The Economic Impact of

Agriculture in Pennsylvania: 2021 Update

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economics | strategy | insight

TEAM PENNSYLVANIA

pennsylvania
DEPARTMENT OF AGRICULTURE

To find your way on a map, first, you must know where you are.

In 2018, the Pennsylvania Department of Agriculture commissioned an in-depth analysis of Pennsylvania agriculture's economic impact alongside our partners at Team Pennsylvania and the Team Pennsylvania Agriculture Advisory Board. That analysis, in some ways, confirmed what we already knew: that Pennsylvania agriculture is significant, both in terms of its unique diversity of businesses and its value as part of the commonwealth's economy.

The report, completed by Econsult and the Fox School of Business, identified trends influencing agriculture's direction, quantified the sector's enormous total economic impact, and provided a roadmap towards launching the Pennsylvania Farm Bill. This was Governor Tom Wolf's bold and necessary investment in Pennsylvania agriculture to grow opportunities and resources, remove barriers to entry, and inspire future generations of agricultural leaders. With the backing of the Pennsylvania legislature, the PA Farm Bill became law in July 2019, with bicameral, bipartisan support.

This updated report provides useful perspective that is only possible though comparisons between the years' data. Understanding this data is the first step in shaping strategic policy that supports our agricultural entrepreneurs and enterprises for the future.

The report is the result of our public-private partnership with PA Department of Agriculture and Pennsylvania agricultural business leaders that serve as part of the Team Pennsylvania Agriculture Advisory Board. This work was directed by the Board, who are leaders from across Pennsylvania in our crop and animal production, food and beverage manufacturing, forestry, and green industries, and collectively share a commitment to the long-term viability of agriculture in Pennsylvania.

As co-chairs of the Agriculture Advisory Board, we encourage you to explore this report, recognize the trends our state is facing, acknowledge Pennsylvania agriculture's strengths and opportunities, as well as understand the weaknesses revealed during the global pandemic, and potential threats to consider as we regain our footing alongside the rest of the national recovery efforts.

Amid more than a year of unprecedented trials posed by the COVID-19 pandemic, we find it important to also recognize the reinvigorated and renewed gratitude for the critical agricultural infrastructure, and the nearly 600,000 Pennsylvanians, responsible for facilitating food and fiber from field to consumer. Our for-profit and non-profit ag organizations have exemplified creativity and resiliency this year while rising to meet the challenge of nourishing their fellow Pennsylvanians and the world during a time of high need. While Pennsylvania agriculture's economic impact is quantified through this report and often cited as 'agriculture's value to the commonwealth', it is critical to acknowledge the intangible value of our state's agriculture businesses and organizations as a vital part of the story supporting the economic impact.

This report, a snapshot of where we are today, will inform the path to cultivating a resilient agriculture industry for tomorrow. We will forge ahead in this journey with an earnest commitment towards progress by working together.

In Partnership,

Russell C. Redding
Secretary of Agriculture
Commonwealth of Pennsylvania

Scott Sechler Sr.
Chairman and President
Bell & Evans

About Econsult Solutions, Inc.

This report was produced by Econsult Solutions, Inc. (“ESI”) and commissioned by Team Pennsylvania. ESI is a Philadelphia-based economic consulting firm that provides businesses and public policy makers with economic consulting services in urban economics, real estate economics, transportation, public infrastructure, development, public policy and finance, community and neighborhood development and planning, as well as expert witness services for litigation support. Its principals are nationally recognized experts in urban development, real estate, government and public policy, planning, transportation, non-profit management, business strategy and administration, as well as litigation and commercial damages. Staff members have outstanding professional and academic credentials, including active positions at the collegiate level, vast experience at the highest levels of the public policy process and extensive consulting experience.

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The Economic Impact of Agriculture in Pennsylvania

Introduction: Context of this Report

2021 Update

This report serves as an update to the May 2018 report "*Pennsylvania Agriculture: A Look at the Economic Impact and Future Trends*," which provided a baseline analysis of Pennsylvania's agriculture through a data-driven approach and informed the development of the Pennsylvania Farm Bill. It provides updated numbers on Pennsylvania's farming sector and offers further insights into why these changes may be occurring. It takes a close look at the 2019 Pennsylvania Farm Bill, at national trends in the agricultural industry, and on the impacts of broader events, including the COVID-19 pandemic and continued impacts from climate change, to present a full picture of Pennsylvania's agricultural industry today.

The Pennsylvania Farm Bill, signed into law on July 1, 2019, has resulted in a total of $37.2 million in support to agriculture in the Commonwealth in the first two years, with an additional $13.6 million proposed for the 2021/22 fiscal year. Responsive to evolving trends in the industry, the Pennsylvania Farm Bill includes:

- **Resources for agricultural business development and succession planning**, including through the Agriculture Business Development Center and a realty transfer tax exemption of preserved farmland to qualified beginning farmers;
- **Building a strong agricultural workforce**, including the Pennsylvania Farm to School Grant Program and the Agriculture and Youth Development Grant Program;
- **Reduced regulatory burdens to strengthen the agricultural business climate in Pennsylvania** through greater funding and financing;
- **Increased processing capabilities**, including through the Pennsylvania Dairy Investment Program and the Center for Animal Agriculture Excellence;
- **New market opportunities and investments in organic**, including added support to a state-level Specialty Crop Block Grant program for priority crops, increased funding to the PA Preferred Homegrown by Heroes Program, and the creation of the PA Preferred Organic Initiative; and
- **Protection for Pennsylvania agriculture** through a $4 million Pennsylvania Rapid Response Disaster Readiness Account offering protection against agricultural disasters including animal health, plant health, and food-borne illness.

At a time of nationwide challenges to the industry, with the number and acreage of farms decreasing over the past decade, the Pennsylvania Farm Bill provides much-needed support to this $81.5 billion industry in Pennsylvania which is central to Pennsylvania's economy and workforce.

Despite these shifts, Pennsylvania agriculture continues to be a strong, successful industry and major contributor to the state's economy. In order to build on the state's strengths and opportunities, it is essential to understand how the agricultural sector has changed in recent years, how the current context, including the Pennsylvania Farm Bill, the COVID-19 pandemic, and continued environmental shifts have impacted the industry, and the industry's importance in the state economy. In line with the 2018 analysis, this report represents the production, processing, forestry and hardwoods, landscaping, ag-related services, and food manufacturing sectors in order to develop a more complete understanding of Pennsylvania's agriculture industry.

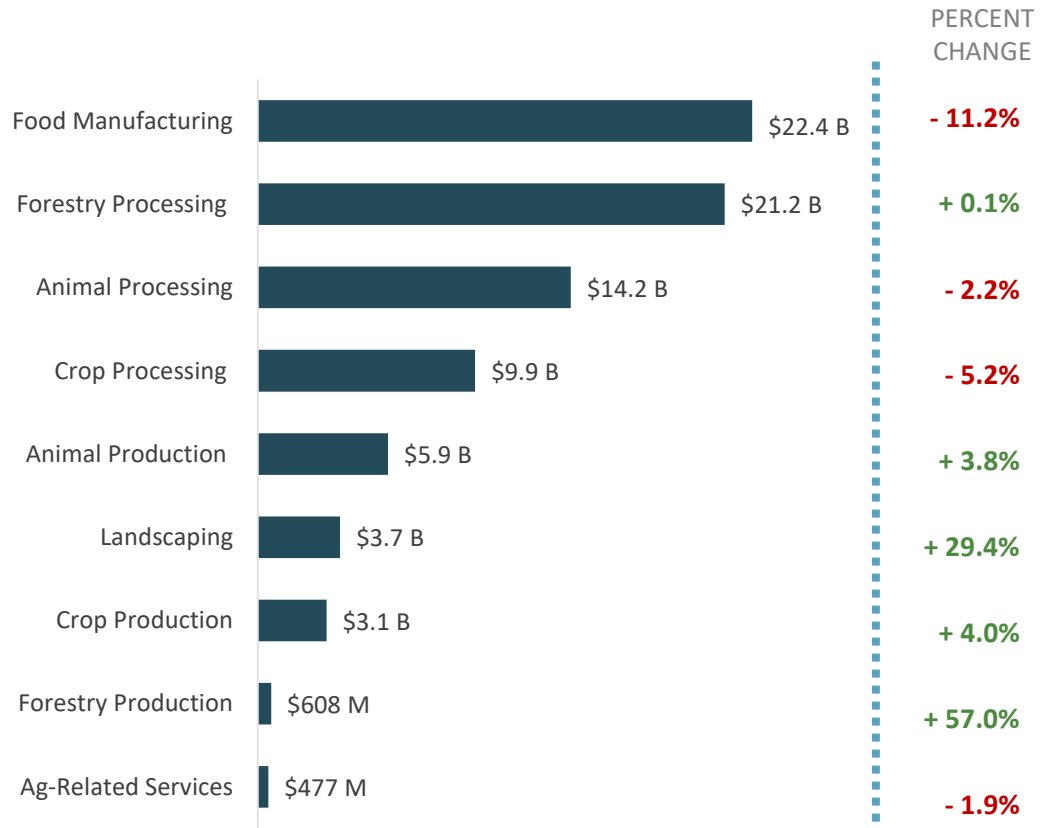
Comparing the Two Reports

2018 Report	2021 Report
Pennsylvania Agriculture: A Look at the Economic Impact and Future Trends	*The Economic Impact of Agriculture in Pennsylvania: 2021 Update*
2012 Agricultural Census	2017 Agricultural Census, with the 5-year growth applied forward to 2019
2017 IMPLAN	2019 IMPLAN
Economic Impact as of 2017	**Economic Impact as of 2019**

Overview of Economic Impacts

The 2018 "*Pennsylvania Agriculture: A Look at the Economic Impact and Future Trends*" report defined Pennsylvania's Agriculture Industry as those industries involved in the production and processing of crops, the production and processing of animals, the production and processing of forestry products, landscaping, and horticultural services, agriculture-related support services, and food manufacturing. This report uses the same definition.

In this update, the total direct economic output of these sectors totals $81.5 billion. This represents a 2.7 percent decrease in total output from the estimate given in the 2018 report of $83.8 billion. This decrease is largely driven by a $2.8 billion decrease in food manufacturing, which is substantial but caused by changes in the operations of individual large companies in Pennsylvania. Despite this decrease in food manufacturing, nearly all other categories saw increases over this period (the exceptions being crop and animal processing as well as agriculture-related services). The reasons for these shifts are complex and are explained in the following section of this report, which further breaks down these categories into subsectors to examine changes in farm numbers and sizes, commodity prices, and nationwide trends.



