy.

Of this amount, $13.3 billion from Other Agriculture, $11.9 billion from Crops, and $4.7 billion comes from Livestock.

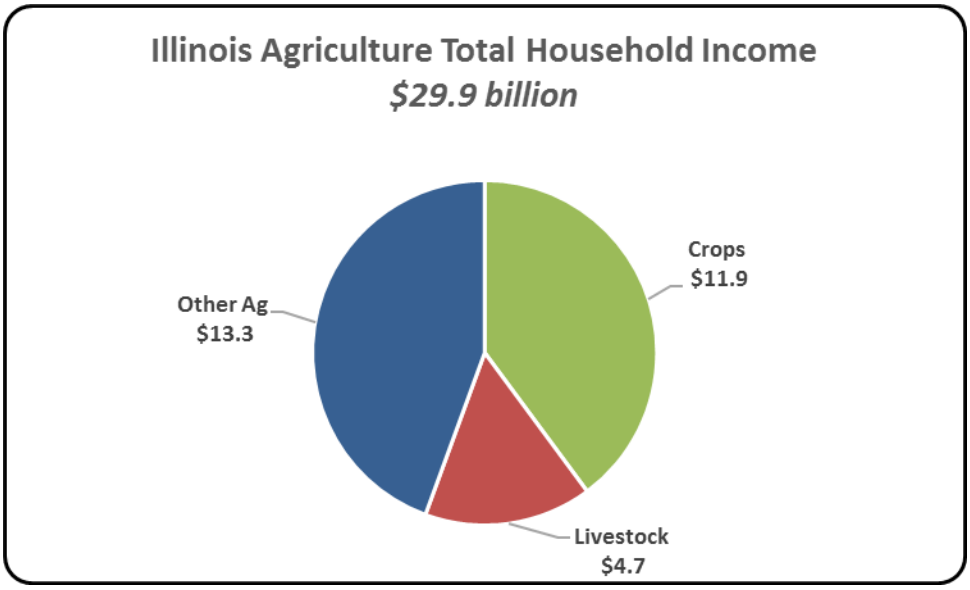

Figure 7, Illinois Agriculture Total Household Income

Detailed Results

The previous section showed the state level results by the three major categories: 1) Crops, 2) Livestock and 3) Other Agriculture. The following section shows the results by industry within each of the three major categories to show which specific industries are major contributors. Goods and services used by the agriculture industry to operate such as banking and insurance are not specifically shown, but they are embedded as required inputs for the agriculture industry and related economic activities.

Crops

The Crops category includes industries such as grain and oilseed farming, soybean processing and more. Total value-added contributed to the Illinois economy from crops was $20.2 billion (see Figure 8). Crop production and related economic activity in Illinois also accounted for 193,585 jobs (see Figure 9), $56.5 billion in output, and $11.9 in household income. The 'Primary Food Processing – Crops' category was a major contributor in this area which shows how important processing is to the value chain. This category also includes items such as wet corn milling and soybean processing.

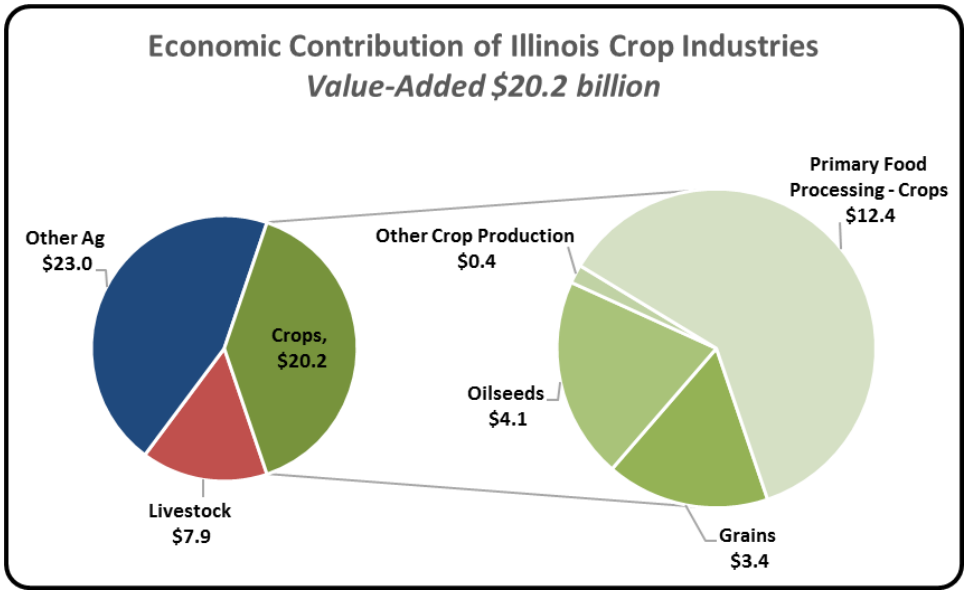

Figure 8, Economic Contribution of Illinois Crop Industries - Value-Added

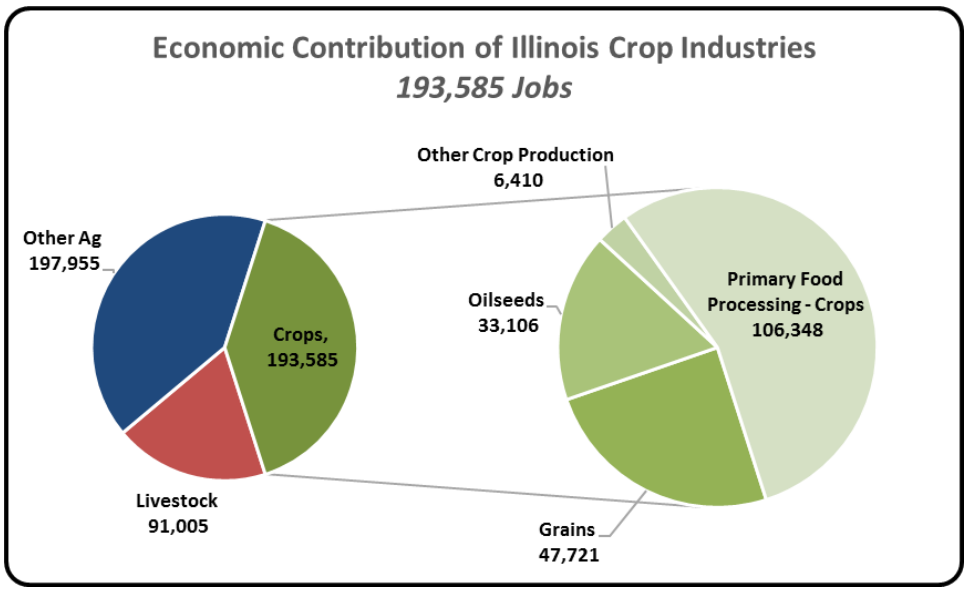

Figure 9, Economic Contribution of Illinois Crop Industries - Jobs

Livestock

The Livestock category includes industries such as beef cattle production, hog production, dairy cattle, poultry production (layers (egg production), broilers and turkeys), meat/poultry processing rendering and more. Total value-added contributed to the economy from livestock and related economic activity in Illinois was about $7.9 billion (see Figure 10).

Livestock production and related economic activity in Illinois also accounted for 91,005 jobs, $24.0 billion in output, and about $4.7 billion in household income. Meat processing is a large contributor to the Illinois economy.

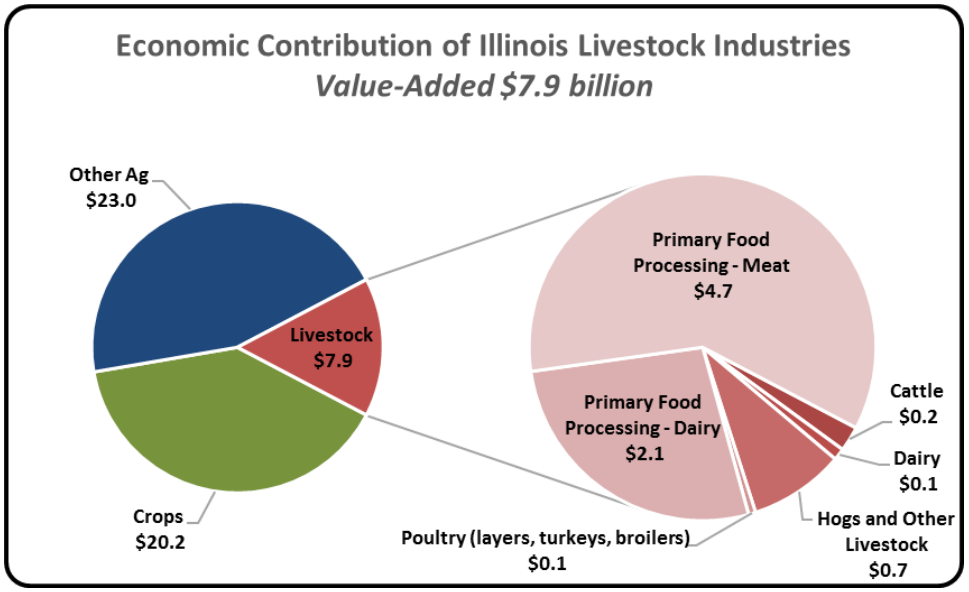

Figure 10, Economic Contribution of Illinois Livestock Industries - Value-Added

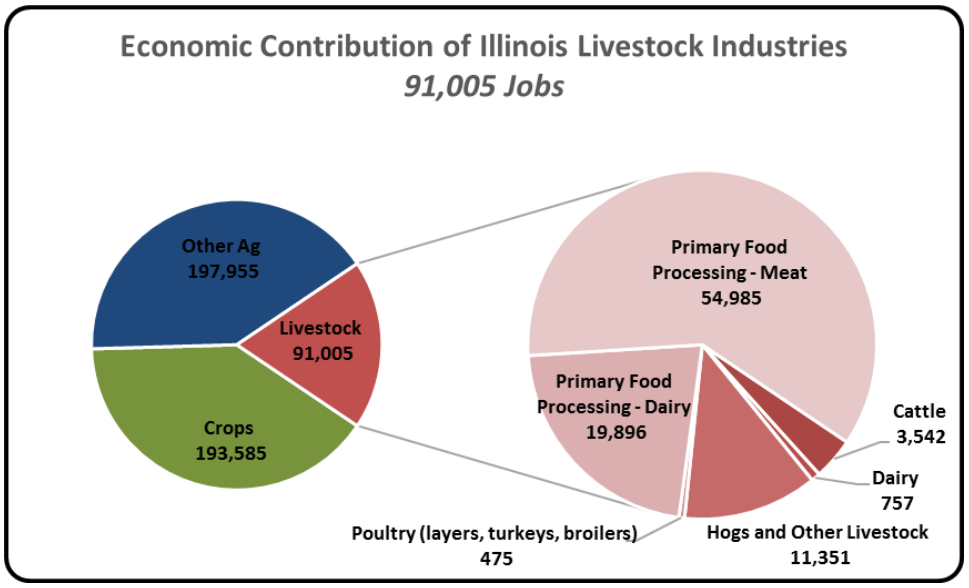

Figure 11, Economic Contribution of Illinois Livestock Industries - Jobs

Other Agriculture

The Other Agriculture category includes industries such as animal feed production, farm machinery and equipment manufacturing, ethanol production, dog and cat food manufacturing, veterinary services, many food manufacturing industries and more. Total value-added contributed to the economy from Other Agriculture was $23.0 billion (see Figure 12).

Other agriculture and related economic activity in Illinois also accounted for 197,955 jobs, $57.1 billion in output, and nearly $13.3 billion in household income. Other food processing and ag chemicals & fertilizer industries were major contributors to the Other Ag category.

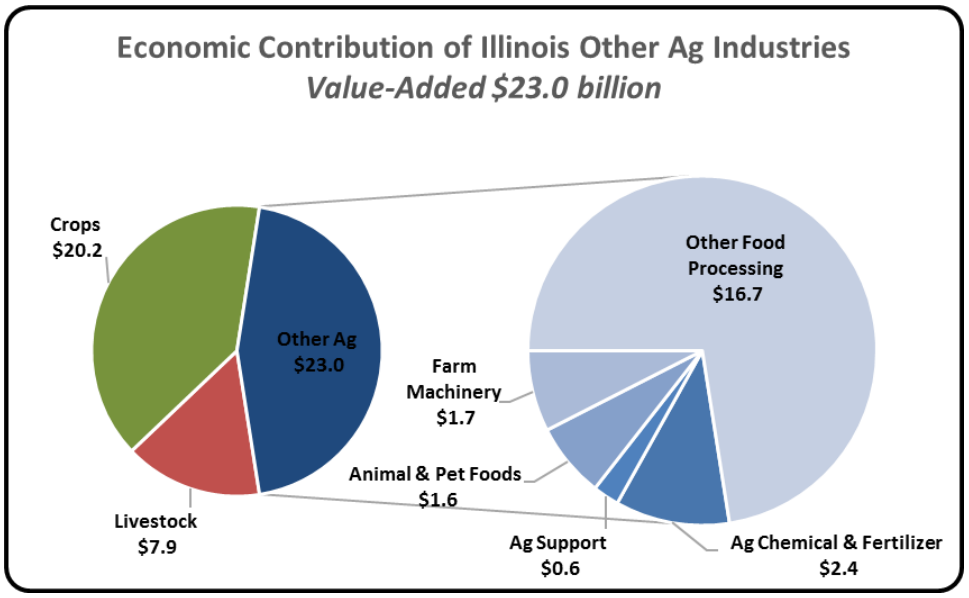

Figure 12, Economic Contribution of Illinois Other Ag Industries - Value-Added

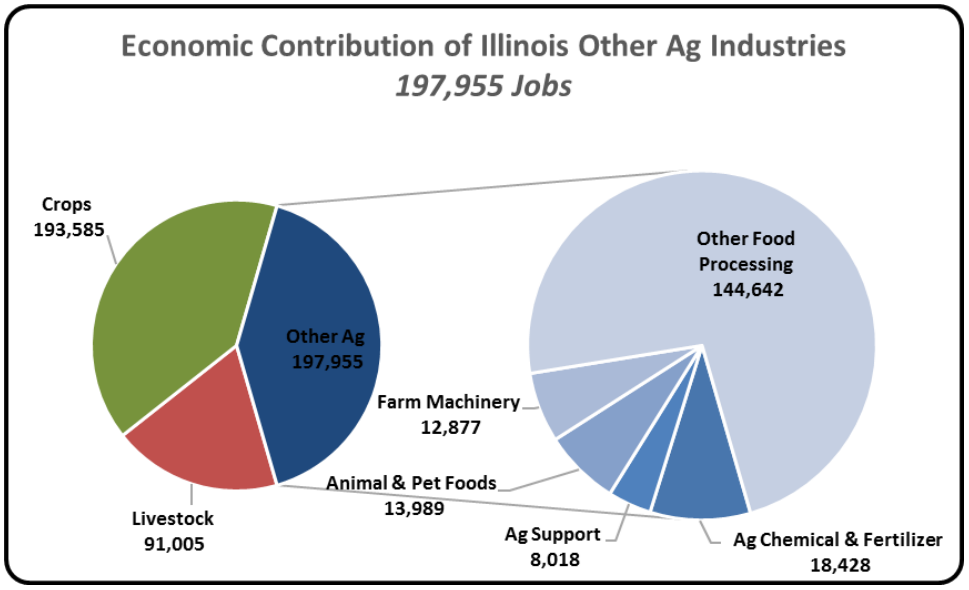

Figure 13, Economic Contribution of Illinois Other Ag Industries - Jobs

County Level Results

The results presented so far in this report have been focused on the state level, however similar analyses have been performed for all of Illinois' 102 counties. As one would expect, the contribution of agriculture varies widely, not just in terms of total contribution, but the degree to which some counties are more or less reliant upon agriculture in terms of the four primary measures of economic activity (value-added, jobs, output, and household income). While there is variation across counties, a county that is very reliant upon agriculture in terms of value-added is more likely to also be reliant upon agriculture in terms of jobs, output, and household income.

