

# Michigan Meat Processing Capacity Assessment Final Report

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**MICHIGAN STATE**  
**UNIVERSITY** | **Extension**



MSU CENTER *for* REGIONAL FOOD SYSTEMS

### ***Executive Summary***

A survey was developed to capture the state of the meat industry in Michigan. Surveys were distributed via mail or email to meat processors throughout Michigan. There were 111 surveys returned and results were analyzed. Survey results indicate that meat processing operations in Michigan are diverse. The majority of meat processors in Michigan are small or very small in size. Retail exempt operations were the most common and less than half of establishments that responded that they slaughter livestock. Beef jerky, bacon and other cured meats were the most common types of processed meats. While processed meats were most common, fresh beef (meat) was also a common signature item for businesses. Location choices of processors appeared to be influenced by their operations, with the distance to the next nearest slaughter facility generally being greater for USDA inspected operations compared to custom exempt slaughter facilities. Few non-USDA inspected businesses were interested in becoming USDA inspected. The majority of the businesses were owned by males, and the average age of owners was about 54. Slightly more than half of the operations have a succession plan in place for their business. Membership to an organization or association was not common among respondents. The majority of all respondents kept electronic records for financial and/or daily operational purposes although some kept both written and electronic records. Word of mouth and other electronic means (website, social media) were the most common methods of advertisement used by establishments. Most meat is purchased as fresh boxed meat. Most processors indicated that costs were the primary consideration in setting price, though a sizable share also tracked market prices when determining the prices they charge. Facility age varied significantly, based on year established, but the majority of operations had gone through some type of renovation in the last 15 years. Most operations employ less than five individuals and hire additional help during the peak processing time from late summer through fall. Challenges identified by respondents included trouble finding qualified workers, food safety regulations, and cost of utilities. Respondents reflect an optimistic outlook for their businesses with future growth potential.

### ***Study Objective***

The objective of this study was to assess the capacity of slaughter, carcass chilling, further processing, and marketing of regionally sourced meat products in Michigan. Information from the survey will be published to share that information. It is expected that this information will increase the capacity of the educators, researchers, livestock farmers and meat processors in Michigan for collectively developing outreach and research programs. Additional grant funding will be sought for research and programs to serve Michigan's meat and livestock industry. The data collected from this survey will assist in the development of local and statewide strategies to foster business-to-business relationships that will improve the connectivity of local and regional meat value chains based in Michigan.

### ***Methods***

A survey of Michigan meat processors was carried out in the spring of 2014. Questions were developed to identify the capacity of slaughter and meat processing throughout the state. Questions included production capacity, training, regulation and identification of challenges and was reviewed by specialists in the MSU Center for Regional Food Systems (CRFS). The

survey was piloted at the Michigan Meat Association annual conference on March 1, 2014 and sent to several processors to test the efficacy of the survey and clarity of questions. Minor changes were made based on the comments of these initial business owners. An electronic version of the survey was created on Qualtrics.com and hard copies were printed for mailing.

The survey was then sent by mail to all (n=402) known meat processors in Michigan, using lists from USDA, Michigan Department of Agriculture and Rural Development (MDARD), MSU and Michigan Meat Association. The survey invited processors to participate in the survey via print form or electronically on the Qualtrics web-based version. The mailing included a \$2 bill as an incentive and allowed respondents the option to enter into a drawing for two \$100 VISA gift cards. Follow up phone calls were conducted by MSU personnel to ensure maximum response rate. Those who indicated by phone that they were willing to fill out the survey were sent another one by mail or email. All surveys received by mail were manually entered into Qualtrics by qualified personnel. Gift card winners were selected using the random selection function in Excel from all respondents on July 10, 2014.

A total of 402 survey invitations were distributed. Of these, 111 completed surveys were received via Qualtrics or by mail, establishing a response rate of 28 percent. All data was coded for proper response values and tabulated on those values where each cell represents the total number of responses and/or percent of total responses out of total responses indicating the selected value. Not all questions were required. Therefore the total number of responses on any question may not sum to 111. In addition, invalid responses on any one question were removed from the question sample. Where "other" categories were available for the respondent, a group other tabulation is included followed by a list of selected written-in entries. Summary statistics were collected for select questions where mean and standard deviation of response was appropriate (cardinal, rather than ordinal values). Responses were not weighted, as no baseline values have been collected to describe the population of meat processors in Michigan.

Stata/SE 13.1 was used for compiling most tables from the survey of Michigan processors. Tabulations and summary statistics are based on random sampling and no representative weights were applied. Checks for consistency were carried out to flag bad responses, however, no records were deemed unrepresentative based on peer responses. However, individual responses were modified to meet question requirements. Where respondents provided a range of values, the minimum, mid-point or maximum was chosen depending on the question. For example, the minimum of the range was selected if the requested value asked for a minimum, while mid-points were used if the question asked for an estimated value. Open-ended responses were simply tabulated for valid responses.

## **Results**

**Slaughter and Processing Demographics:** Of the establishments that answered the survey, 59% do not slaughter animals (n=57) and 41% do slaughter (n=40). The average counts of animals processed per year in 2013 are listed in Table 1. Table 1 reveals a significant range of operation size, based on count of processed animals. The median value denotes the most common size of operation, where the average values may be skewed by unusually large processors. The

relatively low medians suggest that smaller operations are more common than large processors. Other species were mentioned including turkey processing, poultry, buffalo and bear. Most facilities require seven to 14 days in advance for scheduling of livestock for slaughter. The median was seven days and the full range of scheduling ranged from 0 to 60 days advanced notice (Table 2). Of the facilities who responded, 75% indicated that length of time needed for advanced scheduling of livestock varied seasonally (Figure 1).

**Table 1. Average number of livestock processed in 2013 per establishment (n=107)**

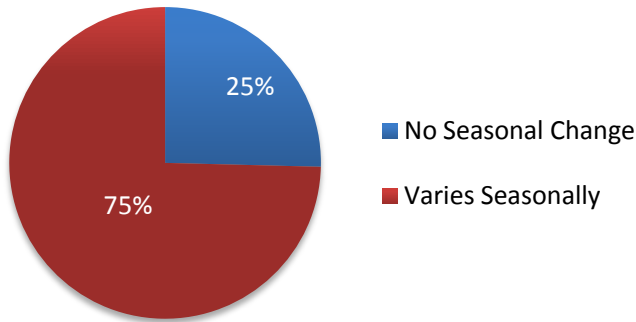
Species	Average	Median*	Minimum	Maximum	Standard Deviation
Finished beef cattle	243	244	0	3080	590
Finished dairy cattle	46	50	0	3000	299
Cull dairy cows or bulls	225	25	0	20000	1,952
Cull beef cows of bulls	15	15	0	520	64
Feeder calves (veal)	6	8	0	475	46
Market lambs	57	40	0	1450	175
Cull ewes or rams	2	8	0	150	15
Market hogs	600	400	0	32000	3,185
Cull sows	3	10	0	100	12
Cull boars	1	10	0	20	3
Market goats	19	18	0	1200	119
Cull goats	0	5	0	10	1
Game animals	229	475	0	3850	525

\* Based on non-zero responses

**Table 2. Days in advance needed to schedule livestock slaughter**

Days	Frequency	Percentage
0	8	12.1
1	3	4.9
2	3	4.9
3	1	1.6
4	2	3.3
5	2	3.3
7	21	34.4
10	2	3.3
14	6	9.8
15	1	1.6
21	1	1.6
30	7	11.5
31	2	3.3
60	2	3.3

**Figure 1. Seasonal change of booking for harvest**



Operators were asked under which type of inspection system their plant operates and were allowed to select all that apply. Of the facilities who responded, 58% were retail-exempt, 30% were custom-exempt, 14% were United States Department of Agriculture (USDA) inspected during slaughter, and 26% were USDA inspected during processing (Figure 2).

