LFPP Mobile Red Meat Mobile Harvesting Unit Feasibility Study

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I. Introduction

The staff at The Appalachian Center for Economic Networks (ACEnet) and a team of subject-matter expert contractors have completed a feasibility study for a small red-meat mobile processing unit in Southeastern Ohio. This group will be referenced as the ACEnet working group throughout this study. This group's motivation comes from working with farmers, producers, and processors and learning about their business challenges raising livestock, processing meat products, and being able to get those products into the hands of consumers. As consumers and professionals who work with entrepreneurs in the agricultural and food sectors, this work is highlighted against the backdrop of rural poverty impacting much of the region identified in this study and the opportunity this work possesses to create income and wealth, for livestock producers and processors, to enable them to support themselves, grow their agriculture businesses, and produce the value-added products that many households enjoy.

The counties that have been included in the regional definition of Southeastern Ohio for this feasibility study are: Athens, Guernsey, Hocking, Meigs, Monroe, Morgan, Muskingum, Noble, Perry, Vinton, Gallia, Washington. This feasibility study was funded through a Local Food Promotion Program grant through the United States Department of Agriculture's Agricultural Marketing Services grant AM200100XXXXG090. This funding enabled the ACEnet working group to delve deeply into the aspects related to assessing the infrastructure of the region for meat processing, completing an inventory of processors in the region, exploring national best practices, identifying nodes of the red-meat value chain within Southeastern Ohio, and assembling the feasibility study with associated documents.

Related to this feasibility study, a business plan and financial plan will be made available for a red-meat mobile processing unit based on our analysis. In the study that follows information is presented from research activities, insight from operating a very small state inspected meat processing facility, interviews with ranchers, processors, consumers, and inspectors, as well as survey data collected from stakeholders over the Summer of 2021 into the Winter of 2022.

<u>Commonly used acronyms and definitions in this feasibility study:</u>

USDA: United States Department of Agriculture

FSIS: Federal Safety Inspection Service

ODA: Ohio Department of Agriculture

MSU/MPU: Mobile Slaughter Unit(s) / Mobile Processing Unit(s) are mobile slaughtering and/or processing facilities that can move from location to location and are fully compliant with all regulations associated with meat inspection for whatever level of inspection the operator intends.

Federally Inspected Plant or Facility: FSIS Inspected establishment(s) where products bear the mark of federal inspection. Products created in these facilities may be sold across state lines.

State Inspected Plant or Facility: These plants are inspected under the authority of the Ohio Department of Agriculture, Division of Meat Inspection. Products created in these establishments have a state mark of inspection applied to them, indicating that they may be sold anywhere in Ohio, including the retail supply chain.

Custom Exempt Plant, Facility, or Operator: These establishments prepare meat products for the livestock owner's personal consumption. Products created in these plants may not be sold through the retail supply chain or across state lines. There are no inspectors (state of federal) on-site and there are limitations on what can happen with meat created in these establishments.

HACCP: Hazard Analysis and Critical Control Point - analyzes the production process for food products, identifies hazards and responses to control hazards to acceptable limits. Identifies the most vulnerable processing step in the production process and details response to monitor, measure, and control for hazards.

SSOPs: Sanitation Standard Operating Procedures - sanitization process and practices for establishments to ensure safe, hygienic, and food-safe products are created within the production environment.

What is Mobile Processing?

Mobile processing is the ability to complete harvest and processing activities related to the creation of edible meat product foodstuffs within a self-contained slaughter facility that can move from site to site (U.S. Department of Agriculture - Food Safety and Inspection Service).

The USDA produced document *Mobile Slaughter Compliance Guide* identifies advantages of mobile processing as being: the ability to provide locally sourced meat products and specialty products, to provide harvesting for producers operating in difficult to access communities, and to meet the growing customer demands for grass-fed, organic, and natural meat products. The USDA identifies MPUs as a pathway to "...serve multiple small producers in areas where slaughter services might be unaffordable or otherwise unavailable. Therefore MSUs can help small producers meet this demand, expand their businesses and create wealth in rural communities." (U.S. Department of Agriculture, *Mobile Slaughter Compliance Guide*).

In a USDA blog post from February 21, 2017 titled: *An Introduction to Mobile Slaughter Units*, Staff Officer for Food Safety and Inspection Service in Health and Safety, Food and Nutrition, Farming, Denise Amann indicates that for small livestock producers there can be immense financial and logistical challenges for livestock owners to access harvesting services from brick and mortar facilities (Amann) . At the time of the writing of this blog post, there were 9 MPUs operating across America under the inspection of FSIS (Amann). The number of MPUs operating in the US is not recorded, because MPU are held to the same standard as any other processing facility but from reviewing the news stories about MPUs, many states seem to have opportunities for livestock producers to access an MPU to observe its operation and possibly contract services. MPUs that are specifically designed to harvest poultry have become a popular solution for some livestock owners and processing situations focused on poultry, deployed in rural and difficult to access communities.

Within the livestock processing industry, there are three primary levels of inspection that establishments can select for their products. The level of inspection determines where products may ultimately be sold or how they may be used by value-added processing establishments for their end markets. The federal level of inspection provides the opportunity to sell products outside of Ohio, and due to the diversity of additional markets that this level of inspection provides it is very attractive to livestock producers. The Ohio Department of Agriculture, Division of Meat Inspection offers the state level of meat inspection which enables products to be sold within retail environments within the state of Ohio. Custom exempt processors are periodically

inspected, with particular attention to their HACCP, SSOPs, and records review when an inspector schedules a visit but their products may only be used by the livestock producer for their personal consumption.

The USDA divides the US national map into FSIS service districts with geographically similar states being grouped together. Ohio is located in USDA FSIS District 50, with Illinois, Indiana, and Michigan. West Virginia is located in USDA FSIS District 80 with Delaware, District of Columbia, Maryland, North Carolina, New Jersey, and Virginia. Pennsylvania is located in USDA FSIS District 60 with Connecticut, Massachusetts, Maine, New Hampshire, New York, Rhode Island, and Vermont. From the USDA *Mobile Slaughter Unit Compliance Guide* facility operators who are considering starting a MSU should contact the District Office for their region to apply for a Grant of Inspection. If an MSU is anticipated to operate across districts, operators are advised to seek a Grant of Inspection for their geographic district first, to fix the inspection name of the plant, with subsequent applications to additional districts. Due to the location in Southeastern Ohio, the MSU in consideration will primarily operate in USDA FSIS District 50 with potential producers from District 60 (Pennsylvania) and District 80 (West Virginia) being sought if additional users of the MSU are recruited in those geographies, or if operators in those regions desire to access the unit.

It is important to note that overall, MPUs have diminished slaughter capacity per day compared to a traditional brick and mortar facility. This feasibility study will identify pathways to introduce an MPU to southeastern Ohio, to increase the slaughter potential for small and medium sized livestock owners, in an effort to alleviate processing bottlenecks and to create regional food resilience in the face of overall meat industry consolidation. It is not an assumption that an MPU would be competitive with a brick and mortar processing facility in terms of processing volume, unless the brick and mortar establishment were a very small plant harvesting less than 8-10 head a day. This feasibility study will examine the red meat animal protein value chain with a focus on Southeastern Ohio, examining the trends in processing production within our region, and explore the feasibility for a Mobile Processing Unit for red meat animal protein.

II. Overview of Red Meat Animal Protein Value Chain

A. National Industry Trends

Prior to COVID-19, the national red meat value chain had been consolidated over several decades, resulting in a drastic reduction of small and medium sized processing facilities operating within communities where livestock are raised, and instead being centrally processed at industrial scale facilities (MacDonald et al. 2000). Although the scale of these facilities is great, the scale also presents challenges for livestock producers to align their production timeline with many other livestock producers to be able to access larger facilities, as well as taking on more transportation costs and feeding costs to move the livestock to the processing facility. Nationally the meat industry has struggled to keep pace with meat consumption over the course of the COVID-19 pandemic resulting in sudden price fluctuations for consumers with limited red-meat protein options in stores, long wait times for producers to schedule livestock for slaughter, and workforce availability challenges for processors to keep pace which has been further demonstrated in the working group survey of meat industry stakeholders. A part of this struggle is due to the consolidation within the meat industry which has occurred at the same time as consumers are seeking locally sourced meat, produce, and vegetables (U.S. Department of Agriculture - Food Safety and Inspection Service). When COVID-19 began to impact processing facilities, the whole meat processing industry began to back-up as animals that were scheduled to be slaughtered were held in feeding lots due to slaughter establishment pandemic shutdowns. Upon reopening, they had diminished capacity due to pandemic protocols, absent employees, and social distancing spacing within plants resulting in a decrease in establishment efficiency. This was observable through the shortages that consumers experienced when grocery shopping as well as the increased price for red-meat protein. Livestock producers noticed challenges and obstacles entering their livestock into processing facilities and making appointments for slaughter and processing, oftentimes resulting in a higher feed cost for animals that should have been sent to slaughter (Selak). Processors noticed increased calls for service and worked to expand their operations, but in many cases faced workforce challenges and financial obligations that made scaling their production process difficult without external intervention (Figueroa).

