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## The Role of State-inspected Slaughter in the U.S. Pork Supply Chain: Survey and Analysis

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## **Executive Summary**

The COVID-19 pandemic and other capacity-restricting events have motivated state and federal governments to invest over \$100 million in grants for state-inspected meat processing plants. This paper evaluates the role of state-inspected plants in U.S. pork production and analyzes survey data from state-inspected plants and officials. The results of the survey indicate that most state-inspected plants are "small" or "very small," which is reflected in their production levels. All non-federally inspected slaughter, which includes both state-inspected and custom-exempt processing, accounted for just 0.6 percent of all U.S. hog slaughter in 2020 and less than 0.5 percent in top-hog-producing states. For the ten states that reported totals, state-inspected hog slaughter accounted for about 45 percent of all non-federally inspected slaughter and just 0.2 percent of total hog slaughter in 2020. Although these plants are small, they were able to increase production and provide additional local slaughter capacity during COVID-19 shutdowns. From 2019 to 2020, non-federally inspected slaughter totals increased by 11.2 percent after years of decline. Over this same period, 47 state-inspected survey respondents indicated that their annual slaughter totals increased by 25.4 percent on average. Funding from the CARES Act and other pandemic relief sources likely supported this effort.

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## **Background**

In response to disruptions caused by the COVID-19 pandemic, state and federal governments have placed a renewed focus on improving the resiliency of the food supply chain. Pandemic-related events led to intense supply- and demand-side shocks that resulted in severe disruption to all levels of food production in 2020. Due to the unique structure of various food supply chains, these shocks impacted each industry in different ways. For the U.S. pork industry, the trouble began in March 2020 and continued throughout the spring and summer months. Stay-at-home orders dramatically impacted the demand for specific pork products<sup>1</sup>, COVID-19 outbreaks caused packing plant closures, and a reduction in packing capacity caused bottlenecks at the farm level. In worst-case scenarios, pork producers had no choice but to euthanize market-ready hogs when no slaughter or processing space was available. This sequence of events led many industry experts to begin questioning how the resiliency of the U.S. pork supply chain may be improved to prevent future disruption (Hayes et al. 2020).

One proposed solution to this problem has been to invest in state-inspected slaughter and processing facilities to increase total packing plant capacity and improve accessibility to local processing options. State slaughter and processing facilities are typically smaller than federally inspected plants, and they are inspected by their respective state departments rather than by the USDA. The size, capacity, and location of these plants will be further discussed in subsequent sections.

In addition to the pandemic-motivated desire for increased supply-chain resiliency, support for smaller meat processors has been on the rise as concern about concentration in the meatpacking industry grows. The Economic Research Service (ERS) reported in 2010 that of the 611 USDA-certified hog slaughter facilities in the country, 12 plants accounted for more than 50 percent of federally inspected hog slaughter. The COVID-19 related shutdowns served as a reminder that the pork supply chain is dependent on a relatively small number of very large-scale slaughter facilities. A U.S. District Court ruling in May 2021 reinforced this issue by striking down a provision of the USDA's New Swine Inspection System (NSIS) that allowed for increased line speeds and a more modern pork inspection process. If upheld, this ruling will ultimately result in slowed production at six affected plants leading to a projected 2.5 percent reduction in overall hog slaughter capacity (Hayes 2021). Small hog producers surrounding the affected plants will likely face higher transportation costs and lower prices received from packers, resulting in a less competitive market and increased consolidation within the industry (Hayes 2021). The negative industry impacts associated with the NSIS ruling provide additional motivation for research into state-inspected slaughter facilities and their potential to help make up some of the lost capacity.

The culmination of interest in improving supply chain resiliency and increasing pork slaughter capacity has led to numerous legislative efforts at the state and federal level and has helped motivate recent USDA funding initiatives. This paper will contribute to the discussion by

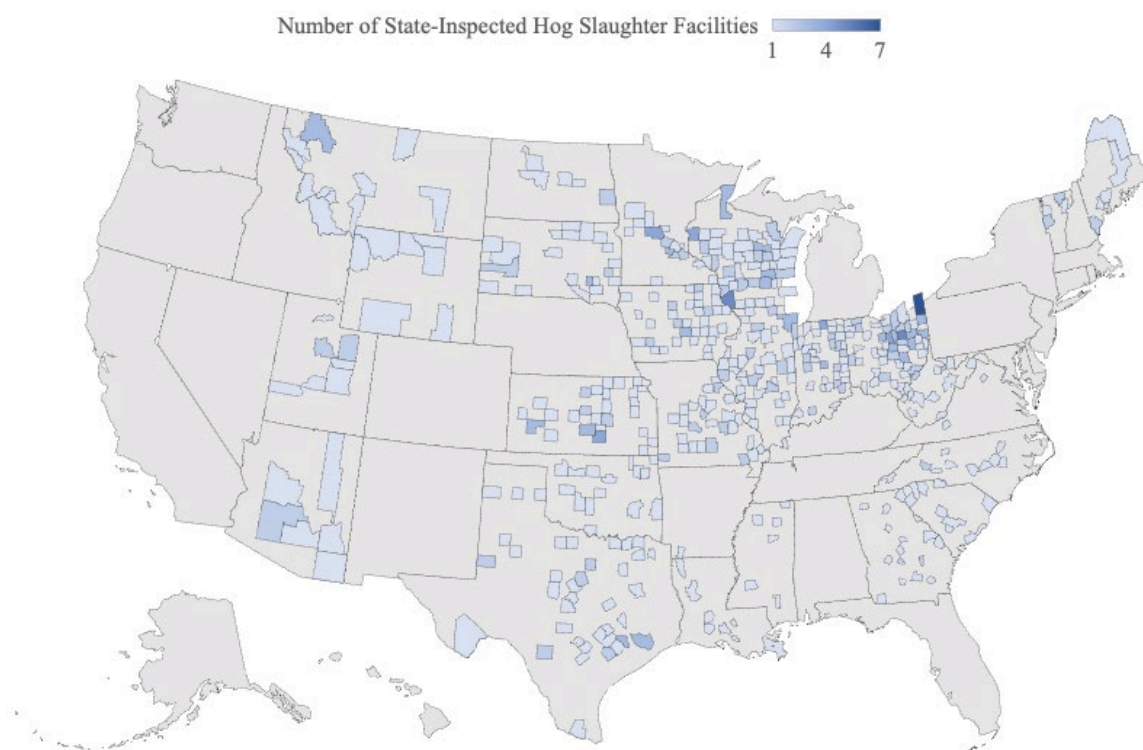
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<sup>1</sup> Restaurant closings and a reduction in food service business caused the demand and price for pork bellies to fall, but at home consumption increased demand for other cuts, i.e., pork loins and boneless hams (Hayes et al. 2020).

assessing state-inspected slaughter plants and their ability to supplement the U.S. pork supply chain. This includes a demographic analysis of state-inspected slaughter plants, an evaluation of the USDA's Cooperative Interstate Shipment program, and a summary of survey data collected from state inspection officials and state-inspected plants.

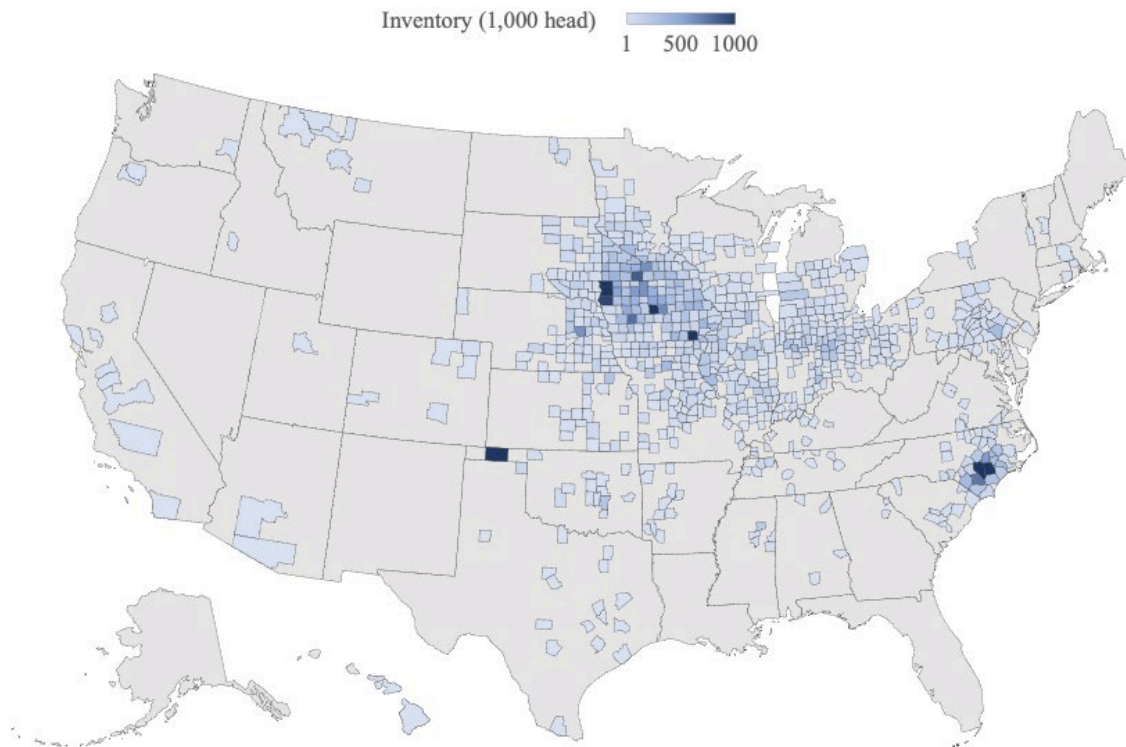
### **Demographic Analysis of State Inspected Slaughter Plants**

