STRENGTHENING PROTEIN SUPPLY CHAINS IN INDIAN COUNTRY

A Guide to Overall Processes and Requirements

First Nations Development Institute

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FORWARD

The ongoing COVID-19 pandemic has highlighted the vulnerabilities of our current meat supply chain, which has been crippled by outbreaks in meat packing plants across the country. With meat packing plants closing to contain these outbreaks, livestock producers have struggled to butcher and package their meat to be sold, causing meat shortages and increased prices in groceries nationally. Native communities, which are often located at the "last mile" of many food supply chains, have experienced the brunt of this meat supply chain disruption. Frequently these communities have seen much smaller quantities of very low-quality meat at higher prices, if it is available at all. At the same time, many Native producers around the country have grass-fed cows and livestock that are sustainably managed in line with traditional practices (including no use of antibiotics, gentle treatment, limited and minimal vaccinations, and strict rules of breeding and reproduction) that could be sources of high-quality protein for their communities. However, many rely on the same meat packing plants to butcher their animals that have been severely impaired by the pandemic. There is an urgent need to create and support a more resilient meat supply chain by focusing on building capacity and infrastructure at the local level that ensures that local producers and consumers have reliable access to sustainably-managed, high-quality protein.

To address this challenge in Native communities, First Nations launched its pilot initiative, *Forging the Last Mile Protein Supply Chains in Indian Country*, in late 2020. As part of this pilot project, First Nations engaged the Indigenous Food and Agriculture Initiative (IFAI) at the University of Arkansas to create this resource publication to provide fundamental information on meat supply chains (including related policies, certifications and codes), share successful models in Native communities, and to describe how interested communities can develop their own butchering facilities. It is our hope that this resource can support the strengthening of protein supply chains across Indian Country.

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INTRODUCTION

INTRODUCTION

During the height of the pandemic, meat processors struggled to remain open, which led to less selection and higher prices for consumers.[1] The bottleneck in processing and packing was severe.[2] In April of 2020, the White House feared shutdowns could reduce meat availability by up to 80%.[3] By the third week of the month, 25% of the meat processing capacity nationally had ceased, even with an executive order calling for plants to remain open on the horizon. One economist characterized the industry as being in "critical condition."[4] One industry leader went further in claiming that the food supply chain was breaking.[5]

Before COVID-19, ranches and processing facilities generally maintained relationships of scale, with larger-scale ranches collaborating with processing facilities that could facilitate more product. As the larger processing plants reduced output or stopped processing agricultural product(s) entirely, the need for additional smaller, regional packing plants became apparent.[6] Larger-scale ranches that previously utilized larger processing facilities were competing with ranches of all sizes for time slots at smaller facilities, straining these supply chains.[7]

Producers might have been drawn to smaller facilities for reasons other than availability alone. Traditionally, getting from production to retail can be an extensive process for farmers and ranchers.[8] Local and regional processors, however, have a shorter supply chain than that of the larger processors and can condense the process for producers.[9] A shorter supply chain can have economic, social, and environmental benefits in the form of higher margins and lower overheads; improved product range; local food chain infrastructure;

1 Virus is Expected to Reduce Meat Selection and Raise Prices. (April 28, 2020). Indian Country Today. https://indiancountrytoday.com/coronavirus/virus-is-expected-to-reduce-meat-selection.

2 Law, T. (2020, April 30). COVID-19 Meat Shortages Could Last for Months. Here's What to Know Before Your Next Grocery Shopping Trip. Time. https://time.com/5830178/meat-shortages-coronavirus/.

3 McCarthy, R., & Danley, S. (2020, June 23). Map: COVID-19 meat plant closures. MEAT+POULTRY. https://www.meatpoultry.com/articles/22993-covid-19-meat-plant-map.

4 Bagenstose, K., Bomey, N., & Chadde, S. (2020, April 30). Meat Shortages Expected as Coronavirus Disrupts Production, Despite Executive Order. USA Today. https://www.usatoday.com/story/news/2020/04/30/coronavirus-meat-shortages-expected-production-plunges/3052398001/.

5 Bagenstose, K., Bomey, N., & Chadde, S. (2020, April 30). Meat Shortages Expected as Coronavirus Disrupts Production, Despite Executive Order. USA Today. https://www.usatoday.com/story/news/2020/04/30/coronavirus-meat-shortages-expected-production-plunges/3052398001/

6 Vallery-Mills, C. (2020, April 30). Cattle Producers Bring S.D. Packing Plant Back Online. TheFencePost.com. https://www.thefencepost.com/news/cattle-producers-bring-s-d-packing-plant-back-online/.