Respondents were asked if their business slaughters and 41% indicated Yes. A few respondents indicated specialized practices including Halal slaughter (6%), Kosher (5%), and Certified Organic slaughter or processing (11%) (Figure 3).

**Figure 2: Type of inspection**

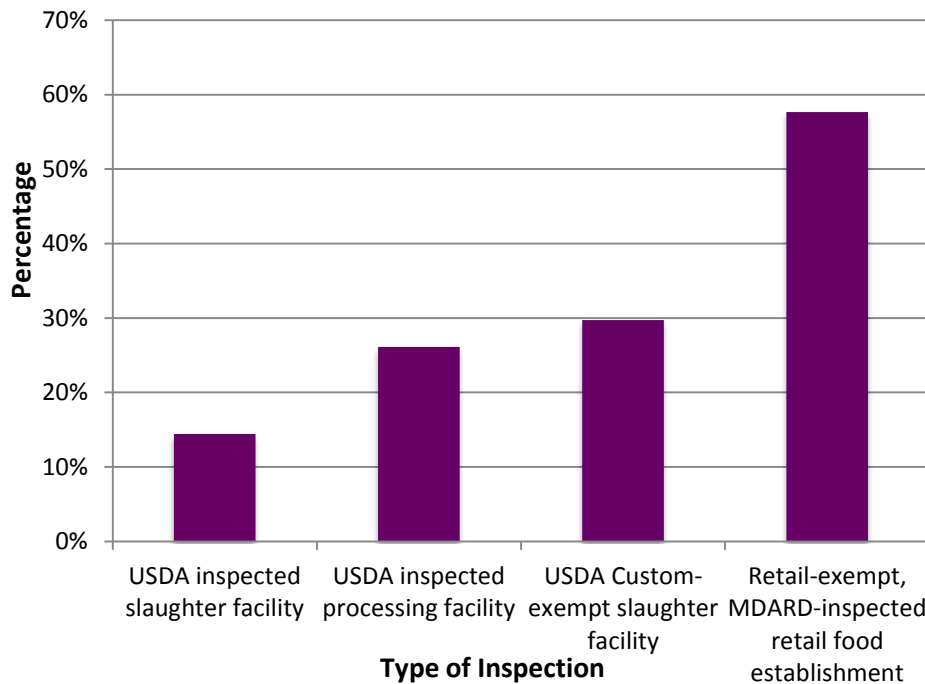
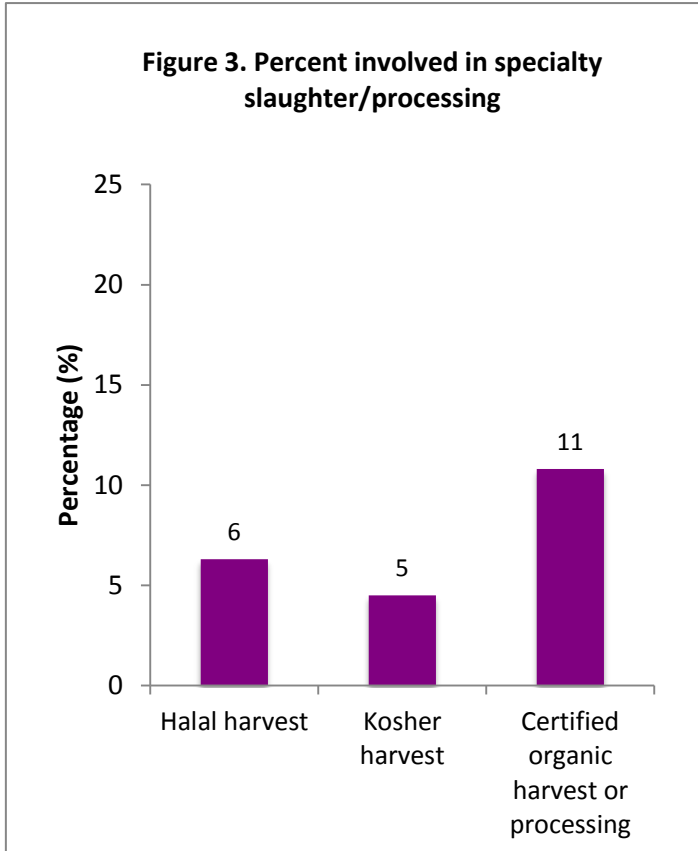


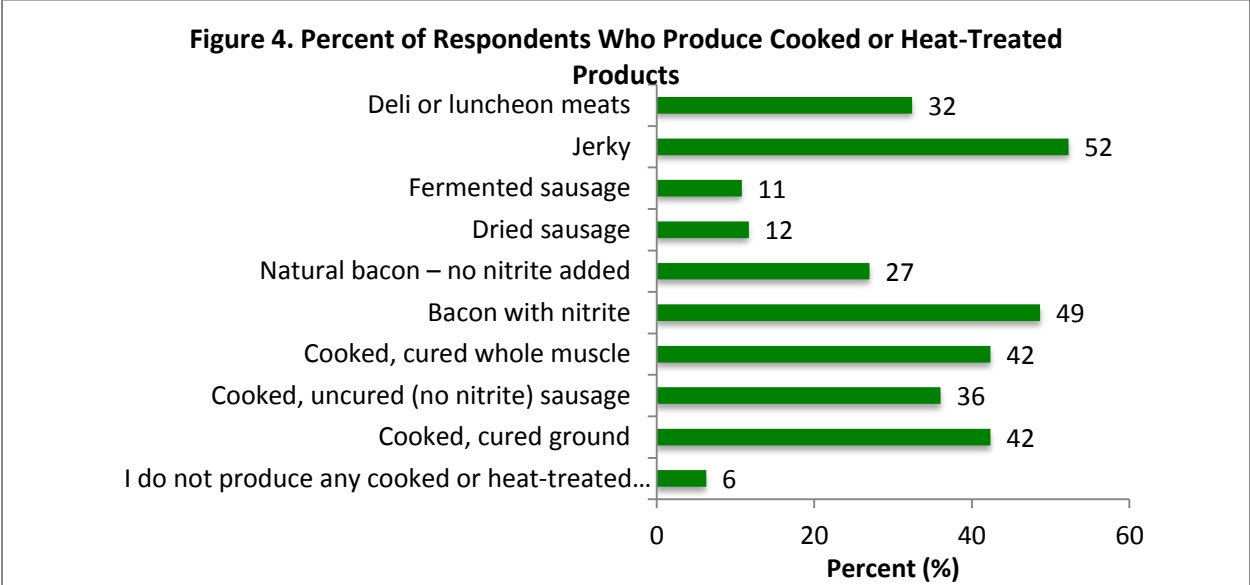
Figure 4 illustrates that the most commonly produced processed products are beef jerky (52%), bacon (49%), and other cured meats (42%). Approximately half of all of those who responded indicated that they are making cured meat products. There are about 27% of respondents who indicated they are making natural (uncured) bacon. Businesses most commonly described bacon, sausage and jerky as both their high volume and also the signature product. Snack sticks were also commonly listed as the highest volume product. In addition, fresh beef was often listed as a signature product. On average, businesses focus most heavily on production of



products for their own shop. Based on the responses, Michigan meat processors focus about 22% of their business on custom work (Table 3). It is evident based on the standard deviation and range of answers that there is a large diversity in the focus of businesses throughout Michigan.

