

Beefing Up Appalachia

Downstream Strategies

April 2018



Table of Contents

Introduction	<i>Page 4</i>
Meat Value Chain	<i>Page 7</i>
Regional Meat Industry	<i>Page 8</i>
Livestock Production	<i>Page 10</i>
Processing	<i>Page 14</i>
Markets and Demand	<i>Page 18</i>
Marketing Insights	<i>Page 20</i>
Retailer Insights	<i>Page 22</i>
Opportunities	<i>Page 24</i>
Conclusions	<i>Page 28</i>

Prepared for

Unlimited Future, Inc
1650 8th Ave.
Huntington, WV 25703
www.unlimitedfuture.org

Prepared by:

Downstream Strategies
911 Greenbag Road
Morgantown, WV 26508
www.downstreamstrategies.com

Data collection, analysis,

business plan development by:
Kitchen Table Consultants
Rebecca Frimmer & Jessica Moore
www.kitchentableconsultants.com

Stroud, A., Fedorko, E. Beefing up Appalachia, Downstream Strategies. 3-2018.



Credit: Mountain Meadows Farm

March, 30, 2018

Letter from the Director

Unlimited Future, Inc. (UFI) is a nonprofit microenterprise development center and business incubator located in Huntington, West Virginia. UFI was organized in 1991 to supply the tools, resources, and connections people need to improve their economic status. Our goal is to achieve a thriving economy supported by successful, locally owned businesses.

In 2012 UFI spearheaded the development of The Wild Ramp, an indoor, year-round farmers market that provides the appeal of a modern retail store with fresh farm products. The Wild Ramp has over 130 farmer, artisan, and value-added vendors from within a 250-mile radius, although most products are produced or grown within 50 miles of the store.

Through our relationship with The Wild Ramp over the past few years, UFI noticed two striking trends: Many meat producers want to expand their product offerings, and customers continually ask for value-added products. Staff couldn't help but notice a gap in what producers could supply and what customers wanted.

Value-added meat products offer a number of perks for producers in the region: They offer a high dollar value, are more shelf-stable, and can easily be sold outside the region. Yet, while niche meat production in West Virginia has expanded, a lack of value-added niche meat products such as bacon, sausages, cured hams, and other meats persists. These findings spurred UFI to secure technical assistance grants from the Just Transition Fund in 2016 and the Appalachian Regional Commission in 2017 to explore the challenges and feasibility of expanding the local meat industry in Central West Virginia.

Several recent developments have advanced resources available for meat producers. In 2015 the West Virginia Food and Farm Coalition's (WVFFC) Meat Working Group developed a processor guide for meat producers. WVFFC also developed the West Virginia Food Mapper, an online interactive map that includes a directory resource for producers seeking meat processing services. Building on the progress made by the WVFFC Meat Working Group, UFI developed this project to survey the state of local and niche meat production and identify strategies to help retail the value of these products in our state.

UFI worked with Downstream Strategies to manage grant activities. Kitchen Table Consultants provided significant expertise regarding the feasibility and market analysis necessary for successful meat and processing businesses. In addition, Tootie Jones of Swift Level Fine Meats and Chuck Talbot and Nadine Perry of Black Oak Holler Farms contributed their insights to this project as local subject-matter experts.

We offer our sincere thanks to all the extension personnel, retailers, processors, farmers, and other survey respondents who took the time and effort to answer our detailed questions and talk to us in person. Special thanks to Quinton Jones of the WV Department of Agriculture Meat Inspection Division for contributing expertise around meat processing regulations. Also thanks to Courtney Boyd and Kaycee James who spearheaded the data collection efforts. In addition, we extend our thanks to the Appalachian Regional Commission for helping us identify these opportunities and to the Just Transition Fund for their support.

We hope that this report will help entrepreneurs and farmers better understand the current state of meat in our region.




Gail Patton
Executive Director, Unlimited Future, Inc




Introduction

Central Appalachia is home to a community of small, diversified farms. As in other areas, West Virginia, Kentucky, and Ohio are struggling with declining farmer incomes, low retention of new farmers, and decreasing farm populations. The region's geography lends itself well to mixed livestock production, which plays an important role in small farm diversification in Appalachia. While livestock and meat production are a significant force, market access is tenuous: Livestock prices can fluctuate due to national supply trends, and producers still face barriers to accessing local and niche markets.

Regional Consumers Eat:

 **39.3** pounds of **beef** per year

 **31.4** pounds of **pork** per year

This study combined findings from processor, retailer, and producer surveys with data from the U.S. Department of Agriculture (USDA) to examine ways in which local beef and pork livestock production can create revenue and jobs in the tri-state area of West Virginia, Ohio, and Kentucky.

Farm Facts:

 **47%** of farms in the study area raise cattle

 **5%** of farms in the study area raise sheep

 **3%** of farms in the study area raise hogs

Through this study, the project team identified a number of opportunities to support the regional livestock industry and create income for West Virginia producers. Kitchen Table Consultants identified nine business concepts that could be successful in the region based on current production, producer interest, and available infrastructure and resources (Table 5) and utilized these to develop two model business plans (Appendix I).

While challenges are significant, there is ample opportunity for West Virginia producers, processors, and new entrepreneurs to capture and retain more of the value of the region's current livestock production. Partnerships with conventional wholesale, high-end wholesale (such as restaurants and specialty retail), and existing food outlets, as well as targeted market development towards larger outside markets could produce valuable new income sources for agricultural and food businesses in the region.



Challenges

- **Profitability:** Processors and producers face financial struggles.
- **Processing and value-added resources:** Access to value-added product processing is limited, and processing costs are high. Long-distance transportation to processing facilities also poses a major challenge for many producers.
- **Market Access:** Distance to markets and lack of diversified market outlets makes reaching new markets challenging for many producers.
- **Seasonality:** Traditional animal processing timeline leads to bottlenecks each fall.
- **Labor:** Producing farms and processors need trained, qualified workers.
- **Capital:** Access to capital remains a constraint for producers looking to expand and for new entrepreneurs seeing to enter value-added or processing businesses.



Credit: Crawford Family Farms

Opportunities

- **Expand producer knowledge** through production/product development support and education.
- **Increase training opportunities** for meat processors and value-added entrepreneurs.
- **Expand workforce training and apprenticeship programs** to help produce a strong, knowledgeable labor force.
- **Facilitate market development** by supporting producer groups, new market outlets, and retail businesses.
- **Explore options** to address the enormous gap (over 600,000 head) between current pork production and consumption in the region.
- **Explore opportunities** to meet the high demand for ground beef alongside culled heifer and cow production.

Study Area

This report focuses on the current role of meat (pork and beef, in particular) in West Virginia's agricultural economy and proposes ways in which West Virginia and the tri-state area of Ohio and Kentucky can increase revenue and jobs by expanding the local meat industry.

The data in this report was compiled over the course of one year by Kitchen Table Consultants (KTC), Unlimited Future (UFI), and Downstream Strategies (DS). The USDA Agricultural Census, the West Virginia Department of Agriculture (WVDA), and other sources provide relevant data at state and federal levels; however, the project team opted to collect more detailed data through a series of surveys. This allowed the project team to dig into production questions at a level of detail far greater than traditionally possible.

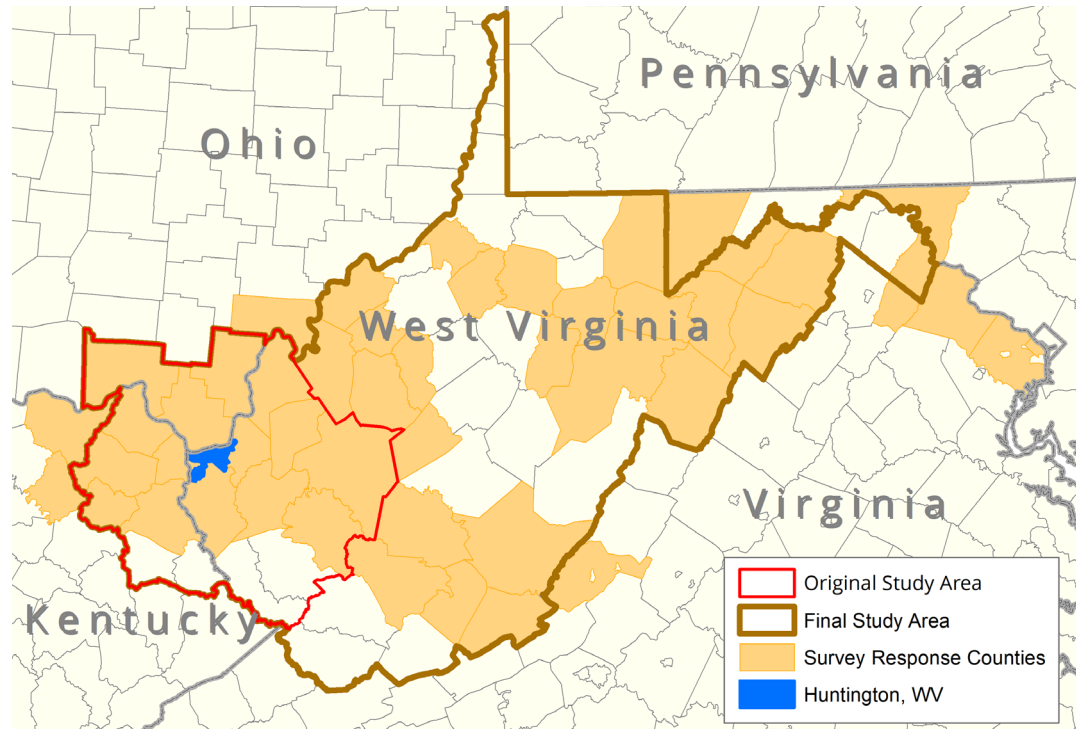


Figure 1: Study area

The project area considered in this report consists of the entire state of West Virginia, and additional counties in neighboring Ohio and Kentucky, as shown in Figure 1.* The study initially concentrated on a 60-mile region around Huntington, West Virginia but was expanded as survey responses and outreach confirmed both need and interest in a much wider region.

