# Marketing Opportunities for Missouri's Niche Meat and Poultry Processors

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### Introduction

This marketing-oriented study addresses a need among Missouri niche meat and poultry processors — that is, understanding market and marketing options for their businesses. It considers how Missouri niche meat and poultry processors may diversify their businesses, adopt new marketing or distribution models to enhance their competitiveness or add capacity to meet emerging business opportunities. In particular, the study delivers on these five objectives:

- Evaluate product diversification options and related markets.
- Determine opportunities for processing multiple species.
- Identify certification programs or attribute-based branding opportunities.
- Outline marketing and business models for processors to consider.
- Describe innovative distribution strategies.

To explore these five areas, the project team executed on several activities:

- The team conducted secondary research to discover product diversification, species marketing and attribute-based branding opportunities.
- The team hosted a one-day workshop focused on sharing "how-to" marketing information and best practices for meat slaughtering and processing businesses.
- The team developed a series of processor audio stories that follow a case study format to facilitate peer-to-peer learning about effective business models, distribution strategies and marketing practicess.

Two elements informed this project's development and completion:

- An advisory committee composed of industry stakeholders, including animal producers and meat processors, formed to provide direction and insights to the project team. The committee voiced input early in the project about how to shape deliverables, and it reviewed project outputs as they were completed.
- The project team conducted a survey of Missouri meat slaughtering and processing businesses. The survey launched in mid-August 2019, and it closed in early November 2019. The project team distributed the survey invitation to an email list of Missouri Association of Meat Processors membership. The survey collected 28 responses — roughly a 20 percent response rate. The following discussion describes the respondents who participated in the survey, and it shares key survey highlights. Findings relevant to the project's main objectives are presented in each respective section that follows this introduction. Note, in addition to sharing overall summary statistics, the project team also conducted crosstabs analysis to explore how responses varied by three characteristics: years of meat business experience, facility inspection type and geography.

#### Characteristics of Survey Respondents

Of the survey's 28 respondents, 82 percent owned Missouri meat slaughtering or processing businesses, and 18 percent identified as hired managers of Missouri slaughtering or processing businesses. Slightly more than half of the respondents operated USDA-inspected facilities. One in five had custom-exempt operations, and one in 10 had state-inspected facilities. To describe their facilities' type of inspection, 14 percent of respondents selected "other."

In terms of how the survey respondents became involved in meat slaughtering or processing work, the largest share (39 percent) said they started their ventures as new businesses. However, 31 percent inherited a business from family, and 26 percent said they got their start in the industry by purchasing an existing business. See Exhibit I1. A small share reopened an existing processing business that had closed.





Source: 2019 Missouri Niche Meat and Poultry Survey; n = 23

On average, survey respondents had quite a lot of experience with operating their meat slaughtering and/or processing businesses. See Exhibit I2. Nearly two-thirds of respondents shared that they had more than 20 years of experience. Just 7 percent of the survey respondents indicated that they had no more than five years of experience.

Exhibit I2 – Respondents' Years of Meat Slaughtering or Processing Experience



Source: 2019 Missouri Niche Meat and Poultry Survey; n = 28

Exhibit 13 illustrates where in the state the survey respondents operated meat slaughtering and/or processing facilities. The survey asked respondents to identify the counties where they operate facilities for slaughtering or processing. However, to protect respondent confidentiality, data on operation location were aggregated by region for reporting purposes. Ten respondents said they operated facilities in northern Missouri, and 12 had operations in central Missouri. The southern region had the fewest respondents; five respondents operated facilities there.

Exhibit 13 – Location of Facilities Operated by Survey Respondents



Source: 2019 Missouri Niche Meat and Poultry Survey; n = 27

Businesses represented in the survey results varied by size. In terms of employment, Exhibit I4 reports the median number of employees recorded per respondent. A median value indicates the midpoint of the data analyzed. The full-time worker median value was 10 full-time workers. Note, in this survey, full-time workers must have worked 30 hours or more per week on average in a year. Businesses employed fewer part-time employees, who average less than 30 hours per week in a year, and seasonal workers, who provide temporary part-time assistance during seasonal increases in business.



Exhibit 14 – Median Employment Reported by Respondents

Number of employees varied by business characteristics. USDA-inspected operations tended to have more full-time workers on staff than operations with state inspection and those that are custom-exempt. The USDA-inspected facilities each had 20 full-time workers on staff, according to the median value. For the other facilities, the median value of full-time workers was seven. The number of part-time and seasonal employees count didn't vary as significantly by facility inspection type.

By region, respondents with facilities in the north tended to employ more full-time workers than those in the other two regions, and northern respondents had fewer seasonal workers than respondents from the central and south regions.

As an alternative measure of business size, Exhibit I5 illustrates the variation in net income before taxes for responding slaughtering and/or processing businesses in 2018. Nearly one-third of respondents said their businesses earned at least \$1 million in net income before taxes for their slaughtering and processing work. Smaller businesses — those earning less than \$100,000 in net income before taxes for slaughtering and processing activities in 2018 — represented 23 percent of responding businesses.

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 27

Operational characteristics tended to dictate income generated by responding meat businesses. Of the responding USDA-inspected facilities, one-third recorded less than \$250,000 in net income before taxes during 2018. In contrast, nearly two-thirds of all other facilities earned less than \$250,000 in net income before taxes. Nearly half of USDA-inspected facilities earned at least \$1 million.

Exhibit 15 – Meat Slaughtering/Processing Business Net Income Before Taxes, 2018



Source: 2019 Missouri Niche Meat and Poultry Survey; n = 26

The survey found that many Missouri meat processing and slaughtering businesses had grown recently, according to two financial indicators. Exhibit I6 reports the share of respondents who said their businesses' total revenue and net income after expenses had increased, decreased or stayed the same in the year preceding the survey. Eighty percent of respondents said their businesses had increased their revenue. For a small share of respondents — roughly 4 percent — their businesses' revenue had declined.

With respect to net income after expenses, 70 percent of respondents said their businesses had grown in this area during the year preceding the survey, but 11.5 percent said net income after expenses had decreased. These results suggest that controlling costs may have presented a challenge for some businesses.

Exhibit 16 – Change in Meat Slaughtering and Processing Business Revenue and Net Income After Expenses in Year Preceding Survey



#### Survey Respondents' Views and Attitudes

As suggested by the previous chart, input costs may have presented a challenge for some respondents. Exhibit I7 shares sentiment noted by respondents in several areas, and it reinforces some concern about input costs. Two-thirds of respondents said they strongly agreed or agreed that input costs were increasing more quickly than the price they could charge for end products. Additionally, a majority of respondents noted some concern about profitability and seasonality. Two-thirds said they were concerned about earning a sustainable profit and also managing business seasonality.



Exhibit 17 – Sentiment Toward Input Costs, Profitability and Seasonality

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 26

Using two statements, the survey evaluated respondent views about byproduct handling. Exhibit I8 shares their responses. One prompt suggested that meat slaughtering and processing businesses lack markets for animal byproducts or offal. Nearly 90 percent of respondents strongly agreed or agreed. One potential measure to address byproduct and offal handling involves working collectively. One-quarter of respondents strongly agreed and nearly 45 percent agreed with this approach.





Source: 2019 Missouri Niche Meat and Poultry Survey; n = 23 for lack markets for animal byproducts or offal, and n = 27 for processors should work collectively to handle animal byproducts and offal

With respect to regulatory requirements, more than three-quarters of respondents said they strongly agreed or agreed with this statement: "Regulatory requirements are too high." Nearly half of respondents strongly agreed with this statement. See Exhibit 19.



Exhibit 19 – Sentiment Toward "Regulatory Requirements Are Too High"

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 28

Returning to this study's marketing orientation, one survey statement evaluated respondent perspectives about available market opportunities. Exhibit 110 shares the results. For the most part, survey respondents noted optimism about market opportunities available to them. Eighteen percent strongly agreed that they have many market opportunities available. Nearly two-thirds agreed.

Respondents representing federally inspected facilities were more likely to agree or strongly agree about having many market opportunities than those from other facilities. By geography, northern respondents were somewhat more likely to strongly agree or agree about having many market opportunities.



Exhibit I10 – Sentiment Toward "Meat Processors Have Many Market Opportunities"

#### Survey Respondents' Outlook

Despite some challenges noted by the Missouri meat slaughtering and processing businesses that responded to the survey, they largely described ambitions for future growth. In the survey, respondents shared the extent to which they planned to change slaughtering and processing volumes in the five years after the survey. Exhibit I11 presents the results. Fifty-six percent of responding businesses said they planned to increase slaughtering volumes by 10 percent to 49 percent. Sixty percent of responding businesses said they planned to increase processing volumes by 10 percent to 49 percent. Relatively few processors planned to maintain existing volumes or decrease volumes handled by their businesses. None planned to discontinue slaughtering or processing activities. By geography, respondents from the north and south regions were most likely to indicate plans to increase slaughtering and processing volumes.

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 28





Source: 2019 Missouri Niche Meat and Poultry Survey; n = 16 for slaughtering, and n = 25 for processing

To close, the survey explored needs for more effectively marketing meat-related products and services. Respondents assessed need by ranking a series of statements. Exhibit 112 shares the results. Ranking an item as No. 1 would indicate a participant thought that item was the most important need. As a result, a lower rank value indicates respondents collectively viewed the item as more important. The top three needs noted by respondents were information about consumer preferences, information about how to enter new distribution channels and funding opportunities to offset marketing costs.



Exhibit 112 – Needs for Meat Businesses to Become More Effective at Marketing

## 1. Product Diversification

According to the Missouri meat slaughtering and processing business survey, the state's slaughtering and processing businesses offer a number of products and services. Exhibit 1.1 reports the share of respondents who indicated offering certain products or services at the time of taking the survey. Respondents most commonly made products using their own recipes, marketed products with their own brand name, offered a custom processing service and operated a retail counter.

Subsequent analysis studied whether respondents' years of meat slaughtering or processing business experience affected responses. In particular, it compared responses from individuals who had more than 20 years of experience and those with 20 years or less experience. According to the analysis, the greatest difference in responses centered on "market products with your own brand name." All respondents with more than 20 years of experience said they currently marketed products with their own brand name. A smaller share of respondents with 20 years or less experience said such. Respondents with USDA-inspected facilities were also more likely to report that they marketed products with their own brand names. USDA-inspected respondents were also less likely to say they offered custom processing services.





Source: 2019 Missouri Niche Meat and Poultry Survey; n = 28

Businesses responding to the survey tended to have a diversified portfolio of branded products. Exhibit 1.2 summarizes the number of branded products respondents sold

directly to end users. Seven in 10 respondents indicated they sold at least 20 branded products directly to end users. Note, for this survey's purposes, different cuts counted as different products. For example, pork chops and stuffed pork chops were two different products, and jerky and meat sticks were two different products. Fourteen percent of respondents said they sold no branded products.

Respondents who had been engaged in meat slaughtering or processing businesses for more than 20 years were more likely to report that they sold 20 or more branded products directly to end users. USDA-inspected facilities relative to all others were more likely to sell at least 20 branded products directly to end users. By region, respondents from south Missouri were less likely to say they sold 20 or more branded products directly to end users than respondents from the state's central or north regions.





Source: 2019 Missouri Niche Meat and Poultry Survey; n = 28

Survey results also suggest that Missouri meat slaughtering and processing businesses continue to diversify their product portfolios. Of 26 respondents, nearly 70 percent increased the number of products offered during the year preceding the survey. Twenty-three percent of respondents said the number of products offered had not changed. The crosstab analysis found that respondents from southern Missouri were less likely to have increased the number of products offered in the year preceding the survey than respondents from the central or north regions.

Meat processors responding to the survey had relatively small product development teams. The 27 respondents averaged 1.8 people on their product development teams. In terms of who's responsible for product development efforts, Missouri meat slaughtering and processing businesses tend to most frequently assign those responsibilities to business owners or the owners' family. See Exhibit 1.3. Respondents could select all that apply. Of the 25 respondents, three-quarters said business owners had product development responsibilities, and half of respondents indicated owners' family members take a role in product development. Relatively few respondents — just 8 percent — said their businesses have a dedicated product development associate. Note, those who selected "other" as a response shared they take a team approach to product development and delegate these responsibilities to an operations manager.





Source: 2019 Missouri Niche Meat and Poultry Survey; n = 25

Typically, those who have product development responsibilities have relatively little formal training, such as a college degree or certificate, in this field. Respondents inputted the percentage of their employees who had formal training in product development; 19 individuals responded. On average, they said 18 percent of their employees involved in product development had such training. Additionally, in terms of time invested in product development, all (n=25) said their businesses invested less than 20 labor hours in product development activities each week.

Missouri meat slaughtering and processing businesses participating in the survey commonly marketed several types of branded meat products. Exhibit 1.4 shares the percentage of respondents who reported their businesses selling a variety of branded meat products directly to end users. Frozen, meat snack, cured, smoked, fully cooked and fresh products were those most commonly marketed directly to end users.



Exhibit 1.4 – Types of Branded Products Sold Directly to End Users

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 23

Respondents who had more than 20 years of meat slaughtering and processing business experience indicated they were more likely than respondents with less experience to operate businesses that offer meat snacks, seasoned or marinated and whole animal branded meat products directly to end users. Respondents with less experience were slightly more likely to market fresh meat than respondents with more than 20 years of experience. In terms of differences by facility inspection type, respondents from USDA-inspected facilities were somewhat more likely to have currently offered meat bundles, seasoned or marinated meats and single-serving products as branded products directly to end users than respondents from other establishments. The respondents from other facilities were somewhat more likely to offer whole animal and fully cooked branded products.

To explore how processors from the three geographies engage in selling branded meat products directly to end users, the project team computed the average number of product types offered by respondents from each region. Respondents from the central region offered more branded product types — 8.9 on average — relative to those from the north and south regions, which averaged 7.8 and 6.0 product types, respectively.

Respondents also were asked to rank two statements to assess whether they have more of a product orientation or customer orientation when considering how to evolve in the future. With a product orientation, a business tends to focus on offering a high-quality product and then educating consumers about why the product has value. Businesses with a customer orientation tend to assess changes in consumer preferences and then deliver products to align with present-day preferences. As illustrated in Exhibit 1.5, a slight majority of survey respondents ranked responding to consumer preferences as most important for the meat industry's future.





\* Question read "Please click and drag the following items to rank them in terms of how critical you believe they are for the meat industry's future." Source: 2019 Missouri Niche Meat and Poultry Survey; n = 19

The crosstabs analysis found respondents from USDA-inspected facilities were more likely to suggest that a customer orientation — that is, responding to consumer preferences — is most critical. Respondents from all other facilities most frequently noted that a product orientation would be most critical. By region, southern respondents were split between product orientation and customer orientation, and just slightly more than half of central region respondents noted having a product orientation. Northern respondents were most likely to have a customer orientation.

The following discussion highlights secondary research into product development trends for meat processors to consider.

#### 1.1 Meat Snacks

According to a Lightspeed/Mintel survey conducted among 2,000 adult internet users, roughly one-third — 34 percent — of those participating in December 2017 had purchased meat snacks during the previous three months. Categories that had been

purchased more widely were cheese-flavored snacks, 55 percent; corn snacks, 53 percent; regular pretzels, 51 percent; and microwaveable popcorn, 48 percent. Snacks consumed by fewer consumers were pretzel thins and crisps, 30 percent; pork rinds, 20 percent; popping corn, 17 percent; and stovetop popcorn, 7 percent (Mitchell 2019b).

Within the salty snacks category, meat snacks have ranked second in annual household spending, according to Nielsen data reported in 2017. Exhibit 1.1.1 summarizes annual spending totals for several salty snacks. Meat snack spending averaged \$25.81, and for pork snacks, annual household spending totaled \$9.38. Potato chips generated the greatest spending per household (Nielsen 2017b).



Exhibit 1.1.1 – Annual Household Spending on Salty Snacks

Meat snack products with a natural, artisanal and premium positioning have become more common. FONA International also reports the popularity of "high protein" as a meat snack positioning statement. In 2017, roughly two in five meat snacks launched in North America claimed being high in protein. High-protein products align well with paleo and Whole30 diets (FONA International). According to a 2018 report from Technomic Inc., high-protein is an appealing snack attribute for 52 percent of consumers (Mitchell 2019b). Exhibit 1.1.2 articulates the top claims used for North American meat snack products from January 2013 to May 2018. In addition to highprotein, other top claims include low, no or reduced allergen; gluten-free; and no additives or preservatives (FONA International). More recently, sugar content has been a focus of meat snack claims. During May 2019, Meatingplace featured newly launched meat snacks from three companies that stressed sugar content (Scott 2019).

Source: Nielsen (Nielsen 2017b)

Rank	Claims
1	Low, no or reduced allergen
2	Gluten-free
3	No additives or preservatives
4	High or added protein
5	Low, no or reduced fat
6	All-natural product
7	Premium
8	Hormone-free
9	Social media
10	Convenient packaging

Exhibit 1.1.2 – Top North American Meat Snack Claims, January 2013 to May 2018

Source: FONA International (2018)

Flavors are another component of meat snack product development and marketing. Exhibit 1.1.3 presents the top 10 meat snack flavors for North American products from January 2013 to May 2018. This list includes animal species terms and added flavorings, such as smoke, teriyaki, BBQ and pepper (FONA International 2018). Although they're not included in the list of top flavors, rosemary, basil, curry, chipotle, kimchi, adobo (FONA International 2018), brown sugar bourbon and sriracha (McGinnes 2018) also add flavor to some products. Nonmeat ingredients included in meat snacks include beans, nuts, chia, flax, soy, seitan, mushrooms, kelp and coconut (FONA International 2018).

Exhibit 1.1.3 – Top North American Meat Snack Flavors, January 2013 to May 2018

Rank	Claims
1	Beef
2	Pork
3	Smoke
4	Teriyaki
5	Chicken
6	Turkey
7	BBQ
8	Bacon
9	Pepper
10	Hickory smoke

Source: FONA International (2018)

Of the types of meat that could be used in meat snacks, consumers find beef to be most appealing, according to FONA International reporting. Four in five consumers mention beef as appealing. Following beef were chicken, 49 percent; turkey, 45 percent; and pork, 45 percent (FONA International 2018).

Datassential conducted a consumer survey, which reached 1,033 respondents, in November 2017 to understand meat and poultry consumption behaviors, and one question asked about meat and poultry products that the consumers had ever eaten as an on-the-go snack. Exhibit 1.1.4 shares the results, which the company included in a set of sample slides. Roughly half of surveyed consumers had at some point eaten cured meat sticks and jerky or dried meat chips, and 48 percent said that they had consumed a meat or poultry appetizer or entrée as a snack. Of the products named in the survey question, mini sausages, jerky trail mixes and meat or poultry bars were least likely to have been tried as on-the-go snacks (Datassential 2018).



Exhibit 1.1.4 – Meat and Poultry Products Ever Eaten as an On-the-Go Snack

Source: Datassential (2018)

The Lightspeed/Mintel survey conducted in December 2017 also asked 558 meat snack buyers to indicate the meat snacks they would be interested in purchasing, and it identified how preferences varied by age. Exhibit 1.1.5 shares the results. Note, consumers participating in the survey had purchased meat snacks in the three months before the survey. Consumers in all three age categories had greatest interest in meat snacks made from prime cuts and those formulated with Asian flavors. Among the youngest respondents —18- to 34-year-olds — other top interests were meat snacks that lacked preservatives and those formatted as snack bars. For 35- to 59-year-olds, other top interests were products made with grass-fed ingredients and no preservatives. Compared with the younger groups, older consumers expressed less interest overall in other types of meat snacks; however, one-third shared that they'd have an interest in preservative-free meat snacks (Mitchell 2019b). Given these insights, product developers may have an opportunity to release meat snack products that use prime cuts as ingredients, offer Asian flavors and avoid preservatives.

	18 to 24	35 to 59	55+
Meat snack made from prime cuts (e.g., filet mignon)	54%	65%	55%
Asian flavors (e.g., teriyaki)	49%	54%	46%
Preservative-free	42%	40%	33%
Meat snack bars	45%	38%	20%
Grass-fed	35%	45%	24%
Humanely raised	36%	37%	24%
Meat snack trail mixes	32%	36%	14%
Artisanal (e.g., small batch)	27%	30%	22%
Uncured	13%	16%	12%

Exhibit 1.1.5 – Meat Snack Consumers' Interest in Purchasing Product Types, 2017

Source: Lightspeed/Mintel cited in The National Provisioner/Independent Processor (Mitchell 2019b)

To gauge trends in meat snack seasonality, Google Trends data can help as they represent Google search term volume changes. Exhibit 1.1.6 charts interest in the "jerky" search term from May 2014 to April 2019. To interpret the chart, "100" represents the highest point of popularity for the search term, and "50" would suggest that the term was half as popular. As illustrated, search term interest maintained an upward trend — denoted by the dotted line — within this five-year period. The data also suggest seasonal interest in jerky. In all of the observed years, search interest peaked during December. (Google 2019). If offering a jerky product, then the holidays may represent a key time for the business. Additionally, jerky manufacturers may consider how to enhance interest in the product during other times of the year.

Spring planting season may represent an opportunity to position jerky as a snack, particularly in rural areas. In April 2019, Farm Journal released data from a Farm Journal Pulse survey that looked into farmers' favorite snacks to consume while planting. Of the 621 respondents, 22 percent said beef jerky was their favorite planting snack. Other top snacks were granola bars, 27 percent of respondents, and chips and peanuts, 22 percent

of respondents. Less popular planting time snacks were candy bars, 15 percent, and cookies, 15 percent (Begemann 2019).



Exhibit 1.1.6 – Interest in "Jerky" Search Term, Google, May 2014 to April 2019

Google Trends data can identify locations where a greater proportion of all search activity centers on "jerky." From May 2018 to April 2019, New Mexico, Montana and Wyoming consumers tended to search more for "jerky" than consumers in other states. Again, this is a measure of search proportion, not absolute search volumes. Exhibit 1.1.7 lists top states for "jerky" search interest. Missouri was No. 18 (Google Trends 2019).

Exhibit 1.1.7 – Top States for "Jerky" Search Interest, May 2018 to April 2019

Rank	States
1	New Mexico
2	Montana
3	Wyoming
4	North Dakota
5	South Dakota
6	Nebraska
7	West Virginia
8	Oklahoma
9	Idaho
10	Kansas

Source: Google (Google Trends 2019)

The Google Trends search analysis by metropolitan area has one Missouri market included. The metropolitan area encompassing Joplin, Mo., and Pittsburg, Kan., ranked sixth. The top three metropolitan areas were North Platte, Neb.; Alpena, Mich.; and Albuquerque-Santa Fe, N.M. See Exhibit 1.1.8 for the full list (Google Trends 2019).

Rank	Metropolitan Areas	
1	North Platte, Neb.	
2	Alpena, Mich.	
3	Albuquerque-Santa Fe, N.M.	
4	Abilene-Sweetwater, Texas	
5	Great Falls, Mont.	
6	Joplin, MoPittsburg, Kan.	
7	Butte-Bozeman, Mont.	
8	Bluefield-Beckley-Oak Hill, W.V.	
9	Wausau-Rhinelander, Wis.	
10	Lincoln-Hastings-Kearney, Neb.	

Exhibit 1.1.8 – Top Metros for "Jerky" Search Interest, May 2018 to April 2019

Source: Google (Google Trends 2019)

Nielsen research from 2017 identified characteristics of meat snack buyers. Baby boomers and Generation X spent slightly more than members of the greatest generation or millennials. Additionally, Asian Americans and Caucasians tended to spend more annually than Hispanics and African Americans (Nielsen 2017b).

In terms of where meat snack buyers tend to access meat snacks, meat snack sales are less likely than salty snack sales to occur in conventional grocery stores and more likely to occur in warehouse clubs, according to data presented by Nielsen during 2017 (Nielsen 2017b). These data may inform distribution options for meat snack suppliers, and they also suggest that meat snack buyers may have a desire to purchase meat snacks in large quantities like those often offered at warehouse clubs.

Convenience stores represent another meat snack distribution channel. These store locations traditionally focused on reaching males and teens. However, meat snacks have gained a more diverse audience (Snac World 2018). Increasingly, buyers at convenience stores prefer clean labels with claims such as gluten-free, non-GMO, low sodium, no MSG, no artificial ingredients or flavors, no antibiotics and minimal processing. Differentiated products and products that offer value have potential (McGinnes 2018). Meat snack product developers have explored several innovation opportunities. Expanding dayparts is one opportunity. As an example, offering bacon jerky may enable buyers to consume bacon more conveniently (Mitchell 2019b). Introducing products designed for morning consumption serves as an opportunity given that nearly threequarters of snackers consume snacks in the morning (Snac World 2018).

Refrigerated meat snacks may have potential. During 2018, Jack Link's introduced its Cold Crafted Linkwich products, which blend cured meat and cheese into hand-held snacks. Meats in the products were hard salami and genoa salami (Mitchell 2019b).

Recent new product introductions include thin meat chips and crisps. They offer a crunch typical of crackers and chips (FONA International 2018). As a result, meat chips and crisps may enable the meat snacks category to compete directly with the potato chip category. As mentioned previously, meat-based trail mixes may resonate with a subset of meat snack consumers; see Exhibit 1.3.4. These mixes include meat as one component. For example, one product adds roasted edamame, salted cashews, sweet cranberries, golden raisins, sunflower seeds and pumpkin seeds to meat (FONA International 2018). Another opportunity involves developing meat snacks with a soft texture. Jack Link's has launched a soft-texture product (Snac World 2018).

#### 1.2 Pork Rinds

Certain consumer segments have evolved to consider pork rinds as a "chic" food, yet others continue to view pork rinds as unappetizing. Pork rinds offer protein and relatively low levels of carbohydrates (Rothbaum 2019), but they also can contain high levels of fat and sodium (Wells 2011). Some firms have focused on improving the product's health profile. For example, Rudolph Foods has reduced salt in one product. Decreasing fat levels may be possible with oven-baked products (Snac World 2018).

Made from pork skin that is fried or baked, rinds enable the value chain to use what might otherwise be considered a byproduct. Recently launched products have been made from humanely raised pork, some include premium ingredients, and others have unique flavors such as chili lime, maple bacon (Rothbaum 2019), barbeque, sea salt and pepper, salt and vinegar, dill pickle and blackberry habanero (Snac World 2018). Often considered a snack, rinds also may find application as croutons or a complement to craft beer (Rothbaum 2019). Other uses include pizza crusts or fish and chicken breading. Pork rinds may also pair well with dips (Snac World 2019). Cracklings and chicharrones share similarities with pork rinds, but they also have key differences. Cracklings have chewier or crunchier features as the skins tend to have more fat, but they can vary by region. Chicharrones may originate from pork skin that retains some fat and lean meat. Again, however, regional differences are common (Rothbaum 2019). Pork skins not used for making rinds have application in gelatin and leather goods. Roughly 30 percent to 35 percent of pork skins have been directed to pork rind production. Each pound of skins can yield roughly 15 ounces of pork rinds (Wells 2011).

A 2018 State of the Industry report from Snac International shares U.S. pork rind sales data for the year preceding June 10, 2018, in multioutlets. Sales totaled nearly \$273 million, which was 17.6 percent growth. Volume sales increased by 16.1 percent to 35.4 million pounds. Unit sales growth was slower — 13.2 percent — which suggests that unit size may have increased (Snac World 2018).

The Lightspeed/Mintel survey from December 2017 measured consumers' pork rind purchase behaviors. Of the 2,000 adult internet users who responded to the survey, one in five had purchased pork rinds in the three months preceding the survey. Young shoppers and consumers who are from large households and are less affluent represent major segments (Mitchell 2019b). Millennials, who have an interest in high-protein, low-carb snack goods, may help the pork rinds category to grow (Watson 2017). Women have also begun to try pork rinds as a snack (Snac World 2018). Compared with other U.S. ethnic groups, the Hispanic community has tended to consume a greater volume of pork rinds (Wells 2011). Some Hispanic consumers substitute pork rinds for meat in dishes such as tacos, eggs, beans and soup (Snack World 2016).

In terms of where consumers buy pork rinds, convenience stores have accounted for nearly half of pork rinds sales (Wells 2011). Male consumers are the typical convenience store shoppers, and they have interest in high-protein, convenient snacks (Yu 2017). Other distribution channels are supermarkets and mass merchandisers (Wells 2011). Pork rids may have a shorter shelf life than other snacks (Watson 2017).