**Geographical Relationship:** The majority of operations report a USDA inspected slaughter plant within 30 miles of their facility. The range of distance to the nearest business is quite wide (Table 4) and one would expect this to vary based on where in the state the processor is located. Only one operation reported more than 90 miles to the nearest USDA slaughter facility, and that distance was reported as 240 miles (Figure 5). It was reported that 39% of facilities have a custom slaughter plant within ten miles and 67% have such facility within 20 miles of their facility (Figure 6). Only one facility indicated that there was no custom slaughter facility in less than 100 miles of their location, and that was reported to be 300 miles. Seventy five percent of respondents indicated that there was another non-slaughter meat processor within 10 miles of their facility (Figure 7). Only 2% believe that the closest non-slaughter meat processor was more than 50 miles.

67% have such facility within 20 miles of their facility (Figure 6). Only one facility indicated that there was no custom slaughter facility in less than 100 miles of their location, and that was reported to be 300 miles. Seventy five percent of respondents indicated that there was another non-slaughter meat processor within 10 miles of their facility (Figure 7). Only 2% believe that the closest non-slaughter meat processor was more than 50 miles.

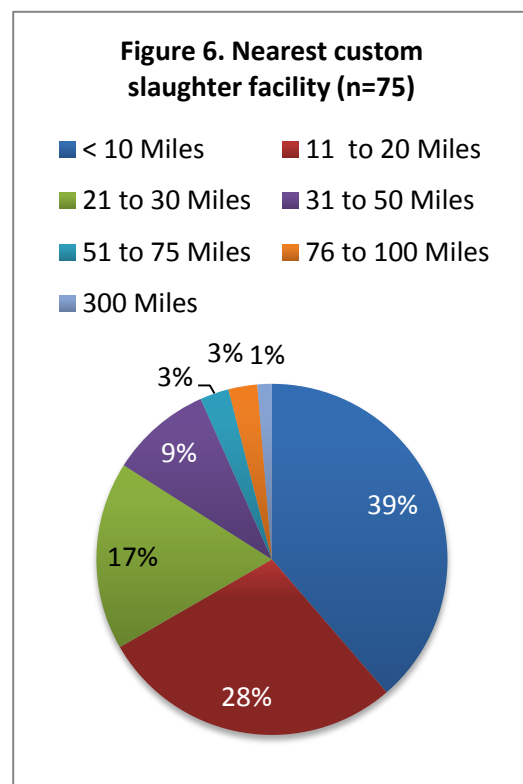
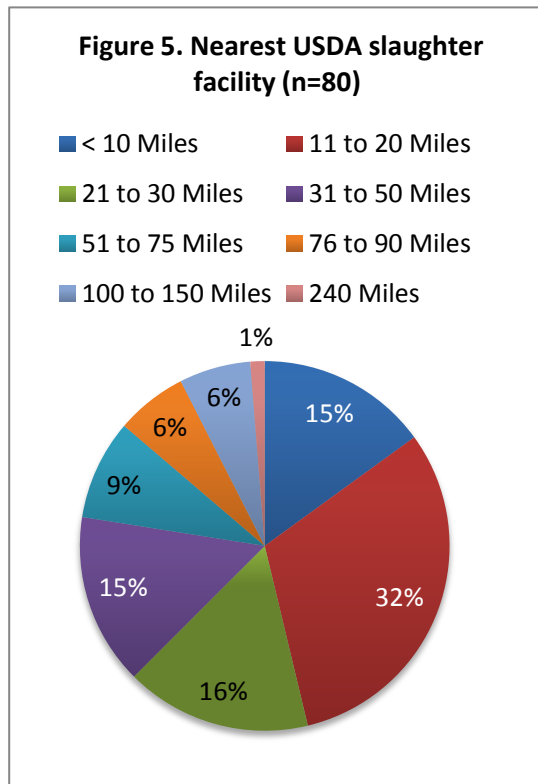


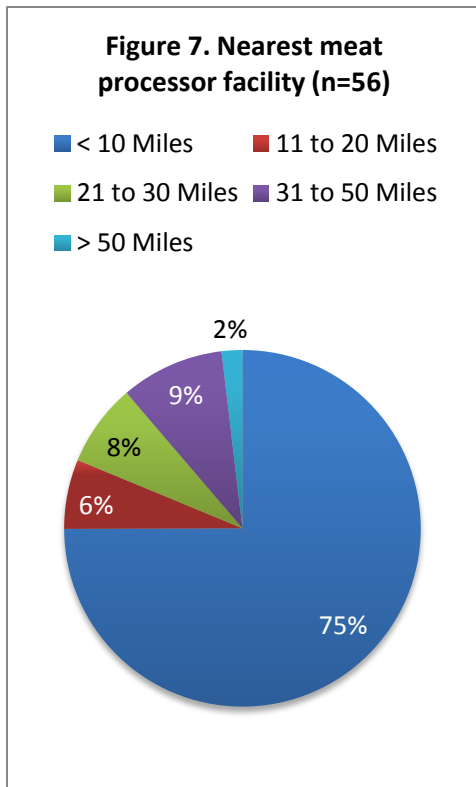
**Table 3. What percentage of your business is focused on each of the following? [respondent answers should total 100%, not reported values]**

Variable	Average (%)	n=	Standard Deviation	Minimum	Maximum
% I produce products for my own shop	37	104	40.10	0	100
% I produce products that I sell at a farmers market	2	105	7.62	0	45
% I supply wholesale and other retail markets	10	105	23.66	0	100
% I supply a local restaurant	4	104	9.68	0	50
% I perform custom meat processing	22	105	31.48	0	100
% I process for people who do their own direct marketing	3	105	8.95	0	50
% I provide a service for recreational game processing	11	105	22.49	0	100
% Other (please indicate)	7	104	22.36	0	100

**Table 4. Distance to nearest business**

Nearest USDA Facility	Slaughter	Nearest Custom Slaughter Facility	Nearest Meat Processor Facility
Range: 2 - 240 Miles		Range: 2 - 300 Miles	Range: < 1 - 60 Miles