Sources: IMPLAN (2019), ESI (2021)

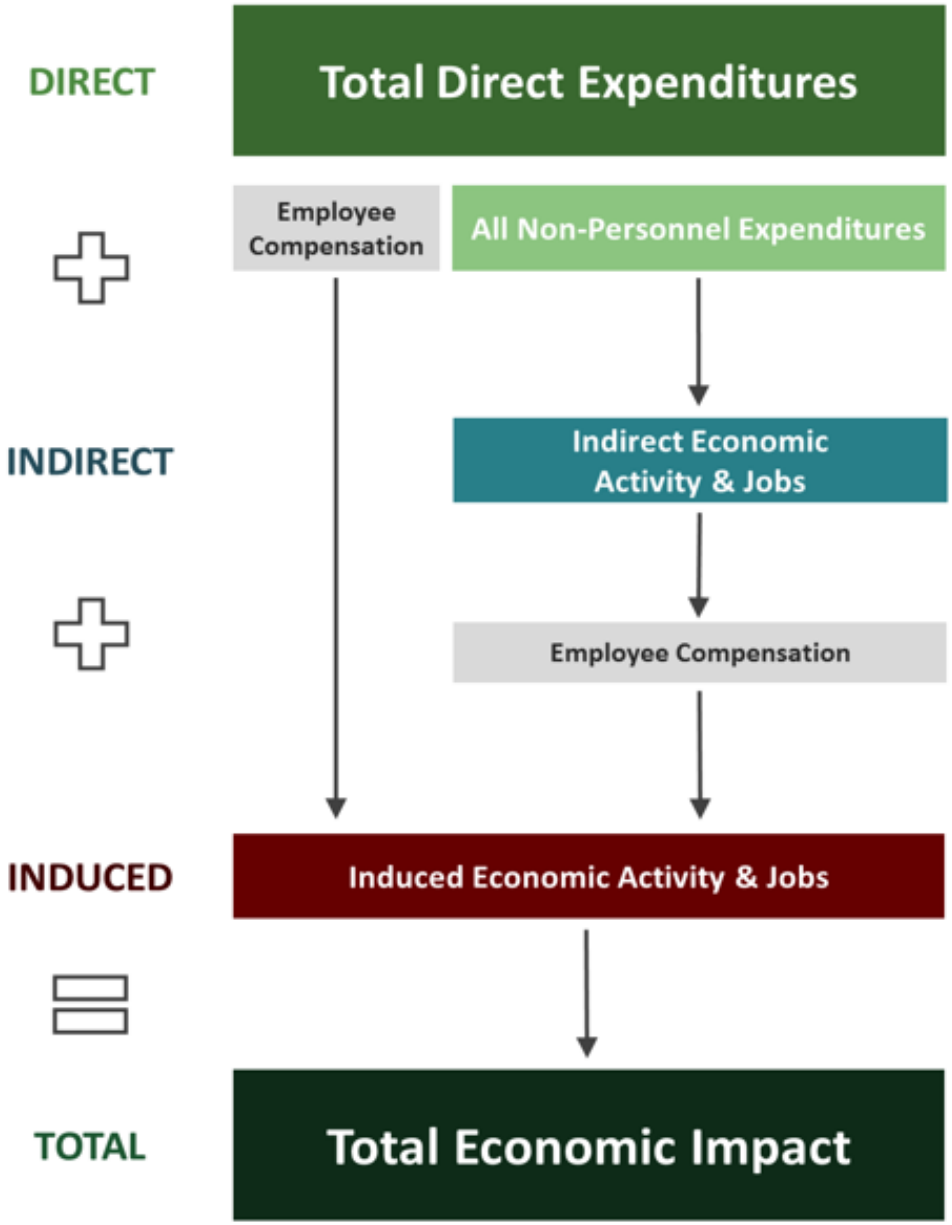
Overview of Economic Impacts

The direct impacts of Pennsylvania's Agriculture Industry do not tell the full story of what agriculture means to the Commonwealth's economy. Spillover effects are generated through inter-industry linkages between the agricultural sectors and other sectors within the economy. These impacts, combined with the direct impacts, provide a more comprehensive picture of how Pennsylvania's agriculture contributes to and drives the state economy.

For example, a cattle farm contributes directly to the local economy by selling farm products, employing individuals directly working on the farm, and paying those employees wages and salaries.

In addition to these impacts, the farmer buys feed from suppliers or other farmers, veterinary services, trucking services, professional services, and farm equipment maintenance and repair, among others. Some of these purchases are from other businesses within the agriculture sector and are therefore already capitated in the direct impacts of the sector. However, the purchases from businesses outside the sector generate additional economic impacts. These impacts are captured in the **indirect impacts.**

The salaries paid to employees working on the farm, as well as to the farmers themselves, generate additional economic impact as they spend their wages in the local economy. These are captured in the **induced impacts.**



Overview of Economic Impacts

Beyond the 301,900 direct jobs, indirect and induced spending supports an additional 291,700 jobs within the Commonwealth for a total of 593,600 jobs supported by the agricultural Industry, representing a 2.5 percent increase in total jobs from the 2017 estimate given in the previous report.

In addition to the $81.5 billion direct output, indirect and induced spending generates an additional $51 billion in impact within the Commonwealth for a total economic impact of $132.5 billion in 2019.

Agricultural industry workers earn $14.5 billion in direct labor income. Indirect and induced spending support an additional $18.3 billion in labor income in the Commonwealth for a total of $32.8 billion income supported by the agricultural Industry.

301,900 DIRECT JOBS

291,700 INDIRECT & INDUCED JOBS

593,600 TOTAL JOBS

$81.5B DIRECT OUTPUT

$51.0B INDIRECT & INDUCED OUTPUT

$132.5B TOTAL OUTPUT

$14.5B DIRECT LABOR INCOME

$18.3B INDIRECT & INDUCED LABOR INCOME

$32.8B TOTAL LABOR INCOME

Agriculture is a major contributor to the state economy:

- **Agriculture contributes $1 out of every $16 in gross state product.**
- **Every dollar of direct output generates $0.63 in additional economic activity.**
- **Agriculture supports 1 out of every 10 jobs in Pennsylvania.**
- **Agriculture supports 7 jobs per $1 million of output.**

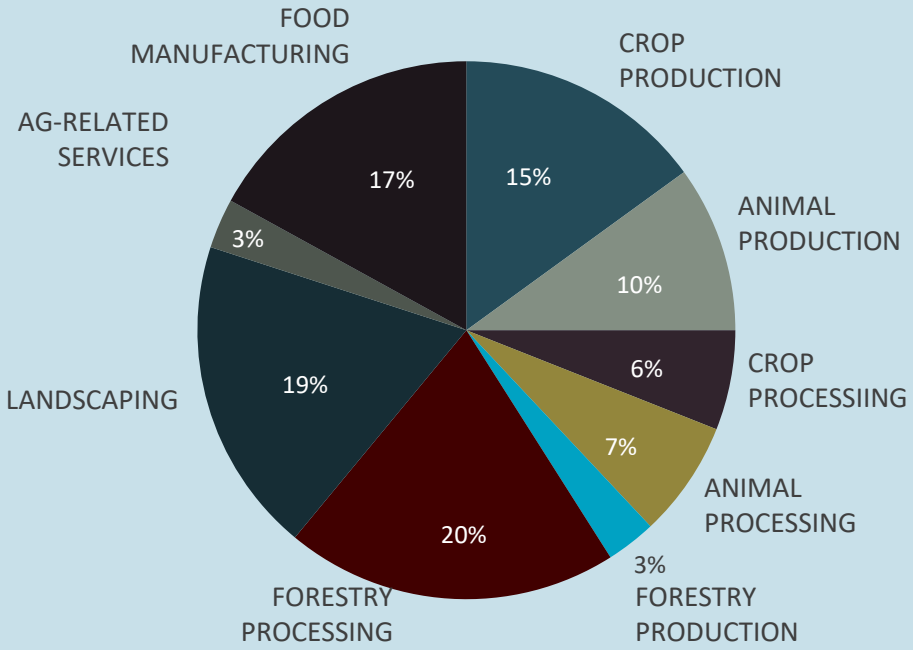
Overview of Economic Impacts

In 2019, Pennsylvania's $81.5 billion agriculture sector supported 301,900 direct jobs and $14.5 billion in labor income.

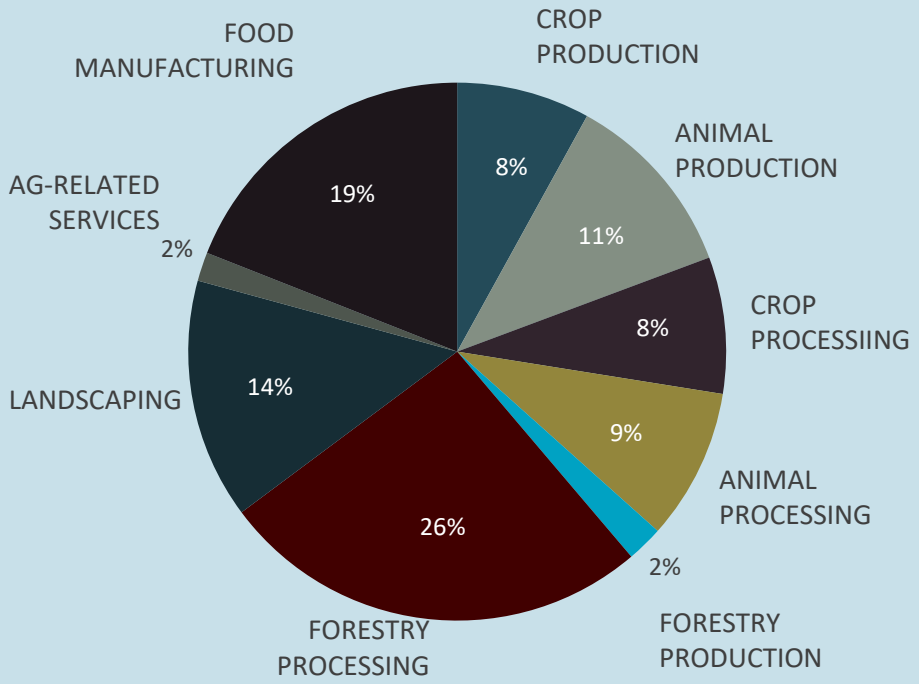
Agriculture jobs represent approximately 5.8 percent of all private sector employment in Pennsylvania. These jobs also support additional jobs in other industries through their indirect and induced impacts, as described on page 10 of this report.

Some jobs, such as those in crop production and landscaping, have lower average wages compared to agriculture as a whole. Others, including crop processing, animal processing, and forestry processing have slightly higher wages. Notably, food manufacturing makes up a relatively small share of agricultural employment compared to its output, meaning that this category is more capital-intensive than others within agriculture.

