Economic Contribution of Agricultural and Food Production Cluster to Ohio Economy
County Level Analysis

Contributors: Ben Brown, Ryan Brune, Connor Frame, and Megan Ritter

In November of 2017, researchers in the Department of Agricultural, Environmental, and Development Economics released *The Economic Contribution of Agricultural and Food Production to the Ohio Economy* report with analysis of Ohio's entire Agricultural and Food Production Cluster. Details of that report are included, but this serves as a parallel analysis of agriculture to each of Ohio's eighty-eight counties. Key results match initial assumptions in those counties with large concentrations of equipment manufacturing, professional services and diary & milk production led total economic contribution by the production agriculture subsector. In addition, counties containing relatively high food processing see the largest total sector contributions, and that counties with relatively small populations experience a higher percentage of employers involved in food and agriculture related careers. Large population centers within Cuyahoga, Franklin and Hamilton counties produced high economic contributions, but had low total population participation in agriculture. Data obtained from IMPLAN, a North Carolina based economic software company, provided the most recent total values, while the North American Industry Classification System was used to determine the percent agriculture contributed to each sector. The IMPLAN model estimates value added for 536 separate subsectors within Ohio's economy. Unlike the statewide report, these county level calculations do not include the contribution from restaurants and bars. It also includes Farm Inputs, Equipment and Farm Professional Services in the agricultural production subsector.

Key findings in the statewide report: Ohio's Agricultural and Food Production Cluster plus Restaurant and Bars account for $1 in every $13 of Ohio's GSP and 1 in 8 jobs in Ohio. Each county differed in these ratios, but as expected large population counties were negatively correlated with small population counties in economic contribution and percentage of workforce involved in agriculture. The total statewide economic value added contribution of the Agricultural and Food Production Cluster minus Restaurants and Bars was $32.5 billion dollars and accounted for a little over 5 percent of the state's gross state product. Value added being the sum of sales minus input costs for each sector. Example: corn production minus seed, fertilizer, ext. The sector employed 402,874 Ohioans in 2015 and because of purchases outside the cluster; a multiplier of 1.6 was used for every dollar of valued added making the total contribution $53 billion. Multipliers are a way of capturing the money spent within Ohio made from an agricultural sector that is then used to purchase additional products, like household items, into the economic contribution.

Declining commodity prices for corn, soybeans and milk in recent years have lowered the value added contribution of some counties, especially those that have corn, soybeans and milk ranked in the top three subsectors. Other subsectors including fruit and vegetable production have shown an increase to the value added contribution. Along with decreasing commodity prices, increasing productivity due to technology advancements have correlated with a decrease in employment within agriculture and food production. Ohio's characteristic as a top agriculture producing state remains strong, but external factors like increasing pressure on land values could be seen as a potential challenge for the production agriculture subsector.

The three main divisions of the Agricultural and Food Production Cluster: Agricultural Production, Agricultural and Food Processing and Food Wholesale/Retail are included in Table 1 with subsectors broken out under their respective division. Different from the statewide report is the inclusion of Farm Inputs, Equipment and Professional Services under the division of Agricultural Production instead of an isolated division.