Nationally, red-meat production has remained relatively consistent mostly due to the capacities of the large volume plants in North America and ample animal supply

within the processing value chain. As production of beef has remained relatively consistent from 2019 to 2020, an important note is that the retail value of the beef harvested has increased while cash receipts for cattle decreased from 2019 to 2020, resulting in less money being returned to the farmers who raised the livestock. The table below from the USDA summarized the national beef production:

Table 1. U.S. beef industry

Year	Total beef disappearance[1]	Retail equivalent of dissappearance[2]	All fresh beef retail value[3]	Retail equivalent value of beef produced[4]	Value of cattle and calf production[5]	Cash receipts[6]
	Billion pounds		Dollars	Billion dollars		
2001	27.0	18.9	3.01	56.9	29.4	40.5
2002	27.9	19.5	3.05	59.5	27.1	38.1
2003	27.0	18.9	3.31	62.6	32.1	45.3
2004	27.8	19.4	3.62	70.3	34.9	47.4
2005	27.8	19.5	3.64	70.8	36.3	49.3
2006	28.1	19.7	3.62	71.2	35.5	49.1
2007	28.1	19.7	3.78	74.4	36.0	49.8
2008	27.3	19.1	3.97	75.9	35.6	48.4
2009	26.8	18.8	3.89	73.0	31.9	43.7
2010	26.4	18.5	4.10	75.8	36.9	51.2
2011	25.5	17.9	4.44	79.3	45.1	62.3
2012	25.8	18.1	4.69	84.7	48.1	66.1
2013	25.5	17.9	4.94	88.2	48.6	67.8
2014	24.7	17.3	5.60	96.9	60.1	81.1
2015	24.8	17.4	6.04	104.9	60.1	78.3
2016	25.7	18.0	5.74	103.3	48.6	63.7
2017	26.5	18.6	5.65	104.8	50.4	66.9
2018	26.8	18.8	5.69	106.7	49.1	67.0
2019	27.3	19.1	5.82	111.2	48.2	66.3
2020	27.6	19.3	6.39	123.3	45.8	63.1

[1]Total amount of beef used in the domestic market on a carcass weight basis.

[2]Amount of the carcass estimated to cutout to retail cuts. This is 70 percent of the total disappearance.

[3]The value of a weighted average of an animal's retail meat cuts.

[4]Retail equivalent value of beef produced.

[5]Production includes total live weights of animals marketed, farm slaughter, and custom slaughter consumed on farms where produced, minus live weight of inshipments, with an adjustment for any increase or decrease in live weight of inventory.

[6]Receipts for cattle marketed for slaughter, including on-farm slaughter.

Sources: USDA, Economic Research Service, World Agricultural Supply and Demand Estimates, and National Agricultural Statistics Service.

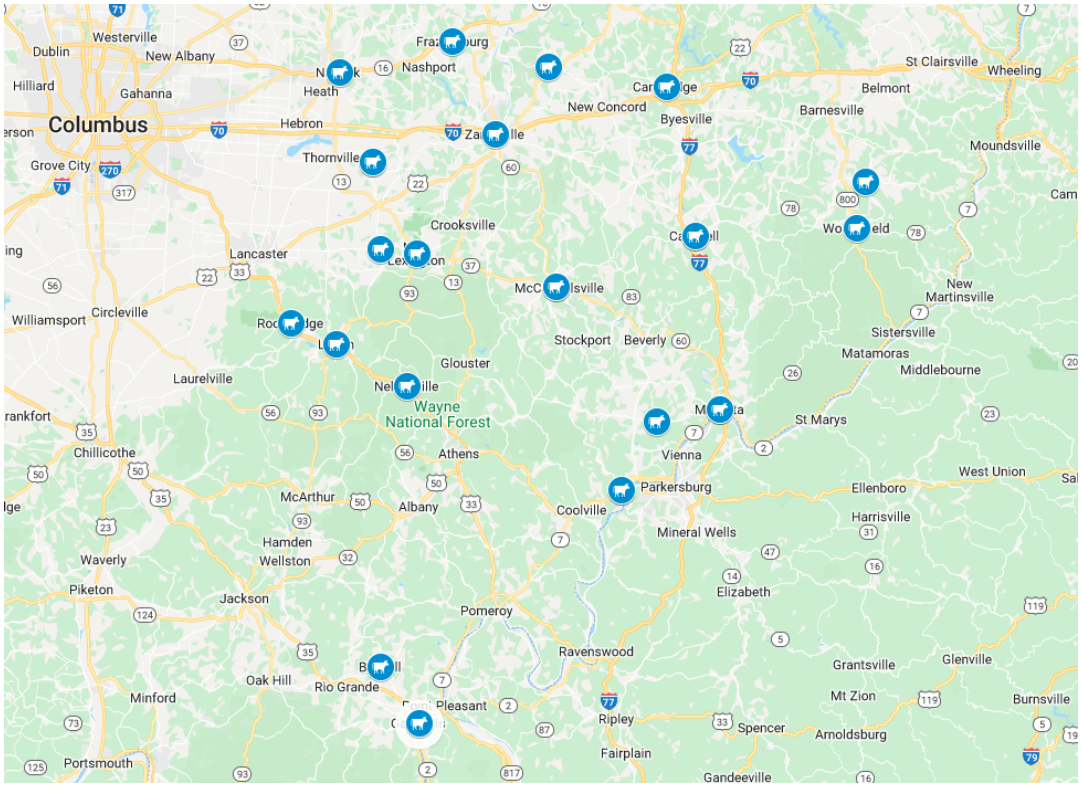
B. Regional Industry Trends

Within Southeast Ohio many of the national trends are observable from the increased wait times producers experience when scheduling with a processor to the absence of cuts consumers are looking for in retail environments. Ohio does not have major meat packing establishments, with most processors in Ohio processing around 30 head of cattle per week (Figueroa). The processors in Ohio are very full due to the nationwide shock in the meat industry stemming from COVID-19 and an already highly consolidated red meat protein supply chain, with many livestock slaughters being scheduled 1 year out resulting in some unborn animals being scheduled for slaughter due to the logistical challenges in processing plants (Selak). Despite being two years into the pandemic in 2022, processors are still hurting for capacity and producers are scheduling slaughters farther in advance than they historically have with some animals being scheduled for slaughter prior to being born, which is an unmitigated logistical and financial risk for livestock producers as well as processing establishments. Slaughter appointments made for animals not yet born has the potential to become burdensome for livestock processors because animals that are raised may die prior to being sent to slaughter, so processing establishments may over-schedule staff or have fewer heads arrive than anticipated resulting in a loss of efficiency. Livestock producers could be financially penalized by processors for scheduling animals for slaughter that die while being raised on-farm and are not able to be processed. If there were flexible and scalable slaughter options for livestock producers, the need to schedule so far out could be reduced and livestock producers could more reliably schedule the livestock they raise for slaughter as the animals are approaching the correct ages and weights.

Ohio possesses 76,900 farm operations, utilizing 13,500,000 acres of farmland in Ohio with an average of 176 acres per farm (“Census of Agriculture - 2017 Census Publications - State and County Profiles - Ohio”). Within Ohio there are 312,000 beef cows, 42,000 goats, 127,000 sheep, and 2,750,000 hogs (“Census of Agriculture - 2017 Census Publications - State and County Profiles - Ohio”).

District 6 of the Ohio Department of Agriculture Division of Meat Inspection has 15 fully inspected facilities under inspection for meat processing and 9 custom establishments with Hocking county being in Zone 7 possessing 1 fully inspected

establishment and 1 custom establishment resulting in a total of 16 fully inspected establishments and 10 custom establishments (“Division of Meat Inspection Coverage Map”). An interactive map has been created to show this information:



III. Size of the Red Meat Economy in Southeastern Ohio

Within Southeast Ohio there is a range of productivity for the livestock owners and producers. Within individual species sales, measured in $1,000, some counties have very strong production sales such as Athens ranking for sheep, goat, wool, mohair, milk or Guernsey and Muskingum for cattle and calves.