301,900 DIRECT JOBS



$14.5 B LABOR INCOME



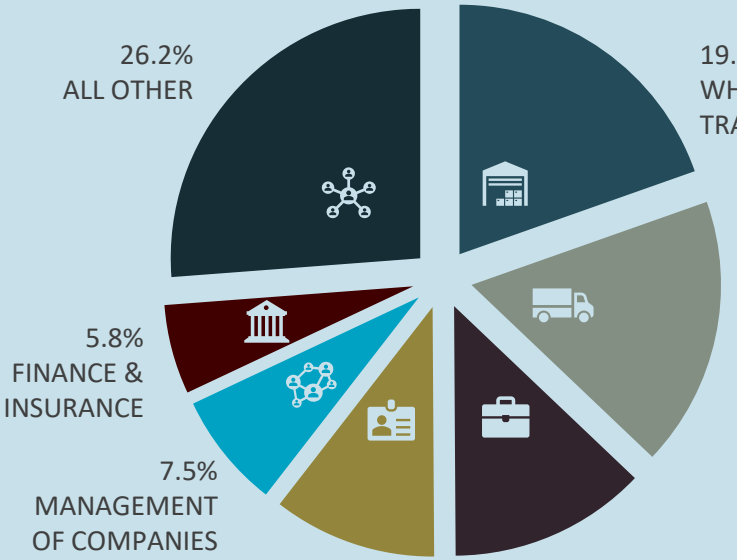
Source: IMPLAN (2019), ESI (2021)

Indirect Economic Impacts

The indirect impacts of agriculture from spending with companies outside the agriculture sector in Pennsylvania fall into a wide range of industries, with the largest impacts (in terms of jobs) in wholesale trade, transportation & warehousing, professional services, administrative & waste management, management of companies & enterprises, and finance & insurance. While the pie chart at the right shows the overall indirect impact of agriculture, individual types of agricultural production and processing may produce more or fewer indirect jobs in each of these categories. To put these numbers in context, the jobs supported by agriculture in wholesale trade comprise approximately 10 percent of all jobs in this sector within the state.

As described previously, agriculture also generates induced effects in the economy through the spending of employees. Those induced effects are primarily seen in health care & social assistance, retail, and accommodation & food services.

Industry Breakdown of Indirect Jobs Generated by Agriculture in Pennsylvania



Source: IMPLAN (2019), ESI (2021)

Overall Trends in Pennsylvania Agriculture

The USDA Census of Agriculture is conducted every five years. As a complete count of every farm in the country, it provides a valuable data set on farm size, demographics, and production. Every five years, the Census provides a unique glimpse into practices and changes in farms across the country.

However, lags in data reporting mean that the most current data reflects the state of agriculture in 2017, with some individual datasets updated more recently. This means that comparisons in the agricultural census between this report and the May 2018 report "*Pennsylvania Agriculture: A Look at the Economic Impact and Future Trends*" reflect changes between 2012 (reported in the 2018 study) and 2017 (reported here). In the economic impact section of this report, growth rates from 2012 to 2017 have been brought forward, so that output values reflect estimated 2019 output level.

Despite this data limitation, the agricultural census remains the most comprehensive and accurate agricultural dataset, allowing for comparisons over time and between states at a detailed level.

Pennsylvania's Trends from 2012 to 2017:

53,157
FARMS
(-10 percent)

7.3 M
ACRES
(-6 percent)

137
AVG ACRES
(+5 percent)

$7.8 B
MARKET VALUE
(+5 percent)

$352 M
INCOME
(+14 percent)

Despite a decrease in the number of farms, the market value of products sold and operations income both increased between 2012 and 2017.

Comparison to National Trends

- The total number of farms in the U.S. declined by 3 percent, mostly due to losses in mid-sized farms while the number of very small and very large farms increased. **Pennsylvania realized a comparatively large decline** (10 percent of total farms), with an increase in only very large farms and all other farm sizes declining in number.
- **Unlike the U.S. which saw a 2 percent decrease in market value, Pennsylvania's farms realized a 5 percent growth rate in market value over this period.**
- This consolidation into fewer, larger crop farms **matched the national trend and realized some financial benefits from economies of scale.** At the same time, animal farm consolidation reveals a higher concentration of animals per farm and therefore larger returns per acre.

Pennsylvania matches National Trends of Farm Consolidation

While the total number of PA farms shrank, per farm average sales and income realized significant increases. The average farm in Pennsylvania sold $145,962 in products in 2017, a 17 percent increase since 2012. Additionally, average farm-related income increased by 18 percent (+$16,562) while net case farm income increased by 42 percent (+$45,020). This trend towards increased consolidation is evident looking at trends across farm sizes. **Over the last five years, all categories of small and mid-sized farms declined while very large farms ($500,000 or more in sales) increased by 7 percent.**

These shifts toward fewer but larger operations hold true in many types of operations, including both livestock and crop farms:

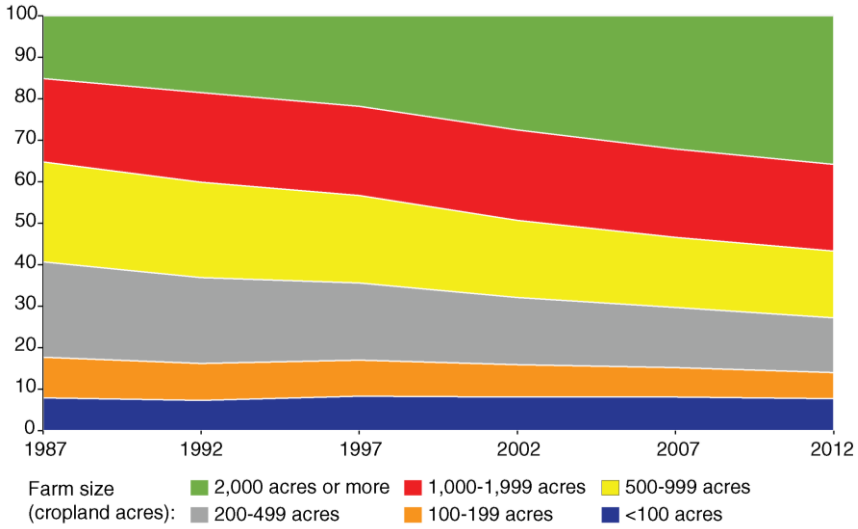
- The number of cattle and calves in Pennsylvania held steady from 2012 to 2017, even as the number of farms decreased by nearly 10 percent. Even so, **Pennsylvania beef farms remain much smaller than the national average** (see pages 18-19 for more information).
- Hog and pig inventories increased by more than 9 percent, even as the number of farms with hogs and pigs on them decreased by more than 10 percent (see page 22-23 for more information).
- On the crops side, the amount of corn grown for grain increased by more than 15 percent (to 144.7 million bushels) even as the number of farms decreased by more than 18 percent and acreage decreased by 4.9 percent.
- In nearly all crop types reported, production either increased more than farm numbers, or decreased by small margins.

While the specifics vary from one Agricultural Census to the next, these are a **continuation of a decades-long trend of consolidation, both in Pennsylvania and nationally**. Larger farms are more technology intensive, increasing demand for workers with advanced skills, and also making it more difficult for smaller farms to compete.

Number of Farms, by Sales Category, 2012 and 2017 (thousands of farms)

Across many types of operations, production or inventory increased even as the number of operations decreased from 2012 to 2017. This shift was driven by an increase in large operations, particularly those with $500,000 or more in sales.

Farms by Size (Cropland Acres), U.S. 1987 - 2012



Source: National Agriculture Statistics Service, 2017 Agricultural Census (left); USDA, Economic Research Service and Agricultural Census (above)

Notable Farm Characteristics

As of 2017, **12 percent of farms had a young producer (defined as age 35 or younger) operating as a primary producer**, with 17 percent of farms having a young producer present. About a quarter of these primary producers were working in dairy cattle and milk production while 17 percent were engaged in crop farming. **With 14 percent of all producers in Pennsylvania age 35 or younger, PA ranks first in the country in the number of young producers. Lancaster County leads in this area, with more than 2,400 young producers (LaGrange County, Indiana, which is ranked second nationally has less than half this number).**

The designation of primary producer is an official term used by the USDA that refers to the person who makes the most decisions on a given farm, as reported by farms to the Agricultural Census.

Currently, **2 percent** of farms in Pennsylvania **are certified as organic** by the USDA National Organic Program. However, since 2012, the number of farms producing organic products has **increased by 76 percent**, from 600 to 1,055 farms, a trend that is likely to continue due to consumer trends nationwide as well as supports from the Pennsylvania Farm Bill.

The market value of these organic products **skyrocketed by 800 percent** from $78 million in 2012 to **$707 million in 2017**, resulting in the average sales per farm increasing from $131,000 to $675,000. With this increase, Pennsylvania now ranks third in the U.S. in organic sales, with nearly 2.5 times the dollar vale of sales of New York, the only other state in the Northeast in the top 10 (USDA 2019 Organic Survey)

While internet access has grown, **31 percent of farms still did not have internet access** as of 2017, down from 38 percent in 2012. With 25 percent of farms nationally lacking internet service, Pennsylvania lags compared to other states. Internet connectivity can be a challenge in rural areas in general, but Pennsylvania differs from other states in its large number of Amish and Mennonite communities, many of whom are farmers. While Mennonites may use electricity and computers (although at lower rates than the general population), Amish individuals do not.

Sources: National Agriculture Statistics Service, 2017 Agricultural Census, Sarah Paez and Lauren Muthler, "More than an inconvenience, Pa.'s broadband crisis affects education, medicine and more," Centre Daily Times *(April 10, 2019), https://www.centredaily.com/news/local/article228780844.html, Rachel McDevitt, "What Does the Future of Farming Look Like: Who and Where are the Big Questions,"* 90.5 *WESA (January 31, 2020), https://www.wesa.fm/post/what-does-future-farming-pennsylvania-look-who-and-where-are-big-questions#stream/0*

Subsector Analysis

Overview

In addition to analyzing agriculture's overall impact on the Pennsylvania economy, it is important to understand how the different subsectors within the agriculture industry provide the vital raw materials and inputs needed to sustain numerous downstream agricultural and non-agricultural industries within the Commonwealth. The following subsector analysis will include an estimate of the direct, indirect, and induced output, as well as the employment and income impacts from eight subsectors within the broader categories of the agricultural sector. These subsectors were selected for inclusion in the May 2018 "*Pennsylvania Agriculture: A Look at the Economic Impact and Future Trends,*" and this section serves as an update and deeper dive into their recent trends and current conditions.

For seven of these subsectors, this analysis will focus on the supply chain of each commodity from initial production to processing:

- Poultry and egg production
- Dairy production
- Beef production
- Other animal production including pigs, sheep, and goats
- Fruit and vegetable production
- Hardwoods and wood product production
- Nursery and landscaping

For example, the poultry subsector encompasses not only the agricultural production of poultry and eggs but is inclusive of the entire production process from initial hatching to final sales. In the first stage—poultry and egg production—broilers, turkeys, and egg-laying hens are hatched and raised while other farmers produce chicken feed to support this sector.

