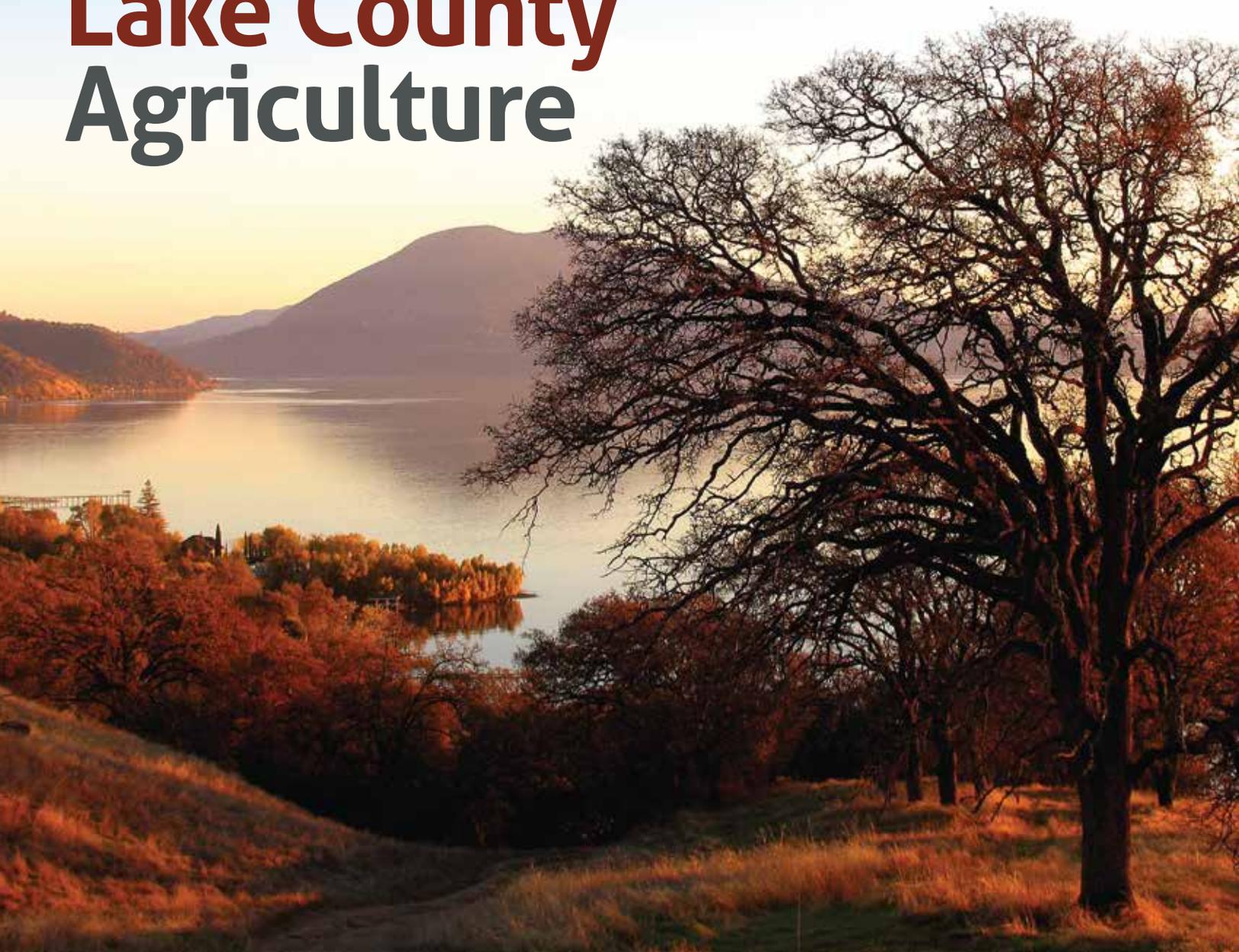




# Economic Contributions of **Lake County** Agriculture





**The Honorable  
Board of Supervisors  
of Lake County**



**Moke Simon**  
*District 1*

**Bruno Sabatier**  
*District 2*

**Eddie "EJ" Crandell**  
*District 3*

**Tina Scott**  
*District 4*

**Rob Brown**  
*District 5*

883 Lakeport Blvd.

Lakeport, CA. 95453

Phone: 707.263.0217

FAX: 707.263.1052

Steven.Hajik@lakecountyca.gov

## Commissioner's Letter

I am pleased to share the **Economic Contributions of Lake County Agriculture**. This report takes an important step beyond the reporting of crop production and values, which our department publishes in the annual Lake County Agricultural Report. This report quantifies agriculture's total economic contribution through food production, local food processing, employment, and economic multiplier effects. In short, the report documents agriculture's broader role in sustaining a thriving local economy.