County Value-Added

Figure 14 shows the share of value-added in a local economy that is derived from agriculture and related economic activity. As shown, there are 48 counties that derive more than 15% of their total value-added from the agriculture industry as shown in the three right columns.

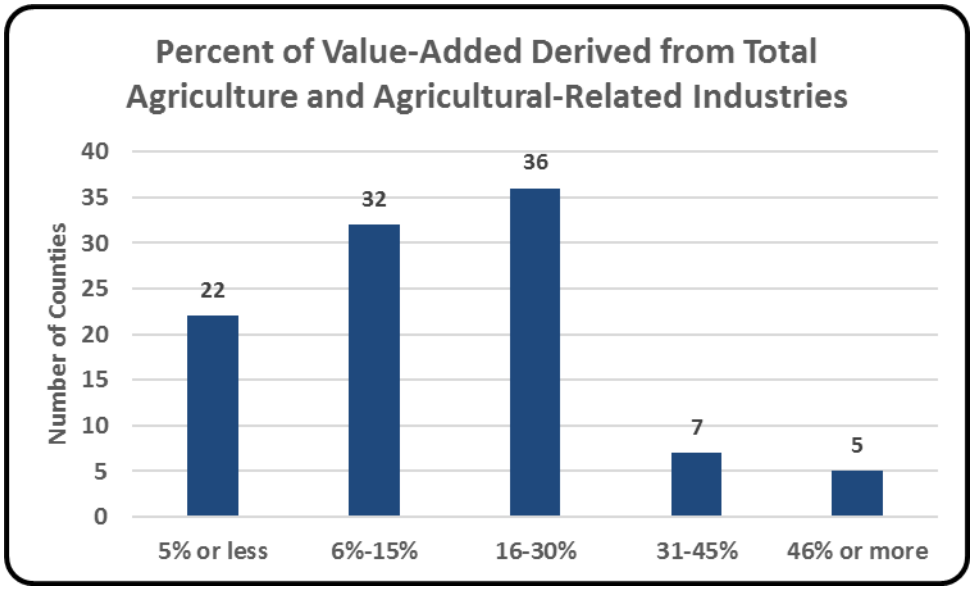

Figure 14, Percent of Value-Added Derived from Total Agriculture and Agricultural-Related Industries

As shown in Figure 15, the top counties that derive the largest share of their total value-added from the agriculture industry include Macon, Cass, Warren, Lee and Stark counties. On a total dollar basis, the leading counties for value-added from the agriculture industry in Illinois include Cook, Macon, Du Page, Will, and Kane counties (see Figure 16). See Appendix B for detailed maps on value-added for crops, livestock, and other ag.

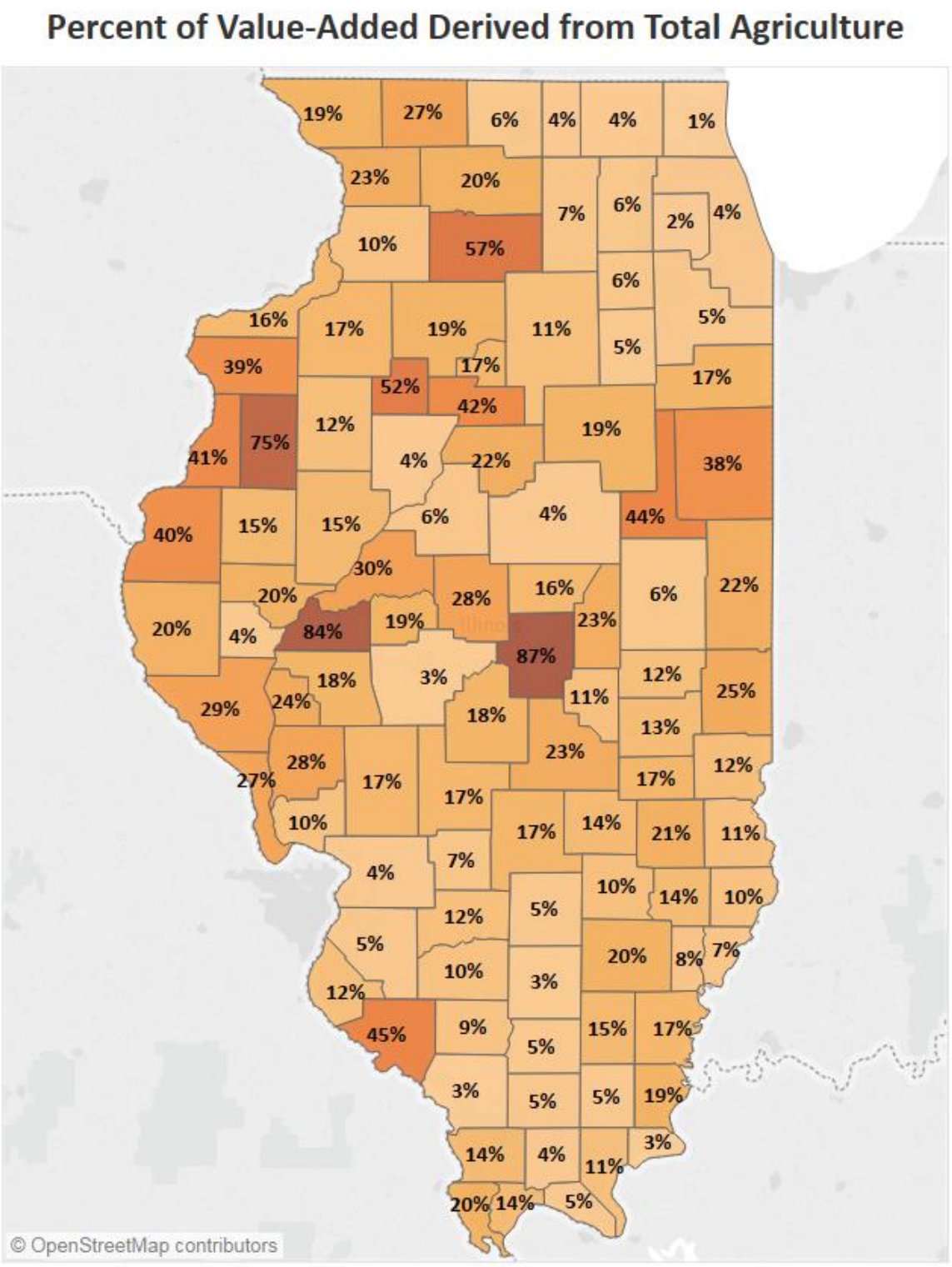

Figure 15, Percent of Value-Added Derived from Total Agriculture

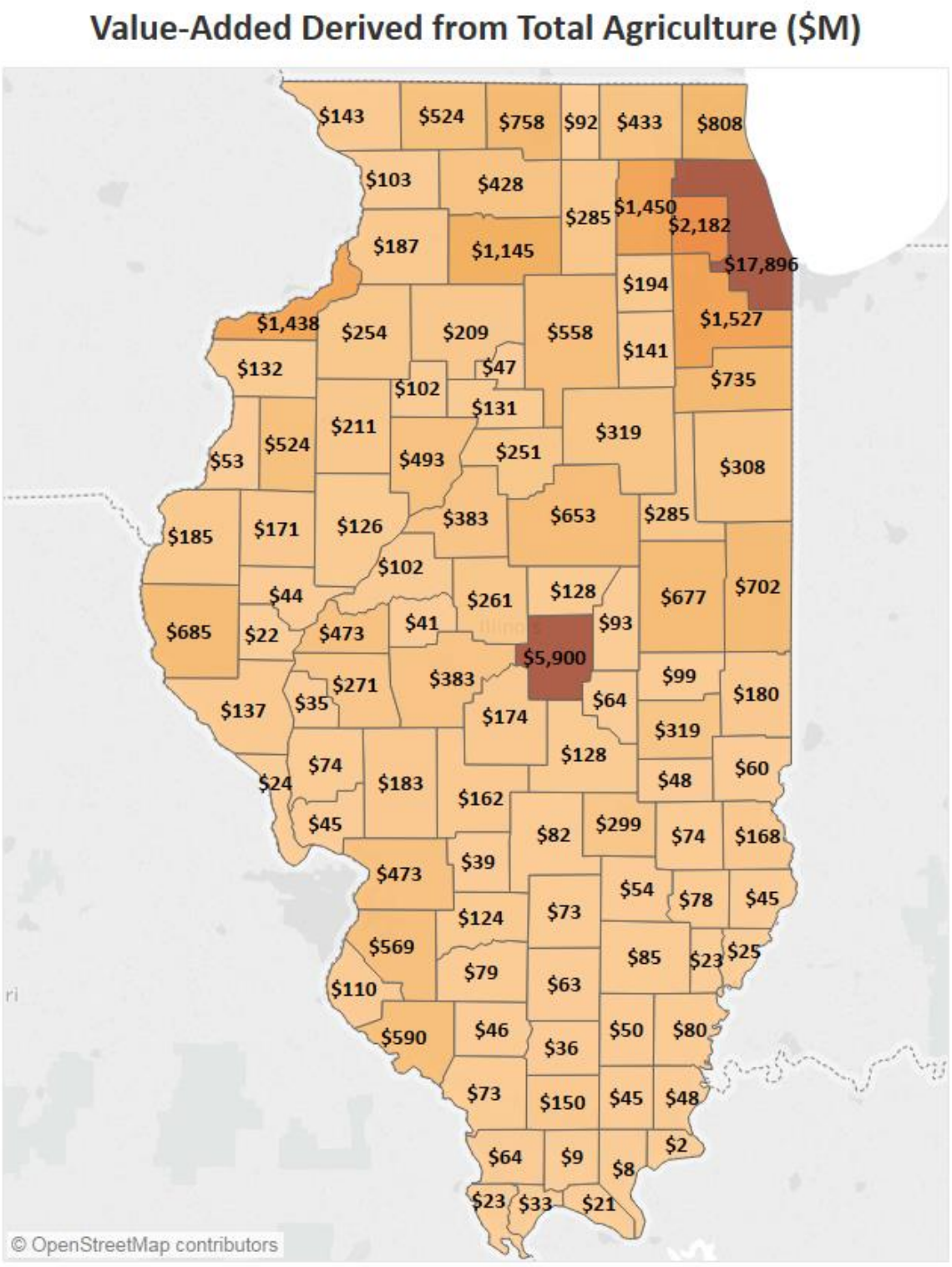

Figure 16, Value-Added Derived from Total Agriculture ($M)

County Jobs

Figure 17 shows the share of jobs derived from agriculture and related economic activity at the county level. As shown, there are 39 counties in the State of Illinois that derive more than 15% of their local jobs from the agriculture industry as shown in the three right columns.

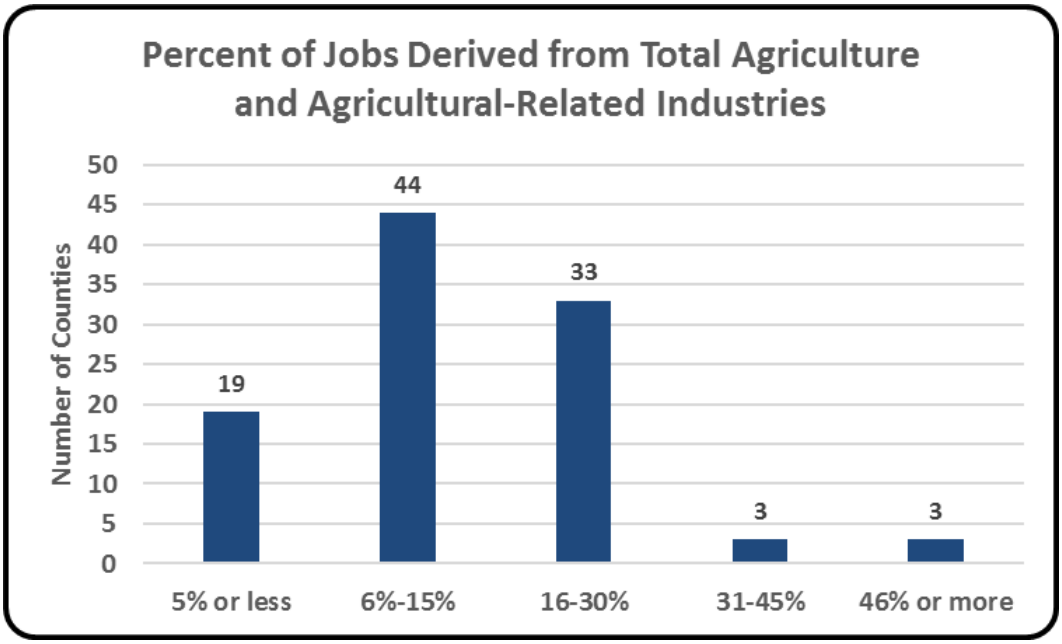

Figure 17, Percent of Jobs Derived from Total Agriculture and Agricultural-Related Industries

As shown in Figure 18, the top counties that derive the largest share of their total jobs from the agriculture industry include Macon, Cass, Warren, Randolph, Ford and Marshall counties. On a total jobs basis, the leading counties for jobs from the agriculture industry in Illinois include Cook, Macon, Du Page, Kane and Will counties (see Figure 19). See Appendix B for detailed maps on jobs for crops, livestock, and other ag.