In the later stages, poultry are slaughtered and processed into poultry products. In the final stages, products are transported from manufacturing plants to distribution through wholesaling and then lastly sold to restaurants and grocery stores for final consumption.

The subsector analyses to follow will incorporate the production and processing stages of each commodity. However, data limitations posed significant issues when attempting to isolate commodity-specific wholesale and retail trade impacts which are not included in the subsector analyses. Nevertheless, by focusing on each commodity's impact on the Pennsylvania economy, it is possible to understand how the animals and crops produced in the Commonwealth support and enable additional downstream industries.

In addition to providing seven deep-dive analyses on Pennsylvania's agricultural commodity production and processing, this section will also analyze one sector made possible, in part, through Pennsylvania's agricultural production:

- Food manufacturing

It is important to note that due to subsector definitions, there is slight overlap of the economic inputs between sectors in some cases, and for this reason, the subsector analyses are not additive in nature (for the overall impact of the sector, please see the prior *Economic Impact of Agriculture in Pennsylvania* section).

Poultry

There are four major commercial enterprises in the United States that constitute the initial production stages of the poultry industry: egg production, broiler production, raising pullets for replacement purposes, and turkey production. According to the 2017 Census of Agriculture, **Pennsylvania ranked 8th nationwide in poultry and egg sales ($1.7 billion), moving up in rank from 10th nationwide in 2012 ($1.4 billion).** Poultry and egg production accounted for roughly 22 percent of Pennsylvania's total market value of agricultural products sold in 2017, up from 18 percent in 2012. The number of poultry farms with sales increased 3.4 percent over this time period (+244 farms) as poultry inventory increased from 66.8 million to 75.9 million birds.

Pennsylvania's 24 percent growth in poultry and egg sales outpaced national growth, which grew by a healthy 15 percent over the five-year period. The U.S.'s South, Eastern Mountain Region, and Delta Region together represent 60 percent of poultry and egg sales by dollar amounts in the nation, with Georgia, North Carolina, and Arkansas as the top three ranking states (making up nearly a full third of sales). Other high-ranking states in terms of sales do not necessarily have the highest inventory numbers, however**. Rather, the wide variety in cost per head of poultry drives some of the difference in sales among top producing states,** with 2017 values ranging from $1.90 per head in Indiana to $9.40 per head in Tennessee. At $4.40 per head, Pennsylvania is slightly above the 2017 national average of $4.20 (these values exclude commercial broilers, which have a more consistent value per pound).

$4.3B DIRECT OUTPUT	10,000 DIRECT JOBS
$2.0B Poultry & Egg Production	4,400 jobs Poultry & Egg Production
$1.5B Poultry Processing	5,000 jobs Poultry Processing
$0.8B Animal Feed Production	600 jobs Animal Feed Production
+ $2.8B INDIRECT & INDUCED	+ 16,600 INDIRECT & INDUCED JOBS
$7.1B TOTAL OUTPUT	**26,600 TOTAL JOBS**

Even though the number of layer farms in Pennsylvania was down a slight 2.6 percent from 2012 to 2017, layer numbers increased by 5 percent, pointing toward higher animal concentrations on a per operation basis. Broiler farms and numbers both increased by over 10 percent, with 173 more farms and 17.2 million more broilers raised in 2017 than 2012. Additionally, turkeys, ducks, and geese were also up from 2012. In addition to growth in poultry production, chicken consumption is also increasing in the United States, from 95 pounds per capita in 2012 to 107 in 2017. Egg production and consumption has also increased nationally, both in raw numbers and on a per capita basis.

In total, chickens comprise 93 percent of Pennsylvania's poultry inventory followed by turkeys (4 percent). By type of poultry production, the number of broiler (-7.7 percent) and layer (-2.6 percent) farms in Pennsylvania decreased over the 2012 to 2017 period while turkey (+10.1 percent) and pullet (+8.4 percent) farms increased.

Poultry

Poultry and Egg Production

In Pennsylvania, broilers, or chickens raised for meat, made up nearly half of the total chicken inventory (46 percent, 34.7 million). Layers, chickens that produce large quantities of eggs, made up approximately 35 percent of inventory (26.3 million). Nearly 62 percent of layers (16.2 million) were located on 29 large commercial egg production farms.

The remaining 13 percent of Pennsylvania's chicken inventory are pullets, chickens supplying the other two enterprise types with replacement flock.

In terms of number sold, pullets had the largest increase from 2012 to 2017 (+15 percent) while layers realized the largest percent decrease (-31 percent). In 2017, nearly 184 million broilers and over 7 million turkeys were sold for meat production (see Poultry Processing below). In Pennsylvania, approximately 69 percent of poultry and egg products demand was met by local production in 2019 (meaning that approximately 69 of poultry and egg products bought, sold, and/or consumed in Pennsylvania were from within the state). On the supply side, 57 percent of local supply of poultry and egg products went toward meeting local demand.

Poultry Processing and Animal Feed Production

While layers and pullets remain within the production stage, broilers and turkeys are processed for their meat in the poultry processing stage which involves the harvest, processing, cutting, and packing of meats. In this stage, the poultry is either processed for consumption or used to manufacture animal feed. In Pennsylvania, approximately 23 percent of processed poultry products demand was met by local production in 2019 (meaning that approximately 23 percent of processed poultry bought, sold, and/or consumed in Pennsylvania was processed within the state). On the supply side, 36 percent of local supply of processed poultry products goes to meeting local demand (with the remaining product shipped for consumption elsewhere).

Poultry Sold by Type, 2017

	Number of Operations	Pct Chg 2012-2017	Head Sold	Pct Chg 2012-2017	Avg. Head per Operation, 2017
Layers	1,768	-2%	9,333,000	-31%	5,300
Pullets	346	+34%	17,919,000	+15%	51,800
Broilers	1,568	+12%	183,894,000	+10%	117,300
Turkeys	629	+30%	7,305,000	-14%	11,600

(Source: National Agriculture Statistics Service, 2017 Agricultural Census)

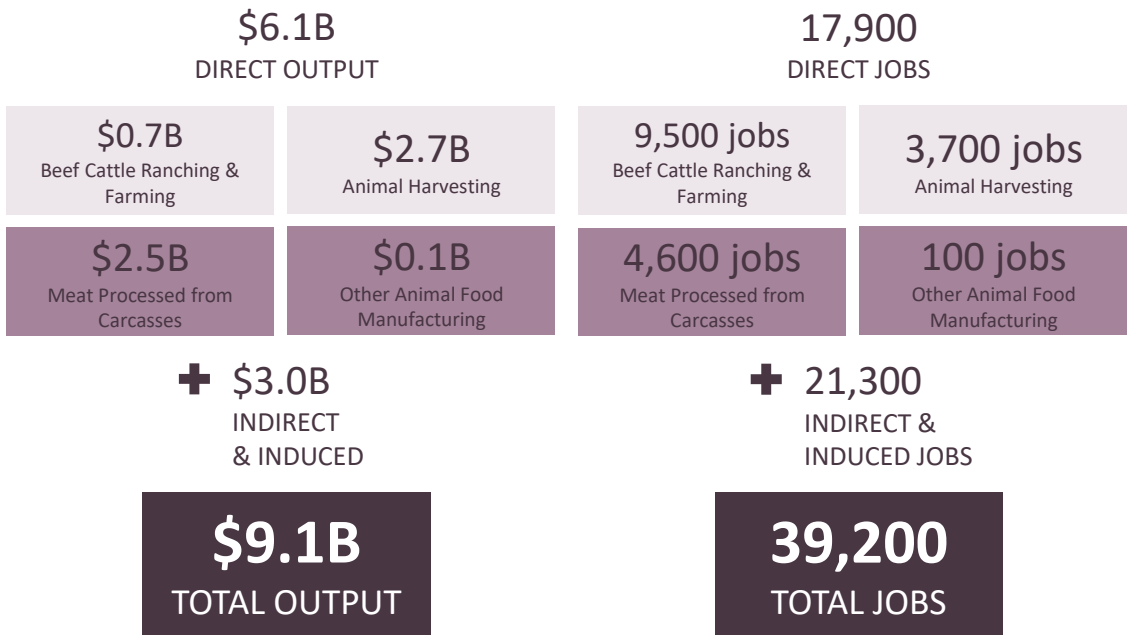
Beef

The Beef subsector in Pennsylvania is made up of beef production (Beef Cattle Ranching and Farming and Beef Cattlelots) and manufacturing *(*Animal Slaughtering, Meat Processed from Carcasses, and Other Animal Food Manufacturing*)*.

Cattle and calf inventory are divided into three categories: milk cows, beef cows, and other cattle (for information about milk cows see the Dairy subsector). Overall, the number of farms with cattle and calf inventory decreased over this time period (-9.8 percent) while total inventory remained largely unchanged (-0.3 percent).

Cattle and calves was the only PA animal production sector to experience a decrease in sales over the time period from 2012 to 2017 (-13 percent) resulting in a drop in ranking from 22nd to 27th nationally. This decrease occurred despite an 11 percent increase in the number of beef cow operations with inventory, coupled with a 47 percent increase in beef cow inventory and a 58 percent increase in sales. Instead, the loss was driven by minor losses in milk cows as well as more substantial losses in other cattle, a category which includes bulls, steers, and heifers.

Nationally, growth in the Northern Plains and Upper Midwest balanced out losses in the Mountain Region and Texas, such that cattle and calf sales held steady overall over this time period (for a 1 percent increase nationwide). The average value per head is comparable in Pennsylvania compared to the U.S. average ($1,080 vs. $1,109) despite variation in average live weight: Pennsylvania cattle are lighter than the national average (with an average live weight of 1,223 pounds compared to 1,349 pounds in 2017).



PA Cattle and Calf Inventory by Type, 2012 and 2017

	2012		2017		Percent Change	
	Farms	Number	Farms	Number	Farms	Number
Total	25,189	1,626,374	22,729	1,621,303	-9.8%	-0.3%
Beef Cows	11,880	148,249	13,176	217,617	+10.9%	+46.8%
Milk Cows	7,829	532,335	6,914	527,617	-11.7%	-0.9%
Other Cattle	21,574	945,790	18,620	876,069	-13.7%	-7.4%

(Source: National Agriculture Statistics Service, 2012 and 2017 Agricultural Census)

Beef

According to the 2017 Census of Agriculture, Pennsylvania ranked 25th nationwide in the number of cattle and calves sold (767,000 head), declining in rank from 22nd nationwide in 2012 (880,000 head). Cattle and calf sales accounted for roughly 8 percent of Pennsylvania's total market value of agricultural products sold in 2017, down from 9.6 percent in 2012. The number of farms with cows and calf sales decreased six percent from 2012 (19,381 farms) to 2017 (18,149 farms).