Google Trends data can suggest how interest in various keywords has changed over time. The data represent Google search term volume, so the search term trend is meant to serve as a proxy for product interest. Exhibit 1.2.1 charts interest in the "pork rinds" search term from May 2014 to April 2019. To interpret the chart, "100" represents the highest point of popularity for the search term, and "50" would suggest that the term was half as popular. As illustrated, U.S. search term interest grew within this five-year period for "pork rinds," and it peaked in early January 2019 (Google 2019). This trend suggests a potential opportunity for delivering pork rinds that tap into heightening consumer interest for the product.



Exhibit 1.2.1 – Interest in "Pork Rinds" Search Term, Google, May 2014 to April 2019

\* Data collection system improved effective Jan. 1, 2016; "0" score indicates too little data available; dotted line serves as the trend line Source: Google (Google Trends 2019)

In addition to tracking search term popularity over time, Google also measures how search term interest varies geographically. To do this, it compares search volume for a specific term in one geography to all searches in that geography. Exhibit 1.2.2 lists the top 10 states for "pork rind" search interest from May 2018 to April 2019. Several states bordering Missouri were part of the top 10, and Missouri ranked No. 9. Again, these are states with the highest proportion of total searches centered on "pork rinds" (Google Trends 2019). Given their search interest in "pork rinds," these states may hold opportunities for distributing pork rind products.

Rank	States
1	Alaska
2	Idaho
3	Kansas
4	Arkansas
5	Oklahoma
6	Kentucky
7	Tennessee
8	West Virginia
9	Missouri
10	Indiana

Exhibit 1.2.2 – Top States for "Pork Rinds" Search Interest, May 2018 to April 2019

Source: Google (Google Trends 2019)

The Google Trends data also pinpoint metropolitan areas that rank high for search term interest. In an analysis of May 2018 to April 2019 searches, Springfield, Mo., and Paducah, Ky.-Cape Girardeau, Mo.-Harrisburg and Mount Vernon, Ill., were two of the top markets for "pork rinds" search interest. This suggests that a higher proportion of total search activity in these areas centered on "pork rinds" relative to proportions in other metropolitan areas. Exhibit 1.2.3 lists the other metros listed in the top 10 (Google Trends 2019). Missouri pork rind marketers may benefit from focusing their distribution and marketing in the state's two metropolitan areas that ranked in the top 10.

Exhibit 1.2.3 – Top Metros for "Pork Rinds" Search Interest, May 2018 to April 2019

Rank	Metropolitan Areas	
1	Charleston-Huntington, W.V.	
2	Knoxville, Tenn.	
3	Flint-Saginaw-Bay City, Mich.	
4	Chattanooga, Tenn.	
5	Springfield, Mo.	
6	Paducah, KyCape Girardeau, Mo	
	Harrisburg and Mount Vernon, Ill.	
7	Louisville, Ky.	
8	Little Rock-Pine Bluff, Ark.	
9	Oklahoma City, Okla.	
10	Dayton, Ohio	

Source: Google (Google Trends 2019)

#### 1.3 Dry-Aged Meat

Dry-aged meat refers to product that dries on all sides as it's stored in a refrigerated environment (Savell and Gehring 2018). To ensure that all sides dry, operators may use wire racks, perforated shelves, trees or hooks (Savell). The dry-aging process requires controlling three variables: temperature, relative humidity and air velocity. Typically, the temperature ranges from 32°F to 39°F, and the relative humidity level ranges from 80 percent to 85 percent. Good air flow should be a priority (U.S. Meat Export Federation).

Dry-aging methods were popular before the 1960s (Savell and Gehring 2018). After that time, vacuum packaging technology enabled meatpackers to use wet-aging methods (Ruby). More than 90 percent of the beef marketed during the 1980s was vacuum-packaged (Savell). In a 2008 publication, Certified Angus Beef noted that dry-aging methods were used for less than 1 percent of beef (Certified Angus Beef 2008).

In either case, aging facilitates enzymes breaking down meat proteins (Certified Angus Beef 2008). Wet aging yields a tender product, but it doesn't build flavor like a dry-aging process does. Compared with dry aging, wet aging triggers less product loss, so it's less costly (U.S. Meat Export Federation). Still, dry-aged product has filled a foodservice and retail niche (Savell and Gehring 2018), and it fits in a competitive environment focused on artisan goods and products that emphasize using all of an animal (Ruby).

Dry-aged meat has a flavor described as tangy, earthy and beefier (Ruby). Others share that dry-aged meat has flavors similar to roasted hazelnuts or dehydrated mushrooms. These unique flavors don't necessarily appeal to all consumers. For meat cuts aged for extended periods, just a small segment may choose them (Passy 2017).

After being aged for 30 days, meat tends to have the good tenderness and a flavor that's not too funky (Passy 2017). Some reports indicate that a 28-day aging process has become the industry norm (Tannenbaum 2018). Others suggest that the aging time varies by intended market. For example, roughly five days to seven days is common for beef available at supermarkets, but that sold in foodservice entities may age from 14 days to 21 days (Certified Angus Beef 2008). However, some restaurants may serve dryaged meat that has aged for more than 100 days (Passy 2017). Choosing the right meat to age for an extended period is important. Well-marbled meat will have less shrinkage and nice flavor, and it may respond better to a longer aging time than a lean piece of meat (Tannenbaum 2018). Cuts commonly directed to dry-aging processes include rib eyes, strip loins and short loins (Meats by Linz 2019).

Given the moisture loss that occurs during dry-aging, product shrinkage is part of the process, and meat aged via a dry process must also have the dry crust trimmed (Savell and Gehring 2018). Trimming the exterior "crust" helps with removing parts of the meat that may harbor bacteria (Passy 2017). Another tool used during aging that may curtail bacterial growth is ultraviolet light (Certified Angus Beef 2008).

Consumer understanding of dry-aged meat attributes and the process used to produce such products may be low, so outreach would be important to help guide consumers through selecting a dry-aged product. During September 2018, Peapod, an online grocer and delivery service, shared that it would offer Meats by Linz products, including dry-aged cuts, through its platform. To help with introducing consumers to dry-aged meat, Peapod created a "virtual butcher shop," which includes a "dry aged steak room" to show how the aging process works (Johnston 2018).

Research from Schweid & Sons provides insight into how restaurants use dry-aged beef. Schweid & Sons surveyed large chain and small-scale restaurant operators in the U.S. For each question, respondents could choose multiple responses and write responses not already provided as possible answers to the question. Exhibit 1.3.1 shares survey respondents' views of the most common descriptors for beef sold at restaurants. Top descriptions were fresh, Certified Angus Beef, Angus and all natural. The "dry aged" characteristic was mentioned less commonly — by 6 percent of respondents — as noted by the light blue bar in Exhibit 1.5.1 (Schweid & Sons 2018).



Exhibit 1.3.1 – Most Common Descriptors Used for Beef Sold at Restaurants

Source: Schweid & Sons Burger Trends Report (Schweid & Sons 2018)

Google search data can indicate the extent to which interest in a search term has changed over time, and Exhibit 1.3.2 shares the trend in "dry aged meat" searches. To interpret the chart, "100" represents the highest point of popularity for the search term, and "50" would suggest that the term was half as popular. The dotted trend line suggests an uptick in overall interest in "dry aged meat," though the data suggest some volatility in "dry aged meat" search interest over time (Google Trends 2019).

Extensive search term analysis by geography wasn't available from Google Trends. Only two states were named in the state-by-state analysis. California ranked as the top state for interest in the "dry aged meat" term from May 2018 to May 2019, and Texas ranked second. In a Google Trends analysis by state, states that rank high have greater search volume for a particular term relative to all Google search activity (Google Trends 2019).



Exhibit 1.3.2 – Interest in "Dry Aged Meat" Search Term, Google, May 2014 to April 2019

In past years, "dry aged beef" experienced an increase in search volume. For May 2014 to May 2019, the trend line in Exhibit 1.3.3 suggests enhanced interest in the "dry aged beef" term's popularity. The data also point to some level of seasonality for dry-aged beef. Annually, popularity spiked to an extent in December. Within the five-year period analyzed, however, late August 2018 — roughly near Labor Day — recorded the peak level of "dry aged beef" search activity (Google Trends 2019).

<sup>\*</sup> Data collection system improved effective Jan. 1, 2016; "0" score indicates too little data available; dotted line serves as the trend line Source: Google (Google Trends 2019)



Exhibit 1.3.3 – Interest in "Dry Aged Beef" Search Term, Google, May 2014 to May 2019

From May 2018 to May 2019, states that had "dry aged beef" searches represent the greatest share of total searches were South Carolina, New York and Oklahoma. Neighboring Illinois also ranked in the top 10 for "dry aged beef" search activity. Exhibit 1.3.4 lists the top 10 states for "dry aged beef" Google searches as a proportion of all searches. Missouri ranked No. 25 (Google Trends 2019).

Exhibit 1.3.4 – Top States for "Dry Aged Beef" Search Interest, May 2018 to May 2019

Rank	States
1	South Carolina
2	New York
3	Oklahoma
4	California
5	Nevada
6	Michigan
7	Texas
8	Colorado
9	Indiana
10	Illinois

Source: Google (Google Trends 2019)

According to Google search data from May 2018 to May 2019, metropolitan areas that tended to have the greatest relative interest in "dry aged beef" from May 2018 to May 2019 were San Francisco-Oakland-San Jose, Calif.; Houston, Texas; and Detroit, Mich. No

Missouri metropolitan areas were ranked in the top 10; see Exhibit 1.3.5 for the full list of top-10 metropolitan areas (Google Trends 2019).

Rank	Metropolitan Areas
1	San Francisco-Oakland-San Jose, Calif.
2	Houston, Texas
3	Detroit, Mich.
4	Denver, Colo.
5	New York, N.Y.
6	Boston, MassManchester, N.H.
7	Atlanta, Ga.
8	Los Angeles, Calif.
9	Dallas-Ft. Worth, Texas
10	Chicago, III.

Exhibit 1.3.5 – Top Metros for "Dry Aged Beef" Search Interest, May 2018 to May 2019

Source: Google (Google Trends 2019)

Restaurants and retailers have introduced dry-aged meat to the marketplace in recent years (Gehring and Savell 2018). Upscale hotels have represented a market for dry-aged beef (Savell). Some consumer segments have developed interests in at-home craft food projects — for example, brewing beer or making wine — and dry-aging meat at home may appeal to consumers as another way to practice "food craft." Already, companies have marketed small refrigerators and storage bags designed for dry-aging meat at home (Gehring and Savell 2018). Educating consumers about how to choose meat cuts well-suited for dry aging and how to safely dry age meat at home may create an opportunity for meat marketers.

Another opportunity is supplying dry-aged meat that restaurants may serve during special events (Gehring and Savell 2018). For example, Delmonico's, a restaurant located in lower Manhattan, New York, listed a rib eye dry-aged for 180 days on its menu to celebrate its 180th anniversary (Passy 2017). Not only do domestic sales represent an opportunity, but buyers in international markets have also expressed interest in meat that has undergone a dry-aging process (U.S. Meat Export Federation).

#### 1.4 Whole Animal Program

"Whole animal" refers to using the entire animal. Traditionally, all of one animal is sold or used before butchering the next animal. As an offshoot of the farm-to-table movement, butchers and chefs have shifted to more creatively consider how to connect consumers and their food, including meat. With fewer steps in the supply chain, whole animal programs, sometimes called "nose-to-tail eating" (Henderson, 2017), simplify product traceability and quality monitoring from the producer to the consumer.

Using the whole animal may curb waste. Currently, one-third of all food produced is lost or wasted (Food and Agriculture Organization of the United Nations, 2017). Chicken, beef and pork make up 22.4 percent of all food waste in the U.S. Food discarded by retailers and consumers represents the bulk of this loss; however, the second largest point at which loss occurs in the supply chain is processing (Royte, 2016). Exhibit 1.4.1 shows 70 percent of a cow's hanging weight on average ends up in retail cuts (Oklahoma Department of Agriculture, Food, & Forestry). The other 30 percent is fat, bone, "scraps" and weight lost to moisture-related shrink (Silverside & Jones, 1992).

Retail Cut	Percentage of Hanging Weight
Round	17%
Sirloin	6%
Short loin	6%
Flank	3%
Rib	6%
Short plate	5%
Chuck	18%
Brisket	4%
Shank	3%
Suet and hanging tender	3%
Moisture loss, fat, bone	30%

Exhibit	1.4.1 –	Percentage	of Beef Anin	nal Used fo	or Retail Cuts
		<i>J</i>			

Source: (Oklahoma Department of Agriculture, Food, & Forestry)

Exhibit 1.4.2 shows the percentage of a hog's hanging weight that is used in various pork cuts. Approximately 80 percent of the animal's hanging weight is used in retail cuts with fat, moisture and other losses accounting for the remaining 20 percent (Oklahoma Department of Agriculture, Food, & Forestry).

Retail Cut	Percentage of Hanging Weight		
Fresh hams	16%		
Pork loin	13%		
Fresh side bacon	13%		
Spareribs	3%		
Boston Butt	5%		
Fresh picnic	7%		
Feet	2%		
Head	3%		
Back fat	13%		
Misc. trim (breakfast sausage)	5%		
Jowl	2%		
Moisture loss, fat, bone	20%		

Exhibit 1.4.2 – Percentage of Hog Used for Retail Cuts

Source: (Oklahoma Department of Agriculture, Food, & Forestry)

Approximately 75 percent of a lamb's hanging weight yields meat. Moisture loss, fat and bone represent roughly one-quarter of the hanging weight (Raines, 1999). For broilers, 64 percent of the carcass weight is meat (Silverside & Jones, 1992).

Species currently sold as whole animals include cows, pigs, chickens, turkeys, lambs, ducks, rabbits and fish. Whole animal programs demand finding uses for the portion of animals that is often wasted, and they depend on consumers diversifying meat consumption and adopting cuts that they may not ordinarily eat (Henderson, 2017).

For restaurants to use scraps, chefs may add skin, gelatin, bone and fat to fill ravioli or include such components as ingredients in ragu (Griesemer, New Jersey chefs get creative to tackle food waste, save money and planet, 2018), sausage or stock (Farr & Binns, 2011). The fat can also be used for frying (Farr & Binns, 2011). Offal can be blended into dog food (The Applestone Meat Company, 2017), but it can also undergo processing into nutrient-rich snacks (Kohr, 2016). For example, EPIC Provisions uses liver in its Beef & Beef Liver Bites (EPIC Provisions, 2019). Exhibit 1.4.3 lists beef organ meat examples, their uses and their nutritional benefits. It illustrates how whole animal buyers can recognize the value of each animal part.
Organ	Nutritional Benefits	Common Uses
Liver	High in vitamin A; popular among athletes for its antifatigue properties	Pate, meatballs, liver and onions
Tongue	High in iron, zinc, potassium, choline, vitamin B-12; boosts immune system	Grilled, taco meat, sandwich meat, soup ingredient
Heart	High in protein, vitamin B-12, iron; low-calorie; cost-efficient	Grill, stew ingredient, hamburger, shish kabob
Brain	High in protein and omega-3 fatty acids; maintains health muscles; boosts immune system	Used in curry dishes, scrambled eggs
Kidneys	Rich in folate, zinc, copper, selenium, protein; popular as a post-workout meal	Sautéed, stew ingredient, pot pie ingredient
Sweetbreads (pancreas and gullet)	High in amino acids and protein; repairs body tissues	Shish kabob, fry, pair with bacon
Tripe	High in protein, selenium, B-12, zinc; low-calorie; low-fat	Stew and soup ingredient

Exhibit 1.4.3 – Beef Organ Meat Nutritional Benefits and Uses

Source: (Ashley, 2017)

Pigs tend to have more usable parts than other animals, so they work well in whole animal programs (Henderson, 2017). Pig tails can be fried and pork trimmings turned into classic French charcuterie (Stern, 2008). Another example is a dish featuring pig knuckles simmered in an Indian-spiced sauce to create a pork curry. The dish, featured on the menu of GoGo Delicious in Austin, Texas, is reported to be low in cost but high in flavor (Cobe, 2017(b)). Animals stored and aged whole before being cut may yield meat with a deeper, richer flavor, particularly some of the cheaper cuts (Henderson, 2017).

One strategy used by many restaurants who have adopted whole animal programs is to tie themselves to one ingredient, such as beef or pork, and make the most of it rather than choose a particular cuisine (Henderson, 2017). Chef Junior Chamon, who owns Graze Restaurant in New Jersey, has slowly eased away from a mix of Greek and Italian dishes and has adopted a whole animal program focused on minimizing waste. The restaurant sources ingredients from local farms, and the kitchen wastes less than 5 ounces — 2 percent — from a 220-pound beef animal (Griesemer).

From a price perspective, a traditional whole animal program bases the price per pound on the whole animal's hanging weight, so the buyer pays one lump sum. Although a whole animal's cost per pound is usually less than the cost per pound for a specific desirable cut, purchasing whole animals may cost more, depending on other factors. For example, meat marketed as being animal welfare-friendly may cost more when purchased whole than meat that doesn't bear the animal welfare label and is sold as individual cuts. Special characteristics aside, purchasing whole animals may offer cost efficiencies compared with buying only highly valued cuts, such as chops or ribs. However, the buyer must find a way to sell or use the other parts. Successfully reducing costs through purchasing whole animals relies on the purchaser knowing what to do with the less familiar parts of the animal. This is less of a barrier for selling whole animals to chefs, but one survey found 74 percent of home cooks tend to prepare routine meals using recipes that are well-known to them (Roerink, 2019). Thus, suggesting recipes that use less common cuts may help with marketing to consumers.

Marketing to restaurants and directly to consumers are potential markets for processors selling whole animals. Frustrated with the way traditional, large-scale meat processors are unable to anticipate their needs — such as which cuts they want and which muscles need to be removed — more chefs are eager to experiment with whole animal butchery. This is not an entirely new strategy for restaurants as the classic make-or-buy question applies to other items such as pastry, fresh pasta and ice cream (Deutsch, 2013). Specific to adopting a whole animal menu, restaurants seek to answer this question: is the additional investment in labor and expertise required to use as much of the animal as possible returned in costs savings, revenue or overall customer experience?

Some restaurants buy slaughtered whole animals and portion them into cuts. To do this, restaurants require extra space and staff training. In addition, butchering must be added to preparation routines. Firebirds is one restaurant chain that has trained its chefs to be competent in-house butchers (Firebirds, 2014).

Other restaurants prefer to work with processors that supply pre-portioned parts of whole animals. Buying whole animals requires chefs and processors to work together to control how an animal is broken down into cuts and products to best meet customers' demands. For example, II Pittore in Philadelphia buys whole racks of lambs with the belly and short ribs still intact. Restaurant staff clean, french and portion the racks into three-chop cuts, which are seared and roasted for a specific dish. All scrap gets made into sausage, which the menu features as an appetizer. In effect, sales of this appetizer pay for the entire lamb, and the rack of lamb entrée is essentially all profit (Deutsch, 2013). Black Angus Steakhouse, a casual-dining chain with 46 locations in the western U.S., sources whole beef loins that staff hand-cut into steaks. Trim and off-weight pieces are blended in a steak chili nachos starter with ground chuck to improve margins (Cobe,

2016). Icanto Restaurant in San Francisco works with small-scale ranchers and processors who supply beef as whole animals butchered into specific cuts (Stern, 2008).

Some of the Missouri restaurants currently adopting a whole animal program are listed in Exhibit 1.4.4. Identified through a Google search, these restaurants were associated with the terms "whole animal" or "nose-to-tail," "restaurant" and "Missouri." Of the restaurants identified, most are located in St. Louis.

Restaurant	Location
Barred Owl Butcher & Table	Columbia
Black Dirt	Kansas City
Bolyard's Meat & Provisions	St. Louis
Farmhaus	St. Louis
J. Devoti Trattoria	St. Louis
Mac's Local Eats	St. Louis
Savage	St. Louis
The Block	St. Louis
The Chocolate Pig	St. Louis

Exhibit 1.4.4 – Missouri Restaurants with Whole Animal Programs

Consumers in many other countries regularly use the whole animal. For example, haggis is a traditional Scottish dish made from sheep organs; black pudding is a type of blood sausage popular in the United Kingdom and Ireland; and liver-based pate is a French delicacy. However, whole animal use has largely slipped from the mindset of U.S. consumers. That said, whole animal use is steeped in American culture. In the 50 years before the Civil War, plantation owners in the South regularly held "pig pickin's" for slaves and roasted whole pigs. From there, restaurants grew out of a simple barbecue pit where the owner sold to-go barbecue (Dove). Restaurants across the country have again begun to serve entire animals for dinner, and whole pig roasts are common (O'Mara, 2014). This dining style gives a celebratory feeling to the dining experience as people come together to cook and eat a whole animal (Horn, 2019). Wedding feasts are examples of events for which a whole animal is prepared, not only for feeding all guests but also uniting guests as they eat together (Fox).

Chefs are powerful change agents. Artisanal cheese industry commentator Liz Thorpe points out, "It's the chefs who introduce us to the way we are going to eat" (Thorpe, 2009, p. 220). Chefs are doing more with beef and pork trim and scraps in an effort to reduce waste and boost the protein content of grain and veggie dishes. For example,

Saigon Sisters in Chicago offers a beef brisket pho, which is prepared by simmering roasted beef bones with spices, onions and a piece of brisket to give the broth a rich, meaty flavor. It serves the pho with rice noodles, a small amount of brisket, herbs, scallions and bean sprouts (Cobe, 2017(a)). Burwell's Stonefire Grill in Charleston, S.C., offers a "flight of flavor" dish in which guests grill the odd-shaped parts that are left over after staff have cut whole filets into steaks. Burwell's, which sells at least 20 of these dishes a night, increases its return on the cost of the filets (Cobe, 2016). Chef Junior Chaman often uses tacos as a way to introduce diners to an unfamiliar ingredient (Griesemer, New Jersey chefs get creative to tackle food waste, save money and planet, 2018). Offal served as part of a small bite or canape is another way (Henderson, 2017). According to Marcia Pelchat, a physiological psychologist at the Monell Chemical Sense Center in Philadelphia, one key to getting people to try new foods is mere exposure, especially in a social setting. "If someone serves it at a party, or you go to an expensive restaurant, that helps cognitively to make you want to try it again" (Fulton, 2011).

In some cases, processors are leading the move toward restaurants purchasing whole animals. Josh Applestone, owner of The Applestone Meat Company in New York, changed his business model so that his wholesale customers could only buy whole or half animals. He gave them two options: 1) he'd carve the carcasses himself when he made his delivery or 2) he would train restaurant staff to do it themselves (Stern, 2008).

Families represent a potential secondary, direct-to-consumer market for whole animal processors. Some predict whole animal butchery may go from niche market to mainstream as consumers continue to learn about the meat they eat and move toward a no-waste mentality (Aramark, 2019). Individuals who raise their own food, including animals, may choose to have their animals butchered by a local processor. Like chefs, families need to be familiar with how to use all parts of the animal they've chosen, taking into account the size of their family and their favorite menus (Farr & Binns, 2011). Ryan Farr, author of *Whole Beast Butchery* (Farr & Binns, 2011), recommends families partner to share the labor and costs incurred when purchasing a whole animal. If sharing a steer, then four families could each get 150 pounds to 200 pounds of meat.

Meal kits offer an opportunity to both educate and teach home cooks about trying new cuts of meat while also offering convenient and healthy options that fit into their busy lifestyles. For 14 years, the Power of Meat report has annually studied shopper preferences and behaviors specific to meat and poultry. The 2019 report focuses on changes in the overall food culture and the resulting implications for food retailers (Stein, 2019), and it found that 34 percent of participating shoppers have purchased a meal kit from a grocery store, and 13 percent have ordered a meal kit from a home

delivery company (Roerink, 2019). Processors may have an opportunity to develop their own meal kits for shoppers and compete with grocery store and online offerings.

Exhibit 1.4.5 summarizes options for processors and slaughterers to position themselves within a whole animal program supply chain. Boxes highlighted in black indicate the processor's position in each chain. Processors engaged in selling whole animals have two options: 1) sell a slaughtered animal as a whole carcass to restaurants or families who then break down the animal into cuts or process the meat themselves into value-added products or 2) sell the whole animal portioned into cuts as ordered by the buyer.



Exhibit 1.4.5 – Whole Animal Program Supply Chain

To grow whole animal programs, the meat industry must invest in education, infrastructure and relationship-building. Education refers to developing skills throughout the supply chain. At restaurants, chefs and wait stuff must understand what to do with more obscure cuts (O'Mara, 2014). Restaurants that purchase whole animals tend to have a lot of ground beef, and moving it requires creativity. Also, chefs must constantly change their menus. End-consumers need to be educated about trying unfamiliar cuts.

Millennials are a potential market to target. Technomic's "2019 Center of the Plate: Beef & Pork Consumer Trend Report" found that 25 percent of millennials chose cuts of beef they didn't eat a year earlier, and 32 percent said the same for pork (Cobe, 2019).

Members of the Butchers Guild work to educate end-consumers about the benefits of buying whole animals and how to use each part (O'Mara, 2014). Founded in 2011, the guild supports whole animal butchery education and preservation of the trade (The Butchers Guild, 2018). Butchers and processors, who interact directly with the public, can serve as educators (O'Mara, 2014). Today, home cooks have access to numerous butchery resources such as online videos, books and in-person seminars. Just 10 years ago, such information was relatively scarce. This growing interest offers another potential opportunity for processors. For example, The Local Pig in Kansas City offers four-hour classes that teach how to butcher, process and prepare a whole pig. Participants learn how to cure belly for bacon, brine fresh leg for ham, emulsify fat and liver for pate and create sausage from trimmings (The Local Pig). Processors could also sell ingredients required to make products such as pate and sausage at home.

With respect to infrastructure, when the University of Kentucky decided to implement a whole animal program for its dining halls, the necessary infrastructure wasn't in place to supply enough meat raised and processed in Kentucky. In particular, there weren't enough slaughterhouses. Several new slaughterhouses were established through at least partial funding from a settlement with cigarette companies. The settlement provided around \$28.4 million in 2018 for state and county agricultural projects funded through the Kentucky Agricultural Development Fund (Kentucky Farm Bureau, 2018). Access to more local facilities incentivized more producers to focus on local markets. The University of Kentucky could then source 57,000 pounds of cattle and hogs annually from 18 Kentucky producers (Nargi, 2019).

Local restaurants may also drive demand for whole animals. The founders of Farm Burger, a 12-restaurant Atlanta-based chain, saw an opportunity to support local agriculture by incentivizing local farmers to supply whole animals to their restaurants (QSR, 2019). Farm Burger markets itself as bringing the farm-to-table experience to the masses. It makes its beef patties from a whole carcass blend, and the burgers feature parts such as offal, face meat and tail meat in their oil or toppings. The restaurants also offer chicken and pork burgers made from whole animals (QSR, 2019).

Relationship-building and flexibility are necessary for whole animal programs. For example, to accommodate the variety of cuts received each week, dining hall menus at the University of Kentucky constantly evolve. Chefs coordinate directly with producers before planning menus in order to understand what is available from local farms. Chefs then estimate how much of each product they typically use per day, and farms fill orders every day or every couple of days to ensure product freshness. By utilizing the whole animal in their menus, dining halls remove the challenge of sourcing a large volume of one cut from local farmers (Nargi, 2019). Processors who prepare whole animals are also important stakeholders in this communication process.

## 1.5 Charcuterie

Charcuterie methods originated from the need to preserve meat when refrigeration wasn't an option. They evolved as an opportunity for butchers to innovate meats that would reflect local ingredients, traditions and preferences. Charcuterie products may use parts of the animal that might otherwise be wasted. Examples include bones, heads, tails, skin, fat and offal. Prepared using curing, drying and aging (Hy-Vee 2016), charcuterie products include bacon, ham, sausage, terrines, galatines, pates, confit (National Pork Board 2015), prosciutto, pancetta, (Hy-Vee 2016), secchi, genoa, sopressata, chorizo, capicola and coppa (Columbus Craft Meats). According to a representative from Skogen Festival Foods, charcuterie meats that have attracted strong consumer interest are hard salami, pancetta and prosciutto (Hamstra 2019).

Although pork has served as a leading ingredient in many charcuterie products, specialty deli products made from duck and beef have potential (Denis 2018). The International Dairy Deli Bakery Association in 2018 anticipated that charcuterie would gain further interest. Specific opportunities include those related to seafood, serrano ham and novel sausages (Sloan 2018).