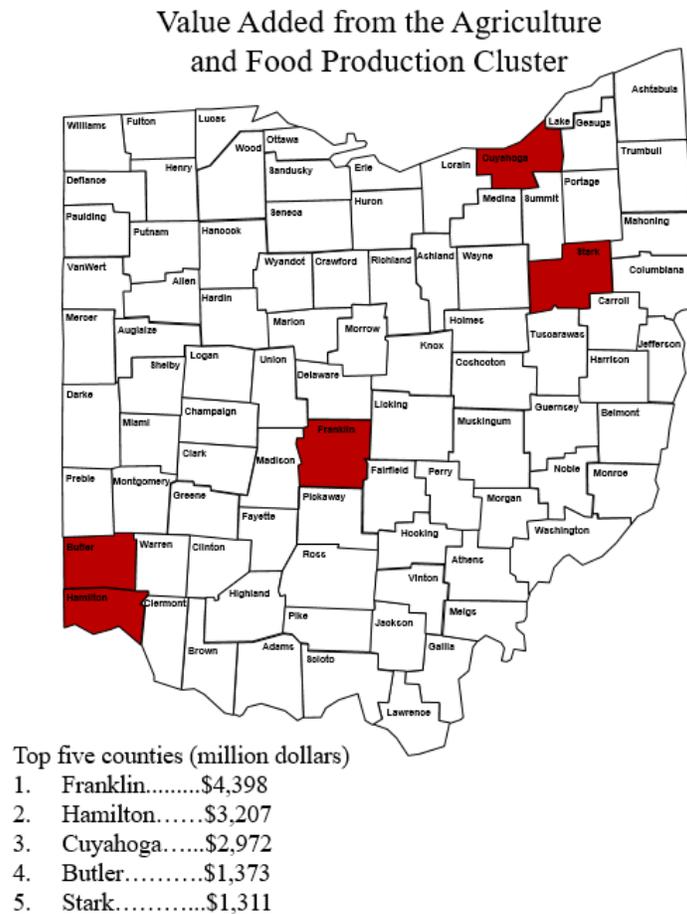| Agricultural Production | Agricultural and Food Processing | Food Wholesale/ Retail | |
|---|---|---|---|
| Farm Inputs, Equipment and Professional Services | Processed Meat, Fish, Poultry & Eggs | Food and Forestry Wholesale | |
| Dairy Cattle and Milk Production | Dairy Processing | Food and Forestry Retail | |
| Beef Cattle Production | Processed Food & Kindred Products | | |
| Poultry & Egg Production | Grain Milling & Flour | | |
| Hogs & Other Farm Animals | Fats & Oils Processing | | |
| Grain Production | Beverage Processing | | |
| Soybeans & Other Oil Seeds | Wood/ Paper/ Furniture Manufacturing | | |
| Misc. Crops, Hay, Sugar, Tobacco & Nuts | | | |
| Fruit & Vegetable Production | | | |
| Greenhouse, Nursery & Floriculture Production | | | |
| Forestry, Hunting & Fishing | | | |
| **Sum of Agriculture Production** | **Sum of Food Processing** | **Sum of Food Wholesale/ Retail** | **Total Agricultural and Food Production Cluster** |

*Table 1: Classification of Sectors*

Starting with Total Value Added from the Agriculture and Food Production Cluster it is not surprising to see in Figure 1 that the top five counties also match five counties with large population centers. With Franklin, Hamilton, and Cuyahoga counties being the location of Columbus, Cincinnati, and Cleveland respectively, it was expected and found that the contribution of production agriculture in terms of both value added and employment was the smallest division contributor, with food processing being the largest contributing division in Franklin, Hamilton, Butler, and Stark Counties. Food wholesale/ retail was the largest contributing division for Cuyahoga County. Statewide, the food processing sector was the largest contributing division at $14,986 million and 2.43% of the states' Gross State Product (GSP).

Franklin County had a high food processing contribution due to the beverage processing sector at $916 million. Notable companies in the area include Anheuser-Busch Companies Inc., BrewDog USA, Coca-Cola and others according to the Columbus Economic Development
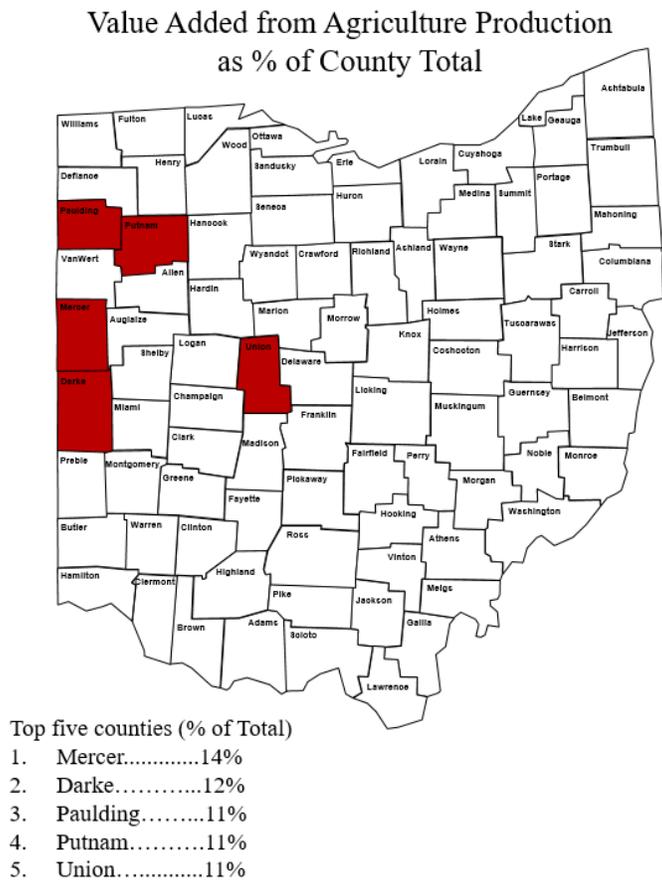
Annual Report. Employment within the Cluster was also largely contributed from the beverage processing subsector. For Hamilton county, the beverage processing subsector was also the largest contribution to the food processing division. Boston Beer Company, the parent company of Sam Adams Beer, and The J.M. Smuckers Co., parent company to Folgers Coffee are major contributors to the subsector. Boston Beer Company produces 20 percent of all Sam Adams Beer within Hamilton County. Cuyahoga County was the lone county in the top five where the top contributing division was Food Wholesale/Retail. Multiple subsectors in this division contributed to the large value, but noticeable was the smaller value for the beverage processing subsector in the Food Processing division. Analysis was not conducted across all 88 counties, but based on the top total value added counties, counties with large beverage processing subsectors had food processing divisions that made up the largest portion of the county's Agricultural and Food Cluster contribution. While Cuyahoga, Franklin and Hamilton Counties are only 3 out of 88, the population represents roughly 29 percent of Ohio's population based on U.S. Census Bureau data and make up a large portion of the Cluster's impact to Ohio.