Section 2279 of the California Food and Agriculture Code requires all county agricultural commissioners to report the annual "value" of agriculture. This typically occurs via our yearly Lake County Agricultural Report. Using 21st century economic tools, we can now fulfill this mandate better than ever. We can also explore additional topics that clarify agriculture's role in sustaining a healthy local economy.

For 2017, agriculture contributed a total of \$339.2 million to the county economy. This far exceeds the \$120.8 million figure from our 2017 Lake County Agricultural Report. Agriculture also supported 2,061 direct employees, or nearly one out of every 12 jobs the county (8.5%). Adding multiplier effects brought total employment to 2,202.

Agriculture has a long tradition in Lake County. For more than a century, it has been a pillar of our economy and culture. With this report, we renew our commitment to sustaining that tradition well into the future.

Respectfully submitted,

Steven Hajik  
Agricultural Commissioner/  
Sealer of Weights & Measures

# Table of Contents

<b>Agricultural Commissioner’s Letter .....</b>	<b>Inside Cover</b>
<b>Lake County Agriculture by the Numbers.....</b>	<b>2</b>
<b>Introduction.....</b>	<b>2</b>
<b>Our Approach.....</b>	<b>3</b>
<b>Direct Effects of Lake County Farm Production .....</b>	<b>3</b>
<i>Figure 1. Distribution of Lake County Farm Production</i>	
<b>Multiplier Effects of Lake County Farm Production .....</b>	<b>4</b>
<i>Figure 2. Economic Effects of Farm Production</i>	
<b>Locally Sourced, Value-Added Food Processing .....</b>	<b>6</b>
<i>Figure 3. Economic Effects of Locally Sourced, Value-Added Food Processing</i>	
<b>Total Economic Contributions of Lake County Agriculture .....</b>	<b>8</b>
<i>Figure 4. Overall Economic Effects of Lake County Agriculture</i>	
<b>Toward the Future .....</b>	<b>9</b>
<b>Additional Questions .....</b>	<b>9</b>
<b>Acknowledgments .....</b>	<b>9</b>



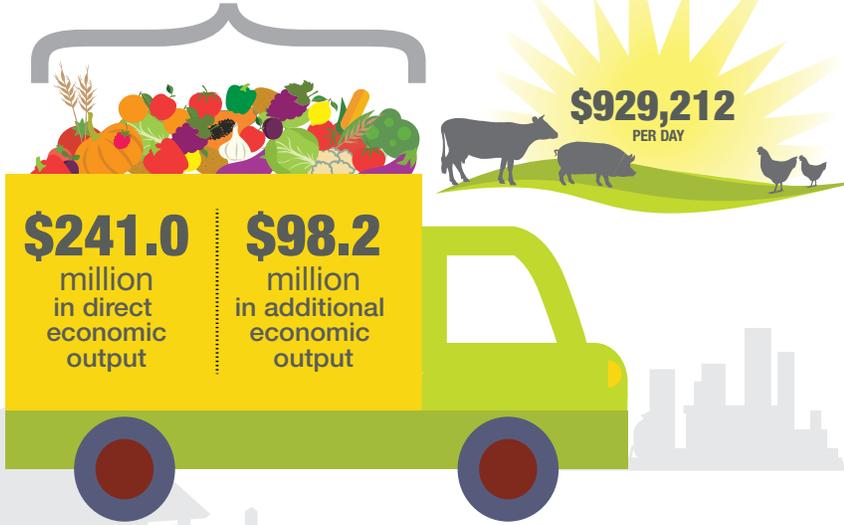
# Lake County Agriculture **BY THE NUMBERS**

For 2017, Lake County Agriculture:

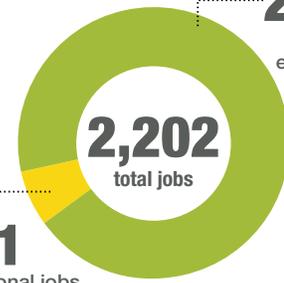
## Economic Contributions

**\$339.2 million**

contributed to the local economy



## Employment Effects



**141**

additional jobs attributable to multiplier effects: expenditures by agricultural companies and their employees

**ONE in TWELVE (8.5%)**

jobs in Lake County directly attributable to the agricultural industry



## Introduction

Residents and visitors alike know and value the contributions agriculture makes to Lake County. Wine grapes, pears, and many other crops grow in fertile soils. Walnut trees and livestock dot the countryside while Lakeport's seasonal farmers' market bustles with local products and pride.

Clearly, agriculture plays a vital role in sustaining a healthy local economy. What's not so clear, however, is the true size of that role. How much money does agriculture pump into the local economy? How many jobs does agriculture support? In other words, just how important is agriculture as a driver of Lake County's economic health?