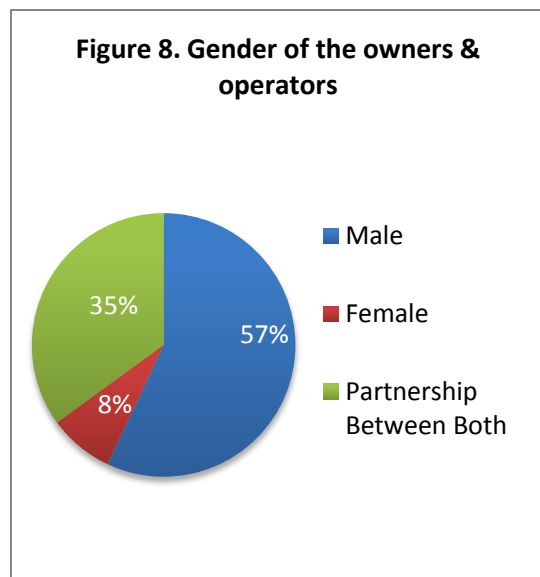




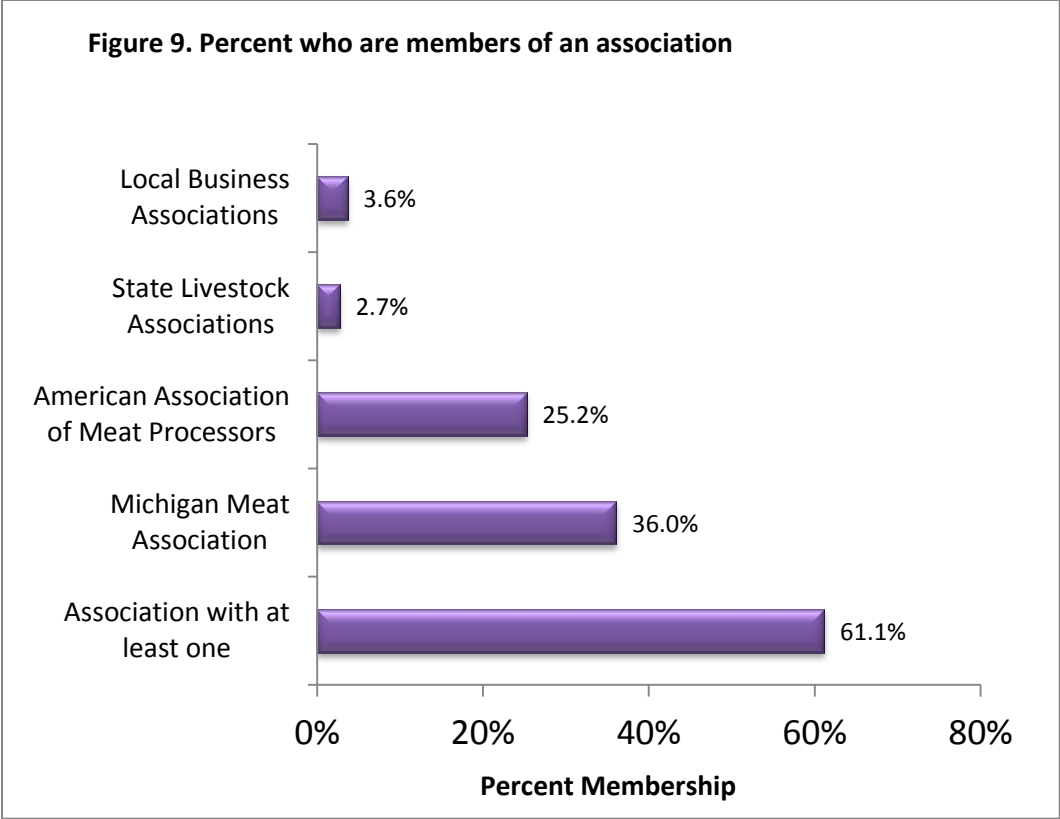
**Owner and Business Demographics:** The majority of meat processing businesses surveyed are owned by men, while 35% of operations are a partnership between both male and female (Figure 8). The age of the business owners responding varies greatly with a range of 22 to 100 years, but the average and median age of the primary owner is about 54, while that of the secondary owner is slightly less. Of those who responded, 36% were members of Michigan Meat Association and 25% were members of American Association of Meat Processors (Figure 9). Only 3% of processors responded as members of a state livestock association and 4% indicated they are a member of a local business association. The majority (61.1%) of respondents indicated having membership with at least one of these associations. The form of business varies, where most (29%) were reported as an LLC, about 19% reported as an S Corporation, 17% as sole proprietor and 16% as C corporations. Few respondents (4%) indicated a partnership (Figure 10).

Respondents indicated that they keep electronic records for financial purposes 36% of the time but only 16% indicated maintaining daily operational records electronically. Hand-written records are kept by 19% of the respondents for financial purposes and by 39% for daily operations. Businesses indicated they keep both written and electronic records 45% of the time for both financial and daily operational purposes.

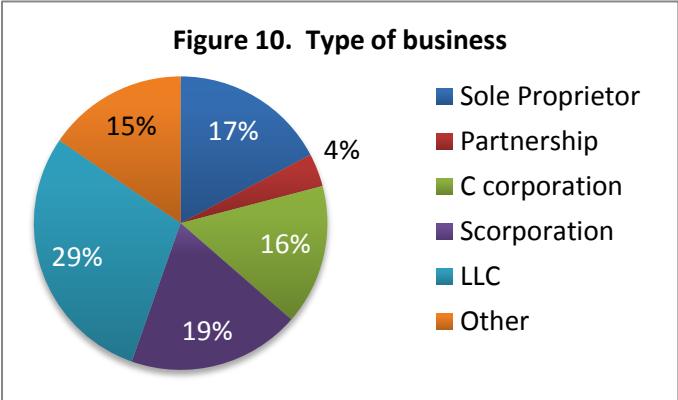
**Succession Plan:** When asked if a succession plan was in place, 52% indicated that they did have a succession plan. Common examples of succession plans indicated by respondents include: trust and will; family succession; partnership within the family; wife and family; stock is owned by third and fourth generation family; sell/turnover to an employee; buy/sell agreement; and currently working on a transition plan. About 25% of respondents under age 45 have a succession plan. This compares to 65% between age 45 and 60 and 45% of those over age 60.