Charcuterie presentations often include items with sour, acidic and bright flavors that provide contrast to the meats (National Pork Board 2015). For example, charcuterie pairs wells with artisanal cheese (Hamstra 2019). Other items commonly included in a charcuterie presentation include breads, pickles, honey (Denis 2018), popcorn, jam (National Pork Board 2015), nuts, crackers and mustard (Hy-Vee 2016).

Nielsen has tracked specialty meat and cheese sales. In the year ending on Feb. 25, 2017, roughly one-third of specialty meat and cheese sales were prosciutto mozzarella, and the mozzarella and hard salami category ranked second in dollar sales. Exhibit 1.5.1 presents the dollar share of specialty meat and cheese sales by product combination for the year preceding Feb. 25, 2017. Other meats commonly included in meat-cheese combinations were pepperoni, genoa salami and sopressata (Nielsen 2017a).



*Exhibit 1.5.1 – Specialty Meat and Cheese Category Dollar Sales Share, Year Preceding Feb. 25, 2017* 

For the specialty meat and cheese combinations evaluated in Exhibit 1.5.1, Exhibit 1.5.2 shares the change in dollar and volume sales compared with year-ago values — assuming a Feb. 25, 2017, year ending. Sales of mozzarella, basil and prosciutto increased more than sales of other combinations. This combination offers salty, creamy and aromatic flavors that may intrigue consumers. For assorted pairings, dollar sales increased by 40 percent, and volume sales increased by 41.2 percent (Nielsen 2017a). This may suggest growing interest in unique specialty meat and cheese pairings that alone don't generate enough sales to report them individually.

In terms of volume sales growth, other specialty meat and cheese combinations that posted at least 30 percent increases were mozzarella and pepperoni, 30.9 percent, and provolone, picante and sopressata, 30.4 percent. Mozzarella and hard salami volume sales increased by 29.6 percent (Nielsen 2017a).

Source: Nielsen (Nielsen 2017a)



Exhibit 1.5.2 – Specialty Meat and Cheese Category Sales Growth vs. Year Ago\*

\* For year that ended on Feb. 25, 2017 Source: Nielsen (Nielsen 2017a)

As the COVID-19 pandemic changed behaviors, pre-packed charcuterie meats faired well. Based on IRI data cited by Midan Marketing, second-quarter 2020 pre-packed charcuterie volume sales were 80% higher than sales during the same period in 2019. Later in 2020, pre-packed volume sales still showed about a 40% improvement relative to 2019. Charcuterie sold at service counters didn't perform as well as buyers looked for contactless options (Uetz 2021).

Historically, charcuterie had somewhat limited availability in specialty retailers and restaurants, but it has since gained more mainstream appeal (Hamstra 2019). A February 2017 report generated by Datassential described charcuterie at the "adoption" stage of the four-step menu adoption cycle, which begins with inception, moves to adoption, advances to proliferation and concludes at ubiquity. At adoption, sales growth occurs through making preparation easier and offering more inexpensive options. Premium and authentic ingredients continue to be important. Typically, trends at the adoption stage appear in fast-casual restaurants, casual independent foodservice entities, specialty grocery stores and gourmet food stores (Datassential).

An April 2019 piece from *Supermarket News* described several trends contributing to the interest in charcuterie. First, consumers have developed preferences for artisan options. Second, they may view charcuterie as snacks that offer protein. Third, charcuterie items have versatility. Some consumers have accepted charcuterie and cheese as whole meals, but these products also have application as quick snacks or options to serve when entertaining (Hamstra 2019). Among 2,000 U.S. consumers surveyed by Consorzio del Prosciutto di Parma, 43 percent said seeing a charcuterie board at a party would lead them to feel impressed by the party's host (Modern Restaurant Management 2018). Fourth, as domestic charcuterie output increases, consumers may choose more U.S.-produced products (Hamstra 2019).

Changes in import rules have also made it easier for U.S. buyers to access international charcuterie products. For example, USDA lifted a ban on salami, pancetta, coppa and other short-maturation products made in northern Italy, and the 100 percent customs reinspection policy for pork products has been revoked, which can simplify access to internationally produced charcuterie (Denis 2018). Further competition from European brands may create a challenge for U.S. companies (Nelson 2018).

Opportunities for charcuterie sales include serving charcuterie in restaurants, selling prepackaged charcuterie, offering charcuterie catering services or supporting consumers as they create their own charcuterie boards. Foodservice has tapped into the charcuterie interest. A November 2018 story from The National Provisioner/Independent Processor reported that the number of menus including charcuterie increased by 60 percent in the previous four-year period (Pellegrini 2018).

Social media has also contributed to charcuterie's popularity as consumers post about their charcuterie board creations. On its blog, Kerry, a food and beverage ingredients firm, named charcuterie as one of the seven meat trends for 2021. It describes that Pinterest searches for Mexican charcuterie grew by 155% from 2019 to 2020, and the number of breakfast charcuterie searches increased by five times (Devitt 2021).

Several large brands have introduced charcuterie products and combinations. During 2017, Niman Ranch launched 23 products in its artisan charcuterie line. Product formats vary from snack packs to lunch kits to foodservice options. The meat used in these products originates from family farms that don't use antibiotics, gestation or farrowing crates or animal byproducts as feed. They also must raise their animals outside or offer deeply bedded pens. Pork used in Niman Ranch products must meet Certified Humane standards (Donnel 2017). Kraft Heinz and Hillshire Farms also offer charcuterie meats via snack packs. The P3 products from Kraft Heinz combine meat, cheese and dried fruit

(Shoup 2018). Applegate is another charcuterie plate marketer. The plates combine genoa salami with three other items. One pairs the salami with cheddar, roasted salted almonds and dark chocolate chunks, and another features pepper jack cheese, sesame sticks and dried cranberries. Two other charcuterie snacks from Applegate combine uncured pepperoni — one made with turkey pepperoni — and cheddar cheese (Applegate 2019). Products that combine charcuterie-type meats with other food items somewhat mimic the Lunchables concept but appeal to adults (Shoup 2018).

Making charcuterie boards to feature prepared meats and cheese has been popular among consumers (Nielsen 2017a), and retailers can leverage the interest to sell products of their own. Google search volume data for the term "charcuterie board" illustrate the trend toward consumers preparing their own boards. Exhibit 1.5.3 summarizes how Google search volume for "charcuterie board" evolved between May 2014 and April 2019. The dotted trend line illustrates that "charcuterie board" search interest has heightened in recent years. The data suggest some seasonality. In particular, during holiday seasons, interest has been strong (Google Trends 2019). More recently, "charcuterie" searches trended upward after the pandemic began in March 2020. In 2021, they've maintained a relatively consistent yet strong position — suggesting the interest in charcuterie continues (Google 2021).



*Exhibit 1.5.3 – Interest in "Charcuterie Board" Search Term, Google, May 2014 to April 2019* 

\* Data collection system improved effective Jan. 1, 2016; "0" score indicates too little data available; dotted line serves as the trend line Source: Google (Google Trends 2019)

The Google search volume data can also provide insights into how interest in a given search term varies by geography. From May 2018 to April 2019, states that indexed high for "charcuterie board" searches were Rhode Island, Montana and South Carolina.

Exhibit 1.5.4 lists the top 10 states. A couple of Midwest states — Nebraska and Kansas — ranked in this list. Missouri ranked as No. 32 (Google Trends 2019).

Rank	States
1	Rhode Island
2	Montana
3	South Carolina
4	Nebraska
5	Kansas
6	New Hampshire
7	Oregon
8	Arizona
9	Georgia
10	North Carolina

Exhibit 1.5.4 – Top States for "Charcuterie Board" Searches, May 2018 to April 2019

Source: Google (Google Trends 2019)

Although Missouri ranked somewhat low relative to other states for the proportion of all searches that were "charcuterie board," one Missouri metropolitan area ranked in the top 10 compared with other U.S. metros. Exhibit 1.5.5 shares that the Kansas City, Mo., metropolitan area ranked seventh, based on its number of "charcuterie board" searches relative to all Google search activity from May 2018 to April 2019 (Google Trends 2019).

Exhibit 1.5.5 – Top Metros for "Charcuterie Board" Searches, May 2018 to April 2019

Rank	Metropolitan Areas
1	San Diego, Calif.
2	Savannah, Ga.
3	Portland-Auburn, Maine
4	Huntsville-Decatur, Ala.
5	Indianapolis, Ind.
6	Ft. Myers-Naples, Fla.
7	Kansas City, Mo.
8	Chattanooga, Tenn.
9	Providence, R.INew Bedford, Mass.
10	Tampa-St. Petersburg, Fla.

Source: Google (Google Trends 2019)

The Google Trends search data from July 2016 to July 2021 indicated the St. Joseph,

Missouri, metro area ranked as the No. 1 metro throughout the country for its relative interest in the "charcuterie" search term. Consumers in this area appear to have particularly strong interest in charcuterie (Google 2021).

As charcuterie has entered the mainstream, products have become more accessible. In recent years, Hy-Vee, for example, began adding charcuterie counters to stores and selling meats from lowa-based La Quercia (Hy-Vee 2016). As charcuterie gains additional mainstream acceptance, niche suppliers will need to distinguish their options from alternatives. Some charcuterie producers have emphasized that their products use meat originating from a certain breed (Hamstra 2019). Other charcuterie producers have experimented with offering seasonal flavors for a limited time. Global flavors may attract attention, but charcuterie products also may have an opportunity to create flavors unique to the ingredients found in their local areas (Denis 2018).

Potential barriers to charcuterie sales may include confusion among consumers — in particular, consumers not understanding charcuterie options, according to a representative from the International Dairy Deli Bakery Association. This barrier has opened an opportunity for brands to market charcuterie and cheese in grab-and-go formats. In Giant Eagle stores, shoppers may participate in the "Bring Your Own Board" experience. It enables consumers to supply their own board and pick up "ready-to-plate" cheeses (Hamstra 2019). A similar approach could work for charcuterie meats.

Educating consumers about how to assemble charcuterie combinations is another opportunity. Columbus Craft Meats developed an online "Build Your Charcuterie Board" tool meat to help consumers choose charcuterie meats and other items that would pair well with those meats. To begin, the tool asks that users identify their desired charcuterie flavor profile: mild, spicy, unique or no specific preference. Next, users select the meats that interest them, and then, the tool recommends cheeses, wines and fresh or dried fruit to include in a board (Columbus Craft Meats). Note, since 2017, Columbus Craft Meats has been part of Hormel Foods (Nelson 2018).

Offering workshops may introduce consumers to charcuterie (Denis 2018). Based in Kansas City, Mo., The Local Pig enrolls participants in butchering and charcuterie classes. Consumers can select from four classes. The two-hour basic charcuterie class gives participants experience with curing bacon, making fermented and smoked sausage, brining ham and creating pate. Other classes focus on teaching participants how to make sausage; process a whole pig, which includes making charcuterie; and butchering a pig into retail cuts. In its storefront, the Local Pig shop supplies a wide range of charcuterie products (The Local Pig 2019).

## 1.6 Chorizo

Typically made from pork and pork fat, chorizo is a spicy Spanish sausage sold raw or cooked. Beef or meat blends can serve as alternative ingredients. The seasonings used in chorizo vary according to country, but possibilities include peppers, chilies, cilantro, smoked paprika, red wine and vinegar (Berry 2018). Chorizo has an opportunity to respond to consumers' growing preference for ethnic cuisine. Although chorizo may most frequently be perceived as a dinner sausage, it has potential to fit in breakfast items, such as spicy chorizo hash (Pellegrini 2017).

Considered a specialty deli item in Nielsen sales data reporting, chorizo posted stronger sales growth in the year preceding Feb. 25, 2017, than the total specialty deli meat category. Exhibit 1.6.1 presents dollar and volume sales changes. As noted, total specialty deli meat sales grew 3.1 percent in dollar sales and 2.8 percent in volume sales. Chorizo posted dollar sales growth of 15.7 percent volume sales growth of 16.4 percent, and it outperformed the sausage, pepperoni and salami specialty deli meats. Of the four types of specialty deli meats with sales tracked, pepperoni ranked second with 4.1 percent dollar sales growth and 5 percent volume sales growth (Nielsen 2017a).



*Exhibit 1.6.1 – U.S. Specialty Deli Meat, Including Chorizo, Sales Growth, Year Preceding Feb. 25, 2017* 

Other Nielsen data cited by The National Provisioner/Independent Processor in 2017 pointed to annual chorizo sales of more than \$91.2 million, which was a slight decline in dollar sales. Given that all sausage sales in the observed period totaled \$7.69 billion, chorizo represented just a small component of the total (Pellegrini 2017).

To gauge consumer interest in chorizo in another way, Exhibit 1.6.2 presents a Google Trends analysis of search interest in the term. The dotted trend line suggests that interest in the chorizo keyword has grown (Google Trends 2019).



Exhibit 1.6.2 – Interest in "Chorizo" Search Term, Google, May 2014 to April 2019

\* Data collection system improved effective Jan. 1, 2016; "0" score indicates too little data available; dotted line serves as the trend line Source: Google (Google Trends 2019)

Geographical analysis of "chorizo" Google search term interest can help to gauge where consumers have had the greatest interest in the product. Exhibit 1.6.3 shares states where the highest proportion of search activity focused on the "chorizo" term. Arizona, California and Washington had the highest proportion of chorizo searches. Midwest states on the list were Illinois and Kansas. Missouri ranked No. 35 (Google Trends 2019).

Exhibit 1.6.3 – Top States for "Chorizo" Search Interest, May 2018 to April 2019

Rank	States
1	Arizona
2	California
3	Washington
4	Illinois
5	Nevada
6	New Mexico
7	Kansas
8	Texas
9	Colorado
10	Oregon

Source: Google (Google Trends 2019)

Metros in Google Trends that tended to have highest proportion of "chorizo" search volume were located in California, Texas, Arizona and Washington. No Missouri metropolitan areas ranked in the top 50. See Exhibit 1.6.4 (Google Trends 2019).

Rank	Metropolitan Areas	
1	Yuma, ArizEl Centro, Calif.	
2	San Angelo, Texas	
3	Tucson, Ariz.	
4	Harlingen-Weslaco-Brownsville-McAllen,	
	Texas	
5	Bakersfield, Calif.	
6	Palm Springs, Calif.	
7	El Paso, Texas	
8	Fresno-Visalia, Calif.	
9	Monterey-Salinas, Calif.	
10	Yakima-Pasco-Richland-Kennewick, Wash.	

Exhibit 1.6.4 – Top Metros for "Chorizo" Search Interest, May 2018 to April 2019

Source: Google (Google Trends 2019)

#### 1.7 Specialty Burgers

For many Americans, burgers are an often-consumed and loved food. Research from Technomic found that the share of consumers who eat hamburgers at least weekly totaled 56 percent in 2017 (Friends of the Earth, Natural Resources Defense Council, Consumer Reports, Center for Food Safety, Food Animal Concerns Trust and U.S. PIRG Education Fund 2018). Mintel research from 2016 found that 62 percent of consumers indicated that they love burgers (Mintel 2016), and Datassential reports that burgers rank No. 10 of more than 3,000 items for being loved by consumers (Mitchell 2019a).

Despite such strong attitudes and behaviors, overall burger eating occasions have declined, according to Technomic data. The firm shared that roughly two-thirds of consumers in 2013 said that they consumed a burger at least weekly compared with 56 percent who said such in 2017 (Green 2017). This indicates a need for burger marketers to align with consumer preferences to support burger consumption in the future. Data from the 2017 Technomic report point to 18- to 34-year-olds, men and Southerners being particularly important segments of burger consumers (Mitchell 2019a).

Mintel's "The State of the Burger" report from 2016 outlined how restaurants have worked to make burgers a menu item that continues to appeal to consumers. The company tracks restaurant menu items, and between the fourth quarter of 2012 and the fourth quarter of 2015, menu mentions of "cheeseburger" and "burger" declined by 15 percent and 6 percent, respectively. In the place of these more generic dish names, restaurants have opted to use more tailored descriptions that highlight key flavors or toppings added to burgers. For example, during the period from fourth-quarter 2012 to fourth-quarter 2015, menu mentions of "bacon burger" and "Southwest burger" grew by 34 percent, respectively (Mintel 2016). Burgers that incorporate Asian, Latin and Filipino flavors have emerged and gained popularity. Unique flavors and ingredients tend to particularly appeal to younger burger consumers (Mitchell 2019a).

Burger concepts and menu descriptions that stress more than just the basics may appeal to consumers who are willing to experiment with the burgers they choose. "The State of the Burger" report segmented burger consumers into three groups: burger traditionalists, burger trenders and burger switchers. According to the report, the largest share of burger consumers — 41 percent — identify as burger traditionalists who prefer plain-and-simple burgers. However, 37 percent fit in the "burger trenders" category, characterized as willing to try burger concepts that are interesting and offer unique toppings. Burger switchers represent the other 22 percent of burger consumers. This group's burger preferences shift according to their moods (D'Adamo 2016). When choosing a burger, several considerations shape consumers' decisions. Specialty burgers may appeal to those considerations. First, Mintel's research suggests that a burger made with premium ingredients could attract consumers willing to pay for a guality product. In particular, the Mintel research findings from 2016 showed a willingness to pay more for premium burgers by four in five consumers (Mintel 2016). Of the 1,781 consumers participating in Mintel's 2018 burger survey, 67 percent shared they would pay a premium for burgers made with premium ingredients (Mitchell 2019a).

Characteristics of the burger itself may largely factor into premium perceptions. For example, using a custom beef blend, particularly for fresh patties, can elevate premium perceptions held by consumers. Brisket, short rib and chuck are common "premium" burger blend options (Mitchell 2019a). The toppings included on a burger can also elevate a burger. Brisket, fried eggs and avocado are toppings, according to Technomic, that may add value to burgers and help marketers develop a unique positioning for their burgers (Green 2017). Delivering other high-quality burger components — for example, the bun and cheese — can further contribute to a premium positioning (Mintel 2016). "The State of the Burger" report shared half of consumers note interest in a variety of cheeses, and nearly half say a freshly baked bun is an important burger

component (D'Adamo 2016). Providing recommendations about how consumers can customize a burger with certain toppings may help to facilitate innovation in how consumers serve a premium burger at home (Mitchell 2019a).

Second, ingredient transparency is a key trend. Mintel found that 59 percent of consumers would like to know from where the beef in a burger originated. This sentiment was even stronger for millennials — at 68 percent (Mintel 2016). For Generation X consumers and baby boomers, knowing beef's origin was slightly less important (D'Adamo 2016). Transparency may also mean communicating with consumers about the meat cuts ground to make a burger or the breed from which burger meat is sourced (Hume 2018). From a breed perspective, labels may denote a burger is "100 percent Angus" beef (Hume 2018).

Third, the fresh, not frozen, characteristic serves as an important factor for some consumers. In its 2017 burger trend report, Technomic found that nearly half of consumers noted "never-frozen beef" as a very important feature of burgers (Green 2017). Mintel has also reported that a "fresh" burger tends to communicate a quality product (Mitchell 2019a).

Fourth, consumers appear to have a willingness to try burgers made from ingredients other than beef, according to the 2016 "The State of the Burger" report. Exhibit 1.7.1 illustrates that 46 percent and 42 percent of consumers surveyed for the report indicated interest in trying chicken and turkey burgers, respectively. Roughly one-third had an interest in buffalo burgers compared with 27 percent, 22 percent and 21 percent indicating interest for salmon, lamb and bean burgers (D'Adamo 2016).



Exhibit 1.7.1 – Share of Consumers Who Would Try Types of Non-Beef Burgers

Source: State of the Burger 2016 (D'Adamo 2016)

To understand the extent of Missouri consumers' interest in various burgers, Exhibit 1.7.2 lists several types of burgers and Missouri's rank in Google Trends. Rankings are assigned according to a search term's popularity, and popularity is measured as the proportion of searches in a given area relative to all searches in that area. The data are specific to May 2018 to May 2019. As illustrated, Missouri ranked high for "pork burger." Of the 20 states ranked, Missouri was first. Missouri also ranked relatively high for "beef burger," "bean burger" and "buffalo burger" (Google Trends 2019).

Burger Type	Missouri's Rank	States Ranked**
Beef burger	13	41
Pork burger	1	20
Chicken burger	31	50
Turkey burger	22	47
Buffalo burger	18	33
Salmon burger	21	24
Bean burger	17	45

Exhibit 1.7.2 – Missouri's Rank in Burger Type Search Interest, May 2018 to May 2019\*

\* No data for lamb burger, tuna burger and tofu burger

\*\* Not all states are ranked for each burger type; this column communicates the number of states ranked for each burger type

Source: Google (Google Trends 2019)

Understanding why consumers choose burgers may help with formulating marketing messages that appeal to them. Satisfying cravings is a top reason motivating burger purchases among consumers, according to research from Technomic. The research, which involved 1,500 consumers, identified reasons that drive consumers to purchase burgers. Fifty-seven percent of consumers noted that cravings triggered them to purchase burgers, and four in 10 shared they purchase burgers because they're a good value. Exhibit 1.7.3 shares that "it will fill me up," "it's easy to eat on the go" and "it's inexpensive" were purchase drivers named by fewer consumers (Technomic 2018).





Source: Technomic (Technomic 2018)

Key distribution points for burgers include retail stores and restaurants. Consumers increasingly prepare burgers at home (Green 2017), so retail distribution may expand. Nielsen has tracked burger sales in grocery stores, drug stores, mass merchandisers, select dollar stores and warehouse stores and other venues. For the year ending May 12, 2018, U.S. burger sales in these channels totaled \$3.3 billion, which was 5 percent growth compared with the previous year. Most burgers sold in stores were meat-based. Those made from alternative protein represent 6 percent of dollar sales (Nielsen 2018).

In a retail store, burger sales may originate from meat, deli or frozen departments. Meat and frozen departments generated the largest share of burger dollar sales in the year preceding May 12, 2018, but dollar sales grew most substantially in the deli and meat departments. Dollar sales grew 15 percent in the deli department compared with 8 percent in the meat department and 2 percent in the frozen department (Nielsen 2018).

For a look into how U.S. restaurants — including large chains and small-scale operations — perceive burger marketing, Schweid & Sons surveyed restaurant operators in 2018 and shared top-level findings in its "Burger Trends Report." Participating restaurants indicated that pre-formed burgers were more commonly sold in restaurants than hand patties, and 8-ounce patties tend to be most popular size. One question requested that respondents name beef cuts popular to use in restaurant burgers. Exhibit 1.7.4 shares the results. Chuck was the most popular answer, and sirloin, custom blend, short rib and brisket were noted as having relatively similar popularity (Schweid & Sons 2018).



Exhibit 1.7.4 – Most Popular Beef Cuts Used in Restaurant Burgers

The Schweid & Sons research also explored common protein toppings added to restaurant burgers. Meat marketers may consider opportunities to pair burgers with toppings and sell the combination as a complementary product. Exhibit 1.7.5 articulates various protein toppings' popularity, according to the participating restaurants. By far, bacon has been the most popular protein topping, and eggs have followed. Two other more novel burger toppings include pulled pork and chili (Schweid & Sons 2018).



Exhibit 1.7.5 – Most Popular Toppings Used on Restaurant Burgers

Source: Schweid & Sons Burger Trends Report (Schweid & Sons 2018)

Research with burger consumers suggests that marketers may consider positioning burgers as options for unique dayparts — namely, breakfast — to expand eating occasions. In its 2017 Burger Consumer Trend Report, Technomic noted slight growth in breakfast burger interest during recent years. Twenty-two percent of consumers noted breakfast burgers being highly appealing in 2015, but that share increased to 26 percent in 2017 (Green 2017). Adding a fried egg topping to a burger may shift a burger from a lunch or dinner staple to a breakfast option, and findings from Technomic suggest that some consumers would entertain ordering a burger topped with a fried egg. Of the

Source: Schweid & Sons Burger Trends Report (Schweid & Sons 2018)

more than 1,500 consumers responding to a survey in 2017, 23 percent said they would place an order for a burger topped with a fried egg. The share of consumers indicating such interest in 2015 was 20 percent (Technomic 2018). Other possible breakfast burger toppings include over-easy eggs, sunny-side eggs and hash browns (Mitchell 2019a). Innovating with flavors and ingredients may involve less risk in the burger market relative to others. Because consumers generally are familiar with cooking a burger, they may feel more confident when experimenting with burgers (Mitchell 2019a).

Burgers may face several key challenges in the future. In a *Food Ingredients First* piece, a representative from Innova Market Insights said that burgers may compete with the variety of sandwich items available on menus. Prepared foods marketed by food trucks, food halls and grocery stores may reduce the number of occasions that consumers choose a burger. As meal kits seek to make at-home food preparation simple, consumers may displace burgers — an easy-to-make meal — with meal kit options (Green 2017). Perceived "unhealthiness" of burgers may be another hindrance for some consumers. Mintel's burger trends report from April 2018 reported that two in five consumers think burgers are unhealthy. Positioning burgers as a treat that offers a good source of protein may help to address the "unhealthy" sentiment (Mitchell 2019a).

### 1.8 Bone Broth

Bone broth results from simmering bones and connective tissues with vegetables and herbs for as little as eight hours. It's different from stock, which is made by simmering bones and vegetables in water for a short time. Making bone broth leverages a meat co-product — animal bones — that might go to waste, and the bone broth contains a variety of nutrients, vitamins and minerals. It's also said to offer health benefits including improved sleep, digestion, joint health, brain function and bone health; weight loss; and decreased inflammation (McDonell 2017 and Hjalmarsdottir 2016).

Consumers purchase ready-to-consume bone broth in shelf-stable or refrigerated forms, or they purchase bone broth powders, capsules or consumables such as bone broth protein bars. Consumers can also make bone broth at home by using leftover bones from cooking or purchasing bones from local farmers, butcher shops, health food stores or online suppliers (Kellyann and Foster). Bones with high amounts of cartilage, such as knuckles, feet and neck bones, work best when preparing bone broth because they contain collagen, which breaks down into gelatin when boiled (Kellyann).

In recent years, bone broth has gained popularity, particularly in North America and Australia (Google Trends). Google Trends data can suggest how interest in various

keywords searched on Google has changed over time. The data represent Google search term interest, so the search term trend is meant to serve as a proxy for product interest. To interpret the chart, "100" represents the highest point of popularity for the search term, and "50" would suggest that the term was half as popular at the given time. Exhibit 1.8.1 shows the trend in U.S. bone broth search activity from May 2014 to May 2019. Annually, bone broth searches saw spikes in popularity during January (Google Trends 2019) — possibly as consumers look for products to consume during winter months and coincide with health-related New Year's resolutions.



Exhibit 1.8.1 – U.S. Interest in "Bone Broth" Search Term, Google, June 2014 to May

\* Data collection system improved effective Jan. 1, 2016; "0" score indicates too little data available; dotted line serves as the trend line Source: Google (Google Trends 2019)

A geographical analysis of search term data can suggest areas where interest for a given product is greater. From June 2018 to June 2019, "bone broth" searches represented a greater proportion of all searches in Oregon, Washington and Montana compared with search activity in other U.S. states, according to a Google Trends analysis. Missouri was listed as No. 38. Exhibit 1.8.2 lists the top 10 states for "bone broth" search interest during the yearlong observation period. No states bordering Missouri ranked in the top 10. Western states tended to have the greatest interest in bone broth searches. U.S. metropolitan areas that indexed highest for "bone broth" search activity from July 2018 to July 2019 were in the West and Northwest regions (Google Trends 2019).

Rank	States
1	Oregon
2	Washington
3	Montana
4	Colorado
5	Hawaii
6	Vermont
7	California
8	Idaho
9	Alaska
10	Utah

Exhibit 1.8.2 – Top States for "Bone Broth" Search Interest, June 2018 to June 2019

\* Data collection is a measure of search proportions rather than search volumes. Source: Google (Google Trends 2019)

According to data from SPINS and Global Market Insights Inc., shelf-stable bone broth sales in the U.S. more than tripled from \$5.83 million in 2016 to \$17.54 million in 2017. Overall U.S. sales of bone broth, including shelf-stable and refrigerated product, reached \$19.72 million in 2017. In 2018, Global Market Insights projected worldwide sales to grow to \$2.8 billion by 2024 due to factors such as rising consumer health consciousness and increased interest in bone broth as a protein source. The premade bone broth "to-go" drink market is also expected to grow (Global Market Insights 2018).