This report sheds light on these and related questions. Using multiple data sources and advanced economic modeling techniques, it analyzes agriculture's total contribution to the Lake County economy. Overall, the findings offer important information for policy makers, the public, and anyone who values a thriving local economy.

## Our Approach

When it comes to economic analysis, it's important to examine the fullest possible range of economic contributions. This report does that by focusing not just on *direct* economic effects such as farm production and employment, but also on *multiplier effects*. *Multiplier effects* are ripples through the economy. These ripples include inter-industry business-to-business supplier purchases as well as consumption spending by employees. The **Multiplier Effects** section on page 4 explains this further.

It's appropriate to calculate *multiplier effects* when analyzing what economists call a *basic industry*. A *basic industry* is one that sells most of its products beyond the local area and thus brings outside money into local communities. Agriculture easily qualifies as a basic industry in Lake County. Therefore, this report includes *multiplier effects* when describing agriculture's total economic contribution.

Our analysis only examines agriculture's economic contributions. To understand agriculture's full economic impact, one would also need to assess agricultural-related costs to society, for example net impacts on water and other natural resources. In addition, the value of property taxes and sales taxes associated with agriculture are also positive impacts on the well-being of the county. While important, these impacts lie beyond the scope of this study.

The calculations draw from local and national data sources. The local sources include industry experts and the 2017 Lake County Agricultural Report produced by the Department of Agriculture. The main national data source is IMPLAN, a widely used economic modeling program (see [www.implan.com](http://www.implan.com)). IMPLAN uses econometric modeling to convert data from more than a dozen federal government sources into local values for every U.S. county and zip code, across 536 industry sectors. Except where otherwise noted, all figures are from the year 2017, the most recent IMPLAN dataset available. Where appropriate, we adjusted IMPLAN sector names for clarity and applied coefficients to reflect Lake County conditions. Please contact the authors for additional details on the methods used.

## Direct Effects of Lake County Farm Production

This section focuses on the simplest measures of economic activity: production and employment. It describes total farm production and the number of agricultural jobs.

### PRODUCTION

**Figure 1** shows the various categories that made up Lake County's farm production value. At \$115.9 million, Fruit & Nut Crops was the single largest production category by dollar value, comprising 96.0% of the county total. Two products dominated this category: wine grapes at \$85.2 million and pears at \$26.9 million.

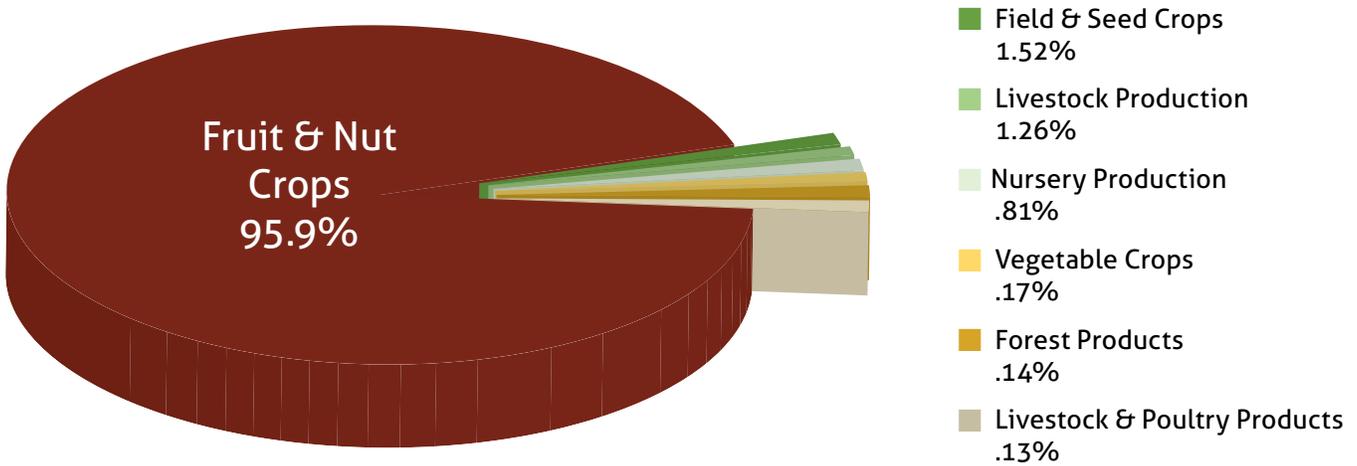
At 1.5%, Field & Seed Crops represented the second largest category (\$1.83 million). Livestock Production followed at \$1.53 million, or 1.3% of the county total.

