

**Economic Impact Analysis
of
The Crop and Livestock Industries in Lake County, Ohio
for the
Lake County Soil and Water Conservation District
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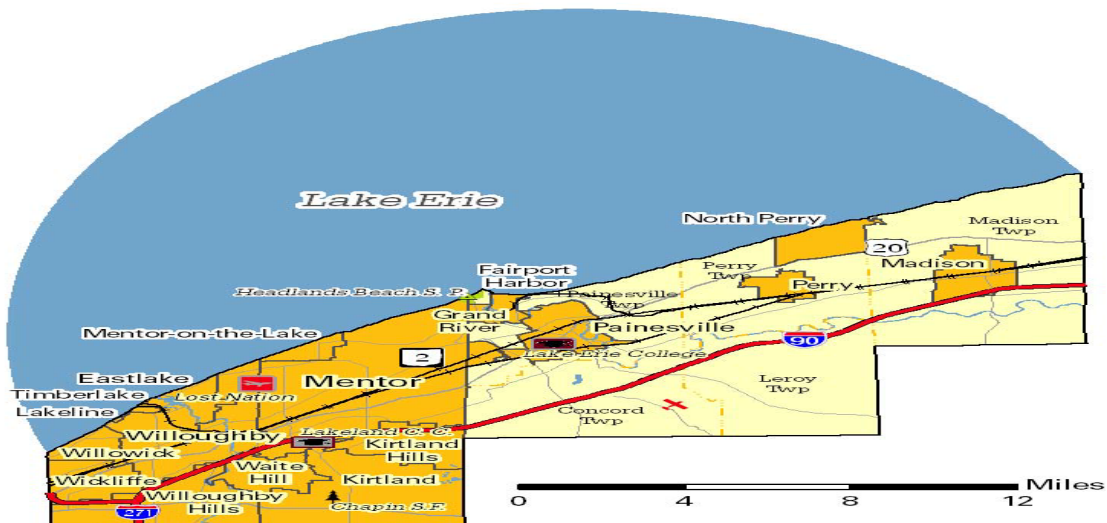
Ohio State University Extension Community Development



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Introduction

Lake County, situated in the northeast portion of the State of Ohio, and bounded by Lake Erie to the north had a population of 230,000 according to the 2010 census data. The County contains traditional rural and suburban areas with future residential development viewed as potential constraint to future agricultural use. In fact, there are over 15,000 acres of farmland with 240 farms with the average farm size being 63 acres. The census data also indicate that the total cash receipt was \$49,750,000 with each farm receiving \$207,293.



In 2012 OSU Extension was asked to review data from an agricultural impact survey developed by the Lake County Soil and Water Conservation District office (LCSWCD). The survey focused on traditional crop and livestock and was an effort to provide an accurate picture of the nature, characteristics and economic impacts of said industries. Prior reports were developed that described the economic impact of the nursery and wine industry in Lake County.

While the intent was to interpret data from the agricultural survey, OSU Extension determined that an appropriate sample size was not obtained and therefore the economic impact of the crop and livestock industries could not be adequately measured with survey data alone. In fact, over 60 surveys were sent and only 20 were received (33%) and of the 20 returned, 4 respondents indicated that they no longer farmed. As a result, existing economic data compiled by IMPLAN were used to inform the modeling used to estimate the impacts of the crop and livestock industries described in this report.

IMPLAN Impact Model

This study estimates the impact of the Lake County crop and livestock industries in Ohio using IMPLAN, an economic input-output (I-O) model to measure overall economic impact. The model captures indirect and induced impacts that occur from direct investment using 2010 IMPLAN data (the most recent available). The analysis is based on the premise that sectors are linked; a change in one sector will create change in others. This study analyzes the two separate activities listed below that account for total economic impact in Ohio.

Summary Analysis

1. Ongoing operation of the Lake County Crop Industry sales and employment using an indicator of 65 annual average full time equivalent (FTE) jobs and annual payroll of \$4.1 million.
2. Ongoing operation of the Lake County Livestock Industry using an employment indicator of 35 annual average full time equivalent (FTE) jobs and annual payroll of \$1 million per year.

In Tables 1 and 2 below, impacts for both industries are disaggregated to show total output, employment, labor income and total value added impact for Ohio and Lake County. As an example, the difference between the total value added impact for the Lake County Crop Industry in Ohio and in Lake County is \$878,947 (\$4,896,822-\$4,017,875), or the added economic impact throughout the state as a result of crop production in Lake County.