Innova Market Insights has tracked new bone broth product launches, and its analysis found that the number of products marketed as "bone broth" increased sixfold from 2015 to 2017. Exhibit 1.8.3 shares new U.S. bone broth product launches as an index value, according to Innova Market Insights. The index value for 2015 was set at 100, and 2017's value had increased to 609 (Innova Market Insights).



Exhibit 1.8.3 – U.S. Bone Broth Product Launch Index\*

As interest in bone broth products has grown, startups, including Ancient Nutrition, have seized the bone broth opportunity. Ancient Nutrition operates as a bone broth protein bar, powder and capsule manufacturer and online retailer. To make its products, the firm sources bones from animals raised on farms across the Midwest (Dr. Axe 6/9/19). Its products are also sold at health food stores, including Whole Foods and the Vitamin Shoppe. According to Nutrition Insight, Ancient Nutrition has become one of the fastest-growing companies in its category. Between 2013 and 2018, the firm was the largest dollar growth contributor to the category (Nutrition Insight 2018).

Another startup company that has seized the bone broth opportunity is Kettle and Fire. According to the firm's blog, the company's products include 100 percent grass-fed beef bone broth and organic chicken bone broth in a variety of flavors. The products are sold online and in health food stores including Wegmans and Whole Foods Market (NOSH). Sold in vacuum-sealed packaging, Kettle and Fire bone broth is shelf-stable for up to two years (CAVU). U.S. Wellness Meats also markets bone and meat products. Based in Canton, Mo., the company sells beef, bison, chicken, lamb and pork bones. It also sells homemade beef and chicken bone broth in liquid and gelatin forms. According to U.S. Wellness Meats product descriptions and online product reviews, the gelatin bone broth varies from liquid bone broth in that it is thicker and richer in flavor. U.S. Wellness Meats advertises its bone broth products as nutrient-dense "superfoods," and it sources much of its product from Midwest farms (GrasslandBeef 2012).

Source: Innova Market Insights (2018)

Swanson Broth & Stock, a Campbell Soup Company brand, also participates in the bone broth market with a USDA organic, non-GMO, free-range chicken bone broth (Campbell's). The product may help to attract health-focused buyers to the Campbell brand, which has experienced stress as its soups, particularly condensed options, may not resonate with health-focused individuals (Hirsch 2019). Campbell Soup Company has also announced that it will enter the to-go bone broth marketplace. To-go products have experienced popularity because of their convenience (Future Market Insights).

Bone broth serves as a protein source, though protein content varies by brand and whether the bone broth is in powder, consumable or liquid form. Bone Broth Protein Pure, a concentrated chicken bone broth powder from Dr. Josh Axe, has 20 grams of protein per serving, which is equivalent to 0.5 cup of chopped chicken breast (DrAxe.com). Ancient Nutrition's bone broth protein bars contain roughly 16 grams of protein per serving, and its bone broth powder and bone broth capsules contain 20 grams and 3 grams per serving, respectively. Beef and chicken bone broth marketed by Kettle and Fire offer 10 grams of protein per serving, and bone broth from Swanson Broth & Stock provides 9 grams of protein per serving (Campbell's and Hirsch 2019).

According to the Kettle and Fire, a company that markets chicken and beef bone broth, both products are nutrient-rich, yet they differ slightly. On its blog, it shares that chicken bone broth is easier to digest. Additionally, chicken bone broth has a milder flavor compared with beef bone broth. In terms of nutritional value, chicken bone broth contains more omega-6 essential fatty acids and protein, and beef bone broth contains a higher concentration of minerals (KettleandFire 2017).

Bone broth can be made from the bones of most animals. As mentioned earlier, Google Trends data can suggest how interest in various keywords searched on Google has changed over time. The data may serve as a proxy for product interest. Exhibit 1.8.4 shows the search trend for "chicken bone broth," "beef bone broth," "turkey bone broth" and "pork bone broth" in the U.S. from June 2018 to June 2019. To interpret the chart, "100" represents the highest point of popularity for the search term, and "50" would suggest that the term was half as popular. As illustrated, search interest for "chicken bone broth" and "beef bone broth" had more volatility, and interest in both search terms peaked in January 2019. Turkey bone broth saw a spike in its popularity in November 2018 (Google Trends 2019) — likely because consumers may search for ideas to use leftover turkey bones after the Thanksgiving holiday.

Assessing Google Trends data by state can indicate whether particular states have interest in bone broth compared with other states. For "beef bone broth" search activity

from July 2014 to July 2019, Missouri and bordering states Illinois and Kansas indexed in the top 20. Their ranks were No. 20, No. 13 and No. 16, respectively. For "beef bone broth" search activity from July 2018 to July 2019, Illinois and Missouri ranked as No. 24 and No. 25. For "turkey bone broth" search activity from July 2014 to July 2019, Illinois indexed as No. 11, and from July 2018 to July 2019, Illinois indexed as No. 20. Missouri was indexed as No. 20 for "chicken bone broth" search activity from July 2014 to July 2014 to July 2019, but from July 2018 to July 2019, Missouri indexed as No. 11 (Google Trends).



Exhibit 1.8.4 – U.S. Interest in Different Types of Bone Broth, June 2018 to June 2019

\* Data collection system improved effective Jan. 1, 2016; "0" score indicates too little data available; dotted line serves as the trend line. Exact search terms were for 'chicken broth', 'beef bone broth', 'turkey bone broth' and 'pork bone broth'.

Source: Google (Google Trends 2019)

Some marketers have developed bone broth products for pets. Similar to bone broth marketed for human consumption, bone broth marketed for pets uses the same ingredients. Bone broth products meant for pet use are typically mixed into pet food, and such products have gained recent popularity because they may provide pets with additional nutrition; alleviate arthritis, diarrhea, upset stomach and allergies; and aid pets with leaky gut syndrome. Primal Pet Foods, a pet food manufacturer and retailer, sells freeze-dried bone broth snacks and liquid bone broth. The company's bone broth pouches contain homemade bone broth mixed with a variety of vegetables and spices

(PrimalPetFoods). Caru Pet Foods, a pet bone broth marketer, started in 2010 as a family-owned business to provide sick pets with a homemade and nutritious diet. Bones used in its products are sourced from a U.S. family-owned farm, and all products are manufactured in the U.S. at USDA-approved facilities. Additionally, all products are made in human-grade facilities from food-grade ingredients (Carupetfood).

# 1.9 Meat-Plant Products

Introducing plant-based proteins has triggered innovation in products that exclusively feature plant-based proteins or those that blend meat and plant-based ingredients. According to a presentation from 210 Analytics, the Power of Meat 2019 report shares data from a consumer survey conducted among 1,500 consumers during December 2018, and it provides insights into consumers' interest in plant-based meat alternatives or products that blend both meat and plant-based ingredients (Roerink 2019). Exhibit 1.9.1 shares that a relatively small share of consumers bought such products.



Exhibit 1.9.1 – Consumer Purchase Behaviors and Intentions for Meat-Plant Products

Larger shares of surveyed consumers noted they would definitely or maybe buy plantbased or vegetarian protein or products made from a blend of meat and plant-based ingredients. Nearly one-quarter of consumers said they definitely would purchase meat and plant ingredient blends, and four in 10 shared they maybe would buy such blended items. Purchase intentions for products made from plant-based or vegetarian protein were somewhat weaker. Slightly more than one-third of the respondents noted that

Source: Power of Meat 2019 (Keefe 2019)

they would absolutely not purchase plant-based or vegetarian protein items compared with roughly one-quarter of consumers feeling such for blended items (Keefe 2019).

The survey tracked how blended meat and plant-based product purchase behavior and intentions vary by a key demographic factor — age. Exhibit 1.9.2 shares the results. Generation Z consumers were more likely to already purchase blended meat and plant-based items than the other generational groups. Nearly a quarter of Generation Z participants noted that they already buy such products. The likelihood that consumers already purchase blended meat and plant-based items declined with age, according to the survey. Only 3 percent of baby boomers indicated that they already purchase blended items. Nearly four in 10 baby boomers shared that they would absolutely not buy blended products. The share of respondents who answered "absolutely not" was lower for the other generational groups (Keefe 2019).





Source: Power of Meat 2019 (Keefe 2019)

To further gauge consumer interest in blended meat and plant-based products, the Power of Meat survey segmented respondents into two groups: one with consumers who identify as "meat eaters" and one with consumers who describe themselves as "flexitarians." Of all of the consumers participating in the survey, 86 percent described themselves as meat eaters, and 10 percent shared that they were flexitarians. Note, 5 percent noted being vegetarian or vegan (Roerink 2019). Exhibit 1.9.3 summarizes purchase behaviors or intentions for blended meat and plant-based items among meat eaters and flexitarians. Fourteen percent of meat eaters said that they already purchase blended items compared with 8 percent of flexitarians. Roughly one-quarter of both groups — 24 percent of meat eaters and 23 percent of flexitarians — noted that they would absolutely not purchase blended meat and plant-based products (Keefe 2019).





Mushrooms have gained recognition as an ingredient to blend with meat for burgers, chili, tacos and other dishes. The Mushroom Council in 2011 began collaborating with the Culinary Institute of America, and the partnership found that minced mushrooms could have a texture similar to that of ground beef. Types of mushrooms found in blends include creminis and portobellos (Black 2014). Monterey Mushrooms is one firm offering mushrooms intended for creating meat-mushroom blends. The Let's Blend brand features finely diced mushrooms (Koger 2018) to mix with ground beef, chicken, lamb, pork or turkey. Three flavors — classic, Mexican and Italian — are available. Gourmet's Finest also offers mushrooms ready for blending via its Mushroom Crumble product. The company targets schools and institutional buyers (Sowder 2019).

Foodservice firms have joined in diversifying menus to include burgers made from meat and mushrooms. As an example, the Cheesecake Factory and Seasons 52 have innovated burgers that feature meat and mushrooms, and dining facilities at Yale, Harvard and the University of Southern California have incorporated mushrooms in

Source: Power of Meat 2019 (Keefe 2019)

traditional meat-only applications. For school cafeterias required to adhere to certain nutrition guidelines, meat-mushroom patties could be an option (Black 2014).

Sonic became the first quick-service restaurant to offer a meat-mushroom burger when it launched its Sonic Slingers in 2018 throughout the U.S. Included on menus for seven weeks, the widespread introduction followed a market test conducted during summer 2017. Chopped mushrooms were 25 percent to 30 percent of each burger (Koger 2018). The restaurant chain launched Sonic Slingers to attract women to visit Sonic locations (Watrous 2018), and in February 2019, *Produce Retailer* mentioned that participating Sonic locations would offer the Signature Slingers for a third time — again for a limited period (Sowder 2019). To expand blended burger offerings in other restaurants, the James Beard Foundation and the Mushroom Council have collaborated with chefs who offering blended burgers for a limited time (Ortenberg 2018). Now in its fifth year, the Blended Burger Project engages chefs from throughout the country in a competition that assesses burger creativity, flavor and presentation (James Beard Foundation 2019).

To encourage home cooks to try meat-mushroom blends, the Mushroom Council sponsored the Blenditarian Challenge in 2018. The challenge collected 1,200 submissions (Sowder 2019). Several firms have developed meat-mushroom burgers intended for retail sales and home consumption. In October 2018, Teton Waters Ranch announced its new frozen burgers made from grass-fed beef and mushrooms (Shilling 2018). Applegate, which is part of Hormel, has also launched organic meat-mushroom burgers, branded with the Great Organic Blend Burger name. One product features turkey, and the other uses grass-fed beef (Siegner 2019). Compared with some meat alternatives, Great Organic Blend Burger products have a short ingredient statement. They only use meat, mushrooms and rosemary (Painter 2019). Grateful Burger is another market entrant. It blends beef and portabella mushrooms in one item — 60 percent of the burger is beef, and 40 percent is mushroom — and chicken, kale and roasted garlic in another. In addition to its retail burgers, Grateful Burger also serves the higher education industry (Food Newsfeed 2018).

Although mushrooms have represented a significant ingredient in blended burgers, some innovation has centered on adding other plant-based ingredients to blends. Better Meat Co combined wheat protein, mushroom, pea fiber and umami extracts into its ingredient blend that resembles croutons. Created through a proprietary process, the first product — named Albina 100 — is meant to blend with ground pork, but Better Meat Co has plans to introduce other plant-based ingredients formulated to work with other meats, such as beef and chicken. When adding the Albina 100 blend to pork, users can add as much as 30 percent of the plant-based blend to make products such as

sausage, meat balls and chorizo. Foodservice firms are the primary audience, but packaged goods may represent another opportunity for the product (Watson 2018).

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# 2. Market Opportunities By Species and Multispecies Processing

Some small and very-small processing plants may not generate enough revenue from processing one species to cover their businesses' costs. Diversifying through processing additional species could help to maximize a business' facility use and add revenue streams. For example, a multispecies processor could offer poultry, beef and pork products that are all grown by local farmers and processed, stored, aggregated and distributed within one facility. In addition, diversification may help to reduce financial risk for slaughtering and processing facilities when drought and other adverse weather or production conditions negatively affect supply of a particular species.

The survey conducted for this project found Missouri meat businesses handle multiple species in their operations. Of the Missouri facilities that answered the animal slaughtering question, all slaughtered cattle, and nearly 95 percent slaughtered hogs. See Exhibit 2.1. Note, respondents indicated animals their operations slaughtered in the past year. Sheep and goat slaughter were also common as 84.2 percent and 78.9 percent of respondents, respectively, noted slaughtering these animal species.



Exhibit 2.1 – Species Slaughtered by Missouri Facilities in the Past Year

In terms of processing activities, Exhibit 2.2 reports the share of respondents that indicated their facilities processed different animal species in the past year. Respondents shared that cattle, 88.5 percent; deer, 80.8 percent; and hogs, 80.8 percent, were the most commonly processed animal species at Missouri facilities. Goats and sheep followed as 61.5 percent of respondents said they processed these species. Facilities less

commonly processed poultry. Note, for this question, respondents indicated animals their operations processed in the past year.



Exhibit 2.2 – Species Processed by Missouri Facilities in the Past Year

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 26

When responding to the question about species slaughtered or processed, respondents could also name other species that their facilities handle. Elk and bison or buffalo were the most frequently cited "other" species handled by respondents. Others were wild hogs, ostrich, antelope, venison, rabbits and alpaca.

Respondents from USDA-inspected facilities and all other facilities reported similar meat slaughtering business activities. The two types of facilities did have some differences in the types of species they process. Notably, respondents from USDA-inspected facilities were less likely to process deer. Additionally, relative to all other facilities, the USDA-inspected facilities were more likely to process chickens and turkeys.

Before adding a species to their processing schedules, existing facilities gauge whether enough producers raise enough animals of the particular species to supply animals to a given facility. Without a steady supply, small and very small processors will find it hard to utilize workers and expensive equipment. In some cases, producers may need to change their practices to ensure processors have a steady supply of finished animals. Beef producers, for example, may stagger when their animals finish according to desired weight. Developing such a schedule takes time, however, and not all animals gain weight at the same rate (Aliotti, 2010). Several tools have helped processors source an adequate and steady supply of animals. They include active scheduling systems and variable pricing. No-show penalties may ensure that throughput is steady week by week and over the year (Gwin, Thiboumery, & Stillman, 2013; Johnson, Marti, & Gwin, 2012). These systems also provide predictability for farmers, who can be more certain they will have processing dates for their livestock. In other case studies, farmers have invested time and money into ] processing businesses through loans, stock purchases, equipment financing or hours of expertise and effort. These investments deepened the mutual commitments between farmers and processors (Gwin, Thiboumery, & Stillman, 2013; Johnson, Marti, & Gwin, 2012).

The following section provides information on the supply of cattle, hogs and poultry in Missouri and the market trends and opportunities for meat derived from these species. Given these market opportunities, the second half of this section details the potential operational, financial and regulatory implications for processors that add a different species to their operational plans.

## 2.1 Supply and Market Opportunities – Beef

Exhibit 2.1.1 reports Missouri cattle inventory from 2015 to 2020. On Jan. 1, 2020, cattle and calves inventory totaled 4.35 million head. From 2019 to 2020, beef cow inventory increased slightly, but dairy cow inventory declined. Total inventory of heifers that weighed at least 500 pounds increased from 2019 to 2020; however, beef cow replacement numbers was relatively steady from 2019 to 2020, and the milk cow replacement count dropped by 5,000 head. Cattle on feed inventory increased by 10,000 head between 2019 and 2020 to total 110,000 head on Jan. 1, 2020. Cattle on feed inventory hadn't been that high since 2017.

	2015	2016	2017	2018	2019	2020
All cattle and calves	3,950	4,050	4,300	4,350	4,250	4,350
All cows that have calved	1,920	1,970	2,120	2,170	2,140	2,160
Beef cows	1,832	1,884	2,035	2,086	2,059	2,083
Dairy cows	88	86	85	84	81	77
Heifers, at least 500 pounds	620	620	640	600	580	600
Beef cow replacements	340	355	365	355	335	335
Milk cow replacements	60	45	45	40	40	35
Other heifers	220	220	230	205	205	230
Steers, at least 500 pounds	390	430	450	410	395	420
Bulls, at least 500 pounds	110	110	120	120	125	120
Calves	910	920	970	1,050	1,010	1,050
Cattle on feed*	70	100	110	80	100	110

Exhibit 2.1.1 – Missouri Cattle Inventory, 2015 to 2019 — Measured in 1,000 Head

\* Also included in the classes above

Source: USDA National Agricultural Statistics Service (2020)

In pounds, Exhibit 2.1.2 shows Missouri commercial animal slaughter by species. For cattle and calves, commercial slaughter substantially increased from 2019 to 2020. In all four years, however, hog pounds slaughtered exceeded slaughter of other animal species. With respect to sheep and lamb slaughter, pounds on a live basis declined slightly from 2017 to 2018 but has maintained a steady level since then. Note, goat commercial slaughter data are only available nationally, not on a state-by-state basis (National Agricultural Statistics Service 2021).

Exhibit 2.1.2 – Missouri Commercial Animal Slaughter — Measured in 1,000 Pounds\*

Species	2017	2018	2019	2020
Cattle^	48,051	54,254	55,305	99,882
Calves	111	84	119	262
Hogs	2,679,522	2,612,590	2,562,179	2,540,840
Sheep and lamb	957	931	932	930

\* Pounds reported on a live basis

^ GE 500 pounds

Source: National Agricultural Statistics Service (2021)

Turning to demand, understanding meat product demand by species and the trends shaping consumption is important for processors. For beef, pork, chicken (broiler) and

turkey, Exhibit 2.1.3 shows consumption data from 2002 to 2020, and it presents projected total consumption through 2030. Note, these data are specific to domestic use. The University of Missouri's Food and Agricultural Policy Research Institute (FAPRI) and Agricultural Markets and Policy group report use data and projections. After totaling 27.6 million pounds in 2020, beef domestic use is projected to decline somewhat through 2025 before increasing to 27.2 million pounds by 2030 (MU Food and Agricultural Policy Research Institute and Agricultural Markets and Policy 2021).



Exhibit 2.1.3 – Domestic Use of Various Species, 2002 to 2030

Source: MU Food and Agricultural Policy Research Institute and Agricultural Markets and Policy (2021)

Per capita U.S. beef consumption peaked in the 1970s and has since declined by about one-third (United States Department of Agriculture, Economic Research Service, 2018). On the other hand, per capita U.S. chicken consumption more than doubled between 1970 and 2017. This indicates consumers "swapping out" beef for chicken in their diets (USDA Economic Research Service, 2019; Waite, 2018). In their 2021 baseline outlook, FAPRI and the Agricultural Markets and Policy team projected beef consumption per capita to decline from its 2020 total and moderate at roughly 55 pounds per capita toward the latter part of the projection period. See Exhibit 2.1.4 (MU Food and Agricultural Policy Research Institute and Agricultural Markets and Policy 2021).



Exhibit 2.1.4 – Per-Capita Consumption of Various Species, 2002 to 2030

Source: MU Food and Agricultural Policy Research Institute and Agricultural Markets and Policy (2021)

By dollar and volume sales, ribeye steaks and strip steaks ranked as the top two cuts from January to July 2018. Exhibit 2.1.5 lists the top 10 cuts, their dollar sales, their volume sales and their average retail prices for the first six months of 2018. As illustrated by the average price column, the list included cuts that carry a price premium and those priced more economically. The tenderloin steak, priced at a high \$17.44 per pound on average, had the lowest volume sales of the 10 cuts included in the list (Krebs, 2018).

				Average Retail
Cut	Su	m of Dollars	Sum of Pounds	Price Per Pound
Ribeye steak	\$	1,432,417,960	156,451,262	\$9.16
Strip steak	\$	947,765,292	116,922,621	\$8.11
T-bone steak	\$	390,553,581	56,107,676	\$6.96
Stew meat	\$	370,945,670	70,621,067	\$5.25
Chuck center roast	\$	365,804,931	87,134,335	\$4.20
Tenderloin steak	\$	292,678,456	16,782,738	\$17.44
Top sirloin steak	\$	279,843,804	44,280,760	\$6.32
Top round first steak	\$	201,625,460	48,315,197	\$4.17
Blade chuck roast	\$	193,009,351	41,161,400	\$4.69
Cubed steak	\$	184,827,350	35,021,493	\$5.28

Exhibit 2.1.5 – Top 10 Beef Cuts at Retail, January to July 2018

Source: IRI/Freshlook categorized by VMMeat System cited by National Cattlemen's Beef Association (Krebs 2018)

For beef, pork, chicken and turkey, Exhibit 2.1.6 shows the retail price data per pound from 2002 to 2030 — the latter portion of this period being projections. A mix of difficult agricultural conditions and strong consumer demand resulted in record-high meat prices in 2014; however, as drought and disease cases diminished, prices began to decline (IBISWorld, 2018). Based on the data from FAPRI and the MU Agricultural Markets and Policy team, beef's average retail price is expected to increase more than 13 percent from \$6.54 per pound in 2020 to \$7.44 per pound in 2030. For this same decadelong period, price grow for the other three species is projected to total 18.6% for pork, 16.4% for broiler and 8.2% for turkey (MU Food and Agricultural Policy Research Institute and Agricultural Markets and Policy 2021).

Price growth is partly explained by processors offering more value-added products to consumers (IBISWorld, 2018). For example, given growing demand for convenience products that require little to no preparation, companies have introduced single-serving portions and products with seasonings and marinades already added (Nelson, 2019). Interest in convenience is expected to increase as research has shown 30 percent of younger shoppers — those who are 34 years old and younger — buy for one meal at a time (Food Marketing Institute and Foundation for Meat & Poultry Education & Research, 2019). More companies are also introducing healthy protein snacks as a wider audience grows to accept products traditionally marked to the sports nutrition and fitness enthusiasts (Gazdziak, 2018).



Exhibit 2.1.6 – Meat Retail Prices Per Pound, 2002 to 2030

Source: MU Food and Agricultural Policy Research Institute and Agricultural Markets and Policy (2021)

With steady predicted domestic beef consumption yet an increase in average beef prices, consumers appear to be more willing to pay for beef. Shoppers 34 years old and younger primarily look for meat that fits with "better for me" and "better for the planet" positioning (Food Marketing Institute and Foundation for Meat & Poultry Education & Research, 2019). Beef processors that offer premium products may capture markets willing to pay higher prices. A market basket study found that 6.3 percent of all carts in 2018 contained beef compared with 4.4 percent for chicken. Beef also commanded more of a share of the basket cost with 2.1 percent of total store sales being for beef compared with 1 percent for chicken (Krebs, Beef drives higher total store sales, 2019b).

Not all beef products can be treated the same, however. As shown in Exhibit 2.1.3, veal production experienced a 24 percent drop between 2017 and 2018. This drop in supply reflects declining veal demand, which possibly stems from increasing consumer concerns regarding animal welfare and negative coverage regarding the way veal calves are raised (Lin, 2019). Transparency is expected to continue to drive consumer interest (Gazdziak, 2018), particularly among baby boomers (Food Marketing Institute and Foundation for Meat & Poultry Education & Research, 2019). Traceability is starting to become expected rather than a value-added characteristic (Aliotti, 2010).

Target markets may be different for different species or products. For example, specialty niche meats, such as prosciutto or beef salami, and primal cuts may be targeted to grocery and restaurant businesses. Local families may prefer to purchase traditional beef cuts direct from the processor. Meat patty popularity has more than doubled from 6 percent of total retail meat department beef sales (in dollars) in 2012 to 13 percent in 2018. Patties with added ingredients such as cheese, peppers, bacon or mushrooms have driven this trend (Krebs, 2019a). Ground beef is an affordable and popular option for lower and middle-income consumers, and quality ground beef such as the 80/20 patty is a go-to protein for millennials with children. Seasonality also plays a factor in beef demand. Beef patty sales tend to peak during the summer, and meatball sales peak during the winter months (Krebs, 2019a).

Price-conscious consumers may more often experiment with recipes from around the world to prepare less-expensive cuts such as brisket (Packaged Facts, 2017). Ethnicinspired dishes accounted for roughly half of the 20 top food trends in 2018 (National Restaurant Association, 2017). Innovation has also created opportunities for the beef segment. The popular supermarket rotisserie chicken has been adapted by Certified Angus Beef, which created a boneless "beeftisserie" roast from the tri-tip muscle. The marbling within this muscle enables the product to retain its tenderness and juicy flavor, even after sitting for three hours in the warming box (Gazdziak, 2018). In the U.S., 97 percent of foodservice establishments report having beef on the menu, and beef represented 16 percent of their total food purchases in 2017 (Technomic, 2017). The percentage of operators purchasing roasts (subprimal and ribs) significantly increased between 2013 and 2017 (Technomic, 2017). Having beef on the menu has been shown to increase customer traffic by 45 percent (United States Department of Agriculture, 2018), and 45 percent of foodservice establishments report that steak adds value to their average check amount (Technomic, 2017).

Exhibits 2.1.7 and 2.1.8 show the market value trends in terms of foodservice establishment purchasing in pounds and price paid by the foodservice operator. Overall, beef volume increased by 3 percent between 2016 and 2017 with ground beef and ribs largely responsible for the 6 percent increase in dollar spend between 2016 and 2017. Value-priced emerging steak cuts are an attractive option for foodservice operators; shoulder tender, oyster steak, Vegas Strip and Merlot cuts were particularly popular (National Restaurant Association, 2017). A significant increase in traditional roast product, such as tenderloin and rib/ribeye/prime rib, purchases indicate many operators are now cutting these products themselves rather than purchasing them pre-cut. Other trends to note are an increase in the volume of ribs purchased by foodservice establishments — likely caused by an increase in barbecue items on menus — and an increase in ground beef volume — helped along by new products introduced by major restaurant chains such as McDonald's Signature Crafted Burgers (Technomic, 2017). Given these trends, niche processors may have an opportunity to work with restaurants and develop pre-seasoned or -marinated ribs and ground beef products for use in barbecue and burger menu items.

Exhibit 2.1.7 – Market Value Trends in Foodservice Establishments (Pounds)



\*Rib/ribeye/ribeye cap, filets, flank/skirt, strip/top loin, porterhouse/t-bone

\*\*Sirloin, flat iron, petite tender medallions, hanger, tri-tip, chuck eye/delmonico, ranch cut, Denver steak/underblade

\*\*\*Tenderloin, rib, ribeye, prime rib, ribeye cap, chuck/shoulder, round

\*\*\*\*Chuckeye/underblade, trip-tip, petite tender (teres major)

Source: (Technomic, 2017)

Exhibit 2.1.8 – Market Value Trends in Foodservice Establishments (Dollars)



\*Rib/ribeye/ribeye cap, filets, flank/skirt, strip/top loin, porterhouse/t-bone \*\*Sirloin, flat iron, petite tender medallions, hanger, tri-tip, chuck eye/delmonico, ranch cut, Denver

steak/underblade

\*\*\*Tenderloin, rib, ribeye, prime rib, ribeye cap, chuck/shoulder, round

\*\*\*\*Chuckeye/underblade, trip-tip, petite tender (teres major)

Source: (Technomic, 2017)

To summarize, major consumer trends influencing the beef sector include the following:

- Foodservice establishments have increased demand for higher priced beef cuts and roasts.
- Restaurants and diners have increasing demand for new cuts of meat (e.g. shoulder tender, oyster steak, Vegas strip steak, merlot cut).
- Processors may cater to a younger generation by offering smaller portion sizes in ready-to-eat and snack meat products.
- Consumers have shown increasing interest in products influenced by local, regional and global tastes.
- Innovation has focused on finding new uses for beef that meet consumer demand for convenience. For example, boneless 'beeftisserie' roasts modeled on the popular rotisserie chicken concept are available in grocery stores.