The combined, total dollar value for all products rose \$59.6 million over the previous decade, from \$61.2 million in 2008 to \$120.8 million in 2017. Inflation totaled 19.5% during this period, averaging just under 2% per year. Thus, agricultural production grew an impressive 77.9% even after adjusting for inflation. Total values do not reflect net profit or loss experienced by individual growers or by the industry overall. Interested readers are encouraged to consult the Department of Agriculture's 2017 Lake County Agricultural Report for additional details on specific products and their value.



**Figure 1. Distribution of Lake County Farm Production**

Source: 2017 Lake County Agricultural Report, Lake County Department of Agriculture/Weights & Measures



## EMPLOYMENT

How many people work in agricultural production? For 2017, agricultural production directly employed 1,812 people in Lake County. The figure encompasses a wide range of production-related jobs, including not just growing and harvesting, but also sales, marketing and many other roles. It does not include food processing jobs such as those at wineries and pear sheds, which we discuss below.

## Multiplier Effects of Lake County Farm Production

This section quantifies the economic ripples that farm production creates in the local economy. These ripples take two forms: *indirect effects* and *induced effects*. The first consists of business-to-business supplier purchases. For example, when a grower buys farm equipment, pesticides, fertilizer, seed, insurance, banking services, and other inputs, the grower creates *indirect effects*.

The second ripple type, *induced effects*, consists of consumption spending by owners and employees of agricultural businesses and their suppliers. They buy groceries, housing, healthcare, leisure activities, and other things for their households. All this spending creates ripples in the economy.

Although agricultural companies and their employees certainly spend money in Napa County, Colusa County, and many other locations outside Lake County, this study only reflects those expenditures that occur within the county. Quantifying expenditures outside the county would be an expensive, complex effort that lies well beyond our scope here.

**Figure 2** shows agriculture's *direct, indirect, and induced* economic effects within the county, for major production categories. The numbers use IMPLAN multipliers for each sector, which are rooted in U.S. Bureau of Economic Analysis data and other sources.



## Figure 2. Economic Effects of Lake County Farm Production

Dollar values are in \$ millions. Figures are for 2017 and come from IMPLAN and U.S. Bureau of Economic Analysis. Not all columns and rows add exactly due to rounding.

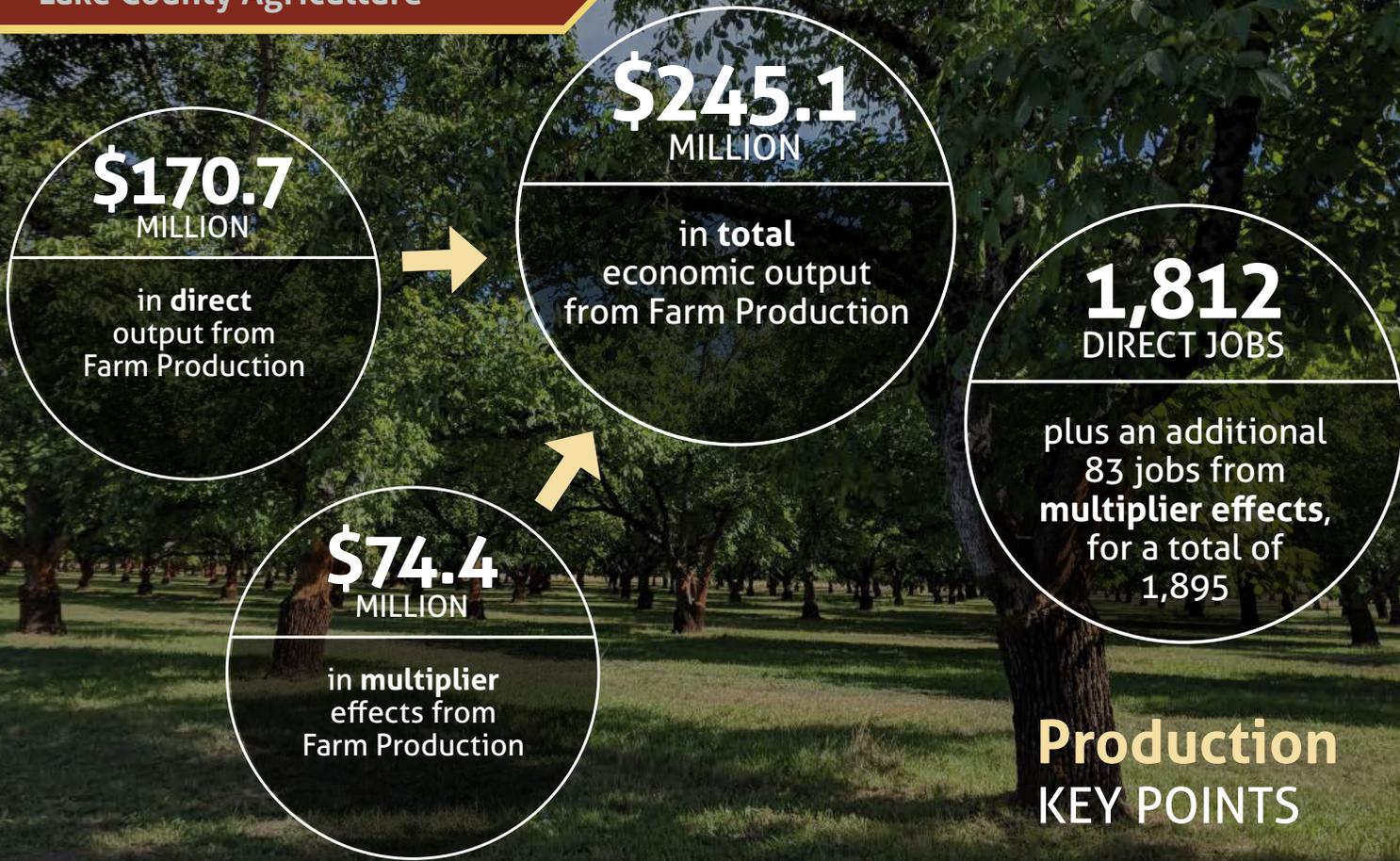
FARM PRODUCTION	Output Effects (\$ Millions)			TOTAL
	Direct	Indirect	Induced	
Fruit Farming	\$112.5	\$27.4	\$23.5	\$163.5
Support Activities for Agriculture	\$50.6	\$0.5	\$19.3	\$70.4
Tree Nut Farming	\$3.7	\$0.9	\$0.7	\$5.2
Livestock Production	\$1.6	\$0.8	\$0.3	\$2.6
Nursery Products	\$1.0	\$0.1	\$0.3	\$1.5
All Other Crop Farming	\$0.9	\$0.2	\$0.2	\$1.3
Vegetable Farming	\$0.2	\$0.0	\$0.0	\$0.3
Commercial Logging	\$0.2	\$0.0	\$0.1	\$0.3
TOTAL ECONOMIC OUTPUT	\$170.7	\$30.0	\$44.4	\$245.1
	Employment Effects (# Jobs)			TOTAL
	Direct	Indirect	Induced	
TOTAL EMPLOYMENT	1,812	52	31	1,895