*Figure 1: Top Five Value Added Counties*



Value Added from the Agriculture and Food Production Cluster

Top five counties (million dollars)
1. Franklin.........$4,398
2. Hamilton.......$3,207
3. Cuyahoga.......$2,972
4. Butler..........$1,373
5. Stark...........$1,311

In Figure 1, counties producing the largest total values of economic contribution from agriculture and food were identified, and it isn't surprising that counties with relatively large total economies also had the largest contributions of agriculture. However, in none of the top five producing counties was production agriculture the top contributing division. To look at the relative value of production agriculture to a county's economy we can use the value added from agricultural production as a percent of the counties total economic output and indeed counties with larger agricultural output in regards to the National Agricultural Statistics Service (NASS) do rise to the top. However, this should not be interpreted as the five counties with the largest total value contribution from production agriculture. The *2016-2017 Ohio Agricultural Statistics Annual Bulletin* shows that land use for agricultural purposes in Mercer, Darke, Paulding, Putnam and Union Counties are 93%, 89%, 83%, 99% and 88% respectively, where land use is the sum of cropland, pastureland, and woodland. Figure 2 illustrates where the five counties lie within Ohio.

*Figure 2: Top Five Counties*



Value Added from Agriculture Production as % of County Total

Top five counties (% of Total)
1. Mercer.............14%
2. Darke………...12%
3. Paulding……...11%
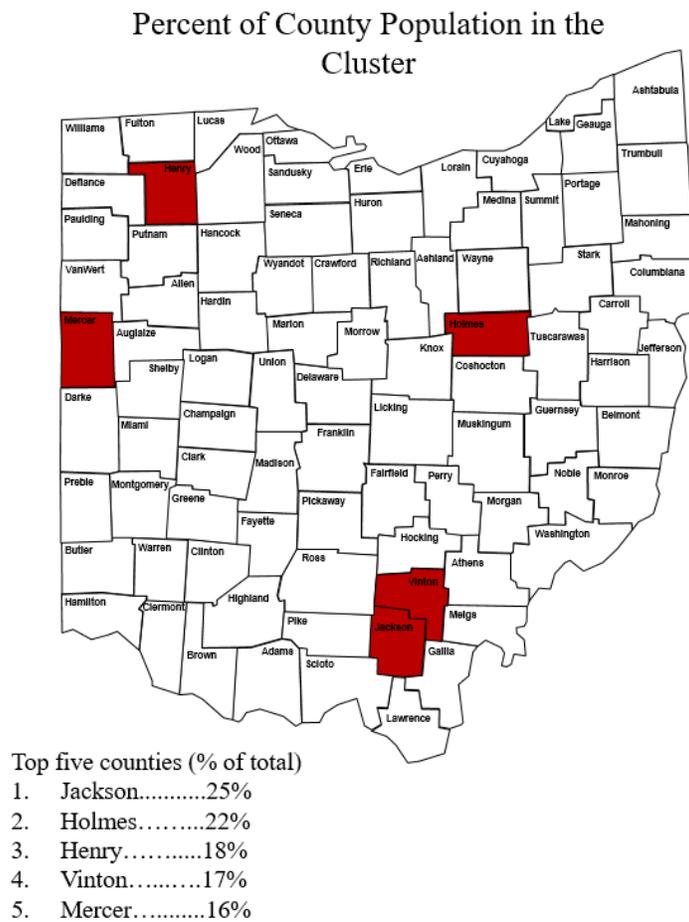4. Putnam……….11%
5. Union…............11%

