



Upper Midwest Meat & Poultry Processor Needs Assessment Report

Empowering Local and Regional Meat Processing in the Upper Midwest Region



Prepared by the Agricultural Utilization Research Institute for the United States Department of Agriculture, Agriculture Marketing Service

(21-TSMMSD-MN-008/AURI No. 22023)

May 2024

Acknowledgments

The Agricultural Research Institute (AURI) and The United States Department of Agriculture, Agricultural Marketing Services (USDA-AMS) would like to extend gratitude to all meat and poultry processors in the five-state region, finance working group members, regional advisory task force members, and other industry stakeholders that contributed to the efforts of the Empowering Local and Regional Meat Processors in the Upper Midwest Project.

This report was created in fulfillment of a cooperative research agreement between the United States Department of Agriculture Agricultural Marketing Service (USDA AMS) Local and Regional Foods Division (LRFD) and the Agricultural Utilization Research Institute (AURI). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the USDA. USDA is an equal opportunity provider, employer, and lender.

Table of Contents

Table of Contents	3
Background.....	4
Purpose	4
Literature Review.....	5
Introduction	5
Plant Closures and Workforce Demand Challenges.....	6
Impact on Livestock Harvest and Processing.....	8
Government Support/Policy	8
Conclusion	9
Methodology.....	9
Interview Findings.....	10
Supply Chain Challenges.....	10
Networking and Collaboration	11
Relevant Resources.....	12
Operational Efficiency.....	12
Relevant Resources.....	13
Regulatory Compliance.....	13
Relevant Resources.....	14
Workforce.....	14
Relevant Resources.....	15
Education and Training	15
Relevant Resources and Suggestions	15
Key Deliverables.....	16
Resource Database	16
Byproduct and Hide Utilization Study.....	16
Cold Storage Assessment (Local and Regional Studies)	17
Meat and Poultry Processing Short Courses.....	17
a. Finance Boot Camp.....	17
b. Short- and Long-Term Strategies for Byproduct and Hide Utilization	18
c. Transitioning a Meat Business.....	18
Recommendations	18
References	19
Appendix.....	20
Needs Assessment Interview Questionnaire.....	20

Background

In September 2021, the Agricultural Utilization Research Institute (AURI) and the United States Department of Agriculture, Agricultural Marketing Service (USDA-AMS) signed a multi-year cooperative agreement focused on the Upper Midwest's small meat and poultry processors. For purposes of this agreement, the Upper Midwest is defined as the following five states: Iowa, Minnesota, North Dakota, South Dakota, and Wisconsin.



The five-state project explored opportunities to strengthen industry resiliency and create solutions to position the meat and poultry processors for success. The project was entitled Empowering Local and Regional Meat Processing in the Upper Midwest and was designed as a regional pilot that could be emulated in other regions in the country.

A regional advisory task force provided guidance on the pilot's main pillars of work, which included understanding the financial barriers facing small meat and poultry processors, conducting a needs assessment to guide technical assistance and business development support, and developing multiple solutions to assist the industry in overcoming barriers. The task force included industry representatives from across the five-state region and convened quarterly during the pilot to advise AURI and USDA-AMS staff. Deliverables were completed in 2022 and 2023, and reporting was completed in early 2024.

This report describes the results of a needs assessment that identified bottlenecks and challenges facing the local and regional meat and poultry processing industry. Prior to conducting the needs assessment, AURI performed a literature review to inform survey questions. Based on feedback from the regional advisory task force, AURI developed several deliverables as follow-on activities. Descriptions of the deliverables are included in this report.

As a final note of introduction, AURI has a long history of supporting the meat industry to drive innovation forward. In addition to maintaining a USDA-inspected meat laboratory available for client use, AURI's meat science team offers resources and assistance related to food safety and HACCP planning, scale-up, product formulation and validation, packaging guidance, and troubleshooting. In 2022, the organization was named a technical assistance provider through the USDA-AMS Meat and Poultry Processing Technical Assistance Network (MPPTA).

Purpose

AURI conducted a needs assessment to better understand resource gaps and opportunity areas among the region's very small and small meat and poultry processors. To inform the needs assessment, AURI staff performed a literature review and worked with USDA-AMS to develop a list of interview questions. AURI conducted focus groups and one-on-one interviews with processors and

industry stakeholders. Following this, AURI facilitated conversations with two working groups: 1) the Regional Advisory Task Force and 2) the Finance Working Group (FWG) to further understand industry needs and prioritize subsequent deliverables. The Upper Midwest Meat and Poultry Processing Regional Advisory Task Force included industry representatives across the five-state region and convened quarterly during the pilot to advise AURI and USDA-AMS staff on project goals. The FWG convened finance and meat industry experts and assisted in prioritizing the pilot's finance-related deliverables.

Literature Review

Globally, in 2020, the coronavirus (COVID-19) pandemic had a significant impact on various sectors, including the meat and poultry processing industry. This literature review focused on the resiliency of the supply chain and the impacts on very small and small meat processors during this challenging period. Literature articles consisted of peer-reviewed journal articles and grey literature.

Key questions addressed were:

- What challenges did small processors experience as larger plants temporarily closed?
- How did the pandemic influence the supply chain from producers to small processors?
- Do these challenges observed in the literature correspond to responses found during the needs assessment interviews?

Introduction

In the Upper Midwest, very small and small processors contribute significantly to the meat and poultry industry. AURI set out to understand the state of these businesses in the early days of the project. It is noteworthy to distinguish the parameters of plant sizes. The United States Department of Agriculture, Food Safety Inspection Service (FSIS, 1996), and the Small Business Administration (2023) categorize meat and poultry processing establishments according to the number of employees or sales:

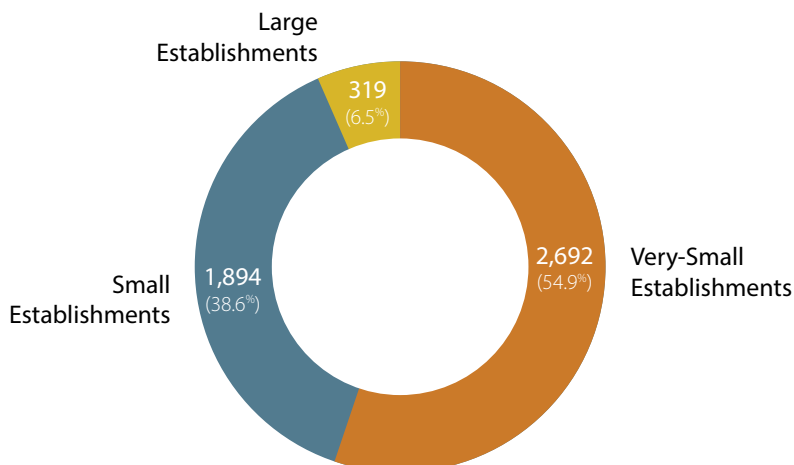
- Very small: 10 or fewer employees or less than \$2.5 million in annual sales
- Small: 11 to 499 employees
- Large: 500 or more employees

Sources: (FSIS, 1996; Small Business Administration, 2023).

Of note: there is no medium plant size definition.

The FSIS Meat, Poultry and Egg Inspection maintains a directory of all inspected meat slaughter and processing establishments in the U.S. In 2020, there were a total of 4,905 establishments:

Figure 1. Meat Slaughter and Processing Establishments in the U.S.