State slaughter and processing facilities are governed and inspected by their respective state inspection departments. Each state department works in conjunction with the U.S. Department of Agriculture (USDA) to ensure that their food safety protocols are "at least equal to" those of federally inspected plants (NASDA 2021). The phrase "at least equal to" means that state-inspection protocols need not be identical to federal procedures in terms of equipment, recordkeeping, information systems, etc., but that the state system must be "at least equal" in terms of upholding food safety and inspection integrity. In 2006 the National Association of State Departments of Agriculture (NASDA) estimated there to be 1,900 state-inspected meat and poultry slaughter and processing facilities in the U.S. Currently, 27 states operate a state-inspection program, and an estimated 604 establishments engage in hog slaughter specifically. Nearly all state-inspected plants process multiple species. Figure 1 shows the number and location of state-inspected pork slaughter facilities by county. Figure 2 illustrates the distribution of hog inventories for all counties with over 1,000 head in inventories during the 2017 Census of Agriculture.



**Figure 1. State-inspected pork slaughter facilities by county.**

*Source:* Establishment directories published by state departments.



**Figure 2. Hog inventories by county.**

*Source:* 2017 Census of Agriculture, NASS.

*Note:* Map includes only counties with inventories greater than 1,000 head.

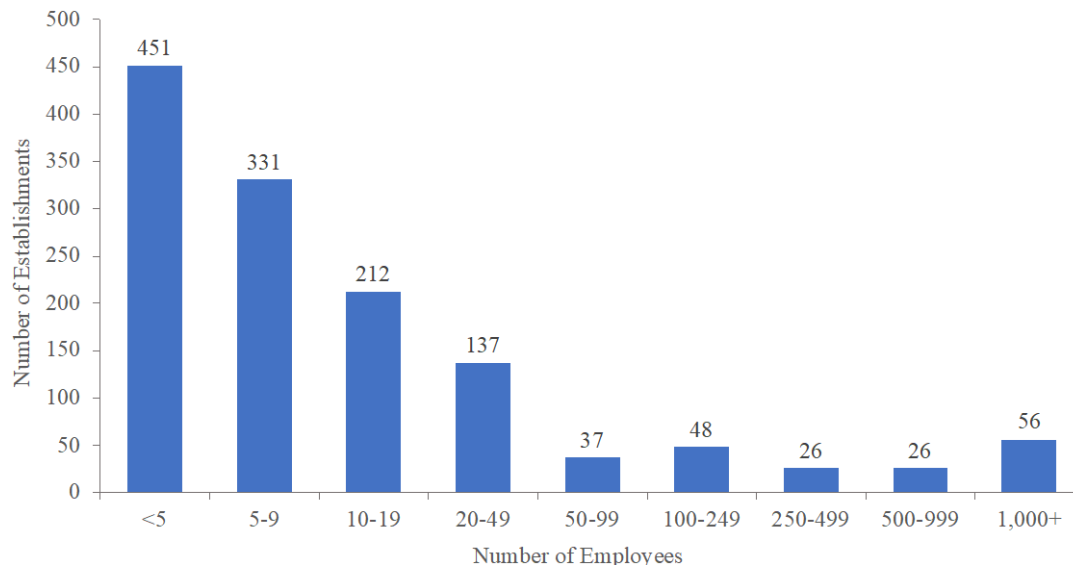
Looking at Figures 1 and 2, it is evident that many top-hog-producing states have a state inspection program. Nearly 90 percent<sup>2</sup> of total U.S. hog slaughter occurs in the 27 states that operate their own inspection programs. However, state-inspected slaughter is not necessarily giving these states a significant boost in terms of pork production. Non-federally inspected (NFI) slaughter is a measure that includes state-inspected, custom-exempt<sup>3</sup>, and on-farm slaughter. In the 27 states with a state inspection program, NFI slaughter accounts for an average of 22 percent of a state's total slaughter. However, among top pork-producing states like Iowa, Minnesota, Illinois, Oklahoma, Indiana, and Missouri, NFI slaughter accounts for less than 0.5 percent of total slaughter on average.

Most state-inspected slaughter facilities would be classified as "small" or "very small" by the USDA's Food Safety Inspection Service (FSIS). A "small" facility employs between 10 and 499 people, and "very small" facilities have less than 10 employees. Figure 3 shows the distribution of all meat slaughter facilities in the country in 2019. This information comes from the U.S. Census Bureau's County Business Patterns (CBP) and includes establishments whose primary business activity is animal slaughter, classified as NAICS 311611. This NAICS coded industry

<sup>2</sup> Hog slaughter totals for North Carolina, South Dakota, Kansas, and Virginia were not reported in 2020. Total slaughter values for these states were approximated using available data and the last reported values.

<sup>3</sup> Custom exempt slaughter plants are not required to prove compliance with state or federal inspection standards. Meat processed at custom-exempt facilities is for private use and cannot be sold commercially (Johnson et al. 2012).

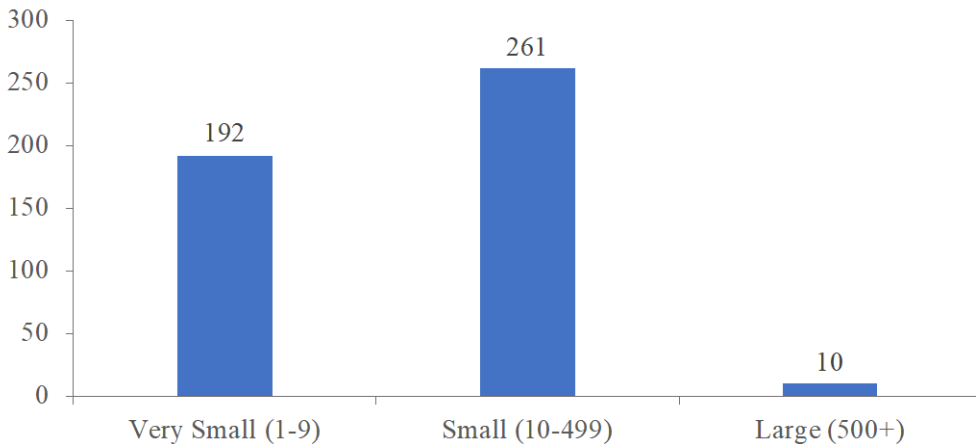
excludes poultry and may also exclude some businesses that provide slaughtering services but bring in more revenue from their value-added processing activities.