#### 2.2 Supply and Market Opportunities – Pork

As shown in Exhibit 2.1.2, Missouri operations have slaughtered more pounds of hogs for commercial use than any other animal. Missouri market hogs inventory increased between 2011 and 2019. In particular, inventory numbers grew quickly between 2016 and 2018. See Exhibit 2.2.1 (National Agricultural Statistics Service; Swine Extension - University of Missouri, 2019). Pork supply tends to be seasonal. It increases in the fall and peaks in November in line with Thanksgiving (National Pork Board, 2018).



Exhibit 2.2.1 – Missouri Market Hogs Inventory, Dec. 1, 2011 to 2017

According to projections — see Exhibits 2.1.3, 2.1.4 and 2.1.6 — pork consumption is expected to increase slowly but steadily from 2020 to 2030, and pork prices are predicted to increase from \$4.03 per pound on average in 2020 to \$4.78 per pound in 2030 (MU Food and Agricultural Policy Research Institute and Agricultural Markets and Policy 2021). However, with the exceptions of bacon, belly and a few other trends, the pork demand's outlook has some challenges. For example, 59 percent of millennial (ages 25 to 34) households without kids purchase pork compared with 72 percent of millennial households with kids. The concern is that as millennial households not purchasing pork begin to have kids, those households won't transition to consuming pork (National Pork Board, 2019b). To reach this audience, one option is to produce a pork nugget product for families that eat on the go. Pork deli meat, ham steaks, fried tenderloin and pulled pork are other options that can be utilized in school lunches (National Pork Board, 2019a).

Source: (National Agricultural Statistics Service; Swine Extension - University of Missouri, 2019)

Younger shoppers who consume pork already view it as a budget-friendly protein, and given their collective desire for new and authentic multicultural experiences (Mya, 2019), inexpensive ready-to-eat ethnic dishes are one option for processors to add to their offerings. Millennial Asians are particularly likely to consume pork (National Pork Board, 2019b). Shoppers who are 34 and younger tend to buy for one meal at a time, and they don't view fresh pork as quick and easy to prepare. Instead, they report that pork is "complicated" to make; bacon and ground pork are exceptions (National Pork Board, 2019b). Processors could target these shoppers by including recipes and cooking methods on packaging as well as sharing nutrition and protein information.

To provide flavorful options, pork processors could offer convenient ready-to-cook preseasoned pork cuts or pork cuts pre-packed with braising liquids. Pork roasts are also a traditional go-to for family celebrations, including Thanksgiving. An opportunity exists for pork processors to add innovative items marketed as "family celebration" dishes such as appetizer platters that feature a quarter or half rack of ribs. Such platters would enable processors to use excess inventory (National Pork Board, 2019a). When asked what dishes people crave at home, a Datassential survey found that 88 percent of respondents said they crave pork chops, 81 percent crave pork sausage, 78 percent crave pork tender, and 77 percent crave pork roast (National Pork Board, 2019a).

The perception that pork is complicated to prepare may explain why people enjoy eating pork while dining out. Consumers reportedly want to see more pork options on menus and say they would visit a restaurant more frequently if it offered more pork dishes, according to Datassential (National Pork Board, 2019a). The Datassential work indicates that 78 percent of diners crave Asian pork dishes when eating out, and 65 percent crave Mexican and Latin pork dishes. In addition, 39 percent crave pork/ham shank, and 39 percent said they crave salads with pork ingredients. Yet many of these dishes don't appear on menus (National Pork Board, 2019a). Despite a 2 percent decline in pork's appearance on restaurant menus between 2008 and 2018, according to Datassential, restaurant owners are open to adding pork to their menus and want to find more ways to do this (National Pork Board, 2019a). This presents an opportunity for working with chefs to explore new cuts. "Hog wings" are one example of a possible shareable menu item. Adding chorizo tacos to breakfast menus is another possibility (National Pork Board, 2019a). Topping a salad with lean pork tenderloin strips or grilled pork kabobs may enable restaurants to differentiate their healthy options with pork, and they could market the item as a "protein-packed Mediterranean salad" (Mintel, 2018).

To summarize, market opportunities for pork processors include the following:

- Processors may have an opportunity to cater to a younger audience those younger than 35 by offering smaller portions and pre-seasoned cuts.
- Consumers have shown preferences for ready-to-eat items, including ethnic dishes.
- Featuring recipe suggestions and cooking methods on packaging may give consumers ideas about how to use pork and help them feel as if they can succeed when cooking with pork cuts.
- Including nutrition and protein information on packaging may stress the benefits of consuming pork.
- Working with chefs to innovate menu items that appeal to health- and dietconscious diners may be an opportunity.

# 2.3 Supply and Market Opportunities – Poultry

During 2017, broiler production in Missouri totaled 1.4 billion pounds, according to data from the USDA National Agricultural Statistics Service. Relative to other states, Missouri ranked No. 12 in 2017 for pounds of broilers produced and the value of broiler production (The Poultry Federation, 2017). Broilers contributed most to Missouri's poultry cash receipts in 2017. Their receipts totaled \$686 million. In 2017, Missouri raised 291 million broilers (USDA National Agricultural Statistics Service, 2018). Nationally, broiler supply has more than doubled since 1970. In 1996, chicken availability, which can serve as a proxy for domestic food production (Waite, 2018), became higher than beef availability (United States Department of Agriculture, Economic Research Service, 2018).

The market data and projections from MU's FAPRI and Agricultural Markets and Policy group suggest broiler domestic use will increase most consistently through 2030 — relative to the trend for beef, pork and turkey. The projections suggest broiler consumption will grow to 100 pounds per capita by 2030. See Exhibits 2.1.3, 2.1.4 and 2.1.6 for more broiler market data and projections (MU Food and Agricultural Policy Research Institute and Agricultural Markets and Policy 2021).

In attempting to explain the shift from beef to chicken, beef industry-funded research from 2009 (Tonser, Schroeder, & Mintert, 2009) suggests growing health concerns, more women participating in the workforce<sup>1</sup> and increased availability of ready-to-cook chicken have been contributing factors. The American Heart Association has suggested

<sup>&</sup>lt;sup>1</sup> Women tend to do the cooking at home, and chicken can be prepared relatively quickly (Tonser, Schroeder, & Mintert, 2009).

poultry as an alternative to red meat (American Heart Association, 2017). A lower retail price (see Exhibit 2.1.6) resulting from increased production and efficiency (Bentley, 2017) also may motivate chicken consumption changes.

Nationally, the poultry segment is expected to grow at the expense of other animal protein sectors from 2019 to 2024 (IBISWorld, 2018). Higher disposable incomes tend to lead to consumers purchasing higher quality rather than higher quantities of meat. Now, higher disposable incomes tend to move consumers to purchase what they perceive as healthier protein sources, especially high-quality fish and chicken (IBISWorld, 2018). Sales of broiler and other meat-type chicken have steadily increased since 1997 — see Exhibit 2.3.1 — and as shown in Exhibits 2.1.3, 2.1.4 and 2.1.6, broiler consumption and price are expected to rise year over year from 2021 to 2030 (MU Food and Agricultural Policy Research Institute and Agricultural Markets and Policy 2021).



Exhibit 2.3.1 – Broiler and Other Meat-Type Chickens Sold in Missouri, 1997 to 2017

Source: (United States Department of Agriculture, 2017)

Nationally, chicken is ranked as consumers' "most-loved" protein (Fitzpatrick, 2018). Other research points to consumers viewing chicken as a "standard food item" (Murawski, 2017). As such, it often serves as a platform for other food industry trends (Gustafson, 2019). In other words, processors seeking ideas for new beef and pork products have looked to the poultry segment for inspiration. For example, inspired by the chicken nuggets that McDonalds introduced in 1983 (Rude, 2016), the Beef Council created a recipe for taco beef nuggets made from ground beef (Cattlemen's Beef Board and National Cattlemen's Beef Association). Brined chicken has become a trendy item in recent years. Its occurrence on food menus increased by 182 percent between 2014 and 2018 (Fitzpatrick, 2018). Brining meat is an age-old preservation method that has become popular as consumers have desired more flavorful dishes. New flavors of chicken-based sausages are increasingly popular, and consumers are beginning to ask for "creative sauces poured over the top of chicken" and "marinated chicken ... with Greek or Middle Eastern spices" (Fitzpatrick, 2018).

To summarize, major consumer trends in the poultry sector are as follows:

- Brined chicken has gained popularity.
- Marketers have introduced pre-packaged chicken accompanied by creative sauces, such as spicy mango, to respond to consumer demand.
- Marinated chicken with different spices, such as Greek or Middle Eastern flavors, have also gained attention.
- To give consumers new options, product developers have offered new flavors of chicken-based sausages.

## 2.4 Supply and Market Opportunities – Lamb

Lamb has not held a large share of the overall market compared with beef, pork and poultry. U.S. lamb consumption has consistently totaled about 1 pound per person per year in recent years (American Lamb Board, n.d a). Consumers enjoy lamb's flavor but have traditionally been less inclined to buy lamb cuts because of their price point and more limited availability compared with alternatives. With respect to the price point, households that buy lamb tend to spend more on food than other households on average (American Lamb Board n.d. b).

Retail sales made up 60 percent of total lamb sales, according to data from 2018. The leg, shoulder and loin represented the top picks, and ground lamb made up nearly 10 percent of total retail lamb sales (American Lamb Board n.d. b). Seasonality influences sales. Spring holidays — namely, Easter and Passover — typically boost lamb consumption. The COVID-19 pandemic sparked growth in retail lamb sales (Gewin 2021). The 2021 Power of Meat study reported retail lamb sales grew 17 percent in 2020 (Simpson 2021). As consumers had more time to cook at home and try something new, some chose lamb. At the time, the American Lamb Board worked to communicate simple ways that consumers could use lamb (Gewin 2020). Even before the pandemic, consumers noted feeling more comfortable with preparing lamb. In 2011, 45 percent of consumers participating in a research study indicated "lamb was too difficult to prepare." That share declined to 15 percent in 2018 (American Lamb Board n.d. b). To

position lamb as an easy-to-use ingredient during the pandemic, the board supported an initiative to urge consumers to cook or order lamb burgers and post about their experiences on social media using the #Glamburger hashtag (Gewin 2021).

Of the consumers who had trialed lamb during the pandemic, a segment appears to have evolved into more regular customers. A Brownfield story quoted the American Lamb Board's executive director who indicated some first-time lamb buyers continued buying lamb later in 2020 through the first part of 2021 (Simpson 2021).

Data from 2018 indicate foodservice generated 40 percent of lamb sales (American Lamb Board n.d. b). For lamb, foodservice buyers have included restaurants, resorts and cruise ships (Wortman 2020). Lamb has gained a presence on many fine-dining menus. Datassential MenuTrends in 2018 found that rack of lamb has been the most popular lamb cut on menus followed by lamb chops, shank and sausage (American Lamb Board, 2018). Fast-casual restaurants such as Cava and Taziki that feature Mediterranean-focused menus have introduced consumers to lamb dishes (Gewin 2021). When the COVID-19 pandemic began and foodservice operations either shut down or had to pivot, the sheep and lamb industry faced challenges. An October 2020 story estimated consumer demand by decline by 25 percent overall in 2020 (Wortman 2020).

Millennials may facilitate lamb demand growth. The American Lamb Board's long-range plan states millennials are the "driving force in the growth of lamb demand ... they are adventurous eaters who want bold, interesting flavors" (American Lamb Board n.d. a). Lamb also tends to appeal to first-generation Americans who have experience with lamb (Gewin 2021). As consumers want to know more about their food and how it was raised, the American Lamb Board believes some shoppers will look for domestic lamb, even though it costs more than imported lamb (American Lamb Board, n.d. a).

To summarize, major consumer trends in the lamb sector are as follows:

- Lamb's high price point may discourage some consumers. By targeting consumers who feel comfortable paying more than average for food, marketers may reach an audience most likely to accept lamb.
- Consumers have increasingly viewed lamb as a less difficult food to prepare. Continuing to stress how to use lamb in easy-to-make recipes may further reduce intimidation that some consumers feel toward lamb.
- Seasonality shapes lamb consumption. Encouraging consumers to choose lamb at times not traditionally associated with the ingredient may diversify use occasions and increase sales.

## 2.5 Diversification through Multispecies Processing

Processing multiple species may enable facilities to capture benefits, but it also requires investments in regulatory compliance and infrastructure. The following discussion shares considerations for processors interested in diversifying their processing facilities.

Processing multiple species can help to maintain maximum plant efficiency. For example, a facility that slaughters and processes grass-fed beef may find that most grass-fed beef is ready to slaughter in early summer. To best utilize its space, that processor may process other species such as hogs, lamb or goats in other months. A plant may also diversify year-round by harvesting, for example, beef three days per week and hogs two days per week. Processing poultry may be a less desirable option for beef processors to consider as it would require facility design changes.

To switch from processing one species to processing multiple species, employees will require training and expertise. Processors may find it challenging to identify employees who have the skills to slaughter and process multiple animal species. Automated machinery may overcome this challenge in the future. Although the cost of robotics technology has dramatically decreased since 2010 (Pellegrini, 2016), automated machinery may not be economically viable for small processing facilities in the short to medium term (Meat Packing Journal, 2014; Rachana, Polson, & Saraswathy, 2017).

In addition, a facility processing multiple species may require some design changes. For example, the area in which livestock are unloaded, held and handled may need design changes to accommodate size differences. Exhibit 2.5.1 shows common and separate areas required for processing poultry, beef and pork, based on publicly available plans for a multispecies processing facility in Michigan (ONEsource Facility Solutions, 2018).





Source: ONEsource Facility Solutions, 2018

As shown, poultry is received, killed, eviscerated and chilled in spaces separate from those that handle beef and pork. Beef and pork can be received in the same area, and

poultry, beef and pork can be fabricated in the same area. All equipment and utensils must be cleaned between species. Given the need for a separate space and specialized poultry processing equipment and the ability to both receive and fabricate beef and pork in the same area and with much of the same equipment — given that it is cleaned between species — processing cattle and hogs in the same facility may be more cost-effective than processing cattle and poultry or hogs and poultry. That said, Good Natured Family Farms is a small-scale processor in Uniontown, Kan. It processes cattle and poultry and attests to the cost efficiencies of doing so (Dreier & Taheri, 2008).

For processing plants to consider diversification, equipment that is flexible enough to slaughter and process more than one type of animal is required. With increased attention focused on humane animal treatment, practices such as how animals are restrained and stabilized at the time of stunning must be carefully managed. Different types of restraints are used for different species (Food and Agriculture Organization of the United Nations, 2004). For example, a facility that processes 100-pound lambs and 2,500-pound bulls will need to function well not only for these animals but for animals that weigh between these extremes.

Some equipment companies specialize in manufacturing units designed to handle multiple species. Industries Riopel (Industries Riopel Inc., 2016), a slaughterhouse equipment manufacturing company based in Quebec, specializes in multispecies slaughtering and meat processing facilities. It makes a carcass washer and motorized cutting table designed for multiple species. Dirigo Food Safety makes a "plug and play" shipping container-based meat processing unit called the Locker (Dirigo Food Safety, 2019). The Locker is designed as a movable "cut and wrap" facility for beef, pork, lamb and other meats. Priced between \$67,000 and \$140,000, no units had been sold as of early 2017 (Curry, 2017).

Robotics may enable processors to increase facility utilization by processing multiple species, but the technology adds costs that some small processors may struggle to finance. Historically, meat processors have been slow to adopt robotics — largely because robotic components aren't always compatible with sanitation requirements. However, robotics adoption in the meat processing industry has gained speed since the U.S. Food and Drug Administration approved wash-down robots and end-of-arm tooling for use in direct food contact (Mitchell, 2016). Automated meat processing systems may offer benefits in terms of worker safety, product quality, consistency, food safety and speed (RBR Staff, 2012). Specifically relevant to multiple species processing is technology that allows robots to determine the specific position of bones in a carcass before stripping off high-quality meat (Toon, 2014). This eliminates the need to operate

different machines or adjust machine settings according to the size of the animal processed. The Pro-Saw meat bandsaw, manufactured by MPBS, is an example of such a machine (MPBS Industries, 2019).

Currently, small processers adding robots in place of human labor is largely infeasible given robotics' high costs (Rachana, Polson, & Saraswathy, 2017). For example, a robot chicken breast remover manufactured by Japanese developer Mayekawa can debone a chicken in less than 2.5 seconds compared with 18 seconds for an expert human. It retails, however, for roughly \$570,000, not including replacement parts and a service contract (RBR Staff, 2012). The machine's cost and the limited possible uses — it only removes chicken breasts — challenge small processors in accessing the technology.

Little publicly available financial data are available regarding the economics of processing one or multiple species. Data that do exist tend to be situation-specific. To help multispecies processing facilities make decisions about the quantities and percentages of animals to process, the Robert M. Kerr Food & Agricultural Products Center at Oklahoma State University (Holcomb, Flynn, & Kenkel, 2012) has developed a template that enables users to perform "what if" analyses. Users input a facility's projected or estimated slaughter capacity in terms of the number of cattle, hogs, sheep/goats or a combination of each to be slaughtered weekly. Other required inputs include the percentage of total slaughter capacity for up to three species. The model also allows users to include additional business generated by wild game processing or "other" revenues; estimated monthly utility rates; working capital; property and income tax rates; and maintenance, insurance and personnel costs. The template then estimates "return on investment" to help processors decide if processing multiple species is financially viable given a variety of operational scenarios. The number and mix of head slaughtered can be adjusted to determine a facility's breakeven level. Download the template at this link: https://food.okstate.edu/training-and-services/feasibility-templates.html.

Exhibit 2.5.2 compares the capital costs of establishing a multispecies processing plant assessed by other feasibility studies. According to the literature, estimated start-up capital needed to establish a mid-sized, multispecies slaughterhouse may range from roughly \$1 million (Jackson, 2013), to nearly \$2.3 million for a facility in Michigan capable of annually harvesting 50,000 chickens, 6,000 turkeys, 60,000 pounds of beef and 60,000 pounds of pork (ONEsource Facility Solutions, 2018), to \$10.9 million for a facility capable of processing 2,400 to 3,000 head of cattle annually in Yreka, Calif. (CalaverasGROWN, 2012). It is not clear whether any of these amounts include automated processing machinery. For the Michigan facility, \$1.6 million of the total \$2.2 million (73%) is estimated for purchasing land and buildings. The proposal estimates a net loss of \$25,000 in the first

year and net income of \$122,000 in the second year (ONEsource Facility Solutions, 2018). For the California facility, \$7.5 million of the total \$10 million (75%) is estimated for land and building purchases. The proposal estimates a net income of \$1.6 million in the first year and \$1.7 million in the second year (CalaverasGROWN, 2012).

Annual Capacity	Michigan	California
Chickens (head)	50,000	
Turkeys (head)	6,000	
Cattle (head)		2,400-3,000
Beef (pounds)	60,000	
Pork (pounds)	60,000	
Cost		
Total establishment cost (millions)	\$2.3	\$10.9
Land and buildings (millions)	\$1.6	\$7.5
Financial <b>Performance</b>		
Year 1 profit/(loss) (millions)	(\$0.2)	\$1.6
Year 2 profit/(loss) (millions)	\$0.1	\$1.7

Exhibit 2.5.2 – Estimated Capital Cost of Establishing a Multispecies Processing Plant

Source: (CalaverasGROWN, 2012; ONEsource Facility Solutions, 2018)

The increased investment required to process multiple species requires greater numbers of animals to be processed in order to gain economies of scale. Return on investment increases as a facility processes more animals (Flynn, 2011). Exhibit 2.5.3 shows the return on equity of three scenarios analyzed in a feasibility study of a multispecies plant in California. Data in parentheses are the percentages of total animals processed. The analysis estimated that a multispecies processing plant must process between 2,000 and 3,500 animals per year in order to be financially viable (CalaverasGROWN, 2012). In terms of specific percentages, financial analyses performed in the feasibility studies reviewed suggest that 75 percent cattle, 12.5 percent lambs and 12.5 percent cull cows (CalaverasGROWN, 2012) or 70 percent cattle and 30 percent hog may provide the greatest returns on equity measured by return on investment (Flynn, 2011).

	Scenario A	Scenario B	Scenario C
Beef cattle (head)	3,000 (75%)	2,000 (80%)	1,920 (86%)
Lambs (head)	500 (12.5%)	500 (20%)	300 (14%)
Cull cows (head)	500 (12.5%)	0	0
% return on equity	28%	24%	1%

Exhibit 2.5.3 – Financial Scenario Analysis of a Multispecies Plant in California

Source: (CalaverasGROWN, 2012)

Another study investigating the feasibility of a multispecies processing facility in the Upper Peninsula of Michigan found that the region needed more slaughtering and processing facilities. According to a model business plan prepared for a small USDAinspected meat processing plant in Oregon, 1,200 beef cattle, 1,800 hogs, 480 lambs and 360 cull cows were required to be processed annually for a multispecies plant to be viable (Food & Livestock Planning, Inc., 2011). These numbers were far out of reach given the Michigan Upper Peninsula's supply at the time (Karen Karp & Partners, 2016). Similarly, a 2007 economic feasibility study conducted in northern Michigan (Knudson & Peterson) states that though a multispecies processing plant may be economically feasible, it is not the industry standard among small beef processing facilities — those with fewer than 10 employees. The study did find, however, that many of the 17 small hog processing plants in Michigan in 2002 also processed cattle. The report concluded that a multispecies plant is not recommended and that processing more than one type of animal is not likely to minimize costs. The reasons given are that equipment needs to be flexible enough to slaughter and process more than one type of animal, employees need to be trained and have expertise to process more than one type of animal, and markets for additional species need to be found.

In contrast, a 2009 study conducted by the University of Georgia found a multispecies livestock slaughter facility in Carroll County, Ga., to be economically feasible with an 8 percent return on total investment (Wolfe, Luke-Morgan, Daniels, & McKissick, 2009). The final projections were based on annually processing 200 head of beef, 250 hogs and 48,000 chickens. This capacity required two days a week for processing beef, one day for processing hogs and two days for processing chickens. The study determined demand for natural, organic or locally produced branded meat products to be higher than what was needed to break even. It was noted, however, that such a facility's success would depend on management aggressively securing new markets.

Processers must be aware of potential changes in regulation if they integrate new species (e.g., wild game) or business processes (e.g., custom packing) into their facilities.

With multispecies processing facilities, regulatory agencies are primarily concerned about a change in finished product purity because of adding a foreign or inferior substance or element. This can happen through:

- a. Having visible debris from another species present during processing,
- b. Failing to adequately address a food safety hazard present in a species, and
- c. Substituting or misbranding species (USDA Food Safety and Inspection Service, 2009).

The USDA Food Safety and Inspection Service (FSIS) enforces "zero tolerance" standards for fecal, ingesta and milk contamination on livestock carcasses at establishments that slaughter livestock. FSIS views preventing carcasses with visible fecal contamination from entering the chilling tank as critical to preventing the cross-contamination of other carcasses (USDA FSIS Center for Learning, 2012), meaning this is an area that multispecies plants need to monitor. Processing facilities should have a written sanitation standard operation procedures (SSOPs) plan and a hazard analysis and critical control point (HACCP) plan (Missouri Department of Agriculture). The SSOPs plan should include cleaning all equipment and utensils before processing a different species. In addition, all raw materials require separate storage areas prior to processing (Government Publishing Office, 2019). To access a list of resources that small and very small establishments may use to develop a HAACP food safety plan, go to fsis.usda.gov/wps/portal/fsis/topics/regulatory-compliance/haccp/resources-andinformation/haccp-validation/haccp-validation-resources.

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# 3. Certification Programs and Attribute-Based Branding

Labeling food products with attribute claims enables food producers to communicate the production and handling practices used throughout a food product's value chain. At the consumer level of the chain, these labels can inform purchase decisions. According to a Michigan State University survey of more than 2,000 Americans in August 2018, 60 percent of the consumers surveyed indicated that food labels help to shape their purchase decision-making. The extent to which consumers refer to food labels varied by socioeconomic status and education level, according to the survey results. Households earning at least \$75,000 annually and college graduates were two groups who tended to direct more attention to food labels (Tekip 2018).

For meat marketers, attribute-based marketing may serve as an opportunity to differentiate meat products. According to Nielsen data cited in a 2019 Power of Meat presentation, meat products bearing production claims, such as all-natural, antibiotic-free and hormone-free, represented 17 percent of all meat sales during the year preceding Jan. 12, 2019. During that year, sales of meat with claims grew faster — in dollar and volume terms — than sales of meat without claims (Roerink 2019).

Although consumers may report that they use label information to make purchase decisions and increasingly purchase meat bearing value-added claims, their preferences for meat with certain attributes may vary by product. In general, the academic literature points to consumers having greater interest in attributes when those attributes are part of higher value products. A 2007 conference paper analyzed retail beef price data aggregated from 65 Oklahoma and Colorado grocery stores located in metropolitan areas. The researchers collected the price data during summer 2006. When ground beef had "special" labels, such as no antibiotics, no hormones or all-natural, price premiums averaged \$1.45 per pound. Typically perceived as higher value products, steaks had steeper premiums when branded with special claims. On average, steaks with special claims had premiums of \$5.87 per pound (Dutton, Ward and Lusk 2007).

A more recent survey conducted in May 2016 found a similar relationship with respect to willingness to pay for value-added attributes. The monthly Food Demand Survey from Oklahoma State University collected responses from 1,023 U.S. consumers. For beef steaks with "no added hormones" on the label, respondents were willing to pay a \$2.15 premium per pound. On average, they were willing to pay a \$1.72 premium per pound for beef hamburger with no added hormones. The Food Demand Survey also tracked willingness to pay for pork and chicken products bearing "no added hormones" labels — despite hormone use being prohibited for these species. On average, consumers were willing to pay higher premiums for pork chops with no added hormones than pork deli ham with no added hormones. The average premium that consumers would pay for chicken breast with no added hormones was higher than the average premium they'd pay for chicken wings with no added hormones (Yang, Raper and Lusk 2020).

The Missouri meat processors who responded to the 2019 survey had the opportunity to indicate the terms they use to market products they sell directly to end users, and 23 processors responded. Of the attributes provided, the greatest share of respondents — 57 percent — reported using the "product of the U.S." label on their products. The other three attributes with the greatest percentage of respondents using the label were local, 48 percent; preservative-, nitrate- or nitrite-free, 43 percent; and specialty, 43 percent. Exhibit 3.1 shares the share of respondents who noted using a variety of attribute-based marketing terms on labels of products they sell directly to end users.



Exhibit 3.1 – Missouri Meat Processor Use of Attribute-Based Marketing Terms

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 23

The crosstabs analysis found a few interesting differences in responses by region. Respondents from the north region were more likely to use hormone-free; preservative-, nitrate or nitrite-free; and product of the U.S. when marketing branded meat products directly to end users, but they were less likely than respondents from the other regions to use the local term. Central and southern respondents more likely used the local term compared with the other attribute labels. Note, the USDA Food Safety and Inspection Service has regulatory authority for meat and poultry labeling. The agency's labeling and program delivery (LPDS) employees take responsibility for reviewing and approving special statements or claims that meat marketers may add to their product labels. Any claim or other feature presented on a label that doesn't have a clear regulatory definition or doesn't appear in the Food Standards and Labeling Policy Book qualifies as a special statement or claim. A wide variety of terms fit the special statement and claim criteria, including "natural," free-from messages, health claims, ingredient and processing explanations and animal raising descriptions. Specific examples include raised without antibiotics, humanely raised, local, made without genetically engineered ingredients, natural, organic and pasture raised. Claims from third-party programs, such as the American Grassfed Association or Animal Welfare Association, also fit as claims. Before a meat business can begin marketing and selling products that bear special statements or claims, the LPDS group must provide approval. Firms must supply the LPDS with a label sketch and the appropriate supporting material to validate the statement or claim. For more specific guidance, go to fsis.usda.gov/wps/wcm/connect/bf170761-33e3-4a2d-8f86-940c2698e2c5/Label-Approval-Guide.pdf?MOD=AJPERES (USDA FSIS 2017).

The following sections summarize trends specific to several attributes commonly used to market meat products.