Beef Production

The number of farms with beef cow inventory has increased, from 11,900 in 2012 to 13,200 in 2017 (+11 percent), as has the total inventory of beef cows (+47 percent). Nearly half of these farms (46 percent) are small, with an inventory of one to nine beef cows.

This growth represents larger increases in both operations and inventory compared both to other states in the region and to the United States as a whole. The region (aside from Delaware, which has had decreases in both the number of operations and inventory) collectively has also seen greater increases than nationally.

In Pennsylvania, approximately 24 percent of beef cattle demand is met by local production, meaning that about a quarter of all beef consumed in Pennsylvania comes from within the state. On the production side, **95 percent of beef produced in PA goes to meeting local demand, with the remaining 5 percent being consumed elsewhere.**

Beef Manufacturing and Wholesaling

The latter stages of the industry consist of the harvesting, cutting, inspecting, packaging, and processing of carcasses into products for consumption or as inputs into other products. In Pennsylvania, 26 percent of local meat harvesting demand is met by local production, meaning that the remaining 74 percent of product is brought in from out of state. Similarly, 41 percent of local demand for meat processed from carcasses is met by local production, with the remaining 59 percent from out of state. In terms of total production, 27 percent of meat harvested locally goes to meeting local demand, while 34 percent of locally processed meat serves local demand.

Once produced and packaged, products are transferred from manufacturers to wholesalers for distribution to restaurants, taverns, meat markets, and grocery stores. It is estimated that there were approximately 1,200 individuals directly employed in the wholesaling of beef products in Pennsylvania in 2019.

Although calves harvested commercially make up a small portion of the overall cattle and calf market share, Pennsylvania is particularly strong in this area, slaughtering more than 19 percent of all calves nationwide. With an average live weight of 428 pounds, calves harvested commercially in Pennsylvania weighed substantially more than the national average of 250 pounds. Because of the higher average weights in Pennsylvania, this represents nearly 33 percent of the national total by weight.

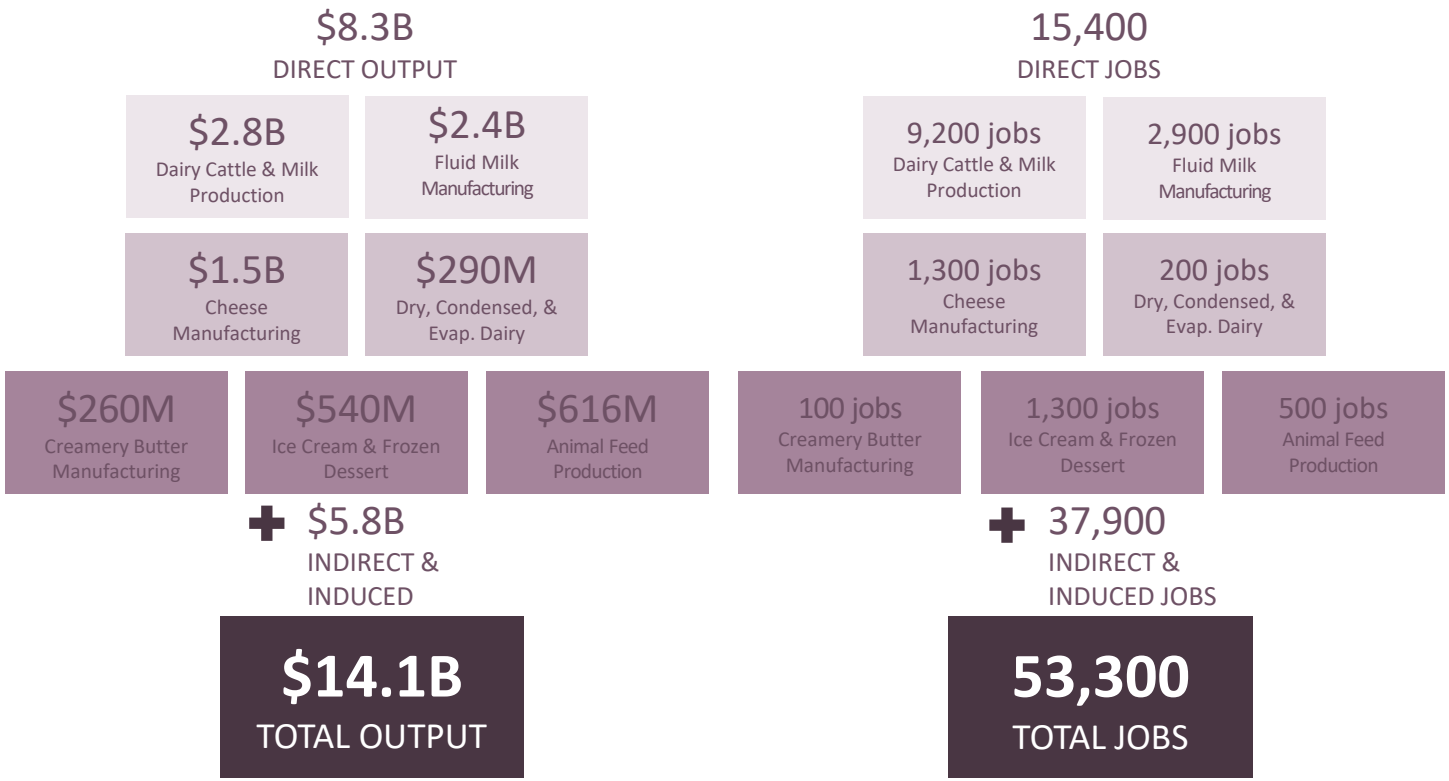
PA Beef Operations and Inventory, 2012 and 2017

	Operations w/ Inventory	% Chg, 2012-2017	Beef Inventory	% Chg, 2012-2017	Head/Op, 2017
Pennsylvania	13,200	+11%	217,600	+47%	17
Delaware	240	-21%	2,400	-37%	10
Maryland	2,500	+3%	48,200	+23%	19
New Jersey	940	+8%	9,400	-1%	10
New York	7,300	+11%	109,900	+28%	15
Ohio	17,700	+5%	300,700	+8%	17
West Virginia	10,300	+2%	205,600	+7%	20
United States	729,000	0%	31,722,000	+10%	44

(Source: National Agriculture Statistics Service, 2012 and 2017 Agricultural Census)

Dairy

Pennsylvania's dairy industry represents a total of $8.3 billion dollars in direct output, including dairy cattle and milk production, fluid milk manufacturing, cheese manufacturing, dry, condensed, and evaporated dairy, butter manufacturing, ice cream and frozen dessert manufacturing, and animal feed production. **With 6,100 dairies, Pennsylvania ranks second only to Wisconsin in the number of dairy operations by state**. The third-ranking state, New York, has only 4,000 operations. However, with average annual sales of $325,000 (compared to a national average of more than $900,000), **Pennsylvania dairies are much smaller than those in western states but are in range with most of the Region** (see the table on the following page).



Dairy

Given the smaller operations in Pennsylvania, the state ranks 6th nationally based on sales. Its one percent growth in sales from 2012 to 2017 was overshadowed by much larger increases in the Upper Midwest and Great Lakes Regions, which together represent nearly a third of total milk sales in the U.S. (California, the #1 ranked state with $36.7 billion in sales, experienced a 7 percent decrease over this period, but still accounts for 18 percent of sales nationwide). Pennsylvania is also strong in butter production, ranking second nationally based on production volume.

Herd sizes in Pennsylvania are much smaller than the national average, with an average size of 76 milk cows compared to 175 nationally. Only 15 percent of all milk cows in the state are located in operations of 500 cows or more, compared to 66 percent of milk cows nationwide.

Fluid milk and other milk product pricing is highly regulated in the United States, with public policy and dairy cooperatives both playing major roles. Class pricing identifies four groupings based on milk's end use: I - fluid milk, II - soft products (which include yogurt, cream, and cottage cheese), III - hard and soft cheeses, and IV – including butter, evaporated milk, and dry products, and prices paid to farmers does not necessarily correspond to retail prices. Declining prices starting in 2015, for example, were in part tied to increased competition from outside of the U.S. impacting demand for exports.

Nationwide, milk prices have fluctuated substantially in recent years, increasing from $18.56 per 100 pounds in 2012 to a peak of $24.07 in 2014, before declining to $17.69 as of 2017; this trend is mirrored in Pennsylvania, where prices went from $20.00 in 2012 to $25.70 in 2014 and then $18.60 in 2017. **Also notable is a decrease in fluid milk consumption nationally**: the U.S. has seen steady annual declines from 2009 (179 pounds consumed per capita) to 2017 (149 pounds consumed). Other dairy products are experiencing growth, with the most notable growth in cheese production, which increased from 10.9 billion pounds to more than 12.6 billion pounds from 2012 to 2017.

PA Region Dairy Sales and Operations by State, 2017

State	Dairy Sales ($M)	Rank in US (by Sales)	Number of Dairies	Avg Sales/ Operation
Pennsylvania	$1,979.4 M	6	6,100	$325,000
Delaware	$16.8 M	46	30	$558,000
Maryland	$174.5 M	28	390	$449,000
New Jersey	$24.0 M	42	70	$347,000
New York	$2,528.3 M	3	4,000	$635,000
Ohio	$1,001.5 M	11	2,400	$417,000
West Virginia	$22.8 M	43	100	$238,000
United States	$36,724.4M		40,336	$910,000

(Source: National Agriculture Statistics Service, 2017 Agricultural Census)

Other Animals

The "Other Animals" subsector includes pork and pigs, sheep, lambs, goats, and horses, among other animal categories. Pork and pig production and processing is by far the largest of this category, with much larger operations than the others: the 2017 Agricultural Census reports approximately 1.2 million hogs in 2,780 farms or operations, compared to 94,400 sheep in 3,750 operations and 52,600 goats in 3,750 operations (likely with some but not complete overlap).

Sheep & Lambs

Nearly three quarters of the 3,750 operations with inventory in Pennsylvania have fewer than 25 sheep or lambs (74 percent, compared to 69 percent nationwide, as of 2017). While the overall number of operations with inventory grew from 2012 to 2017 (by 4 percent), the number with wool sales declined by 43 percent, from more than 1,900 to just 1,090 in 2017.

Nationally, there was a 15 percent increase in operations with inventory, coupled with a 14 percent decline in operations with sales.

Goats

Of the 52,600 goats in operations with inventory in Pennsylvania, more than 15,000 are goats raised for milk. **Representing 29 percent of all goat inventory, goats raised for milk reflects a particular strength within Pennsylvania's goat operations,** even as the majority of goats are raised for meat or other purposes (as only 20 percent of all goat inventory nationwide is raised for milk). Additionally, 500 angora goats produce approximately 7,250 pounds of mohair annually (in comparison, sheep operations in the state produce 260,000 pounds of wool).