**Figure 3. Size distribution of U.S. meat slaughter facilities.**

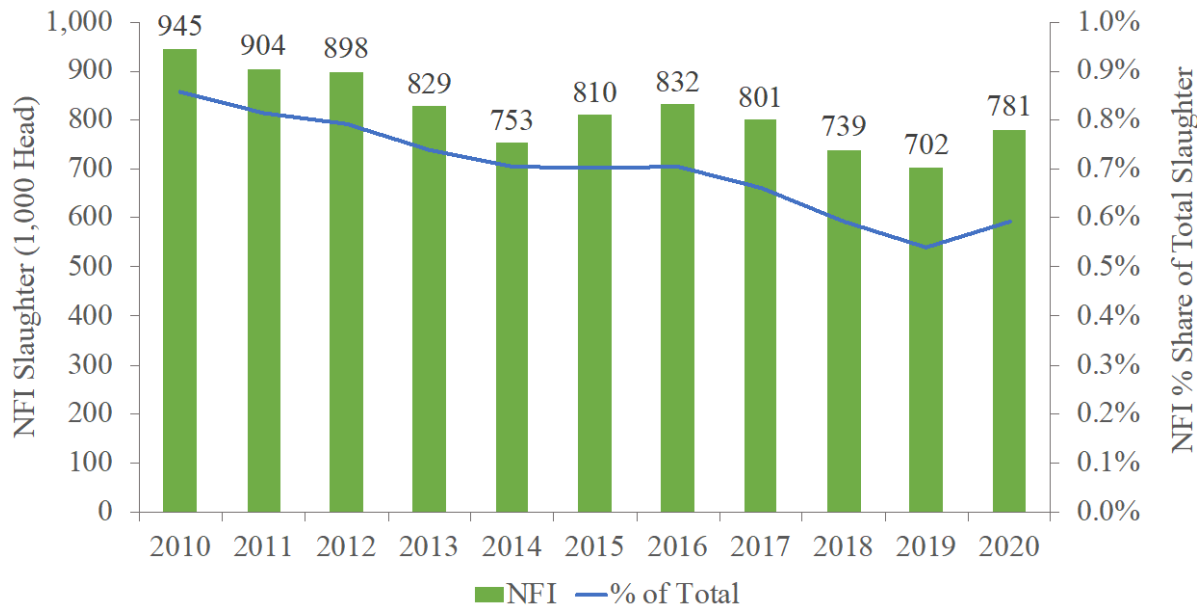
*Source:* 2019 County Business Pattern Tables, U.S. Census Bureau.

The CBP data does not allow state-inspected plants to be disaggregated, but FSIS publishes a directory of federally inspected establishments and their size classification. Subtracting the federal distribution from the total produces an approximate distribution of non-federally inspected slaughter facilities in the U.S. whose primary business is animal slaughter rather than processing. Note that the CBP data is from 2019 and the FSIS information was generated in May 2021, so the total distribution will not equal federal plus non-federal establishment counts. This is because several new state-inspected plants have opened between 2019 and 2021, and information on FSIS plants from 2019 was not available. Figure 4 shows that most non-federally inspected facilities are small or very small.



**Figure 4. Size distribution of non-federally inspected U.S. meat slaughter facilities.**  
 Source: 2019 County Business Pattern Tables, U.S. Census Bureau.

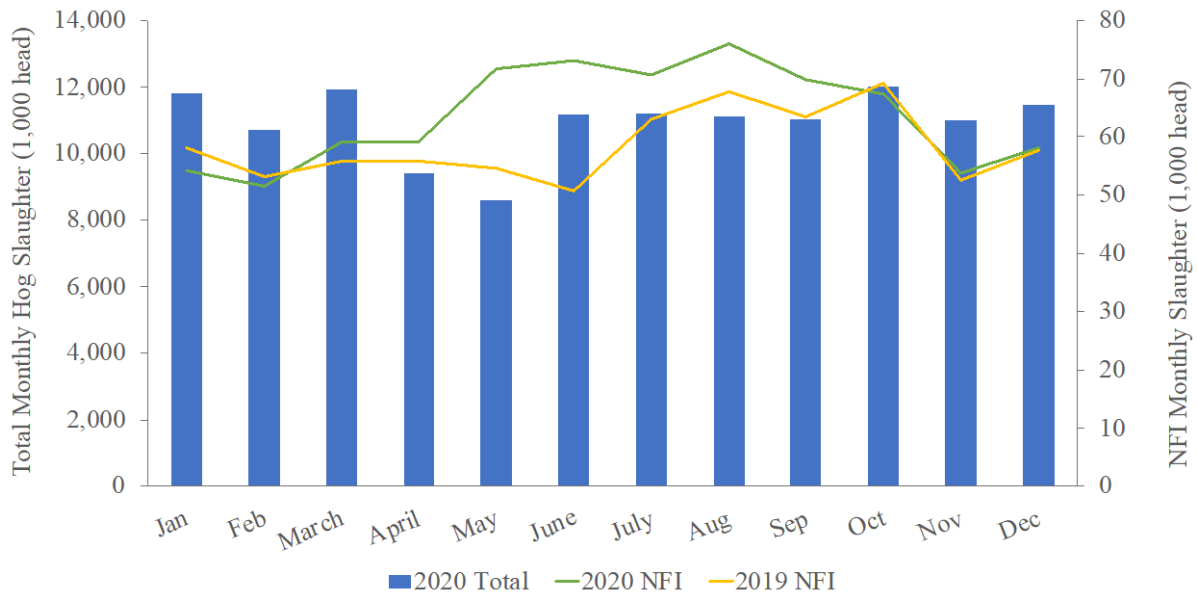
In terms of production, all of these plants also comprise a small percentage of total hog slaughter. Figure 5 shows that since 2010, non-federally inspected slaughter has accounted for less than one percent of total U.S. hog slaughter. Although hog production and commercial slaughter totals have been growing, NFI slaughter has seen an overall decline in the last decade. From 2010 to 2020, NFI slaughter decreased 17.4 percent while total U.S. commercial slaughter increased 19.3 percent. Thus, the percent share of total slaughter comprised by NFI plants decreased from 0.86 percent in 2010 to 0.59 percent in 2020.



**Figure 5. Non-federally inspected slaughter totals and percent share of total slaughter.**

Source: NASS.





**Figure 6. Total vs. Non-Federally Inspected Monthly Slaughter Totals**

Source: NASS.

Though the 10-year trend in NFI slaughter is negative, there was an increase in NFI slaughter in 2020 that can likely be attributed to large packing plant shutdowns brought on by COVID-19. The shutdown and slowdown of packing plant operations led to as much as a 45% decline in daily U.S. slaughter capacity in the spring of 2020 (Cowley 2020). This issue is illustrated in Figure 6, where 2020 NFI slaughter rises well above 2019 levels in April and May and remains above 2019 levels until the fourth quarter. At its highest point in August 2020, NFI monthly slaughter totaled 74,900 hogs which was just 0.67 percent of total slaughter.

As previously mentioned, the measure of non-federally inspected slaughter includes state-inspected, custom exempt, and on-farm slaughter. State-inspected slaughter numbers are not published by the USDA, but many states were willing to share their state-level totals for this paper. The available data show that an even smaller proportion of total slaughter comes from state-inspected plants than from all NFI sources. Table 1 below shows total, NFI, and state-inspected slaughter totals in 2020. State-inspected slaughter accounts for 45.0 percent of all NFI slaughter and just 0.2 percent of total slaughter in states with available data. This indicates that a significant portion of NFI slaughter, especially in states like Iowa, must come from custom-exempt slaughter for private consumption.

**Table 1. Total, NFI, and State-Inspected Slaughter Totals in 2020 (measured in head)**

State	Total Slaughter	NFI Slaughter	State-Inspected Slaughter	State-Inspected as % of NFI	State-Inspected as % of Total
IA	40,346,700	36,107	5,199	14.4	0.01
MN	12,013,700	34,924	8,538	24.4	0.1
IN	8,641,200	47,648	31,406	65.9	0.4
MO**	8,632,800	37,566	8,654	23.0	0.1
WI	865,300	47,118	43,965	93.3	5.1
SC	93,800	50,018	16,471	32.9	17.6
WY	4,700	*	827	*	17.6
AZ	1,700	*	1,265	*	74.4
NC	*	*	42,249	*	*
VA	*	*	196	*	*
Total	70,599,900	253,381	158,470	45.0	0.2

\* Indicates state total not reported by NASS in 2020.

\*\*Missouri's state-inspected slaughter total includes all red meat species and likely overstates the state-inspected share of total hog slaughter.

In a survey<sup>4</sup> conducted with state-inspected slaughter facilities in nine top hog-producing states, participants were asked about their estimated weekly slaughter capacity and annual hog slaughter totals. Note that survey respondents account for about 14 percent of a state's total slaughter plants on average. The results of 49 responses are displayed in Table 2 below as an average for each survey state.

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<sup>4</sup> Survey design and response distributions are detailed in Section 3 and Appendix A.

**Table 2. Average Weekly Hog Slaughter Capacity and Average Annual Hog Slaughter Totals**

State	Average Weekly Capacity	Average Annual Slaughter (2016-2020)
Illinois	16	568
Indiana	42	583
Iowa	17	585
Minnesota	29	862
Missouri	17	675
North Carolina**	200+	4,000+
Ohio	17	397
Oklahoma	*	*
Wisconsin	19	523

\* No responses received from state-inspected plants in Oklahoma.

\*\*The sole respondent from North Carolina disclosed weekly but not annual slaughter totals. Total was approximated based on total state slaughter, number of establishments, and weekly capacity reported by the plant.