Data Collection

KTC, UFI, and DS utilized several surveys to collect comprehensive data from producers and businesses:

- **Producer surveys:** A March 2017 survey gathered information concerning the livestock supply chain and producer interest in expansion from 39 respondents. An additional survey in the spring of 2017 asked additional, detailed questions about production and markets from 45 respondents in West Virginia and the tri-state region. In total, these two surveys reached 61 unique producers as seven producers responded to both surveys.†
- **Processor survey:** Sixteen processors (out of 21 contacted) were surveyed in 2017 about services offered, pricing, capacity, and volume.
- **Retailer survey and pricing questionnaire:** Thirteen retailers were surveyed in 2017 about demand for meat products, marketing, and the pricing of meat products.

In addition to surveys, the team conducted follow-up phone calls as well as in-person conversations. The team reached out to local extension offices, farm bureaus, and other niche meat producer networks to ensure that a representative sample of meat producers was identified (see Appendix III for example survey questions). Additional datasets used in the following analysis include the USDA Agricultural Census and WVDA agricultural statistics, both of which are collected annually.

* Some statistics are not available at the same density for Ohio and Kentucky, so data sources will be carefully defined.

† This is a conservative number. Actual combined responses totaled 77, but the project team could only verify a combined total of 61 due to anonymous responses. There was a verifiable overlap in 7 producer responses.

Meat Value Chain

How does meat get from farms to tables, and where does money change hands along the way?

The meat supply chain consists of a network of participants—producers, processors, and buyers—who each play an important role in the process of bringing finished meat products to consumers. Whereas supply chains focus on the logistics of producing a product, **value chains capture the flow of resources that link producers, processors, and markets.** Each of the players in the meat production value chain plays a vital role upon which all other participants rely. Given the mutual dependence of actors in the chain, support for one link on the chain strengthens the entire network. As a result, value chains thrive when their actors cooperate to produce higher-quality products, thus generating more income for all participants along the chain.¹

The meat production value chain (Figure 2) begins with breeders who produce young animals. Depending on the species, young animals are moved to either feedlots or to backgrounders (stockers who transition animals from primarily consuming grass to a grain-based diet) who raise and finish animals to their full weight. Livestock then move to slaughter facilities and processors to be converted into meat products. Depending on the product, some may move on to value-added processors, who add additional value to the product through smoking, curing, or other processing methods. Meat products ready for sale then enter the food distribution system via distributors and may end up in retail markets, wholesale distribution chains, restaurants, and/or direct marketing outlets such as farmers markets.

Producers can fit into this value chain at almost any stage, and many niche producers retain ownership of the product from start to finish by selling directly to consumers.

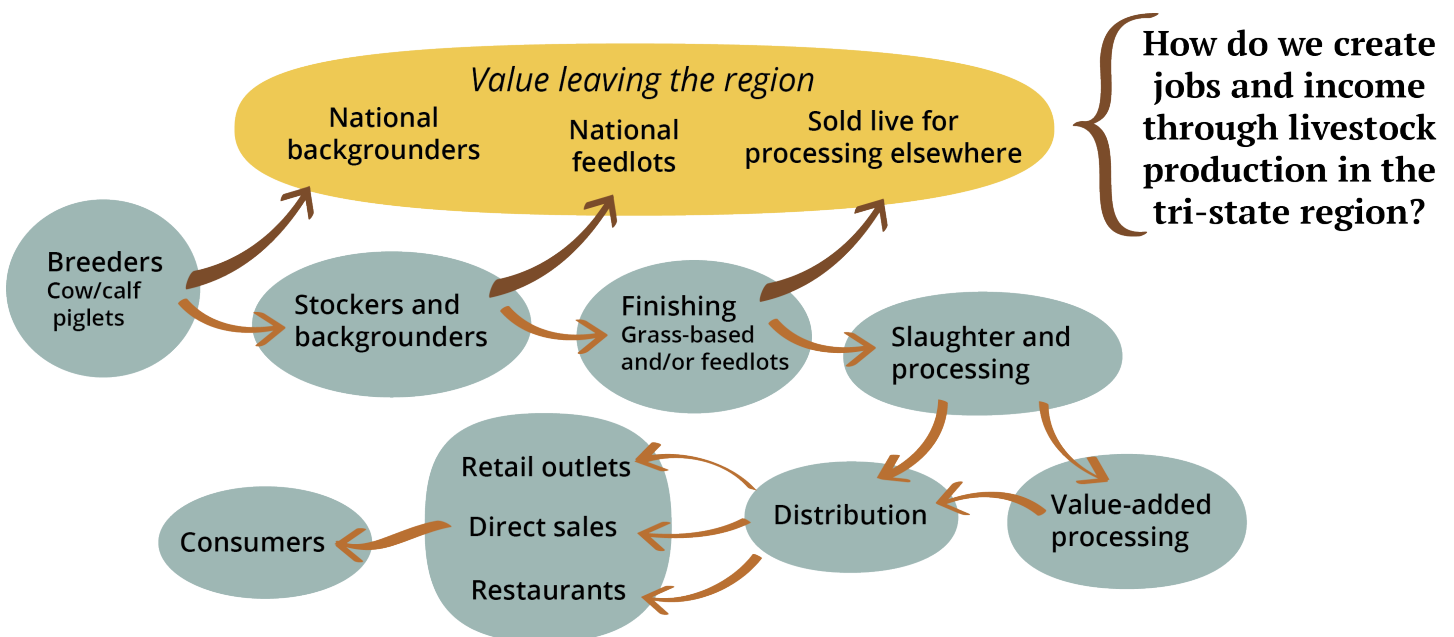


Figure 2: Meat value chain

Capturing and Creating Value

One approach to sustaining healthy local agricultural economies is to examine ways in which producers can capture and create value within their existing production—or, in other words, **better monetize what they already have on hand.**

“Capturing value” refers to the process of retaining some percentage of the monetary value of each transaction. Producers can capture value by retaining ownership of their products until the final transaction. For example, a producer cooperative that operates a processing facility and markets directly to consumers captures value by removing intermediaries or “middle-men” (such as external processors, distributors and retailers) from the equation.²

“Creating value” refers to producing or marketing a higher-value product known as a “value-added product.” Examples include smoked and cured bacon, branded products, and products with marketing tags or certifications such as “grass-fed” or “mst-finished.”³

Regional Meat Industry

There are 26,277 farms within the project study area, 12,752 of which have livestock inventories.⁴ Farms in the study area are small on average (155 acres), but still account for over 4 million acres of land. USDA Cropscape data indicates that approximately 20% of acreage reported by farm operations in the region is in pasture and an additional 16% is in hay or alfalfa production.⁵

Diversification

Diversification of on-farm enterprises (such as raising more than one type of livestock) helps producers generate income evenly throughout the year. Product diversification also helps offset the impact of crop failures or poor harvests. For small to mid-size farms, diversification lends important stability to their businesses. Livestock production provides an important income stream to small farms.⁶

Farms in the study area—particularly those on the smaller end of the spectrum—tend to be diverse in the types of products they produce. Results from the March 2017 producer survey show that 46% of producer respondents raise more than one type of livestock. These 19 producers are categorized as small farms, with an average farm size of around 150 acres.



Livestock and Meat Production

- The combined value of live beef cattle, and hog inventories on West Virginia farms is **\$221.5 million**.^{*}
- The combined value of beef and pork production in West Virginia is **\$173.5 million**.[†] Given the predominance of beef and pork, this figure essentially represents the value of meat production in the state.

^{*} This figure excludes non-beef cattle. Total inventory of all cattle in the region is upwards of 436,000 with a value of approximately \$405 million.

[†] This figure does not include the value of beef or pork production in Kentucky or Ohio.

Sources: WVDA 2016 and 2017 Annual Agricultural Bulletin

Credit: Mountain Meadows Farm

Economic Impact

The regional meat industry has a significant economic impact on the study area and surrounding regional economy. A recent report estimates current direct, induced, and indirect economic impact of meat production and processing in West Virginia to be at least \$604 million. This accounts for 45 slaughter and packing jobs,[†] an additional 20 indirect and induced jobs, as well as meat production inputs, facility operating costs, and cash receipts to farmers.⁷

Economic impact is not limited to the production of meat itself. Livestock production require significant inputs and an overview of economic impacts found a total of 15,543 farm operations in West Virginia reported hay, haylage, grass silage, and greenchop production (all important food sources for livestock) in 2012, with a total of 608,458 acres harvested resulting in a total of 972,238 tons of dry product. This accounts for \$33 million in sales of feed product to livestock operations.⁸

Jobs in Livestock Production

Of 32 producer respondents, farmers reported a total of **147.5 full-time equivalent (FTE) positions** (including family) to produce, market, and sell at maximum farm capacity. The average per farm was approximately **4.6 FTEs**.

Meat Fabrication and Sales

The 2017 retailer survey found an average of **4 FTE employees** per retail business or meat department of retail buyers. Slaughter, processing, and value-added processors report an average of **4.7 FTE jobs per business**.

Did you know?
According to a 2017 calculation, every additional 1,000 head of cattle slaughtered in WV translates to 3.5 slaughter and processing jobs, and 1.5 indirect / induced jobs.

Red Meat Production

A total of 7.3 million pounds of red meat were produced in West Virginia in 2016. This includes beef, pork, veal, lamb, and mutton. Estimates of total dressed weights by animal produced in the state indicate that this number is made up of primarily beef and pork.* While this figure may seem substantial, total red meat consumption in West Virginia was estimated at 131.2 million pounds in 2015—plus an additional 94 million pounds of poultry consumed within the state. West Virginia's total red meat harvest is merely 5.5% of the state's total annual consumption.⁹



* The difference between the total pounds beef/hogs (dressed weight) and total commercial red meat production in West Virginia is small, indicating that a small percent of the total in-state commercial meat production is veal, lamb, or mutton.

† This number reflects direct meat slaughter/packing and does not include management and administrative positions.