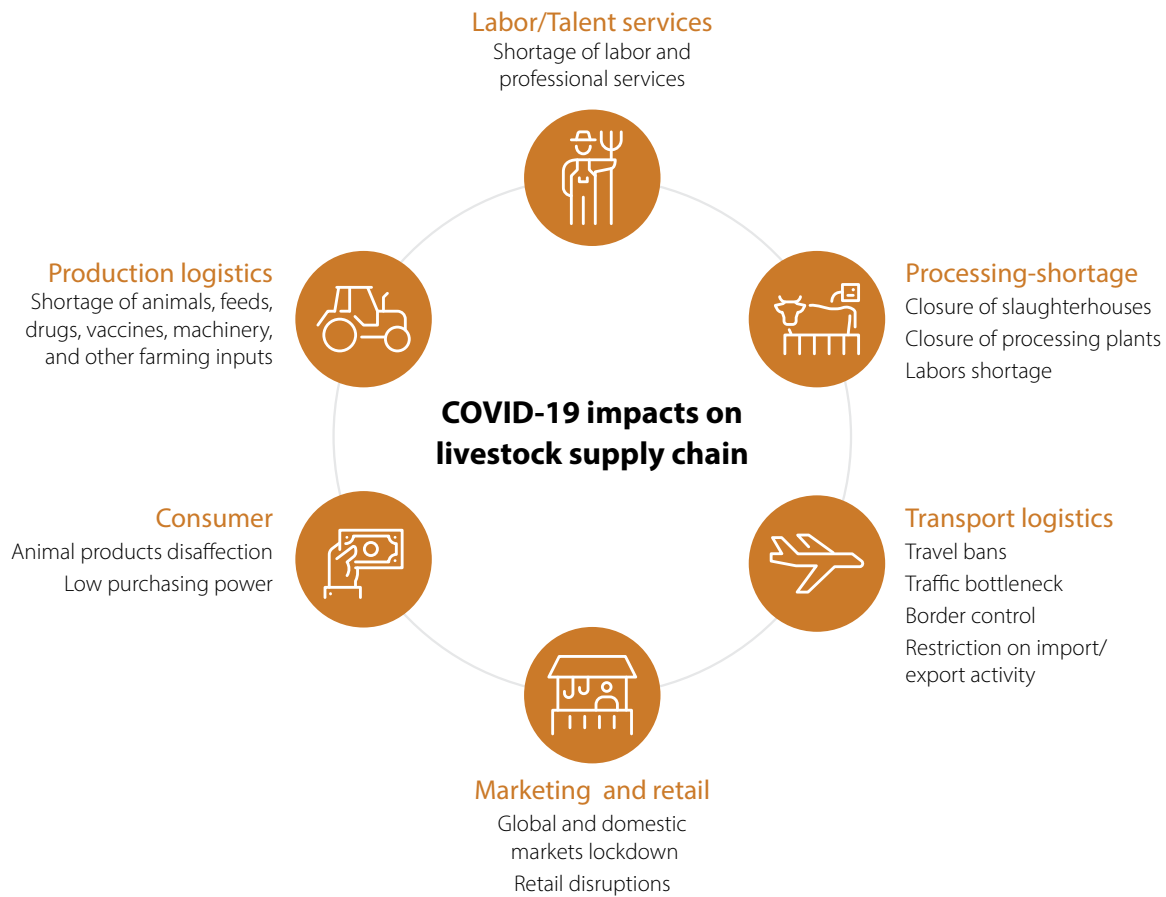


Sources: (FSIS, 2020)

University of Illinois researchers identified the factors associated with meat processing plant business survival from 1997-2020 (Isley et al., 2023). Poultry plants were excluded from the study. Some of the primary findings determined that 9.7 years is the average plant survival rate. In addition, women-managed rural plants are less likely to survive, and plants with fewer than 50 employees are also less likely to survive. Results showed that small plants' survival was related to business diversification, such as selling meat products to both rural and urban areas and utilizing various outlets to sell products.

In the early days of the COVID-19 pandemic, Executive Order 13917 established meat and poultry processing as an essential activity, therefore continuing operations to harvest and process meat (Executive Order 13917, 2020). Multiple factors impacted the meat and poultry supply chain during the COVID-19 pandemic (Rodriguez et al., 2022) (Figure 2). Supply chain challenges occurred from the producer to the consumer: including shortages of farm inputs, labor gaps, plant closings, logistical restrictions, retail disruptions, and changes in consumer purchasing habits.

Figure 2. COVID-19 Impacts on the Livestock Supply Chain



Source: Rodriguez-Morales et al., 2022

Plant Closures and Workforce Demand Challenges

As employees at large commercial packing plants tested positive for COVID-19, meat and poultry packing plants temporarily shut down or reduced the throughput of harvesting, fabricating, and processing lines. The media outlet, MEAT + POULTRY developed a real-time map of the United States highlighting the impacted large packing plants (Figure 3). A snapshot of temporary meat plant closures during the third week of November 2020 provides an illustration of the widespread COVID-19 impact on the meat industry. The interactive map allowed users to view an individual plant's operational status, including whether it had temporarily closed or reopened by date, as well as the number of employees that tested positive for COVID-19.

Figure 3. U.S. Map of Temporary Meat Plant Closures

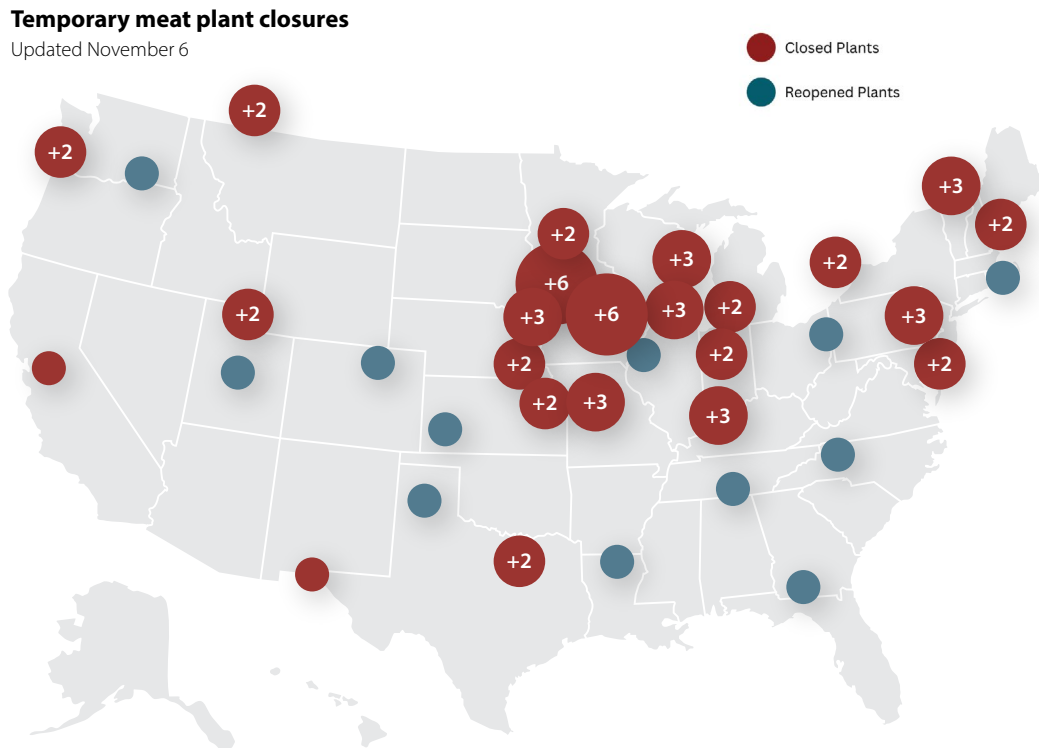


Image Source: <https://www.meatpoultry.com/articles/22993-covid-19-meat-plant-map>

The temporary closures of these large meat and poultry packing facilities resulted in very small and small-sized meat and poultry processors increasing their capacity to accommodate displaced animals. Additional hours and second shifts at local processing plants were established to process animals. To keep up with demand, several institutions nationwide with inspected meat laboratories also assisted in harvesting and processing livestock.