7 Held, L. (2020, May 26). As COVID-19 Disrupts the Industrial Meat System, Independent Processors Have a Moment to Shine. Civil Eats. https://civileats.com/2020/05/19/as-covid-19-disrupts-the-industrial-meat-system-independent-processors-have-a-moment-to-shine/.

8 Gaston, M. (2020, April 25). Shifts in Legislation Allow for More Food Options. The Sheridan Press. https://www.thesheridanpress.com/news/local/shifts-in-legislation-allow-for-more-food-options/article_58ca180c-84be-5d47-ad6b-5668e03555e6.html.

9 Gaston, M. (2020, April 25). Shifts in Legislation Allow for More Food Options. The Sheridan Press. https://www.thesheridanpress.com/news/local/shifts-in-legislation-allow-for-more-food-options/article_58ca180c-84be-5d47-ad6b-5668e03555e6.html.

increased producer negotiating power; access to public and larger scale markets; and other advantages.[10]

In response to the disruption in the supply chain, custom processors also saw changes. Generally, custom processors have limited access to markets as their output must only be for the personal use of the owner of the animal.[11] Generally, promoting resilience in a food supply chain may require building redundancy in available linkages, either through establishing new links or modifying existing linkages to move goods from the producer to the consumer. In light of the processor shortage, however, there has been a push to pass legislation allowing custom processors to sell meat commercially, subject to some limitations.[12] Interest in supporting this flexibility could, therefore, alleviate pressure points in the protein supply chain.

The food supply chain disruptions caused by the COVID-19 pandemic begin with the very sources of food. Food sourcing, the acquisition, purchasing, or procurement of food, ingredients, and other consumables, is the foundational access to food. While issues relevant to food became more visibly pronounced across the United States during the COVID-19 pandemic, the pandemic largely exacerbated those issues Tribal reservations already faced. Between 11 and 14 percent of Americans generally face food insecurities. In comparison, an estimated 40% of Native Americans are affected by the issue.[13] Organizations that typically buy bulk goods, such as hospitals and schools, were unable to procure an adequate amount of food for anticipated levels of demand. Much like other foods, the protein supply chain faced similar challenges during much of the pandemic, with meat processing facilities across the nation being forced to close or restrict processing activity due to their high propensity for COVID-19 infections and spread amongst their workforces. These closures broadly impacted consumers and food producers alike, as shown by the increase in on-shelf meat prices; a decrease in available meat protein at the consumer and retail level; and farmers and ranchers facing the daunting alternatives to euthanize, give away, or retain market-ready livestock resulting in further economic losses.[14]

10 Jarzębowski, S., & Bezat, N. (2018). Supply Chain Management According to the Concept of Short Supply Chain. International Journal on Food System Dynamics.

11 Exemptions, 9 C.F.R. §303.1(a)(2), (2012). https://www.govinfo.gov/content/pkg/CFR-2012-title9-vol2/pdf/CFR-2012-title9-vol2-sec303-1.pdf

12 Held, L. (2020, May 26). As COVID-19 Disrupts the Industrial Meat System, Independent Processors Have a Moment to Shine. Civil Eats. https://civileats.com/2020/05/19/as-covid-19-disrupts-the-industrial-meat-system-independent-processors-have-a-moment-to-shine/.

13 Eschner, K. (2020, July 13). COVID-19 is Exposing the Food Deserts Around Native American Reservations. MSN. https://www.msn.com/en-us/news/technology/covid-19-is-exposing-the-food-deserts-around-native-american-reservations/ar-BB16FWoK.

14 Brown, H. C., & Fu, J. (2020, December 21). As Covid-19 Closes Meat Plants, What Happens to Prices and Supply? Your Questions, Answered. The Counter. https://thecounter.org/covid-19-shutters-meatpacking-plants-meat-shortages-smithfield-south-dakota/.

The transportation sector also saw significant disruptions during the height of the COVID-19 pandemic, drastically impacting agriculture and food supply chains. According to the U.S. Center for Disease Control and Prevention (CDC), long-haul truckers were and likely remain uniquely at risk for COVID-19 infections and spread.[15] United States ports have also faced backlogs, as imports have fallen off significantly as a result of labor shortages throughout the world. Social distancing measures require many places of business, including ports, to have fewer workers on the clock at one time.[16] A pandemic-driven increase in consumer demand exceeding available supply coincided with this decrease in shipping and transportation efficiency, further compounding food sourcing issues.