Credit: Mountain Meadows Farm

Livestock Production



Cattle

In total, 12,431 farms reported beef cattle inventory of 192,159, which account for at least \$217.4 million in market value of products sold in the study area. In 2016 8,500 head of cattle were processed in West Virginia.

- 85% of all respondents raise beef cattle.
- 29% of respondents with beef sell finished cattle.
- 72% sell weaned calves.
- 46% sell yearlings.
- 32% sell beef.
- 76% of beef producers market their products with one or more marketing claims.

Top five marketing claims by number of respondents:

- Family-owned farm: 18
- Pastured raised: 14
- Grass-fed: 13
- Angus or other specific breed: 10
- Grain-finished: 7

Hogs

Eight hundred ninety five farms in the study area reported hog inventory of around 7,000 animals. Approximately 9,200 head are processed annually in West Virginia alone.

- 23% all surveyed producers raised hogs
- 67% breed hogs
- 17% sell weaned piglets
- 67% sell finished hogs
- 58% sell pork
- 100% of hog producers market their products making one or more marketing claims.

Top marketing claims:

- Heritage Breed: 5
- Pastured: 5
- Animal Welfare Approved (AWA): 2
- GMO-Free Feed: 1



Production Models

In order to fully quantify the livestock production cycles of beef and pork in the region, Kitchen Table Consultants broke out the various meat value-chain sectors in the 2017 producer survey. These provide a valuable insight into the current production models and offer a guide for future expansion.

Breeding

A majority of the surveyed producers breed and sell calves, yearlings or piglets. This is the first step in the regional meat value chain and shows the region has a good supply of young animals born each year.

- 72% of cattle producers sell weaned calves.
- 46% of cattle producers sell yearlings for finishing elsewhere.
- 67% of hog producers breed hogs and 50% of those indicate they sell weaned piglets.

The largest pool of producer respondents that breed calves are doing so on a small scale, but there are some large breeders in the survey pool, as well. Mirroring USDA data, hog producers are a small pool in this survey when compared to cattle breeders: the largest entities are producing less than 30 piglets annually.

Stockers & Backgrounders

The next step along the meat value chain are stockers, backgrounders, and finishers. These operators may often be the same as the initial breeders, but producers frequently purchase weaned calves and raise them to weight and sell them as yearlings. This region has high grass growth during the summers and raising calves to yearlings is common.

- 18% of cattle producers indicate they purchase weaned calves or yearlings and finish them each year.
- 42% of hog producers that they purchased weaned piglets to raise.

Purchasing & Finishing

It is important to note that there are a number of cattle producers who indicated that they finish their cattle. Hog producers finish a higher percentage of piglets. Finishing requires raising a weaned calf, yearling or piglet to its full weight for processing and depending on the production method can require careful forage management and/or grain and other feedstock.

- 29% of cattle producer respondents indicated selling live finished cattle.
- 67% of hog producers indicate they sell live full-weight hogs.

Sales Outlets

Auctions are an important sales outlet for producers selling live animals in the state. High percentages of producer respondents indicate they sell their weaned calves and yearlings at auction.

- The majority of respondents' weaned calves (72%) and yearlings (68%) are sold at auction, as opposed to only 29% of finished cattle.
- Respondents reported fewer weaned piglets (50%) and finished hogs (38%) sold at auction.

The vast majority of surveyed livestock producers (over 80% of beef and 100% of hog producers) sell a limited line of products directly to customers. Fewer producers sell their products wholesale (38% of beef producers and 80% of hog producers). Direct consumer sales allow for the highest price point, providing a larger budget to cover processing cost.

- Of the 32% of cattle producers who sell beef products, 85% sell direct to consumers and 46% sell wholesale.
- Of the 75% of hog producers who sell pork products, 75% sell direct to consumers and 58% sell wholesale.*

* Note that these are of relatively small numbers of producers. For example, 9 out of 12 total producers indicated selling pork products.

Producer Survey Insights

Early-stage Activity

A significant amount of transactions occur at the early stage of animals' lives. Only a few producer respondents reported activity around finished products, which suggests that many calves, yearlings, and piglets are leaving the region, taking future revenue with them.¹⁰ This mirrors results from other studies that indicate slaughter of only 8,500 cattle in West Virginia in 2016 as compared to the total beef cattle inventory of 191,389.¹¹ This significant market gap presents an opportunity to increase capacity to finish and process meat within the region, keeping more jobs and dollars in the states.

Marketing Claims

The vast majority of livestock farmers (100% of hog farmers and 76% of beef farmers) are using specialized marketing claims (such as "grass-fed" or "antibiotic free") about their practices that could be leveraged to create higher price points and offset processing costs.

Producer tip:
Livestock producers can work with certifiers, cooperatives and other organizations to grow livestock to specification to meet marketing claim or quality standards.

Interest in Increased Finishing

The vast majority of livestock producers (100% of hog farmers, 75% of beef) would be interested in increasing their production volume by finishing more animals on the farm if the market opportunity existed. About half of farmers interviewed stated that if the market opportunity were proven, they would be interested in selling meat—as opposed to live animals—from animals raised on their farm.¹²

Challenges

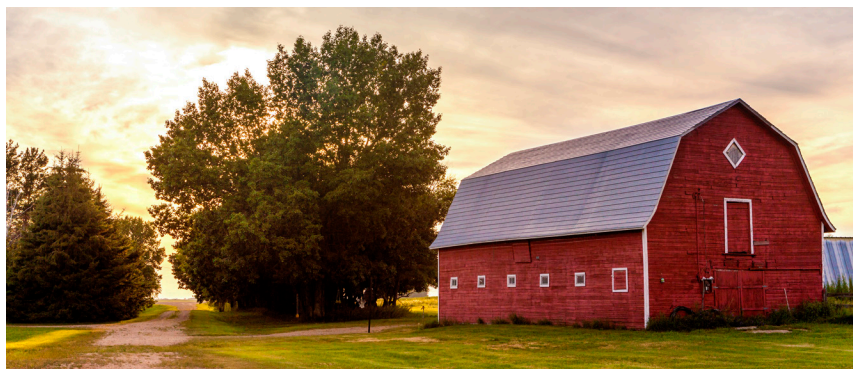
- Profitability (14)
- Access to processing (11)
- Access to markets (9)
- Financing and capital (8)

Barriers to Expansion

- Not enough farm land or infrastructure (8)
- Not sure if expanding will be profitable (8)
- No access to required processing services (5)
- Do not have enough working capital (5)
- No access to markets to sell (4)

Production Level Differences

While regional consumption of beef and pork is almost equivalent, the region's 192,159 head of beef cattle far outnumber the 6,429 head of hogs within the study area. The quantity of hogs sold at auction seems to indicate that a higher percentage of hogs born in the state are consumed here. A high percentage of weaned piglets (67%) and live finished hogs (50%) are sold in the region as compared to cattle. West Virginia data from 2016 indicated slaughter of over 9,200 hogs whereas the annual inventory for 2016 in West Virginia was only 5,873.* This fits the hypothesis that a higher number of hogs are slaughtered in the region than are counted in yearly inventories.



* Hog production inventory numbers do not reflect the total number of hogs in the state over the course of the year. Hogs have a shorter life cycle and piglet crops can be farrowed, raised, and sold before annual counts pick them up. For example, the total hog inventory for West Virginia in 2017 was 5,000 head with a pig crop of 5,300. Data is not available to indicate the age and status of the annual inventory vs. yearly pig crop.

What Are Producers Interested In?

Cattle Producers

- 68% of finished cattle farmers would be interested in selling to a regional buyer.
- Over 75% would be interested in finishing cattle yearlings and/or beef calves to full weight if business opportunities existed.
- **48% expressed interest in selling directly to wholesale or retail markets.**

Hog Producers

- 67% of finished hog farmers would be interested in selling to a regional buyer.
- 100% would be interested in finishing piglets to full weight if business opportunities existed.
- **50% expressed interest in selling directly to wholesale or retail markets.**

Producer interest

Along with production data, producers were asked to provide insight into some of their challenges and barriers to expansion. Sixty-six percent of producers who responded to the question “[Are you] Satisfied with your livestock business?” affirmed that they are.

Q: Assuming it requires no additional work other than raising livestock and transporting them no more than 60 miles each way from your farm, would you consider selling your finished animals privately to a buyer in the region?

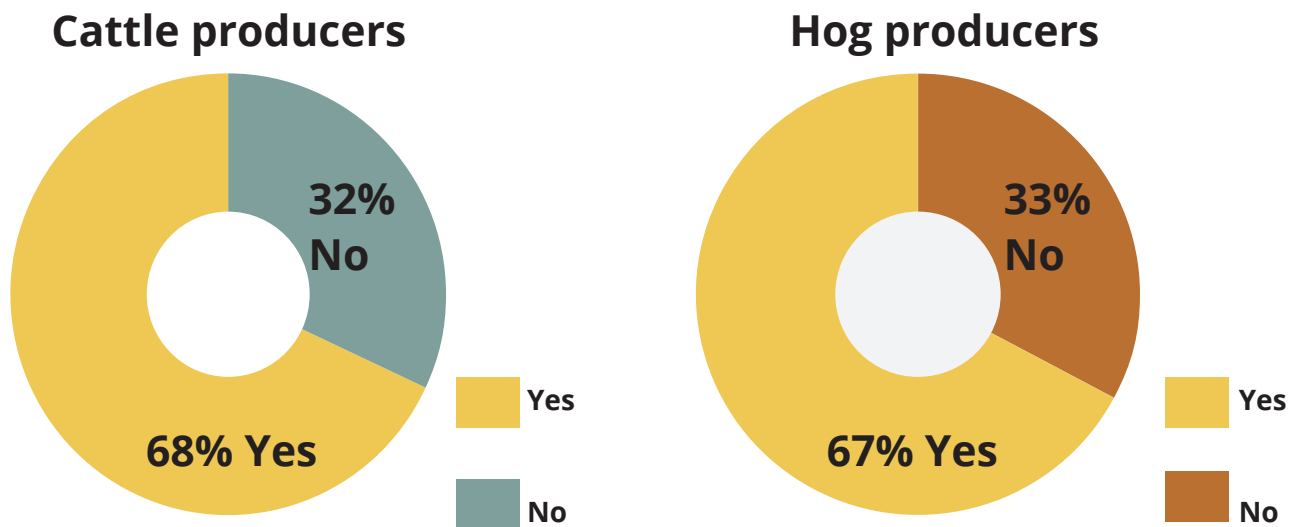


Figure 2: Interest in finishing animals for regional buyer



Processing

Processing is a critical component in the meat value chain and is the point at which the animal is transformed from livestock into consumable, saleable products. Without access to processing, livestock producers lose out on a significant portion of the monetary value of their efforts. In 2016 just 8,500 head of cattle and 9,200 head of hogs were slaughtered in West Virginia—a mere fraction of the total state inventory of 414,389 head of cattle and 5,873 hogs.