In larger processing facilities, employees typically stand in close proximity to one another to meet the volume and line speed of conveyor belts moving meat products throughout the facility (GAO, 2023). On the other hand, small plants have fewer employees and can accommodate social distancing with the recommended six feet of separation (CDC, 2020). In a report by the U.S. Government Accountability Office (GAO) on working conditions, employees at an FSIS-inspected plant were 70 times more likely than the general population to contract COVID-19 (GAO, 2023). For preventative measures, personal protective equipment (PPE) was utilized in plants to protect employees (OSHA), and plastic barriers were placed between workers at larger facilities. Over time, companies progressively increased the number of employees who returned to work, and plant efficiency improved.



Impact on Livestock Harvest and Processing

The pandemic caused a backlog of animal harvesting. Processing limitations resulted in farmers extending the amount of time a live animal was on the farm even though harvesting and processing animals past their target market weight impacts meat quality, carcass yield, tenderness, and additional intermuscular fat that must be trimmed (Buseman, 2020). Beef cattle typically take 13 months (400 days), hogs 6 months (118 days), and poultry 3 months (6 to 12 weeks) to reach market age and weight (Hines et al., 2023; Hamre et al., 2021). A farmer and a small processor typically agree on harvest dates one to three months in advance, but with the pandemic, packers and local processors required 10 months of planning time (Asch, 2020 & Halich, 2020). Also, farmers traveled much greater distances to access available harvest time slots.

In the more extreme cases, farmers had to resort to euthanasia. According to the National Pork Producers Council, 10 million pigs were euthanized across the country by September 2020 due to the backlog of pigs unable to be harvested (Lewis, 2020). Not only were farmers losing money by not selling their animals, but the toll and impact on the livelihoods and mental health of owners and employees was overwhelming (Successful Farming, 2020). For this particular reason, the USDA National Incident Coordination Center developed a program to help livestock farmers navigate this difficult time (Successful Farming, 2020).



Comparing 2019 to 2020, Midwestern states experienced a weekly decline in pork harvesting by 30-40% during the first three months of the pandemic (Padilla, 2021). Beef processing declined by 40% in April and May 2020 (Lusk et al., 2021). The beef industry saw revenue losses of 9.2 billion dollars (Peel, 2020). Furthermore, farmers experienced a dramatic decrease in live hog and live cattle prices (Martinez et al., 2021). Lastly, poultry production decreased 2% during the COVID-19 pandemic, resulting in a 1% reduction in chicken meat global trade (Hafez, 2020).

Government Support/Policy

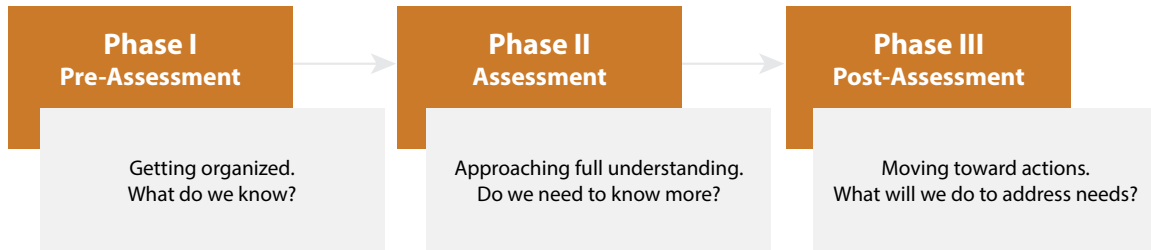
At both the federal level and in several states, government agencies developed initiatives to support the supply chain through capital infrastructure investments for meat and poultry processors. These processors included very small, small, and large plants, excluding the nationally dominant beef, pork, chicken, and poultry “big four” companies. In general, custom-exempt meat and poultry processing entities were considered ineligible, unless the custom-exempt applicant intended to obtain a Federal Grant of Inspection, FSIS Cooperative Interstate Shipment Program (CIS), or included in a state meat and poultry inspection program, as part of their grant proposal. Specific grants and loans included the Meat and Poultry Processing Expansion Program (MPPEP) Phase I and Phase II, Local Meat and Poultry Processing Capacity Grant, Meat and Poultry Inspection Readiness Grant (MPIRG), Indigenous Animal Grant, and the Intermediary Relending Loan Program (USDA, 2021). At the state level, several agriculture departments provided grants to Alleviate the burden of equipment and labor challenges at the processor level, including all five states in the Upper Midwest.

Conclusion

In summary, there were profound effects on very small and small meat and poultry processors during this time. The resilience of small meat processors during the COVID-19 pandemic is a complex issue influenced by various factors, including industry structure, government initiatives, and worker safety. Following the completion of the literature review, interviews with meat industry experts were conducted to further understand these factors and their implications and to develop strategies to enhance the resilience of the meat processing industry going forward.

Methodology

Figure 4. Needs Assessment Three-Phase Model, Credit: Altschuld and Kumar (1)



AURI followed a three-step process to assess industry needs (Figure 4). In the pre-assessment phase, the team aligned on the focus for the needs assessment to explore bottlenecks and challenges facing the regional and local meat industry in the Upper Midwest. Anecdotally, many industry issues were highlighted during the early days of the COVID-19 pandemic and generated a broad concern for the resiliency of the meat industry. The team worked to validate and understand what issues were ongoing with the goal of developing solutions and recommendations for overcoming persistent issues. This phase concluded with a literature review to better understand the issues, beyond the anecdotal.

In the second phase, the team prepared for expert interviews to further explore bottlenecks and challenges, and to understand what could be done to overcome them. In collaboration with the regional advisory task force, the team developed a list of potential participants and interview questions. USDA-AMS reviewed the questions in advance to ensure the assessment goals would be met (see appendices for a full list of questions). Forty-two processors and industry partners across the five-state region were identified to participate in the needs assessment interview process based on their affiliation with the meat and poultry sector. AURI staff contacted the 42 representatives requesting their participation in the assessment. In total, 26 participants representing 21 organizations across the five-state region of Iowa, Minnesota, North Dakota, South Dakota, and Wisconsin accepted the invitation to participate (Figure 5) in the assessment. Participants included very small and small meat and poultry processors, representatives from state meat inspector programs, and industry stakeholders (farm bureaus, farmer unions, state meat association boards of directors, and meat-cutting program instructors) (Figure 6).

Figure 5. Needs Assessment Number of Participants Interviewed by State

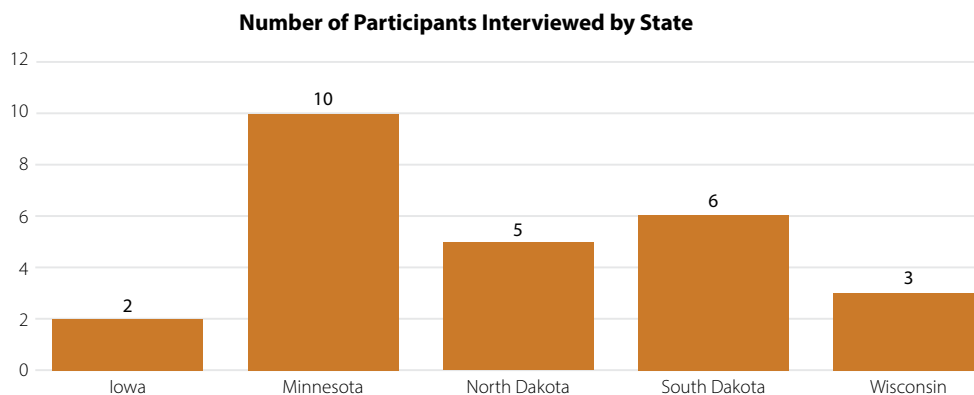
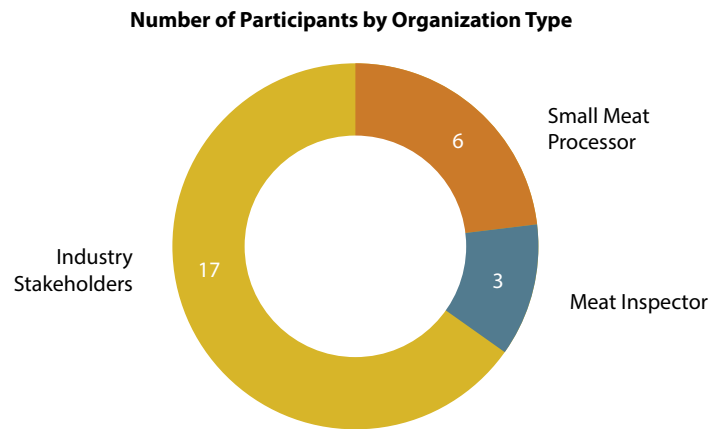


Figure 6: Number of Participants by Organization Type



Questions were provided to participants in advance to yield higher-quality interviews and minimize time commitments. Interviews were conducted virtually and in person, typically lasting 30 minutes to 60 minutes. Interviews and data collection occurred during August and September 2022.