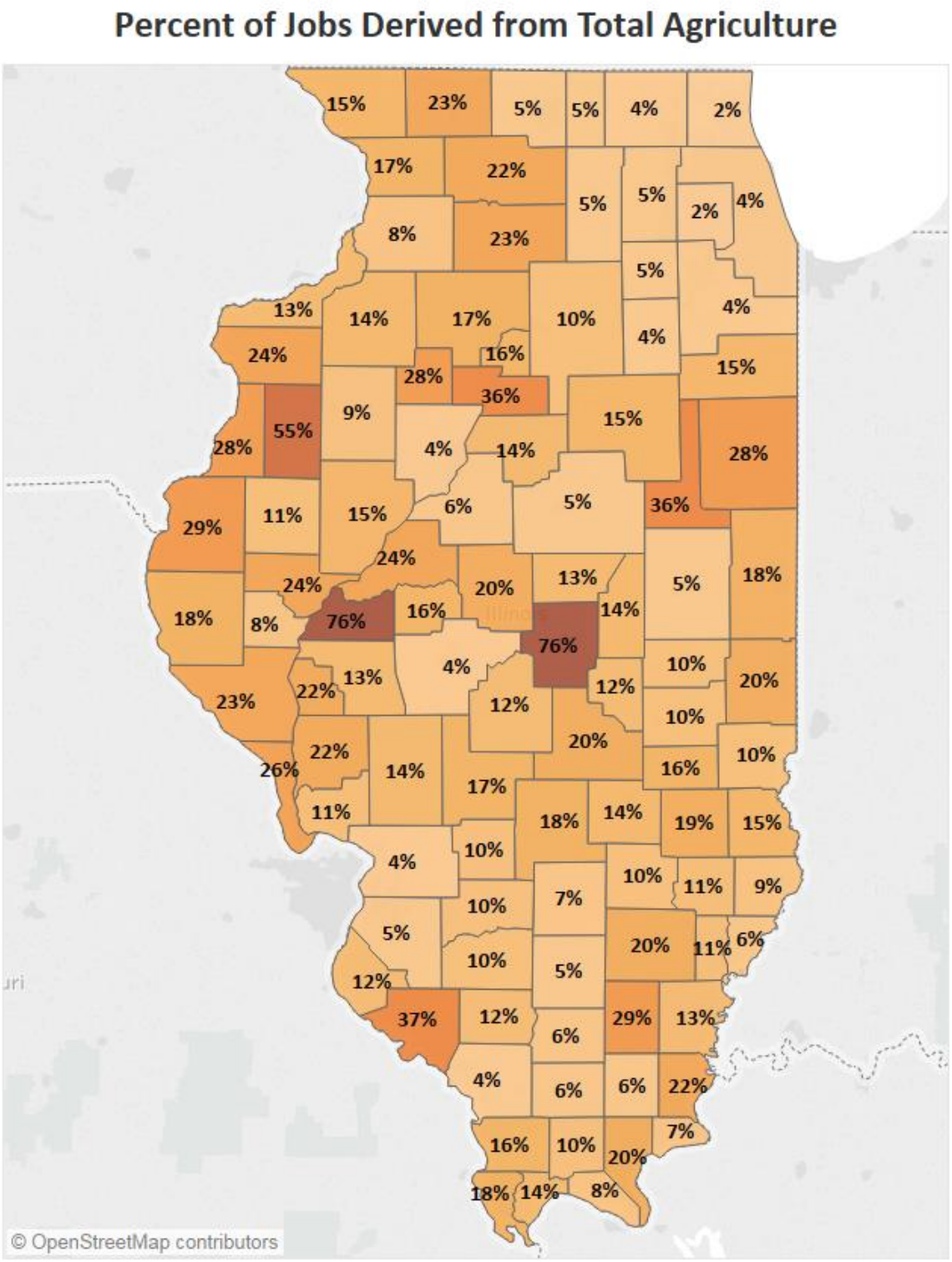

Figure 18, Percent of Jobs Derived from Total Agriculture

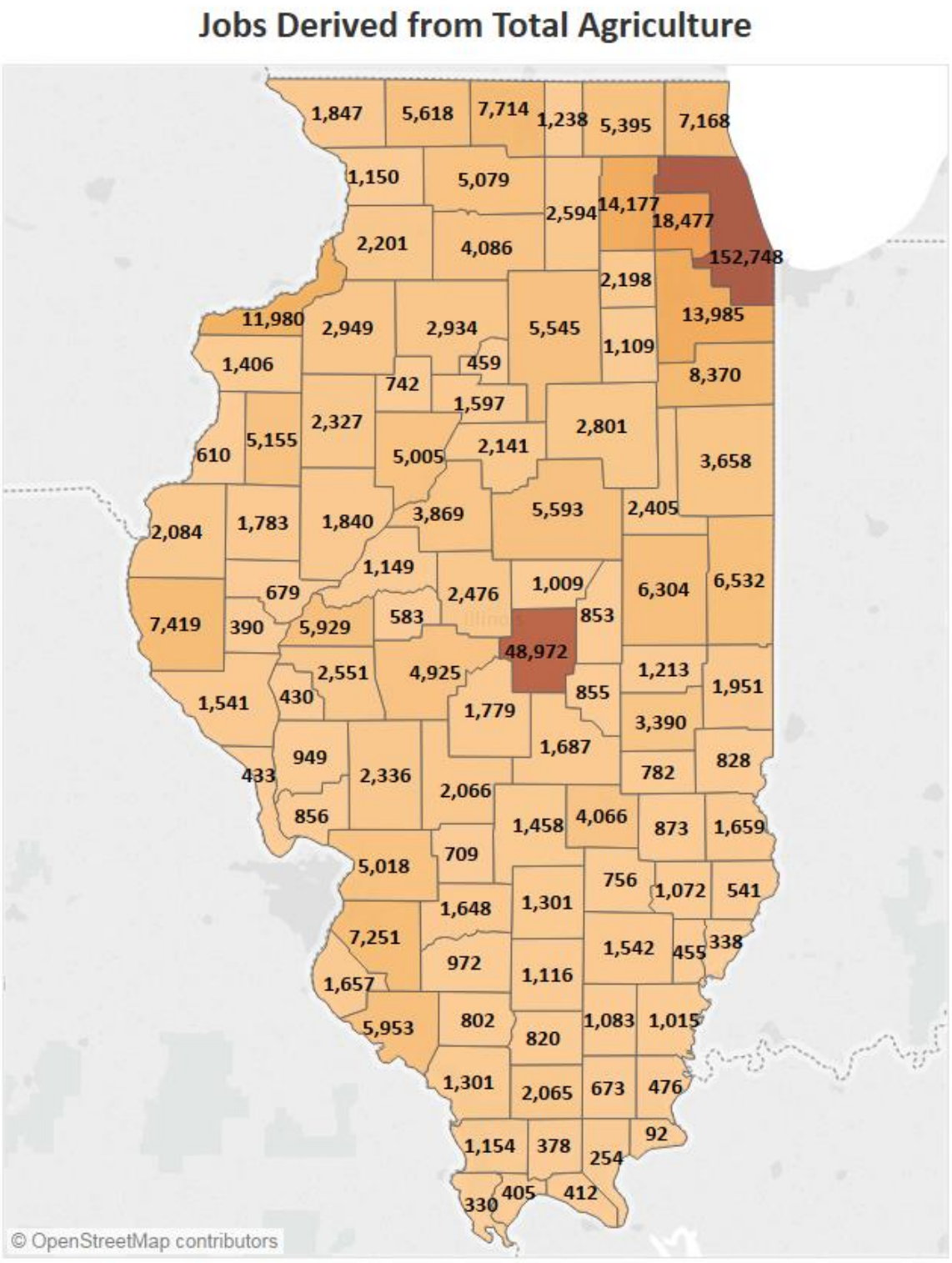

Figure 19, Jobs Derived from Total Agriculture

Congressional District Results

The results of this study also show the importance of agriculture at the Congressional District level.

Value-Added

The percentage of value-added generated from agriculture and related industries ranges from 1% in several Congressional Districts to 27% and $9.0 billion in the 13th Congressional District (see Figure 20 and Figure 21)

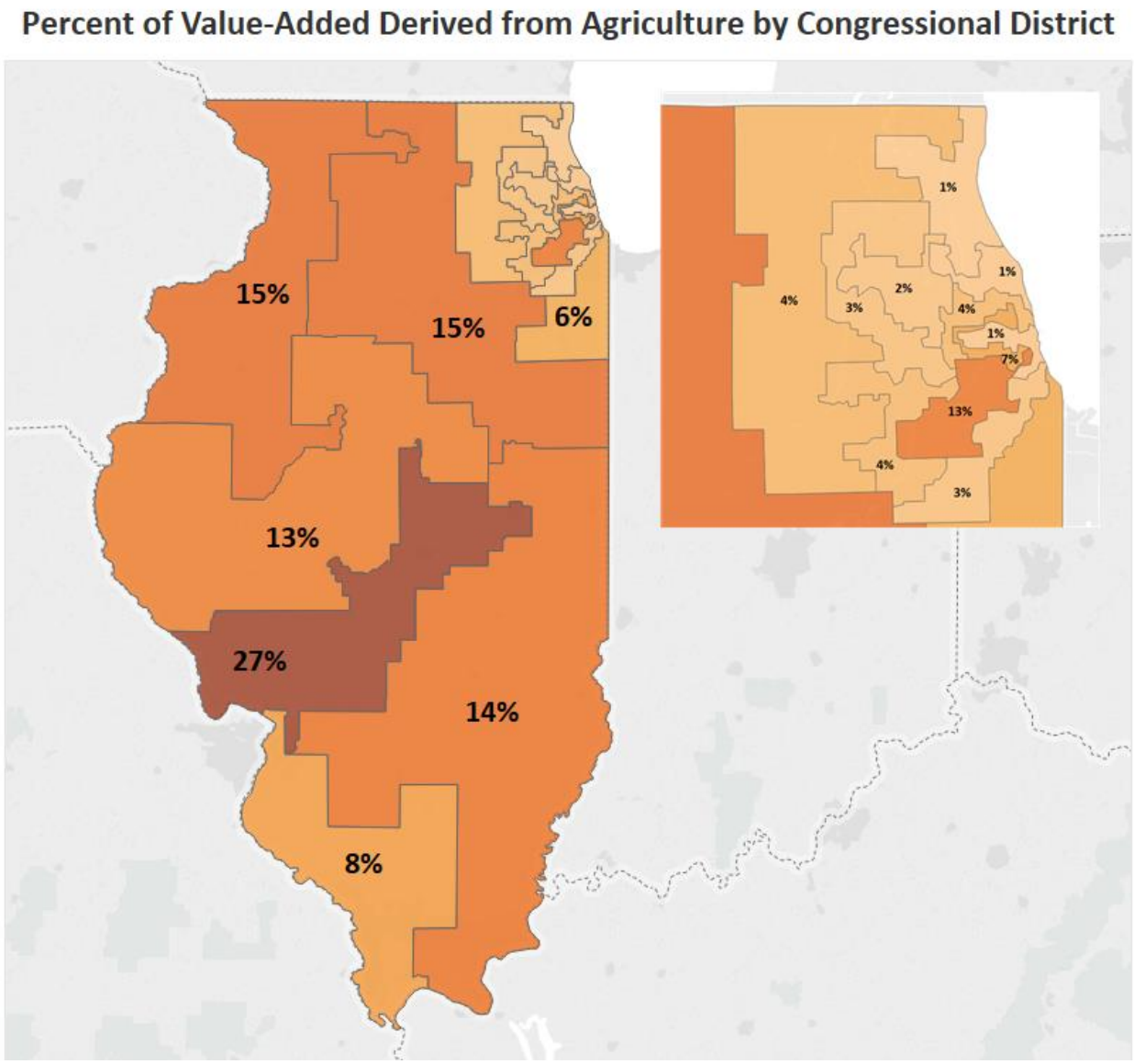

Figure 20, Percent of Value-Added Derived from Agriculture by Congressional District