Quality local processing is especially critical for producers who are selling packed meat products. The fabrication quality, consistency in cuts, vacuum seal, labeling, and product handling can have a significant impact on the final product. The range of services processors provide limits the types and variety of value-added meat products that can be produced. Proximity to a processor can also drastically effect the profitability of processing as transportation costs and time spent can significantly impact bottom lines.

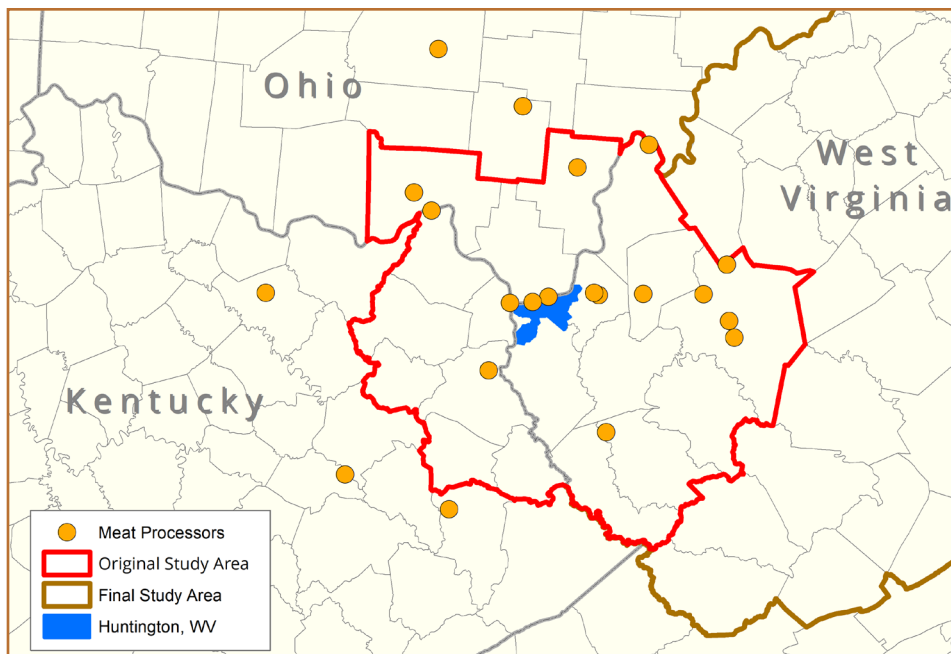


Figure 3: Processor respondents

Regional Processors

There are 57 meat processing plants certified to slaughter or process in West Virginia. However, a 2013 survey of meat processing businesses conducted by the WVFFC Meat Working Group found that **there were only 25 licensed USDA meat processing businesses and eight USDA slaughter facilities in West Virginia.** This poses a significant challenge for local livestock producers as USDA inspection is required for retail meat sales across state lines. It is important to note that the USDA inspected meat processing list includes poultry plants, and 14 private meat manufacturing businesses (barbeque, jerky, sausage, etc.) that are not accessible to farmers.¹³ Producers often must travel out of state to or processing services, with West Virginia farmers often going to Virginia, Ohio, or North Carolina.

A 2017 survey of 16 meat processors in the Tri-county region of WV, KY and OH, found that 44% (7) of surveyed facilities were USDA inspected, and 56% were state or custom inspected (9). West Virginia had only one USDA inspected respondent.¹⁴

Processor Survey

Out of seven processor respondents who responded to capacity questions, processors reported that they were operating at an average of 73% capacity with a range from 25%-100%.¹⁵ This means that if a processor has the capacity to slaughter 100 head of beef cattle per day, they are averaging at only 73% utilization. This presents a gap in utilization and indicates that the plant may be losing money on staffing and overhead. Some producers with the ability to slaughter higher quantities indicated that they lack the storage or staffing to cut and wrap those volumes. As indicated by Table 1, meat cutting requires the highest amount of labor. A lack of cutting floor staff can lead to bottlenecks for meat processors.

Table 1: Average number of employees needed to operate at capacity.¹⁶

Kill floor operating at capacity	Cutting floor operating at capacity	Further value-added processing services operating at capacity
3.8 employees	6.5 employees	3.9 employees

Challenges Facing Processors

Little public data is available on niche meat processors. Like many producers, meat processors are constrained by the localized decline in agriculture and the hyper-competitive nature of the global food system. These challenges, along with low profit margins and aging infrastructure, can lead to the disappearance of smaller local processors and create difficulty when opening new plants.¹⁷

High Operating Costs

Profitability is a frequent challenge for meat processors. Maintaining and operating meat processing plants can be expensive given the needs for specialized equipment, cooling, and off-loading/handling facilities. Additionally, a paid USDA inspector is required to be on-site during any processing, funded by tax-payer dollars. Cooler and freezer space is expensive to maintain, and attracting skilled labor is often a challenge due to lack of training and low wages paid to meat cutters. Processors also face challenges when adding new products as additional value-added certifications and processes are often required. Unless a producer market for new services is identified, value-added product services can lead to significant risk on part of the processors.

Labor

In an assessment of meat processing in western North Carolina, the Appalachian Sustainable Agriculture Project (ASAP) found that identifying and retaining a skilled labor force was a common challenge faced by failed and successful meat processing businesses alike. Many processors only offer minimum wages for highly seasonal work; as a result, turnover for meat processing employees is high, and employers struggle to keep positions filled throughout the year.¹⁸

Seasonality

Seasonality poses an additional challenge for meat processors. Many breeds have reduced fertility outside of their natural breeding cycles, and most producers in the region choose to raise and finish animals during the high forage seasons: spring through fall. This results in large numbers of finished animals being sold and processed every autumn, which often creates a rush for existing processing infrastructure and leads to production bottlenecks. Meat processing facilities are often booked from September through February to handle the fall livestock harvest. Those handling wild game feel additional pressure.

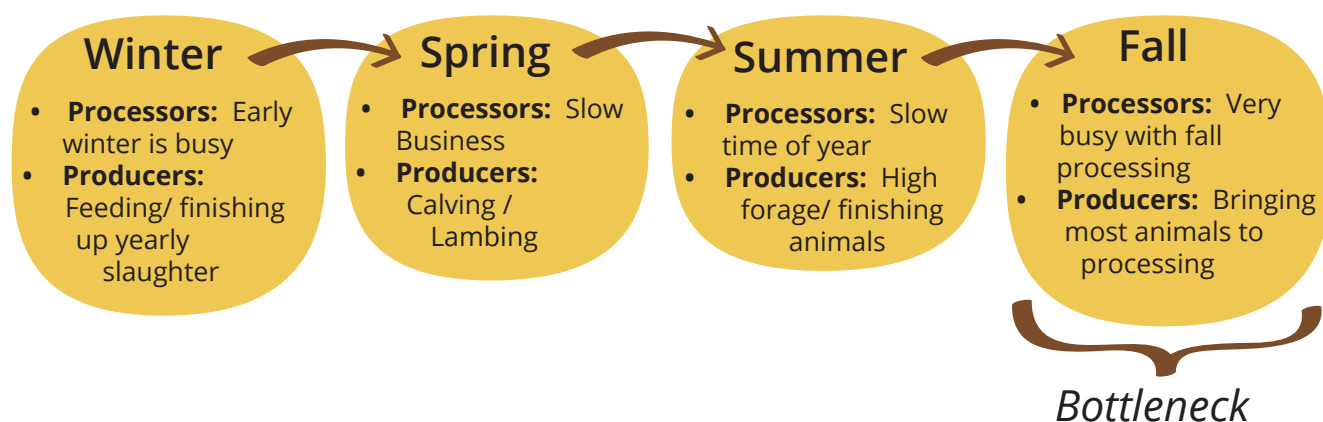


Figure 4: Processing seasonality

Conversely, many plants struggle to get by during slow summer and winter periods. Overhead costs remain constant year-round, and extreme seasonality exacerbates the challenge of retaining skilled labor.¹⁹ A 2012 Central Appalachia Network convening of processors and producers found that small processors in central Appalachia especially struggle with a short production season and often have to raise prices during the high months to sustain their businesses throughout the dry periods.²⁰

Table 2: Farmer and processor concerns about processing (Gwin, Thiboumery and Stillman, June 2013)

What farmers say	What processors say
There are not enough processing facilities.	There aren't enough farmers bringing me enough livestock.
Processors don't have the right services or inspection status.	Farmers ask me to do new things, but they don't have enough volume to cover my costs.
I have to schedule a processing date to far in advance.	Farmers don't come when they say they will, or they bring fewer or different animals than they said they would bring.
I can't get a processing date during the fall.	I have no business in the spring.
Processing costs too much.	Farmers don't want to pay what processing really costs.
Processors make cutting, packaging, and labeling mistakes.	I don't have enough year-round, steady business to hire skilled labor and pay them a good wage.
My order wasn't ready on time, and my customers are unhappy.	Farmers don't pick up their orders on time, using valuable cooler space.