Once interviews were completed, AURI conducted a qualitative data analysis known as Grounded Theory. Grounded Theory uses open and axial coding, which uncovers resulting themes. This analysis resulted in 575 salient statements (codes) divided into 25 categories. These 25 categories were then narrowed into six major subthemes described below in the "Findings" section.

In the final post-assessment phase, the task force prioritized several deliverables supporting resiliency in the local and regional meat processing industry. The objectives and activities for these deliverables are discussed in detail in the "Deliverables" section of this report.

Interview Findings

AURI, USDA-AMS, and the Regional Advisory Taskforce identified the six most critical categories of needs resulting from the assessment. Listed in order of priority they are:

- Supply chain challenges
- Networking and collaboration
- Operational efficiency
- Regulatory compliance
- Workforce
- Education and training

Supply Chain Challenges

Multiple processors and other participants shared COVID-19 pandemic related challenges resulting in supply chain disruptions from producer to consumer. For example, the overwhelming backlog of animals in the early period of the pandemic caused wait times for inspectors to dramatically increase. This backlog of animals also forced producers to book harvest times up to 18 months in advance with processors. While the backlog has diminished over time, many participants desired more coordination and collaboration between processors and producers. The use of contracts to secure a consistent supply of cattle months in advance of harvest dates could avoid no-shows and last-minute cancellations. This practice could also reward producers for contracting processing slots for animals and provide processing discounts to producers willing to contract a specific number of animals for delivery over a specific period. This may require producers to alter their breeding timelines, but processors would benefit from the certainty of supply compared to reacting to one-off requests.



Many interviewees noted delays in the availability of equipment, ingredients, and packaging materials necessary for efficient operations. Some noted buying band saws from deli cases rather than their normal equipment suppliers. Input prices have also risen due to inflationary pressures straining processor budgets. Processors pass these higher prices on to their customers. As a result, consumers have had to make different purchase decisions opting for smaller cuts and value products.

During the pandemic, consumers flocked to local and regional meat processors to support small businesses. Many of these consumers were new to buying from these processors and, unlike the typical pre-pandemic customer base, were not necessarily interested in buying their meat products in bulk. Rather, they were purchasing smaller cuts of meat (e.g., chops, steaks) given limited at-home storage space. This change in purchasing behavior resulted in an overstock of larger meat cuts for many small processors accustomed to selling quarters and halves, which impacted their cold storage inventory and ultimately hurt business financials.

Networking and Collaboration

Small meat processors expressed a desire to network and collaborate in their state and region. Often deeply rooted in their communities, they share common values around legacy and independence. Participants frequently referred to their interaction with other processors as important aspects of participating in state meat processing associations and trade show events. In the five-state Upper Midwest region, each state currently has its own trade association. Participants noted that building relationships with one another and having a venue to share industry information are important benefits these associations offer. While these benefits are great for members, many within the industry expressed concern related to how to reach non-members.

Peer-to-peer relationships can be beneficial for both new entrants to the industry as well as those who have been in the business for some time. Mentorship opportunities can help overcome the steep learning curve new processors encounter. Processors indicated a desire to learn about best practices and mistakes that have been made by others in order to avoid repeating them in the future. A strong network can also create connections to suppliers and vendors with a history of meeting the needs of the industry, and processors can share tips for maintaining successful relationships with livestock producers. Participants also pointed to how increased collaboration between producers and processors could result in premium marketing opportunities such as co-development of branding or a store-front location. Peer-to-peer relationships can also facilitate the development of partnerships with one another, or even producers, to collaboratively meet the needs of challenging market segments, such as schools and restaurants.

Networking can also build awareness of valuable resources. The lack of connections with business or financial experts was often mentioned by interviewees. Linkages to consultants with feasibility study expertise, financial institutions familiar with the industry,

and marketing experts were most often mentioned as important. In addition, many noted the existence of specific online tools that remain unused due to a lack of awareness, or tools that at one time were of great value but are now outdated. A centralized resource hub dedicated to the industry and maintained on an ongoing basis would be valuable.

A final concept researchers learned while conducting the interviews included processors working collaboratively to tackle capacity issues. As noted in the supply chain challenges section above, processors often complain about supply inconsistencies that alternate between being unable to accommodate the requests for animals to be harvested and/or processed and having excess capacity. While some of this variability may be due to seasonality, some is simply due to a processor's specific customer needs. Working collaboratively when there's a need for more capacity or a need for more animals could be a means to even out some of these inconsistencies.

Relevant Resources

AURI developed a resource database to address processor requests for a centralized hub. This database provides a single point to identify valuable resources and avoid wasted time and effort. The resource database will be accessible to the public via an online, searchable tool. The tool permits the user to generate customized lists of relevant resources by geography and the topical area specified by the user.

Although focused primarily on resources available in the Midwest, the resource database includes national resources that may be relevant to entities within the Midwest. Each resource includes the name of the provider and a full description of the resource. Types of resources include advocacy, business planning & development, education & training, financial assistance, regulatory assistance, and technical assistance. A link to the resource database can be found in the "Deliverables" section of this report.



Operational Efficiency

Meat cutting is the core function of a processing business that requires intensive management, leaving less time for operational activities. Small meat processors who often lack dedicated staff to handle essential tasks, such as regulatory compliance, finance, marketing, sales, and human resources, face difficult operational trade-offs. Although resources exist that describe high-level business models for local and regional meat processing businesses, there is a need for better guidance and technical assistance that helps operators balance the management of plant processing flow with regulatory compliance, managing employees, and handling other essential business tasks. Technical assistance, in particular, would benefit facility optimization, floor layout, and other process flow considerations. Likewise, benchmarking information would provide insights into how various aspects of the business could be improved through best practices or investment in new equipment and so forth. For construction or expansion, new planning templates could guide scale decisions, as well as the number of species and animals, expected payback, and other input requirements such as labor. Participants noted the slaughter side of the equation can be especially challenging economically.

In addition, smaller processors often explained that they lack the time and expertise to complete and evaluate complex business plans, feasibility analyses, marketing studies, or grant applications. Finally, resources providing equipment comparisons, options, costs and benefits would be valuable.

Furthermore, participants noted aging facilities are particularly problematic for maintaining operational efficiencies. Antiquated facilities demand extra attention and are costly to maintain, impacting a processor's bottom line as well as their future outlook in terms of resale value or a financial exit. Many processors have the desire and need to upgrade HVAC systems and/or expand cold storage space. Aging cooling systems are inefficient and limit the number of animals processed in a day. Given how costly these upgrades are, processors have difficulties securing the funds needed. Processors expressed frustration with the lack of federal grants and loans targeting custom-exempt processors. Similarly, many state and federal programs have traditionally targeted equipment upgrades rather than facility upgrades. Interviewees also relayed difficulties accessing low-interest financing, meeting feasibility study requirements and underwriting expectations, and supplementing working capital during or immediately following upgrades.