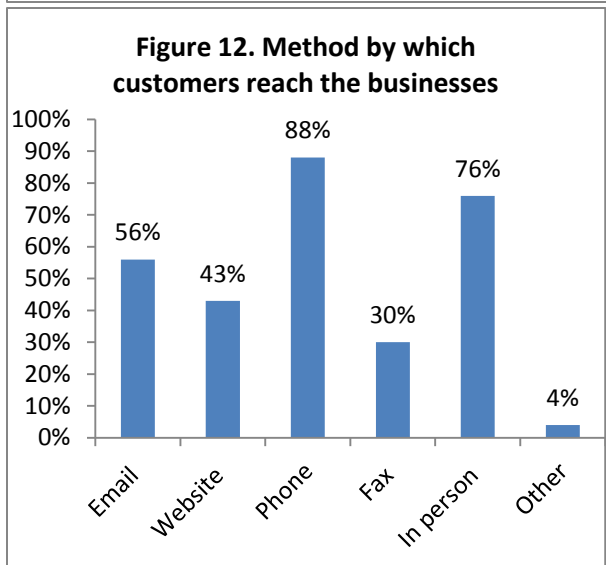
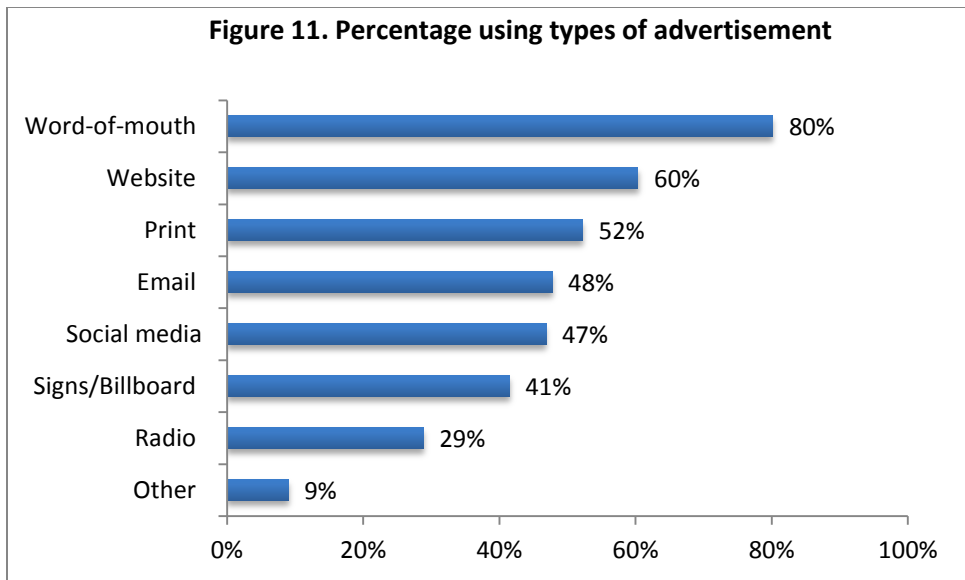




**Communications:** Respondents were asked to indicate what modes of advertisement they rely on. They could select as many as applied. From the responses, and write-ins, it is evident that processors employ a variety marketing strategies. The most highly utilized method of advertisement reported was word of mouth (Figure 11). Website is the second most common method of advertisement followed by print methods. Email, social media, and signs/billboards were indicated as the next most popular method of advertisement. Respondents indicated that their customers contact them primarily by phone and in-person (Figure 12). Finally, 56% indicated that they are contacted by customers through email.



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**Marketing:** Fresh boxed meat is the most common method of purchasing raw materials followed by the purchase of live animals (Table 5). On average, respondents sell 34% of their products as fresh retail cuts and processed meats (Table 6). The least common method of sales is frozen primal and wholesale cuts. In both purchase and sales, the methods vary greatly from plant to plant. While some facilities utilize various sources for meat products, it is clear that some facilities only utilize meat from live animals they bring in, some only bring in carcasses, and some only buy boxed meat. Respondents indicated that 38% of their livestock, and 24% responded that

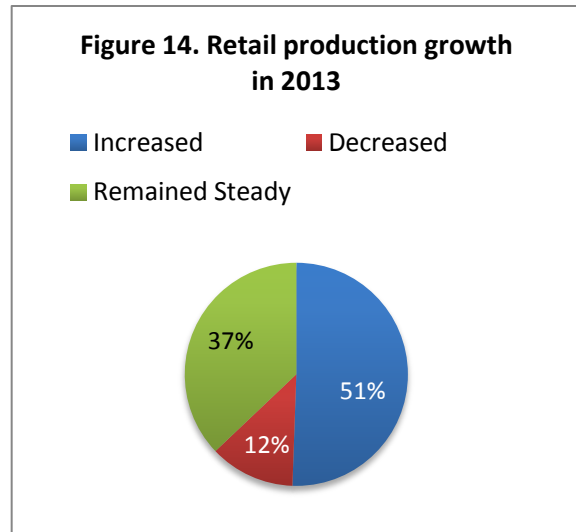
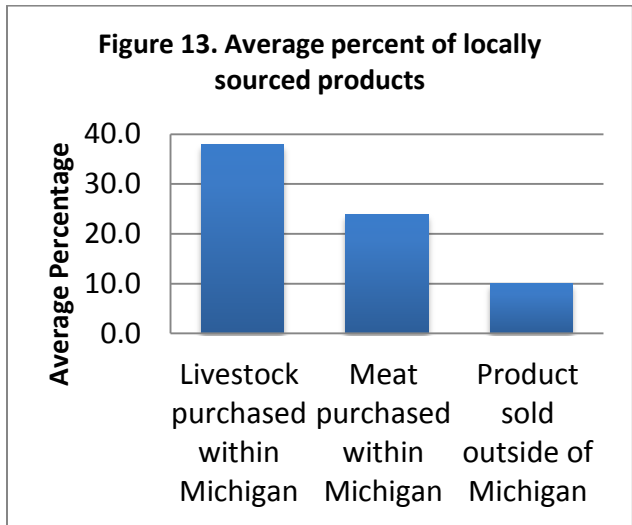
their purchased meat is definitely sourced from within the state of Michigan (Figure 13). On average, only 10% of product made is sold outside the state of Michigan. Only 12% of facilities have experienced decreased production in the past year, while 51% have grown (Figure 14).

**Table 5. Form in which meat raw materials are purchased**

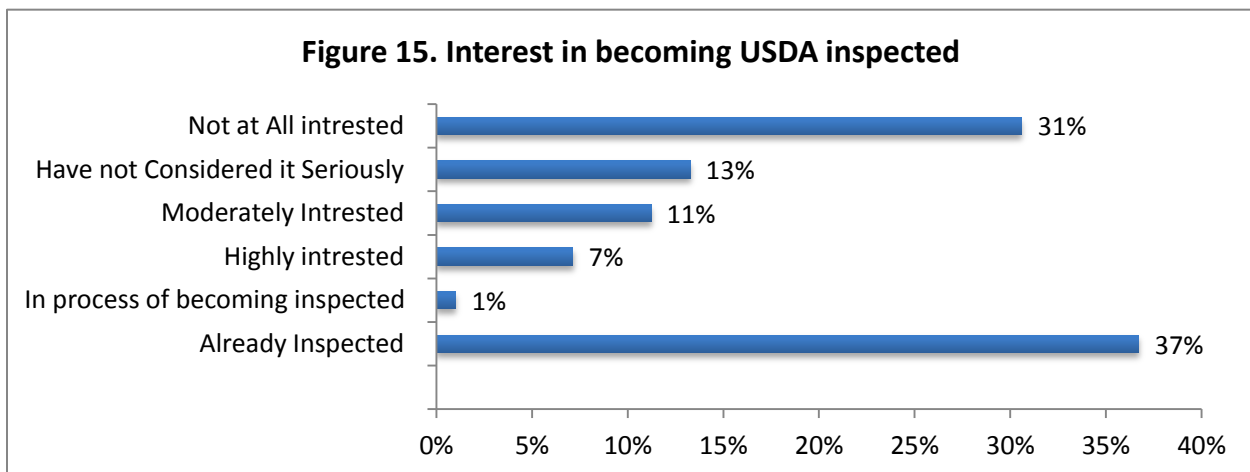
Form of raw meat	Average	Standard Deviation	Minimum	Maximum
% Live animal	22.32	37.90	0	100
% Whole or ½ carcass	6.44	18.79	0	100
% Combo-bin of meat	3.99	15.77	0	98
% Boxed meat – fresh	46.08	38.03	0	100
% Boxed meat – frozen	7.21	12.20	0	50
% Already processed	3.32	6.13	0	30