While many state-inspected plants run at a very small capacity and comprise a minor share of the total pork supply, their potential importance to the U.S. pork supply chain was put on display during the COVID-19 pandemic. During large plant shutdowns and panic-buying behaviors at grocery stores, state-inspected and custom-exempt meat processors played an important role in local food supply chains. Pork producers relied on local processors to provide a small amount of excess slaughter capacity, and pork consumers began sourcing more meat products from their local lockers, resulting in an inundation of business at these plants. In the previously mentioned survey of slaughter establishments in top-hog-producing states, respondents reportedly increased their hog slaughter totals by 25.4 percent on average from 2019 to 2020. For the 10 states that are represented in Table 1, the total number of hogs slaughtered at state inspected plants increased 31.0 percent from 2019 to 2020.

The surge of non-federally inspected slaughter in 2020 was made possible in part by the Coronavirus Aid, Relief, and Economic Security (CARES) Act. The CARES Act allocated millions of dollars to states which were distributed as grants to small meat processors. In most cases, these grants were intended to help small meat processors expand their operations and support the increased demand for meat products and slaughter capacity (IDALS 2021). As the meatpacking industry continues to face capacity issues such as the NSIS ruling and cyber-attacks, industry experts and policymakers seem to be increasingly interested in supporting state-inspected and custom-exempt meat processors.

#### *The Cooperative Interstate Shipment (CIS) Program*

There are currently many barriers preventing state-inspected plants from increasing production to supplement the U.S. pork supply. In addition to labor shortages and cost-related inefficiencies, state-inspected plants are limited to doing business via intrastate commerce, meaning they are only permitted to sell and distribute their products within the state where the meat originates (NASDA 2021). Because of this, state-inspected plants were limited in their

ability to supply meat products and add inspected slaughter capacity during times of crisis in the spring of 2020.

One way for state-inspected facilities to increase their market access is to participate in a USDA Food Safety and Inspection Service (FSIS) initiative called the Cooperative Interstate Shipment (CIS) program. This program was created by a provision in the 2008 Farm Bill and was launched in 2012. The CIS program allows state-inspected plants to participate in interstate and international commerce, enjoying virtually all the same marketing freedoms as federally inspected plants. States can become eligible for this program by working with the USDA to ensure that they are able to conduct inspections in accordance with FSIS standards. This includes using the same information system and lab equipment as FSIS. State-inspected facilities that are located in a CIS state and have fewer than 25 employees are eligible for the program (FSIS 2021). To become certified, a business submits an application to the state, receives a visit from state inspectors to flag any potential issues, and hosts a visit from federal inspectors to check that all requirements are met. Once approved, CIS participants continue working with their state inspection department, but state inspectors receive federal training to ensure that CIS facilities continue meeting all FSIS requirements.

While this program has the potential to help state-inspected plants reach new markets, it may not be a universal solution. Depending on how closely a state's inspection protocols align with FSIS, the program's requirements may make CIS eligibility quite expensive for some state departments and unattainable for many state-inspected plants. Small and very-small plants with less than 25 employees may not be able to justify the capital expenditure required to convert their systems and equipment, and slightly larger plants with more business activity likely would not qualify for the program. Furthermore, many small plants also offer custom-exempt slaughter and may be best suited to serve their local communities rather than distribute inspected product. The CIS program has been active for nearly ten years but has just 93 participants within nine states, including the addition of South Dakota in June 2021. Of these 93 participants, an estimated 23 CIS-certified establishments are slaughter facilities (FSIS 2021).

### **Survey Results and Analysis**

To better understand the scale of state-inspected slaughter facilities and their interest in interstate shipment, a survey was sent via email to 242 hog slaughter establishments. The selected establishments are located in the top pork-producing states of Iowa, Illinois, Indiana, Minnesota, Missouri, North Carolina, Ohio, and Oklahoma. Because the Cooperative Interstate Shipment program is a point of interest for the study, the survey was also sent to pork slaughter plants in Wisconsin, the state with the second greatest number of CIS-certified facilities. There are approximately 380 facilities believed to slaughter hogs within the nine selected survey states. Of this number, 242 businesses could be reached by email and thus received the survey. There were 60 responses to the survey resulting in a 25% response rate. Table 3 shows the distribution of responses, and more information can be found in Appendix A.

**Table 3. Distribution of Survey Responses by State**

	IA	IN	MO	OH	WI	MN	IL	OK	NC
Total Hog Slaughter Plants	41	47	35	96	69	23	45	14	11
Surveys Sent	27	25	23	55	64	15	25	6	3
CIS Responses	1	1	0	1	3	Not CIS Eligible			
Non-CIS Responses	5	8	6	12	10	5	7	0	1
Total Responses	6	9	6	13	13	5	7	0	1
Response Rate	22%	36%	26%	24%	20%	33%	28%	0%	33%
% Of Total Represented	15%	19%	17%	14%	19%	22%	16%	0%	9%

Survey participants were first asked to classify their business to ensure that the response came from a slaughter facility. Some respondents indicated that their business performed processing activities only, but these responses were still included in the analysis related to interstate shipment and expansion. The survey asked plants to identify the percentage of their total hog slaughter that was state-inspected rather than custom-exempt, the number of employees, their CIS eligibility or interest, and the impact that interstate shipment eligibility might have on their intentions to expand the business. The responses to these questions are summarized in Table 4 as a percentage of all respondents for each question.

**Table 4. Results of Selected Survey Questions, Reported as a Percentage of Responses**

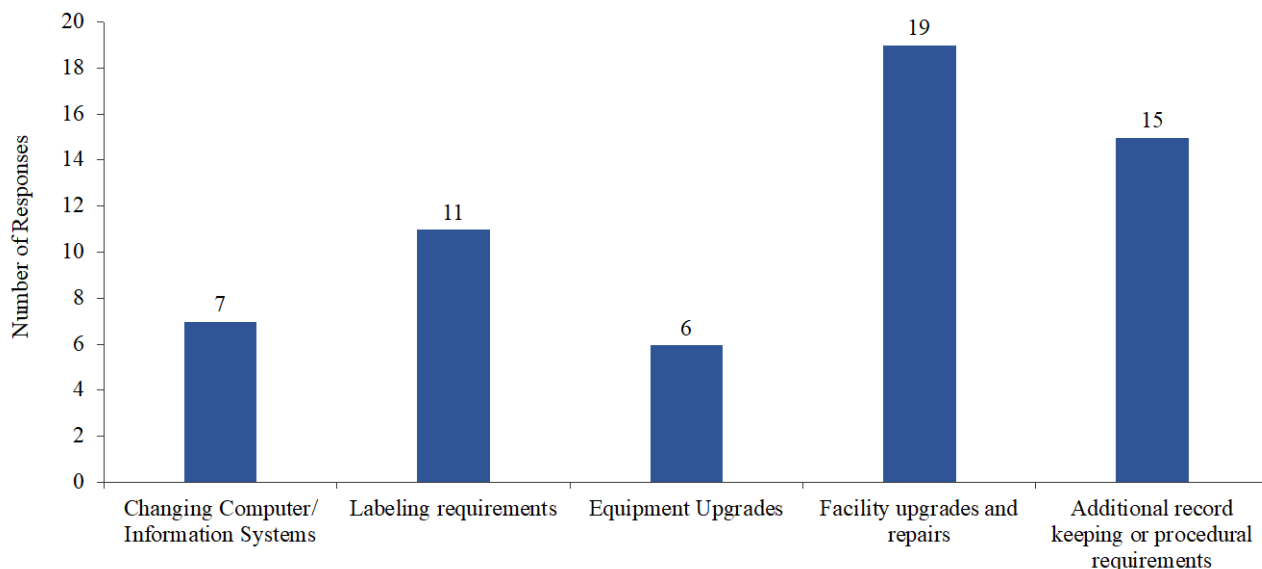
<b>Classification:</b>				
<u>State-Inspected Slaughter and Further Processing</u>	<u>State-Inspected AND Custom Slaughter and Further Processing</u>		<u>State-Inspected Slaughter Only</u>	<u>State-Inspected Processing Only</u>
23.3%	70.0%		1.7%	5.0%
<b>Percentage of total hog slaughter that is state inspected:</b>				
<u>0-20%</u>	<u>20-40%</u>	<u>40-60%</u>	<u>60-80%</u>	<u>80-100%</u>
24.5%	7.5%	5.7%	3.8%	58.5%
<b>Number of Employees:</b>				
<u>1-10</u>	<u>10-20</u>	<u>20-30</u>	<u>30-40</u>	<u>40+</u>
49.2%	42.4%	3.4%	0.0%	5.1%
<b>For CIS States: Are you CIS eligible?</b>				
<u>Yes, and CIS certified</u>	<u>Yes, but not participating</u>	<u>No, not eligible</u>	<u>Unsure/Unfamiliar</u>	
13.3%	60.0%	6.7%	20.0%	
<b>For Non-CIS States: What is your level of interest in the CIS program?</b>				
<u>Very interested, we would apply for CIS</u>	<u>Somewhat interested, we would want to learn more</u>		<u>Not interested</u>	<u>Unsure</u>
41.7%	33.3%		8.3%	16.7%
<b>Likelihood of expanding business if granted interstate shipment eligibility:</b>				
<u>Very likely</u>	<u>Somewhat likely</u>	<u>Somewhat unlikely</u>	<u>Very unlikely</u>	<u>Unsure</u>
24.5%	41.5%	9.4%	17.0%	7.5%

*Note:* Not all questions were answered by all respondents. See Appendix A for the full list of survey questions.