Table 2: Processing Concerns from Local Meat and Poultry Processing: The Importance of Business Commitments for Long-Term Viability (Gwin, Thiboumery and Stillman, June 2013)

Processor Opportunities

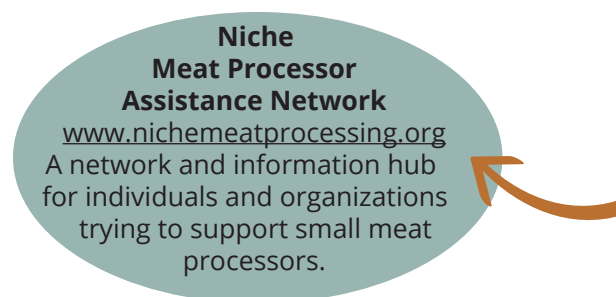
In response to data indicating that processors may not be operating at capacity in the region, a 2013 analysis of meat processing through the Niche Meat Processor Assistance Network identified a variety of potential interventions that could help producers and processors strengthen their relationships and commitments. Recommendations included:

- **Direct interactions between processors and their producer customers** through business advise, marketing, and distribution. This could include shared marketing, distribution services, providing market outlets and marketing connections.
- **Direct financial commitment between processors and producers.** This could include a producer buying into the business, producer-owned or cooperative processing, contracts or growing agreements.
- **Technical assistance to both producers and processors to improve these critical relationships.** This could include setting up systems to better plan production, enhance efficiency, develop contracts and protocols.
- Additional processor support opportunities include providing **direct technical assistance** specifically focused on scale-appropriate food safety techniques and certification/training for small plants.²¹

There are opportunities to expand upon these ideas regionally. The interventions and opportunities above all present ways to improve the businesses of meat processors in the region and warrant further study.

Local Opportunity

Several interviewed processors indicated that they had additional capacity to slaughter but had constraints in processing capacity. This indicates that there may be an opportunity for expanded retail meat businesses to take and breakdown carcasses and/or produce value-added products at a separate facility. Additionally, Buzz Foods, a food distributor/meat processor based out of Charleston, West Virginia is looking to expand quality meat offerings and is working to develop a local food program/element to their business that may offer additional services in the future.



Capturing Retail Opportunity:

Swift Level Fine Meats - Lewisburg , WV

SWIFT LEVEL FINE MEATS is a retail and wholesale distributor with a retail meat shop in Lewisburg, West Virginia. Founded in 2016, Swift Level Fine Meats was established to sell beef for Swift Level Land and Cattle, an established grass-fed meat line based out of Greenbrier County, West Virginia. The company currently carries beef, lamb, pork, chicken, turkey, rabbit, guinea, pheasant, organs, trout, and seafood.

Swift Level owner Jennifer Jones has increased beef sales on farm and has already incorporated other meat-producing farms into the Swift Level Land and Cattle sales stream. Recognizing public demand and lack of retail outlets to meet daily consumer demand, Jones saw sufficient opportunity to develop, built, and start a complimentary business.

Swift Level Fine Meats opened the shop in July 2017 to capture the retail opportunity Jones identified through on-farm and projected sales. Since opening, the shop has seen a 200% increase in retail sales and sales of over \$167,000 first six months. Swift Level Fine Meats sources from six poultry producers, six egg producers, five pork producers, four lamb producers, one beef producer, two rabbit producers, two WV trout producers, and one local cheesemaker along with other retail products.



Credit: Swift Level Land and Cattle

Insights: "Customers are interested in fresh cut local meat. Customers want to know where the meat comes from, what it eats, and how it is treated." – Jennifer Jones, Swift Level Fine Meats



All Local Meats

ALL GRASS BEEF

PASTURED LAMB

PORK - CHICKEN - TURKEY

WEST VIRGINIA TROUT

RABBIT - PHEASANT

Challenges: Producers do not have on-farm exempt products packaged well enough to be competitive with retail customers. Swift Level Fine meats is working with producers and processors to address packaging challenges such as maintaining consistent inventories and constantly bringing in new producers. Experience in the meat business has been helpful, but managing used equipment, freezers, coolers, boilers has been a challenge.

Tips for others starting out:

- Find good repair folks that come when called.
- Employee training and experience is key. Employees need to know anatomy of each species/carcass and how it cooks best. They must understand standards of meat presentation and follow standard operating procedure guidelines. Find interested, energetic people who are excited about the business and willing to learn.
- Pay your employees well, and do not consider this a low wage field. You get what you pay for.

More information

<http://www.swiftlevelfinemeats.com/>

Markets and Demand

As interest in local food grows nationwide, consumers are increasingly interested in knowing more about where their food comes from and how it is raised. As a result, ever-growing numbers of consumers are shifting towards clean eating and pasture-based meats from suppliers such as Butcher Box, US Wellness, White Oak Pastures, and local brand Swift Level Fine Meats. This trend presents ample opportunity for meat producers in the region.



Niche Meat Sales

Food Hubs: Food hubs and local food retailers have been on the rise for the last few years, and there is still opportunity for expansion across the region. These outlets often source product locally in order to keep more of the value in the region. Many of these hubs source local meat but often find the consumer demand for value-added meats (bacons, cured meats, etc.) outstrips the limited—and in many cases, non-existent—local supply. This demand is significant and represents a market gap desperately in need of filling.

Restaurants: In the 2017 retailer survey, the second-most important attribute for retail meat buyers was that their pork and beef be “local”.²² Demand from restaurants and grocers for consistent local meat products continues to grow.

Value Added Opportunities: Niche meat production in the state has expanded, but value-added niche meat products such as bacon, sausages, cured hams, and other meats are still in short supply. Success stories such as Benton Hams in Tennessee show that value-added meat products offer a promising potential for sale both in and outside the region.

Consumer Habits

Consumers in the project impact area consume over **39 pounds of beef per year per capita and over 31 pounds of pork per year.**^{*23}

To meet the total demand for beef and pork in the project study area, 234,419 cattle and 672,336 hogs need to be slaughtered annually.

Niche meat consumption: Estimated consumption of niche or locally-raised meats in the project study area would require slaughter of 2,835 head of cattle and 8996 hogs.[†]

Gap: Study area producers would need to increase the number of beef finished and slaughtered annually to 23,442 head to meet 10% of the current beef intake in the state.

Producers would have to slaughter and process 99% of the current cattle inventory (234,419 head) into beef products and would have to increase hog production 90 fold to meet the quantity needed for regional consumption.[‡]

* Using the methodology developed and used by the Leopold Center’s Food Market Estimator and adjusted for loss in trim and preparation.

† Estimates for niche meat consumption based on a study in western North Carolina.

‡ Estimated using West Virginia and regional numbers. Actual slaughter numbers are not available at the county level for Ohio and Kentucky.

What Retailers Say

The retailer survey allowed the team to get a picture of local demand, preferred practices, and marketing claims. While this is not a full market analysis of the niche meat market, valuable insights can be gleaned. A total of 13 retailers were surveyed, including five butcher shops, four grocers, two specialty grocers, one natural foods store, and one grocery/gas station.

The volume of sales reported by retailers confirmed that beef sales were 1.8 times the volume versus pork sales. Note that this is a higher margin than reported by the average regional consumption pattern data.

Local Sourcing

Sixty-two percent of the surveyed retailers indicated that they source local beef and pork.²⁴ While the retailer survey was limited in scope and primarily focused on determining price and product ranges, this is a promising trend overall and shows there may be more of an opportunity to expand upon local retail sales.

Business planning tip:
Average price points for products can be used to estimate the margin for finished cattle and hogs that go through a custom processing facility.

Market Size

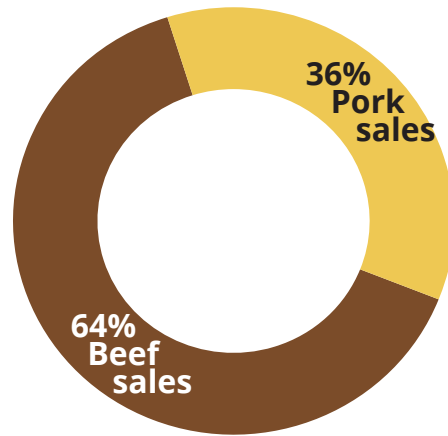


Figure 5: Sales at retailers

Pricing Variance

The 2017 retailer survey examined pricing in 13 different establishments. The variance in pricing tells us that customers encounter a wide variety of price points in the region. This is likely influenced by a variety of factors including the source of product (local/national), marketing claims, and the demographics of each store's local area.



Table 3: Beef product pricing

Beef type	Average price	Min	Max
Ground beef (e.g. 85/15)	\$5.00	\$3.19	\$ 9.00
Beef roast (e.g. Top round)	\$5.55	\$3.49	\$ 9.00
Beef steaks (e.g. New York strip)	\$9.85	\$6.91	\$14.99

Table 4: Pork product pricing

Pork type	Average price	Min	Max
Ground pork	\$3.64	\$2.19	\$ 6.50
Pork chops	\$4.72	\$2.79	\$11.00
Bacon	\$5.31	\$4.29	\$ 8.00
Sausage	\$3.93	\$2.19	\$ 7.00

Marketing Insights

It is not uncommon for retail markets and producers to use different marketing labels to promote their products. For instance, Figures 6 and 7 (what beef/pork shoppers want) show a clear mismatch in the buying preferences of consumers and the claims producers are using in their marketing. Buyers sourcing local meats did indicate interest in the marketing claims of “local,” “grass-fed,” “Animal Welfare Approved,” and “Certified Naturally Grown.”²⁶



Beef Retailer Insights

- Retailers report that ground beef is the most popular, followed by steaks and roasts.
- Over 50% of retail buyers surveyed stated preference for USDA graded beef, though only about 10% of farmers are marketing their beef as such.
- Respondents reported nearly 90% of their shoppers seek beef that has not been treated with antibiotics.²⁵