USDA 2017 Census for Agriculture					
	Cattle and calves - Sales in $1,000 ; (Rank in Ohio)	Hogs and pigs - Sales in $1,000 ; (Rank in Ohio)	Sheep, goats, wool, mohair, milk - Sales in $1,000 ; (Rank in Ohio)	Total Livestock Sales Rank in Ohio	Total Livestock Sales Rank in US
Athens	$3,688; (60/88)	D; (77/88)	$576; (12/88)	75/88	2,387/3,073
Guernsey	$11,346;(18/88)	$2,032; (52/88)	$236; (34/88)	51/88	1,806/3,073
Gallia	$8,109;(24/88)	$526; (58/88)	$302; (26/88)	62/88	2,127/3,073
Hocking	$828; (80/88)	D; (84/88)	$42; (81/88)	86/88	2,833/3,073
Meigs	$3,739; (59/88)	$90; (68/88)	$56; (75/88)	73/88	2,367/3,073
Monroe	$4,975; (44/88)	$42; (76/88)	$736; (5/88)	67/88	2,165/3,073
Morgan	$4,297; (49/88)	$2,709; (48/88)	$185; (44/88)	58/88	2,049/3,073
Muskingum	$15,372; (13/88)	$3,442; (44/88)	$376; (17/88)	29/88	1,088/3,073
Noble	$3,937; (54/88)	$37; (78/88)	$385; (15/88)	77/88	2,468/3,073
Perry	$4,620; (46/88)	$5,269; (37/88)	$147; (53/88)	60/88	2,066/3,073
Vinton	D; (79/88)	$25; (83/88)	D; (87/88)	85/88	2,816/3,073
Washington	$10,499; (20/88)	$80; (70/88)	$141; (56/88)	47/88	1,695/3,073

D - indicates that information was withheld to avoid disclosing information about individual operations.

	Cattle and calves - Sales in $1,000	Hogs and pigs - Sales in $1,000	Sheep, goats, wool, mohair, milk - Sales in $1,000
Southeastern Ohio Total	$71,770 Or $71,770,000	$14,252 Or $14,252,000	$3,182 Or $3,182,000

Based on the information in the 2017 Census for Agriculture conducted by the USDA, the annual total red meat sales for Southeastern Ohio is $89,204,000. There are

sufficient livestock owners in the region needing slaughter processing for their animals to support improvements to the infrastructure of the region to support this industry. Ohio possesses 32 counties that are defined by the Appalachian Regional Commission as being Appalachian counties, and the state of Ohio produces county profile reports for all of Ohio's 88 counties as well as the 32 county Appalachian region of Ohio. Within Appalachian Ohio, the total Agriculture receipts for livestock and products is $783,512,000, with the 12 counties identified in this study contained within this value (Ohio Office of Research, 2021).

IV. Economic Feasibility for a Mobile Processor

Based on animal supply for the region, the distance between processors, and the reports of processors booking 10-14 months out for slaughter appointments shared via the working group survey of stakeholders, we believe there is sufficient work for an MPU in Southeastern Ohio.

There are three ownership models for a Southeastern Ohio MPU that could fill gaps in the regional meat value chain that will be explored in this feasibility study based on our work throughout the region, the literature available, and ACEnet staff experience operating a small processing center used by ACEnet clients. The top three models that appear to have the most viability are: cooperative ownership of an MPU among livestock producers in Southeastern Ohio, an institution of higher education or educational institution owned MPU, or through the expansion of an existing processing facility operating an MPU.

A. Access to Labor

Workforce challenges are commonly cited as a detriment to processing facilities, due to the physical demands of the work as well as the art of meat cutting and butchering (Figueroa). Ohio Jobs and Family Services December 2021 unemployment rates by county are summarized in the table below for Southeastern Ohio ("January 2022 Ranking of Ohio County Unemployment Rates").

Ohio Unemployment Rates by County - December 2021	
County	Unemployment Rate (%)
Athens	3.7%

Guernsey	4.3%
Gallia	4.2%
Hocking	3.6%
Meigs	5.1%
Monroe	6%
Morgan	5.3%
Muskingum	3.8%
Noble	5.4%
Perry	4%
Vinton	4.6%
Washington	4.1%

The median household income for Athens county is $40,905 with 22% of the county population living in poverty (“US Census Bureau QuickFacts: Athens County, Ohio”). Athens and Southeastern Ohio do have game processors for deer hunting with 7 located in Southeastern Ohio (“Ohio Game Processors”). There are also exempt processing operations throughout the region that are not under inspection by the Ohio Department of Agriculture, Division of Meat Inspection. The presence of game processors throughout Southeastern Ohio as well as the hunters they support are an asset in the regional workforce value chain for the meat industry, although to-date these industries have operated in silos.

If an MPU were introduced into the region as a teaching tool, it could have several beneficial positive outcomes related to developing an enhanced workforce supply for Southeastern Ohio meat processors through exposure to contemporary meat processing environments. The MPU could also be rented out by the owners to other existing processors to overcome temporary bottlenecks in livestock harvesting, and expose the processing establishment’s workforce to the production environment within an MPU. This could serve as an important introduction for future skilled labor for the MPU within Southeastern Ohio.

Ohio Means Jobs has a workforce supply tool, available to the public, that shows the workforce supply for a range of careers and industries. For Butchers and Meat Cutters there is little information known about their employment as reported to the

Bureau of Labor Statistics, there are also no institutions or organizations offering credentials to train individuals for these positions as of March 2022 (“OhioMeansJobs - Workforce Supply Tool”). In May of 2022 Rio Grande and Rio Grande Community College announced an Associates Degree in Meat Sciences program of study to begin instructing students in Fall of 2022. This program of study will introduce a new workforce supply to further livestock processing and support new and existing enterprises working in the red meat value chain within the region. With the presence of game processors and hunters in the region, there are potential skilled workers who could enhance their skills and abilities through training in an MPU and receiving meat industry credentials and certifications. This could enable some game processors to also process inspected meat for livestock owners if their facilities are suitable, or they could access a shared-use processing space, like the one ACEnet operates to keep game processing and meat processing separated in space and time.

Access to Animals

There is sufficient access to animals throughout Southeastern Ohio for red meat processors, but from surveying producers and processors the working group has learned that there are challenges transporting animals from producers to processors. Producers have experienced long wait times to schedule animals to be harvested and a long distance drive to a facility that offers the services producers are seeking. Processors have indicated that they are working at full capacity, and they struggle to access a qualified workforce to accept more clients. Both of these findings were highlighted in the stakeholder responses that were received by the working group.

In 2017 the USDA Completed a Census for Agriculture, including the number of farms in counties, the size of the farms in total, the share of sales by type for produce or livestock, a headcount of livestock within counties. The information for southeast Ohio is summarized below:

USDA 2017 Census for Agriculture								
	Number of farms	Acres in farms	Average farm size	Share of Sales by Type - Livestock, poultry, and products	Cattle and calves	Goats	Hogs and pigs	Sheep and lambs
Athens	687	98,742	144	50%	9,965	1,684	319	2,316
Guernsey	1,103	151,837	138	60%	18,823	1,202	7,005	1,070
Gallia	990	118,630	120	50%	18,258	1,241	668	1,829
Hocking	377	38,357	102	19%	2,202	302	130	398
Meigs	515	78,449	152	35%	9,754	297	567	448
Monroe	808	107,724	133	65%	12,713	856	217	3,017
Morgan	530	99,210	187	60%	13,872	551	4,930	756
Muskingum	1,263	189,022	150	59%	26,757	967	16,113	3,303
Noble	593	80,124	135	64%	10,301	522	67	2,740
Perry	762	101,130	133	32%	10,210	1,001	16,032	938
Vinton	227	31,457	139	20%	3,038	52	78	136
Washington	1,106	144,406	131	45%	21,129	735	2,293	1,497
Totals	8,961	1,239,088	1,664		157,022	9,410	48,419	18,448

A USDA National Agricultural Statistics Service report detailing the Great Lakes Region of Ohio cattle County Estimates for 2021 lists 137,700 heads of cattle in Southeastern Ohio, which doesn't indicate if calves are included in the head count ("USDA NASS Cattle County Estimates - Ohio"). In 2017 The Ohio State University CFAES Center for Cooperatives completed an inventory of red meat species in all of Ohio's 88 counties. Within Southeastern Ohio the table below summarizes the information:

2017 OSU CFAES Center for Cooperatives - County Livestock Totals				
	Goats	**Sheep**	**Hogs**	**Beef Cattle**
Athens	1,684	2,316	319	4,461
Guernsey	1,202	1,070	7,005	10,547
Gallia	1,241	1,829	558	9,468
Hocking	302	398	130	1,304

Meigs	297	448	567	5,203
Monroe	856	3,017	217	6,658
Morgan	551	756	4,930	6,748
Muskingum	967	3,303	16,113	12,945
Noble	522	2,740	67	6,390
Perry	1,001	938	16,032	4,609
Vinton	52	136	78	1,544
Washington	735	1,497	2,293	9,053
Totals	9,410	18,448	48,309	78,930

With respect to goat producers, Athens county is the second highest goat producer in the state with Coshocton being the tenth highest goat producer in the state (The Ohio State University - College of Food, Agricultural, and Environmental Sciences). With respect to sheep production, Muskingum county has the seventh highest sheep production in the state of Ohio and Gallia is the third highest sheep producer (The Ohio State University - College of Food, Agricultural, and Environmental Sciences) . For beef producers Muskingum is the number one beef cattle county in Ohio, Guernsey county is the number four beef cattle county, Gallia county is the fifth highest beef producer, and Washington county is the number seven beef cattle producer in Ohio (The Ohio State University - College of Food, Agricultural, and Environmental Sciences). This information from OSU is mirrored in the 2017 USDA Agricultural Census in the county ranking within Ohio for sales related to species.