The results in Table 4 indicate that 70 percent of respondents were state-inspected slaughter and processing facilities that also offer custom processing. For over 58 percent of respondents, state-inspected work makes up 80-100 percent of their business, but for 25 percent of plants, inspected work accounts for less than 20 percent. Furthermore, over 90 percent of plants represented in the survey have between 1 and 20 employees. When asked about CIS eligibility, 60 percent of respondents from CIS states were aware of the program but not participating, 13 percent of plants were CIS certified, and 20 percent were unfamiliar with the program. In non-

CIS states, more than 75 percent of respondents were at least somewhat interested in the CIS program, with 42 percent saying that they would apply for the program if it was available. Although many noted concerns about labor, nearly 70 percent of respondents said they would be at least somewhat likely to increase slaughter capacity if granted interstate shipment eligibility.

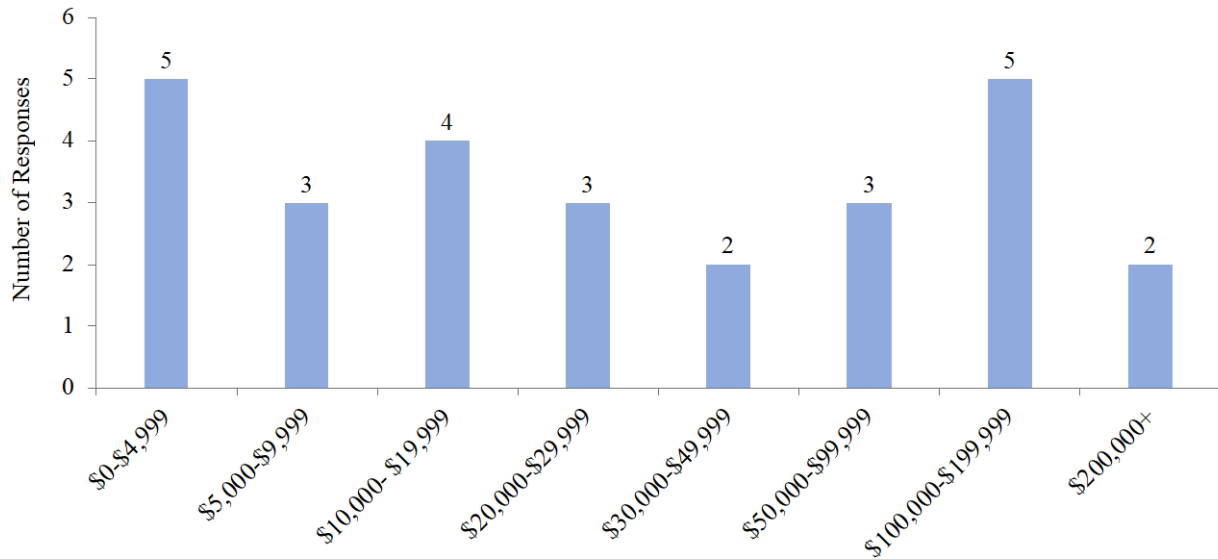
Survey participants were asked which aspects of their current facility would be the most expensive or difficult to transition from state to federal inspection standards. The most common response category was facility upgrades and repairs (33%), followed by additional recordkeeping (26%) and labeling requirements (19%). Figure 7 shows the distribution of responses.



**Figure 7. Responses to the question: "What would be the most difficult or expensive part of transitioning from state to federal standards?"**

When asked about the cost of making these changes, 19 percent of respondents estimated that the required investment would be under \$5,000, while an equal percentage estimated costs to be between \$100,000 and \$199,999. Fifteen percent of respondents estimated that they would spend between \$10,000 and \$19,999 to transition from state to federal standards. The average

cost estimate across all states was nearly \$52,000, and the distribution of responses is summarized in Figure 8.



**Figure 8. Estimated cost of meeting USDA inspection criteria.**

The open-ended question of estimated cost yielded the lowest response rate with just 27 estimates from 60 completed surveys. However, it may be one of the most valuable pieces of information collected from participants. Although a small percentage of businesses are represented in each state, the relative "ease" at which a plant feels they could meet USDA standards appears to match up with current CIS participation within states. Table 5 shows the average cost estimate for each state as well as the current status of CIS participation in that state.



**Table 5. Estimated Cost of CIS Certification and CIS Participation by State**

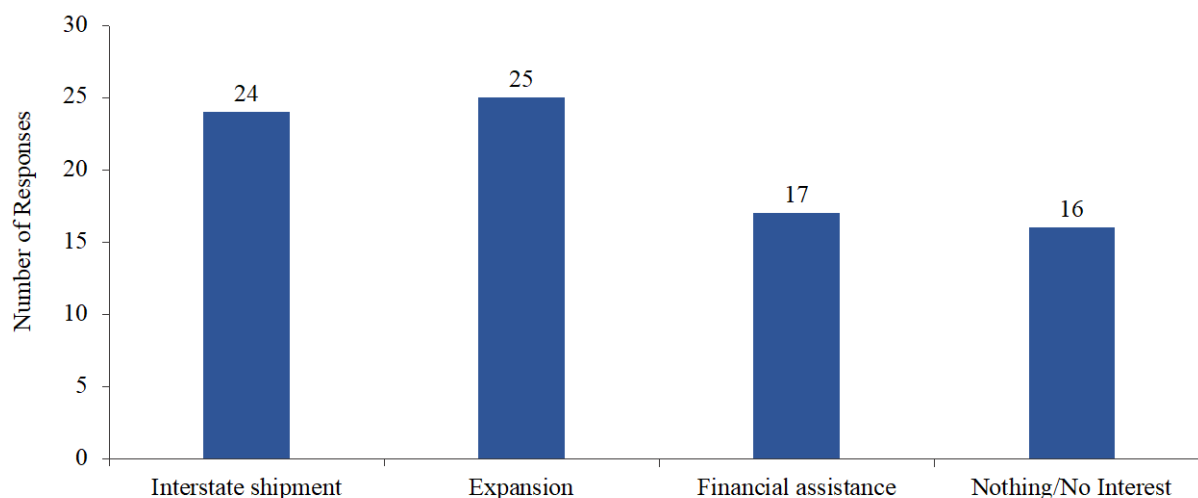
State	Number of Estimates Reported	Average Cost Estimate	CIS Participation Status
OH	4	\$4,625	32 Total, 7 Slaughter
WI	9	\$40,625	23 Total, 5 Slaughter
IN	5	\$42,020	18 Total, 4 Slaughter
IA	2	\$50,125	10 Total, 2 Slaughter
MO	1	\$100,000	2 Total, 0 Slaughter
IL	1	\$11,000	Not Participating
MN	5	\$117,000	Not Participating
Total/Average	27	\$52,199	85 Total, 18 Slaughter

If we ignore the single response from Illinois, it seems that the lowest cost estimates are associated with the highest CIS participation rates. This is not a claim of causality, but it may serve as evidence that some states and state-inspected plants have an easier time obtaining CIS certification depending on how closely their state program aligns with USDA protocols. For example, the state of Iowa was already using the Public Health Information System (PHIS) that is used by FSIS, but a state that uses a different system may incur additional costs when applying for CIS eligibility. The Iowa Meat Inspection Bureau initially estimated the state's cost of meeting CIS requirements to be \$200,000. This includes trainings for state inspectors, which were less expensive when conducted virtually, and some lab equipment purchases. The department shared that no CIS applicants in Iowa have had to make substantial changes beyond standard repairs, cleaning, and revising the language of their procedures. They also reported that all plants that have undergone a federal visit have passed and received CIS certification. State inspection programs can get up to 50 percent of their inspection costs reimbursed by FSIS, and once certified, CIS states are eligible for up to 60 percent cost reimbursement (FSIS 2021). However, this may not be enough to incentivize some states to adopt the program. Officials with the Minnesota Dairy and Meat Inspection Division stated that even with the 60 percent reimbursement rate, the added costs of starting and operating the program were not financially feasible.