**Table 6. Form in which meat products are sold**

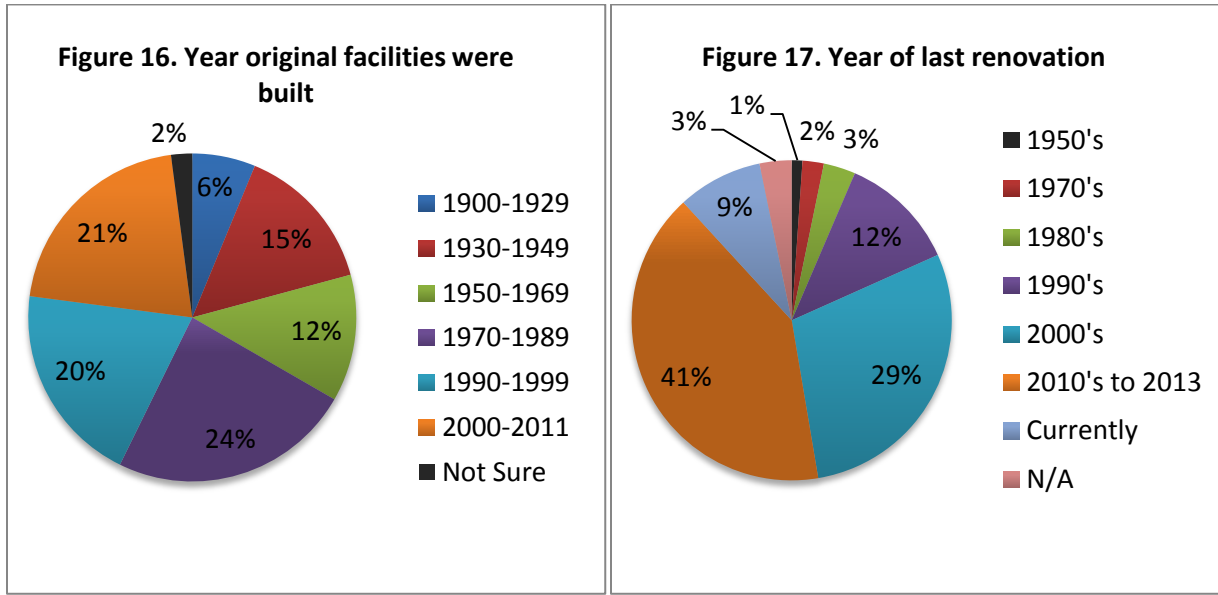
Form of meat	Average	Standard Deviation
% Whole or half carcass	13.12	29.07
% Primal & wholesale cuts – fresh	6.33	19.66
% Primal & wholesale cuts – frozen	3.25	13.07
% Retail cuts & processed meats – fresh	34.40	36.66
% Retail cuts & processed meats – frozen	15.11	20.66
% Retail cuts & processed meats –cooked or prepared	17.35	26.32



**USDA Inspection:** Although 37% of the respondents already have USDA inspection, only 19% of establishments indicated any interest or are in the process of becoming USDA inspected (Figure 15). Of the reasons listed in the survey, obstacles to USDA inspection included “too much intrusion on business” (15%), “too costly” (13%), “too much paperwork” (11%), and “too unsure of the steps to become inspected” (9%). “Other” was selected in 24% of the respondents and the most common indications were that it is not needed for the operation and building limitations, although several responses were a combination of the single selection choices listed.

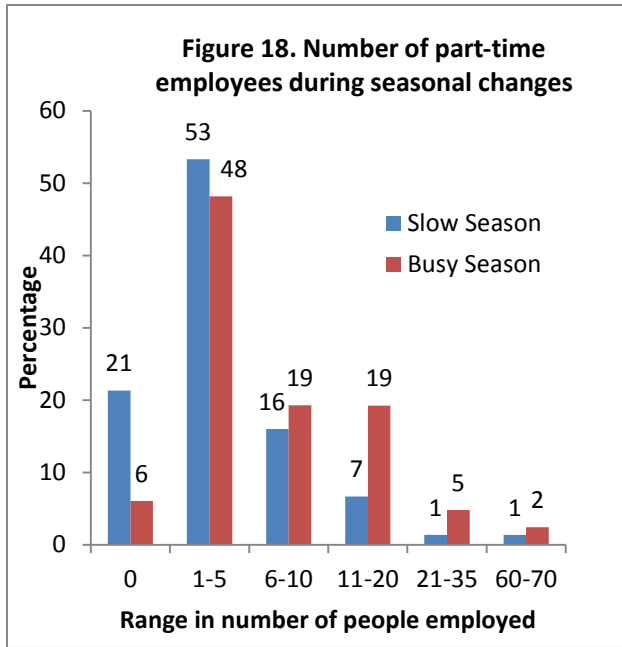


**Facilities:** The first year of use for facilities ranged from 1900 to 2011 (Figure 16). Approximately 6% of the facilities reported being built prior to 1930. Respondents indicated the majority of facilities were built after 1970, where about 21% of facilities were reportedly built after 2000. Furthermore, 41% of all facilities have undergone renovations since 2010 and 70% have been renovated after 1999 (Figure 17). Additionally, another 66% of operations have plans for expansion in the next three years.



**Employees:** Operations employment varied across respondents, from zero full time employees to 600. Additionally, respondents indicated significant employment numbers in terms of part-time employees. Part-time employment largely depended on the season, as the number of responded indicating no part-time employees during the slow season was 21% yet only 6% during the busy season (Figure 18). Most commonly, businesses indicate that they have one to five part-time employees during either season. The number of employees greatly increases during the busy season as indicated most clearly by the change in percent of businesses which employ no employees and the change in the percent of businesses who hire 11-20 employees at the slow versus busy season.

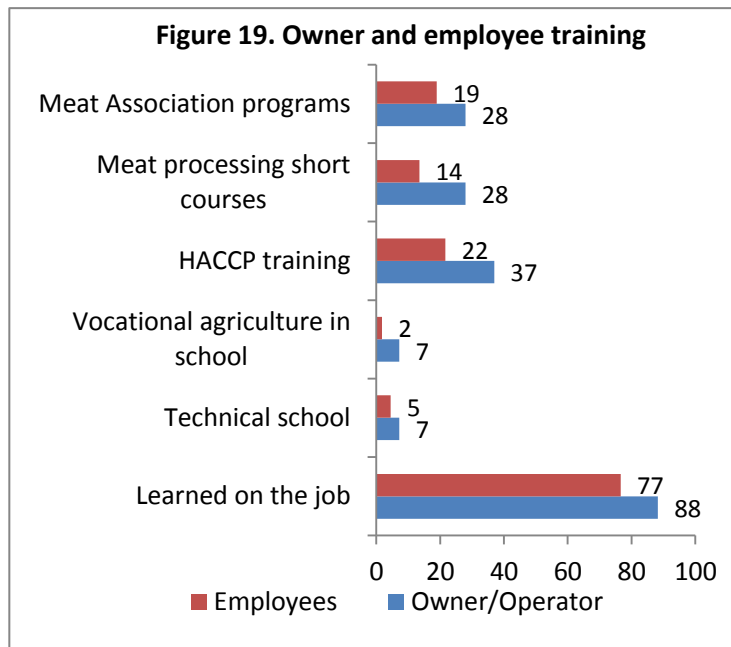
In regard to methods of training, the majority of employees (77%) and owners (88%) learned on the job without any formal training (Figure 19). Several of the owners have received HACCP training and also training from meat association programs. Seven percent or less of employees and owners gained training in vocational agriculture and/or technical school.