Disruptions in sourcing and transportation have created an enhanced strain on food storage systems. Many small farms and ranches that rely on outsourcing to process their products—including animals, fruits, and vegetables—do not have the in-house capability to store their agricultural products longer than a few days or weeks past their typical processing dates. Many of these agricultural enterprises have been unable to find replacement processors, resulting in goods "going bad" and significant economic losses.[17] While the federal government has established programs and loans designed to assist farms and ranches disrupted by the COVID-19 pandemic,[18] primarily through the U.S. Department of Agriculture (USDA) and Small Business Administration (SBA),[19] the extreme demand for federal loans and grants has made securing assistance difficult for many farmers and ranchers.[20] Farmers have been forced to plow good vegetable crop back into their fields. In contrast, ranchers have had to euthanize or donate otherwise marketable animals.

15 Centers for Disease Control and Prevention. (2020, May 15). What Long-Haul Truck Driver Employees Need to Know about COVID-19. Centers for Disease Control and Prevention. https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/long-haul-trucking-employees.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fcommunity%2Forganizations%2Flong-haul-trucking.html

16 DAT. (2021, February 26). COVID-19 impact on trucking and freight. DAT Freight & Analytics. https://www.dat.com/industry-trends/covid-19.

17 Thakkar, R. & Corinaldesi, G. (2020, May 12). Food Supply Chains and Covid-19. Duke Today. https://www.today.duke.edu/2020/05/food-supply-chains-and-covid-19.

18 USDA Pandemic Assistance for Producers. Farmers.gov. (2021, July 6). https://www.farmers.gov/pandemic-assistance.

19 U.S. Small Business Administration. (2020, August 18). Frequently Asked Questions Regarding Agricultural and Farm Loan Collateral Security and the SBA Economic Injury Disaster Loan Program (EIDL). https://www.sba.gov/sites/default/files/2020-09/Frequently%20Asked%20Questions%20Regarding%20Agricultural%20and%20Farm%20Loan%20Collateral%20Security%20and%20the%20SBA%20Economic%20Injury%20Disaster%20Loan%20Program%20%28EIDL%29-508.pdf.

20 McClain, S. D. (2020, April 15). Farmers Join Rush for SBA Relief Loans; Money Running Out. Capital Press. https://www.capitalpress.com/ag_sectors/smallfarm/farmers-join-rush-for-sba-relief-loans-money-running-out/article_6f153d7e-7f31-11ea-9431-979c836ccc73.html.


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The root cause of each of these issues was the COVID-19 pandemic causing global labor shortages. Initially, COVID-19 transmission and employee illness caused labor shortages, and meat processing facilities were particularly vulnerable and adversely affected. By April 2021, meatpacking plants accounted for 334,000 COVID-19 cases alone.[21] Beef and pork processing plants doubled COVID-19 outbreaks within their counties.[22] The labor shortage impact is still being felt across the food industry, impacting all sectors in the agriculture and food industry.

Native food systems and supply chains experience a range of needs and opportunities. Primacy and systemic redundancy incorporating reliable sourcing and culturally appropriate foods and investment in food systems reflect some of the major needs within Indigenous food systems. Opportunities that can address these needs include tribal food systems development, commitment to food sovereignty as a component of tribal sovereignty, targeted sourcing, economic development supporting up and downstream producers and operators in Indian Country, and off-reservation revenue capture.[23]

Photo cedit: jackienix - stock.adobe.com

21 Preidt, R. (2021, April 20). Meatpacking Plants Accounted for 334,000 U.S. COVID Cases. WebMD. https://www.webmd.com/lung/news/20210420/meatpacking-plants-accounted-for-334000-us-covid-cases.

22 Id.

23 Fletcher, M. L. (2008). Indian tribal businesses and the off-reservation market. Lewis & Clark Law Review, 12(4), 1063.

NEEDS

PRIMACY

Many Indigenous communities reside in food deserts, with federal nutrition programs serving as an integral component for food access. These programs federally source foods from all areas of the U.S., even when these same or similar foods are produced locally.[24] Even when large portions of Indigenous communities do not access federal feeding programs, the available food sources are generated from places outside of the reservation and incorporate foods that are not produced or sourced from local or tribal producers.[25]

Tribes cannot be genuinely sovereign unless they can feed their people. Currently, the vast majority of food available on reservations originates in locations off-reservation or outside of Indigenous communities.[26] Reliance on food sources that are not produced locally and/or tribally precludes Indian Country's interest in promoting food sovereignty.[27] Primacy of food sources, that is, transitioning from national and off-reservation foods to local and tribally produced foods as primary foods offered on reservations, reduces reliance on non-tribal foods and empowers local production and tribal agriculture. By designating tribally produced and sourced food offerings as priority, Tribes can influence the policies of food production and distribution to create "closed-loop" food systems.