Equine

Pennsylvania has approximately 13,800 operations with horses and ponies, for a total of 88,000 animals, more than 73,000 of which are based at operations with fewer than 25. This definition excludes boarding, training and riding facilities, as well as any other operation that fails to generate a minimum of $1,000 in sales of equine products. When including all activity within the state, there are approximately 224,000 horses, with Pennsylvania ranking 8th nationally according to the American Horse Council. There are also 9,583 mules, burros, and donkeys on 2,743 operations in the state.

$2.7B DIRECT OUTPUT		9,300 DIRECT JOBS	
$0.4B Animal Production	$1.2B Animal Harvesting	5,700 jobs Animal Production	1,600 jobs Animal Harvesting
$1.0B Meat Processed from Carcasses	$0.1B Other Animal Food Manufacturing	1,900 jobs Meat Processed from Carcasses	50 jobs Other Animal Food Manufacturing
+ $1.5B INDIRECT & INDUCED		+ 11,000 INDIRECT & INDUCED JOBS	
$4.3B TOTAL OUTPUT		**20,300 TOTAL JOBS**	

Other Animals

Pigs & Hogs

With a 25 percent growth in sales, Pennsylvania's hog and pig sale growth outpaced the U.S. average of 17 percent growth over the 2012 to 2017 period, even as the rest of the Northeast Region experienced a 16 percent decrease in sales. This increase was driven by growth in commercial slaughter, as the number of heads increased by 21 percent from 2012 to 2017, reaching nearly 3.5 million in 2017. At the same time, a 4 percent growth in average live weight further contributed to growth as measured in pounds, even as hogs in Pennsylvania are slaughtered at a slightly smaller size than the national average (271 versus 282 pounds).

Over this period, inventory numbers grew by a more modest 10 percent and the value per head of inventory dropped from $110 to $96 (after peaking at $130 in 2014). The U.S average value per head displayed similar trends but at slightly higher values, going from $116 in 2012 to $98 in 2017, with a peak of $144 in 2014. This 2014 peak was tied to high losses caused by the Porcine Epidemic Diarrhea virus that led to a decrease in supply as demand continued to rise. Increases in production since that year have driven the price per head (and by extension the price per pound) down. The Upper Midwest, Northern Plains, Heartland, and Eastern Mountain Regions, which all experienced growth, make up 78 percent of all U.S. hog sales.

Types of Hog and Pig Operations in Pennsylvania, 2012-2017, and Compared with U.S.

Type of Operation	Farms, 2017	Pct Chg 2012-2017	Head, 2017	Pct Chg 2012-2017	Share of Inventory, PA	Share of Inventory, US
Farrow to Wean	250	-5%	234,000	+11%	19%	12%
Farrow to Finish	660	+1%	93,300	+7%	8%	26%
Finish Only	1240	-13%	725,100	+10%	59%	45%
Farrow to Feeder	270	-15%	56,900	+45%	5%	1%
Nursery	50	-12%	98,200	-3%	8%	8%
Other Practices	300	-20%	31,800	-15%	3%	7%
Total	**2,780**	**-10%**	**1,239,300**	**+9%**	100%	100%

(Source: National Agriculture Statistics Service, 2012 and 2017 Agricultural Census)

Nearly half of all pig production operations in Pennsylvania (representing 59 percent of inventory) are finishers, meaning that they purchase feeder pigs and bring them to final market weight. In farrow to wean and farrow to feeder operations (representing 19 percent and 8 percent of inventory, respectively), pigs are raised until they are either weaned (in farrow to wean) or until they reach approximately 50 pounds (in farrow to feeder). Nursery production (representing 8 percent of inventory) includes operations that purchase weaned pigs and bring them to market weight, while farrow to finish operations (8 percent of inventory) raise pigs through the full lifecycle

Compared to overall production in the United States, finisher and farrow to feeder operations make up a larger share of Pennsylvania's pork production, while farrow to finish operations make up a smaller share. In generally, specialization in certain life stages has increased efficiencies and lowered pork prices in the United States,

Fruits and Vegetables

Fruit and vegetable production and processing is a subset of both crop production and food and beverage processing and is inclusive of seed, nut, and mushroom production. While canned fruit and vegetable manufacturing makes up the largest share of direct output in this category, mushrooms and food grown under glass represent a larger share of jobs, given the labor-intensive nature of those activities.

From 2012 to 2017, Pennsylvania saw a 6 percent increase in its number of vegetable farms, an increase driven by growth in the smallest operations (less than one acre). However, because these operations make up only 1 percent of total acreage, their impact on total production is minimal compared to midsized and large operations. Midsized operations of 15 to 100 acres also grew in number over this period (by 12 percent), and account for approximately 37 percent of total acreage. Large farms, which make up more than 60 percent of total acreage as of 2017, have decreased in number from 94 operations in 2012 to 82 in 2017, but grown in average acreage.

States within the region vary widely in the share of crop operations with vegetables or fruit, with 37 percent all crop sales in New Jersey and New York falling within these categories, and Delaware and West Virginia also having high levels of fruit and vegetable operations and sales. Maryland has a similar profile to Pennsylvania, while Ohio has a much higher share of corn and soy sales compared to the rest of the region, which drives down its fruit and vegetable share (see the table on the following page).

$3.5B DIRECT OUTPUT			16,300 DIRECT JOBS		
$724M Mushrooms & Food Grown Under Glass	$186M Fruit Farming	$124M Vegetable & Melon	7,000 jobs Mushrooms & Food Grown Under Glass	3,300 jobs Fruit Farming	900 jobs Vegetable & Melon
$425K Tree Nut Farming	$2.4B Canned Fruit & Veg Manu.	$113M Frozen Fruit & Veg Manu.	5 jobs Tree Nut Farming	4,800 jobs Canned Fruit & Veg Manu.	300 jobs Frozen Fruit & Veg Manu.
+ $2.6B INDIRECT & INDUCED			+ 15,300 INDIRECT & INDUCED JOBS		
$6.1B TOTAL OUTPUT			**31,600 TOTAL JOBS**		

Fruits and Vegetables

Although Pennsylvania ranks only 22nd in crop production nationally (based on sales), it has the 5th highest number of fruit and vegetable farms in the United States. This is because these operations have relatively low sales on average, with the average sales per farm at $49,500 (compared to a national average of $259,900 and a regional average of more than $90,000).

While Pennsylvania's vegetable sales total of $187.3 million puts it in only 18th place nationwide, the state is relatively strong in sweet fresh market corn, cantaloupe, fresh market pumpkin, snap pea processing, and fresh market strawberries (all of which are classified under vegetable production by the Agricultural Census).

PA Region Fruit and Vegetable Sales and Farms by State, 2017

State	Number of Farms	Sales ($M)	Avg Sales/ Farm	Farms as Share of State Total	Sales as Share of All Crops
Pennsylvania	7,240	$358.9 M	$49,500	21%	13%
Delaware	270	$64.1 M	$240,900	20%	20%
Maryland	1,510	$95.1 M	$63,000	22%	10%
New Jersey	2,340	$363.8 M	$155,500	36%	37%
New York	6,670	$778.5 M	$116,700	31%	37%
Ohio	4,910	$193.4 M	$39,400	10%	4%
West Virginia	1,850	$32.8 M	$17,800	14%	21%
United States	185,310	$48,165.1 M	$259,900	18%	25%

(Source: National Agriculture Statistics Service, 2017 Agricultural Census)

Mushrooms (which are actually fungi and are not included in the table above) play an important role in Pennsylvania agriculture, representing an especially strong competitive advantage in the state compared to the U.S. as a whole. With 113 operations and 17.3 million square feet in production, Pennsylvania ranks number one in the United States in mushroom production and sales. Its $612 million in sales represents 46 percent of the U.S. total, even as this amount remains a small share of the state's overall crop production.

Although California, Washington, and Florida dominate fruit, tree nut, and berry sales in the U.S. (making up 86 percent of sales), **Pennsylvania is particularly strong in apples, for which it is ranked 4th nationally (for 4.6 percent of the U.S. total), and peaches, for which it is ranked 3rd (for 3.4 percent of the U.S. total).**

Peach production and value was an area of particular growth, as yields increased from 4.73 tons per acre in 2012 to 5.35 in 2017. These increased yields meant that production volume increased despite there being less acreage in cultivation, and higher prices meant further increase in the value of utilized production. **This 14 percent increase in value contributed to Pennsylvania surpassing Georgia and South Carolina in both tonnage and dollar value of peach production in 2017**.

Food and Beverage Processing

Food and beverage processing includes a wide range of manufacturing activities that interact directly with other elements of the agricultural industry. Pennsylvania has a number of large food and beverage processing companies and plants, particularly in snack food manufacturing (including pretzels and chips, both particular strengths in the state), as well as bread and bakery products and bottled drinks. Changes in an individual large company's or plant's operations can drive substantial changes in manufacturing totals from one year to the next. In addition to the large enterprises that have a strong presence in Pennsylvania, there are a large number of small companies that also contribute to food and beverage processing in the state.

While this sector as a whole realized a -$2.8 billion decline since 2017, growth rates between individual subsectors had significant disparities.

Examples of activities included in food & beverage processing include:

- Bread and Bakery Products
- Frozen Cakes and Other Pastries
- Dry Pasta, Mixes, & Dough Manufacturing
- Roasted Nuts & Peanut Butter Manufacturing
- Coffee & Tea Manufacturing
- Tortilla Manufacturing
- Mayonnaise, Dressing, & Sauce Manufacturing
- Other Snack Food Manufacturing

Subsectors such as dog and cat food manufacturing, snack food manufacturing, bottled soda and water manufacturing, and tobacco product manufacturing experienced the largest declines, as sales of tobacco and soda continued a downward trend during this time period. Also a factor were plant closures in these categories including of the Altria Tobacco Plant in Limerick and the Coca-Cola Bottling Company of the Lehigh Valley, as well as the sale of animal food manufacturer Ainsworth to Smuckers, which moved some operations out of state. Other categories realized impressive growth, however. For example, Frozen Cakes and Other Pastries, while small, increased the number of Pennsylvania operations from eight plants in 2016 to eleven in 2019. It is important to note that information on food manufacturing is not available from the Agricultural census, so these numbers come from other sources, including IMPLAN and secondary research.

$22.4B DIRECT OUTPUT		50,250 DIRECT JOBS	
$11.2B Food Processing	$4.3B Animal Food Manufacturing	38,000 jobs Food Processing	2,900 jobs Animal Food Manufacturing
$2.4B Alcoholic Beverages	$3.4B Other Beverages & Ice	4,100 jobs Alcoholic Beverages	4,900 jobs Other Beverages & Ice
$1.0B Tobacco Product Manufacturing		350 jobs Tobacco Product Manufacturing	
+ $15.9B INDIRECT & INDUCED		+ 89,750 INDIRECT & INDUCED JOBS	
$38.3B TOTAL OUTPUT		**140,000 TOTAL JOBS**	

Forestry Production and Processing

Forestry production and processing represents about a quarter of Pennsylvania's agriculture's direct output, making this one of the largest subsectors in terms of economic impact. The large majority of this activity is in forestry processing, which encompasses a wide range of activities. Pennsylvania is ranked particularly highly in cut Christmas trees and short-term woody crops, for which it ranks third in sales (behind Oregon and North Carolina) and second in the number of operations (behind only Oregon). In fact, Pennsylvania represents more than 9 percent of all operations of this type nationwide. Cut Christmas trees alone total $28.8 million in sales.