#### 3.1 Organic

**Consumer Perceptions and Behaviors.** Since USDA began regulating the organic label, interest in the organic attribute has expanded (Carlson 2016). Through its Food Literacy and Engagement Poll, Michigan State University surveyed more than 2,000 Americans in August 2018 about the extent to which they seek out "organic" on food labels and purchase organic foods. Roughly one-fifth of the respondents said they always look for the organic label, and roughly one-third said they sometimes look for organic. One-quarter reported that they never look for organic. In terms of purchase behaviors, Exhibit 3.1.1 shares the results about organic food purchase frequency. A relatively small share — 13 percent — of respondents said they always purchase organic foods. Forty-six percent said they sometimes make organic food purchases, and one-quarter said they rarely purchase organic foods (Michigan State University 2018).

Exhibit 3.1.1 – Organic Foods Purchase Frequency



Source: Michigan State University (2018)

The Michigan State University survey further explored the factors motivating organic purchases; consumers could select more than one option. The most commonly cited reasons for purchasing organic foods were viewing organic food as healthier and more natural. Four in 10 selected these responses. Other top reasons for buying organic food were avoiding pesticides, 36 percent; viewing organic food as a safer option, 33 percent; avoiding GMOs, 27 percent; supporting local farmers, 27 percent; and perceiving organic as better for the environment, 26 percent. In terms of the reasons that preclude consumers from purchasing organic foods, the most commonly cited barrier was the added expense (Michigan State University 2018).

**Sales.** At the farm level, sales of organic livestock and poultry commodities have grown overall in recent years but varied by species. As seen in Exhibit 3.1.2, farm-level dollar sales of certified organic broiler chickens in 2016 far exceeded sales of certified organic cattle and poultry. Certified organic broiler chicken sales totaled \$750 million — a 78 percent increase in sales relative to 2015 (USDA NASS 2017). Sales forecasts published by Meat + Poultry in April 2020 indicated that the organic chicken market will continue to grow (Loria 2020b). Although certified organic turkey was the smallest category in terms of total commodity sales, the category did experience 19 percent sales growth from 2015 to 2016 (USDA NASS 2017). Several factors may explain the differences in organic sales by commodity. For one, poultry tends to be cheaper per pound than beef, so consumers may absorb price premiums for organic poultry more readily than they would absorb premiums for organic beef.

Commodity	Commodity Sales, 2016 (million dollars)	Percent Growth Between 2015 and 2016
Broiler chickens	\$750	78%
Cattle	\$233	0%
Turkeys	\$83	19%

Exhibit 3.1.2 – Dollar Sales of Certified Organic Livestock and Poultry Commodities

Source: USDA NASS (2017)

In 2017, organic meat, poultry and fish sales were \$1.2 billion — the first time the category surpassed \$1 billion in sales, according to data from the Organic Trade Association (Henderson 2018). In an April 2020 webinar, the New Hope Network shared Nutrition Business Journal organic sales data, which reported that all U.S. organic food and beverage sales totaled \$46.6 billion in 2019. Of that total, organic meat, fish and poultry captured a 4 percent share. Thus, the organic meat, fish and poultry category's sales were an estimated \$1.86 billion (New Hope Network 2020).

Relative to sales of all organic food and beverage products, sales of organic meat, fish and poultry grew more rapidly during 2019, according to the Nutrition Business Journal data. Overall organic food and beverage sales registered 4 percent growth in 2019 — a decline from 6 percent growth in 2018. In comparison, 2019 sales growth for the organic

# 11.4%

growth in organic meat, fish and poultry sales during 2019 compared with 4% overall organic food and beverage sales growth, according to the Nutrition Business Journal

meat, fish and poultry category was 11.4 percent (New Hope Network 2020). The difference signals that organic sales may be entering a period of maturity for some product categories, but meat, fish and poultry held their strength.

Nielsen data cited in a 2019 Power of Meat presentation indicate that sales of organic meat and poultry products in the 52 weeks ending Jan. 12, 2019, totaled \$950 million. For comparison purposes, meat sales in the meat department of retail stores totaled \$67 billion during this period. Plus, retailers sold \$23 billion in meat products through grocery, deli and frozen sections. In this data set, organic dollar sales were shown to have increased by 13.1 percent — a greater increase than the sales growth experienced by any of the other production claims tracked — and volume sales had grown by 4.2 percent (Roerink 2019). A gap exists between prices for organic meat and conventional meat. For example, in the first quarter of 2017, the price of U.S.-sourced organic beef averaged \$7.97 and carried a price premium of 67 percent compared with the prices of

conventional beef. These premiums are the result of increased costs to produce organic products and consumer demand (Agricultural Marketing Resource Center).

Despite the growth, organic meat represents a relatively small share of total meat product sales. When considering fresh and processed organic meat sales, organic has had a 1.4 percent market share, based on Nielsen data (Loria 2020b). The 2018 Power of Meat report published by the Food Marketing Institute and the Foundation for Meat & Poultry Research & Education and prepared by 210 Analytics shared findings from an online consumer survey conducted during December 2017 among U.S. adults who shop for food and consume meat at home at least occasionally. Twenty-nine percent of the respondents indicated that they'd like to see their meat department carry or carry more organic products (210 Analytics 2018).

**Target Consumers.** During January 2020, Packaged Facts, a market research firm, released research findings that examine how organic product use differs according to demographic factors. The research found two key consumer segments that tend to prefer organic products: 1) upscale consumers who tend to have more education and higher household incomes and 2) consumers who are part of the Gen Z and millennial generations. According to the Packaged Facts research, specific demographic factors tend to correlate with greater organic meat consumption. Young consumers, consumers who have children living at home and consumers who earn higher levels of household income are groups that Packaged Facts termed as "core consumers of organic meat." Members of the Gen Z and millennial generations tend to more frequently buy organic meat as they tend to associate organic meat with better taste and health (Packaged Facts 2020). According to reporting by Supermarket News, the average annual household income of organic meat purchasers is more than \$200,000 (Mitchell 2019).

A group that Packaged Facts termed as "peripheral organic meat buyers" consider organic meat if they can purchase product on sale (Packaged Facts 2020).

**COVID-19 Impacts.** The coronavirus pandemic may shift the extent to which consumers value and seek out the certified organic attribute, according to early research. In mid-April 2020, a New Hope Network NEXT Data and Insights survey collected responses from 1,000 U.S. adults between the ages of 18 and 65. The sample was weighted to reflect the U.S. population based on age, gender and geographic region. Twenty percent of respondents said purchasing certified organic products was less important at the time than it was in 2019; however, 15 percent said buying certified organic had become more important. Despite one-fifth of consumers saying that buying certified organic had become less important, some consumers noted buying more organic products to

support environmental and social causes. Of the surveyed consumers, 22 percent indicated they were doing more to buy organic compared with 20 percent who said they were doing less (New Hope Network 2020).

Ethnographic research firm Saage Insights, interviewed an 18-person consumer group in early May 2020 to assess how U.S. adults had changed meat preferences and behaviors because of the pandemic. The firm selected interviewees from California, New York, Ohio, Virginia and Georgia. Participants in the research voiced how organic meat resonated with them and how they viewed organic choices as a safe option (Eagle 2020).

**Standards and Label Use.** A product's organic ingredient composition determines how the term "organic" may be used to market it. The USDA Agricultural Marketing Service (AMS) maintains four categories of organic labels: "100 percent organic," "organic," "made with organic" and "specific ingredient listings." Products that qualify as "100 percent organic" and "organic" may use the USDA organic seal, which is displayed in Exhibit 3.1.3. In products labeled "organic," at least 95 percent of the ingredients must be organic. "Made with organic" refers to a product with at least 70 percent organic ingredients. A specific ingredient listing refers to a label that points out the particular ingredients that are organically produced; in this case, less than 70 percent of the total product would be organic. Access more on USDA AMS organic labeling standards at <u>ams.usda.gov/grades-standards/organic-labeling-standards</u> (USDA AMS e).

Exhibit 3.1.3 – Four-Color and Black-and-White USDA Organic Seal



Source: USDA AMS (c)

To raise certified organic animals, farm operations must follow USDA guidelines and standards, which include raising animals to accommodate their natural behavior, feeding

animals 100 percent organic feed and not using antibiotics or hormones. Also, organic products must not be produced using prohibited substances or practices (USDA 2019).

To use the USDA organic seal on a meat product, the animal producer and processor must go through the organic certification process. The certification process requires creating an organic system plan (OSP), paying certification fees and being reviewed by a USDA National Organic Program-authorized certifying agent (USDA AMS g). Facilities that receive the organic certification may also process meat that lacks the organic attribute. However, if a facility processes both organic and non-organic meat, then it must physically segregate the organic and non-organic product streams and clean equipment between organic and non-organic runs. Additionally, for traceability purposes, the facility must ensure that its recordkeeping systems can verify the identity of organic product from receiving animals through slaughtering and processing. Records must also support that equipment has been cleaned properly (Thistlethwaite).

A certifier must ensure a product's ingredients comply with OSP regulations before producers and processors use the USDA organic seal or any organic references on a product label. If a product does not obtain or meet requirements, then it cannot make any organic claims or use the USDA seal. Violators may be fined up to \$17,952 for each incident (USDA AMS d). Continuing an organic certification requires yearly inspections by a certifying agent and compliance with USDA regulations. Certification costs depend on factors including the certifying agent and operation size. Fees include an application fee, annual renewal fees and inspection fees (USDA AMS a and USDA AMS g).

### 3.2 Local

**Consumer Perceptions and Behaviors**. A subset of consumers search for production location information during food shopping trips. The Michigan State University Food Literacy and Engagement Poll conducted during August 2018 asked respondents to indicate how often they look for certain information when shopping for food. Exhibit 3.2.1 reports the extent to which respondents reviewed labels for food production location information. Half of the shoppers responding said they always or sometimes search for production location information. One in five respondents indicated they rarely seek out production location information, and more than one-third of respondents never search for production location information (Michigan State University 2018).

*Exhibit 3.2.1 – Frequency of Searching for Production Location Information When Shopping for Food* 



#### Source: Michigan State University (2018)

"Local" commonly differentiates food or beverage products and offers information about production location. In December 2018, Nielsen studied consumer awareness of multiple issues, and the greatest share of U.S. consumers participating in the survey (46 percent) named "buy local" as a cause of which they were aware. Other top causes ranked highly for consumer awareness were the decline in bee populations, 40 percent; GMO in foods, 35 percent; no added sugar or sugar reduction, 33 percent; and antibiotic use in animal production, 32 percent (Nielsen 2019b).

Several market researchers have studied consumer perceptions related to local meat. In a December 2018 survey, Nielsen asked consumers to share what they think constitutes a "local" product. For meat, the 20,000 respondents were more likely to think meat from the same state as the store where it's sold was local compared with meat from the same city or town as the store or meat from the U.S. Roughly one-third said they viewed local meat as a product that originated from the state where it's sold (Nielsen 2019a).

For a segment of consumers, the local characteristic shapes their food purchase decisions. In an annual survey, the International Food Information Council evaluates consumer attitudes and behaviors specific to food and health. The council's online survey conducted in April 2020 collected responses from 1,011 U.S. adults who were 18-to 80-year-olds. Note, the council adjusted results to ensure they were representative of all U.S. consumers. When shopping for food and beverages, roughly 25 percent of respondents said "locally sourced" labels affect their purchase decisions. A slightly smaller share of consumers said they looked for locally sourced labels when eating away from home (International Food Information Council 2020).

Relative to the other labels that the International Food Information Council included in the question, locally sourced ranked toward the bottom of the list for its effect on food and beverage purchase decisions when shopping; it followed natural, no added hormones or steroids, non-GMO, organic and raised without antibiotics. However, when eating away from home, a similar share of respondents said locally sourced and raised without antibiotics affect purchase decisions; only the "natural" label was noted by a greater share of consumers as an attribute that shapes purchase decisions when eating away from home (International Food Information Council 2020).

With respect to how the local attribute affects meat purchases, 41 percent of consumers viewed "local" as a consideration when purchasing meat, but 23 percent said "local" was not important, according to Nielsen consumer survey research from December 2018. Consumers most frequently reported "local" as an important characteristic when shopping for produce, bakery products and eggs (Nielsen 2019a). A study conducted by Category Partners illustrated the extent to which 21- to 65-year-olds consider "origin/locally sourced" as a factor they seek in fresh meat products they purchase. Fourteen percent of the 1,000 consumers surveyed chose "origin/locally sourced" as one of their top five most valued factors. Origin/locally sourced ranked relatively low compared with other factors. The three most important factors noted by respondents were quality/appearance, type of meat and value/price per pound (Crews 2018).

Several motivators encourage consumers to buy local products. Those include accessing fresh products, supporting local businesses and tracing the product to where it originated. For food service businesses, including restaurants that have sourced local foods, they've purchased locally to provide a fresh, quality product; satisfy customer demands; add novelty to their operations; and offer support and a connection to local businesses and the community (Martinez et al. 2010).

**Sales.** No local meat sales data are reported in aggregate. However, a share of consumers would like meat departments where they shop to have or have more locally

raised options. According to the 2018 Power of Meat report, 32 percent of consumers participating in the survey indicated a need for meat departments to carry or carry more of such products (210 Analytics 2018). The 2019 Power of Meat study found that 38 percent of respondents noted a desire for meat departments to stock more locally raised meat products (Sloan 2020).

### 38%

share of consumers in 2019 who indicated a desire for meat departments to stock more locally raised options **Target Consumers.** The Category Partners research explored how origin/locally sourced meat preferences vary by several demographic characteristics. Compared with women, men noted more concern about origin/locally sourced fresh meat. Hispanics and Latinos also tended to view origin/locally sourced as an important factor when purchasing fresh meat. By age, consumers who were 34 and younger were more likely to view origin/locally sourced as a factor affecting their fresh meat purchase decisions (Crews 2018). Nielsen found consumers with lower incomes had a greater likelihood of identifying "buying local" as an extremely important choice (Nielsen 2019a). Because young consumers who prefer local products may just be beginning their careers, they may earn less and explain the relationship between income and local preferences.

A segment of consumers is willing to pay premiums for local foods. An ATKearney survey found that of the 1,000 U.S shoppers participating, 70 percent were willing to pay more for locally labeled food. It also found that some consumers would pay as much as 10 percent more for local fresh goods, including produce and meat (Crowe 2014).

**COVID-19 Impacts.** During the COVID-19 pandemic, local meat marketers noted sharp growth in meat demand. The surge in local meat interest coincided with short supplies in many mainstream grocers. In early May 2020, Field Agent, a retail auditor and researcher, conducted a meat availability audit in grocery stores throughout the country. It also surveyed 1,500 U.S. adults to measure how they and their households had changed their meat-related behaviors because of the pandemic. Nearly half of respondents said they stocked up on meat when supplies were available and shopped at multiple retailers. Eleven percent of the participating adults said they used local butchers as a strategy to access meat products (Field Agent 2020). New York-based Saage Insights, an ethnographic researcher, also conducted research in early May 2020 to assess how U.S. adults had changed their meat preferences and behaviors because of the pandemic. For this research, Saage Insights interviewed 18 U.S. consumers from California, New York, Ohio, Virginia and Georgia. "Local" was one term that resonated with these selected interviewees. To show support of local meat, interviewees noted purchasing product from local butchers or farms (Eagle 2020).

**Standards and Label Use.** Applied to meat, no strict standard dictates what "local" or "locally grown" labels mean. A publication from the USDA Economic Research Service describes how "local" may describe a product that originates from a certain county, state or multistate region. From USDA's perspective, it views "local" meat supply chains taking one of three forms. Very local products have simple supply chains that stretch from the farmer to a processor to a buyer. Local-independent supply chains involve a farmer working with a processor, but the farmer markets the meat through a farm stand,

farmers market, restaurant or retailer. Of the three chains, the regional-aggregated model has the most complexity. With this configuration, multiple farms supply a niche meat company, which coordinates with a processor and manages sales to buyers (Gwin, Thiboumery and Stillman 2013).

#### 3.3 Humanely Raised and Animal Welfare

**Consumer Perceptions and Behaviors.** The 2020 consumer survey conducted by the International Food Information Council assessed consumers' views toward farm animal welfare and perceptions about how animal welfare and other production factors affect their food and beverage purchase decisions. Of the 1,011 U.S. adults who responded, more than 40 percent assigned "knowing that the food was produced with animal welfare in mind" with a "4" or "5" on a five-point scale, where "5" meant very important and "1" meant not important at all. Slightly less than 10 percent said the animal welfare issue wasn't important at all (International Food Information Council 2020).

The Food Demand Survey from Oklahoma State University also tracked changes in consumer sentiment about farm animal welfare. The survey, which collected at least 1,000 responses per month from May 2013 to May 2018, asked respondents to self-assess their awareness of farm animal welfare and 18 other topics and their level of concern about those topics. The survey measured awareness by requesting respondents to select the extent to which they had heard or read about the given topics in the past two weeks on a scale of "1" to "5" where "1" meant nothing and "5" meant a great deal. On average, farm animal welfare ranked sixth in awareness of the 19 topics. The five-year average score, estimated by averaging monthly averages, was 2.12, suggesting that consumers had heard or read a little about farm animal welfare issues in the two weeks preceding the survey (Oklahoma State University 2018).

For each of the 19 topics, the Food Demand Survey also asked respondents to share their concern. In particular, it described concern as the extent that consumers perceive the various topics to "pose a health hazard in the food that you eat in the next two weeks." Respondents made their selections on a scale from "1" to "5" where "1" meant very unconcerned and "5" meant very concerned. Farm animal welfare ranked as the fifth most concerning topic. Its five-year average score was 3.27, which suggested that consumers on average felt neither concerned or unconcerned about farm animal welfare posing a food-related health hazard (Oklahoma State University 2018).

Consumers participating in the Food Demand Survey largely didn't regard animal welfare as a highly important factor affecting their food purchases. Exhibit 3.3.1 reports the five-year trend in the relative importance of various food attributes for their role in purchases on a -1.0 to 1.0 scale, as measured in the Food Demand Survey. A higher number suggests consumers in aggregate viewed the attribute as more important at purchase time. Four factors tended to serve as the most important purchase considerations: taste, safety, price and nutrition. Appearance had a moderate level of importance followed by animal welfare and naturalness, which tended to have similar levels of importance. During the five-year observation period, consumers tended to view several factors as less important: novelty, origin, fairness, environment and convenience (Oklahoma State University 2018).





Source: Food Demand Survey (Oklahoma State University 2018)

Data from the 2019 Power of Meat study suggests that consumers may lack knowledge about the state of animal welfare. Exhibit 3.3.2 summarizes data from two questions posed to the 1,500 shoppers who participated in the study's December 2018 survey. Half of respondents shared they view U.S.-raised livestock to have good animal welfare, but one-quarter answered the question by saying "no clue." Four in 10 respondents agreed that they buy meat and poultry from animals raised with good animal welfare standards; however, 44 percent noted they had "no clue" about the welfare of animals raised for their meat and poultry (Roerink 2019). These findings suggest an opportunity for meat marketers to inform customers about animal welfare standards.



Exhibit 3.3.2 – Consumer Perceptions of U.S. Animal Welfare

Source: Power of Meat 2019 (Roerink 2019)

Research findings from Consumer Reports suggest how consumers perceive the humanely raised claim. In a 2016 survey of 1,000 consumers meant to represent U.S. consumers, four in five respondents indicated they thought farms undergo inspection as a form of humanely raised claim verification. For 77 percent of respondents, they viewed animals having enough living space as a humanely raised characteristic, and 71 percent associated humane slaughtering with humanely raised (Calvo 2016).

**Sales.** Humanely raised animal product sales represent a small segment of total animal product sales. Humanely raised meat sales totaled \$515 million in the 52 weeks ending on Jan. 12, 2019. All meat sales, including those made in the meat, grocery, deli and frozen sections, totaled \$87 billion during the same period. Humanely raised experienced a 0.6 percent increase in sales value but a 1.3 percent decrease in total pounds sold in the year ending on Jan. 12, 2019 (Roerink 2019). In 2017, roughly 500 million animals — an estimated 5 percent of total U.S. animal production — were raised through humanely raised programs, according to data cited in a paper by representatives from the American Society for the Prevention of Cruelty to Animals and Lake Research Partner (Spain et al. 2018).

Findings from the 2018 Power of Meat report suggest an opportunity for meat marketers to supply more meat bearing humanely raised labels. Twenty-eight percent of the respondents said they'd like to see their meat departments carry or carry more meat with the humanely raised claim (210 Analytics 2018).

## 28%

share of 2018 Power of Meat survey respondents who would like meat departments to carry or carry more humanely raised meat

**Target Consumers.** To provide insights about specific consumer segments that may have the greatest interest in humanely raised meat products, a 2018 paper published in *Animals* highlights results captured in a 2016 poll of more than 1,000 U.S. consumers. To participate, consumers must have been U.S. residents who were primary or co-primary household grocery shoppers responsible for buying animal-source foods. They also must have been at least 18 years old. Note, Lake Research Partners implemented the online survey. Four of the five study authors were affiliated with the American Society for the Prevention of Cruelty to Animals. The authors weighted the responses to ensure that they reflect typical animal-source food consumers (Spain et al. 2018).

Overall, 78 percent of respondents reported feeling somewhat or very concerned about animal welfare. The concern was greater among women compared with men. Of the women surveyed, 82 percent said they feel somewhat or very concerned about animal welfare. Seventy-two percent of the men felt this way. However, males were somewhat more likely than females to pay some or a lot of attention to labels about how animals are raised — 65 percent of women and 72 percent of men (Spain et al. 2018).

By age group, consumers younger than 45 — particularly those who were 30- to 44year-olds — were more likely to say they felt somewhat or very concerned about animal welfare. See Exhibit 3.3.3. A greater share of consumers in the two youngest age categories — younger than 30 and 30 to 44 — noted paying some or a lot of attention to labels about animal production practices. The gap in sentiment widened when respondents indicated whether they'd pay more for animal welfare-certified chicken breast. Eighty-three percent of the youngest group — those younger than 30 — said they would pay \$0.50 more for a pound of chicken breast with an animal welfare certification. In contrast, half of consumers 60 and older would pay the premium for chicken breast with animal welfare certification (Spain et al. 2018). The International Food Information Council's 2020 survey results showed how being a parent can also affect views about animal welfare. A greater share of parents with children younger than 18 — 51 percent — thought animal welfare was an important characteristic of products they purchase. Among respondents who didn't have children, 42 percent said such (International Food Information Council 2020).

Age Group	Somewhat or Very Concerned About Welfare	Pay Some or A Lot of Attention to Labels About How Animals are Raised	Willingness to Pay More for Chicken Breast with Animal Welfare Certification*
<30	78%	76%	83%
30-44	86%	77%	75%
45-59	75%	64%	63%
<u>&gt;</u> 60	70%	58%	50%

Exhibit 3.3.3 – Attitudes Regarding Animal Welfare

\* Willingness to pay \$0.50 more per pound if chicken breast had a trusted welfare certification Source: Animals (Spain et al. 2018)

In the survey conducted by Lake Research Partners and the American Society for the Prevention of Cruelty to Animals, income had an effect on attention paid to the animal production label and willingness to pay for chicken breast with animal welfare certification, but it affected concern about animal welfare very little. Of consumers with annual household income less than \$50,000, 65 percent said they pay some or a lot of attention to labels about how animals are raised compared with 73 percent of consumers with household incomes of \$50,000 to \$100,000 and 72 percent of those with household incomes that exceed \$100,000. With respect to willingness to pay, 63 percent of respondents from the lowest income bracket — those with household income from the lowest income strate than \$100,000 — were willing to pay more, and 73 percent of respondents from the household incomes greater than \$100,000 — were willing to pay more (Spain et al. 2018).

Note, willingness to pay didn't markedly vary by gender. None of the animal welfare variables described here — concern about animal welfare, paying attention to animal production labels and chicken breast willingness to pay — varied extensively by respondents' geographic region (Spain et al. 2018).

**Standards and Label Use.** Global Animal Partnership and Certified Humane have both created certification programs focused on verifying humane treatment of animals, and each has created a label to display on meat products that meet certification requirements. The Global Animal Partnership requires that animals are reared in a healthy and productive environment where they can behave naturally. The program requires providing animals with access to quality feed, water and shelter, and their

environment must protect them from disease, illness and injury. Sick animals must be treated. The environment must also allow animals to play and minimize stress and pain. The program has varying standards for varying certification levels, which include outdoor access, pasture raised and entire life on farm. The program also customizes standards by eight species: beef, bison, chickens, goats, laying hens, pigs, sheep and turkeys (Global Animal Partnership).

For a firm to use the Certified Humane label, it must not use cages, crates or tie stalls for animals, and it must allow natural animal behaviors. Animals must also eat rations that lack animal byproducts, antibiotics and growth hormones. For producers, they must adhere to food safety and environmental regulations. Processors are responsible for following American Meat Institute standards (Certified Humane).

The Business Benchmark on Farm Animal Welfare initiative since 2012 has tracked global commitment to animal welfare among businesses along the food value chain. In 2018, the benchmark included input from 150 companies, including 52 located in North America, that participate in the food value chain as retailers, wholesalers, producers, manufacturers, restaurants or bars. Examples include Amazon/Whole Foods Market, Campbell Soup Company, Hershey, Seaboard, US Foods, Cracker Barrel and Papa John's Pizza. Of the 150 companies participating in the benchmark during 2018, 11.3 percent had included farm animal welfare as an integral component of their business strategies, and 42 percent had some evidence of implementing practices related to farm animal welfare. A survey of the participating benchmark firms found 73 percent noted directing more attention to animal welfare. The specific animal welfare issues that have garnered the most attention among benchmark companies are close confinement, prophylactic antibiotic use and growth-promoting substances. Of the participating companies, 77 percent, 55 percent and 51 percent, respectively, have created policies specific to these topics. Three key factors have driven firms to consider farm animal welfare: consumer interest, risk management and business opportunities (Amos and Sullivan 2018).

Companies participating in the Business Benchmark on Farm Animal Welfare initiative have noted consumer willingness to pay as a factor that has affected further welfarerelated practice adoption. Survey results from 2018 noted willingness to pay as a barrier for 82 percent of participating firms (Amos and Sullivan 2018).

#### 3.4 No Growth Hormone

**Consumer Perceptions and Behaviors.** Consumers tend to view growth hormone use in livestock negatively, according to survey research Midan Marketing conducted in

January 2014. The survey captured 201 responses from consumers who identified as primary grocery shoppers and meal preparers and had purchased and consumed fresh beef and pork in the 30 days before the survey. Three in four felt negative about growth hormone use in livestock (Midan Marketing 2014).

### 74%

percentage of consumers surveyed in 2014 by Midan Marketing who had negative sentiment about administering growth hormones to livestock

In its April 2020 survey of U.S. adults, the International Food Information Council measured the extent to which consumers viewed "no added hormones or steroids" as a label that affects their food and beverage purchase behaviors. Of the characteristics evaluated in the question, "no added hormones or steroids" ranked second — after "natural" — as a label that affects food and beverage purchases. More than 30 percent of respondents said "no added hormones or steroids" labels affect their food and beverage shopping behaviors. When eating away from home, roughly one in five of the respondents said the "no added hormones or steroids" characteristic influenced their purchase behaviors (International Food Information Council 2020).

The 2018 Power of Meat report also measured how the hormone-free attribute affects purchase intentions, and its findings were specific to meat and poultry. Exhibit 3.4.1 presents consumer views about how noticing the hormone-free claim would affect their purchasing behaviors. Of the 950 respondents who responded, two-thirds said seeing the hormone-free claim on a meat or poultry product would make them more likely to purchase the product instead of a conventional alternative. Just 2 percent said noticing the hormone-free claim would make them less likely to purchase a given product instead of a conventional offering (210 Analytics 2018). Data from Midan Marketing research suggests consumers select products without added hormones slightly less often. Of retail beef consumers participating in the research, 45 percent indicated they'd at least most of the time choose cuts with no added hormones (Pellegrini 2018).

*Exhibit 3.4.1 – Likelihood of Purchasing Hormone-Free Product Instead of Conventional Product of the Consumers Who Notice the Hormone-Free Claim* 



Source: 2018 Power of Meat

**Sales.** In the 52 weeks ending on Jan. 12, 2019, sales of meat labeled as being raised without growth hormones totaled \$3.4 billion. Only antibiotic-free and all-natural labels had higher sales values within the niche meat space. Total meat sales in the meat department reached \$67 billion, and when considering meat sold in other departments, including the grocery, deli and frozen sections, total meat sales increased to \$87 billion. Thus, meat marketed as being raised without growth hormones captured a small share of the overall market (Roerink 2019). Nielsen reported that meat with hormone-free labels represented 3 percent of meat department products during 2015 (Nielsen 2016).