SYSTEMIC REDUNDANCY

While the COVID-19 pandemic did not break existing Indigenous food systems, pre-existing pitfalls exacerbated issues. As processing facilities bottlenecked the food supply chain and closed or significantly reduced operations, ingrained efficiencies like "just in time" operations to the supply chain broke down.[28] "Just in time" production counts on availability of the next step in the supply chain to have the capacity to receive the product at the time of completion. For livestock producers, that is when stock has reached market weight.

Systemic efficiencies only work when the system operates within the tolerances.[29] If capacity for processing, excess production, or labor shortage are exacerbated beyond systemic tolerances, systemic redundancies are currently insufficient to absorb the impacts of the variation.[30] A survey of procurement and supply chain managers from across

24 Warne, D., & Wescott, S. (2019). Social Determinants of American Indian Nutritional Health. Current developments in nutrition, 3(Suppl 2), 12–18. https://doi.org/10.1093/cdn/nzz054

25 LaDuke, W., Brown, F., Kennedy, N., Reed, T., Warner, L., & Keller, A. (n.d.). Sustainable Tribal Economies: A Guide to Restoring Energy and Food Sovereignty in Native America. https://www7.nau.edu/itep/main/iteps/ORCA/3347_ORCA.pdf.

26 https://indiancountrytoday.com/archive/what-is-a-food-desert-do-you-live-in-one-235-million-in-this-country-do

27 https://d3n8a8pro7vhmx.cloudfront.net/themes/524d95ff9670a41eab000002/attachments/original/1388422349/Sustainable_Tribal_Economies_HTE.pdf?1388422349

28 https://hungercenter.org/wp-content/uploads/2021/05/Cultivating-Resilience-Indian-Country-Olivia-Chan-Joel-Anderson-IFAI.pdf (Page 42)

29 https://arrellfoodinstitute.ca/covid-19-food-system/

30 https://www.thedenverchannel.com/news/national/pandemic-related-food-supply-chain-disruptions-gave-smaller-meat-processing-plants-more-business

industries indicates that nearly 47 percent are "reducing reliance on single/few factories" like processing facilities as part of their longer-term supply chain resilience strategy.[31] By developing this infrastructure, food producers will have multiple access points to sell and produce for value-added processing, supporting alternative market channels if one processing facility can no longer receive product. Notably, developing this redundancy may be time and capital-intensive but fundamental to achieving lasting food security.

CULTURALLY APPROPRIATE FOODS

Available proteins in food systems currently serving Indian Country have become inconsistent with traditional Indigenous dietary requirements.[32] Access to culturally appropriate foods has become very limited with profound impacts on health and culture.[33] The demand for culturally relevant foods is not currently being met, resulting in untapped markets to serve. By incorporating appropriate and culturally relevant foods into tribal food economies, "traditional and cultural food security" is increased.[34] Traditional and cultural food security includes culturally relevant food practices impacting the following:

a. Availability of local, healthy and traditional foods

b. Revitalization of traditional farming systems to enhance interaction of individuals with their environmental companions

c. Enhancement and spread of household and community knowledge of traditional foods and procurement and preparation methods

d. Adequate time and financial resources to acquire and prepare traditional foods

e. Equivalence of desired and actual consumption of traditional foods.

31 Van Hoek, Remko. (2021). Larger, counter-intuitive and lasting – The PSM role in responding to the COVID-19 pandemic, exploring opportunities for theoretical and actionable advances. Science Direct, 27(3), 100688.