During the Great Recession, eastern U.S. hardwood production fell from above eleven billion board feet in 2005 to a low of less than six billion in 2009, with numbers remaining below 8.5 billion board feet through 2019. At the same time, the share of lumber exported from the U.S. increased from 20 percent of American grade lumber produced in 2009 to nearly 50 percent in 2017. This was driven by growth in China's hardwood market associated with furniture manufacturers moving from the U.S. to China as well as an increased demand for American hardwood among China's middle class. However, from 2017 to 2019, tariffs contributed to declines in the export of hardwoods (40 percent decrease in exports compared to the 2017 peak). When some of these tariffs were lifted in early 2020, prices began to increase before the COVID-19 pandemic disrupted trade.

Source: PA Hardwoods Development Council, "State of the Forest Products Industry in Pennsylvania 2020"

$21.8B DIRECT OUTPUT	69,300 DIRECT JOBS
$0.6B Forestry Production	8,200 jobs Forestry Production
$21.2B Forestry Processing	61,000 jobs Forestry Processing
✚ $17.3B INDIRECT & INDUCED	✚ 99,300 INDIRECT & INDUCED JOBS
$39.1B TOTAL OUTPUT	**168,600 TOTAL JOBS**

Examples of activities included in forestry processing include:

- Sawmills
- Engineered Wood Member and Truss Manufacturing
- Wood Container and Pallet Manufacturing
- Manufactured Home (Mobile Home) Manufacturing
- Prefabricated Wood Building Manufacturing
- Wood Windows and Doors Manufacturing
- Stationery Product Manufacturing
- Sanitary Paper Product Manufacturing
- Paper Mills
- Paperboard Container Manufacturing
- Paper Bag and Treated Paper Manufacturing

Nursery, Landscaping, and Related Activities

Nursery and landscaping encompasses floriculture, nurseries, propagative materials (including bulbs, corms, rhizomes, and tubers; cuttings, seedlings, liners, and plugs; flower and vegetable seeds; and vegetable and tobacco transplants to farm fields), sod, vegetables grown under protection, and fruit grown under protection, as well as landscape services. Although landscape services make up the majority of this subsector, less data is available on this category, as it is not captured by the Agricultural Census.

As of 2017, Pennsylvania had 1,558 floriculture operations, including 1,200 with area under cover and 755 with area in the open (about 400 operations included both types of production). With nearly $205 million in sales, floriculture represents more than half of Pennsylvania's nursey and floriculture output, with nurseries representing another 28 percent.

While floriculture sales increased by 3 percent in Pennsylvania from 2012 to 2017, nursery sales decreased by 20 percent over this period. This represents a major loss, as sales nationally increased by 15 percent, and sales in neighboring New Jersey by 32 percent.

Although it represents only a small share of this subsector, Pennsylvania's growth in sod sales outpaced the national average: while the sales value from 2012 is not reported by the Agricultural Census, there was a 46 percent increase in the acres devoted to sod over the five-year period, compared to a 6 percent increase nationwide.

In nearly all areas of nursery, floriculture, and related activities, Pennsylvania operations are smaller in both physical scale and average sales than both the national average and the neighboring states of New York and New Jersey.

$4.1B	63,500
DIRECT OUTPUT	DIRECT JOBS
$0.4B Nursery & Floriculture	3,700 jobs Nursery & Floriculture
$3.7B Landscape & Horticultural Services	59,800 jobs Landscape & Horticultural Services
+ $3.3B INDIRECT & INDUCED	+ 21,700 INDIRECT & INDUCED JOBS
$7.5B TOTAL OUTPUT	**85,200 TOTAL JOBS**

Floriculture, Nursey, and Related Operations in PA, NJ, and NY, 2017

	Number of Operations			Sales		
	Pennsylvania	New Jersey	New York	Pennsylvania	New Jersey	New York
Floriculture	1,558	662	1,377	$204,690,000	$179,732,000	$184,655,000
Nursery	678	640	522	$100,920,000	$240,974,000	$121,595,000
Propogative Materials	102	52	73	$24,169,000	$23,005,000	$19,931,000
Sod	12	33	16	$4,838,000	$28,192,000	$18,214,000
Vegetables Under Protection	689	124	601	$21,587,000	$7,976,000	$38,628,000
Fruit Under Protection	37	14	51	$149,000	$64,000	$331,000

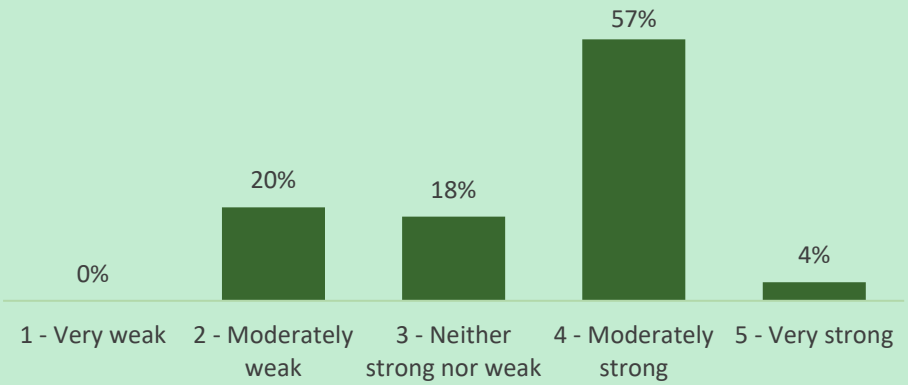
(Source: National Agriculture Statistics Service, 2017 Agricultural Census)

Future Impacts

Stakeholder Survey: Pre-COVID Sentiments

The May 2018 "*Pennsylvania Agriculture: A Look at the Economic Impact and Future Trends*" detailed the state of the agriculture industry in Pennsylvania based on routinely collected data. However, in order to have more timely feedback of Pennsylvania's agriculture industry (particularly in the context of 2020), ESI conducted a stakeholder survey in Winter 2020. The aim of this survey was to garner information about the most significant threats and opportunities facing farmers both prior to the COVID-19 pandemic and during. In terms of the overall **pre-COVID state of the industry, over 60 percent noted that they believe the industry to be moderately or very strong** while 20 percent of respondents believe the industry to be in a moderately weak position. When asked about the most significant factors impacting the success of the sector, labor supply and quality as well as low commodity prices, increased regulations, and limited local processors were recorded as the top five responses.

Q: Thinking back to the time before COVID, what was the condition of the agriculture industry in PA?



Q: Prior to the COVID crisis, what were the most significant factors impacting the success of agriculture in PA? (Select up to 5)

Top Selections (% of respondents selecting as one of five)

1	Labor Supply (60%)
2	Commodity Prices (38%)
3	Environmental Regulations (30%)
4	Lack of Local Processors (28%)
5	Labor Quality (28%)

Percent of respondents rating the following programs from the PA Farm Bill as "somewhat effective" or "very effective":

61%	Resources for Business Development and Succession Planning
52%	Protections for Pennsylvania Agriculture
50%	New Market Opportunities, Investments in Organic
50%	Reduced Regulatory Burdens, Strengthened Ag Business Climate
46%	Increased Processing Capabilities
43%	Building a Strong Agricultural Workforce

Source: ESI Stakeholder Survey, January 2021

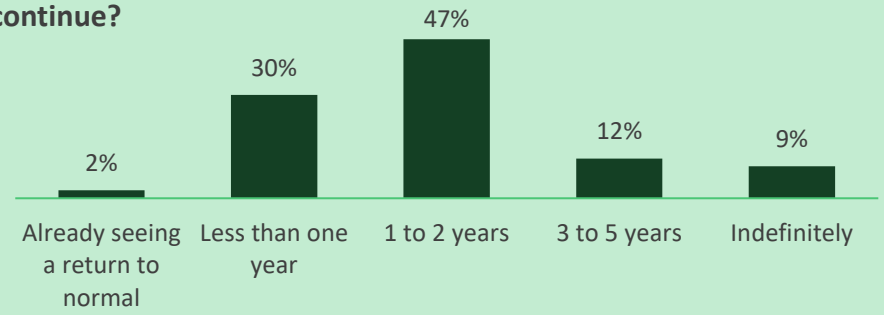
COVID-19 Impact on Pennsylvania Agriculture

The economic information and analysis in this update report provides a picture of where Pennsylvania's agriculture industry stood prior to two crucial events – the passage and implementation of the PA Farm Bill and, of course, the COVID-19 pandemic which spread across Pennsylvania and the country beginning in March 2020 and has profoundly impacted national food and agriculture supply chains. Pennsylvania farmers and others in the agricultural sectors were negatively impacted. Key issues cited by stakeholders in surveys and roundtables conducted for this report included:

- **Health and safety requirements put in place to limit the spread of the virus** led to cash-flow issues from increased expenditures for PPE, business interruptions, and the need to revamp production and business models.
- **Workforce shortages** as a result of worker safety concerns and COVID-related issues, resulting in labor shortages due to health concerns, lack of childcare and school closures, immigration restrictions, and competition from other industries.
- **Disruptions in market distribution channels**, caused by loss of business from shuttered restaurants, schools, and other institutional purchasers impacted by shutdowns, and a shift to growing demand from grocers, packaged meal providers, and other direct to consumer outlets.

As the crisis continued, Pennsylvania farmers and producers were forced to adapt to this changing landscape, aided by existing and new government programs and innovating on the fly to meet the new realities they faced.

Q: How long do you expect these impacts from COVID-19 to continue?



They:

- **Accessed government COVID-relief loan and grant programs –** With the support of the Department of Agriculture, local government and economic development officials and their local financial institutions, Pennsylvania agriculture stakeholders used federal and state funds to help sustain and adapt their operations during the crisis. Programs like the federal Payroll Protection Program (PPP), Economic Injury Disaster Loans (EIDL), SBA Loan forgiveness programs and state and local government grant programs using federal, state, and local resources all were crucial to survival.
- **Federal support for food assistance** -- The Federal Corona Food Assistance Program provided $353 million to PA communities for pandemic-related food support. This provided an important source of funding for PA farmers supporting local efforts across the Commonwealth and strengthened connections between PA farmers and food support networks across the state. .
- **Accessed existing resources and networks –** PA farmers and agricultural businesses also leveraged existing resources and networks to support their repositioning efforts. Webinars and information from industry associations, the Penn State extension program, the Department of Agriculture and local business associations all were cited as key source of industry knowledge and support during the rapidly evolving pandemic and economic crisis.