Beyond issues with upgrades, many processing facilities have significant cold storage limitations. Processors are maxed out within their current facility footprints and unable to operate at an optimal level. Sometimes, processors experience this pinch point because their customers do not pick up finished products in a timely manner. Processors that are unable to invest in expensive refrigerated or freezer space often resort to using reefer trailers or leasing space offsite. Leasing space at a third-party commercial cold storage facility is costly and challenging, given limited availability and distance from processing facilities. Cold storage limitations also reduce carcass hang times, which has a negative impact on final product quality.

Another challenge for small meat and poultry processors is adding value to non-edibles (i.e., hides, lungs, glands, bones, blood, or inedible offal). Removal of animal byproducts and hides from the processing facility was traditionally completed by renderers. Historically, processors received five to thirty-five dollars per hide depending on the quality from rendering companies. Today, processors pay renderers to collect the hides and offal (see sidebar for example). Participants identified the need to better utilize and add value to the hides, as well as other byproducts and inedibles. They are interested in low-tech solutions that can be implemented by a single processor or collaborative opportunities requiring larger investments for more complex technologies.

Relevant Resources

In response to the needs identified above, AURI commissioned two studies, both of which are explained further in the "Deliverables" section of this report. The Cold Storage Assessment explored the need for additional cold storage in the five-state region and a defined local region in northern Minnesota. A Hides and Byproducts Utilization Study identified waste management of animal hides and byproduct strategies for solid waste generated from very small and small meat processing and rendering establishments. AURI also hosted a webinar on anaerobic digestion in February 2024, a link to the recording can be found [here](#). Additionally, a benchmarking study was developed as a direct result of the Upper Midwest pilot. AURI selected this project not only based on the needs assessment findings but also following the recommendations of the Upper Midwest Pilot's Finance Working Group. More information about this working group and the benchmarking activities can be found [online](#).

Regulatory Compliance

Regulatory compliance was a common theme throughout the interviews. Processors seek to better understand complex regulations, but a shortage of inspectors compounds the lack of clarity. Participants across the region shared challenges resulting from insufficient numbers of both state and federal inspectors. Information is needed related to inspection requirements, status, and the process to transition to a different inspection level. In general, processors expressed a desire for this complicated information to be delivered in easy-to-understand formats. In addition, several respondents noted a need for proactive information and guidance for startup meat processing facilities. This includes understanding what certifications and permits are required before commencing slaughter and/or breakdown of carcasses.

State meat inspection programs actively educate and engage with processors to address their regulatory questions and have taken steps to make it easier to access answers. For example, the Minnesota Department of Agriculture created a booklet entitled "[Starting a Meat and Poultry Processing Business](#)" to assist processors with understanding necessary certifications

and permits. Furthermore, extension agencies, state meat processing associations, academic institutions, and other organizations, including AURI, regularly provide food safety Hazard Analysis and Critical Control Points (HACCP) certification training and coaching. Despite these efforts, nearly every interviewee emphasized the need for additional HACCP training and resources. They highlighted the need for templates, common in-plant solutions, and training delivered one-on-one or in a group setting. One participant even noted the potential value of a dedicated HACCP advisor role. Such an advisor could provide valuable testing and corrective actions, food safety training, quality management, controls training, and labeling assistance for processors and producers. Processors also experience a gap when seeking answers related to municipality and county-level regulations, which can vary considerably. This variability poses challenges for technical assistance providers who aim to advise processors regarding wastewater rules and guidance, as well as other zoning and permit requirements.

Lastly, aging facilities and outdated equipment, freezer space, and HVAC/airflow systems not only affect operation efficiencies, as noted above, but can also impact a processor's ability to maintain regulatory compliance. For example, outdated flooring in a processing facility can fail to meet standards for proper sanitation, which in turn can affect food safety compliance and protocols.

Relevant Resources

Prior to this pilot project, AURI created and continues to maintain a number of relevant resources on its webpage related to meat food safety. Processors can learn about the importance of implementing a proper HACCP plan in their facility through several videos covering the key HACCP principles. They can be found online [here](#). Furthermore, the American Association of Meat Processors (AAMP) provides HACCP templates to its members.

Workforce

Concerns about the workforce of the future are top of mind and may limit processing capacity and impact overall business profitability. Over 90% of participants interviewed pointed to the difficulty of recruiting and retaining employees for all roles spanning harvest, processing, operations, maintenance, trucking, and so forth. In general, the five-state region is experiencing a tight labor market. At the time of this study, the unemployment rates ranged from 2.1% in the Dakotas to 2.7% in Minnesota and Iowa, and 2.9% in Wisconsin (26). The national average for this same period was 3.6%. In addition to low unemployment, processors are keenly aware that processing jobs are physically challenging and not necessarily a desirable line of work for many. Compounding this issue, processors struggle to provide competitive employee benefits due to their nominal purchasing power in the insurance market. As such, processors seek training related to labor retention, incentives, improving labor reliability, and reducing turnover.

When considering the workforce of the future, participants were interested in outreach efforts through 4-H, FFA, and middle and high schools. Both Minnesota and Wisconsin have recently funded high school-level meat-cutting programs at several schools statewide. Minnesota also appropriated \$150,000 to establish two 2-year college programs offering certificates to students at Ridgewater Community College (Willmar, MN) and Central Lakes College (Staples, MN). In addition, a \$500,000 grant was awarded to Central Lakes College to purchase a mobile harvest unit offering additional hands-on meat harvesting training. Community college programs were also started in North Dakota, South Dakota, and Wisconsin. Participants would like increased outreach to build awareness of meat processing careers amongst minorities and women. Internships, scholarships, and tuition reimbursement

A Wyoming study (25) demonstrated that rendering can lead to as much as \$140 per head loss for smaller processing facilities. Additionally, there has been a shift in the value and demand for hides as synthetic production of the byproduct becomes mainstream. Stakeholders reported local processors were receiving payments of \$5-\$25 per hide from rendering companies before COVID whereas today some processors must pay a \$5 tipping fee per hide for removal. Rather than a value-added coproduct utilization opportunity, hides and other byproducts end up in a landfill. The economics of undervalued byproducts impacts the profitability of existing plants and financing requests for new facilities and expansions. In collaboration with the Hide and Leather Council of America and MPPTA providers, AURI is participating in a byproduct working group to assist local processors in capturing value for pet product ingredients and byproduct utilization. By participating in the working group, AURI contributed to conducting research on [sustainable uses for byproducts and hides](#) and offered staff expertise to the working group.

could encourage students to pursue careers in the meat industry. Moreover, programs exist in the five-state region providing grant dollars to meat processors to attract employees through retention incentives or bonuses. Programs and grants include the Workforce Innovation and Opportunity Act, the Farmers Union Foundation, the USDA National Institute of Food and Agriculture Meat and Poultry Agriculture Workforce Training grant, Wisconsin's Meat Talent Development grant, and Minnesota's Meat Education and Training grant. Nonetheless, participants insisted the next generation will work smarter, not harder. Therefore, automation and other technologies must find their way into small-scale meat processing.

Relevant Resources

In response to the needs assessment findings and feedback from the regional advisory task force, AURI offered a webinar discussing transitioning ownership of a meat processing business. Several industry experts and processor owners shared tips for successfully transferring ownership to another individual. Forty-two individuals registered for the webinar, and a recording can be found online [here](#). AURI sits on the advisory boards of several two-year college meat-cutting programs and also advises local high school instructors as they establish their meat-cutting curricula.