32 https://www7.nau.edu/itep/main/iteps/ORCA/3347_ORCA.pdf (page 22)

33 https://ourenvironment.berkeley.edu/sites/ourenvironment.berkeley.edu/files/user/profile2/main/publications/Sowerwine%20et%20al_Reframing%20Native%20American%20Food%20Insecurity.pdf

34 https://ourenvironment.berkeley.edu/sites/ourenvironment.berkeley.edu/files/user/profile2/main/publications/Sowerwine%20et%20al_Reframing%20Native%20American%20Food%20Insecurity.pdf

INVESTMENT IN FOOD SYSTEMS

While over 3.5 billion dollars is generated from Indian Country agriculture,[35] the majority of those revenues is from production agriculture. The missing link in capturing an even greater return to Indian Country agriculture is systemic investment in food systems. As most of agricultural revenue in Indian Country is from farm production sales, there is additional opportunity to capture even more revenue by investing in value-added agriculture. By adding just one additional step, food processing, to the supply chain in product development, an additional 15 percent of total food dollars spent could be recaptured.[36] Currently, only about 7.3 percent of food dollars spent are attributable to production sales. Therefore, processing capacity alone could more than double the revenue shares captured by Indian Country agribusiness producers and operators. This difference amounts to an additional $3.7 billion in revenue that would be available for tribal communities and food systems. The potential to capture additional revenues from value-added agriculture could exceed even that of the Tribal gaming industry.

35 Perdue, Sonny and Hubert Hamer (April 2009). 2017 Census of Agriculture: United States Summary and State Data. USDA National Agricultural Statistics Service, AC 17-A-51, 1(51), Table 61: 72.

36 https://hungercenter.org/wp-content/uploads/2021/05/Cultivating-Resilience-Indian-Country-Olivia-Chan-Joel-Anderson-IFAI.pdf

OPPORTUNITIES

TRIBAL FOOD SYSTEMS DEVELOPMENT

In order to address the deficiencies in primacy, systemic redundancy, availability of culturally appropriate foods, and investments in food systems, a renewed focus on tribal food systems development must occur. By emphasizing tribal sovereignty through food sovereignty, integrative sourcing opportunities, food and agriculturally based economic development, and off-reservation revenue collection, Tribes and tribal communities can reassert tribal priorities and preferences in strengthening and expanding tribal food systems, creating resilient and sustainable local food economies serving tribal peoples.

FOOD SOVEREIGNTY

Historical treatment of Indigenous Peoples in North America has resulted in a separation from traditional and culturally relevant food sources and practices.[37] As federal Indian policy over the last 200 years has left many tribal communities dependent on federal nutrition programs, tribal self-determination, concerning food and agriculture systems, is experiencing a resurgence. By getting into the proverbial driver's seat, Tribes can assert tribal food priorities reflecting the needs and demands of the tribal community.[38]

SOURCING

In order to create a locally circular tribal food system with shortened supply chains, Tribes must be able to source from within in the community. By leveraging self-sourcing opportunities to meet existing demand in tribal programs like schools, health care facilities, daycares, and elder services, Tribes reinject dollars into the tribal economy.[39] Local tribal producers are benefitted allowing their operations to become resilient and sustainable and further recirculating dollars in the tribal economy.

37 Coté C. "Indigenizing" Food Sovereignty. Revitalizing Indigenous Food Practices and Ecological Knowledges in Canada and the United States. Humanities. 2016; 5(3):57. https://doi.org/10.3390/h5030057
38 Sowerwine, J., Sarna-Wojcicki, D., Mucioki, M., Hillman, L., Lake, F., & Friedman, E. (2019). Enhancing Food Sovereignty: A Five-year Collaborative Tribal-University Research and Extension Project in California and Oregon. Journal of Agriculture, Food Systems, and Community Development, 9(B), 167-190. https://doi.org/10.5304/jafscd.2019.09B.013
39 Givens, Maria (2020), Many Faces of Sovereignty: One Tribe's Story of Reclaiming its Food System, The Daily Yonder. https://dailyyonder.com/many-faces-of-sovereignty-one-tribes-story-of-reclaiming-its-food-system/2020/06/12/

Additionally, Tribes can vertically integrate their own resources, shoring up access to desired food and agricultural products for service-based and revenue-driven operations.[40] Vertical integration further allows Tribes to capitalize on economies of scale and scope. This scale carries two primary advantages. First, seamlessly maintaining operations allows the Tribe to build on its efficiencies in providing products and services. Second, this integration supports greater coordination across procurement, staging the Tribe as a preferred buyer for necessary supplies.