Recovery Priorities

While still amid the pandemic, plans for recovery are top of mind for Pennsylvania agriculture stakeholders. In our survey and roundtables, they highlighted some key priorities for successful recovery:

- Access to vaccines for employees and adequate PPE
- Labor supply chain assistance
- Access to capital to upgrade equipment and technology
- Need for entrepreneurship assistance to support business growth
- Expanded broadband access to facilitate new business models
- Help navigating federal and state funding programs
- Assistance navigating changes in communications/business processes

COVID-19 Impact on Pennsylvania Agriculture

The Pandemic Response Reveals Strengths, Weaknesses, Opportunities, Threats

The COVID-19 pandemic has identified factors that allow for a renewed look at the strengths, weaknesses, opportunities, and threats (SWOT) facing Pennsylvania agriculture. In many cases, these are not merely pandemic-related issues, but the pandemic has put more of a focus on the need to build on the strengths, address the weaknesses, seize the opportunities, and confront the threats facing the industry.

Strengths realized during COVID

- Growth of direct-to-consumer market, helped by Pennsylvania Farm Bill programs
- Growth of interest in fresh food purchases at local grocery, markets, and farmers markets
- Consumer recognition of fresh food/organic value, and their willingness to spend more on organics, helping margins
- Fast recovery of garden centers/landscaping due to increased interest in sprucing up homes and businesses, particularly as people spent more time at home and in their backyards
- Specialty food and goods, a strength in PA, fared better in crisis due to adaptability
- Urban agriculture growth accelerated, with more city residents interested in growing their own food or patronizing local markets

Opportunities/Strengths

- If Pennsylvania helps to build and support the systems and infrastructure needed to support a shift to direct-to-consumer sales, it will expand the potential customer base for Pennsylvania farmers
- Long term shifts in buying habits will benefit PA's organic and direct to consumer efforts and take advantage of programs already in place from the PA Farm Bill
- Home yard improvement trends should allow PA landscapers and gardeners to capitalize on pent-up demand
- As the crisis ends and economy recovers, PA already has programs and funding in place as a result of Farm Bill progress – should be a competitive advantage

Weaknesses exposed during COVID

- The fragility of the food service and restaurant industry economic model
- Workforce challenges – COVID only accentuated how hard it is to attract, retain employees in agriculture
- PPE supply/cost and facility safety issues revealed lack of preparedness for crisis
- Small farmers had difficulty accessing public support due to lack of connections to loan and grant providers
- Supply chain challenges due to crisis revealed supply/demand mismatch

Threats/Weaknesses

- Food service/restaurant industry decline due to COVID impact is permanent and disrupts supply chain
- Workforce skill and supply issues grow– demographic shifts, immigration limits, safety concerns make it difficult to attract and retain employees over the long-term
- Long-term financial sustainability after government funding ends is a concern, particularly if the economic recovery is sluggish

Long-Term Opportunities and Threats for PA Agriculture

Opportunities

In addition to the opportunities identified during the COVID pandemic, Pennsylvania agriculture has other opportunities to improve economic performance and success:

- **New trade, immigration policies –** With a new administration in Washington, there will likely be new trade and immigration policies. Pennsylvania farmers will benefit from trade policies that support agricultural priorities. Similarly, Pennsylvania farmers rely on immigrants as a key element of their labor force and will benefit from comprehensive immigration reform that supports a predictable flow of quality labor to Pennsylvania farms and producers.
- **Grow apprenticeship programs –** As farms and producers have adopted and integrated more technology, there is a need for more highly skilled workers. Pennsylvania has some great examples of agricultural apprenticeship programs but needs to take those to scale to reap the full benefits and support the workforce of the future.
- **Adoption of resilient/conservation practices –** The Pennsylvania Farm Bill's emphasis on conservation and resilient practices has positioned Pennsylvania to adapt to climate change with greater focus on environmentally safe practices.
- **Organic and sustainable demand –** Pennsylvania's investment in promotion of organic and sustainable farming has matched growth in interest for organic and sustainable food. This provides an opportunity for improved margins and promotion of PA farm products to a broader marketplace.
- **Urban agriculture interest and investment –** COVID-19 only accelerated the trend towards urban agriculture, and potential expansion of Pennsylvania urban agriculture programs could pay off due to increased demand for local food, potential urban employment opportunities, and sustainable land-use and development.
- **Growth in hemp products**– Pennsylvania's success in promoting the hemp industry in PA bodes well for promoting future innovations and adaptations.
- **Increased awareness of state/federal programs –** A positive outcome of the pandemic has been increased awareness and use of federal and state farm programs, and an increased recognition by government leaders of the importance of agriculture to the state economy and community well-being.

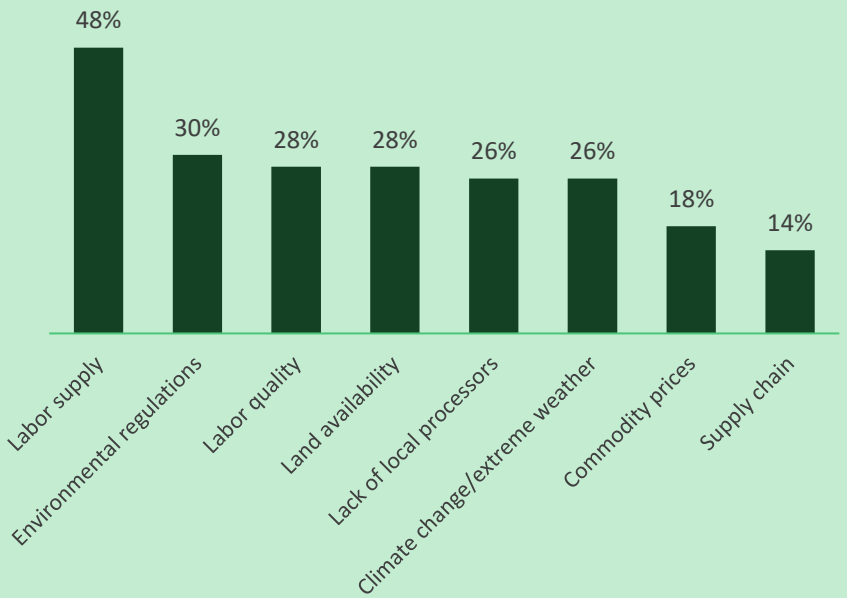
Long-Term Opportunities and Threats for PA Agriculture

Threats

In addition to the immense challenges associated with COVID-19, threats facing Pennsylvania's agriculture going forward include:

- **Workforce, workforce, workforce –** In every roundtable discussion, it was agreed that the biggest long-term threat to Pennsylvania agriculture is the inability to attract and retain high-quality workers. A sustainable workforce requires a focus on addressing:
  - The need for advanced technological skills due to adoption and increased use of automation and technology
  - Wage competition from rising wages in retail and other competitive workplaces
  - Anti-immigration sentiments, threatening the ability of farms to attract a growing pool of workers.
- **Climate Change –** Heat and extreme weather patterns are disrupting PA farms and adding costs due to new environmental regulations.
- **Water access, availability and quality –** In Pennsylvania, we often take water for granted. But with pressure from suburban sprawl and climate change, we need to focus and invest in farmers and producers to access clean and safe water, as well as to manage stormwater safely.
- **Loss of small farms** – Pennsylvania is characterized by smaller farms than other states, but as we saw in the economic trends, Pennsylvania is facing a significant loss of its small farms due to gentrification, land loss, or lack of succession planning, as well as economic threats due to commodity pricing and rising technology costs.

Q: What are the biggest future threats or challenges that the agricultural industry is facing in PA? (Select up to 5)



Pennsylvania Agriculture Policy Going Forward

Pennsylvania has laid a strong base of policy for the future of the agricultural industry through the collaborative work of farmers, producers, industry associations, the PA Department of Agriculture and other state and local government partners on the PA Farm Bill and other innovative policy and economic development strategies. But it will take even greater collaboration and strategic thinking to continue the progress through the COVID recovery and an uncertain future economic environment. Based on our economic analysis and the survey and roundtable insights we received from key stakeholders, the following are areas requiring focus and attention for future success:

- **Workforce development must be a priority** – Almost every conversation and topic involving agriculture in Pennsylvania has a focus on the need for a continued emphasis on workforce development. Expanded apprenticeships and access to immigrant labor are keys to providing a high quality and plentiful workforce. In addition, there is a need to expand awareness of the opportunities that are available in agriculture, as well as how technology has fundamentally changed the industry.
- **Research and better understand supply chain issues and challenges going forward beyond COVID** – it will be important to track and understand the supply chain trends that solidify after the COVID disruption. Are the changes permanent or are we looking at an expanded marketplace – and how do we make sure Pennsylvania farmers and producers benefit from new opportunities?
- **Support growth of and access for rural internet and broadband –** The need for fast, reliable internet access for all communities has been accelerated by the COVID disruption. With 31% of PA farms still lacking access to broadband, Pennsylvania must prioritize expanded broadband access for all communities and explore the training and incentives necessary to support the competitiveness of the state's small farmers and producers.
- **Invest in agricultural infrastructure –** As technology becomes more important in agricultural production, processing and distribution, it will be important to develop financing and support for investments in new technology, as well as in needed cold chain distribution centers. In addition, continued investment in non-agricultural infrastructure, including roads, bridges, water systems and stormwater management, will support the success of the sector.
- **Build on connections with food support network –** The COVID-19 economic crisis revealed the challenges that many Pennsylvanian's have with food insecurity, and the important role that PA farmers and producers play in supporting the needs of PA communities. It will be important to review what we have learned during the pandemic and build stronger ties and connections to reduce food insecurity in PA.
- **Support business needs of PA agricultural industry** – It will be important to leverage the growth of online programming due to COVID and expand the offerings of Penn State extension and similar programs for business, entrepreneurship, communications and use of technology. In addition, building stronger business networks, including connections to financial and economic development institutions, will help to support the financial sustainability of Pennsylvania farms and specialized agricultural producers.
- **Strengthen and support organic promotion and enforcement** – Pennsylvania has had an early emphasis on promoting organic products from PA producers. However, with 76% growth in farms and 800% in sales from 2012 to 2017, and more growth during the pandemic it will be important to remain aggressive in both expanding promotion and enforcement to support early and current adopters of Pennsylvania's organic standards.
- **Expand urban agriculture programs and opportunities** – The next frontier for agriculture in Pennsylvania will occur in urban communities, as vertical and indoor farming expands, as well as urban land reclamation will allow for more availability. Commonwealth programs and policies will need to be inclusive of urban opportunities, and additional supports and promotions may be required.

pennsylvania
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Acknowledgements
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