For example, "Fruit Farming" in Lake County has an indirect effects multiplier of 0.2435 and an induced effects multiplier of 0.2092. This means that for 2017, each dollar's worth of direct output in pears, grapes, and other fruit generated an extra 24 cents in supplier purchases, plus 20 extra cents in consumption spending by agricultural company owners and employees.

Every sector has its own, unique multipliers reflecting where companies and employees spent their money. Each sector also has its own unique multipliers for employment resulting in the combined employment figures shown in **Figure 2**.

Note that category names and production data in **Figure 2** differ from the county's 2017 Lake County Agricultural Report. They follow IMPLAN, which tracks a standard classification system used nationwide called the North American Industrial Classification System (NAICS). Each NAICS category has an explicit definition.

Also, because IMPLAN uses a different methodology than the county's annual agriculture survey, direct production values for various sectors in **Figure 2** differ from those in the 2017 Lake County Agricultural Report. The total value of farm production also differs, largely due to IMPLAN's inclusion of "Support activities for agriculture," a sector that includes soil preparation, planting, cultivating, harvesting, labor contracting, and other farm management services.

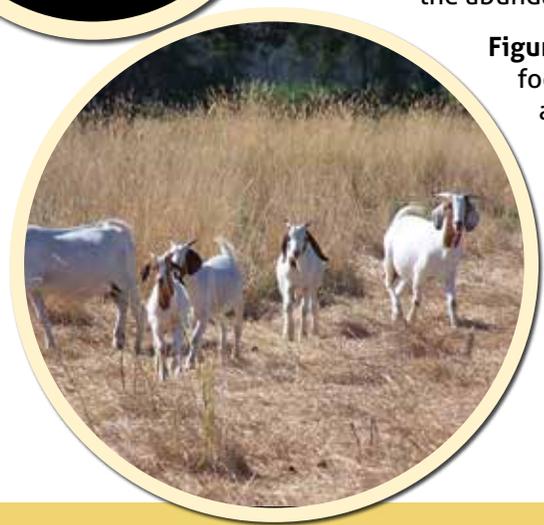


## Locally Sourced, Value-Added Food Processing

Farm production tells only part of the story. Lake County is home to several food processors that play a key role in the local economy. This section explores the economic contributions they make. The discussion is neither an exact science nor a full assessment, but rather gives the reader a basic overview of the topic. A full assessment would require significant additional research that includes collecting detailed financial information from individual companies.