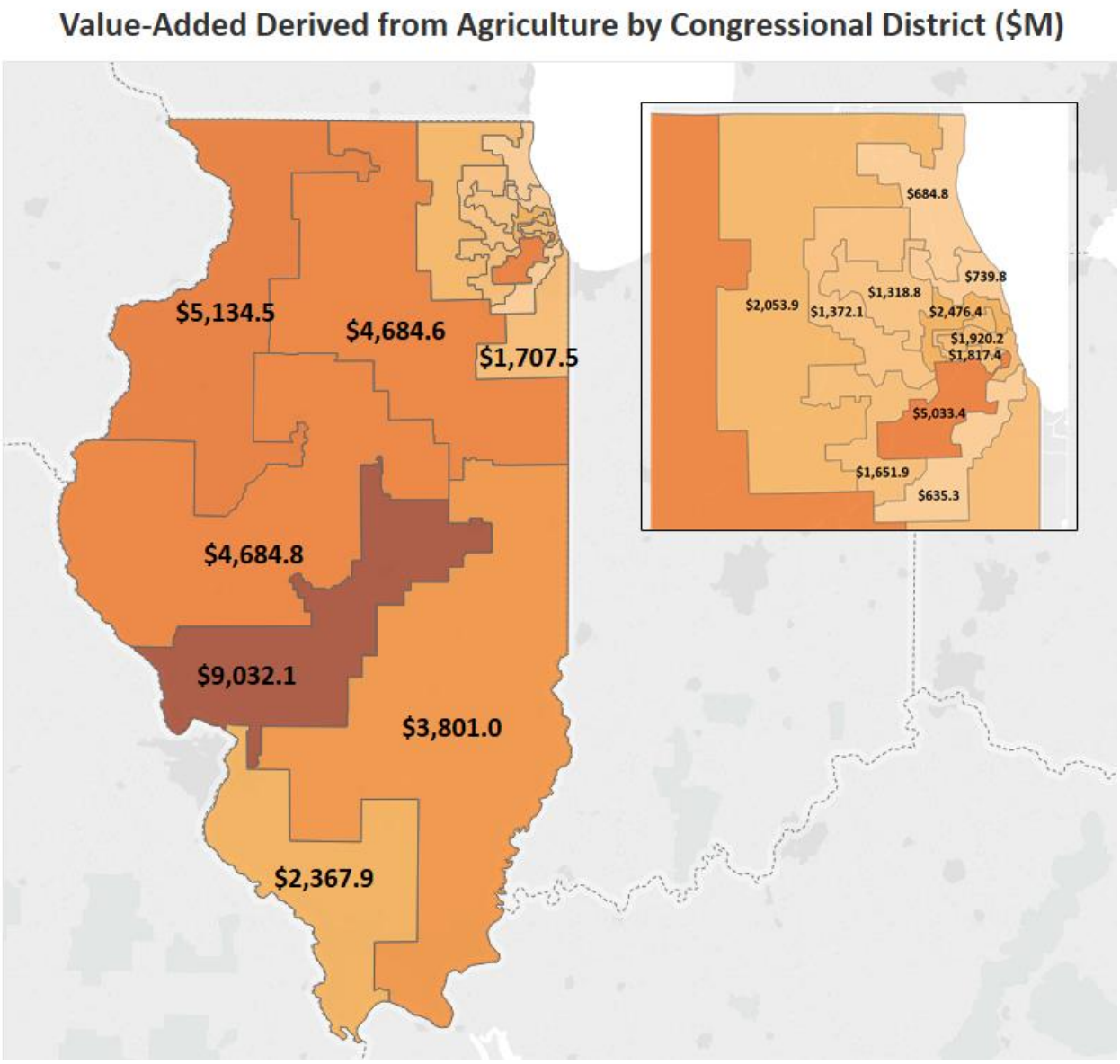

Figure 21, Value-Added Derived from Agriculture by Congressional District ($M)

Jobs

Six congressional districts in Illinois derive at least 10% of their total jobs from the agriculture and related industries as shown in Figure 22. The 13th Congressional District can attribute over 85,000 jobs to agriculture and its related industries.

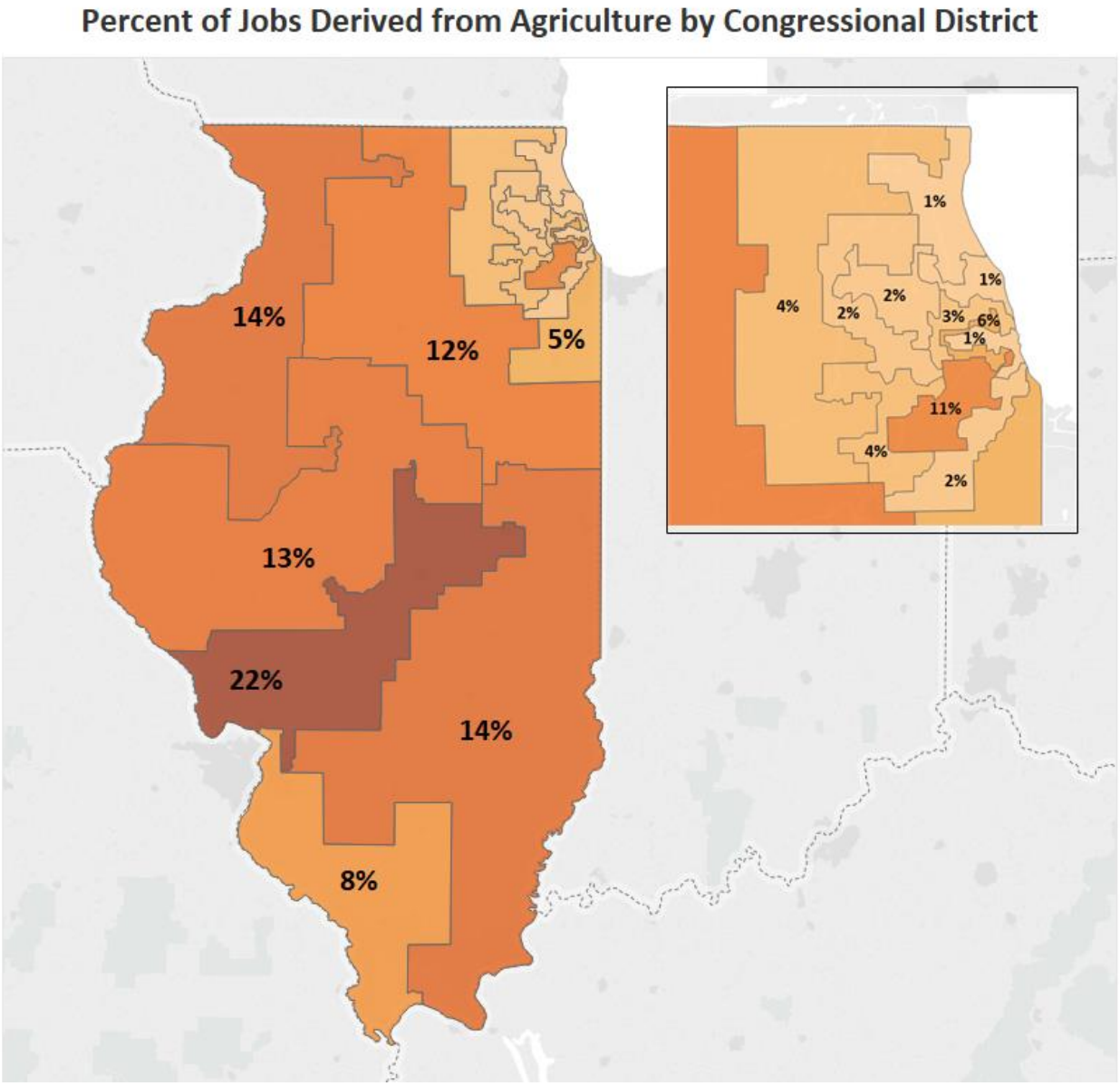

Figure 22, Percent of Jobs Derived from Agriculture by Congressional District

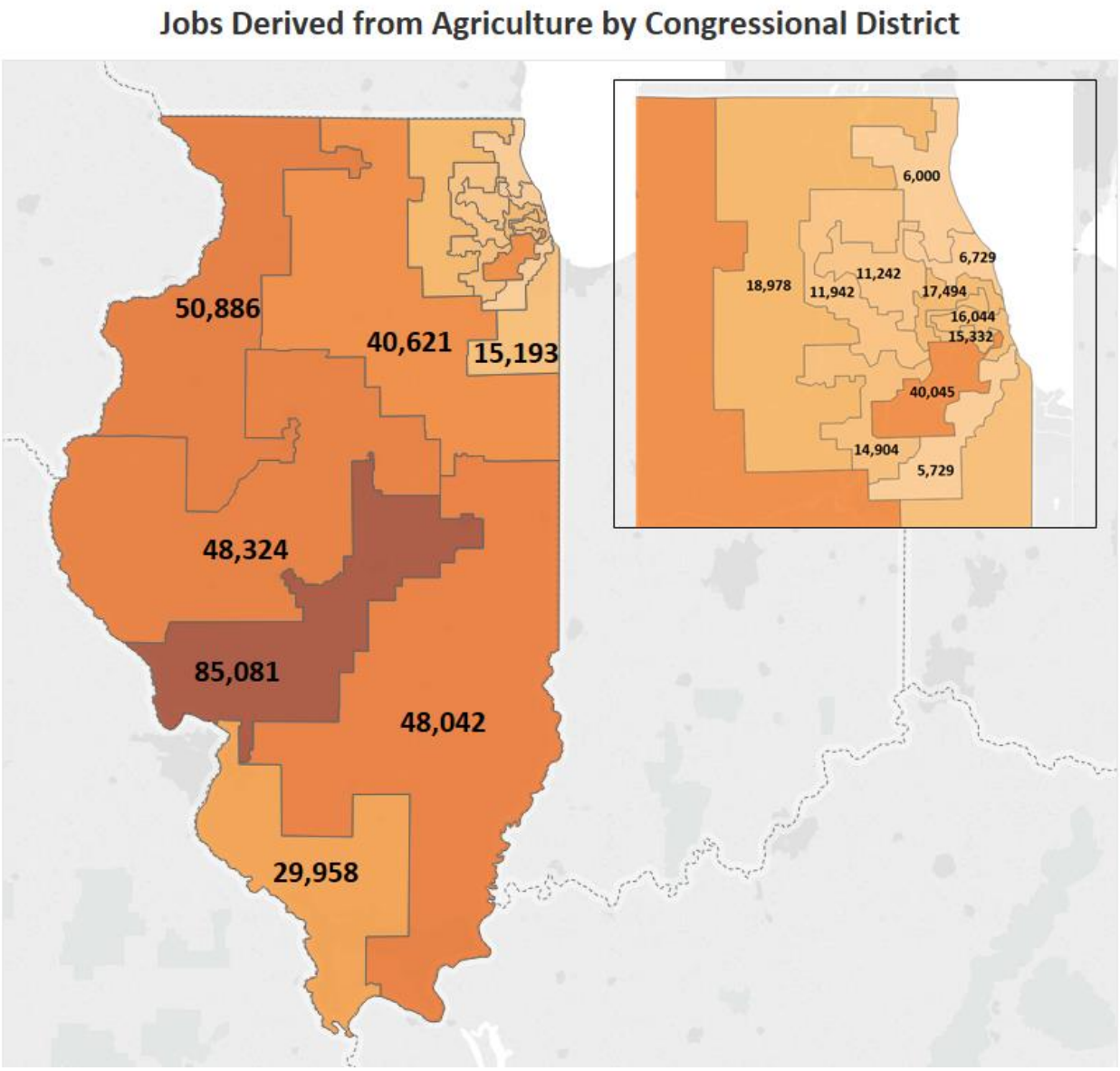

Figure 23, Jobs Derived from Agriculture by Congressional District

Illinois Agriculture: Looking Ahead

Competition from Alternative Products

The popularity of plant-based alternatives to milk has added competition to an already challenging market for dairy producers. The dairy industry continues to need to respond to this growing market segment to adapt to consumer preferences. Communication from industry stakeholders needs to highlight the benefits of dairy products in the face of this challenge. By looking at the dairy community's national initiative, Undeniably Dairy ™, we can see how the dairy industry has been responding through initiatives to reach consumers.

A similar situation can be seen playing out with the growing number of fake meats that are increasing in both availability and popularity. With many restaurants and fast food restaurants selling meat substitutes animal proteins face another challenge. This challenge is being addressed through consumer education and by continuing to market quality animal protein products. Long-term consumer trends are difficult to anticipate and will continue to weigh on the minds of industry stakeholders. By focusing on the benefits of animal protein products consumers can continue to help producers be successful in a challenging time.

Trade

Being the 4th largest producer of pigs and the 19th largest producer of cattle, animal agriculture is an important contributor to the Illinois economy. Pork and beef production that is exported contributes value-added processing to Illinois. Increasing Illinois exports of meat and other value-added activities adds more value to the Illinois economy than the export of basic bulk commodities. Trade agreements are very important to having access to market Illinois products to other countries. Pursuing trade deals with important ag partners will be necessary for success in markets that demand Illinois products. Pork will continue to be a demanded export with African Swine Fever continuing to spread across the globe and decimate pig populations.

Livestock Growth

Looking forward, the livestock industry will continue to play a critical role in the Illinois economy. Total livestock animal unit numbers in Illinois declined slightly in 2018 (see Figure 24).

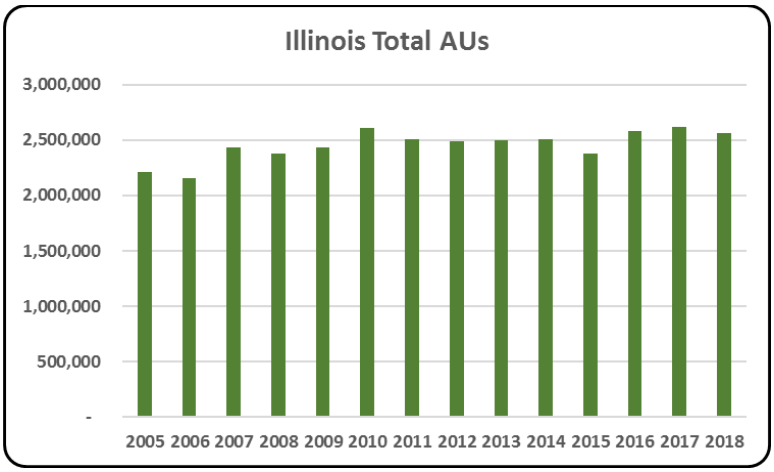

Figure 24, Illinois Total AUs

However, several species such as laying hens and hogs were on the rise over the last decade with increases of 28% and 26%, respectively. Illinois dairy cow animal unit numbers have declined about 10% over the past ten years, while beef cow numbers have also declined, which has led to the overall decline in animal units in the state.