Across the three data sets that exist to review the livestock inventory of the region, the 2017 USDA Agricultural Census appears to have the most uniform and robust livestock headcounts and economic data, although cattle and calves are combined in their metric which makes an accurate headcount of harvestable livestock more challenging. The 2017 USDA Agricultural Census total for cattle and calves in southeastern Ohio is 157,022, 9,410 goats, 48,419 hogs and pigs, and 18,448 sheep and lambs (“Census of Agriculture - 2017 Census Publications - State and County Profiles - Ohio”).

With respect to throughput of the MPU, the unit in consideration has a capacity of around 20 head of beef per day with complete workforce complement and hanging cooler space for sides, although it is more likely that 8-10 head a day is a more realistic target. If the MPU were to work 260 business days per year, establish relationships with livestock owners throughout the region, be able to achieve 20 slaughters per day, and have access to ideal harvesting pad locations, workforce, and hanging cold storage; the MPU would take 44 years to harvest the region, using the 2017 USDA Agriculture Census livestock headcounts for all red meat species. Based on existing and previously completed feasibility studies produced by other organizations into the costs related to building a livestock processing facility for red meat processing plants in rural communities, a brick and mortar processing facility which processes 1,000 head of livestock, would cost approximately $1,125,600 and provide 4,020 sq ft within the facility (MATSON CONSULTING and Virginia Foundation for Agriculture Innovation and Rural Sustainability, 2020). For a lower cost than a brick and mortar processing facility, the MPU sacrifices on throughput and is limited in the number of heads of animals it can slaughter in a day as well as a need to unload the MPU somewhere for value-added processing, or livestock producer side or primal pick-up, to continue harvesting. It is anticipated that an MPU in Southeastern Ohio would work to alleviate the demand for slaughter during busy times of the year and for livestock producers who need increased slaughter capacity in their community. The MPU could possibly be an educational tool to help develop additional workforce for established processing plants in the region.

B. Mobile Meat Processing in Southeastern Appalachia Survey

The ACEnet working group conducted an electronic survey of consumers, producers, and processors starting on May 13, 2021 and concluding on August 14, 2021. We received 231 responses with 142 consumers, 81 producers, and 8 processors. These responses represent 50 counties in Ohio. Among producers, the responses received reflect 13,413 acres with an average of 172 acres per producer.

Within consumer responses, we observed customers have a strong preference for local meat products. Consumers indicated that their purchases of meat products were done to support local farmers and local economies. Within the respondents there was preference for pasture-raised, non-GMO feed, as well as grass-fed and finished

growing practices. The largest barriers identified by consumer respondents to purchasing more red meat were high prices and inconvenient markets. 90.78% of consumer respondents indicated that they are likely or very likely to purchase local red meat if it were available.

Among producers we learned that 50% of respondents engaged in pasture-raised livestock as well as grass-fed and finished livestock. 21% of livestock producers use non-GMO feed. There were few certifications among producers with 8% possessing a humane certification, 4% naturally grown, and 3% organic. The highest impact barriers to livestock producers raising more livestock are significant wait times for slaughter dates, the distance to processors is too far, and it is a burden to manage the logistics of working with multiple processors.

Within processors we had a limited response rate of 8 respondents, despite reaching out to 300 processing facilities. This reflects a portion of the establishments within our region, but is not as comprehensive as the producer and consumer responses. Within the responses we received, we learned that processors are operating at full capacity and they lack the workforce to expand or increase their operations. None of the processor respondents considered the introduction of a MPU to be a negative for their businesses. Overall, processors see mobile slaughter as the most impactful solution to the processing bottleneck as a pathway to provide more red meat protein to consumers followed by expanding collaborative cold storage.

Challenges that we received through the survey across roles related to red meat production and processing ranged but are reflective of regional and national challenges to meat production. Livestock producers require infrastructure related to handling offal and other waste by-products. Livestock producers are fiercely independent and developing the momentum to create a farmer co-op can be challenging. Specific to operating an MPU in southeastern Ohio, there will be additional logistics to prepare for that are currently not in the operational field of vision for producers, because there are no successful examples within the Southeastern Ohio region. A limitation of the MPU is the need to have it parked at one location per working day to aim for the maximum slaughter possibility for that location, therefore each farm must have an adequate need for processing to reach target throughput. Additional challenges from accessing a

qualified workforce have been reported. Lastly, there is concern that inspection workload may not support an MPU due to inspectors already having many stops over the course of a workday.

We also learned of opportunities through this survey for the region. Respondents believe that mobile processing solves a specific problem related to red meat production. An MPU could be beneficial to set-up or test a meat product line or marketing strategy. An MPU is viewed by many respondents as an innovative solution to the bottleneck and there is widespread belief that this innovative solution has investment potential. Due to the lower cost to procure a MPU compared to brick and mortar it has the potential to scale if a set of producers are identified and additional users desire the service. It has potential to meet consumer and producer demands and regulations for more humane slaughter. Finally, there is also the belief that the quality of meat harvested from a MPU will result in a higher quality carcass due to less stress on the animal leading up to slaughter but additional research into this topic for all species would need to be completed if a label-based claim were desired for products created in the MPU.

67.2% of respondents believe that mobile meat slaughter would alleviate the regional processing bottleneck. Uncertainties exist around staffing the unit, the volume it could process, and the capacity of the operator. 54% of respondents had no concerns about the introduction of mobile slaughter to the region. The concerns that were shared were related to zoning issues, regulatory issues, and food safety. The MPU in consideration is a pre-fabricated trailer unit that comes with HACCP and SOP guidance from the manufacturer to ensure compliance with all regulatory expectations as well as food safety best practices.

C. Access to Renderer

The state of Ohio does permit composting livestock for agricultural operations, using approved species: Cattle (except those over 2-years-of-age showing signs of neurologic disease, unless authorized by the chief of the Division of Animal Industry), Horses, Poultry, Sheep and goats, and Swine (The Ohio State University Extension et al.). The MPU will utilize a hazardous waste and inedible removal vendor to ensure regulatory compliance and safe handling of all wastestream products coming from

processing when unable to legally engage in livestock composting with land and livestock owners.

Due to economies of scale between very large processing plants and small to medium sized plants, the accumulation of edible and inedible byproducts is an additional burden of any smaller processor with large processors being able to use their volume to develop a stream of revenue to hold these byproducts for a processor. Common outlets for many edible meat byproducts may be restaurants meeting the culinary needs of international customers as well as food businesses, with inedible meats becoming pet foods, and hides tanned into leather (Knudson et al.) . There are strategies to reduce the need for Waste Removal Companies to service the MPU but due to uncertain opportunities related to use of the processing by-products a waste removal company will be budgeted for the MPU in consideration. Opportunities that could further diversify MPU income related to rendering and waste removal costs include: Appalachian folkway heritage hide tanning using brains and hides harvested from the MPU, development of a local pet food business, jewelry creation from bones harvested through the MPU. There are local artisans and entrepreneurs in Southeastern Ohio practicing many of the potential identified opportunities who could be solicited to integrate the stream of MPU processing byproducts into their value-added products. With consistency in raw materials, these entrepreneurs could further develop their product lines using by-products from the MPU that otherwise would require a hazardous and inedible waste removal company to be contracted, which would result in an expense for the MPU operator.

D. Access to feed/feedlot

The MPU in consideration would not require a separate feedlot from the owner feedlot that the animals are already used to. Special considerations would need to be made for harvest scheduled at new locations dependent on the duration the animals have been on-site and what their needs are. Harvests scheduled in collaboration with county fair boards would require additional feed to maintain the weight of the animal leading up to harvest, but could assist with slaughtering those animals to reduce the strain on brick and mortar facilities as well as transportation costs of livestock owners to transport animals to slaughter facilities.

For the purposes of this feasibility study, the harvesting pads in consideration will not be set-up for long term animal storage. The planning for this unit anticipates that livestock owners will bring their livestock to a harvesting pad and will complete harvest activities for those animals on that day.

E. Access to Transportation

Many producers of animal livestock must transport their animals to one of the regional, state, or federally inspected processing facilities. This trip can be cost prohibitive, time intensive, possibly resulting in inhumane treatment/conditions for the livestock animal at some point in its transportation, and with increasingly long wait times for harvest. A MPU would facilitate the livestock owner to schedule service days from the MPU, which would arrive at their property, or to a nearby location, to harvest on-site, which would result in a regional increase in the local production of red-meat products. This local network of production will produce a more resilient regional network of livestock producers and value-added entrepreneurs, facilitated by transportation of the harvesting facilities to the livestock producer's community.