Beef Retailer Desires Compared To Producer Claims

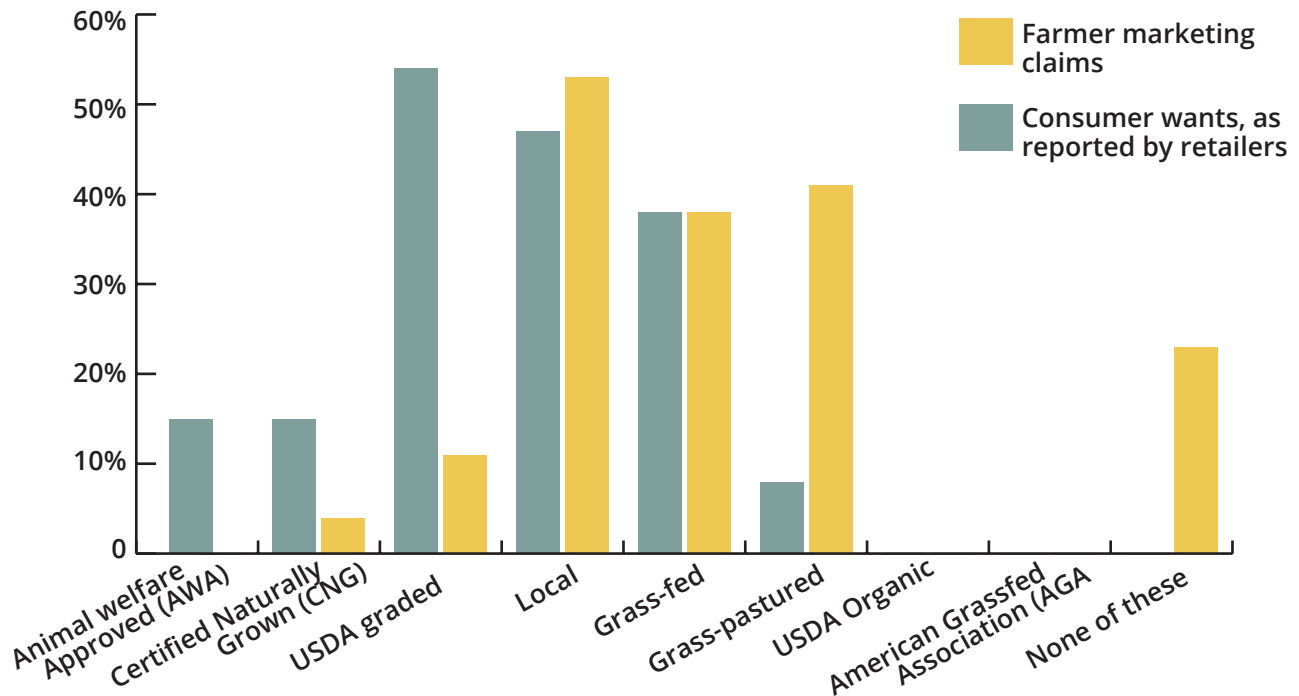


Figure 6: Beef retailer buying preferences versus beef producer marketing claims

Pork Retailer Insights

- Retailers report that bacon is most popular, followed by chops and steaks.
- 45% of retail buyers seek Certified Naturally Grown certification and local pork.
- Nearly 100% of retail shoppers seek pork that has not been treated with antibiotics or hormones.
- None of the retailers are making marketing claims about heritage breed products when over half the producers are.²⁷



Credit: Pork and Pickles

Pork Retailer Desires Compared to Producer Claims

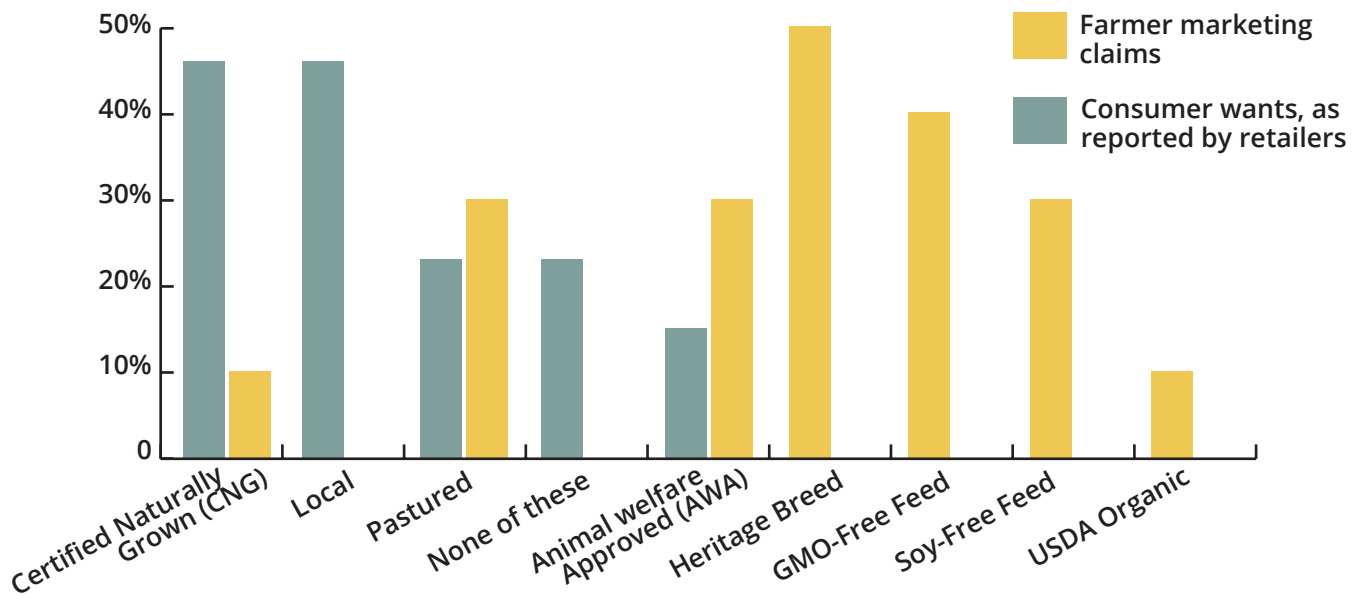


Figure 7: Pork retailer buying preferences versus pork producer marketing claims



Retailer Insights

Ground beef is a top product for retailers and presents a major production opportunity. West Virginia's current production model is skewed heavily towards cow/calf production. This presents an opportunity for developing cull cow lines for processing into ground meat.²⁸

Retailers also see large demand for bacon, yet there is currently very little local supply to meet that demand. As such, there exists an opportunity for producers and processors to develop value-added bacon lines, along with other value-added pork products such as sausages.

Marketing and branding is a large and complicated subject. The retailer survey illustrated the gaps between what producers believe consumers and retailers want versus what retailers and customers say they want. Both parties could benefit from understanding the differences and similarities between their respective marketing strategies in hopes of finding common ground that meets the needs of all parties. Producers can greatly benefit from staying abreast with the latest trends among customers, and retailers can strengthen their relationship with producers, allowing them educate consumers on the latest and greatest happenings within the industry.

Retailers were very interested in sourcing USDA graded beef. Currently, **there is no slaughter facility that provides USDA grading services**. The availability of this service would open significant market avenues for meat producers in the region.

Most popular meat products

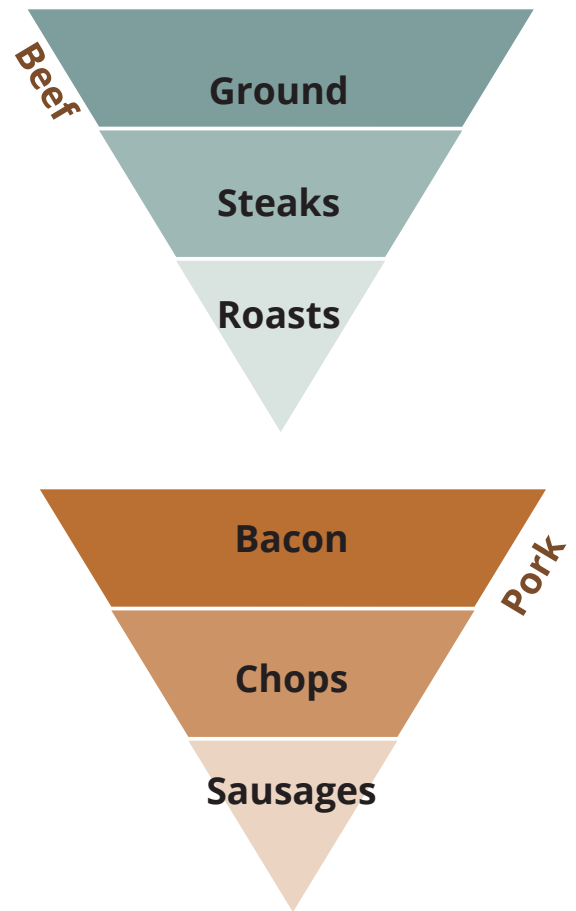


Figure 8: Retailer survey, top 3 retail meat products



Creating Value-added Opportunities

ACEnet | Pork & Pickles - Athens, OH

ACENET Appalachian Center for Economic Networks (ACEnet) is a community-based economic development organization that grows the regional economy by supporting entrepreneurs and strengthening economic sectors. ACEnet currently operates the Athens Food Ventures Center which is utilized by approximately 65 food entrepreneurs annually, offers shared-use, licensed, commercial kitchen.

ACEnet provides business support help and ACEnet Food Ventures Center manager Adam Kody works with entrepreneurs like Becky Clark, owner of Pork & Pickles, to create a HACCP plans. Adam recently was trained on HACCP at Michigan State University to provide training and technical assistance to all meat producers that will be using a new 500 sq ft Meat Processing facility at the Nelsonville Food Hub, ensuring proper food handling and safety practices are followed.

More information: <https://acenetworks.org/>



Credit: Pork & Pickles

PORK & PICKLES is an Athens, OH business started in 2016 by owner/operator Becky Clark. Pork & Pickles produces artisanal meat products including sausages, hand-cut pork, and specialty refrigerated pickle products. Pork & Pickles partners with two southeast Ohio farmers: Dexter Run Farms, in Meigs County and Humble Roots in Athens, Ohio, to produce humanely and naturally raised pork. Whenever possible, they use locally-sourced produce, herbs, and spices to create hand-made sausages. Access to additional equipment for artisanal butchering, charcuterie and sausage packaging will enable her to develop wholesale markets.