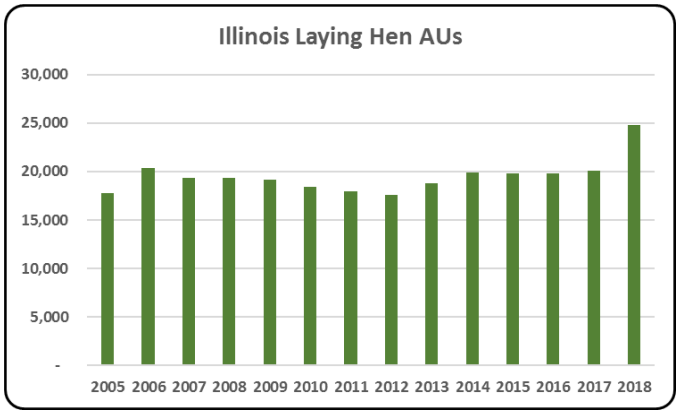

Figure 25, Illinois Laying Hen AUs

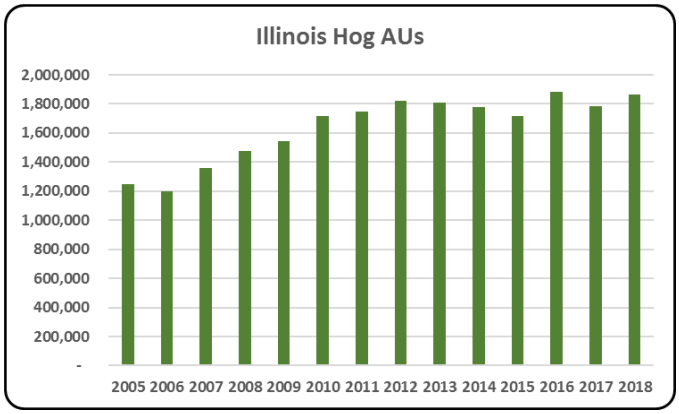

Figure 26, Illinois Hog AUs

Appendix A, IMPLAN Aggregation Scheme

IMPLAN Code	IMPLAN Description	Aggregation Description
1	Oilseed farming	Oilseeds
2	Grain farming	Grains
3	Vegetable and melon farming	Other Crop Production
4	Fruit farming	Other Crop Production
5	Tree nut farming	Other Crop Production
6	Greenhouse, nursery, and floriculture production	Other Crop Production
7	Tobacco farming	Other Crop Production
8	Cotton farming	Other Crop Production
9	Sugarcane and sugar beet farming	Other Crop Production
10	All other crop farming	Other Crop Production
15	Forestry, forest products, and timber tract production	Other Crop Production
16	Commercial logging	Other Crop Production
11	Beef cattle ranching and farming, including feedlots and dual-purpose ranching and farming	Cattle
12	Dairy cattle and milk production	Dairy
13	Poultry and egg production	Poultry
14	Animal production, except cattle and poultry and eggs	Hogs and Other Livestock
17	Commercial fishing	Hogs and Other Livestock
18	Commercial hunting and trapping	Hogs and Other Livestock
19	Support activities for agriculture and forestry	Ag Support
459	Veterinary services	Ag Support
33	Potash, soda, and borate mineral mining	Ag Chemical and Fertilizer
34	Phosphate rock mining	Ag Chemical and Fertilizer
35	Other chemical and fertilizer mineral mining	Ag Chemical and Fertilizer
165	Other basic organic chemical manufacturing	Ag Chemical and Fertilizer
169	Nitrogenous fertilizer manufacturing	Ag Chemical and Fertilizer
170	Phosphatic fertilizer manufacturing	Ag Chemical and Fertilizer
171	Fertilizer mixing	Ag Chemical and Fertilizer
172	Pesticide and other agricultural chemical manufacturing	Ag Chemical and Fertilizer
65	Dog and cat food manufacturing	Animal and Pet Foods
66	Other animal food manufacturing	Animal and Pet Foods
262	Farm machinery and equipment manufacturing	Farm Machinery
72	Fats and oils refining and blending	Other Food Processing
73	Breakfast cereal manufacturing	Other Food Processing
76	Nonchocolate confectionery manufacturing	Other Food Processing
77	Chocolate and confectionery manufacturing from cacao beans	Other Food Processing
78	Confectionery manufacturing from purchased chocolate	Other Food Processing

79	Frozen fruits, juices and vegetables manufacturing	Other Food Processing
80	Frozen specialties manufacturing	Other Food Processing
83	Dehydrated food products manufacturing	Other Food Processing
94	Bread and bakery product, except frozen, manufacturing	Other Food Processing
95	Frozen cakes and other pastries manufacturing	Other Food Processing
96	Cookie and cracker manufacturing	Other Food Processing
97	Dry pasta, mixes, and dough manufacturing	Other Food Processing
98	Tortilla manufacturing	Other Food Processing
99	Roasted nuts and peanut butter manufacturing	Other Food Processing
100	Other snack food manufacturing	Other Food Processing
101	Coffee and tea manufacturing	Other Food Processing
102	Flavoring syrup and concentrate manufacturing	Other Food Processing
103	Mayonnaise, dressing, and sauce manufacturing	Other Food Processing
104	Spice and extract manufacturing	Other Food Processing
105	All other food manufacturing	Other Food Processing
106	Bottled and canned soft drinks & water	Other Food Processing
107	Manufactured ice	Other Food Processing
108	Breweries	Other Food Processing
109	Wineries	Other Food Processing
110	Distilleries	Other Food Processing
111	Tobacco product manufacturing	Other Food Processing
67	Flour milling	Primary Food Processing - Crops
68	Rice milling	Primary Food Processing - Crops
69	Malt manufacturing	Primary Food Processing - Crops
70	Wet corn milling	Primary Food Processing - Crops
71	Soybean and other oilseed processing	Primary Food Processing - Crops
74	Beet sugar manufacturing	Primary Food Processing - Crops
75	Sugar cane mills and refining	Primary Food Processing - Crops
81	Canned fruits and vegetables manufacturing	Primary Food Processing - Crops
82	Canned specialties	Primary Food Processing - Crops
84	Fluid milk manufacturing	Primary Food Processing - Dairy
85	Creamery butter manufacturing	Primary Food Processing - Dairy
86	Cheese manufacturing	Primary Food Processing - Dairy
87	Dry, condensed, and evaporated dairy product manufacturing	Primary Food Processing - Dairy
88	Ice cream and frozen dessert manufacturing	Primary Food Processing - Dairy
89	Animal, except poultry, slaughtering	Primary Food Processing - Meat
90	Meat processed from carcasses	Primary Food Processing - Meat
91	Rendering and meat byproduct processing	Primary Food Processing - Meat
92	Poultry processing	Primary Food Processing - Meat
93	Seafood product preparation and packaging	Primary Food Processing - Meat

Appendix B, Detailed County Level Maps

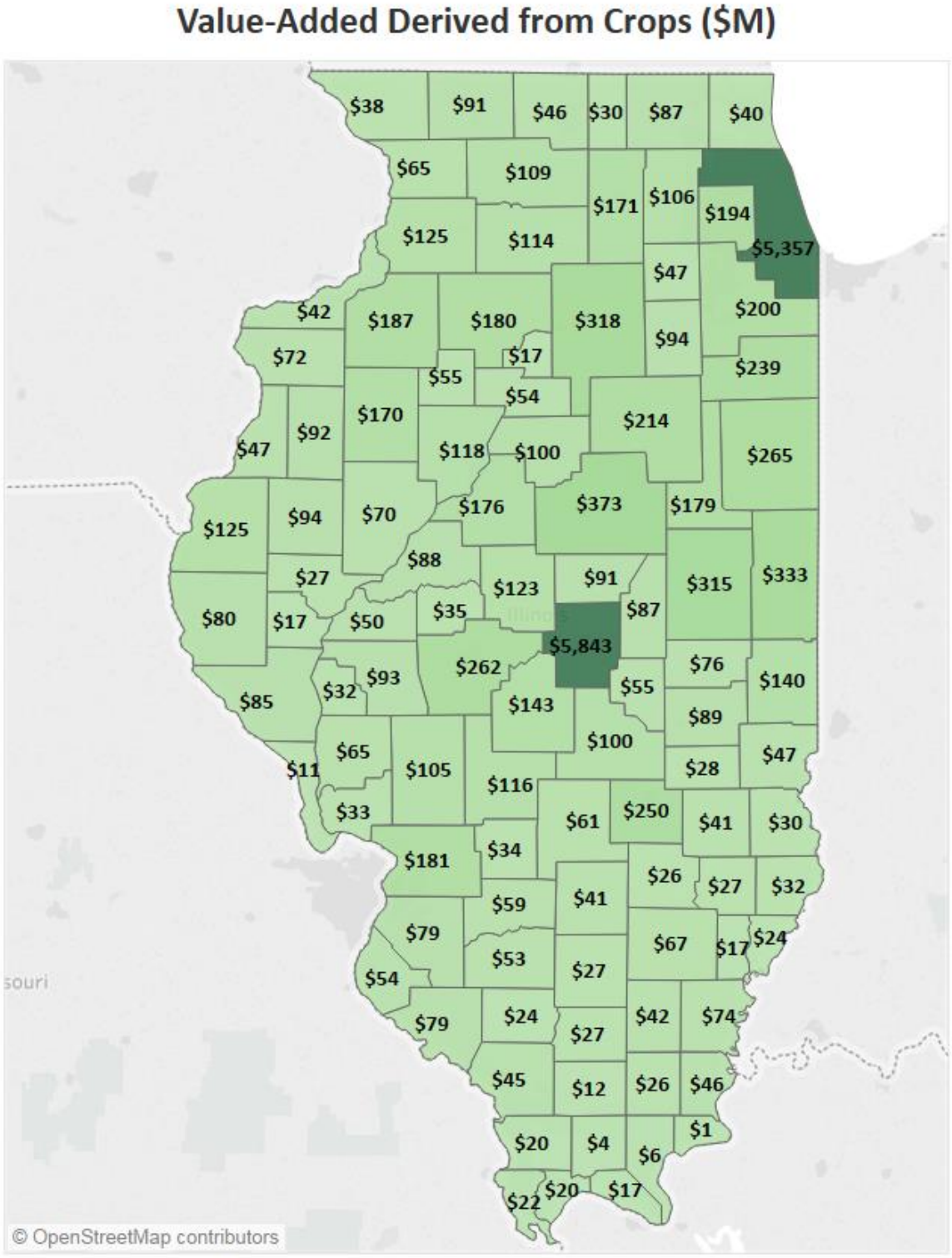

Figure 27, Value-Added Derived from Crops ($M)