Table 1. Estimated Economic Contribution of the Crop and Animal Livestock Industry in Ohio

Activity	Total Output	Employment	Labor Income	Total Value Added
Crop Industry	\$8,680,242	65	\$4,118,441	\$4,896,822
Animal Livestock	\$5,942,421	35	\$1,023,194	\$2,089,815
Total	\$14,622,663	100	\$5,141,635	\$6,986,637

Table 2. Economic Contribution of the Crop and Animal Livestock Industry in Lake County

Activity	Total Output	Employment	Labor Income	Total Value Added
Crop Industry	\$7,328,698	63	\$3,636,892	\$4,017,875
Animal Livestock	\$4,013,569	35	\$700,625	\$1,386,991
Total	\$11,342,267	98	\$4,337,517	\$5,404,866

Using input/output modeling, we can estimate the extent to which the Lake County crop and livestock industries contribute to other employment (measured in FTEs), output, income (measured in dollars) and total value added.

Impact terms for purposes of this study are defined below:

- The direct effect is felt when dollars are spent for the operation of Crop and Livestock industries in Lake County, Ohio.

- The indirect effect occurs as Ohio businesses provide goods and services used by the Crop and Livestock industries in Lake County, and when these businesses, in turn, make additional purchases from Ohio businesses.
- The induced effect occurs as workers in the directly and indirectly affected industries receive income that they then use to purchase consumer goods and services from other businesses in Ohio.
- The total effect to operate the Crop and Livestock industries in Lake County is the sum of the direct, indirect, and induced effects.

II. Economic Impact – Crop Industry

Economic Value Added

The total economic value added attributable to Lake County crop production realized within the Ohio economy is estimated to be almost \$4.9 million. The most significant impact is felt in the Fruit Farming sector at approximately \$1.3 million. The top 20 sectors (they are accountable for approximately 84% of the impact of the crop industry) are listed in Table 3 below:

Table 3: Crop Production Economic Value-Added

Sector	Description	Total
4	Fruit farming	\$1,311,887
3	Vegetable and melon farming	\$575,572
361	Imputed rental activity for owner-occupied dwellings	\$324,579
360	Real estate establishments	\$263,429
10	All other crop farming	\$187,066
319	Wholesale trade businesses	\$166,760
354	Monetary authorities and depository credit intermediation activities	\$144,321
1	Oilseed farming	\$117,052
19	Support activities for agriculture and forestry	\$114,484
394	Offices of physicians, dentists, and other health practitioners	\$110,739
31	Electric power generation, transmission, and distribution	\$95,332
397	Private hospitals	\$85,844
413	Food services and drinking places	\$85,805
357	Insurance carriers	\$77,374
355	Nondepository credit intermediation and related activities	\$69,326
2	Grain farming	\$44,987
351	Telecommunications	\$42,657
367	Legal services	\$39,033

329	Retail Stores - General merchandise	\$38,431
335	Transport by truck	<u>\$37,864</u>
	Total	\$4,896,822

Crop Production Employment

The total employment attributable to Lake County Crop Production realized within the Ohio economy is estimated to be 65 full-time jobs. The most significant impact is felt in the Fruit Farming sector at almost 13 jobs. The top 20 sectors (they are accountable for approximately 78% of the impact of the crop industry) are listed in Table 4 below:

Table 4: Crop Production Employment

Sector	Description	Total
4	Fruit farming	12.7
19	Support activities for agriculture and forestry	4.8
3	Vegetable and melon farming	4.8
2	Grain farming	3.3
413	Food services and drinking places	3.3
1	Oilseed farming	2.8
360	Real estate establishments	2.6
10	All other crop farming	2.4
394	Offices of physicians, dentists, and other health practitioners	1.4
319	Wholesale trade businesses	1.3
397	Private hospitals	1.3
329	Retail Stores - General merchandise	1.0
398	Nursing and residential care facilities	1.0
324	Retail Stores - Food and beverage	1.0
355	Nondepository credit intermediation and related activities	1.0
354	Monetary authorities and depository credit intermediation activities	0.9
425	Civic, social, professional, and similar organizations	0.7
382	Employment services	0.7
356	Securities, commodity contracts, investments, and related activities	0.7
388	Services to buildings and dwellings	0.7
320	Retail Stores - Motor vehicle and parts	0.6
335	Transport by truck	0.6
400	Individual and family services	0.5
331	Retail Nonstores - Direct and electronic sales	0.5
330	Retail Stores - Miscellaneous	<u>0.5</u>
	Total	65.2