Education and Training

Developing new training opportunities and raising awareness of existing resources are equally critical. Technical topics of interest include animal handling, harvesting, fabricating, meat cutting, meat quality, HACCP, value-added products such as sausage and beef sticks, and specialty products such as halal and kosher. Participants also estimated many processors would benefit from training related to the function of various ingredients typically used in value-added product formulations. For example, sodium nitrite, phosphate, and sodium erythorbate are traditionally used in value-added meat and poultry products. Alternatively, processors may be interested in using clean-label options such as celery juice, celery juice powder, sodium bicarbonate, potassium carbonate, and cherry juice powder. Rather than using an ingredient just because they've always included it, processors would benefit from understanding why and how it should be used. General business operations were also highlighted as a need for further skills development. Specifically, the areas of employee recruitment and retention, financial literacy, capital investments, financing, marketing, benchmarking business data, sales, pricing, business planning, succession planning, grant-writing, and relationship building were identified.

Relevant Resources and Suggestions

AURI has a wealth of resources available on its website designed for food entrepreneurs that may address gaps within the local and regional meat processing industry. They are:

- [Meat Food Safety Videos](#): Learn the importance of implementing a proper HACCP plan in your facility with helpful videos. Overview of Hazard Analysis and Critical Control Points and AURI videos on each key principle.
- [Halal + Kosher Minnesota Meat Market Assessment](#): Halal and kosher meat markets offer untapped opportunities for

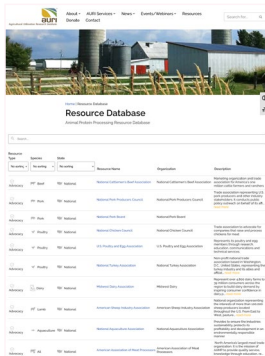
Minnesota farmers to diversify and expand their markets and for new and emerging farmers to participate in food production. To do so, the landscape of the halal and kosher markets needs to be described. This report provides an overview of criteria, barriers, consumer concerns, and preferences.

- [Clean Label Guide](#): This tool provides important information to help small and medium-sized Minnesota food producers transition to product ingredients that are “clean label.”
- [Pricing and Go-to-Market Guide for Food Products](#): This guide can help entrepreneurs struggling with the best way to set a price point for their product in a clear, concise, and strategic way. A [video series](#) is also available.
- [E-Commerce and Digital Marketing Guide](#): This self-guided module seeks to demystify e-commerce and digital marketing for food businesses, providing fundamental information and considerations for scaling food businesses as they consider building their brand’s online presence.
- [More Sustainable Packaging Solutions for Ground Beef](#): In partnership with the Minnesota Beef Council and Packaging Technology and Research (PTR), AURI published a report to improve consumer confidence in beef by identifying and refining more sustainable packaging solutions.

Key Deliverables

AURI selected several items from the needs assessment to inform the development of technical assistance resources. Criteria for selection included a high ranking from the Regional Advisory Task Force, as well as alignment with AURI’s value-added agricultural mission and organizational strengths. The following deliverables were developed:

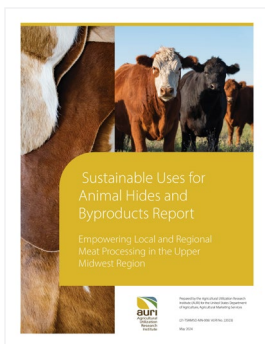
- Resource Database
- Byproduct and Hide Utilization Study
- Cold Storage Assessment
- Meat and Poultry Processing Short Courses



1. Resource Database

Knowledge and awareness of existing resources were critical gaps for many meat and poultry processors in the Upper Midwest. Specifically, processors indicated that searching online for reliable guidance was time-consuming. Therefore, AURI categorized over 160 resources in an easy-to-navigate online database. This tool provides direct links to resources. The resource database will be updated as new resources become available.

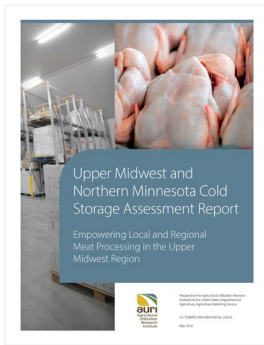
The resource database is available online at <https://auri.org/resource-database/>



2. Byproduct and Hide Utilization Study

AURI collaborated with EvaluateServe to conduct a deeper assessment of the opportunities to add value to meat processing byproducts. This study, entitled Sustainable Uses for Animal Hides, identified waste management strategies for animal hides and byproducts generated by very small and small meat processing and rendering establishments. It explores waste management techniques to reduce the costs of byproduct disposal through opportunities to add value to hides and other byproducts through pet food markets, niche consumer products, composting, and anaerobic digestion.

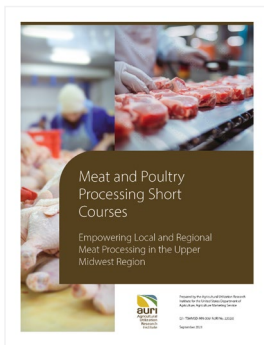
Please refer to the Sustainable Uses for Animal Hides Report for more information available online [here](#).



3. Cold Storage Assessment (Local and Regional Studies)

Cold storage is a necessity in meat processing operations. Aging facilities, equipment, and HVAC/air flow systems are challenging to upgrade due to high replacement costs. Therefore, AURI explored the need for additional cold storage in both the five-state region and a defined local region in Northern Minnesota. Key findings identified a need for additional cold storage among larger regional independent processors located outside areas with higher cold storage penetration. This is also true for smaller processors with consistently high-volume production and serving high-volume customer segments such as retail, hospitality, food service, and schools. There is also a need for more cold storage located in closer proximity to their facilities resulting in easier access and lower transportation costs.

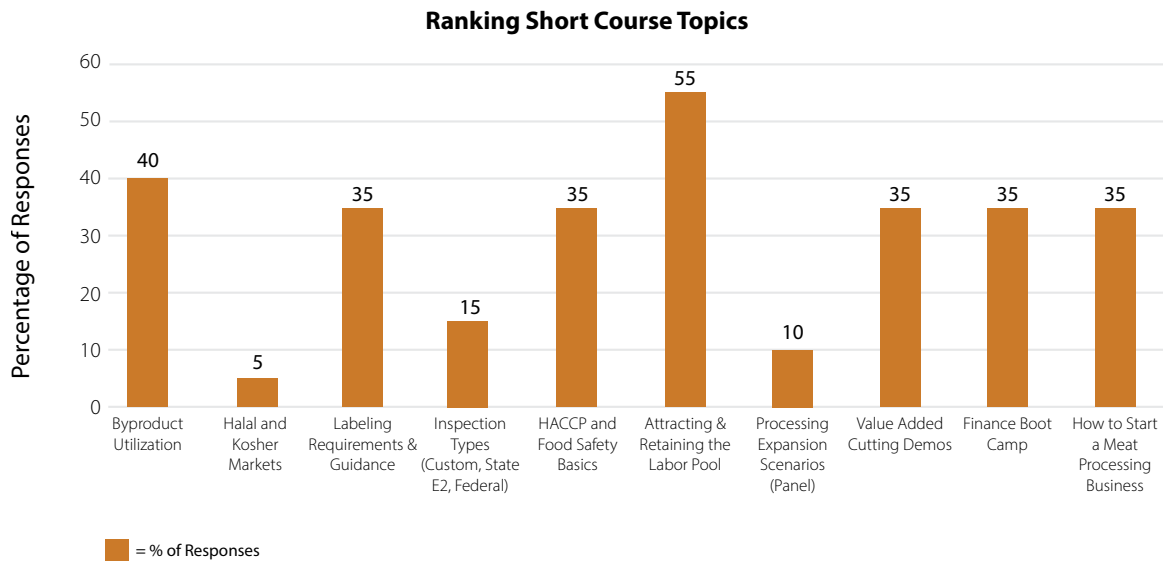
For more information, please refer to the Five-State Region Cold Storage Assessment and Northern Minnesota Cold Storage Assessment Reports, available online [here](#).



4. Meat and Poultry Processing Short Courses

Short courses were of great interest to participants. AURI recognized the existence of several established educational and training seminars for processors and their employees. Not wishing to duplicate existing content, AURI selected several non-duplicative topics from the findings and presented these to the Regional Advisory Task Force for ranking (Chart 3).