**Challenges Processors Express:** Respondents were asked to reflect on challenges to their operations. They were asked to select up to three top challenges from a long list of potential business obstacles. Responses were ordered by the number of times they were selected. This ordering is shown in Table 7 from most common selection to least. The top three challenges were finding qualified workers, food safety regulations, and cost of utilities. Other challenges listed included cost of commodities, equipment, labor, insurance, and health care as well as debt, wages, cost of commodities, government regulations, time off from the job, taxes, facility management, and financing growth. Additionally, “getting ready for the variance”<sup>1</sup>

and that “MDA[RD] – not proactive” were also written in by respondents.

**Growth Potential:** Based on responses of those establishments that slaughter, 53% indicated an increase in the number of livestock they slaughtered in the last year (Figure 20), while 35% suggested they have seen no change. A minority (12%) of processors that responded have experienced declines. For those operations that slaughter livestock, Figure 21 depicts the clear seasonality of production that results in a desire for growth in January through June. Over 58% of businesses would like to grow in all aspects of production between January and June, with the highest percentage of people wanting to grow production in April. Over 25% of operations are interested in growing all aspects of production from July to December. More than half of all operations indicated that they are already at maximum capacity from August through December. In general, meat processors typically have increased farm animal slaughter and processing in the late summer



<sup>1</sup> Likely refers to the requirement by the Michigan Department of Agriculture and Rural Development (MDARD) for retail-exempt processors processing certain products to have a [Specialized Meat Processing at Retail Food Establishments Variance](#).

and fall and results from this survey reveal an increase starting in July, peaking in August, yet remaining high in September and October (Figure 22). Combining Figures 21 and 22 indicate that capacity is a limiting factor between September and October and that supply constraints may be a limiting factor in other months.

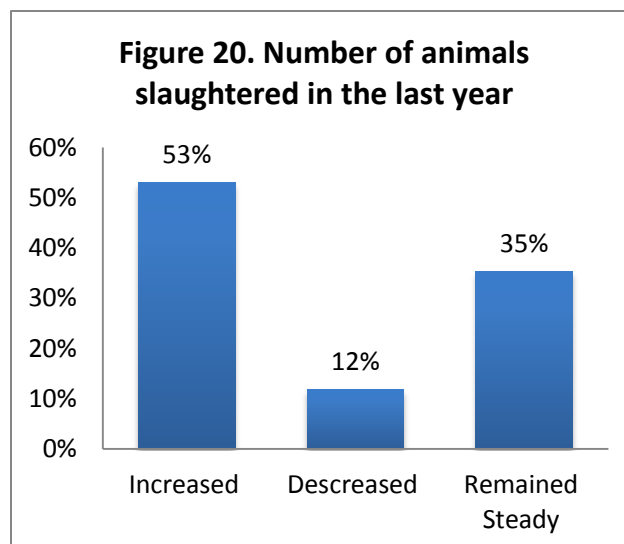
**Table 7. Top challenges that meat processors expressed from list of choices**

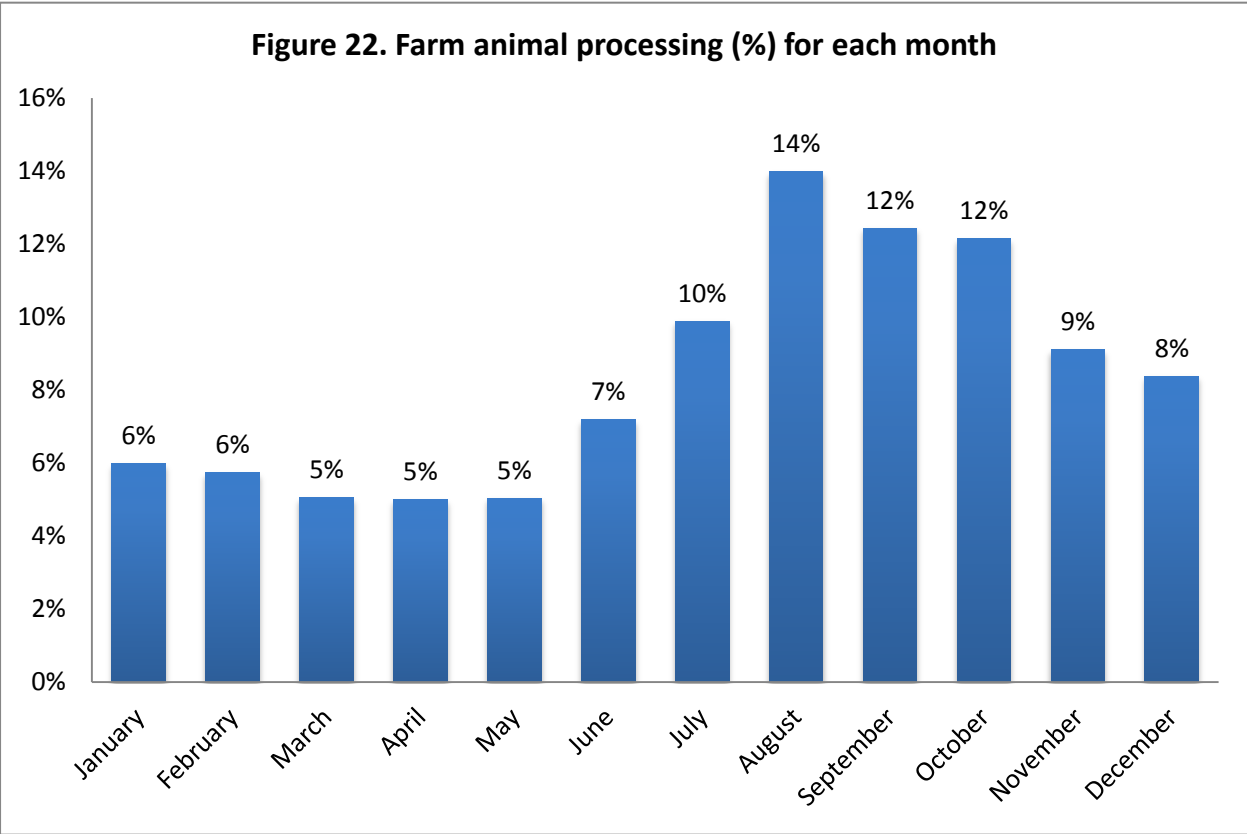
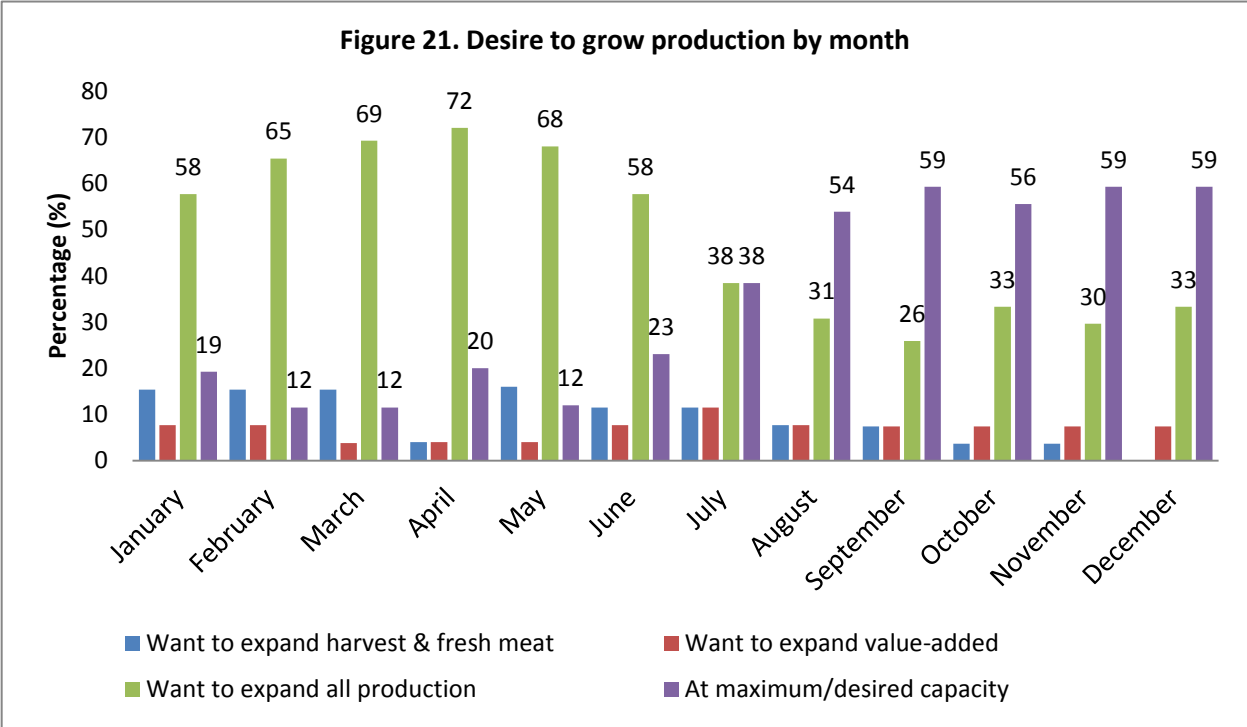
Top challenges*
Finding qualified workers
Food safety regulations
Cost of utilities
Current market conditions
Seasonality of demand for product
Environmental regulations
Access to customers (marketing)
Other**
Labor regulations
Shelf-life and storage
Planning for future demand
Managing current growth
Inconsistent supply of livestock
Interaction with inspectors
Keeping pace with technology
Limitations due to inspection status
Developing a succession plan
Waste water processing
Other**
Access to quality raw materials
Quality water source/availability