Crop Production Labor Income

The total estimated labor income is defined as all forms of employment income, including employee compensation (wages and benefits) and proprietor income. The labor income attributable to Lake County's Crop Industry realized within the Ohio economy is estimated to be over \$4.1 million. The most significant impact is felt in Fruit Farming at approximately \$1.6 million. The top 20 sectors (they are accountable for approximately 86% of the impact of the Crop Industry) are listed in Table 5 below:

Table 5: Crop Production Labor Income

Sector	Description	Total
4	Fruit farming	\$1,645,211
3	Vegetable and melon farming	\$697,237
10	All other crop farming	\$200,025
19	Support activities for agriculture and forestry	\$116,955
394	Offices of physicians, dentists, and other health practitioners	\$107,240
319	Wholesale trade businesses	\$93,917
397	Private hospitals	\$78,615
355	Nondepository credit intermediation and related activities	\$62,347
1	Oilseed farming	\$57,861
413	Food services and drinking places	\$55,086
354	Monetary authorities and depository credit intermediation activities	\$49,736
360	Real estate establishments	\$36,217
2	Grain farming	\$34,119
335	Transport by truck	\$31,435
398	Nursing and residential care facilities	\$31,339
320	Retail Stores - Motor vehicle and parts	\$27,404
432	Other state and local government enterprises	\$27,355
357	Insurance carriers	\$27,170
324	Retail Stores - Food and beverage	\$25,612
367	Legal services	<u>\$25,523</u>
	Total	\$4,118,440

III. Economic Impact – Livestock Industry

Economic Value Added

The total economic value added attributable to the Lake County Livestock Industry realized within the Ohio economy is estimated to be almost \$2.1 million. The most significant impact is felt in the poultry and egg production sector at \$346,000. The top 20 sectors (they are accountable for approximately 85% of the impact of the Livestock Industry) are listed in Table 6 below:

Table 6: Livestock Operations Economic Value Added

Sector	Description	Total
13	Poultry and egg production	\$346,229
12	Dairy cattle and milk production	\$305,150
14	Animal production, except cattle and poultry and eggs	\$223,559
319	Wholesale trade businesses	\$145,273
42	Other animal food manufacturing	\$109,891
360	Real estate establishments	\$95,679
361	Imputed rental activity for owner-occupied dwellings	\$76,721
11	Cattle ranching and farming	\$68,604
335	Transport by truck	\$55,856
31	Electric power generation, transmission, and distribution	\$50,723
354	Monetary authorities and depository credit intermediation activities	\$45,651
394	Offices of physicians, dentists, and other health practitioners	\$27,701
413	Food services and drinking places	\$23,758
355	Nondepository credit intermediation and related activities	\$23,409
357	Insurance carriers	\$23,282
333	Transport by rail	\$22,570
397	Private hospitals	\$21,602
381	Management of companies and enterprises	\$18,624
19	Support activities for agriculture and forestry	\$17,698
367	Legal services	<u>\$16,110</u>
	Total	\$2,089,815

Livestock Employment

The total employment attributable to the Lake County Livestock industry realized within the Ohio economy is estimated to be 35 full-time jobs. The most significant impact is felt in the animal production (hogs, sheep, rabbit, goats, llamas, dogs and cats raising and selling), with the exception of cattle, poultry, and eggs sector at 9 jobs. The top 20 sectors (they are accountable for approximately 86% of the impact of the Livestock industry) are listed in Table 7 below:

Table 7: Livestock Industry Employment

Sector	Description	Total
14	Animal production, except cattle, poultry and eggs	9.4
12	Dairy cattle and milk production	4.9
13	Poultry and egg production	2.9
11	Cattle ranching and farming	2.7
319	Wholesale trade businesses	1.1
2	Grain farming	1.0
360	Real estate establishments	0.9
413	Food services and drinking places	0.9

335	Transport by truck	0.8
19	Support activities for agriculture and forestry	0.7
42	Other animal food manufacturing	0.7
394	Offices of physicians, dentists, and other health practitioners	0.3
355	Nondepository credit intermediation and related activities	0.3
397	Private hospitals	0.3
382	Employment services	0.3
354	Monetary authorities and depository credit intermediation activities	0.3
39	Maintenance and repair construction of nonresidential structures	0.3
398	Nursing and residential care facilities	0.2
329	Retail Stores - General merchandise	0.2
1	Oilseed farming	<u>0.2</u>
	Total	35.0