County agriculture contribution profiles for Mercer and Darke counties were similar as both counties had the same two subsectors contributing the majority of value added products to the county economies: Poultry & Egg Production and Pork Production. For Paulding and Putnam counties there was not a specific subsector that stood above the rest, but more of a balanced

distribution. Soybeans & Other Oil Crops had relatively high values for both counties. In contrast, Union County had a top contributing subsector of Farm Inputs, Equipment & Other Professional services that made up 9% of the entire counties economy. This subsector made up 90% of the contribution of the Agricultural and Food Cluster.

While one indication of contribution to a county's economy is through the value added calculation, another indicator is the number of people employed with-in the Cluster. Similar to the total contribution illustration above in Figure 1, counties with high food processing and relatively large populations also have the largest total number of employment in agriculture, but have a low percentage in relation to the entire county population. Figure 3, identifies the five counties with the highest percentage of the population involved in the Agriculture and Food Cluster. As seen above, Franklin County had the largest total value added to the economy and the highest employment at almost 38 thousand people, but represents roughly 4% of the counties workforce. Whereas Jackson County did not make the top five in total value added contribution, but has 25 percent of its workforce involved in the Cluster.

*Figure 3: Percent of Population involved in Agriculture and Food*



Percent of County Population in the Cluster

Top five counties (% of total)
1. Jackson............25%
2. Holmes……....22%
3. Henry……......18%
4. Vinton….....….17%
5. Mercer…..........16%

Summary

   Understanding components of the statewide economy are important, as trends within the sector help identify strengths and weaknesses. However, county analysis helps those within and around the industry become stronger more informed decision makers in issues relevant to the Agricultural and Food Production Cluster. Not surprising, counties with larger populations had the highest total value added contribution to the county's economy and the highest number of employees within the work force, but had lower percentages of the county total in values and employees to those counties with small populations. In counties with large value added from the entire cluster, Food Processing was the largest contributing division for the majority of counties in the top five. A strong beverage-processing subsector helped elevate the Food Processing division for these counties. Isolating the Production Agriculture division including Farm Inputs, Equipment and Professional Services as a percent of the county's total economy identified five counties that have relatively high land use in agriculture and high total sales from agriculture commodities.

Individual county fact sheets for all eighty-eight Ohio counties are listed here: https://aede.osu.edu/research/osu-farm-management/agricultural-impact/contribution-agriculture-county

Appendix I. includes a list of counties and their value of total contribution, value of production agriculture contribution, and employment. State rankings are in parentheses.


References:

"Columbus Region: Food and Beverage." *Columbus 2020, 2017.*

DiCarolis, Janice. et al. *The Economic Contribution of Agricultural and Food Production to the Ohio Economy. 2017.*

IMPLAN. 2017. 2015 Ohio state data package. www.implan.com

Turner, Cheryl, and Brooke Morris. *Ohio Agricultural Statistics 2016-2017 Annual Bulletin.* USDA, National Agricultural Statistics Service, 2017.

US Census. 2017a. County Business Profiles. https://www.census.gov/programs-surveys/cbp.html

THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

| | Agriculture Production Value Added | Ag Production % of Employment | Total Cluster Value Added | Total % of Employment |
|---|---|---|---|---|
| Adams | $26,132,407 (72) | 10% (5) | $56,773,236 (77) | 14% (13) |
| Allen | $78,125,934 (19) | 2% (65) | $319,126,539 (24) | 7% (64) |
| Ashland | $74,074,340 (24) | 5% (36) | $184,902,491 (48) | 10% (38) |
| Ashtabula | $46,313,267 (52) | 3% (56) | $170,069,071 (50) | 8% (59) |
| Athens | $10,832,931 (82) | 2% (63) | $84,474,544 (69) | 6% (74) |
| Auglaize | $71,793,513 (25) | 4% (39) | $265,307,529 (34) | 10% (33) |
| Belmont | $48,773,321 (50) | 3% (58) | $145,203,550 (55) | 8% (54) |
| Brown | $32,761,777 (68) | 7% (20) | $61,715,467 (76) | 11% (28) |
| Butler | $49,768,789 (48) | 1% (81) | $1,323,431,575 (4) | 6% (73) |
| Carroll | $27,087,761 (71) | 6% (22) | $52,115,212 (78) | 10% (37) |
| Champaign | $41,533,589 (62) | 5% (28) | $106,563,182 (65) | 11% (30) |
| Clark | $49,500,983 (49) | 2% (69) | $287,447,821 (29) | 7% (62) |
| Clermont | $38,145,667 (65) | 2% (70) | $290,746,554 (27) | 6% (75) |
| Clinton | $53,920,762 (42) | 4% (42) | $132,673,146 (57) | 8% (51) |
| Columbiana | $56,804,685 (35) | 3% (54) | $264,737,172 (35) | 9% (41) |
| Coshocton | $60,830,386 (31) | 7% (17) | $187,589,390 (47) | 15% (7) |
| Crawford | $56,705,986 (37) | 4% (40) | $94,785,325 (67) | 8% (57) |
| Cuyahoga | $97,944,901 (9) | >1% (86) | $2,870,230,295 (3) | 4% (88) |
| Darke | $239,806,461 (4) | 8% (12) | $301,799,993 (25) | 12% (23) |
| Defiance | $74,738,470 (21) | 5% (33) | $132,202,917 (58) | 9% (43) |
| Delaware | $71,115,273 (26) | 1% (78) | $414,656,942 (15) | 5% (81) |
| Erie | $40,597,271 (64) | 2% (62) | $168,143,020 (51) | 6% (68) |
| Fairfield | $57,092,509 (34) | 2% (64) | $286,483,386 (30) | 7% (66) |
| Fayette | $41,430,653 (63) | 4% (44) | $203,165,951 (45) | 13% (19) |
| Franklin | $163,203,968 (5) | > 1% (87) | $4,233,913,386 (1) | 4% (86) |
| Fulton | $74,574,695 (22) | 5% (34) | $195,829,037 (46) | 10% (32) |
| Gallia | $15,592,444 (77) | 6% (27) | $37,233,957 (81) | 8% (49) |
| Geauga | $56,208,056 (38) | 3% (61) | $237,554,367 (40) | 7% (63) |
| Greene | $43,688,591 (56) | 1% (77) | $215,452,629 (43) | 4% (83) |
| Guernsey | $20,965,101 (75) | 6% (26) | $74,530,511 (72) | 10% (35) |
| Hamilton | $111,589,093 (8) | >1% (88) | $3,094,701,906 (2) | 4% (85) |
| Hancock | $56,118,896 (39) | 2% (67) | $385,962,349 (18) | 9% (46) |
| Hardin | $82,800,471 (14) | 8% (13) | $138,666,355 (56) | 15% (11) |
| Harrison | $10,621,659 (83) | 7% (18) | $28,975,047 (84) | 13% (16) |
| Henry | $54,239,652 (41) | 6% (24) | $334,766,774 (21) | 18% (3) |
| Highland | $45,616,926 (55) | 9% (9) | $76,818,531 (71) | 13% (18) |
| Hocking | $6,799,259 (87) | 5% (32) | $47,538,393 (79) | 12% (22) |
| Holmes | $132,411,907 (7) | 7% (16) | $385,876,069 (19) | 22% (2) |
| Huron | $89,862,265 (11) | 5% (37) | $324,490,460 (22) | 11% (26) |
| Jackson | $22,937,105 (74) | 4% (47) | $239,977,669 (39) | 25% (1) |
| Jefferson | $9,879,886 (84) | 2% (71) | $79,391,785 (70) | 6% (69) |
| Knox | $50,521,887 (47) | 5% (30) | $122,081,622 (62) | 10% (34) |
| Lake | $82,942,001 (13) | 1% (80) | $630,592,252 (10) | 6% (76) |
| Lawrence | $6,325,381 (88) | 4% (41) | $40,616,956 (80) | 8% (55) |