\*Each respondent could choose up to three responses. Listed in order of most selections to least.

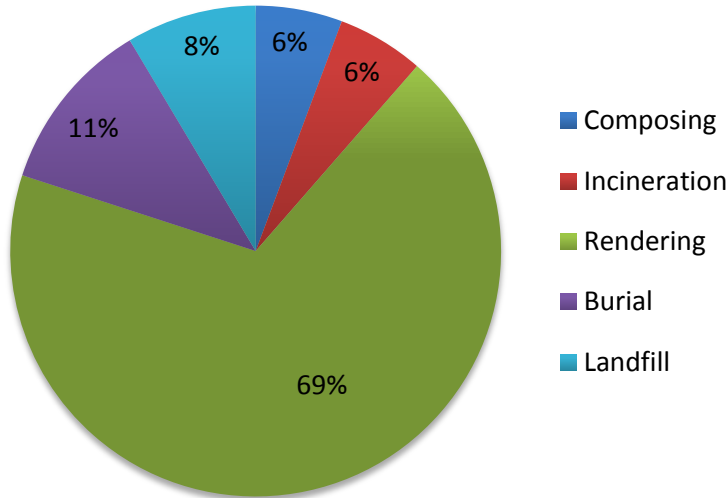
\*\*Other was listed twice with space for written answer.

**Byproduct value recovery:** The majority of meat processors that slaughter use rendering (69%) as a method of disposing of offal and inedible waste (Figure 23). Other options, although not frequently used, include burial (11%), landfill (8%), composting (6%) and incineration (6%). Hides, including game hides, beef hides, goat and sheep hides were reported as the most common source of recovering value from offal.





**Figure 23. Disposal of offal and inedible waste**



**Pricing products:** The majority of respondents (55%) indicated that they use some sort of inward pricing and mentioned costs as a primary factor in determining the price they charge. About 28% of respondents indicated they use outward pricing based on demand or market conditions to determine price of product. The remaining 18% of respondents indicated they used some combination of both cost and demand or market conditions to determine the price of the product.

**Pricing of products purchased:** Overwhelmingly, respondents indicated that they use the current market price to determine the price paid for product. Some respondents indicated they purchase meat from national distributors (boxed meat) and do not have any control over the given price. Several responses indicated that there is no negotiation with pricing.

**Summary**

Results of the survey indicate that Michigan has a diverse meat processor population and there is great variation in the types of establishments throughout the state. The majority of meat processors in Michigan are small or very small in size. Retail exempt operations were the most common type of operation and less than half of establishments responding slaughter livestock. Facility age varied significantly, based on year established, but the majority of operations had gone through some type of renovation in the last 15 years. There appears to be an optimistic outlook for the businesses with growth potential of the meat industry in Michigan.

**Evaluation**

The goals of this project were met. A survey was developed to capture the state of the meat industry in Michigan. Results were analyzed and reported. The report of results of the study will be shared with appropriate stakeholders.

Modifications were made to the goals and objectives. The resource publication of a directory of Michigan meat processors was created but is not currently being printed for distribution. Distribution will be limited to electronic means. Furthermore, this resource is not all-inclusive as some survey participants chose not to have their information shared. Other processors did not



respond to the survey and are not included unless they are USDA inspected. The list of USDA inspected operations in Michigan is already available publically via the USDA website so those operations were included regardless of if they completed the survey or not.

Additional challenges with survey tabulation and results were encountered with some of the open-ended questions. With open-ended questions, answers varied greatly and in some instances were not able to be analyzed in a way that provided meaningful information that could be summarized. In some instances, open-ended questions provided answers that did not make sense and had to be excluded.

### ***Dissemination of Project results***

Results from the survey have been or will be shared with MDARD, Michigan Meat Association members, Center for Regional Food Systems Livestock Work Group and other CRFS affiliate members, and others. Results from this survey will be used to establish need for additional research and guide future work of MSU Extension programming. Portions of the survey results will be shared on MSU Extension News (<http://msue.anr.msu.edu/>) in various articles as the authors see fit.

### ***Acknowledgements***

Financial assistance was provided by the Michigan Department of Agriculture and Rural Development and the Michigan State University Center for Regional Food Systems Livestock Workgroup. Appreciation is expressed to meat processors who completed the survey. The Michigan State University Center for Economic Analysis was instrumental in assisting with analysis.