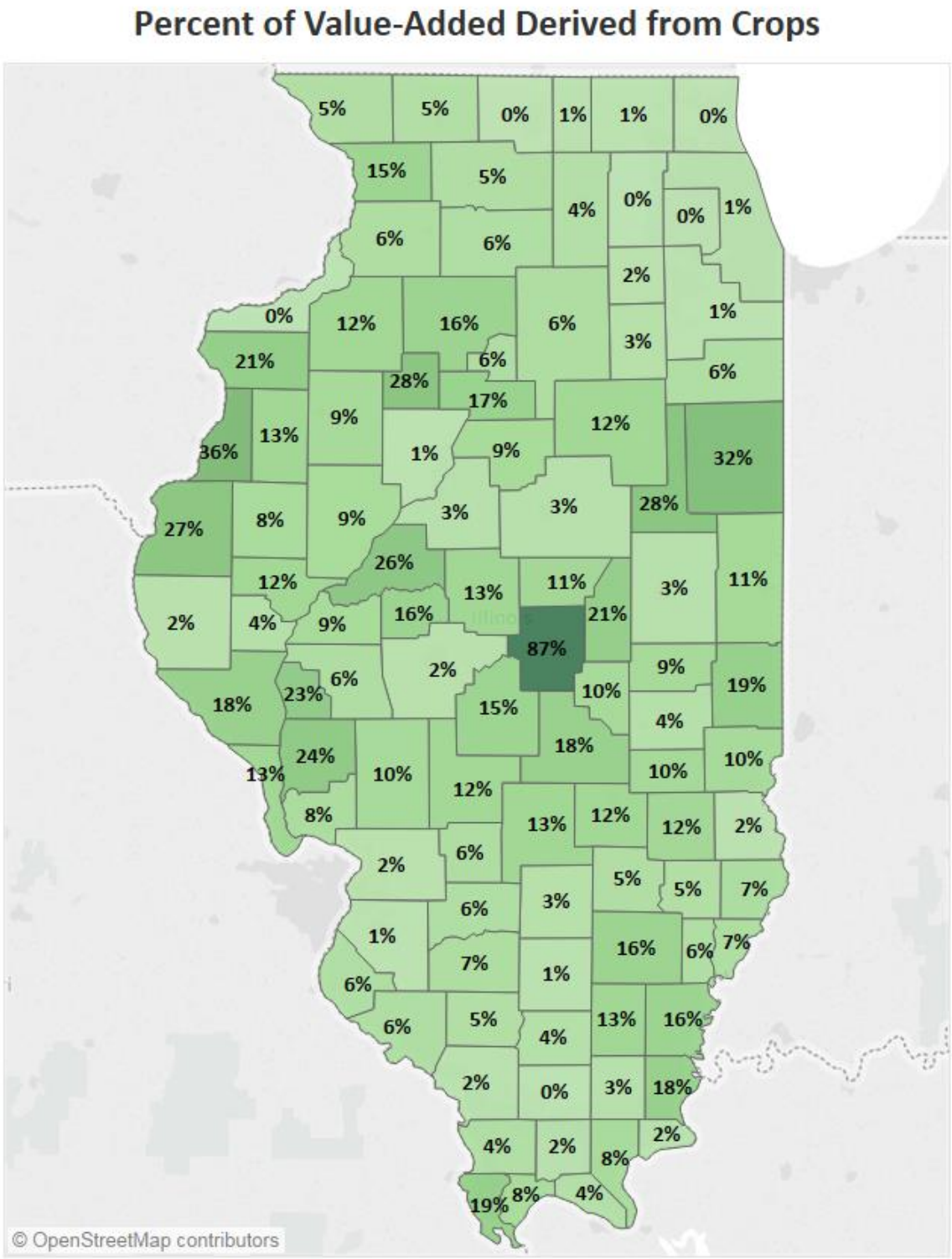

Figure 28, Percent of Value-Added Derived from Crops

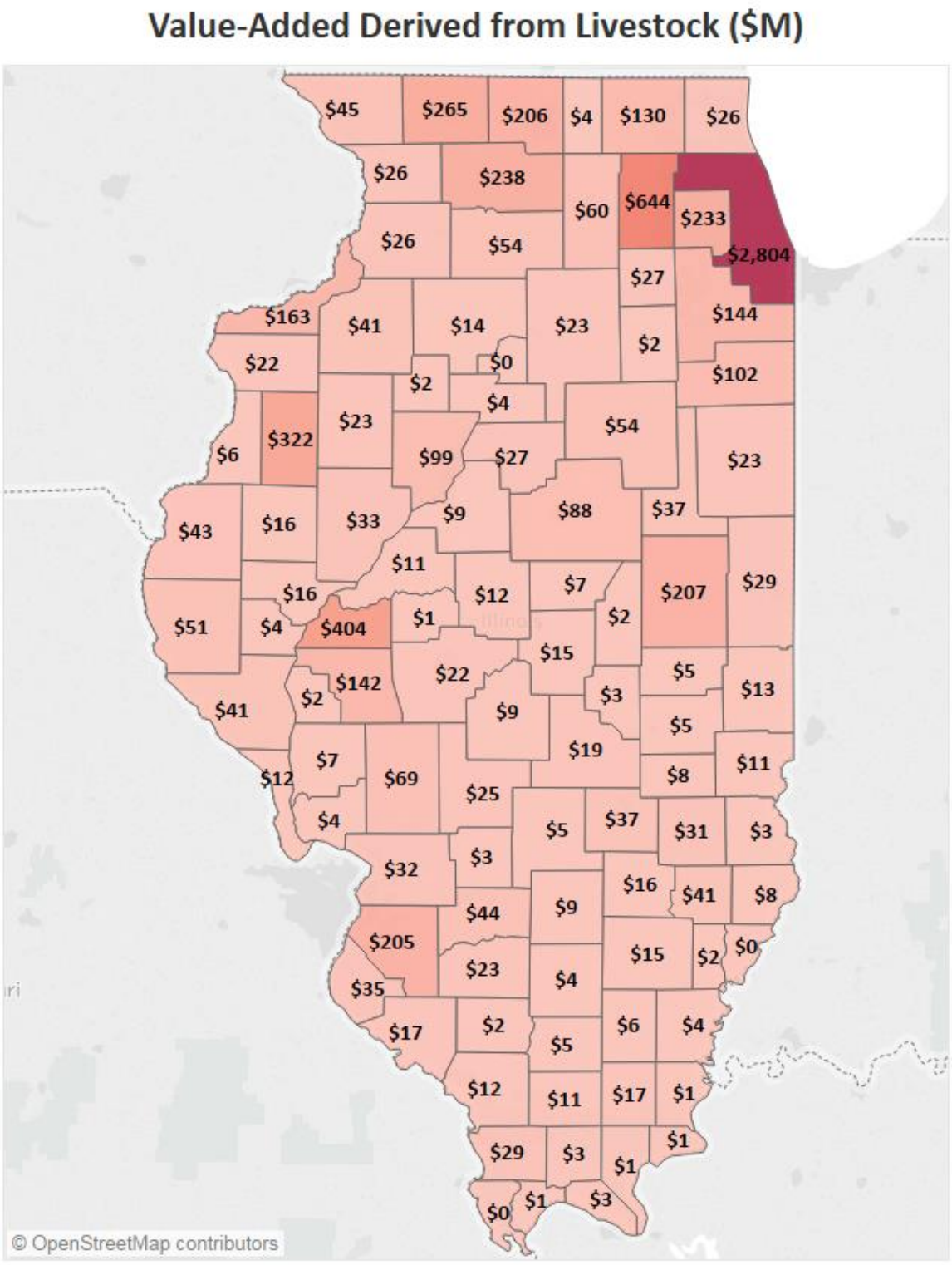

Figure 29, Value-Added Derived from Livestock ($M)

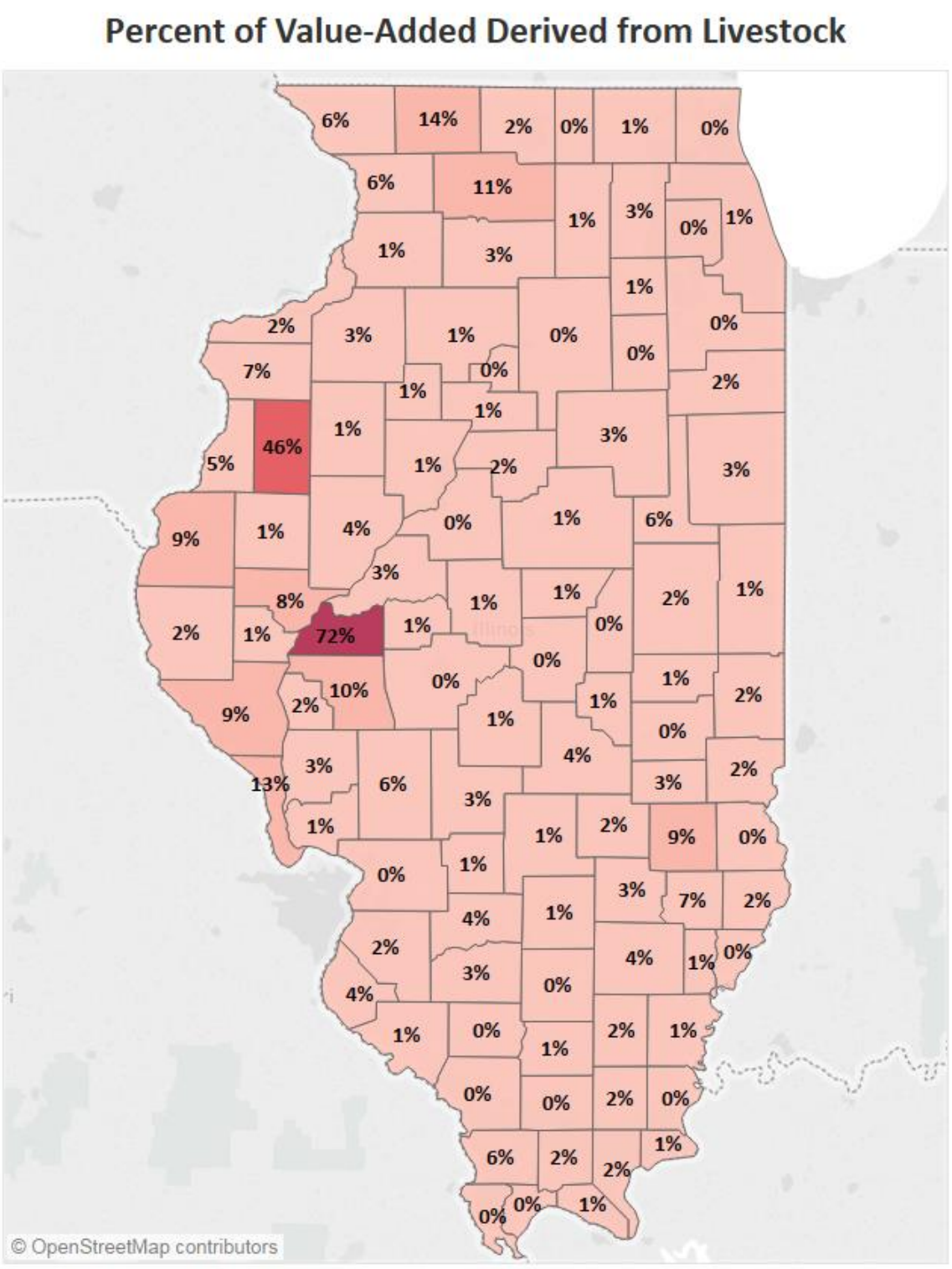

Figure 30, Percent of Value-Added Derived from Livestock

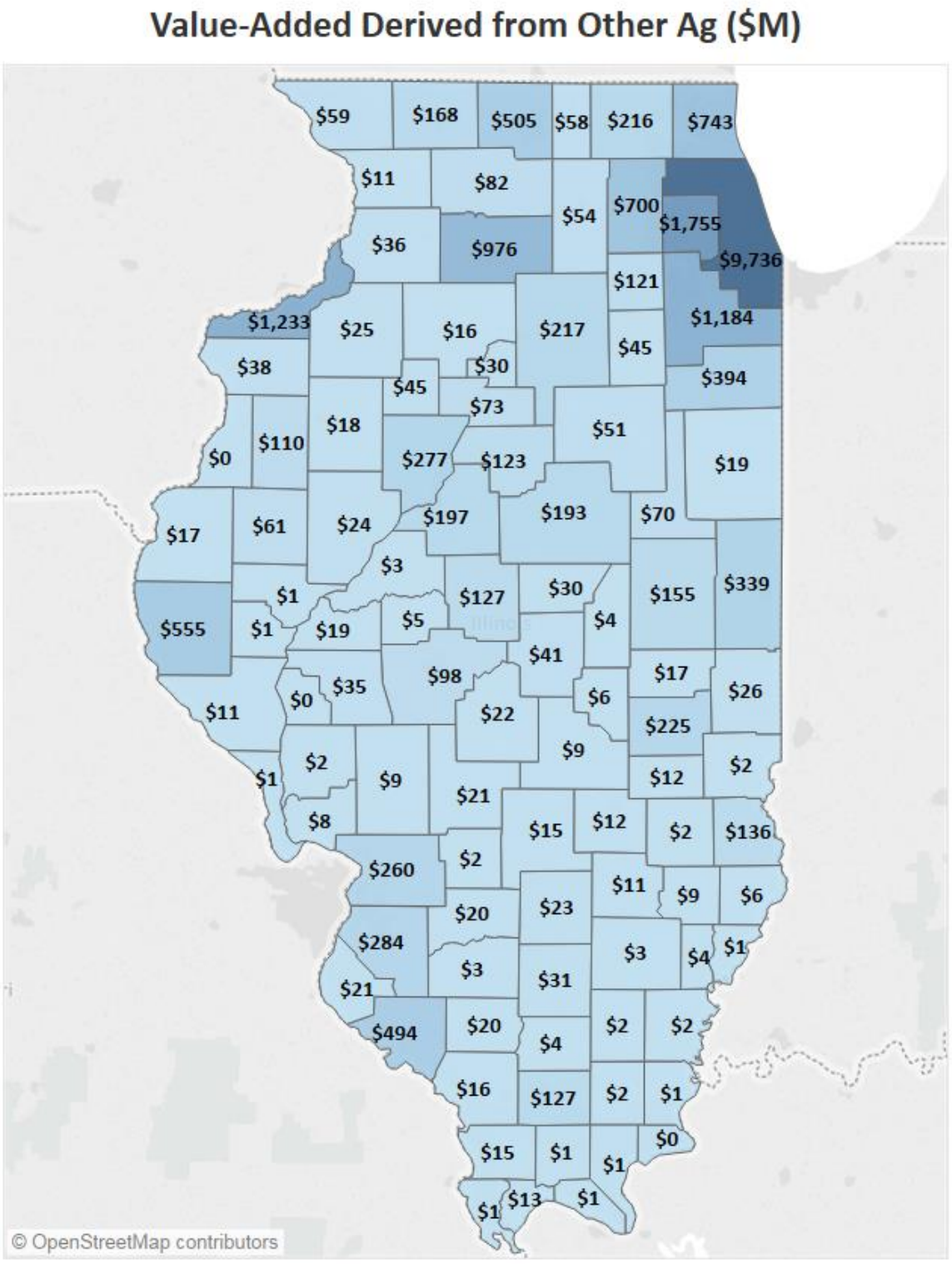

Figure 31, Value-Added Derived from Other Ag ($M)