At the individual plant level, each business decides which inspection option they are best suited for based on their size, business model, expansion intentions, and the incentives to change. For some plants, interstate shipment is not a priority, but for others, reaching new markets may allow the business to expand. There are several factors that may influence a plant's decision to seek CIS eligibility or switch from state to federal inspection. One of the most important factors, based on conversations with the Iowa Meat Inspection Bureau, is a plant's proximity to a border. Plants that are located near state lines may have more opportunities and lower costs associated with distributing their products outside of the state. Appendix B contains maps of each state in the survey and the number of state-inspected pork slaughter establishments in each county, providing a visual representation of how close each state's inspected plants are to the border. Another important factor is a plant's relationships with potential buyers. A state-inspected slaughter facility in Minnesota shared that they have several out-of-state retailers interested in

their products, so they have begun investigating the costs associated with switching to federal inspection. More generally, each plant must weigh the costs of making upgrades and switching programs with the potential benefits and funding incentives offered to do so.

Aside from CIS participation, the only other way for state-inspected establishments to gain interstate shipment eligibility is to become federally inspected. For facilities outside of CIS eligible states or for those that do not meet the CIS criteria, federal inspection may be a better option. Survey participants were asked what factors might motivate them to switch from state to federal inspection and were given a multiple-choice list to choose from. The list included interstate shipment eligibility, expanding their business, potential opportunities for financial assistance, or nothing/no interest. The most selected factors were expanding the business (30%) and interstate shipment (29%). Note that respondents could select more than one factor. However, out of 52 individual respondents, 16 said that nothing would motivate them to become federally inspected. Figure 9 summarizes the responses.



**Figure 9. Potentially motivating factors of becoming federally inspected.**

Starting in March 2020, allocations from the Coronavirus Aid, Relief, and Economic Security (CARES) Act have funded grants for small to medium sized meat processors in Iowa (\$4 million), Indiana (\$4 million), South Dakota (\$5 million), Washington (\$4.6 million), Kentucky (\$2 million), Arkansas (\$5 million), Missouri (\$17 million), Oklahoma (\$10 million), and other states in the U.S. The Consolidated Appropriations Act, passed in December 2020, added an additional \$60 million in grants for small meat processors to upgrade their facilities, and \$200,000 in grants could be used to help small facilities meet USDA inspection standards and achieve interstate shipment eligibility (American Farm Bureau 2021, Bodine 2021, Eddington 2020, IDALS 2021, Investopedia 2021, WSDA 2021).

In Iowa specifically, funding was allocated through three different types of grants. The grant type most related to this study was the Business Improvement Grant, which awarded funding to 109 meat and poultry facilities to purchase or upgrade equipment. This grant stipulated that

facility improvements must allow the business to "increase its processing capacity to accommodate the increased demands brought on by the COVID-19 pandemic." Custom-exempt plants could also put this funding towards becoming inspected, and state-inspected plants could use funding to offset the costs of CIS certification (IDALS 2021). In Missouri, over \$17 million in grants were awarded and the number of state-inspected meat and poultry processing plants have doubled (Harker 2021). Grants in South Dakota, awarded to promote the expansion of slaughter and processing operations, are expected to fund at least 16 new facilities and 83 existing facilities (Shaffer 2021). Since the start of the COVID-19 pandemic, many other states have awarded grants to state-inspected and custom-exempt meat processors incentivizing them to expand their operations, seek interstate shipment eligibility, and support the U.S. meat supply chain. In June 2021, the USDA announced an additional \$4 billion in pandemic aid that would be directed to a few targeted groups including meat processors (Abbott 2021).

Survey participants were asked how potential state or USDA funding initiatives could help them increase capacity and expand. This was an open-ended question, but similar responses were categorized and are displayed in Table 6. Thirty-two percent of responses were related to labor and training programs. Many respondents left comments about their struggles with finding quality applicants and the cost and time expenditures associated with training. Several respondents commented that labor shortages are the most limiting factor in terms of business growth. Nineteen percent of respondents listed both facility and equipment upgrades as potential uses of funding. Although, a few plants indicated that equipment and facility upgrades would be targeted towards increasing efficiency so that less labor would be required to accomplish the same level of production. Other responses were related to making CIS status more financially attainable and streamlining the entire inspection process, including having more state inspectors available.

**Table 6. How could USDA or state funding be directed to motivate an increase in slaughter capacity?**

<u>Response</u>	<u>Number of Responses</u>
Labor and training	12
Equipment upgrades	7
Facility/ infrastructure upgrades	7
Assisting with the costs of applying for CIS	4
Expanding the business	2
Adding cooler/ freezer space	2
Hiring more inspectors	1
Assisting with debt load from startup	1
Streamlining the inspection process	1

## **Conclusion**

The demographic analysis and survey results indicate that state-inspected plants are small, and they operate on a very small scale. Non-federally inspected slaughter accounts for less than 0.6 percent of total U.S. slaughter, and state-inspected slaughter makes up an even smaller proportion. The survey results, though limited in scope, indicate that state-inspected plants in most top-hog-producing states have an average weekly slaughter capacity of between 16 and 42 hogs, and they average between 400 and 900 hogs annually. To understand how small-scale each of these plants truly is, recall that Iowa has an estimated 41 state-inspected hog slaughter facilities, and the 2020 state-wide state-inspected slaughter total was 5,199 hogs. To put this in perspective, there is a large, USDA inspected packing plant within the state of Iowa that processes 19,500 hogs each day and accounts for nearly 4 percent of U.S. pork processing capacity (Eller 2020). This means that one large plant can do in one day roughly four times what all state-inspected plants in Iowa could do in one year. No amount of funding or surges in production would allow state-inspected plants to make up for even a slight disruption at this large plant.

However, state-inspected plants have shown throughout the COVID-19 pandemic and large plant shutdowns that, with funding support, they are able to increase capacity. Recall that from 2019 to 2020, state-inspected survey respondents increased their annual slaughter totals by over 25 percent on average. Total non-federally inspected slaughter also increased by over 11 percent during this time, and of the ten states with available data, state-inspected slaughter numbers increased nearly 31 percent from 2019 to 2020. This points to the possibility that non-federally inspected slaughter establishments may be capable of capturing and sustaining a larger share of total slaughter. Because most state-inspected slaughter plants are located in the states and counties with the greatest hog inventories, investing in local processing options may help increase local slaughter capacity, decrease transportation costs, and improve market competition for small or specialized hog producers.

To meet the goals of future funding initiatives most effectively, many state-inspected plants will likely need to seek interstate shipment eligibility. In its first ten years, the Cooperative Interstate Shipment (CIS) program has seen relatively low levels of participation, especially among slaughter facilities. However, two of the program's nine participating states only just became CIS eligible since the beginning of 2020, and they will likely see higher rates of CIS certification in the next few years. The Iowa Meat Inspection Bureau indicated that they have several slaughter facilities currently in the application process. The survey responses identify areas that plant operators view as the most difficult or expensive to transition to federal standards, and they estimate the cost of making these changes. This information could be used to allocate grants or low-interest loans specifically for CIS certification or the transition to federal inspection.

Due to limited resources and data availability, this study was somewhat limited in scope. For future work on this issue, I recommend conducting a formal evaluation of the CIS program once its recent state participants have been active for several years. For more comprehensive survey data, I would recommend incorporating phone calls and follow-up emails to reach a greater percentage of state-inspected establishments. The events that occurred in 2020 related to the

COVID-19 pandemic were unprecedented, and 2021 may be too soon to be analyzing the outcome that it had on the meatpacking industry. As more data becomes available, I would recommend conducting an updated analysis and perhaps investigating the impact that federal and state grants have had on small meat processors, including custom-exempt facilities.