To avoid overstating the numbers, we only include food manufacturers and sectors that fit two strict criteria: 1) they use mostly local agricultural inputs; and 2) they are unlikely to exist here without the presence of the associated agricultural sector. Many processing facilities would not operate in Lake County were it not for the abundant supply of raw agricultural products, especially wine grapes.

**Figure 3** shows the economic effects of locally sourced, value-added food processing. Largest by far, "Wineries" dominate this category at \$64.2 million in direct output. Note that the winery numbers avoid double-counting by including only the dollar values and employment that wineries add to wine grapes by producing wine. The "Fruit Farming" sector in **Figure 2** already included the value of wine grape production.



### Figure 3. Economic Effects of Locally Sourced, Value-Added Food Processing

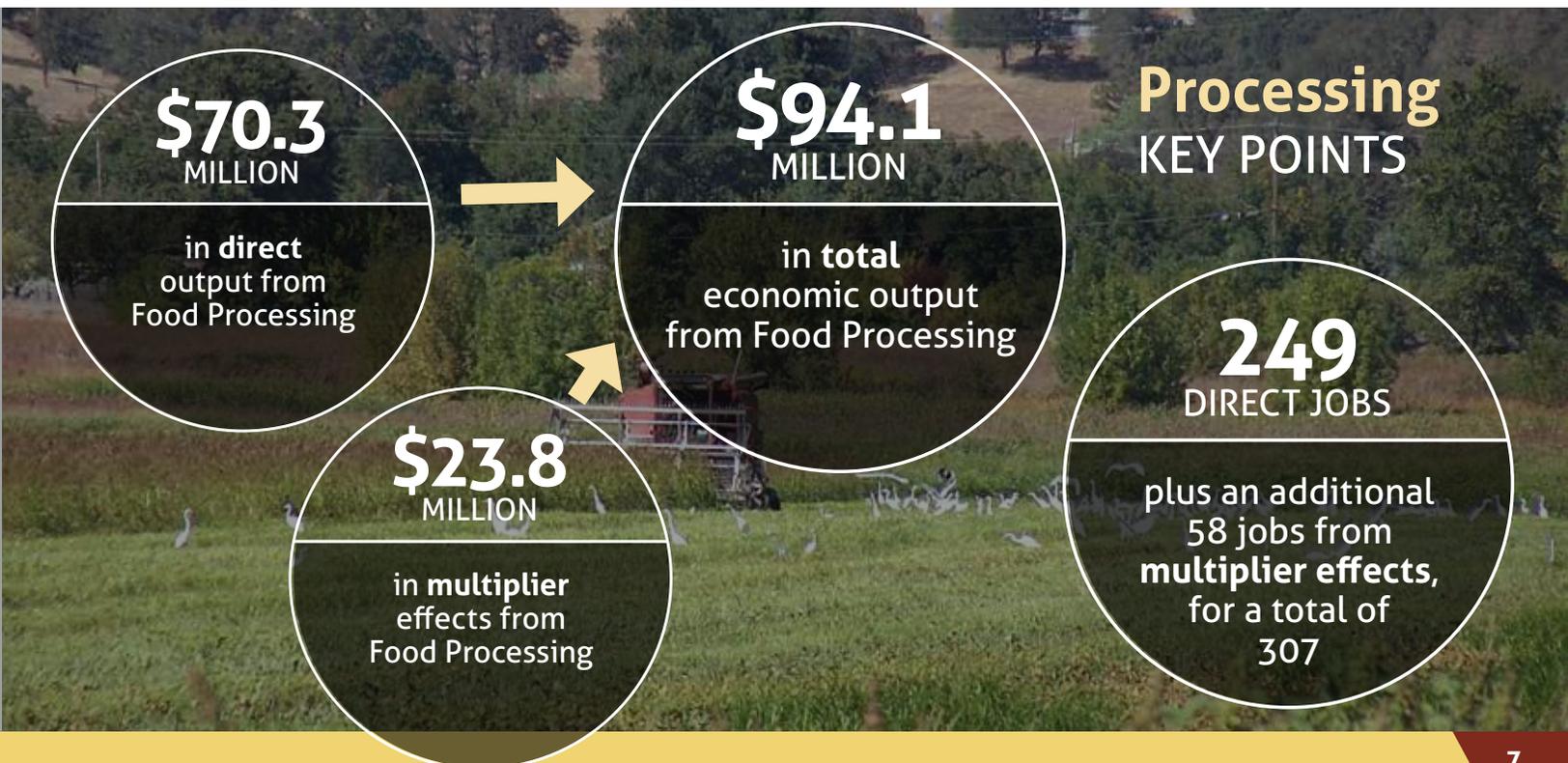
Sources: IMPLAN and U.S. Bureau of Economic Analysis data, with input by local industry experts. Not all columns and rows add exactly due to rounding.