Access to ACEnet resources:

Pork & Pickles began using the ACEnet Food Ventures center full-time as a tenant in 2017. Pork & Pickles processes an average of 2.5 pigs per month using the shared use kitchen facility and processing equipment. ACEnet Food Ventures Center manager Adam Kody also worked with Becky Clark, owner of Pork and Pickles, to create a HACCP plan for her meat products.

Insights:

Social media has been a critical piece in promoting Pork & Pickles "Something switched...customers started finding me" – Becky Clark, Owner Pork & Pickles.

Challenges:

Pork and Pickles currently has a limited market, due to a local ordinance that only allows meat producers to sell directly to consumers. With the expansion of the Nelsonville Food Hub's Ohio Department of Agriculture inspected processing space, Pork and Pickles will see a new market opportunity with the ability to sell directly to local restaurants.

Expansion plans

Upon the opening of ACEnet meat processing room, Pork and Pickles plans to expand to processing one whole cow and six pigs per month. They will also be able to expand product lines through the use of the meat grinder, sausage stuffer, meat saw, and vacuum-packaging machine.

More information: <http://www.porknpickles.com/>





Capturing and creating value along the value-chain

There are clearly many opportunities to capture and create value along the meat value chain. Producer, retailer, and producer surveys revealed many “potholes” that can be addressed by supporting producers, retailers, and processors.

Producer Opportunity

Processor & Retail Opportunity

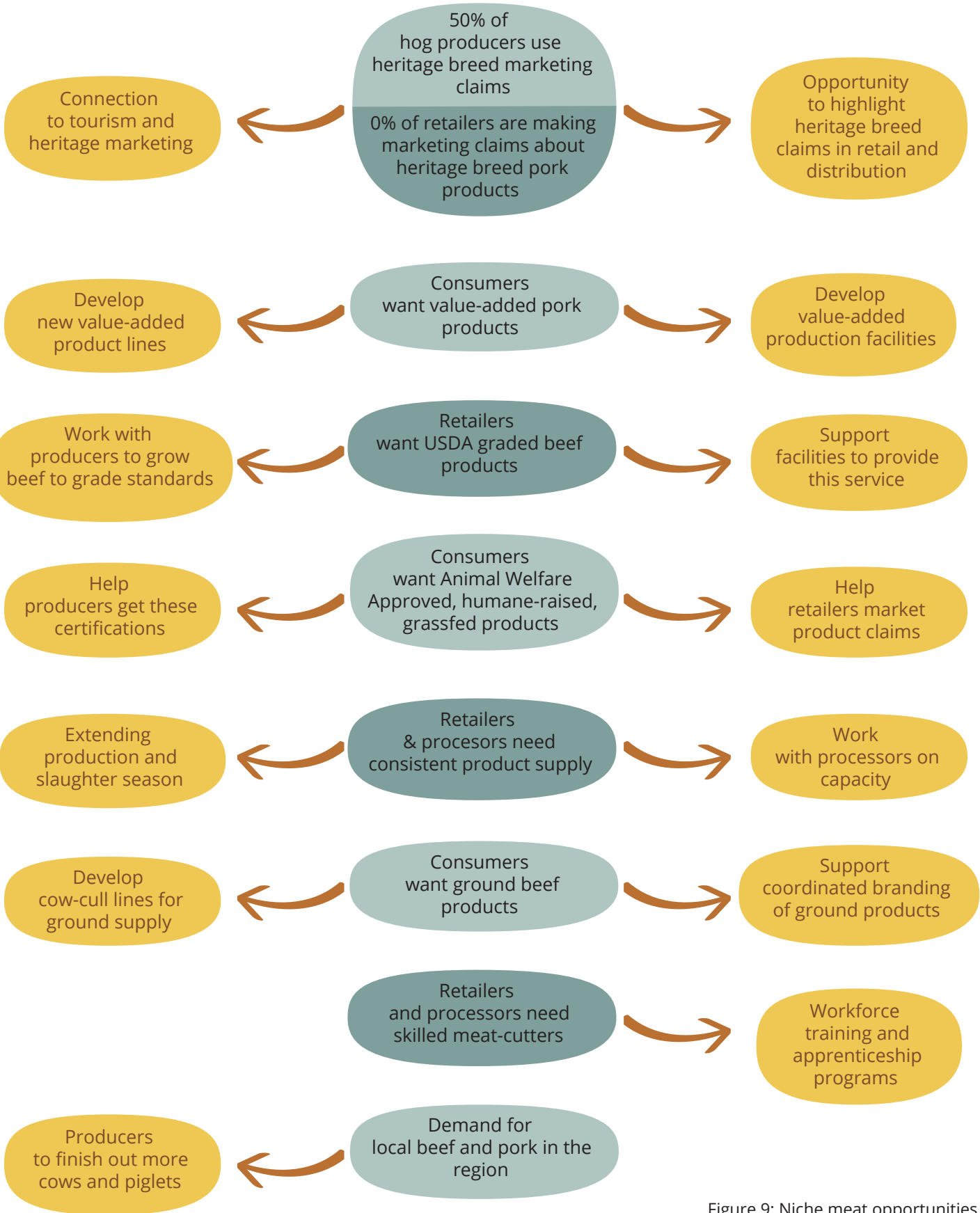


Figure 9: Niche meat opportunities

How do we use tri-state beef and pork production to create revenue and jobs?

After examining the study data, national trends, and best practices from other areas in the country, KTC developed nine business concepts geared towards creating revenue and jobs in the tri-state area. These were developed in consideration of existing assets, markets, and respondent interest (Table 5). KTC reached out to meat industry professionals and stakeholders to provide feedback on these concepts and identified two for further examination: a Value-Added Processing Facility and a Meat Brand concept. Both of these were explored in more detail through mini-business plans (See Appendix I).

Meat Brand Concept

A promising business opportunity is the creation of an aggregated meat brand based on a set of high quality marketing claims: (1) Appalachian-raised, (2) sustainable farming practices, and (3) high quality protocols.

This strategy would require onboarding producers who would raise animals to a set of clearly defined standards. These high-quality livestock would be utilized to create a line of high-end products to be aggregated and sold under one brand with a specific set of marketing claims such as “locally raised,” “never ever,” “grass-fed,” “pasture raised / no confinement,” breed-specific claims, USDA Organic, Animal Welfare Approved, and Certified Naturally Grown. This concept leverages existing resources (farmers, livestock, processors) and would create additional market opportunities for both established and beginning farmers.

This strategy would entail buying animals at hanging weight from producers, taking ownership after delivery to the processor, and creating a traceable product line with high-quality packaging and marketing claims, with the potential to expand with value-added products. The sales of these products could be local or in conjunction with a regional or national distributor to widely distribute end products to a large audience. Integrating a network of relationships with farmers, processors, and distributors will be a key to success.

Who's already doing this?

North Carolina Natural Hog Growers Association

The NCNHGA was formed by several NC free range hog growers over 10 years ago. The co-op markets AWA, GAP rated and non-GMO verified hogs to niche markets. www.facebook.com/ncnhga/



Wisconsin Grass-fed Beef Co-op

The Wisconsin Grass-fed Beef Cooperative is made up of about 175 Wisconsin family farms who market under the “Wisconsin Meadows” cooperative brand. www.wisconsingrassfed.coop/

Adirondack Grazers Cooperative

A New York based cooperative of Northeast family farms producing the finest quality, humanely raised, grass fed beef for wholesale markets. www.facebook.com/adkgrazers/



Credit: Mountain Meadows Farm

USDA-Certified Specialty Value-added Beef and Pork Processing Facility

Given the lack of processing options in the region, there is a strong market need and opportunity for a local value-added processing facility to serve Huntington, the tri-state region, and beyond. Such a facility would receive raw beef and pork product from a USDA-certified slaughterhouse or processor that would be further refined on site to create specialty value added products. A processing facility would fill an existing demand for meat processing in the region, provide additional product opportunities for local livestock producers, and create new local small batch products and marketing opportunities. (See Appendix I)

Who's already doing this?

Willis Meat Processing

Virginia based Willis Meat Processing provides meat processing services for beef, pork, deer and lamb and has a retail meat case for fresh meat. sites.google.com/site/willismeatprocessing/

Old Line Custom Meat Company

Old Line Meats (Baltimore, MD) is a USDA inspected fresh meat fabricator selling wholesale meats to restaurants, butcher shops, grocery stores and institutions. <http://www.oldlinemeats.com>

Allegheny Meats - Virginia

Alleghany Meats is a USDA-inspected, Animal Welfare Approved value-added slaughter and processing facility established in 2012 that processes beef, bison, hog, goat, and lamb. www.alleghanymeats.com/



Business Concepts

Business Concept	Outcome
Farmer meat cooperative brand	Capturing value by retaining producer ownership of product and creating value through shared branding.
Standard processor: Slaughter Facility and cutting floor	Capturing value by developing a business in-region to "capture" dollars currently spent outside the state.
Value-added processor with improved value-added capabilities	Creating value by creating a new opportunity to add value to meat products, capturing value of producers that may spend outside the region currently.
National and or e-commerce company, direct to consumer retail	Capturing value by developing a business in-region to "capture" dollars and Creating Value through shared branding.
Regional e-commerce company, direct to consumer retail and subscription	Capturing value by developing a business in-region to "capture" dollars and Creating Value through shared branding.
Warehousing and storage	Capturing value by developing a business in-region to help producers expand.
Regionally-focused wholesale distributor	Capturing value by developing a business in-region to "capture" dollars, creating value through shared marketing and product consistency.
Local meat retail concept (restaurant, eatery, food truck)	Capturing value by creating a direct market outlet for producers, creating value by converting raw local products into higher value meals for consumers.
Food product marketing company	Capturing value by marketing products that may otherwise be sold outside the region, creating value through marketing and logistics.