Livestock Industry Labor income

The total estimated labor income is defined as all forms of employment income, including employee compensation (wages and benefits) and proprietor income. The labor income attributable to Lake County's Livestock Industry realized within the Ohio economy is estimated to be over \$1 million. The most significant impact is felt in poultry and egg production at \$240,153. The top 20 sectors (they are accountable for approximately 79% of the impact of the Livestock Industry) are listed in Table 8 below:

Table 8: Livestock Industry Labor Income Employment

Sector	Description	Total
13	Poultry and egg production	\$240,153
319	Wholesale trade businesses	\$81,816
14	Animal production, except cattle and poultry and eggs	\$77,724
12	Dairy cattle and milk production	\$46,390
335	Transport by truck	\$46,373
42	Other animal food manufacturing	\$41,824
11	Cattle ranching and farming	\$27,659
394	Offices of physicians, dentists, and other health practitioners	\$26,826
355	Nondepository credit intermediation and related activities	\$21,052
397	Private hospitals	\$19,783
19	Support activities for agriculture and forestry	\$18,080
381	Management of companies and enterprises	\$16,232
354	Monetary authorities and depository credit intermediation activities	\$15,732
413	Food services and drinking places	\$15,252
333	Transport by rail	\$13,336
360	Real estate establishments	\$13,154
31	Electric power generation, transmission, and distribution	\$12,950
39	Maintenance and repair construction of nonresidential structures	\$12,078

367	Legal services	\$10,534
368	Accounting, tax preparation, bookkeeping, and payroll services	<u>\$10,517</u>
	Total	\$1,023,194

IV. Top Ten Sectors Impacted

Results from this analysis also produced the top ten sectors impacted by the Lake County crop and livestock industries on the Ohio economy. Below are tables for the total output, income and employment listed by sector. The results reveal more detail on the complex interactions between the agricultural industry in Lake County and the overall economy in Ohio.

As demonstrated in the “Top Ten” Tables 9 and 10 below, poultry and egg production, animal production, fruit and vegetable farming businesses consistently land in the top one or two sectors benefiting most from the direct investment and operation of crop and livestock businesses. In addition, wholesale trade businesses, transport by truck and food services are also among the top ten sectors which benefit most directly.

The total annual economic output attributable to the crop and livestock realized within the Ohio economy is over \$14.6 million, with \$10.3 million (or 71%) distributed among the top ten sectors in Ohio as listed in Tables 9 and 10. Economic output is equal to the value of production (sales) within the crop and livestock industries in Lake County and is a measure of the total amount of money that changes hands within the Ohio economy as a result.

Local income for the top ten sectors is the sum of the wages, salaries, and income earned by the owners of the crop and livestock businesses. The annual estimated local income for both the crop and livestock industries for all sectors within Ohio is over \$5.1 million, with \$3.7, or about 73 percent distributed among the top ten sectors of the regional economy as demonstrated in Table 8. Income generated by the crop and livestock industries in Lake County is circulated through the local and regional economy.

Table 11 lists the top ten sectors most impacted by employment in the crop and livestock industries within Ohio. The total jobs impacted, including direct, indirect and induced, are 101 jobs in both sectors. For every one job in the crop and livestock industries, .9 jobs are supported in similar agricultural-related or support industries. In the top ten sectors impacted, there were about 65 jobs created, representing 64% of the total jobs supported by the Crop and Livestock industries in Lake County.

Table 9 Top Ten Sectors for Output

NAICS	Crop Production	
4	Fruit farming	\$2,226,740
3	Vegetable and melon farming	\$1,011,058
10	All other crop farming	\$542,897
361	Imputed rental activity for owner-occupied dwellings	\$368,417
	Monetary authorities and depository credit intermediation	
354	activities	\$326,478
360	Real estate establishments	\$303,617
1	Oilseed farming	\$251,931
319	Wholesale trade businesses	\$199,251
2	Grain farming	\$190,643
394	Offices of physicians, dentists, and other health practitioners	<u>\$174,078</u>
	Total	\$5,595,109
NAICS	Livestock	
13	Poultry and egg production	\$1,748,700
12	Dairy cattle and milk production	\$783,656
42	Other animal food manufacturing	\$780,210
14	Animal production, except cattle and poultry and eggs	\$428,069
11	Cattle ranching and farming	\$387,848
319	Wholesale trade businesses	\$173,577
360	Real estate establishments	\$110,276
335	Transport by truck	\$103,705
	Monetary authorities and depository credit intermediation	
354	activities	\$103,270
361	Imputed rental activity for owner-occupied dwellings	<u>\$87,083</u>
	Total	\$4,706,393