Depending on how the owner wants to sell their meat products there are options that may require additional transportation. The MPU Business Plan assumption is that animals would be harvested into primals in the drip cooler on the MPU. If the owner wants to sell freezer sides, they may do so but would need to complete sales or prepare on-site freezer space prior to the MPU departing. The MPU could also drive the harvested primals to a cut and wrap facility, for the purposes of the MPU Business Plan, ACEnet's cut and wrap facility where the livestock owner could customize their retail cuts and value-added meat products or contract to have that work completed.

As an environmental and cost savings technique, the diesel semi that is required to pull the trailer could be converted to a biodiesel vehicle, increasing it's range using lower-cost biodiesel and enabling the MPU to incorporate a second line of income through removing spent grease from local restaurants and reducing the need for diesel fuel, ultimately decreasing the cost of transporting the MPU to and from harvest sites while adding a source of income to the business from removing spent grease from local restaurants. This also has the potential to enable the MPU operator to form business

relationships with restaurants that could serve MPU harvested meat, to find outlets for ground meat and other products.

F. Utilities and associated infrastructure

Southeast Ohio is in the foothills of the Appalachian mountain range, which has a long history of extractive industries and underinvestment in infrastructure. While these trends are a challenge to launch a new venture in a physical location, for a MPU the absence of infrastructure is not a significant barrier so long as sufficient water and electricity are available at the harvest site and the plan for hazardous and/or inedible waste removal is followed. Even without water and electricity at a site there is the potential to operate the MPU from the generator and on-board water reservoir.

Challenges with a traditional brick and mortar establishment in Southeastern Ohio can span from struggles with utility providers to limited access to safe water to seasonal flooding of small streams and creeks. An advantage of a MPU against these challenges can be found in the mobile nature of the operation; the on-site power generation would enable activities to be completed independent of the regional power grid, the water that is used in the MPU is carried by the MPU, and because the MPU is mobile it is not subject to the same liabilities as a physical facility, nor the same start-up costs.

Related to the associated infrastructure for a MPU is a processing space for higher-value meat products. In planning this feasibility study and reviewing MPU operators in other markets, operators are able to harvest livestock and hang within the trailer and begin to cool from warm meat and start the aging process of 7-10 days for beef (Hedrick et al.). Pork requires a similar hangtime of 4-12 days to age the sides and enhance characteristics, with most of the aging being accomplished within the first 4 days (The Pig Site). This system of processing requires a drip or hanging freezer and inspected production space to complete the aging and produce retail cuts or value-added meat products. In planning this study for Southeast Ohio there are 23 fully inspected facilities under the authority of the Division of Meat Inspection, Ohio Department of Agriculture as well as 14 custom establishments that could utilize an MPU to increase their slaughter potential (“Division of Meat Inspection Coverage Map”). Any of the 23 local establishments would be suitable to partner for aging, additional

processing, or value-added processing depending on where the harvest site is located, the presence of infrastructure to support a rail system unloading, and how the livestock owner would like their finished products processed. The Appalachian Center for Economic Networks (ACEnet) operates the Farm & Food Enterprise Center (FFEC), which contains an ODA inspected meat processing space, located in ACEnet's Nelsonville Business Center. This space could be an ideal cut and wrap facility serving the needs of the MPU, but presently there is not a rail system or sufficient cooler space for aging of hanging sides.

A limitation in Southeastern Ohio is access to hanging coolers for beef to age in, outside of the existing processing facilities. This is a reason that an existing processing facility would be an ideal operator of a regional MPU, to have hanging cooler space available for when the MPU returns to the docking site. Meat processors without hanging cooler space could be eligible to seek grant funding or guaranteed loans to expand their production spaces and infrastructure through federal and state aid packages focused on the meat industry to aid in the recovery from COVID-19.

ACEnet does possess sufficient real estate within the ACEnet Nelsonville Business Center to be able to have a modular freezer unit with a rail system installed if this project advances in Southeastern Ohio. Due to the proximity to ACEnet's ODA inspected meat processing space, the location of the modular freezer in Nelsonville would enable entrepreneurs, or Good and Local MPU, to engage in value-added processing within an inspected facility.

G. Summary of Economic Feasibility

Within Southeastern Ohio the workforce has some elements that suggest that there are more meat cutting skills present than processors are able to attract, but there is no linkage between these industries to allow these occupational silos to draw from each other's workforce. There is sufficient livestock inventory within the region to support introduction of an MPU. Many counties in southeastern Ohio have a substantial share of their total agricultural income from livestock activities ("USDA NASS Cattle County Estimates - Ohio"). From the ACEnet survey of consumers, producers, and processors, literature review, and operating a very small meat processing facility we

have identified three ways that an MPU could be economically feasible for southeastern Ohio.

1) Cooperatively owned among livestock owners in southeastern Ohio
2) Institution of Higher Education or educational institution owned
3) Expansion of an existing processing facility

V. Market Feasibility for a Mobile Processor

A. Demand Drivers

County	Farms	Cattle and calves	Goats	Hogs and pigs	Sheep and lambs	Cattle and calves - Sales in $1,000 ; (Rank in Ohio)	Hogs and pigs - Sales in $1,000 ; (Rank in Ohio)	Sheep, goats, wool, mohair, milk - Sales in $1,000 ; (Rank in Ohio)
Athens	687	9,965	1,684	319	2,316	$3,688; (60/88)	D; (77/88)	$576; (12/88)
Guernsey	1103	18,823	1,202	7,005	1,070	$11,346;(18/88)	$2,032; (52/88)	$236; (34/88)
Gallia	990	18,258	1,241	668	1,829	$8,109;(24/88)	$526; (58/88)	$302; (26/88)
Hocking	377	2,202	302	130	398	$828; (80/88)	D; (84/88)	$42; (81/88)
Meigs	515	9,754	297	567	448	$3,739; (59/88)	$90; (68/88)	$56; (75/88)
Monroe	808	12,713	856	217	3,017	$4,975; (44/88)	$42; (76/88)	$736; (5/88)
Morgan	530	13,872	551	4,930	756	$4,297; (49/88)	$2,709; (48/88)	$185; (44/88)
Muskingum	1263	26,757	967	16,113	3,303	$15,372; (13/88)	$3,442; (44/88)	$376; (17/88)
Noble	593	10,301	522	67	2,740	$3,937; (54/88)	$37; (78/88)	$385; (15/88)
Perry	762	10,210	1,001	16,032	938	$4,620; (46/88)	$5,269; (37/88)	$147; (53/88)
Vinton	227	3,038	52	78	136	D; (79/88)	$25; (83/88)	D; (87/88)
Washington	1106	21,129	735	2,293	1,497	$10,499; (20/88)	$80; (70/88)	$141; (56/88)

D - indicates that information was withheld to avoid disclosing information about individual operations

There is sufficient access to livestock for an MPU to harvest and process within southeastern Ohio and a total livestock economic value of $89,204,000. With an increased level of meat processing, attainable through an MPU, is there a market for the products that would be created? The survey that the working group facilitated indicates that there is a strong consumer demand for local meat products.

B. Size

Based on the presence of multiple red meat species in southeastern Ohio, the MPU will possess a HACCP and SOPs to support processing all red meat livestock but on separate days based on livestock owner needs. The MPU in consideration will provide an increase to the slaughter potential of the region, but create a flexible opportunity for the cooperative ownership to derive income from the provision of this service to the region. This is due to the limited size of on-unit storage for harvested sides, 15 head of beef or 12,000 lbs, and the current absence within our region of an adequate cold storage location with a rail system for aging of sides prior to additional processing. Based on the literature review and best practices, it is more reasonable to anticipate 8-10 head of beef, approximately 7,200 lbs, to be the maximum harvest potential for the MPU in consideration for southeastern Ohio at start-up. For pork processing, the average hot carcass weight is 192 lbs, which would permit harvesting upto 62 head of hog in a day and be compliant with the weight limitations of the MPU. 62 head of hog is an unrealistic processing number for this unit, and a more realistic number may be one head every 45 minutes to hour. This would result in the harvest of 10-11 head of hog, with a weight of 2,016 lbs of pork. Goats and sheep have similar average dressing percentages, with approximately half the live weight of the animal being lost during slaughter, initial processing, and aging. For goats with an average live weight of 57 lbs and a hot weight of 27.4 lbs the MPU could harvest 437 head before it hits the cooler capacity of 12,000 lbs. Again, 437 heads to be slaughtered is unrealistic and we anticipate a similar rate of production as with hogs to process 10-11 head of goat in a day, resulting in around 275 lbs of meat. For sheep or lamb processing with an average weight of 135 lbs and a hot weight of 67.5 lbs, the MPU could harvest 177 head of sheep. It is unrealistic to process 177 head of sheep in a workday, so the more realistic number of 10-11 head of sheep or lamb would produce approximately 675 lbs of meat.