## References

- Abbot, C. "USDA to implement up to \$4 billion in pandemic aid through mid-August." *Successful Farming*, June 16, 2021.
- Bodine, S. "\$60 million to Help Expand Small Meat Processors Included in New Coronavirus Aid Bill." *Farms.com*, December 24, 2020.
- Cowley, C., "Covid-19 Disruptions in the U.S. Meat Supply Chain." *Federal Reserve Bank of Kansas City*, July 2020.
- Eddington, S., Anderson, R. "Farm Bureau lauds \$5 million Meat Processing Grant." *Arkansas Farm Bureau*, August 21, 2020.
- Eller, D. "Tyson reopening its Waterloo processing plant with increased safety measures for workers." *Des Moines Register*, May 6, 2020.
- Harker, J. "Nearly 150 Smaller Processing Plants Get CARES Funding." *Brownfield Ag News for America*, May 5, 2021.
- Hayes, D.J., Schulz, L.L., Hart, C.E., Jacobs, K.L., "A descriptive analysis of the COVID-19 impacts on U.S. pork, turkey, and egg markets." *Agribusiness* 37 (2020):122-141.
- Hayes, D.J. "Economic Impact of the Recent District Court Ruling Regarding Line Speeds on the U.S. Pork Industry." *Iowa State University*. May 2021.
- Iowa Department of Agriculture. "More than 200 small meat and poultry processors awarded CARES Act funds to grow their businesses." *The National Provisioner*, November 19, 2020.
- Johnson, R., Marti, D., Gwin, L. *Slaughter and Processing Options and Issues for Locally Sourced Meat*. Washington DC: USDA Economic Research Service. Livestock, Dairy, and Poultry Outlook No.24. June 2012.
- Kentucky Agricultural Development Fund. "Gov. Beshear announces \$2 million in CARES Act funds for meat processing expansion." *The National Provisioner*, November 25, 2020.
- National Association of State Departments of Agriculture (NASDA). *Interstate Meat Sales Background*. Washington, D.C., 2021.
- Shaffer, E. "Small South Dakota meat processors to get \$5 million boost." *Meat + Poultry*, June 7, 2021.
- USDA Economic Research Service (ERS). *Analysis of Previous Farm Bills*. Washington, D.C. 2014.
- USDA Economic Research Service (ERS). *Solving Processing Issues a Key to Successful Local Meat Marketing*. Washington, D.C. 2013.
- USDA Food Safety and Inspection Service (FSIS). *Cooperative Interstate Shipping Program*. Washington, D.C. 2021.
- USDA Food Safety and Inspection Service (FSIS). *Meat, Poultry and Egg Product Inspection Directory*. Washington, D.C. 2021.
- Washington State Department of Agriculture. "Relief grants for small meat processors." *Morning Ag Clips*, October 26, 2020.

## Appendix A

**Table 7. Survey Questions for CIS States (IN, IA, OH, MO, WI)**

Question	Answer Choices
1. Please select the choice that best describes your business.	<ul style="list-style-type: none"> <li>a. State-Inspected Slaughter and Further Processing</li> <li>b. State-Inspected AND Custom Slaughter and Further Processing</li> <li>c. State-Inspected Slaughter Only</li> <li>d. State-Inspected Processing Only</li> </ul>
2. Does your facility process hogs?	<ul style="list-style-type: none"> <li>a. Yes</li> <li>b. No</li> </ul>
3. How many people does your business employ?	<ul style="list-style-type: none"> <li>a. 1-10</li> <li>b. 10-20</li> <li>c. 20-30</li> <li>d. 30-40</li> <li>e. 40+</li> </ul>
<i>Only displayed for respondents who selected choice (b) for Question #1</i>	<ul style="list-style-type: none"> <li>a. 0-20%</li> <li>b. 20-40%</li> <li>c. 40-60%</li> <li>d. 60-80%</li> <li>e. 80-100%</li> </ul>
4. What proportion of hog slaughter is state-inspected (rather than custom-exempt)?	
5. What is your weekly hog slaughter capacity?	Answers reported using a sliding scale
6. Is your business eligible to participate in the Cooperative Interstate Shipment (CIS) program?	<ul style="list-style-type: none"> <li>a. Yes, and we are CIS certified</li> <li>b. Yes, but we are not participating</li> <li>c. No, we are not eligible</li> <li>d. Unsure/Unfamiliar with CIS program</li> </ul>
<i>Only displayed for respondents who chose any option other than (d) for Question #6</i>	<ul style="list-style-type: none"> <li>a. Changing computer/information systems</li> <li>b. Labeling requirements</li> <li>c. Equipment upgrades</li> <li>d. Facility upgrades/ repairs</li> <li>e. Additional recordkeeping/ procedural requirements</li> <li>f. Other (please list):</li> </ul>
7. CIS program certification requires state-inspected plants to meet federal inspection criteria. Which of the following aspects of your business would be (or were) the most difficult or expensive to transition from state to federal standards? (select all that apply)	
<i>Only displayed for respondents who chose any option other than (d) for Question #6</i>	Answer entered in text box
8. What would you estimate to be the total expenses associated with gaining CIS certification or becoming federally inspected?	
<i>Only displayed for respondents who chose option (d) for Question #6</i>	Answer entered in text box
9. CIS program certification requires state inspected plants to meet federal inspection criteria. What would you estimate to be the total expenses associated	

with gaining CIS certification or becoming federally inspected?	
10. Which of the following would motivate you to become federally inspected? (select all that apply)	<ul style="list-style-type: none"> <li>a. Interstate shipment</li> <li>b. Expanding the business</li> <li>c. Financial Assistance</li> <li>d. Nothing/ No Interest</li> <li>e. Other (please list):</li> </ul>
11. How likely would you be to expand your business (i.e., increase slaughter capacity) if state-inspected plants could engage in interstate commerce?	<ul style="list-style-type: none"> <li>a. Very likely</li> <li>b. Somewhat likely</li> <li>c. Somewhat unlikely</li> <li>d. Very unlikely</li> <li>e. Unsure</li> </ul>
12. How could funding from state or USDA initiatives best be directed to motivate state-inspected plants to seek interstate shipment and increase capacity?	Answer entered in text box
13. If willing to share, what were your annual hog slaughter totals for the past 5 years? (slide bar for each year)	2016: reported using sliding scale 2017: reported using sliding scale 2018: reported using sliding scale 2019: reported using sliding scale 2020: reported using sliding scale
14. Additional Comments	Answer entered in text box



**Table 8. Survey Questions for Non-CIS States (IL, MN, NC, OK)**

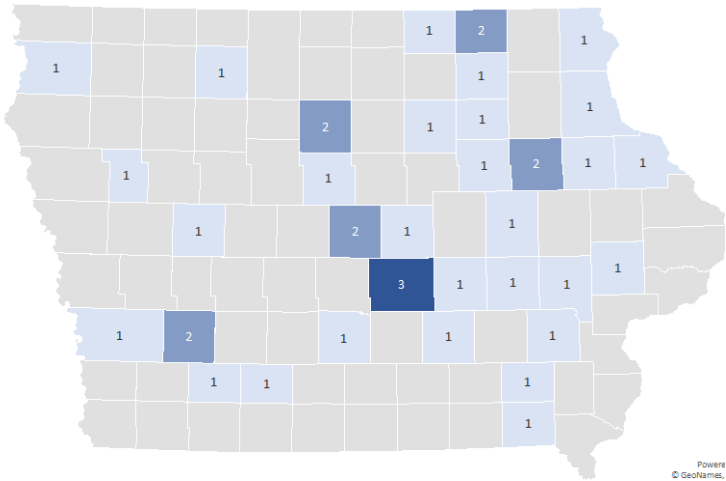
Question	Answer Choices
1. Please select the choice that best describes your business.	<ul style="list-style-type: none"> <li>a. State-Inspected Slaughter and Further Processing</li> <li>b. State-Inspected AND Custom Slaughter and Further Processing</li> <li>c. State-Inspected Slaughter Only</li> <li>d. State-Inspected Processing Only</li> </ul>
2. Does your facility process hogs?	<ul style="list-style-type: none"> <li>a. Yes</li> <li>b. No</li> </ul>
3. How many people does your business employ?	<ul style="list-style-type: none"> <li>a. 1-10</li> <li>b. 10-20</li> <li>c. 20-30</li> <li>d. 30-40</li> <li>e. 40+</li> </ul>
<p><i>Only displayed for respondents who selected choice (b) for Question #1</i></p> 4. What proportion of hog slaughter is state-inspected (rather than custom-exempt)?	<ul style="list-style-type: none"> <li>a. 0-20%</li> <li>b. 20-40%</li> <li>c. 40-60%</li> <li>d. 60-80%</li> <li>e. 80-100%</li> </ul>
5. What is your weekly hog slaughter capacity?	Answers reported using a sliding scale
6. Which of the following would motivate you to become federally inspected? (select all that apply)	<ul style="list-style-type: none"> <li>a. Interstate shipment</li> <li>b. Expanding the business</li> <li>c. Financial Assistance</li> <li>d. Nothing/ No Interest</li> <li>e. Other (please list):</li> </ul>
7. Which of the following aspects of your business would be (or were) the most difficult or expensive to transition from state to federal standards? (select all that apply)	<ul style="list-style-type: none"> <li>a. Changing computer/information systems</li> <li>b. Labeling requirements</li> <li>c. Equipment upgrades</li> <li>d. Facility upgrades/ repairs</li> <li>e. Additional recordkeeping/ procedural requirements</li> <li>f. Other (please list):</li> </ul>
8. What would you estimate to be the total expenses associated with becoming federally inspected?	Answer entered in text box
9. The Cooperative Interstate Shipment (CIS) program allows state-inspected facilities with less than 25 employees and meeting federal criteria to engage in interstate commerce. Eight states currently offer this program. If your state became CIS eligible, how interested would you be in participating?	<ul style="list-style-type: none"> <li>a. Very interested- we would apply for CIS certification</li> <li>b. Somewhat interested- we would want to learn more about it</li> <li>c. Not interested</li> <li>d. Unsure</li> </ul>
10. How likely would you be to expand your business (i.e., increase slaughter capacity) if state-inspected plants could engage in interstate commerce?	<ul style="list-style-type: none"> <li>a. Very likely</li> <li>b. Somewhat likely</li> <li>c. Somewhat unlikely</li> <li>d. Very unlikely</li> <li>e. Unsure</li> </ul>