Table 10 Top Ten Sectors for Labor Income

NAICS	Crop Production	
4	Fruit farming	\$1,645,211
3	Vegetable and melon farming	\$697,237
10	All other crop farming	\$200,025
19	Support activities for agriculture and forestry	\$116,956
394	Offices of physicians, dentists and other health practitioners	\$107,241
319	Wholesale trade businesses	\$93,918
397	Private hospitals	\$78,616
355	Nondepository credit intermediation and related activities	\$62,347
1	Oilseed farming	\$57,862
413	Food services and drinking places	<u>\$55,087</u>
	Total	\$3,114,499
NAICS	Livestock	
13	Poultry and egg production	\$240,153
319	Wholesale trade businesses	\$81,816

14	Animal production, except cattle and poultry and eggs	\$77,725
12	Dairy cattle and milk production	\$46,391
335	Transport by truck	\$46,373
42	Other animal food production	\$41,824
11	Cattle ranching and farming	\$27,659
394	Offices of physicians, dentists, and other health practitioners	\$26,827
355	Nondepository credit intermediation and related activities	\$21,052
397	Private hospitals	<u>\$19,783</u>
	Total	\$629,603

Table 11 Top Ten Sectors for Employment
NAICS Crop Production

4	Fruit farming	12.7
19	Support activities for agriculture and forestry	4.8
3	Vegetable and melon farming	4.8
2	Grain farming	3.3
413	Food services and drinking places	3.3
1	Oilseed farming	2.8
360	Real estate establishments	2.6
10	All other crop farming	2.4
394	Offices of physicians, dentists, and other health practitioners	1.4
319	Wholesale trade	<u>1.3</u>
	Total	39.4

NAICS Livestock		
14	Animal production, except cattle and poultry and eggs	9.4
12	Dairy cattle and milk production	4.9
13	Poultry and egg production	2.9
11	Cattle ranching and farming	2.7
319	Wholesale trade businesses	1.1
2	Grain farming	1.0
360	Real estate establishments	0.9
413	Food services and drinking places	0.9
335	Transport by truck	0.8
19	Support activities for agriculture and forestry	<u>0.7</u>
	Total	25.3

IV. Conclusion

The agricultural industry, specifically crop and livestock operations in Lake County, contributes jobs, income, and economic output to the Lake County and Ohio economies. The greatest contributions are to the various sectors that comprise the agricultural economy in addition to support businesses such as real estate, food services and wholesale businesses. The agricultural

industry in Lake County is an important component to the overall local, regional and state economy.

Table 12. Summary of Impact

Activity	Lake County	State of Ohio
Crop Industry		
Jobs	63.2	65.2
Output or Sales	\$7,328,698	\$8,680,242
Value Added	\$4,017,874	\$4,896,822
Livestock Industry		
Jobs	35.9	35
Output or Sales	\$4,013,569	\$5,942,422
Value Added	\$1,386,991	\$1,023,194

Appendix

Glossary of terms below adapted from the IMPLAN Glossary at
http://implan.com/v3/index.php?option=com_glossary&Itemid=164

Full Time Equivalent Employment (FTE)

Full-time equivalent employment is the number of full-time equivalent jobs, as determined by total hours worked divided by average annual hours worked in fulltime jobs.

Labor Income

Labor Income IMPLAN is the total payroll cost of the employee paid by the employer in addition to proprietor (owner) income. This includes, wage and salary, all benefits (e.g., health, retirement, etc) and employer- paid payroll taxes (e.g., employer side of social security, unemployment taxes, etc).

Output

Output represents the value of industry production. In IMPLAN these are annual production estimates for the year of the data set and are in producer prices.

Manufacturing	output = sales +/- change in inventory
Service Sector	output = sales
Retail and wholesale trade	output = gross margin (not gross sales)

Total Value-added

Total value added is the contribution of each private industry and of government to the nation's output, or GDP. It represents total output of an industry or establishment (which consists of sales or receipts and other operating income, commodity taxes, and inventory change) less the cost of its intermediate inputs (which consist of energy, raw materials, semi-finished goods, and services that are purchased from domestic industries or from foreign sources).