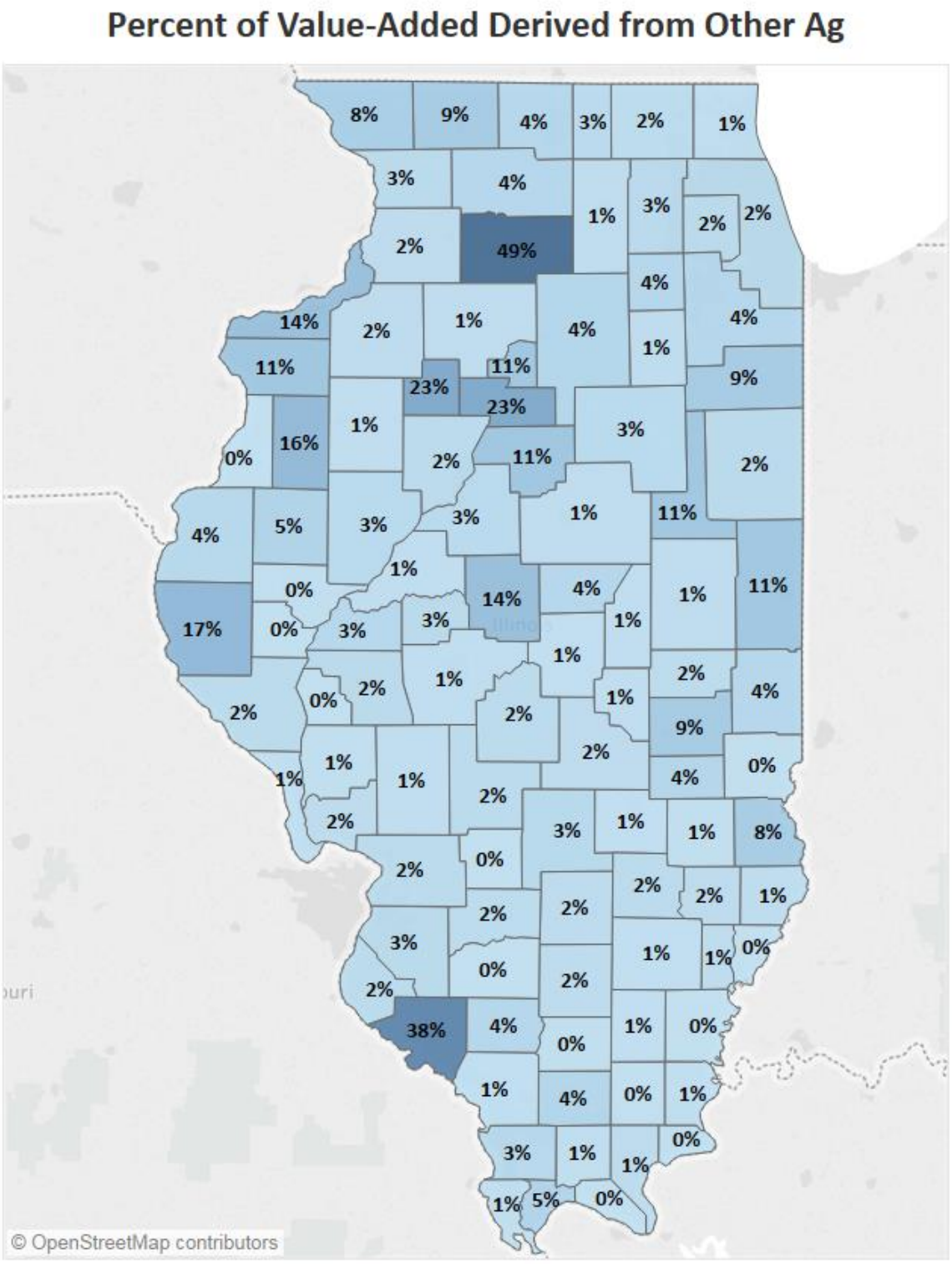

Figure 32, Percent of Value-Added Derived from Other Ag

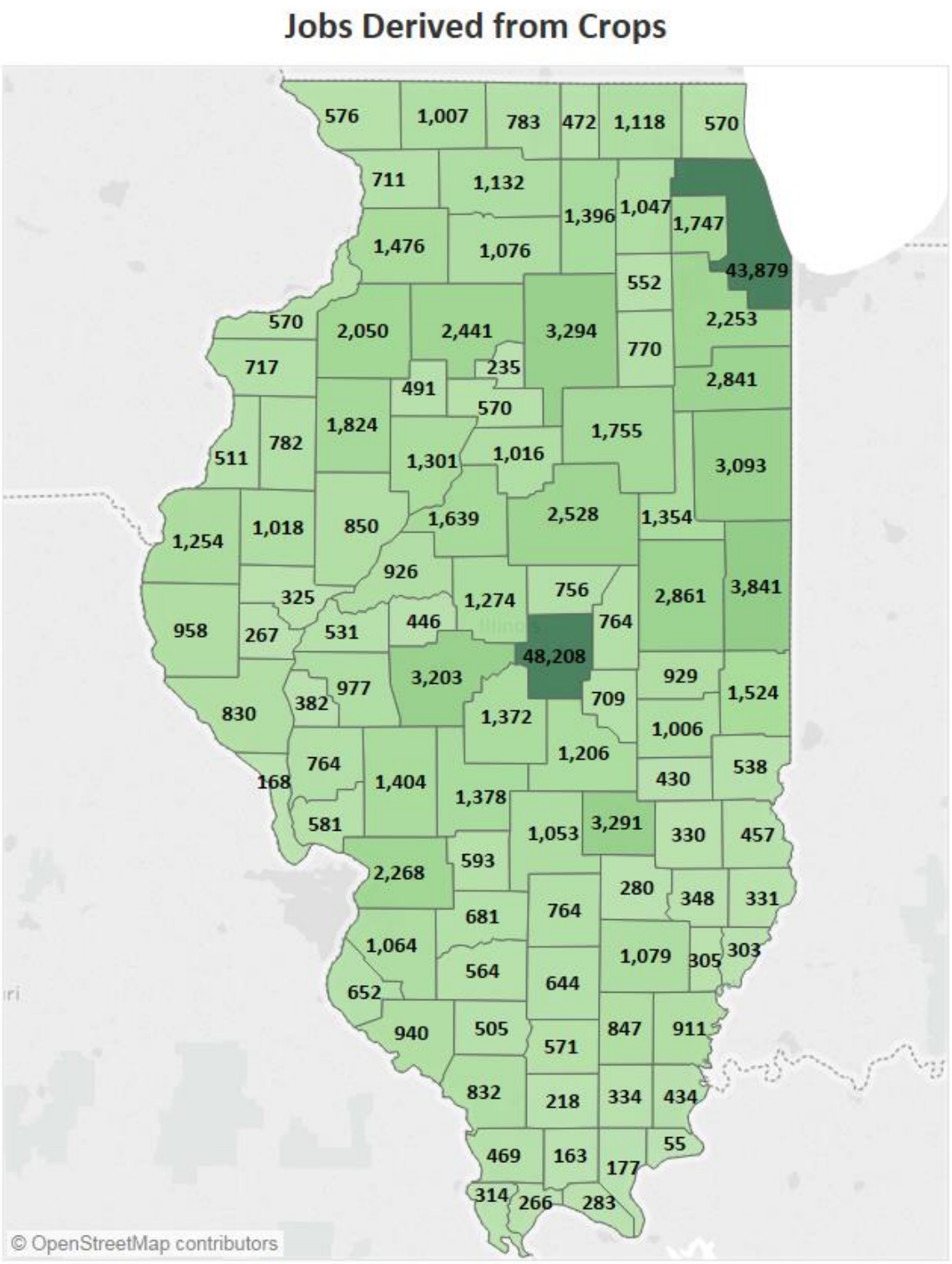

Figure 33, Jobs Derived from Crops

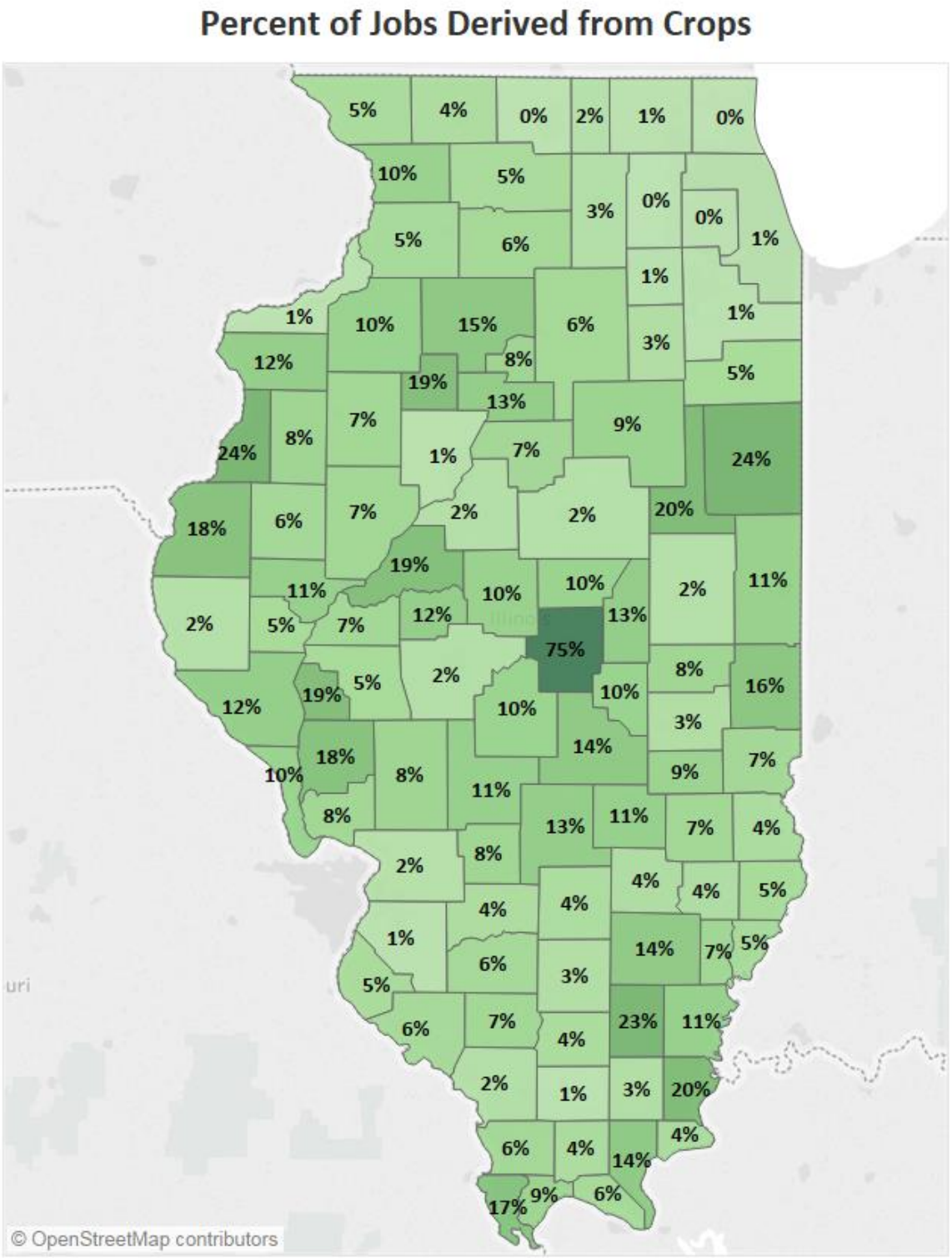

Figure 34, Percent of Jobs Derived from Crops

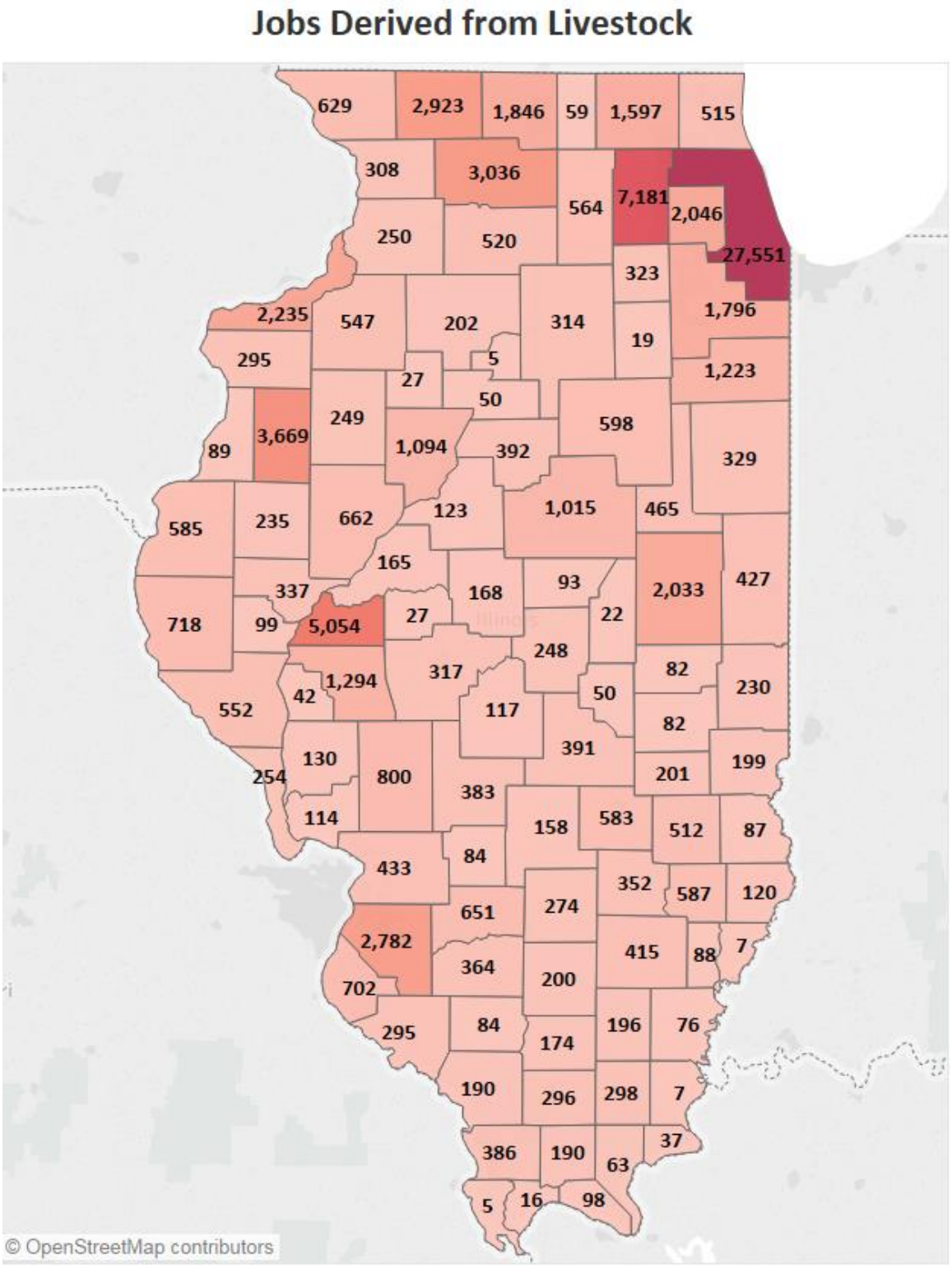

Figure 35, Jobs Derived from Livestock

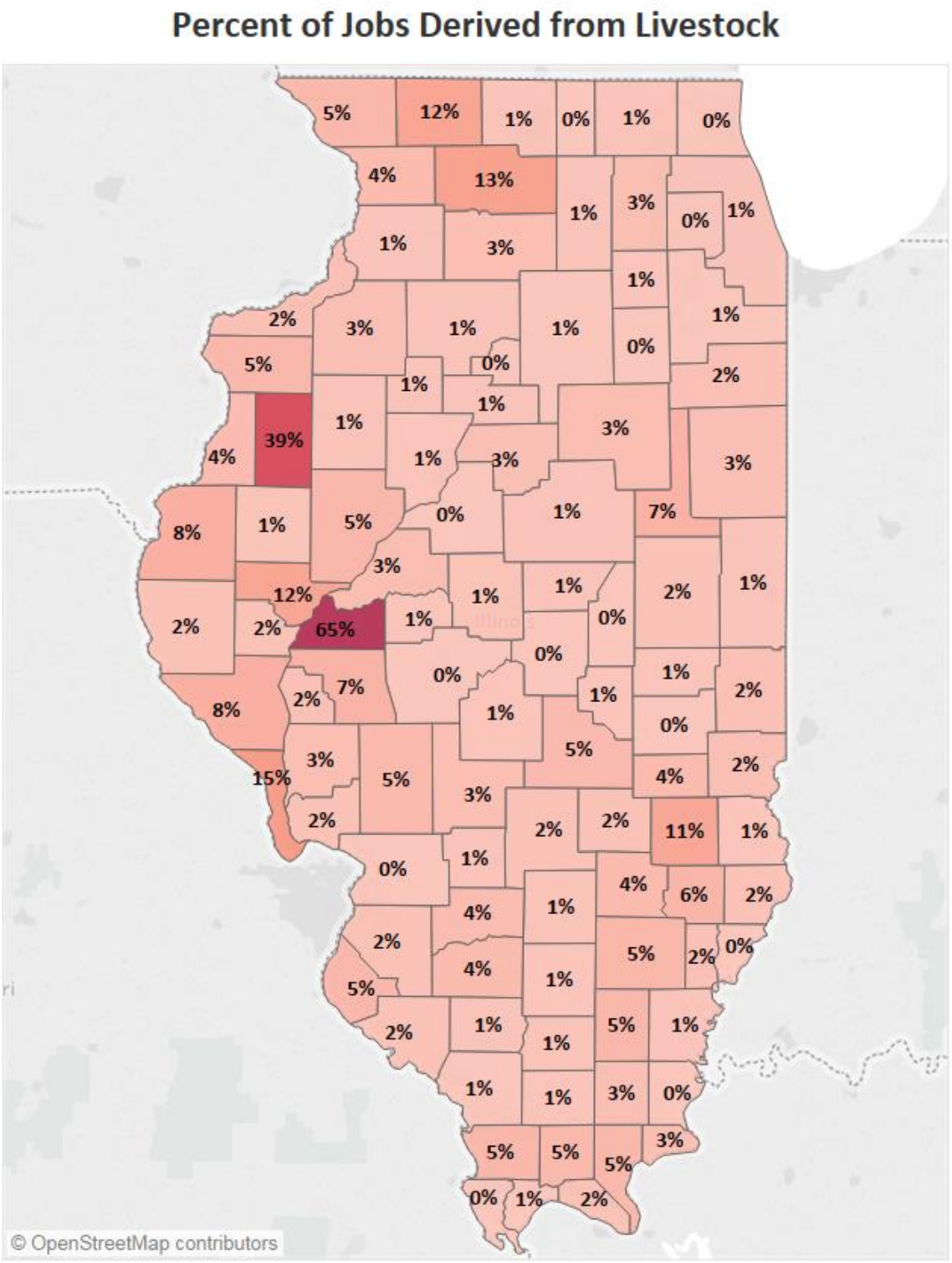

Figure 36, Percent of Jobs Derived from Livestock

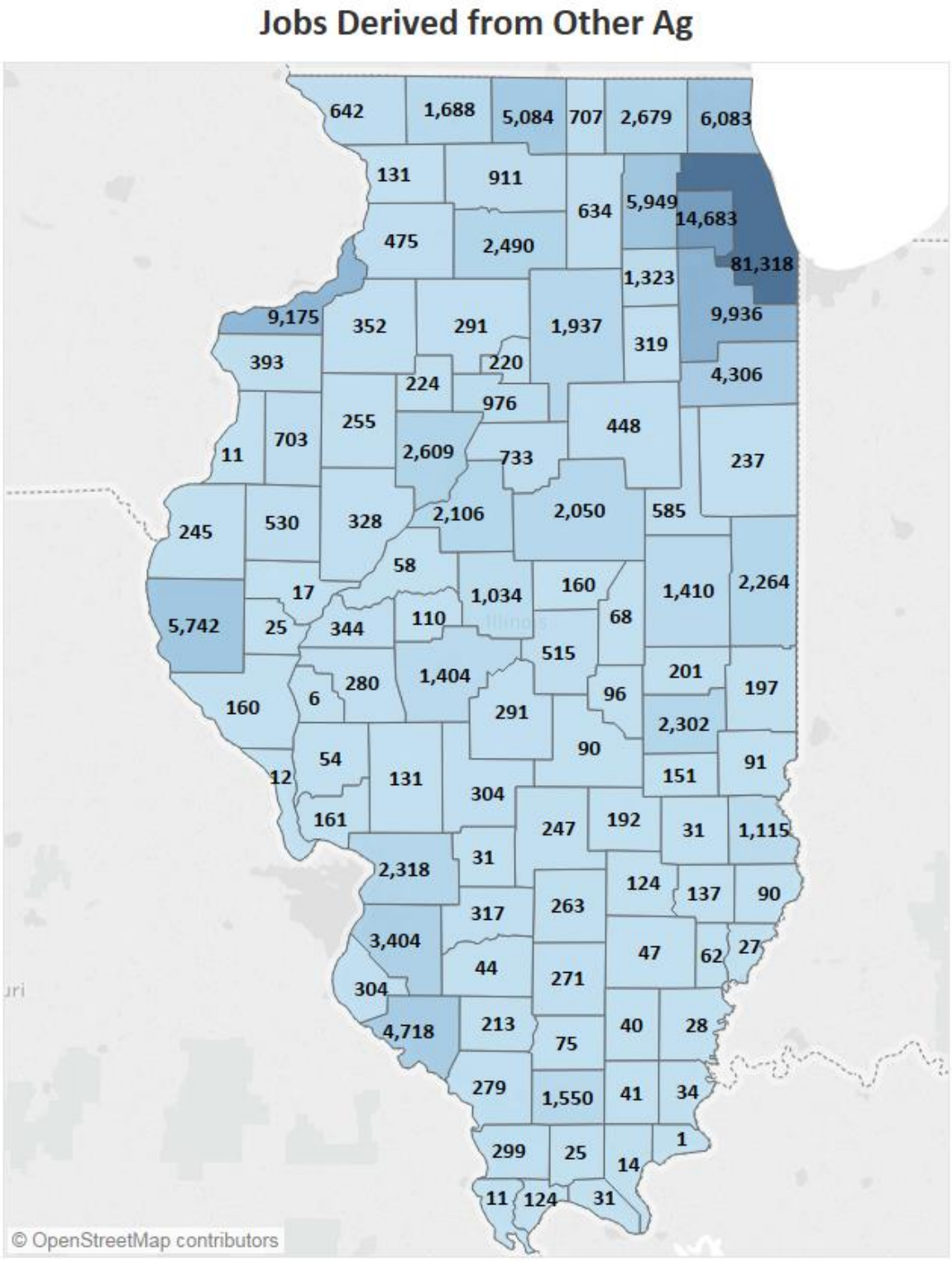

Figure 37, Jobs Derived from Other Ag

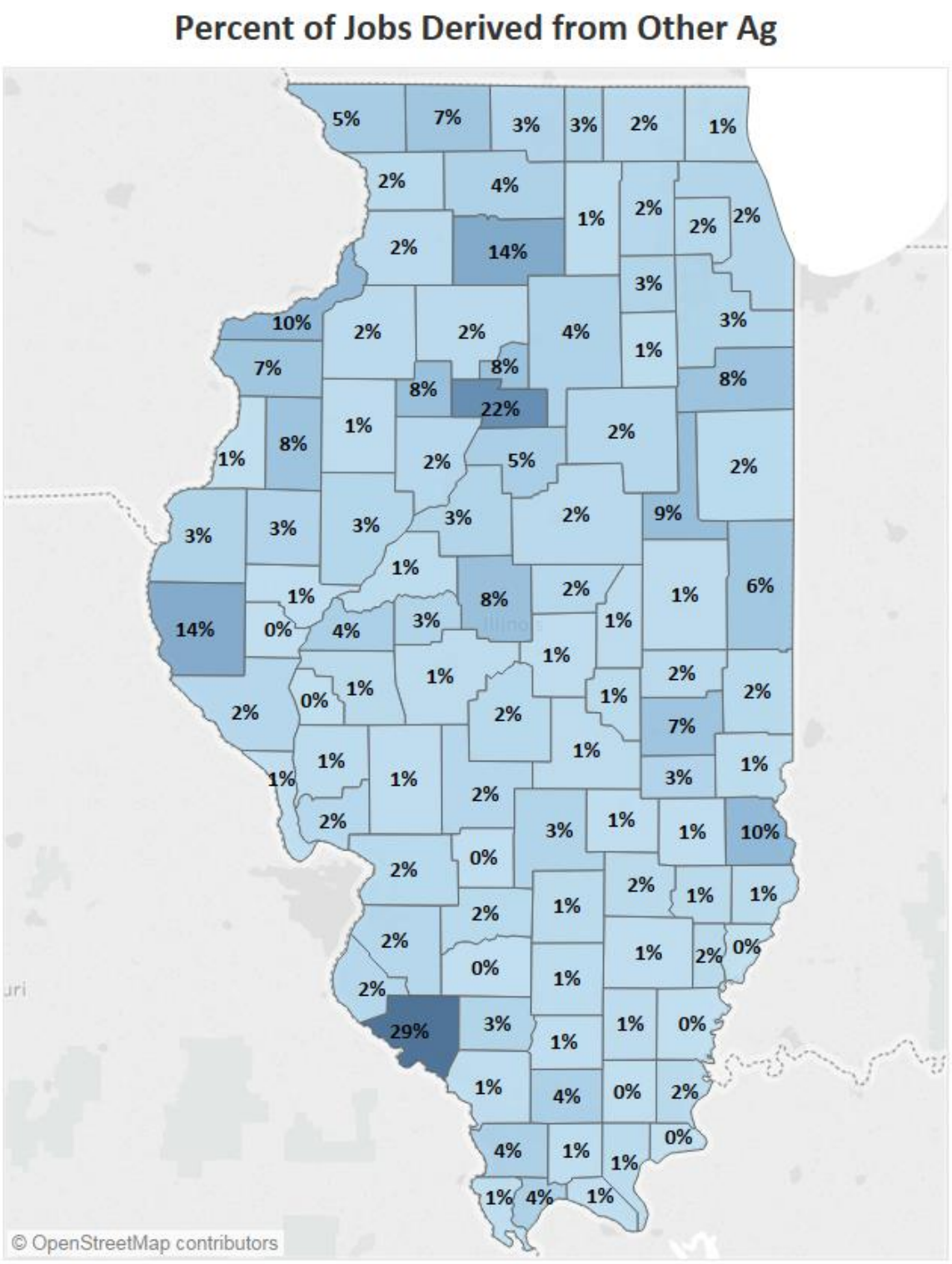

Figure 38, Percent of Jobs Derived from Other Ag

Appendix C, Warren County Livestock Case Study

In Warren County, Illinois, there were 3,669 direct, indirect, and induced jobs supported by the livestock category and $322 million in value-added in this 2019 study (using 2017 IMPLAN data), which increased significantly from 1,761 jobs and $97.6 million in value-added in the 2015 study (using 2012 IMPLAN data). While these increases may raise concern in some counties that have not seen significant changes in their livestock industry, there were several improvements in the IMPLAN system since the previous Illinois study was completed.

According to IMPLAN 2013 data release notes[4], there have been several updates to the underlying data in the IMPLAN input-output model since the previous Illinois AECS study was completed using the 2012 IMPLAN data. The 2017 IMPLAN data:

- Incorporates Bureau of Economic Analysis (BEA) Benchmark input-output (I-O) tables which were released in 2014.
- Reflects latest methodological revisions to BEA National Income and Product Accounts
- Enhanced use of demographic data from the Census Bureau's American Community Survey on county and zip-code level estimates of household income distributions.
- Includes data from the latest BEA Regional Economic Accounts, the 2012 Economic Census, the 2012 Census of Agriculture, Bureau of Labor Statistics QCEW dataset, preliminary 2012 Commodity Flow Survey results, among many more.

Specific to agriculture industries included in this study, the IMPLAN data has been refined using updates from:

- New Census of Agriculture