11. How could funding from state or USDA initiatives best be directed to motivate state-inspected plants to seek interstate shipment and increase capacity?	Answer entered in text box
12. If willing to share, what were your annual hog slaughter totals for the past 5 years? (slide bar for each year)	2016: reported using sliding scale 2017: reported using sliding scale 2018: reported using sliding scale 2019: reported using sliding scale 2020: reported using sliding scale
13. Additional Comments	Answer entered in text box

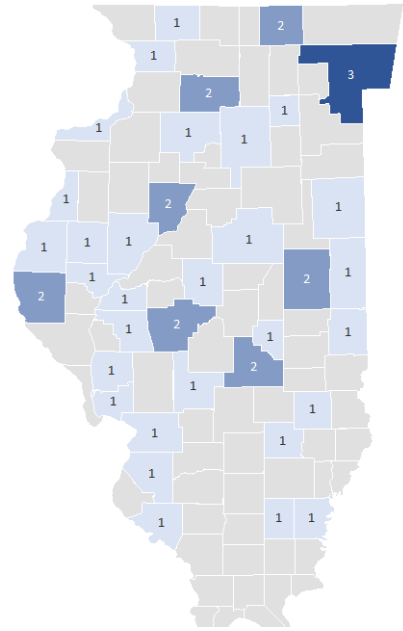
**Appendix B**

**Figures 10–18. Maps of state-inspected pork slaughter facilities by county in surveyed states.**

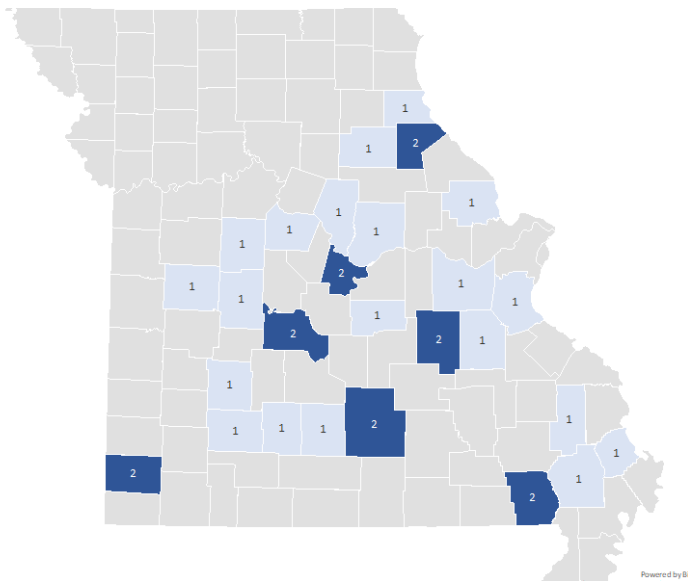
**Figure 10. Iowa.**



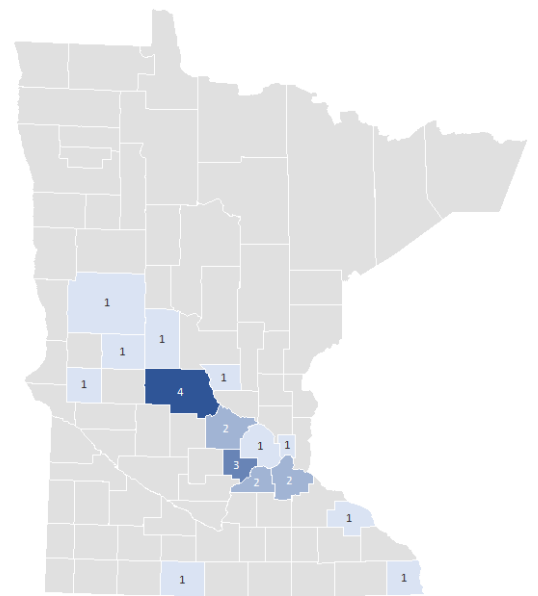
**Figure 11. Illinois.**



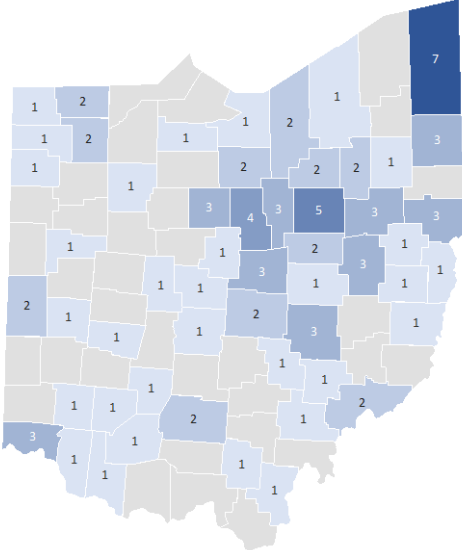
**Figure 12. Missouri.**



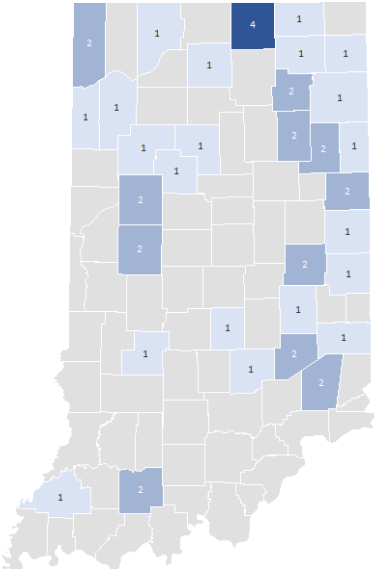
**Figure 13. Minnesota.**



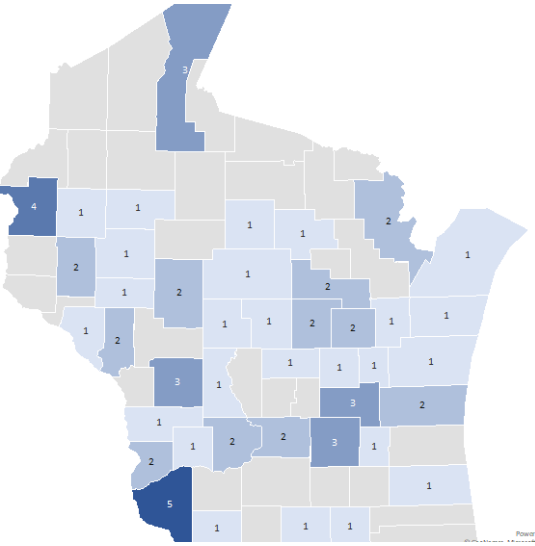
**Figure 14. Ohio.**



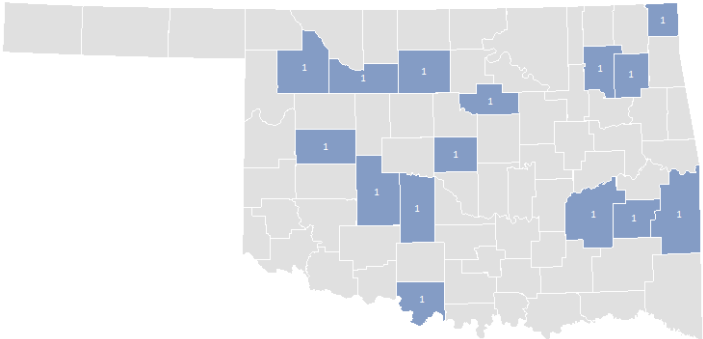
**Figure 15. Indiana.**



**Figure 16. Wisconsin.**



**Figure 17. Oklahoma.**



**Figure 18. North Carolina.**