C. Practicality

The MPU is not anticipated to compete with a traditional brick and mortar processing facility, rather it is an opportunity to regionally increase the pace of harvest for livestock and alleviate the production bottleneck and to provide regional food system

resilience. This MPU would provide non-ownership small and medium livestock producers with another option to consider when harvesting their livestock, although processing would still need to be scheduled 3-4 weeks in-advance at an approved harvest pad. Unique applications of the MPU may result in benefits beyond increased food production for SE Ohio, with applications including: workforce development programs to train future meat industry workers while increasing the rate of harvest, addressing the increasing mandate for humane animal slaughter, opportunities to harvest in nontraditional spaces such as county fairs to reduce the number of animals that have to be transported to traditional processing facilities during that busy time, and the creation of a flexible and on-demand harvesting unit for existing processors to rent to overcome temporary bottlenecks at their establishments.

One limitation that has been recognized through this feasibility study is the lack of suitable hanging coolers within ACEnet for aging sides of red-meat before additional processing. The lack of suitable cooler storage will result in the MPU not being able to deposit their harvest within ACEnet's cut and wrap facility, and requiring the MPU to hold the sides until they are ready to be processed into value-added products. It is for this reason that an existing processor may be a more viable operator of an MPU, because their cooler space is turning over more frequently and they already possess the infrastructure to handle and process hanging sides. Additionally, an institution of Higher Education or learning with a central kitchen for on-campus food service, could be a good operator of an MPU due to their kitchen needs and opportunities for hanging cooler space to be created and serve multiple purposes for the institution. The new Associates Degree available through Rio Grande Community College could also be an ideal operator-owner of an MPU servicing Southeastern Ohio communities, pairing workforce exposure with processing to increase the region's red meat production while developing the next generation or skilled labor within the red meat value chain. In the interim, until a suitable partner emerges with plans to engage in meat processing, ACEnet will steward this effort and could leverage available space on the ACEnet Nelsonville campus to house a modular rail freezer for hanging sides to be stored until they are either sold or processed into value-added meat products. The modular freezer that is being included in this feasibility study has a capacity of 100 hanging sides,

providing three load bearing rails for primals and sides. This is sufficient space to enable the aging of handing sides until they are able to be worked into value-added products in ACEnet's Nelsonville Business Center.

D. Niche Market Opportunities

Within Southeastern Ohio there are numerous opportunities to engage in niche meat processing marketing for products harvested through an MPU. There is a longstanding local-food movement that has lifted up many food entrepreneurs within the region, resulting in a supportive consumer base as well as multiple opportunities to sell ground products as well as other value-added meat products to restaurants. Additionally, there are several institutions of higher education operating in Southeastern Ohio with a residential student population that could also be solicited as consumers of meat products from Good and Local MPU.

Over the course of this feasibility study, a compelling harvest practice began to emerge from reviewing interviews with livestock producers and processors. Due to the distance livestock producers may be required to transport livestock for processing and the presence of county fairgrounds in the counties within the feasibility study geography. Additionally livestock producers and livestock processors have identified county fair season as a driver of the bottleneck at processing establishments. As a result of this information, a novel deployment of the MPU would be to work with county fair boards to offer on-site livestock harvest following the county fair. This would reduce the transportation costs of livestock producers, provide a high-value service within their communities, reduce the volume of livestock being sent to existing livestock processing facilities following county fairs, and allow the MPU to operate in a consistent site with similar levels of infrastructure between counties. This could reduce the construction costs associated with developing a harvest pad site, and enable livestock producers without the means to build on their property a pathway to locally have livestock processed.

As a minimum viable product, the MPU would produce locally harvested primals and sides of red meat. Additional value-added processing is possible due to the level of inspection within the MPU. Federal inspection or ODA inspection will enable the primals and sides to be processed in a state of federally inspected processing facility, with

federally inspected meat products being able to enter the food supply chains of CIS-participating surrounding states.

In conjunction with an inspected value-added processing production space the MPU business could retail higher value retail products. It is within that activity that the greatest earnings potential exists for the operators.

E. Level of Competition

The listing below is from the Ohio Department of Agriculture, Division of Meat Inspection listing meat processors within Zone 6 and establishments from Zone 7 included due to geographical proximity.

Establishment #	Establishment Name	District	Business City/State/Zip	Business County	Type Business	Type Inspection
1325	ACEnet, Inc.	6	Nelsonville , OH 45764	ATHENS	RM	FULL
136	John C. Enos & Karen L. Enos	6	Cambridge , OH 43725	GUERNSEY	RM	FULL
44	Cle-Mor Market	7	Rockbridge , OH 43149	HOCKING	RM	FULL
5050	Steve's Meats	7	Logan , OH 43138	HOCKING	RM	CUST
5029	Headley Meats	6	Woodsfield , OH 43793	MONROE	RM	CUST
5041	Moore Ridge Meats	6	Jerusalem , OH 43747	MONROE	RM	CUST
175	Malta Meats Processing	6	Malta , OH 43758	MORGAN	RM	FULL
193	Hilltop Butcher Shop	6	Malta OH 43758	MORGAN	RM	FULL
13	Carl Rittberger Sr., Inc.	6	Zanesville , OH 43701	MUSKINGUM	RM	FULL
110	Olde Village Meats, LLC	6	Frazeysburg , OH 43822	MUSKINGUM	RM	FULL
115	Shirer Brothers	6	Adamsville , OH 43802	MUSKINGUM	RM	FULL
5021	Ramages Quality Processing	6	Caldwell , OH 43724	NOBLE	RM	CUST
5127	Saling's Custom Meat Processing, LLC	6	Caldwell , Oh 43724	NOBLE	RM	CUST
179	Rex Knipe	6	New Lexington , OH 43764	PERRY	RM	FULL
5090	Family Farm, LLC	6	Glenford OH 43739	PERRY	RM	CUSTOM
5165	Lazy Acre Meats	6	Junction City ,	PERRY	RM	CUST

			OH 43748			
5521	Cotterman Brothers Processing	6	Glenford , OH 43739	PERRY	RM	CUST
32	Hickory Hills Processing, LLC	6	Marietta , OH 45750	WASHINGTON	RM	FULL
184	Staley Countryside Meats, LLC	6	Little Hocking OH 45742	WASHINGTON	RM	FULL
1223	Hepner & Hepner, Inc.	6	Newark , OH 43055	WASHINGTON	RM	FULL
1237	Ely Chapman Education Foundation	6	Marietta , OH 45750	WASHINGTON	RM	FULL
1286	Pine Ridge Meat Processing, LLC	6	Fleming , OH 45729	WASHINGTON	RM	FULL
5068	Mullenix's Meat Processing	6	Little Hocking , OH 45742	WASHINGTON	RM	CUST
31	R & C Packing, Inc.	6	Bidwell , OH 45614	GALLIA	RM	FULL
1352	Wholesale Meats Inc.	6	Gallipolis , OH 45631	GALLIA	RM	FULL
5049	The Butcher Shoppe, LLC	6	Gallipolis , OH 45631	GALLIA	RM	CUST
5088	The Local Butcher	6	Gallipolis OH 45631	GALLIA	RM	CUSTOM

ACEnet has created this map, displaying the southeastern Ohio meat processing assets, the FSIS inspected establishments within the state of Ohio, and all other Division of Meat Inspection facilities in Ohio including poultry processing establishments. Within Southeast Ohio there are a plethora of processing establishments, but few of them provide federally inspected livestock harvesting, resulting in many processors being inspected by ODA or operating as custom exempt establishments. Due to this arrangement of enterprise, livestock producers have limited opportunities to have their livestock processed at an establishment that enables maximum return on the investment of raising livestock. Livestock producers could take their sides and primals from Good and Local MPU and enter them into any other existing meat processing business in Southeastern Ohio for value-added processing, and this represents an opportunity for livestock producers as well as livestock processors. Without having to perform the challenging and intensive activity of livestock slaughter, they will reap the benefits of additional heads of livestock being harvested

and made available for value-added processing. This also represents an opportunity for the Livestock Owner Cooperative to engage in value-added processing to derive additional income from the MPU processing activities.

F. Pricing

The Good and Local MPU Business Plan and Financials detail this information. The MPU start-up costs are $1,191,613.00 and include the MPU trailer, modular hanging freezer, vehicle to tow the MPU, working capital, and other expenses.

The MPU would harvest a head of beef for $130.00, with $1,845.00 of revenue for every beef processed into value-added products. Monthly 60 head of beef are processed in the financials for Good and Local MPU with 30 entering value-added processing. Annually this would represent 720 head of cattle harvested with 390 subsequently processed into value-added products solid by Good and Local MPU. Pork harvests are $90.00 per head and for every head processed into value-added products $361.00 of revenue exists. A monthly target of 40 pork harvests with a greater share entering into value-added processing of 30 on average. Annually this represents 480 head of pork harvested with 360 processed into value-added products. Sheep and goat processing has been combined for simplicity and similarity of cost and meat yield. Sheep and goat harvests are $220 per head with each animal entered into value-added processing for $205 of revenue. Due to the volume of sheep and goats in the market 60 head a month has been budgeted with half entering the value-added processing pipeline. This represents 720 head of goat or sheep annually with 360 being processed into value-added products.