Sales of meat with the hormone-free label have grown. In the 52 weeks ending on Jan. 12, 2019, sales grew by 5.2 percent, and volume grew by 4.1 percent. This was stronger performance than sales of meat without claims. Sales of all meat with claims grew 4.8 percent in dollar sales terms and 0.4 percent in volume sales terms (Roerink 2019).

According to survey research conducted by the Natural Marketing Institute, 67 percent of participating consumers said stores offering hormone-free meat and poultry was important (Gazdziak 2016). Research cited in the 2019 Power of Meat report indicated that roughly half of consumers voiced a need for meat departments to offer more meat products with the hormone-free or no added hormone attributes (Mitchell 2019). Interest in purchasing meat with the "no added hormones" label has varied somewhat by species. To assess preferences among consumers who buy meat at least monthly, Midan Marketing conducted research on Tyson Fresh Meats' behalf. Eighteen percent of the participants said they tend to buy beef labeled as having no hormones added. For pork, 11 percent of consumers who bought pork at least monthly indicated they choose pork without added hormones (Pellegrini 2018).

**Target Consumers.** In terms of consumer interest in hormone-free products, Nielsen research found that millennials and people from the Gen X generation tend to search for hormone-free labels more frequently. It also connected interest in hormone-free labels to households that earn more than \$100,000 annually (Hartman 2018).

The Power of Meat publication from 2018 reinforces the hormone-free product interest being slightly stronger among younger consumers. Of the consumers participating in the survey research, 57 percent of millennials and 69 percent of baby boomers had seen hormone-free labels on meat packaging. Among millennials, 67 percent said that seeing the hormone-free label would increase their purchase likelihood. Six in 10 baby boomers agreed (210 Analytics 2018).

**Standards and Label Use.** USDA regulates the use of no growth hormone claims. It doesn't permit hormone use in the swine and poultry industries. Therefore, if pork and poultry product labels are to mention hormones, then they should state "Federal regulations prohibit the use of hormones" (USDA FSIS 2015). Some pork marketers do choose to use free from hormone

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share of packaged pork product volume bearing "free from hormones" attribute, according to Nielsen

language on product labels. Nielsen data reported in December 2019 indicate that onethird of packaged pork product volume is "free from hormones" (Nelson 2019).

Beef producers, however, may consider adding "hormone-free" or "no hormones administered" to labels if their production practices fit accordingly. Firms must provide USDA with proper documentation to prove cattle had no hormones (USDA FSIS 2015).

#### 3.5 Antibiotic-Free

**Consumer Perceptions and Behaviors.** Antibiotic use represents a food safety consideration for some consumers. In its 2020 Food and Health Survey, the International Food Information Council asked participating consumers to identify what they viewed as

the most important food safety issue at the time. Although less than 5 percent of consumers considered antibiotics to be the most important, more than 15 percent ranked antibiotics as No. 2 or No. 3 (International Food Information Council 2020).

Antibiotic-free meat has attracted some consumers' interest when making purchase decisions. For more than 25 percent of respondents in the 2020 International Food Information Council survey, they buy foods and beverages with the "raised without antibiotics" label. Slightly more than 20 percent of respondents indicated they choose "raised without antibiotics"-advertised products when they eat away from home (International Food Information Council Foundation 2020).

In a Consumer Reports survey, the group asked consumers about how the "raised without antibiotics" claim affected meat product decision-making. The survey collected responses from 1,000 consumers representative of all U.S. consumers. When shopping at supermarkets, 43 percent said they always or often buy antibiotic-free meat. Roughly 60 percent indicated that the availability of meat raised without antibiotics would make them more likely to eat at a restaurant (Calvo and Meltzer-Warren 2018).

Since the U.S. FDA placed limitations on antibiotic use for growth-promotion purposes — a policy effective since 2017 — a relatively large segment of consumers say they've felt more confident in purchasing meat, poultry, egg and milk products, according to data captured in the 2020 International Food Information Council consumer survey research. The 2020 survey found 58 percent of respondents felt more confident (International Food Information Council 2020).

#### 58%

share of consumers more confident in purchasing meat after U.S. FDA limited antibiotic use for growth promotion purposes, according to the International Food Information Council

**Sales.** In the 52 weeks that ended on Jan. 12, 2019, antibiotic-free meat sales totaled \$4.9 billion, based on Nielsen sales reporting. During that year, dollar sales increased by 3.1 percent, but volume sales declined by 4.2 percent (Roerink 2019). Market researcher IRI tracked dollar and volume sales growth for meat bearing the "no antibiotics ever" claim during 2018. It reported 19.2 percent dollar sales growth and 21.1 percent volume sales growth (Mitchell 2019).

According to the Nielsen data shared in the 2019 Power of Meat report, antibiotic-free meat only followed all-natural meat in dollar sales in the niche meat space in terms of

overall dollar sales. Still, however, it represented a relatively small share of total meat sales. Meat department sales in the year preceding Jan. 12, 2019, totaled \$67 billion. When accounting for other meat sales made through the deli, frozen and grocery sections, the sales total increased to \$87 billion (Roerink 2019).

In some cases, antibiotic-free interest may vary by meat cut. For example, a January 2018 story from Reuters reported that Sanderson Farms Inc. in a regulatory filing described antibiotic-free breast meat and chicken tenders as being more strongly demanded than other antibiotic-free chicken cuts. In its regulatory filing, Sanderson Farms indicated that antibiotic-free sales represented 6.4 percent of total chicken sales during the first 10 months of 2017; however, during the same period, 40.5 percent of total fresh chicken production in the U.S. was considered antibiotic-free. Chicken raised in an antibiotic-free system but not sold as such would be directed through the conventional supply chain and not capture premiums (Polansek 2018).

From the consumer's perspective, some research suggests that too few antibiotic-free options are available. According to the consumer survey research summarized in the 2019 Power of Meat report, roughly half of consumers would like to see more antibiotic-free and hormone-free options offered in meat departments (Mitchell 2019).

**Target Consumers.** In a 2019 blog post, the Center for Food Integrity explored the characteristics of consumers who have contributed to online interactions about antibiotic resistance. These same consumers might have interest in antibiotic-free meat. The group that showed the most interest via these online conversations was composed of females who were white, educated, middle-class and 25- to 40-year-olds (Fleck 2019).

The 2018 Power of Meat report findings reinforced that younger consumers may have slightly greater interest in antibiotic-free meat compared with older consumers. Two-thirds of millennials surveyed said that seeing the antibiotic-free claim would make them more likely to purchase a given meat product, and six in 10 baby boomers agreed (210 Analytics 2018). In terms of preferences by gender, a story from The National Provisioner summarized willingness to pay research shared by a Datassential representative. Among women, 38 percent would pay more for antibiotic-free products. Just 27 percent of men said they'd pay more (Pellegrini 2018).

**Standards.** Antibiotic-free meat lacks a single standard or definition. Some regulatory provisions, however, do impose limitations on antibiotic use in animals. Beginning in 2017, the U.S. FDA stipulated that no longer could antibiotics used to treat human health — those deemed medically important — be administered to animals to promote

growth or feed efficiency. This action intended to reduce bacterial resistance risk (CDC Division of Healthcare Quality Promotion 2020). FDA policy implemented in 2017 also restricts over-the-counter antimicrobial drug sales for use in animal feed or drinking water. Those drugs require a veterinary feed directive or prescription (U.S. Food and Drug Administration 2020).

Although no clear standard exists, meat marketers tend to use several antibiotic-related terms on meat packaging. Typically, "raised without antibiotics" denotes products derived from animals that never received antibiotics. Alternative phrases include "no antibiotics ever" and "never given antibiotics." If an animal in this pro duction system requires antibiotics, then it's segregated at processing and marketed as conventional meat. The

#### Raised without antibiotics: antibiotics never administered to animal

No critically important antibiotics: antibiotics only administered to animal if they're not deemed important to human medicine

No growth-promoting antibiotics: animal has had no antibiotic treatments intended to facilitate growth

"no critically important antibiotics" label describes meat derived from animals that don't receive antibiotics used in human medicine. To use the "no growth-promoting antibiotics" label, marketers must administer no antibiotics — including those not considered medically important — to animals for the purpose of stimulating quicker growth (Calvo and Meltzer-Warren 2018).

#### 3.6 Natural

**Consumer Perceptions and Behaviors.** A majority of Americans seek out natural labels on food products at least periodically when they shop, according to Michigan State University's Food Literacy and Engagement Poll conducted in August 2018. Two-thirds of the more than 2,000 Americans who responded said they always or sometimes search labels for the "natural" claim. See Exhibit 3.6.1. Nineteen percent indicated they never look for information about product naturalness (Michigan State University 2018).

Exhibit 3.6.1 – Frequency of Searching for Natural Information When Shopping for Food



Source: Michigan State University (2018)

The natural characteristic also affects purchases to an extent. L.E.K. Consulting conducts a biennial food and beverage consumer survey. Of the nearly 1,600 participants in the 2018 installment, two-thirds were committed or casual buyers. A committed buyer frequently or always purchased food with a given claim, and a casual buyer would occasionally buy food with a given claim. The only claims with a greater share of committed or casual buyers were no artificial ingredients, no preservatives and locally

produced/sourced. The percentage of committed or casual all-natural buyers had declined slightly over time (Steingoltz, Picciola and Wilson 2018). The 2020 International Food Information Council found that natural influenced purchases of a smaller share of consumers, particularly when they eat food away from home. More than 40 percent of participating consumers said they regularly purchased natural foods and beverages, but less

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share of consumers who identify as committed or casual buyers of all-natural foods, according to L.E.K. Consulting consumer survey research

than 25 percent said the natural label was a label influencing their away-from-home purchases (International Food Information Council 2020).

To assess how various meat product attributes affect retail meat buying, Category Partners surveyed 1,000 consumers. The participants, who were 21- to 65-year-olds, were asked to rank the five most important factors they look for when purchasing fresh meat. They could choose from 20 attributes. Exhibit 3.6.2 presents the results. Nearly one in five chose "all natural" as a top-five factor they seek in meat products they purchase. Consumers were most likely to name quality or appearance, type of meat and value or price per pound as top factors influencing their meat purchases. Nearly half of the 1,000 respondents named these characteristics in their lists of top five factors that shape their fresh meat purchases (Crews 2018).





**Sales.** Meat products with the "all-natural" label have captured a share of overall U.S. meat sales. According to the 2019 Power of Meat report, "all-natural" meat sales totaled \$7.3 billion during the year preceding Jan. 12, 2019. For the year, all-natural meat dollar sales grew by 6.4 percent, and the volume sales increased by 3.1 percent, according to Nielsen. Sales of meat with the "all-natural" label were higher than sales of meat with any other claim tracked in the 2019 Power of Meat report (Roerink 2019).

Natural meat sales may have opportunity to grow, given the share of consumers participating in the 2018 Power of Meat research who said they'd like to see all-natural meat in meat departments or more of such products in meat departments. Roughly two in five consumers said they'd like meat departments to carry or carry more all-natural options. Supercenter shoppers (45 percent) were more likely than supermarket shoppers (35 percent) to agree with the statement (210 Analytics 2018).

Source: Category Partners (Crews 2018)

Consumers interested in natural products also tend to show a willingness to pay extra for the natural characteristic, and that sentiment will affect sales totals. The 2018 consumer survey conducted by L.E.K. Consulting asked consumers how often they would be willing to pay a premium for natural products. Note, natural appears to have served as an umbrella term for a variety of natural-related claims: no artificial ingredients, no preservatives, all-natural, organic, non-GMO and clean label. Of the nearly 1,800 consumers responding, 22 percent would pay premiums for natural foods all of the time, and 51 percent said they'd pay premiums some of the time. The remaining 27 percent would never pay premiums (Steingoltz, Picciola and Wilson 2018).

**Target Consumers.** The survey research conducted by Category Partners also assessed how preferences for the "all natural" label on meat varied by demographic factors. According to the findings, consumers 34 and younger tended to identify "all natural" as a decision factor. By ethnicity, Hispanic and Latino consumers viewed "all natural" as an important factor affecting their fresh meat purchase decisions. Relative to men, women more commonly noted "all natural" as a concern about meat (Crews 2018). The L.E.K. Consulting survey research from 2018 also found that committed natural buyers those who frequently or always purchase products with multiple natural characteristics such as no artificial ingredients, no preservatives, all-natural, organic, non-GMO and clean label — tend to be younger. According to the survey results, 35 percent of millennials and 32 percent of Gen X'ers fit the committed definition for natural products. Twenty-six percent of boomers and older consumers qualified as committed natural products purchasers (Steingoltz, Picciola and Wilson 2018).

Consumer segmentation research conducted by Midan Marketing toward the end of 2018 indicates characteristics of consumers who tend to most value natural meats. Based on survey research conducted with 1,200 U.S. adults who consumed meat or poultry in the three months preceding the survey, the firm's segmentation 2.0 report divides consumers into five meat consumer categories: convenience chasers, family-first food lovers, aging traditionalists, rising flexitarians and wellness divas. Consumers within a given category have similar meat attitudes and mindsets. Exhibit 3.6.3 shows the distribution of meat consumers among these categories. Profiles for family-first food lovers and protein progressives suggest these consumers would likely be most interested in "natural" labels. Protein progressives like to try all kinds of proteins, including plant-based options, and they value meat labels such as "all-natural." Family-first food lovers see food as a way to make memories with their families and friends and look for purchasing products with nothing added (Barnett Fox 2019).



#### Exhibit 3.6.3 – Meat Consumer Segments from Midan Marketing

Source: Midan Marketing (Barnett Fox 2019)

**Standards.** For a meat product to bear a "natural" label, it must satisfy several conditions dictated by the USDA's Food Safety and Inspection Service. USDA considers natural products to lack artificial ingredients and added color. Plus, the products must undergo only minimal processing (USDA FSIS 2015). To give consumers more information about the phrase, the USDA Food Safety and Inspection Service mandates that meat marketers describe the meaning behind "natural" claims used to market their meat products (USDA Food Safety and Inspection Service 2015).

Consumers who purchase meat products labeled "natural" sometimes misunderstand what the label means. A study published in January 2019 provides some insights into consumer understanding of the "natural" term. The study analyzed results collected from 1,290 U.S. consumers who noted being responsible for at least half of their households' grocery shopping. They completed the survey during December 2018, and the Corn Refiners Association provided funding for the study. One survey question specifically asked respondents to identify what they thought was the best description of USDA's "natural" meat definition. Exhibit 3.6.4 shares the results. Nearly one-third of respondents thought "natural" meant no hormones, and nearly 24 percent said natural meant "no antibiotics." Nearly 27 percent of respondents correctly identified "minimally processed" as a definition for "natural" meat (Lusk 2019). These findings suggest confusion about the "natural" term.



Exhibit 3.6.4 – Consumer Perceptions of USDA "Natural" Meat Definition\*

\* Survey prompt read as "The U.S. Department of Agriculture (USDA) regulates the use of the label 'natural' for meat. Which of the following best matches the current USDA definition for 'natural' meat?" Source: Lusk (2019)

### 3.7 Grass-Fed

**Consumer Perceptions and Behaviors.** In meat marketing, the "grass-fed" term tends to indicate meat raised on pasture for a given time. "Pasture-raised" is an alternative term. According to a Midan Marketing survey of U.S. adult consumers who had

# 17%

percentage of U.S. adult consumers surveyed by Midan Marketing who identified as regular grass-fed beef buyers

consumed meat in the three months before the survey, a relatively small share of consumers purchased grass-fed options. The survey collected 1,200 responses, and Midan summarized the results in a 2019 report. Of the meat-eater respondents, 17 percent said they were regular grass-fed beef customers. The share was greater among consumers who identified as being aware of grass-fed beef; one-quarter of those respondents indicated they were regular buyers. Improving grass-fed awareness may support stronger sales. A U.S. Beef Shopper Journey Study conducted by Meat & Livestock Australia found three in 10 beef shoppers in the U.S. didn't know about grass-fed beef options in the stores where they shop. Six in 10 respondents thought their stores stocked grass-fed beef (Strailey 2019).

**Sales.** Grass-fed product sales have grown in recent years. SPINS, a market research firm, has tracked the change in sales over time. In the year preceding Feb. 24, 2019, grass-fed

retail sales totaled \$254.4 million, which was 16 percent growth relative to sales in the previous year. In terms of market share, grass-fed has captured a larger segment of sales in the natural channel than it has in the conventional channel. Of all retail meat sold in the natural channel, SPINS in 2019 estimated a 15 percent share for grass-fed. In the conventional channel, grass-fed had a 1 percent share, and it had a 4 percent share of the specialty channel (Benenson 2019). Survey data from the Progressive Grocer further explains the retail grass-fed interest. Of the 44 grocery store operators who responded to Progressive Grocer's retail meat survey in late 2019, 57 percent said they had increased grass-fed beef sales in the past year (Dudlicek 2020). Some grocery shoppers have indicated their desire for more grass-fed beef options, too. The 2018 Power of Meat report found that 33 percent of surveyed consumers preferred to see more grass-fed options at retail (210 Analytics. 2018).

Note, the SPINS data don't fully reflect grass-fed sales as transactions through specialty grocer, butcher shop, farmers market, CSA, e-commerce, restaurant and foodservice channels aren't included (Benenson 2019). A May 2020 comment from market researcher Fact.MR noted strong grass-fed meat demand among North American food processors (Kumar 2020). An April 2017 report from Stone Barns Center for Food and Agriculture, Armonia LLC, Bonterra Partners and SLM Partners estimated nonretail grass-fed sales. Based on data from multiple market researchers, the report indicated that 42 percent of grass-fed beef sales occurred at retail during 2015. The other two sales channels monitored were direct marketing, an estimated 12 percent of grass-fed beef sales, and food service, an estimated 46 percent of sales (Cheung et al. 2017).

By species, grass-fed beef has commanded greater sales than sales of other grass-fed or pasture-raised species, according to a UC Davis food scientist. Chicken and lamb have tended to tie for second. Although grass-fed pork sales haven't performed as strongly, they may have potential if product were readily available (Loria 2020c).

Within the grass-fed marketplace, several product categories have performed well. According to SPINS data from the year preceding Feb. 24, 2019, shelf-stable meat snacks other than traditional jerky led sas the fastest growing grass-fed meat product category in the combined conventional, specialty and natural channels. Its sales grew 48 percent in the yearlong period. Other top categories in terms of sales growth were burgers, 20 percent, and beef and pork cuts, 16 percent. Categories in which grass-fed hadn't penetrated the market as strongly included shelf-stable jerky, 14 percent; dinner sausage, 9 percent; hot dogs, 4 percent; and breakfast meat, 2 percent. Sales of grassfed deli meat declined in the year preceding Feb. 24, 2019 (Benenson 2019). According to the Utah State University research, Midwestern consumers were most likely to say they eat grass-fed beef when it's grilled, pan fried or barbecued (Crandall 2018).

The grass-fed attribute tends to pair well with other value-added attributes. For example, in November 2019, market researcher IRI reported organic grass-fed beef sales for the previous year. Sales had grown by 16.1 percent. Grass-fed also tends to fit well with the regenerative agriculture trend, particularly if producers can raise animals on land unsuitable for other uses such as crop production (Loria 2020c). Grass-fed beef sourced from local operations has also captured attention, according to trends observed by a Pennsylvania grocer (Loria 2020a).

Despite the opportunity, grass-fed meat does face some constraints. Of the consumers in the Utah State University study who noted being dissatisfied with grass-fed beef, the survey asked them to choose the primary reason for feeling dissatisfied. The Midwestern respondents voiced two main reasons for their dissatisfaction: price and tenderness (Crandall 2018). The grass-fed price premium has limited grass-fed meat consumption (Kumar 2020). In some cases, the grass-fed premium has surpassed the organic premium. Factors contributing to the premium include supply chain inefficiencies and a "longer production cycle" (Crawford 2018). Varying quality has created a problem for some grass-fed meat. Other challenges include limited seasonal access and confusion about the grass-fed claim's meaning (Cheung et al. 2017).

Competition from international suppliers is another factor. In a February 2020 story from Meat + Poultry, a representative from California-based Panorama Meats described that U.S.-raised grass-fed beef has totaled less than 20 percent of U.S. grass-fed beef sales (Loria 2020b). Australia and Uruguay have imported grass-fed meat to the U.S. (Loria 2020c). Meat & Livestock Australia reports half of U.S.-available grass-fed beef is sourced from Australia (Strailey 2019). Reliance on imported grass-fed meat serves as one reason why COVID-19 may limit grass-fed meat sales potential. According to commentary from a researcher with Fact.MR in May 2020, North America was poised to increase grass-fed meat demand. With disrupted trade, however, grass-fed meat sales in 2020 may suffer. Recovery in the grass-fed meat market will depend on how the pandemic progresses in terms of enabling trade and more typical supply chain movements to resume. The extent to which the pandemic may change consumer preferences could also influence future grass-fed meat market potential (Kumar 2020).

**Target Consumers.** Several consumer segments have facilitated grass-fed meat sales more than others. According to research conducted by Nurture Ranch, a grass-fed meat supplier, consumers who have at least a college education tend to prefer grass-fed beef

more than other consumers (Mason 2017). Verde, another grass-fed beef supplier, has noted millennial moms, urban couples, rural shoppers and a segment of older consumers as segments interested in grass-fed beef (Crawford 2018). A representative from Strauss Brands noted high-income baby boomers and Gen X consumers as grassfed beef adopters (Loria 2020c). Mintel described parents with children younger than 18 and 35- to 54-year-olds who earn at least \$50,000 and baby boomers interested in health and fitness as potential grass-fed meat market segments (Cheung et al. 2017).

According to the Utah State University research, several demographic variables tended to affect grass-fed beef purchase intent. Married consumers or those in a domestic partnership were more likely to buy, but smaller households — those with one or two individuals — were more likely than larger households to purchase. In terms of income, the group most likely to purchase grass-fed beef were households that earned \$50,000 to \$74,999 per year. Compared with households with children, those without children had a higher purchase intent (Crandall 2018).

By region, grass-fed meat trial and consumption may vary. The Pasture Project, an effort of the Wallace Center, cited 2019 survey data from Datassential to illustrate grass-fed meat interest among Midwesterns. Grass-fed trial among 500 responding consumers from the Midwest was 60 percent. One in 10 of the Midwesterns were frequent grassfed customers; they had consumed grass-fed products many times (Pasture Project). In 2018, a Utah State University master's student conducted a nationwide study to gauge grass-fed preferences among adults who were primary grocery shoppers. The survey sample, which totaled 484 respondents, closely resembled the U.S. population. Recent grass-fed beef consumption was less likely among Midwestern respondents than respondents from other regions. Of the 114 Midwestern respondents, one-third had eaten grass-fed beef in the past month compared with 40 percent in the Northeast, 41.2 percent in the South and 48 percent in the West. The Utah State University research found most U.S. grass-fed beef consumers in March 2018 consumed the product at home (Crandall 2018).

To assess grass-fed beef satisfaction among U.S. consumers, the Utah State University survey asked respondents by region to indicate their level of satisfaction; those who had eaten grass-fed beef were invited to respond to this question. Exhibit 3.6.1 summarizes the responses. Slightly more than two-thirds of Midwestern respondents indicated they felt very or extremely satisfied with grass-fed beef. Consumers from the South were more likely to indicate being very or extremely satisfied — 73.3 percent of those who had eaten grass-fed beef (Crandall 2018).



Exhibit 3.6.1 – Satisfaction with Grass-Fed Beef Among Grass-Fed Consumers

Source: Utah State University (Crandall 2018)

**Standards.** To certify meat as grass-fed, producers may choose from several programs. USDA created its Grass Fed Program for Small and Very Small (SVS) Producers with small-scale beef and lamb producers in mind. To qualify for the program, an operation must annually market no more than 49 cattle or lambs from 99 ewes. Participating farms must also complete an application and detailed farm or ranch plan that shows that they only use grass and forage for animal diets, and during the growing season, animals must have continuous pasture access. As exception to these guidelines, animals before weaning may also have milk in their diets. Operations that USDA approves receive a certificate to verify they may market their animals as "USDA Certified grass-fed." The application review cost is \$115, and the approval is valid for two years. As of May 2020, six operations throughout the U.S. had the certification for sheep; no Missouri farms had received the certification for sheep. More than 70 cattle operations had the certification, and three of those were located in Missouri (USDA AMS b). Other grass-fed certification programs include those from the American Grassfed Association, Food Alliance, PCO Certified Organic and A Greener World.

### 3.8 Audubon-Certified Bird Friendly

As part of a program that began in the mid-2010s (Oldham 2020), the Audubon certification demonstrates that the farm producing a given animal used practices meant to support livestock and grassland bird well-being. Participating Audubon ranches must cultivate a forage mix suited well for cattle and grassland birds, including bobwhite

quail, greater prairie chickens and upland sandpipers (Audubon). The program has focused on certifying beef (Audubon Rockies) and bison products (Graham 2020).



#### Exhibit 3.8.1 – Grazed on Audubon Certified Bird-Friendly Land Label

Source: Audubon

**Consumer Preferences and Behaviors.** The Audubon certification's focus on biodiversity aligns with regenerative agriculture principles, which include supporting soil health, water quality, animal welfare and ecosystem health (Stine 2019). Increasingly, consumers have become more aware of regenerative agriculture. In its 2020 survey of consumers,

the International Food Information Council assessed respondents' familiarity and interest in regenerative agriculture. More than 15 percent said they'd heard of regenerative agriculture and wanted to learn more, and 40 percent had not heard of regenerative agriculture but were interested in learning more. More than 40 percent said they lacked interest in learning more (International Food Information Council 2020).

#### 55%

share of consumers in the 2020 International Food Information Council survey findings who indicated an interest in learning more about regenerative agriculture

Gaining more information about regenerative agriculture may change the extent to which consumers look for regenerative agriculture-related messages on product labels. According to the 2020 International Food Information Council research, consumers haven't yet overwhelmingly considered regenerative agriculture as a factor that affects their food and beverage purchases. Roughly 5 percent of the 2020 survey participants said they regularly bought food made using regenerative agriculture practices. The same share said they regularly purchased food away from home that was made using regenerative agriculture practices (International Food Information Council 2020).

**Sales.** Products with the "Audubon Certified" label tend to earn a price premium (Audubon) to compensate for costs incurred to comply with the certification protocols. According to a post from the Cheyenne Bird Banter blog, the typical premium ranges from \$0.10 to \$0.40 per pound (Gorges 2019). Audubon has said that ranchers using the seal have improved profitability by 10 percent in some cases (Oldham 2020).

As of April 2020, more than 80 ranchers in 13 states had adopted the conservation ranching practices. These ranchers manage 2.2 million acres in total (Oldham 2020). On

its website in June 2020, Audubon listed seven Missouri locations as "Audubon Conservation Ranches" (Audubon). Earlier in 2020, MDC reported that Missouri conservation ranching program enrollment exceeded 10,000 acres. For Round Rock Ranch in Dade County, Mo., its distribution channels include wholesale and retail sales. Directly selling product to consumers through a private label brand is a

# 10,000

acres in Missouri reported to have enrolled in the conservation ranching program, according to data shared by the Missouri Department of Conservation in 2020

planned action for the ranch in the future. Brush Creek Ranch in Henry County has also certified land through the Audubon program (Graham 2020). Early in 2020, Back Forty Bison, located in Dade County, Missouri, announced that it had received the Audubon certification. No other bison operation had received the certification. In the operation's announcement, it described that Food Alliance would serve as the auditor for the program, and the Missouri River Bird Observatory would conduct monitoring activities to assess how well implementing the program practices would support bird populations. Two other partners in the operation's work to receive the certification were MDC and the Dade County Soil and Water Conservation District (Roller 2020).

Relative to Missouri, Texas, South Dakota and Wyoming had denser concentrations of ranches participating in the conservation ranching program in June 2020 (Audubon). South Dakota-based Evergreen Ranching and Livestock has the Audubon certification, and it supplies two distribution points in Missouri — hospitals part of the Truman Medical Center system (Graham 2020).

The official Audubon website lists retailers, including grocery and retail stores and online distributors, that supply beef raised on land that has qualified for the Audubon certification. Additionally, several on-farm retailers, community supported agriculture farms, ranches and restaurants are listed as distribution outlets. Nine U.S. states had participating ranches or distribution outlets as of mid-June 2020 (Audubon).