Table 5: Business Concepts from Kitchen Table Consultants

Conclusions

There are ample opportunities to capture existing value and create new value within the West Virginia meat industry.

Market Opportunity Exists

➔ **Opportunity:** Correlation between desire for local ground beef and number of farmers doing cow-calf operations. Consider opportunity for a local cull cow beef line because all ground brings costs down. Look deeper at beef standards preferences and cross reference. Investigate premium pricing.

➔ **Opportunity:** Marketing claims and production practices: retail buyers want graded beef, could be an opportunity for more animal welfare certified sales and marketing for beef, also opportunity for sales and marketing focused on animal welfare/life on pasture (based on retailer and demand survey). Half of hog producers are making heritage breed marketing claims, none of the surveyed retailers are making those marketing claims for the pork they sell.

➔ **Opportunity:** Large gap exists between current pork production and regional pork consumption. There is an opportunity to bridge this gap through more local marketing.



Credit: Greenbrier Valley Pasture Network

Food For Thought:

The butcher shops are showing us the widest variety of pricing, which leads us to want to understand the story on marketing claims.

Producers Want To Expand

➔ **Opportunity:** The vast majority of livestock farmers would be interested in finishing more animals on the farm (increasing volume) if the market opportunity existed (100% of hog farmers, 75% of beef), creating more volume locally for local meat products.

➔ **Opportunity:** There is interest in changing current practices. About half of farmers interviewed stated that if the market opportunity were proven, they would be interested in selling meat (as opposed to live animals) from animals raised on their farm, creating more volume locally.

➔ **Opportunity:** In-region consumption of pork is high, illustrating an opportunity for expansion especially with the addition of value-added processing for popular pork products such as bacon, sausage, and hams.

Room for new entrepreneurs

➔ **Opportunity:** Market opportunities for new meat industry businesses. An increase in value-added processors would allow producers and entrepreneurs to sell more than raw cuts of meat, such as specialized products with production focused claims, further increasing their value.



Next Steps

There are tremendous opportunities for local meat markets in West Virginia and the tri-state regions of Ohio and Kentucky. Several conditions within the region speak to those opportunities, such as high numbers of existing livestock producers, high in-region meat consumption, and proximity to outside markets.

Key infrastructure and facility gaps remain, especially in terms of slaughter and processing. Development of these entities is crucial if producers are to expand and capture more value from their existing herds. Similarly, new value-added meat product facilities would allow producers and other food entrepreneurs to expand into new markets and retain a high portion of the value of their herds. Producers and entrepreneurs in these sectors will need capital and technical support to get their businesses up and running.

KTC has provided two mini business plans that outline market opportunities, assets, financial considerations, and business models. These are a good resource for new entrepreneurs and will help guide future businesses.

Lastly, all parties would benefit from further research on some specific subjects, including: alternative models to support producers and processors; detailed market research on specific wholesale opportunities present in the region, especially for ground meats, sausages, and cubed steaks; and an analysis of regional value-added market opportunities.

Acknowledgements

Thank you to Courtney Boyd, Kaycee Sebastiani, Jennifer Jones for your help during the data collection, Thank you to Sara Cottingham and Jason Clingerman at Downstream Strategies for your help developing report materials. Lauren Kemp, Nadine Perry, Leslie Shaller, Bill Woodrum, Tom McConnell, Dickenson Gould, Benjamin F. Gilmer, Mary Oldham, Joyce Shaffer and Darwin Stemple for your feedback and insight on this project and the West Virginia Meat working group. Thank you to Crawford Family Farms, Pork & Pickles, Mountain Meadows Farm, and the Wild Ramp for providing photos for this report.

Sources

- Bureau of Labor Statistics. Occupational Employment Statistics - Multiple occupations for one geographical area. West Virginia, May 2016.
- Born H, Bachmann J. 2006. Adding Value to Farm Products: An Overview. ATTRA – National Sustainable Agriculture Information Service. <https://attra.ncat.org/attra-pub/download.php?id=270>
- Central Appalachian Network. “The Local Meat Industry: Opportunities and Challenges in Central Appalachia.” Lewisburg, WV. 2012.
- Center for Agroecology and Sustainable Food Systems University of Santa Cruz. Teaching Direct Marketing and Small Farm Viability. <https://casfs.ucsc.edu/about/publications/Teaching-Direct-Marketing/index.html> Accessed 2-18
- Economic Research Service. Food Availability (Per Capita) Data System. 2015. <https://www.ers.usda.gov/data-products/food-availability-per-capita-data-system/> Accessed 8-2017.
- Gwin, L. & Quanbeck, K. 2014 “The Economics of Local Meat Processing.” AgMag, Fall 2014.
- Gwin, Lauren, Arion Thiboumery, and Richard Stillman. June 2013 ,Local Meat and Poultry Processing: The Importance of Business Commitments for Long-Term Viability, ERR-150, U.S. Department of Agriculture, Economic Research Service, June 2013
- Hartz L, Eades D, Brown C, McConnell T, Hereford A, Boettner F. 2012. West Virginia food system: seasonal production expansion and its impacts. Downstream Strategies. Jan.
- www.downstreamstrategies.com/documents/reports_publication/ds_food_system_report_final.pdf
- Knopf, D. 2014 Agriculture Remains the Backbone of West Virginia, National Agricultural Statistics Service in Conservation Jun 19, 2014 <https://www.usda.gov/media/blog/2014/06/19/agriculture-remains-backbone-west-virginia>, Accessed 2-2018
- Leopold Center for Sustainable Agriculture. “Exploring Small-scale Meat Processing Expansions in Iowa.” Ames, IA. Swenson, Dave. Iowa State University Department of Economics, 2011.
- Leopold Center for Sustainable Agriculture. 2008. U.S. Food Market Estimator FAQ. 2008
- Local Food Research Center. “Large Animal Meat Processing Feasibility in Western North Carolina.” Asheville, NC. Appalachian Sustainable Agriculture Project, 2012.
- Michigan Department of Agriculture. “Feasibility Assessment of a Meat Slaughtering/Processing Plant or Feedlot in Northern Michigan.”
- Knudson, William A., Peterson, Christopher. 2007.
- Norton, R. 2014. “Agricultural value chains: A game changer for small holders” <https://www.devex.com/news/agricultural-value-chains-a-game-changer-for-small-holders-83981>. Accessed 2-2018.
- Stroud A and Fedorko E. 2017. Overview of the West Virginia livestock industry. Downstream Strategies.
- Unlimited Future Inc. 2017a. Beefing up the Local Food Economy Producer Survey.
- _____. 2017b. Beefing up the Local Food Economy Processor Survey.
- _____. 2017c. Beefing up the Local Food Economy Detail Producer Survey.
- _____. 2017d. Beefing up the Local Food Economy Retailer Survey.
- University of Minnesota Extension. 2015. “Economic Impact of a Beef Packing Plant Closure in Windom, Minnesota.”
- USDA NASS, 2012 Census of Agriculture, West Virginia Profile: Other crops and hay.
- _____, State Summary - West Virginia Table 1: Historical Highlights.
- _____, State Summary - West Virginia Table 65.
- _____, Quick Stats - West Virginia.
- USDA NASS, Livestock Slaughter 2016 Summary. April 2017. ISSN: 0499-0544. Page 67. Red meat production pounds calculated as head kill X live weight X dressing percentage.
- USDA NASS, Livestock Slaughter 2016 Summary. April 2017. ISSN: 0499-0544.
- USDA NASS, July Livestock Slaughter Report. August 2017
- West Virginia Department of Agriculture/USDA NASS. West Virginia Annual Bulletin No. 47. Charleston WV. 2016.
- _____, No. 48. Charleston WV. 2017. https://www.nass.usda.gov/Statistics_by_State/West_Virginia/Publications/Annual_Statistical_Bulletin/2017/Bulletin2017-All.pdf
- West Virginia Food and Farm Coalition. 2014. “A West Virginia Producer’s Guide to Processing & Marketing Meat & Poultry.” Oak Hill, WV. 2014.
- West Virginia Food and Farm Coalition. 2013. Meat Working Group Survey.

Endnotes

- 1 Norton, 2014
- 2 Born and Bachmann, 2006
- 3 Born and Bachmann, 2006
- 4 USDA Agricultural Census, 2012
- 5 USDA, 2012
- 6 University Santa Cruz , 2015
- 7 Stroud and Fedorko, 2017
- 8 Stroud and Fedorko, 2017
- 9 Stroud and Fedorko, 2017
- 10 KTC, 2017
- 11 Stroud and Fedorko, 2017
- 12 Unlimited Future Producer Survey, 2017a
- 13 West Virginia Food and Farm Coalition, 2013
- 14 Unlimited Future Survey, 2017b
- 15 Unlimited Future Processor Survey, 2017b
- 16 KTC, 2017
- 17 Gwin and Quanbeck, 2014
- 18 Local Food Research Center, 2012
- 19 Gwin, Thiboumery and Stillman, 2013
- 20 Central Appalachian Network, 2012
- 21 Gwin, Thiboumery, and Stillman, 2013
- 22 Unlimited Future, 2017d
- 23 Stroud and Fedorko, 2017
- 24 UFI Retailer Survey
- 25 Unlimited Future, 2017d
- 26 Unlimited Future, 2017d
- 27 Unlimited Future, 2017d and Unlimited Future Processor Survey, 2017
- 28 KTC, 2017

Closing Note

This report is intended to be an overview of the meat industry specifically focused on the guiding questions of how to keep the most value of livestock products produced in WV and the tri-state region. The project team would like to acknowledge the importance of traditional livestock markets, auctions, and brokers in the region for their support of the livestock industry, however, for this project, focus was on niche meat production and therefore a throughout examinations examination of those systems was outside the scope of this project.

Additionally, this report is primarily focused on red meat production. It is worth noting, however, that poultry and egg production is a significant sector in West Virginia agriculture and accounting for a total of \$401.4 million dollars of sales and 2,991 total farm operations and can provide an important step towards farm viability for many diversified farms across the country.