If production targets are achieved and expenses are controlled through recruiting enough livestock to be processed the business demonstrates viability. Even if some species are removed the business remains viable, however beef processing is a strong economic driver for this model.

G. Market Plan Scenarios

The initial market planning for Good and Local MPU is to work with livestock producer cooperative ownership livestock while refining operations and offering services to surrounding regions. The annual county fair season is an opportunity to showcase the MPU to livestock producers and to contract service to existing livestock processors. The

products created from the MPU would be focused on local retail settings, restaurants, institutional buyers, and CSA programs.

H. Examples

Nationally there are viable examples of successful mobile processing businesses serving their market. The Bay Area Ranchers Cooperative is one such example, who formed in response to decreasing local opportunities to process their livestock in the San Francisco Bay Area. Their recent announcement in late winter / early spring 2022 of beginning operations at their mobile meat processing facility serves to give additional hope to the viability of this project. Island Grown Farmers Cooperative is another successful example, started in 2002 to create butchering access to small farmers on the San Juan Islands. Both of these examples serve to demonstrate the need to provide financially inclusive livestock harvesting services to communities. Over the course of engaging with the stakeholders in the region, the working group was connected to a livestock producer in Western Ohio who was awaiting the delivery of his red meat mobile processing unit. He had been learning about them for several years and he was expected to begin operations in Spring 2022 in Southwestern Ohio.

I. Commitment of Buyers

Buyers within Southeastern Ohio range a great deal in terms of economic ability to individually purchase locally sourced meat and farm products. Within many communities in Southeastern Ohio there are strong Farmer’s Markets and other local markets which give local entrepreneurs an opportunity to access local markets and find customers. The working group survey found that 90.78% of survey respondents were likely or very likely to purchase more local red meat if it were available. These consumers were also seeking pasture-rasied, non-GMO feed, and grass-fed growing practices but struggled to find them in the marketplace. These practices are not often implemented on the scale of industrial agriculture and are more likely to be practiced by a small to medium sized livestock producer. Through offering smaller scale livestock producers the option to access livestock harvest services, greater diversity of meat products could be made available to the consumers in the market where the MPU operates.

J. Commitment of Producers

Livestock producers would be recruited to join the livestock producer cooperative ownership group initially. Once that group is formed and has several months of harvest scheduled, a projected schedule can be formed that can be used to evaluate offering harvesting services to additional livestock producers outside of the cooperative. The producer-ownership structure is an asset in securing commitments from producers, and through word-of-mouth referrals as well as exposure at county fairs there are opportunities to secure access to additional livestock inventory if required.

K. Summary of Market Feasibility

Based on the information assembled, if the livestock producers can be recruited, there is a viable economic opportunity for the owners of a red mead MPU servicing Southeastern, Ohio. A livestock processor who can offer scalable increases to competitor processors during busy times, while still also offering geographically remote communities a valuable agricultural business service. Through creation of value-added meat products, additional revenue opportunities emerge. Even accounting for inedible removal costs and other overhead, with beef processing there is potential to support livestock processors. As The University of Rio Grande and Rio Grande Community College begin their Meat Science program of study, additional workforce will be contributed into the region which would further support the viability of a MPU. The local food movement and locally prominent businesses would be excellent opportunities to capture consumer segments, with locally-sourced restaurants forming a strong secondary segment. A MPU serving Southeastern Ohio would alleviate the seasonal bottleneck that processors and producers experience, and if cooperatively owned could help to build agricultural producer wealth. It is the belief of the working group that red meat MPU operations are a compelling business within rural agricultural communities, and they represent a unique opportunity to take local control over food resiliency.

VI. Technical Feasibility for a Mobile Processor

A. Environmental and regulatory issues

Ohio was the first state in the nation to participate in the USDA’s Cooperative Interstate Shipment (CIS) Program, beginning in August of 2012, enabling small meat

processors to ship products across state lines if all elements of harvest and processing are completed in USDA inspected facilities (US Department of Agriculture).

From operating a small meat processing plant, ACEnet has learned that the Division of Meat Inspection in Ohio has their own workforce challenges that prevent them from being as flexible and responsive to processor issues as they would like. Most of the inspectors we have personally met are interested in mobile processing, but have concerns about logistical scheduling issues and knowing where to appear for inspected production. The harvesting pads or county fairgrounds are a possible solution to this obstacle, since all mobile slaughters will require a harvesting pad to have access to everything that an MPU requires. Ohio Division of Meat Inspection regulators have asked for scheduling to be established 3 weeks out, and for mobile processing under FSIS inspection this would need to be scheduled at least one month out.

The MPU in consideration comes with a HACCP Plan and SSOPs produced by the manufacturer, tailored to the use-cases the buyer intends. ACEnet also possesses staff with sufficient expertise to author a HACCP Plan and SSOPs for meat processing and food businesses.

A. Summary of Technical feasibility

The state of Ohio was the first state in the nation to enter into the CIS program, to enable processors to ship products across state lines. This entrepreneurship within the state as well as recognition of the importance of the food supply chain serving Ohioans is an asset for the feasibility of a MPU. The grant of inspection for the MPU will be able to be procured with the services available through the MPU producer.

ACEnet currently operates a meat processing space that is made available to ACEnet clients. This space is currently under ODA Inspection but has previously been approved for FSIS inspection if an ACEnet client desires. Within the staff of ACEnet this is sufficient expertise related to operating a meat processing facility to enable the staff to operate an MPU. Several key differences exist between an MPU and the brick and mortar establishment that ACEnet has operated. First, the MPU is mobile and will require a truck and driver to move the MPU to sites and ACEnet does not currently have a CDL driver. Additionally, the facility that ACEnet operates is a cut and wrap facility with sufficient equipment and implements to process sides of beef or larger red meat primals

into value-added products. The facility that ACEnet operates has sufficient space to receive a modular freezer with a rail system that could enable aging and value-added processing. When recruiting workforce a CDL being present among the staff will need to be accounted for due to the size and weight of the MPU.

VII. Financial Feasibility for a Mobile Processor

A. Capital

1. The capital required to launch a red meat MPU in southeastern Ohio are projected to be $1,191,613.00 with $865,000.00 being the cost of the MPU and modular freezer with rail-system.

B. Cash Flow

1. With sufficient access to livestock to process, and coordination with buyers there is sufficient cashflow on a monthly and annual basis to cover business expenses.

C. Access to Capital

1. Local / Regional Programs:
    a) Ohio Meat Processing Grant: This program provides grants of up to $250,000 to Ohio livestock and poultry producers so they can implement processing efficiencies, expand or construct facilities at existing sites, assist in training and certification, and improve harvest services.
    b) Appalachian Growth Capital: CDFI focused on starting and growing businesses in Appalachian Ohio.
    c) Partner Community Capital: CDFI focused on small and mid-sized businesses, agricultural enterprises, and nonprofits in Central Appalachia. Loans $5,00 - $75,000
    d) Ohio Valley Regional Development Commission : Gap financing up to $300,000 for start-up or expanding businesses that create jobs in a 12- country region in southern Ohio.

2. National Programs:
    a) Through the Food Supply Chain Guaranteed Loan Program, USDA will partner with lenders to guarantee loans of up to $40 million to help eligible entities expand meat and poultry processing capacity and finance other food supply chain infrastructure. Lenders may provide the loans to eligible cooperatives, corporations, for-profits, nonprofits, Tribal communities, public bodies, and people in rural and urban areas.
3. USDA Rural Development Grant Programs:
    a) Meat & Poultry Processing Expansion Program Grants: The Meat and Poultry Processing Expansion Program (MPPEP) provides grants to help eligible processors expand their capacity. USDA Rural Development designed the MPPEP to encourage competition and sustainable growth in the U.S. meat processing sector and to help improve supply chain resiliency. Applications are due May 11, 2022. See the Request for Applications here. The maximum award size is $25 million or 20% of total project costs, whichever amount is smaller.
    b) Value-Added Producers Grants: The Value-Added Producer Grant (VAPG) program helps agricultural producers enter into value-added activities related to the processing and marketing of new products. The goals of this program are to generate new products, create and expand marketing opportunities and increase producer income. You may receive priority if you are a beginning farmer or rancher, a socially-disadvantaged farmer or rancher, a small or medium-sized farm or ranch structured as a family farm, a farmer or rancher cooperative or are proposing a mid-tier value chain. Proposals are due April 25, 2022.