- NASS Data for Agricultural Output
- New BEA Benchmark
- A new sectoring scheme that expanded the IMPLAN sectoring scheme from 440 sectors to 536, causing changes but providing more accurate detail on various industries such as meat processing.
    - According to the IMPLAN data notes, "Another result of splitting sectors is that ratios like output per worker, income per worker, etc. may differ for the more-detailed sector from the previously more-aggregated sector since the more-aggregated sector is a weighted average of its more-detailed parts. For example, suppose sector 501 has a very high income per worker, while sectors 502 and 503 have low income per worker. This would result in the old sector 413 having an income per worker ratio somewhere in the middle – not too high, not too low. Comparing 501 to the old 413, you would see an increase in income per

[4] https://implanhelp.zendesk.com/hc/en-us/articles/360000751014-2013-Data-Release-Notes

> worker, while comparing sector 502 or 503 to the old 413, you would see a decrease in income per worker. These changes do not necessarily reflect a change in workers' earnings, but rather just reflect a more-detailed allocation of the workers into more specific sectors, each of which has its own earnings rate."

For example, the 2012 sectoring scheme had one sector for animal slaughtering, rendering, and processing all averaged into one sector. In the 2017 IMPLAN data, that sector was split out into three separate sectors for slaughtering, rendering and processing which allows each of them to be reported more accurately.

The number of direct jobs for animal slaughtering, rendering, and processing in Warren County, Illinois remained about the same from 2012 to 2017; however the multipliers and values such as output per worker and value-added per worker for animal slaughtering increased significantly due to the more detailed sectoring scheme. These improvements to the IMPLAN models and underlying data between 2012 and 2017 contributed to some of the large increases shown in certain categories, such as livestock processing by reflecting a higher total value added back into the community and increasing indirect and induced jobs.