FOOD PROCESSING	Output Effects (\$ Millions)			TOTAL
	Direct	Indirect	Induced	
Wineries	\$64.2	\$16.1	\$5.9	\$86.2
Miscellaneous Processing & Packing	\$6.1	\$0.4	\$1.4	\$7.8
TOTAL ECONOMIC OUTPUT	\$70.3	\$16.5	\$7.3	\$94.1
	Employment Effects (# Jobs)			TOTAL
	Direct	Indirect	Induced	
TOTAL EMPLOYMENT	249	43	15	307

Lake County viticulture and wine making date back to the 1870's and have grown rapidly in recent decades. Several wineries are owned by families that formerly grew pears, walnuts, and other crops before converting to vineyards. The region's reputation continues to grow, as do economic multiplier effects through bottling, wine tastings, weddings, and other activities.

"Miscellaneous Processing & Packing" in **Figure 3** combines multiple activities that add value, especially to pears. Although \$8.4 million of the county's pear crop went to canneries, all of them outside the county, most pears (\$17.7 million) were for the fresh market. An estimated 60% of these fresh market pears went to local facilities (pear sheds) for sorting, grading, cleaning, and packing. Such activity nearly doubled the value of the product, from just over three hundred dollars per ton to more than six hundred dollars per ton.

This catch-all category also captures many niche activities. For example, several families process their olives into bottled olive oil and related products. Others directly sell shelled walnuts. A local hops grower supplies portions of the county's \$2.9 million brewery sector. Other niche products include: 1) goat milk soaps, salves, and cheeses; 2) condiments and other products from pears; 3) award-winning salsas made with local tomatoes; and 4) a wide array of honey, jams, and jellies.



## Total Economic Contributions of Lake County Agriculture

The previous sections have provided key pieces to an economic puzzle. This section combines those puzzle pieces into a final picture showing the overall economic effects of Lake County agriculture.

As **Figure 4** shows, the total 2017 economic contribution of Lake County agriculture was \$339.2 million. This consisted of \$241.0 million in combined, direct output from production and processing, plus \$98.2 million in multiplier effects.

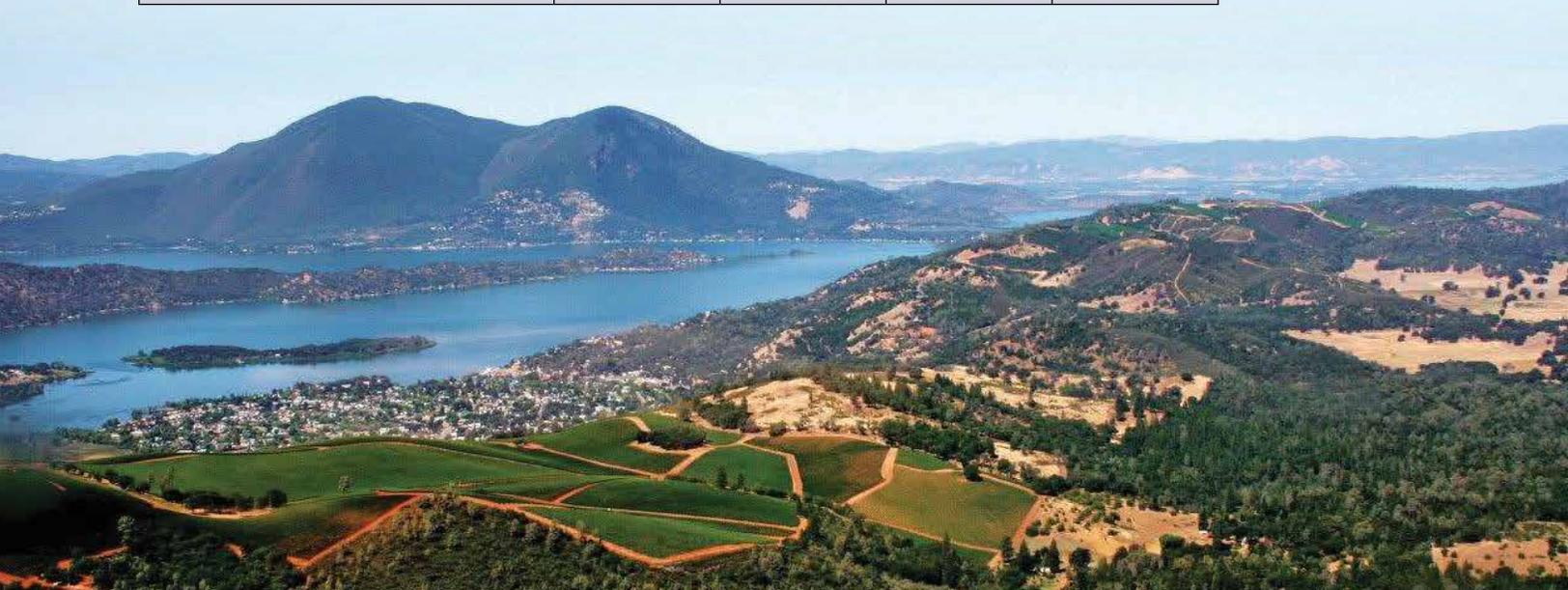
For perspective, agriculture pumped nearly one million dollars per day into the county economy during 2017 (\$929,212 to be exact), or \$38,717 per hour. The \$241.0 million in direct output represented 7.5% of the county's total economic output of \$3.201 billion, or about one out of every thirteen dollars.