4. USDA Agricultural Marketing Service Grant Programs:
    a) Meat & Poultry Inspection Readiness Grants: The Meat and Poultry Inspection Readiness Grant (MPIRG) program assists currently operational meat and poultry slaughter and processing facilities in obtaining a Federal Grant of Inspection under the Federal Meat Inspection Act (FMIA) or the Poultry Products Inspection Act (PPIA); or to operate as a State-inspected facility that is compliant with FMIA or PPIA under a respective Cooperative Interstate Shipment (CIS) program. Applications are due May 24, 2022. See the Request for Applications here.
    b) Farmers Market Promotion Program: Farmers Market Promotion Program (FMPP) funds projects that develop, coordinate, and expand direct producer-to-consumer markets to help increase access to and availability of locally and regionally produced agricultural products by developing, coordinating, expanding, and providing outreach, training, and technical assistance to domestic farmers markets, roadside stands, community-supported agriculture programs, agritourism activities, online sales or other direct producer-to-consumer (including direct producer-to-retail, direct producer-to-restaurant, and direct producer-to-institutional marketing) market opportunities. Proposals are due May 16, 2022.
5. MISC Links:
    a) Complete list of USDA meat & poultry supply chain programs - https://www.usda.gov/meat
    b) Meat & Poultry Processing Expansion Fact Sheet - https://www.rd.usda.gov/sites/default/files/508_rd_factsheet_mppep.pdf

c) Meat & Poultry Processing Capacity Technical Assistance - https://www.ams.usda.gov/services/grants/mppta

D. Ownership Structure

1. The ownership structure is anticipated to be composed of a livestock producer cooperative, with approximately 25 particiapting members. A buy-in has been recommended of $9536.00 per participating member joining the livestock producer cooperative.

E. Financial Plan

1. A Business Plan and Financial Plan has been prepared for Good and Local MPU.

VIII. Management Feasibility for a Mobile Processor

A. Qualifications and Necessary Skills of Management Team

1. The management team will need to possess sufficient business administrative experience to understand rural business environments and costs, including how to grow livestock producer participants and enable completion of consumer sales. They will need to interface with the ODA and USDA staff assigned to inspect and regulate the operations of Good and Local MPU. They will need to possess sufficient communication skills to enable the livestock producer network to be successful in recruiting efforts.

B. Business Structure

1. Nonprofit cooperative in Ohio

C. Business Plan

1. Link to Business Plan

D. Summary of Management feasibility

1. While this would be a new activity for this group of livestock producers, there is enough existing knowledge and skills related to the meat processing industry with the region that there is sufficient potential to manage this business. Assistance from ACEnet, other MPU operators in the region, and the Niche Meat Processing Assistance Network will form the outline of broad knowledge and

skill support that the MPU owners will receive. The working group believes that other cooperative MPU operators would provide a strong case study to help prepare the Southeastern Ohio cooperative members for the responsibilities of operating a MPU.

IX. Conclusions and Recommendations

A red meat protein mobile harvest unit for southeastern Ohio would be a new service for livestock producers, but there is livestock inventory within the region, new workforce development programs coming onling to grow the skills labor, and innovative funding available from multiple levels of the state and federal government to support this initiative. With value-added retail sales from the harvesting activities, there are revenues available that could support the MPU as well as the livestock owner cooperative members. This business activity serves to support agricultural producers while helping the ownership group to generate a new line item of income for their agricultural businesses. Forming the network of livestock producers and assessing their livestock inventory is the first step that is advised for anyone considering this activity. Based on the annual totals, livestock producers should be recruited by species and geography. As livestock producers in one community are identified, working with their neighbors to uncover any additional livestock producers who would be interested in a harvest nearby. The flexibility of the MPU to provide service to livestock producers as well as be contracted out to livestock processors to overcome seasonal bottlenecks or to be contracted to institutions of higher education for experiential learning are strong alternative sources of income for the MPU. As potential owner operators are identified, it is recommended that they review the resources on the Niche Meat Processing Assistance Website as well as reachout to staff at ACEnet to talk through the regional resources that exist and what connections need to be made.

A MPU providing locally accessible livestock harvesting service would increase the regional pace of livestock harvest. It would enable community members to focus on their agricultural businesses without needing to refocus on transportation and the fuel and time needed to transport livestock. Based on the headcounts of livestock in the region there is sufficient livestock inventory across species, and due to that and the uncertain composition of the ownership group’s livestock holdings the financials have

been built flexibly to accommodate this shifting composition. Beef value-added processing should be prioritized by the MPU operators due to the potential revenue available through beef processing. For owner operators the MPU could represent a new form of income to support their businesses, in a region that has many agricultural producers struggling to cover their expenses.

The working group has been thankful for the time and opportunity to delve deeply into the regional and national meat industry ranging from livestock producers to livestock processors and the end consumer of meat products. This work has highlighted the differences in needs and structural challenges that all participants in the regional meat economy face when transacting. As a result of this work, we now possess a functional knowledge of what an MPU could do to support the regional red meat protein value chain, and what projected costs need to be accounted for with an entrepreneur entering the meat industry.

X. Citations and References

Works Cited

Amann, Denise. “An Introduction to Mobile Slaughter Units.” *USDA*, 21 February 2017, https://www.usda.gov/media/blog/2010/08/30/introduction-mobile-slaughter-units. Accessed 21 March 2022.

“Census of Agriculture - 2017 Census Publications - State and County Profiles - Ohio.” *USDA NASS*, 22 February 2019, https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Ohio/index.php. Accessed 21 January 2022.

“Census of Agriculture - 2017 Census Publications - State and County Profiles - Ohio.” *USDA NASS*, USDA, 22 February 2019, https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Ohio/index.php. Accessed 2 February 2022.

“County Estimates.” *County Estimates*, 27 August 2021, https://www.nass.usda.gov/Statistics_by_State/Ohio/Publications/County_Estimates/2021/OH_Cattle_County_2021.pdf. Accessed 22 March 2022.

“Division of Meat Inspection Coverage Map.” *Ohio Department of Agriculture*, https://agri.ohio.gov/divisions/meat-inspection/meat-district-coverage-map. Accessed 21 January 2022.

Figueroa, Alejandro. “Ohio meat packing facilities are experiencing major backlogs. A state grant could help.” *WYSO*, 3 January 2022, https://www.wyso.org/local-and-statewide-news/2022-01-03/ohio-meat-packing-facilities-are-experiencing-major-backlogs-a-state-grant-could-help. Accessed 21 January 2022.

“January 2022 Ranking of Ohio County Unemployment Rates.” *Ohio Labor Market Information*, 1 January 2022, https://ohiolmi.com/_docs/LAUS/Ranking.pdf. Accessed 1 February 2022.

Knudson, William A., et al. “A Feasibility Assessment of a Meat Slaughtering/Processing Plant or Feedlot in Northern Michigan William A. Knudson and H. Ch.” *MSU College of Agriculture and Natural Resources*, January 2007,

https://www.canr.msu.edu/productcenter/uploads/files/processingpaper.pdf. Accessed 2 February 2022.

"Ohio Game Processors." *Ohio CWD Certified Processors and Taxidermists*, https://ohiodnr.gov/static/documents/wildlife/wildlife-management/Ohio+CWD+Certified+Processors+and+Taxidermists.pdf. Accessed 1 February 2022.

"OhioMeansJobs - Workforce Supply Tool." *Workforce Data Tools*, https://workforcedatatools.chrr.ohio-state.edu/workforcesupply/. Accessed 1 February 2022.

The Ohio State University - College of Food, Agricultural, and Environmental Sciences. "Meat Processing Business Tool Kit | Meat Science Extension." *Meat Science Extension*, https://meatsci.osu.edu/programs/meat-processing-business-toolkit. Accessed 2 February 2022.

The Ohio State University Extension, et al. "Composting Livestock and Poultry." *Field Office Technical Guide*, 2000, https://efotg.sc.egov.usda.gov/references/public/OH/Ohio_composting_manual.pdf. Accessed 2 February 2022.

The Pig Site. "Ageing and the Impact on Meat Quality." *The Pig Site*, 1 June 2012, https://www.thepigsite.com/articles/ageing-and-the-impact-on-meat-quality. Accessed 2 February 2022.

Selak, Ron. "Beefing up meat processing in the Valley | News, Sports, Jobs." *The Vindicator*, 9 January 2022, https://www.vindy.com/news/local-news/2022/01/beefing-up-meat-processing-in-the-valley/. Accessed 21 January 2022.

"US Census Bureau QuickFacts: Athens County, Ohio." *U.S. Census Bureau*, https://www.census.gov/quickfacts/athenscountyohio. Accessed 2 February 2022.

US Department of Agriculture. "Agriculture Deputy Secretary Merrigan Announces New Opportunities for Small Meat and Poultry Processors." Press Release from USDA. *Ohio First to Participate in USDA Cooperative Interstate Shipment Program*, Washington, USDA, August 9, 2012 August 2012, https://www.usda.gov/media/press-releases/2012/08/09/agriculture-deputy-secret

ary-merrigan-announces-new-opportunities. Accessed 24 January 2022. Press Release.

U.S. Department of Agriculture - Food Safety and Inspection Service. “Mobile Slaughter Unit Compliance Guide.” *Mobile Slaughter Unit Compliance Guide*, USDA, May 2010, https://www.fsis.usda.gov/guidelines/2010-0001. Accessed 12 December 2020.