| | Agriculture Production Value Added | Ag Production % of Employment | Total Cluster Value Added | Total % of Employment |
|---|---|---|---|---|
| Licking | $80,959,369 (17) | 3% (57) | $290,176,991 (28) | 7% (61) |
| Logan | $47,525,570 (51) | 4% (45) | $129,164,871 (61) | 8% (58) |
| Lorain | $75,209,443 (20) | 1% (73) | $376,334,667 (20) | 5% (78) |
| Lucas | $65,557,760 (29) | >1% (84) | $745,401,227 (9) | 4% (87) |
| Madison | $69,435,722 (27) | 4% (38) | $113,507,126 (64) | 8% (53) |
| Mahoning | $43,627,477 (57) | 1% (82) | $413,002,404 (16) | 5% (80) |
| Marion | $82,089,222 (16) | 3% (50) | $261,902,767 (36) | 10% (36) |
| Medina | $67,362,783 (28) | 2% (72) | $492,849,630 (13) | 6% (67) |
| Meigs | $12,179,096 (81) | 9% (6) | $22,478,977 (87) | 13% (17) |
| Mercer | $287,020,607 (2) | 7% (15) | $486,428,489 (14) | 16% (5) |
| Miami | $41,628,715 (61) | 3% (59) | $320,490,163 (23) | 9% (44) |
| Monroe | $13,856,148 (79) | 12% (2) | $21,979,543 (88) | 15% (12) |
| Montgomery | $53,434,618 (43) | >1% (83) | $965,102,826 (8) | 4% (84) |
| Morgan | $13,011,573 (80) | 9% (8) | $23,902,013 (86) | 14% (14) |
| Morrow | $42,743,432 (59) | 9% (7) | $70,494,294 (73) | 12% (20) |
| Muskingum | $30,721,596 (70) | 3% (55) | $272,726,649 (33) | 8% (47) |
| Noble | $8,823,935 (85) | 10% (4) | $29,242,985 (83) | 16% (6) |
| Ottawa | $42,511,100 (60) | 4% (43) | $89,869,973 (68) | 8% (56) |
| Paulding | $54,709,543 (40) | 12% (1) | $66,561,674 (75) | 15% (9) |
| Perry | $14,860,292 (78) | 8% (14) | $30,646,479 (82) | 12% (24) |
| Pickaway | $58,449,378 (33) | 5% (29) | $104,937,335 (66) | 9% (42) |
| Pike | $20,526,229 (76) | 4% (48) | $69,036,918 (74) | 11% (25) |
| Portage | $33,902,467 (66) | 1% (75) | $282,939,009 (31) | 5% (79) |
| Preble | $52,009,567 (46) | 9% (10) | $171,486,943 (49) | 15% (10) |
| Putnam | $145,093,953 (6) | 10% (3) | $299,022,297 (26) | 13% (15) |
| Richland | $60,865,434 (30) | 2% (66) | $241,549,299 (38) | 6% (72) |
| Ross | $33,267,855 (67) | 3% (52) | $281,600,791 (32) | 10% (39) |
| Sandusky | $74,346,534 (23) | 3% (53) | $212,843,255 (44) | 8% (48) |
| Scioto | $24,304,785 (73) | 3% (51) | $117,445,217 (63) | 7% (60) |
| Seneca | $56,748,780 (36) | 6% (25) | $153,350,740 (52) | 10% (31) |
| Shelby | $80,446,033 (18) | 3% (49) | $226,462,435 (42) | 9% (45) |
| Stark | $82,669,192 (15) | 1% (79) | $1,225,863,198 (5) | 7% (65) |
| Summit | $53,052,421 (44) | >1% (85) | $1,086,245,523 (6) | 4% (82) |
| Trumbull | $46,191,278 (54) | 1% (74) | $256,092,067 (37) | 6% (77) |
| Tuscarawas | $52,437,891 (45) | 3% (60) | $227,995,907 (41) | 8% (52) |
| Union | $459,647,601 (1) | 7% (21) | $549,639,730 (12) | 9% (40) |
| Van Wert | $89,276,531 (12) | 7% (19) | $131,848,326 (60) | 11% (27) |
| Vinton | $8,559,330 (86) | 8% (11) | $27,107,972 (85) | 17% (4) |
| Warren | $46,224,334 (53) | 1% (76) | $552,430,711 (11) | 6% (70) |
| Washington | $30,966,222 (69) | 4% (46) | $132,119,584 (59) | 8% (50) |
| Wayne | $283,008,467 (3) | 5% (31) | $1,002,275,825 (7) | 15% (8) |
| Williams | $43,262,519 (58) | 5% (35) | $145,407,816 (54) | 11% (29) |
| Wood | $97,920,671 (10) | 2% (68) | $387,193,635 (17) | 6% (71) |
| Wyandot | $60,516,234 (32) | 6% (23) | $149,052,657 (53) | 12% (21) |