Chart 3. Regional Advisory Task Force Needs Assessment Ranking of Short Course Topics



*Note: Percentages exceed 100% as the request was to select the top three suggested short course topics

Based on the task force rankings, AURI opted to host three online short courses. Topics included financing a meat processing business, utilizing byproducts and hides, and transitioning to a meat processing business.

a. Finance Boot Camp

Financing a new meat or poultry processing business requires a significant amount of capital and planning. The needs assessment and key findings from the [Finance Working Group](#) showed that processors find the topic of finance challenging. AURI partnered with the [Food Finance Institute](#) to address various options for a start-up operation to raise funds to finance a meat processing business and best practices for developing a business model.

Key takeaways from the session included identifying the essential elements of a processing business (e.g., building, equipment, working capital, etc.) and examples of funding sources (e.g., grants, SBA 7a guarantees, debt financing, etc.). Participants were provided with a “sources and uses” capital template and a packet with a business model template.

To access the webinar recording, please visit <https://youtu.be/pjegyA406NY>

b. Short- and Long-Term Strategies for Byproduct and Hide Utilization

Byproduct and hide utilization is a challenge for many smaller processors as they are difficult and often costly to dispose of, which cuts into business profitability. This short course provided an overview of the historical uses and evolution of the hide and leather industry. In addition, a panel of industry experts and processors discussed their approaches to utilizing alternative byproduct and waste management systems and addressed questions from participants. The session also highlighted the benefits and challenges of utilizing composting equipment as a solution. Several topics can be referenced in the [Byproduct and Hide Utilization Study](#).

To access the webinar recording, please visit <https://youtu.be/nqvpAWd6Rr0>

c. Transitioning a Meat Business

This short course highlighted best practices including key considerations for transferring ownership to new owners. This included legal and financial issues, finding the right buyer and creating a transition plan to ensure the business continues to thrive. Several processors were asked to share their insights from their experience transitioning their business. Processors discussed unexpected hurdles, the availability of support, and what additional resources could ease the transition process. To access the webinar recording, please visit [link](#).

Recommendations

1. Review the eligibility of federal and state funding opportunities as they relate to the challenges noted in the operational efficiencies section above. Specifically, future funding opportunities should consider:
 - a. Eligibility of custom-exempt meat processors
 - b. Increased eligibility for projects requiring construction either through more favorable cost-shares, project minimums and maximums, and so forth
 - c. Eligibility of off-site cold storage facilities in areas with low penetration that often are closer to meat processors
 - d. Eligibility of projects that specifically address reducing the cost of byproducts and hide disposal or add value to these waste streams
 - e. Eligibility of automation technologies available to local and regional meat processors that span the needs of a meat enterprise, from slaughter and processing to operations and management
2. Build awareness of the MPPTA Network. Many of the needs highlighted in the findings section of this report could be tackled directly by technical assistance providers or, at a minimum, connected with the proper resources. The MPPTA providers meet regularly to discuss the needs of the industry and how they can work collaboratively. They are open to leveraging existing resources and creating new resources, which could include further development of planning guides and templates.
3. Explore adding more technical and business training opportunities for local and regional meat processors. Consider offering content in multiple languages.
4. Develop models or alternative solutions for recruitment and retention of employees in the local and regional meat processing space. A webinar highlighting successful strategies implemented by meat processors should be considered.
5. Both federal and state leaders should prioritize the training and recruitment of more meat inspectors or other inspection processes through technology that could benefit their operations, and to work with meat processors across inspection levels.
6. Expand processor awareness and participation in benchmarking efforts. This could be accomplished by expanding the benchmarking work initiated by AURI or through other regional pilots. States should consider subsidizing participation in the early years to encourage participation.
7. State membership organizations should explore strategies to increase participation and appeal to those not subscribing. Consider trial memberships or offering services such as collaborative matchmaking opportunities or creating mentorship programs.

8. Promote the resource database as a centralized hub for a variety of meat processor resources. As part of AURI's scope of work as an MPPTA Technical Assistant, new and improved resources will be added as they become available.
9. The State of Minnesota should evaluate the opportunity to participate in the Cooperative Interstate Shipping Program since its neighboring states are participating.

References

1. Altschuld, J.W., & Kumar, D.D. Needs Assessment An Overview (Volume 1). 1995. Sage Publications, Inc.
2. Asch, S. Pandemic Demand Strains Central Texas Meat Supply Chain 2020. Austin American Statesman. Available online at [Pandemic Demand Strains Central Texas Meat Supply chain \(statesman.com\)](https://www.statesman.com/story/news/2020/05/01/pandemic-demand-strains-central-texas-meat-supply-chain/3211117001)
3. Buseman, B., Schwartz, C. Things to Consider Before Harvesting a Market Animal at Home. 2020. University of Nebraska-Lincoln. Available online at [Things to Consider Before Harvesting a Market Animal at Home | UNL Beef.](https://www.unl.edu/beef/things-to-consider-before-harvesting-a-market-animal-at-home)
4. Executive Order 13917, Delegating Authority Under the Defense Production Act with Respect to the Food Supply Chain Resources During the National Emergency Caused by the Outbreak of COVID-19. 85 Fed. Reg. 26,313, 26,313-14 (May 1, 2020).
5. Food Safety Inspection Service Mobile Slaughter United Compliance Guide. May 2010. Available online at <https://www.fsis.usda.gov/guidelines/2010-0001>.
6. Food Safety Inspection Service. Guidance and Outreach to Small and Very Small Meat Processors Report on United States Department of Agriculture Food Safety Inspection Service. 2020. Available online at [NMPAN-Report-Online-FINAL.pdf \(sustainableagriculture.net\).](https://www.nmpan-report.com/NMPAN-Report-Online-FINAL.pdf)
7. Food Safety Inspection Services. Pathogen Reduction: Hazard Analysis and Critical Control Points (HACCP) Systems. 1996. Available online at [Federal Register: Pathogen Reduction; Hazard Analysis and Critical Control Point \(HACCP\) Systems.](https://www.federalregister.gov/documents/1996/07/18/pathogen-reduction-hazard-analysis-and-critical-control-point-haccp-systems)
8. Hafez, H.M., Attia, Y.A. Challenges to the Poultry Industry: Current Perspectives and Strategic Future after the COVID-19 Outbreak. Front Vet Sci. (2020) 7:516. doi: 10.3389/fvets.2020.00516. Available online at [Frontiers | Challenges to the Poultry Industry: Current Perspectives and Strategic Future After the COVID-19 Outbreak \(frontiersin.org\)](https://www.frontiersin.org/articles/10.3389/fvets.2020.00516/full)
9. Halich, G. Locally Produced Beef and Coronavirus Impacts. 2020. University of Kentucky, Martin-Gatton College of Agriculture, Food and Environment, Department of Agricultural Economics. Available online at <https://agecon.ca.uky.edu/locally-produced-beef-and-coronavirus-impacts>
10. Hamre, M., & Phillips, H. Raising Chickens for Meat. 2021. University of Minnesota Extension, College of Food, Agricultural and Natural Resource Sciences. Available online at [Raising Chickens for Meat | UMN Extension.](https://www.extension.umn.edu/food-agricultural/natural-resources/raising-chickens-for-meat)
11. Hines, E., and Mikesell, R.E. Adjusting and Monitoring Meat Animal Growth Rate. Penn State Extension. March 3, 2023. Available online at [Adjusting and Monitoring Meat Animal Growth Rate \(psu.edu\).](https://www.psu.edu/extension/adjusting-and-monitoring-meat-animal-growth-rate)
12. Isley, C. and Low, S. Meat Processing Plant Survival: The Role of Plant and Regional Characteristics. 2022. Journal of the Agricultural and Applied Economics Association. Available online at https://www.researchgate.net/publication/371308927_Meat_processing_plant_survival_The_role_of_plant_and_regional_characteristics
13. Lewis, S. Farmers will have to Euthanize Millions of Pigs as Meat Plants Remain Closed. 2020. CBS News. Available online at [Farmers will have to Euthanize Millions of Pigs as Meat Plants Remain Closed - CBS News.](https://www.cbsnews.com/news/farmers-will-have-to-euthanize-millions-of-pigs-as-meat-plants-remain-closed/)
14. Lusk, J. L., Tonsor, G. T., & Schulz, L. L. 2021. Beef and Pork Marketing Margins and Price Spreads During COVID-19. Applied Economic Perspectives and Policy. Available online at [Beef and Pork Marketing Margins and Price Spreads during COVID-19 \(wiley.com\).](https://onlinelibrary.wiley.com/doi/10.1002/aep.13080)
15. Martinez, C.C., Maples, J.G., and Benavidez, J. 2021. "Beef Cattle Markets and COVID-19," Applied Economic Perspectives and Policy 43(1): 304-314. Available online at <https://onlinelibrary.wiley.com/doi/full/10.1002/aep.13080>
16. Meat and Poultry Processing Workers and Employers: Interim Guidance from CDC and the Occupational Safety and Health Administration (OSHA) Centers for Disease Control and Prevention. April 26, 2020. Available online at [Meat and Poultry Processing Workers and Employers: Interim Guidance from CDC and the Occupational Safety and Health Administration \(OSHA\).](https://www.cdc.gov/media/releases/2020/s0426-meat-poultry-processing.html)
17. Occupational Safety and Health Administration. Available online at [Meatpacking - Overview | Occupational Safety and Health Administration \(osha.gov\).](https://www.osha-slc.gov/newsroom/2020/04/26/meatpacking-overview)
18. Padilla, S.L., Schulz, L.L., Vaiknoras, K., MacLachlan, M.J. COVID-19 Working Paper: Changes in Regional Hog Slaughter During COVID-19. United States Department of Agriculture Economic Research Service. December 2021 Available online at <https://www.ers.usda.gov/webdocs/publications/102784/ap-095.pdf?v=8960>