The Root Cellar, an artisan food retailer with stores in Columbia, Mo., and Jefferson City, Mo., stocks meat labeled with the "Audubon Certified Grazed on Bird Friendly Land" designation. The owners of Root Cellar source the certified meat products from their other start-up business, Prairiebird Pastures, which works in cooperation with the National Audubon Society and several Missouri conservation ranches. In addition to distributing product via retail, Prairiebird Pastures sells its products online. On its website, the business offers multiple "packs" or bundles that include a variety of "Audubon Certified" meats and meat snacks ranging from frozen ground beef to smoked meat snack sticks. The packs also include other products that complement the Audubon-certified meat. These products include Hemme Brothers cheese and Country Goodies jam (Prairiebird Pastures). The other three Missouri-based distribution outlets for "Audubon Certified" beef, according to a June 2020 listing on the Audubon website, were restaurants in Arrow Rock and Kansas City. Two of those restaurant distribution points were the hospitals part of the Truman Medical Center system (Audubon).

Start-up company Blue Nest Beef operates as an "Audubon Certified" online meats retailer, and it sources its products from several "Audubon Certified" conservation ranches in Oklahoma and South Dakota. Blue Nest Beef sells "boxes" on its website. The company's subscription-based business model involves shipping a variety of "Audubon Certified" products to consumers' homes at pre-determined intervals (Blue Nest Beef).

**Standards.** To use the "Audubon Certified Grazed on Bird Friendly Land" label, a livestock producer must enroll in Audubon's "Conservation Ranching" program and follow several protocols, including adhering to a habitat management plan, removing all antibiotics from livestock production and allowing animals to graze freely (Audubon). Participating producers incur no fee, and they may opt out at any time. To develop habitat management plans, producers work with private land conservationists or agencies such as the USDA Natural Resources Conservation Service (NRCS) or Missouri Department of Conservation (MDC) to integrate site-specific practices that support conserving birds and their habitats into their property management activities. Developing a habitat management plan often does not have a cost.

Ranch plans must undergo an independent review, which verifies the plan will contribute to enhanced productivity and bird habitat (Oldham 2020). The initial certification process takes at least six months. After a farm meets the initial requirements, it may apply the "Audubon Certified" label on its products (Audubon).
Farms must fully comply with a second set of requirements by the end of their third year of certification, and they must continue adhering to those requirements in following years. Failure to meet these protocols can result in losing the opportunity to both participate in the conservation ranching program and place the "Audubon Certified" label on finished products. Access more about the certification requirements at <u>nas-national-prod.s3.amazonaws.com/texas oaks and prairies protocol template dec 2019.pdf</u>. (Audubon). Ranches participating in the conservation ranching program have an annual bird survey to monitor bird populations (Oldham 2020). According to surveys conducted at two Missouri operations that have the certification, bird populations — in particular, those of quail and nongame grassland birds — have improved (Graham 2020).

Producers may receive financial incentives to assist with implementing Audubon methods and bird-friendly practices. For example, with cost-share assistance, participating conservation ranches can reduce the cost of implementing required conservation practices (Audubon). MDC, NRCS and soil and water conservation districts may have available funding to offer cost-share assistance to Missouri producers or can direct producers to available funding programs.

In November 2017, MDC paired with the National Audubon Society (Audubon) to encourage more Missouri livestock producers to participate in the Audubon "Conservation Ranching" program. To educate and recruit more Missouri producers, Audubon has offered a series of workshops with MDC to teach about grassland-bird conservation (Missouri Department of Conservation 2017). To learn about upcoming Audubon workshops, subscribe to the organization's newsletter at act.audubon.org/onlineactions/WqHrNgz7nUeexRmtBoJuzg2.

### 3.9 Non-GMO

**Consumer Preferences and Behaviors.** In August 2018, Michigan State University surveyed more than 2,000 Americans through its Food Literacy and Engagement Poll (Tekip 2018). One component of the survey asked respondents to indicate how often they look for certain pieces of information on food labels while shopping. Of the respondents, 22 percent said they always search for non-GMO or GMO-free statements

# 49%

share of consumers who responded to a Michigan State University Food Literacy and Engagement Poll in 2018 and said they always or sometimes seek non-GMO or GMO-free statements on labels when shopping on labels, and 27 percent said they sometimes seek this information. Roughly three in 10 never look for non-GMO or GMO-free information (Michigan State University 2018).

In the 2020 International Food Information Council report, non-GMO ranked third for the percentage of consumers who noted its importance as a label that affected them when shopping for food and beverages. More than 30 percent of respondents selected that they regularly buy foods and beverages marketed as non-GMO. However, just roughly 20 percent of the participating consumers said they regularly purchase non-GMO foods and beverages when they eat away from home, which includes restaurant meals and takeout (International Food Information Council 2020).

**Sales.** Although sales data for non-GMO meats aren't readily available, the consumer research conducted for the 2018 Power of Meat project indicates an opportunity to grow sales in this niche. Of the consumers surveyed for the report, one-third said they'd like meat departments to offer or offer more non-GMO options (210 Analytics 2018).

More certified non-GMO products have been available over time. Between 2010 and 2019, the Non-GMO Project verified 60,000 new products from more than 5,000 brands. Annually, participation in The Non-GMO Project verification program has grown 15 percent to 20 percent, according to comments from August 2019 (Watrous 2019).

**Target Consumers.** Perceptions of GMOs tend to vary by demographic characteristics. Younger consumers represent one group that has noted more concern about how GMOs affect health. According to a Pew Research Center poll of 1,480 U.S. adults, roughly 48 percent of 18- to 29-year-olds compared with 29 percent of adults who were at least 65 years old selected that they believe GMO foods negatively affect health. Conducted between May 10 and June 16, 2016, the survey found that views about GMOs' effects on health varied little by consumer education level. Thirty-nine percent of respondents with post-graduate degrees and 32 percent of respondents with high school diplomas or less education believed GMO foods affected health negatively. The same poll found income differences led to modest differences in attitudes toward the health risk associated with GMOs (Watson 2016).

**Standards.** Several entities have created standards to use in verifying a product's non-GMO status. For example, the nonprofit Non-GMO Project developed a non-GMO seal. For meat products to bear the Non-GMO Project label, producers must meet the program's requirements, which include feeding animals a non-GMO diet. For meat animals, the non-GMO diet requirement begins at birth. For poultry, it takes effect in the second day after hatching (Non-GMO Project).

The USDA Process Verified Program administered by the Agricultural Marketing Service offers meat marketers another option to verify non-GMO claims. To participate, firms choose the process points they'd like to verify — for example, a certain quality standard, production or handling practice or product characteristic that can be quantified. To prove they meet the conditions of the process, firms must keep records and engage an independent, qualified auditor from the Agricultural Marketing Service. Auditors conduct two reviews: one of the supporting documentation and another of the facility and on-site process. Firms that successfully complete the verification process may use the Process Verified Program shield on their products and add "USDA Process Verified" to their marketing communications. Three poultry marketers used the USDA Process Verified Program during July 2020. Two had "Raised with Non-GMO/Non-GE Grains" as a process verified point, and a chicken marketer named "Non-GMO Verified" as a process verified point (USDA AMS f).

## 3.10 Craft

"Artisanal" describes products made in small batches, and often, these products have been "hand-crafted." The term itself tends to suggest the product is made from quality ingredients and features better flavor (Siegner 2018). Considered a subset of "artisanal," "craft" is often used to describe meat. No universally accepted "craft" standard, but the term typically labels meat that is 1) produced in small batches by independent processors and 2) uniquely raised with non-industrialized methods. Craft meat often has associations with family farms, high ethical standards and better flavor and quality (Heitzeberg 2018). Using "craft" as a label can help consumers perceive a product as artisanal, innovative and natural (Bloch 2018). A key aspect of artisanal and craft goods is the story used to market products and link consumers to producers (Siegner 2018).

According to Innova Market Insights, craft and artisanal food product launches saw a compound annual growth rate of 28% globally from 2013 to 2018 (Ingredients Network 2018). The artisanal beverage category, which includes craft beer and artisanal coffee, has gained particular attention in recent years and serves as an example of the market opportunity for craft and artisanal products. As of July 2019, craft beer represented 12.7 percent of the total U.S. beer market, and from 2017 to 2018, the category grew by 3.9 percent. In contrast, non-craft beer sales dropped by 0.8 percent during that same period (Talbot 2018 and Jones 2019). According to Center for Urban Education about Sustainable Agriculture, the term "artisan" may have lost some of its power as big-name

brands have increasingly used the label in pursuit of differentiating products (Center for Urban Education about Sustainable Agriculture).

According to Brown Gibbons Lange & Company, artisanal and craft meat has experienced recent demand growth because consumers increasingly seek higher quality products and value transparency in how the products they purchase and consume are made. The company notes that artisanal cured meats are a thriving market (Tilson and Gomez 2018). The meat snacks category also serves as an example. According to a publication on meat snacks by Fona International, meat snack sales will reach \$9.47 billion by 2021. Artisanal products are thought to serve as a primary driver for the category to grow (Fona International 2018).

Startup meat retailer Crowd Cow positions itself as a craft meats marketplace. Via the company's website, consumers can choose products to purchase by farm location, how the meat is raised and the personalized farm story provided. In addition to Crowd Cow describing some beef products in its marketplace as "craft" meats, other labels used to market Crowd Cow meats include "local," "pasture-raised," "dry aged," grass-fed and no hormones or antibiotics (Crowd Cow).

To respond to consumer demand for high-quality meat products, many companies, even those traditionally associated with large-scale operations, have used "craft" and "artisanal" messaging in meat marketing. In 2017, Hormel Foods announced that it would acquire Columbus Manufacturing Inc., an American artisanal and craft deli meat processor, for \$850 million because of the recent interest in artisanal and craft prepackaged deli meats and meat snacks (Wells 2017). Arby's, a quick-serve restaurant chain, adopted the term "MeatCraft" to market its products, but it does not clearly define what "MeatCraft" means. Domino's Pizza Inc. began using the term "artisan" in 2011 to describe a new line of pizzas made with higher quality ingredients. Using these labels to describe their products, Arby's and Domino's have tapped into the artisanal and craft markets to invoke images of product authenticity and quality (Hsu 2011).

Combining several artisanal goods in a single product is another trend in the craft goods marketplace. Due to recent interest in craft meats and beverages, Kansas City, Mo., startup Craft Beer Jerky offers craft beer-infused meats. The firm's products, which include jerky and beef snack sticks, are created in small batches, hand-cut and infused with local craft beer. Craft Beer Jerky sells its products online and in select breweries and liquor stores throughout Missouri, Kansas, Nebraska and Florida (CraftBeerJerky).

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# 4. Business Models and Distribution

Two project objectives intended to discover innovative business model and distribution options for Missouri meat slaughtering and processing businesses to consider. To explore these areas, the project team created a series of audio stories featuring Missouri meat slaughtering and processing businesses that had innovated in these areas.

Available on YouTube at <u>bit.ly/NicheMeatMissouri</u>, these audio stories engage peer-topeer learning. Participating processors provide perspective about what has worked well in terms of how they approach marketing, structuring their businesses and distributing products. Audio stories feature the following processing businesses:

- Country Meat Shop Mark Reynolds
- Cypress Valley Meat Company, Natural State Processing & 5R Custom Meats Andy Shaw
- Essner's Custom Butchering Denise Essner
- Hermann Wurst Haus Mike Sloan
- Jennings Premium Meats Jason Jennings
- Paradise Locker/Fantasma Finest Louis Fantasma
- Stonie's Sausage Shop Tyson Wibbenmeyer

To provide meat processing businesses with ideas about structuring and operating their businesses, a series of video lessons were produced for this project. In 15 minutes to 30 minutes, these lessons share tips and research-based recommendations related to several topics. The list below highlights video lessons that touch on business model-related material. Watch the lessons at <u>bit.ly/NicheMeatMissouri</u>.

- Starting a Business Risk Management
- Business Structure Scenarios for Meat Processors
- Succession Planning for Your Business
- Communicating in the Family Business

The survey executed as part of this project provides some insights about Missouri meat slaughtering and processing business models and distribution strategies. The following discussion summarizes the relevant findings.

#### 4.1 Business Models

As reported in the introduction, Missouri meat slaughtering and processing businesses responding to this project's survey tended to operate multiple business units. They most commonly made products using their businesses' own recipes, 96.4 percent; marketed products with their own brand name, 82.1 percent; offered a custom processing service, 82.1 percent; and operated a retail counter, 78.6 percent. In addition to selecting the business units that businesses currently operated, survey respondents also indicated business units that they had ever operated. Comparing the two would pinpoint business units that meat slaughtering and processing businesses had increasingly added or removed from their business models. Exhibit 4.1.1 presents the share of respondents whose businesses had ever had a given unit as part of their operations and the share that had given units as part of their operations when they completed the survey.

The results show a notable drop in the share of responding businesses having offered a catering service and offered a custom processing service. Sixty-eight percent of respondents said their businesses at some point had offered catering, but 42.9 percent offered catering at the time of responding to the survey — a drop of 25 percentage points. All respondents said their businesses had at some point provided a custom processing service, but 82.1 percent offered custom processing when they responded to the survey — an 18-percentage-point decline.



*Exhibit 4.1.1 – Business Units Ever Operated by Respondents and Operated by Respondents at the Time of the Survey* 

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 28

The survey further asked respondents to identify why they had discontinued certain business units. Those that had discontinued catering most frequently cited insufficient labor, too little profit and focusing on other business units as reasons why they stopped offering catering services. Of the respondents who had discontinued offering custom processing, the most frequently cited reasons were the regulatory compliance burden and insufficient labor.

Responses varied somewhat according to respondent years of slaughtering or processing business experience. Respondents who had more than 20 years of experience were more likely than respondents with less experience to market products with their own brand names. They were also more likely to offering a catering service, serve meat products at their own deli or restaurant and operate a retail counter or store. Operators with no more than 20 years of experience, however, were more likely to offer a custom processing service.

When evaluating responses by facility inspection type, USDA-inspected facilities were more likely to market products with their own brand name and somewhat more likely to serve meat products at their own deli or restaurant or operate a retail counter or store. All other facilities were significantly more likely to offer custom processing.

### 4.2 Distribution

Meat slaughtering and processing businesses have multiple distribution channels from which to choose. They include e-commerce, foodservice, retail and on-site restaurants or delis. The survey conducted as part of this project asked respondents to report the share of total meat handled for slaughtering and processing that they sold through given channels. Exhibit 4.2.1 details distribution channels according to the average volume of meat sold through each. The top distribution channels were custom processing for producers, sales through their own retail stores or counters and wholesale sales.

*Exhibit 4.2.1 – Share of Meat Volume Sold Through Various Distribution Channels by Missouri Meat Slaughtering and Processing Facilities* 



Source: 2019 Missouri Niche Meat and Poultry Survey; n = 28

By respondent years of experience, those with no more than 20 years of experience were more likely to sell a greater share of their meat volume handled through custom processing orders for producers and e-commerce than respondents with more years of experience. The respondents who had more than 20 years of experience said they sold more of their meat volume through their own retail stores or counters than respondents who had less experience.

Respondents from USDA-inspected facilities notably sold more meat volume through wholesale channels than all other facilities. Also, respondents who represented all other facilities said their businesses relied much more heavily on custom processing as a distribution channel.

To assess whether respondents viewed an opportunity to shorten the supply chain — that is, work with farmers to create more farm-to-market distribution channels — the survey collected respondent attitudes toward the following statement: "The future of the meat processing industry depends on creating direct farm-to-market distribution channels." Exhibit 4.2.4 shares the results. Roughly 14 percent of respondents said they

strongly agreed about direct farm-to-market distribution channels being key to the meat processing industry's future, and roughly 40 percent said they agreed. However, nearly 43 percent disagreed, and roughly 4 percent strongly disagreed.





Source: 2019 Missouri Niche Meat and Poultry Survey; n = 28

# 5. Marketing Communications

As mentioned earlier, the video lessons created for this project share educational content in 15- to 30-minute videos. In addition to the video lessons focused on business structure and operations, several provide ideas about how to approach marketing. Access these marketing-focused video lessons at <u>bit.ly/NicheMeatMissouri</u>. They have the following titles:

- Creating a Communications Plan
- Strategies for Making a Flexible Communications Plan
- Putting Your Plan into Action: Do's and Don'ts
- Facebook Marketing Basics
- 6 Facebook Marketing Strategies
- Instagram Marketing Basics
- 7 Instagram Marketing Strategies

The survey conducted as part of this project captured data specific to respondents' marketing communications activities. Because this project centers on marketing, understanding the state of Missouri meat slaughtering and processing businesses' marketing helped to communicate their views about marketing and explain their goals and plans for marketing communications efforts.

# 5.1 Brand Awareness

To gauge businesses' self-perceptions of their brand awareness, the survey queried respondents about brand awareness on two levels. First, respondents assessed how well consumers in their county were aware of their brand. Second, they evaluated their brand awareness among Missouri meat consumers. Exhibit 5.1.1 presents the results. Overall, respondents felt confident about meat consumers in their county being aware of their brands. More than 90 percent strongly agreed or agreed about having strong brand awareness among meat consumers in their county. Respondents indicated feeling less certain about whether their brand awareness was strong among all Missouri meat consumers. Two-thirds of respondents said they strongly agreed or agreed about having strong brand awareness among Missouri meat consumers.

*Exhibit 5.1.1 – Self-Reported Brand Awareness of Missouri Meat Slaughtering and Processing Businesses* 



Source: 2019 Missouri Niche Meat and Poultry Survey; n = 27

By region, respondents had similar thoughts about their brand awareness among meat consumers in their counties. At least 80 percent of all respondents regardless of region indicated they strongly agreed or agreed about having strong brand awareness. Respondents from the three regions had somewhat less consensus about brand awareness among Missouri meat consumers. Respondents in the north region were more likely to strongly agree or agree their businesses had strong brand awareness among Missouri meat consumers.

### 5.2 Marketing Communication Tools

To enhance brand awareness, Missouri meat processing and slaughtering businesses have a variety of tools available. This project's survey assessed the extent to which respondents used certain communication tools to promote their meat products and services. Exhibit 5.2.1 illustrates that responding businesses most frequently used Facebook pages, 82.1 percent; their own business websites, 71.4 percent; and newspaper ads, 64.3 percent, to promote their meat products and services. Roughly half noted using signs and billboards and email messages, and several mentioned radio ads. Of the other communication channels listed as options, third-party websites, Pinterest, direct mail and Twitter were used by no more than one-fourth of respondents. "Other" responses included word of mouth, Google Maps, TV ads and print ads other than those placed in newspapers.



Exhibit 5.2.1 – Communication Channels Used to Promote Meat Products and Services

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 28

The crosstabs analysis found that USDA-inspected facilities were more likely to use email messages, Instagram and their own business websites as communication channels to promote meat products and services than all other facilities. Respondents from all other facilities were somewhat more likely than those from USDA-inspected facilities to use radio ads and signs or billboards to promote their meat products and services.

The regional analysis found that Facebook was one of the top two communication channels used to promote meat products and services for respondents from all three regions. The others were signs and billboards in the south region, business websites in the north region and email messages and business websites in the central region. On average, respondents in the central region said they used 5.9 communication channels to promote their meat products and services followed by 4.8 channels on average by north respondents and 3.4 channels on average by south respondents.

In terms of the measuring effectiveness of these communication channels, the survey asked respondents to consider how well the channels build awareness for their businesses and drive sales for their businesses. Exhibit 5.2.2 reports the results for awareness-building. All respondents who provided input about the effectiveness of direct mail, flyers, Pinterest and websites operated by third parties said these channels were very effective or effective at building awareness for their products and services. Newspaper ads had the greatest percentage of consumers (35 percent) who indicated the channel being ineffective or very ineffective at building awareness.

*Exhibit 5.2.2 – Effectiveness of Communication Channels Used to Promote Meat Products and Services in Building Awareness* 



Source: 2019 Missouri Niche Meat and Poultry Survey; n = 5 for direct mail, n = 14 for email, n = 23 for Facebook, n = 7 for flyers, n = 8 for Instagram, n = 17 for newspaper ads, n = 3 for Pinterest, n = 11 for radio ads, n = 15 for signs/billboards, n = 6 for Twitter, n = 20 for your own business' website, n = 2 for website operated by third party

With respect to driving sales, all respondents who answered about flyers and websites operated by third parties said these two channels were very effective or effective. Nine in 10 respondents who responded about Facebook pages and their businesses' own websites said these channels were very effective or effective at driving sales, and more than 80 percent reported signs and billboards, email messages, direct mail and radio ads very effectively or effectively drove sales. The smallest share of respondents (50 percent) noted Twitter as a very effective or effective channel at driving sales. Exhibit 5.2.3 shares more about respondent views toward communication channel effectiveness.



*Exhibit 5.2.3 – Effectiveness of Communication Channels Used to Promote Meat Products and Services in Driving Sales* 

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 6 for direct mail, n = 14 for email, n = 23 for Facebook, n = 7 for flyers, n = 8 for Instagram, n = 17 for newspaper ads, n = 3 for Pinterest, n = 11 for radio ads, n = 15 for signs/billboards, n = 6 for Twitter, n = 20 for your own business' website, n = 2 for website operated by third party

For most communication channels, respondents indicated that they would maintain their investment into those channels during the year following the survey. However, the survey found some willingness to increase investment in certain channels and plans to decrease investment in others. See Exhibit 5.2.4. Channels for which respondents noted the greatest interest in increasing investment were Facebook pages, 41 percent of respondents; email messages, 37 percent; business websites, 36 percent; and Instagram, 27 percent. Half of respondents said they intended to decrease investment in newspaper ads, and one-third said they planned to invest less in flyers and direct mail.



Exhibit 5.2.4 – Planned Investment in Communication Channels in Year Following Survey

■ Increase investment ■ Maintain current level of investment ■ Decrease investment ■ Not applicable

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 12 for direct mail, n = 19 for email, n = 22 for Facebook, n = 14 for flyers, n = 11 for Instagram, n = 21 for newspaper ads, n = 4 for Pinterest, n = 16 for radio ads, n = 19 for signs/billboards, n = 8 for Twitter, n = 22 for your own business' website, n = 2 for website operated by third party

#### 5.3 Marketing Communication Personnel

Missouri meat slaughtering and processing businesses tend to have a relatively small staff dedicated to marketing communications responsibilities. On average, respondents indicated their businesses employed 1.9 people to work on marketing communications, according to 27 responses submitted. Respondents also noted who tended to take responsibility for marketing communications activities. Exhibit 5.3.1 shares the results; note, respondents could select all responses that applied. Seven in 10 respondents indicated that owner family members assumed responsibilities for marketing communications efforts, and nearly half of respondents said the owner had marketing communications responsibilities. Relatively few respondents — just 11 percent — reported their businesses had dedicated marketing associates to take responsibility for marketing communications work.

Exhibit 5.3.1 – Personnel Responsible for Meat Business Marketing Communications



Source: 2019 Missouri Niche Meat and Poultry Survey; n = 27

In terms of time committed to marketing communications activities, more than 90 percent of survey respondents indicated their businesses invest less than 20 labor hours per week into marketing communications efforts.

In some cases, meat businesses may choose to outsource portions of the marketing communications responsibilities to consultants, ad agencies or other businesses that have specialized marketing communications expertise. Of the 28 individuals who responded to the question, one-third had engaged an outside vendor to support their businesses' marketing communications activities in the year preceding the survey. Respondents had most frequently sought external expertise with website design and social media. Exhibit 5.3.2 shares the percentage of respondents who engaged external assistance for various marketing communications activities; note, respondents could select all activities where they had sought external expertise.



*Exhibit 5.3.2 – Marketing Communications for Which Respondents Sought External Assistance in the Year Preceding the Survey* 

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 10

# **Concluding Comments**

The following comments highlight main points shared throughout the study, and they point to opportunities that Missouri meat marketers may consider.

### **Product Diversification**

Missouri meat slaughtering and processing businesses have tended to operate multiple business units, according to the 2019 survey of Missouri meat slaughtering and processing businesses. They also have tended to market a diversified portfolio of branded products — most commonly, frozen, meat snack, cured, smoked, fully cooked and fresh meat products — direct to end users.

Innovation and evolving consumer preferences open the potential to develop new products or alter current products to meet marketplace demands. For example, opportunities may exist to expand a meat snack product portfolio to include thin meat crisps that mimic the experience provided by crackers or chips. Trail mixes that include meat as a component may also open new marketing opportunities in a product category already offered by many Missouri meat businesses.

Other products such as pork rinds or charcuterie meats made from Missouri meat, meat with premium characteristics or unique flavors may give meat businesses an opportunity to differentiate their product offerings and serve specific customer niches.

As another pathway to diversifying a product lineup, meat businesses may consider how to develop uses for animal products that may otherwise be viewed as waste. For example, making bone broth would use bones and connective tissue, and whole animal programs may allow meat marketers to partner with foodservice businesses and educate those customers about how to use all animal components.

Missouri meat businesses with plans to develop new products should consider factors such as their available ingredient supply, customer base, competition, interests and capital investment needs before entering into a new product category.

### **Species Diversification**

Missouri meat slaughtering facilities have most commonly handled cattle, hogs, sheep and goats. Facilities with processing capacity have handled these four species, and most have also processed deer. Processing multiple species may enable facilities to capture some benefits, such as maximizing plant efficiency and diversifying their businesses, but it also requires investments in regulatory compliance and infrastructure. From a consumption perspective, per-capita consumption estimates from the University of Missouri's Food and Agricultural Policy Research Institute and the Agricultural Markets and Policy group project growth in chicken consumption during the next decade. Beef per-capita consumption declines slightly in these projections, and pork and turkey consumption largely stays flat with relatively modest year-over-year changes.

Although each category has nuances with respect to consumer preferences and demand, a few consumer trends tend to apply more widely. The following ideas may help to drive demand for meat marketed by Missouri businesses:

- Package meat in smaller portions.
- Offer pre-seasoned options to reduce preparation time.
- Add unique flavors perhaps those common in ethnic cuisine.
- Share ideas about how to cook and use specific cuts.
- Market fully cooked items that are ready to eat.

#### Attribute-Based Marketing

Labeling food products with attribute claims enables food producers to communicate the production and handling practices used throughout a food product's value chain. Missouri meat slaughtering and processing facilities that responded to the 2019 survey indicated they most commonly used product of the U.S.; local; preservative-, nitrate- or nitrite-free; and specialty labels on products sold directly to end users.

Nielsen data reported in the Power of Meat 2018 reported natural meat and antibioticfree meat to generate more sales in the prior year than meat with claims such as organic and grass-fed. At the consumer level, interest in these attribute claims tends to vary by demographic factors. By listening to target customers and collecting information about what they view as important characteristics in food, Missouri meat businesses can gauge the attributes most likely to drive purchase decisions for their meat products.

### **Distribution and Marketing Communications**

Like the diversity in products offered by Missouri meat slaughtering and processing businesses, these businesses have also tended to rely on multiple channels to distribute products. The 2019 survey found they most relied on custom processing for producers, their own retail stores or counters and wholesale sales as distribution channels for their products. Conversations with processors since the COVID-19 pandemic began indicate an interest in experimenting with new channels such as e-commerce.

Processors and their families take a lead role in shaping slaughtering and processing businesses' marketing communications activities. These businesses have commonly used

communication channels such as Facebook, websites, newspapers, signs or billboards, email and radio to promote their products and services.

The project team produced a series of video lessons to share educational content related to marketing and business models. Businesses can access these 15- to 30-minute video lessons plus a series of 15-minute audio stories that share ideas direct from processing businesses that serve Missouri at <u>bit.ly/NicheMeatMissouri.</u>

#### Looking Forward

To close, the 2019 survey explored needs for more effectively marketing meat-related products and services. Respondents assessed need by ranking a series of statements. The chart shares the results. Ranking an item as No. 1 would indicate a participant thought that item was the most important need. As a result, a lower rank value indicates respondents collectively viewed the item as more important. The top three needs noted by respondents were information about consumer preferences, information about how to enter new distribution channels and funding opportunities to offset marketing costs. Efforts to support Missouri meat processors and other Missouri meat business may address these needs cited by processors.



#### Needs for Meat Businesses to Become More Effective at Marketing

Source: 2019 Missouri Niche Meat and Poultry Survey; n = 23