Total employment was 2,202. This included 2,061 jobs directly in agriculture plus 141 additional jobs from multiplier effects. The 2,061 direct agricultural jobs represented 8.5% of Lake County's total employment of 24,384, or about one out of every twelve jobs.

**Figure 4. Overall Economic Effects of Lake County Agriculture**

*Not all columns and rows add exactly due to rounding.*

Type of Effect	Direct	Indirect	Induced	TOTAL
<b>FARM PRODUCTION</b>				
Output Effects (\$ Millions)	\$170.7	\$30.0	\$44.4	\$245.1
Employment Effects (# Jobs)	1,812	52	31	1,895
<b>LOCALLY SOURCED, VALUE-ADDED FOOD PROCESSING</b>				
Output Effects (\$ Millions)	\$70.3	\$16.5	\$7.3	\$94.1
Employment Effects (# Jobs)	249	43	15	307
<b>TOTAL VALUE OF AGRICULTURAL INDUSTRY</b>				
Output Effects (\$ Millions)	\$241.0	\$46.5	\$51.7	\$339.2
Employment Effects (# Jobs)	2,061	95	46	2,202



## Toward the Future

This report has documented the role that Lake County agriculture plays as a local economic driver. Including local food processing and multiplier effects, agriculture contributed \$339.2 million to the county economy. Agriculture also played an important role in county employment, directly or indirectly supporting jobs 2,202 jobs. Just counting direct effects, agriculture accounted for nearly one out of every thirteen dollars in the county economy and about one out of every twelve jobs.

Agriculture is an important pillar of the Lake County economy and represents a vital link to both the county's cultural past and competitive future. Although this report has presented many facts and figures, it has barely begun to fill key information gaps about agriculture's role, including contributions to the county via property taxes, sales taxes, and other payments. The process of developing this report has raised several additional questions that lie beyond the scope of this report but may warrant future research (below). In the meantime, the findings herein provide the clearest picture yet of Lake County agriculture's important economic role.

## Additional Questions

### ■ TAXES

What contribution do agricultural businesses make to county revenues? Our initial estimate puts agriculture's net contribution at \$3.84 million for excise, sales and property taxes, as well as fees, licenses and permits. Additional research could firm up this number.

### ■ PROCESSING

The overwhelming majority of Lake County's raw agricultural products leaves the county for processing. What new policies, programs, and other initiatives could expand locally sourced, value-added food processing within Lake County?

### ■ ECOSYSTEM SERVICES

What is the annual dollar value of wildlife habitat, scenic beauty, carbon sequestration, pollination, and more than twenty other ecosystem services that Lake County's agricultural lands provide to society?

### ■ ECONOMIC DIVERSIFICATION

What new policies, programs, and other initiatives could diversify agricultural production, making it more resilient to economic shocks?

### ■ ECONOMIC SHOCKS

How would potential shocks affect agriculture's economic results, for example significant new regulations, labor policies, water issues, or changes in the price of key inputs? Modern economic tools make it possible to analyze various scenarios.

### ■ CANNABIS AND HEMP

What economic opportunities and risks do commercial cannabis and industrial hemp production pose for Lake County agriculture?

## Acknowledgments

This report was produced by Agricultural Impact Associates LLC under contract to the Lake County Department of Agriculture. Lead researchers were Dr. Jeff Langholz (jeff@ag-impact.com) and Dr. Fernando DePaolis (fernando@ag-impact.com). Steven Hajik supervised the project on behalf of the county. We thank agency staff and members of the agricultural industry who helped develop this report.



Lake County Department of Agriculture  
[www.lakecountycalifornia.gov/Government/Directory/Ag](http://www.lakecountycalifornia.gov/Government/Directory/Ag)  
(June 2019)

Agricultural Impact Associates 