19. Peel, D.S., Aherin, D., Blach, R., Burdine, K., Close, D., Hagerman, A., et al. Economic Damages to the U.S. Beef Cattle Industry Due to COVID-19. National Cattleman's Beef Association (NCBA) (2020). Available online at <https://extension.okstate.edu/fact-sheets/economic-damages-to-the-u-s-beef-cattle-industry-due-to-covid-19.html>.
20. Rodriguez-Morales, A.J., Gonzalez-Bulnes, A., and Hashem N.M. Animal Welfare and Livestock Supply Chain Sustainability Under the COVID-19 Outbreak: An Overview. *Frontier in Veterinary Science*. (2020). Available online at [Frontiers | Animal Welfare and Livestock Supply Chain Sustainability Under the COVID-19 Outbreak: An Overview | Veterinary Science \(frontiersin.org\)](https://www.frontiersin.org/articles/10.3389/fvets.2020.582111/full)
21. Small Business Administration. March 2023. Available online at <https://advocacy.sba.gov/wp-content/uploads/2023/03/Frequently-Asked-Questions-About-Small-Business-March-2023-508c.pdf>
22. USDA sets up National Incident Coordination Center to Help Livestock Producers. 2020. *Successful Farming*. Available online at [USDA sets up National Incident Coordination Center to Help Livestock Producers \(agriculture.com\)](https://www.agriculture.com/news/industry/USDA-sets-up-National-Incident-Coordination-Center-to-Help-Livestock-Producers).
23. United States Department of Agriculture. July 9, 2021. Available online at [USDA Announces \\$500 Million for Expanded Meat & Poultry Processing Capacity as Part of Efforts to Increase Competition, Level the Playing Field for Family Farmers and Ranchers, and Build a Better Food System | USDA](https://www.usda.gov/press-releases/2021/07/09/USDA-Announces-500-Million-for-Expanded-Meat-Poultry-Processing-Capacity-as-Part-of-Efforts-to-Increase-Competition-Level-the-Playing-Field-for-Family-Farmers-and-Ranchers-and-Build-a-Better-Food-System).
24. United States Government Accountability Office (GAO). Meat and Poultry Worker Safety: OSHA Should Determine How to Address Persistent Hazards Exacerbated by COVID-19. 2023. Available online at [GAO-23-105104, Meat and Poultry Worker Safety: OSHA Should Determine How to Address Persistent Hazards Exacerbated by COVID-19](https://www.gao.gov/products/GAO-23-105104).
25. Wyoming Beef Industry Study. Wyoming Business Council and Orbis Advantage, Inc. 2020. Available online at [WY Beef Study 2019 Orbis-FullReport-Copy-2.pdf \(wyomingbusiness.org\)](https://www.wyomingbusiness.org/wp-content/uploads/2020/08/WY-Beef-Study-2019-Orbis-FullReport-Copy-2.pdf)
26. Annual unemployment rate in the United States in 2022, by state. Statista. Available online at <https://www.statista.com/statistics/223675/state-unemployment-rate-in-the-us/>

Appendix

Needs Assessment Interview Questionnaire:

1. What gaps exist in the protein supply chain (producer to consumer)?
2. What factors are causing disruption in the protein supply chain?
3. What gaps exist that would support the viability of local and regional protein processing businesses?
4. What are your top five bottlenecks impacting local and regional meat processing?
5. In your opinion, what should be done to improve livestock processing in your state?
6. If applicable, could you describe the frequency of your interactions working collaboratively with local and regional protein processors?
7. What ability does your organization have to assist the needs of competitiveness for very small to small protein processors?
8. What ability does your organization have to assist the needs of completeness for large-scale protein processors?
9. What type of services do you believe your organization could in the future offer local and regional protein processors?
10. What types of programs and services do you offer local and regional protein processing facilities? Please check the box next to the program types and describe.
 - Market assistance
 - Financial assistance
 - Legal and regulatory assistance
 - Policy/Advocacy
 - Educational and training assistance
 - Product development assistance, e.g., product formulations
 - Business development assistance
 - Engineering assistance
 - Other- please specify
11. What support are local and regional protein processors not receiving today, and why?
12. What factors impact local and regional meat processors' ability to access, attend, or utilize training, tools, or techniques?
13. What types of resources do you utilize when working with local and regional protein processors?
14. Where do you see opportunities for infrastructure development and improvement at local and regional protein processing facilities?

15. How does your organization promote local and regional protein processing?
16. What short courses should be provided to assist local and regional protein processors?
17. What resources are not currently available that you believe would be beneficial for small-scale protein processors?
18. When you receive inquiries related to the meat industry, are more questions focused on meat science, food safety, regulations, product formulations, business development, etc.?
19. Do you feel that the protein processing industry is aware of existing resources and services? If not, do you have any ideas on how to make them aware?
20. If applicable, how could you customize an academic curriculum (e.g., meat science, food safety) to support meat processors?
21. Are there areas you do not offer support to local and regional processors?
22. What skills do your staff need to improve to better assist the local protein processors?
23. What type of resources, bulletins, newsletters, etc., does your organization create to share information with local and regional protein processors? What is included in that material?
24. Are livestock processing options in your state adequate (even before COVID-19)?
25. How has livestock processing access changed since COVID-19?
26. Do you believe livestock producers would raise more livestock if they had access to more processing facilities locally or regionally? And if so, how much?
27. In your opinion, since the COVID-19 pandemic, how has the pricing of protein products changed?
28. Please list and share any other comments about local and regional meat processing, business development, technical assistance, or marketing.
29. Please list top challenges or barriers for very small to small local and regional protein processors.
30. What assistance would be most beneficial to overcome these challenges?
31. Are livestock processing options in your state adequate?
32. How prepared is your state to meet workforce development needs?
33. What regulatory hurdles impact local and regional protein processors?