In addition to sourcing on reservation or within the community, leveraging external resources to inject non-tribal dollars into the community is also beneficial. Federal nutrition programs are currently piloting self-sourcing opportunities through the Food Distribution Program on Indian Reservations, wherein Tribes are authorized to source foods of their choice to fill the commodity offerings in substitution of those offered through USDA. When Tribes use federal dollars to purchase locally produced and processed products, external dollars flow back to tribal producers and operators, again recirculating the tribal economy. Tribes also benefit from direct relationships with local suppliers and can make real-time decisions regarding sourcing versus being dependent upon availability of the food commodities offered through USDA and also choose more culturally relevant and in-demand foods beyond USDA's offerings.[41]

40 Id.

41 Muciok, Megan, Jennifer Sowerwine, Daniel Sarna-Wojcicki, Thinking inside and outside the box: local and national considerations of the Food Distribution Program on Indian Reservations (FDPIR), Journal of Rural Studies, Volume 57,2018, Pages 88-98.

COMPONENTS OF A MEAT PROCESSING FACILITY

THE PROCESS: EQUIPMENT, MACHINERY, DESIGN

Because different species require different equipment and machinery, facility design and equipment specifications will depend largely on the type or types of livestock to be processed and the intended end product or products. However, some general guidelines apply to every facility that will process cattle, calves, sheep, goats, and hogs.[42] Every facility that processes larger livestock will have areas in common, such as animal holding areas, slaughter areas, coolers, freezers, storage facilities, and waste management facilities. All facilities should be built strong enough and tall enough to prevent livestock from escaping and withstand the weight of the animals. However, the exact design and specifications of each area will need to address the specific needs of the processing facility.[43] For example, a facility that will only process goats will not need as much storage or freezer space as a facility that will also process bison.

The intended end-product will also shape the equipment, machinery, and design of any processing facility. Whether the facility will process basic cuts of meat, ground or mixed products, or smoked or cooked products will determine equipment procurement.

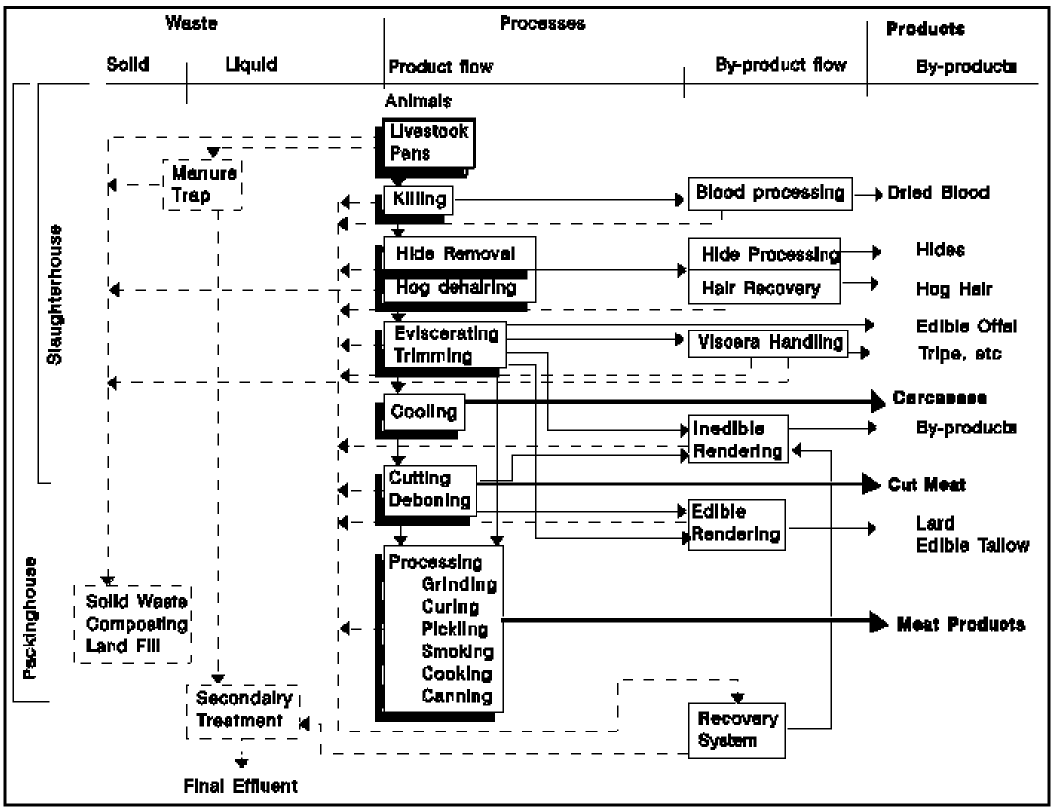

Figure 1. "Management of Waste from Animal Product Processing." Food and Agriculture Organization of the United Nations, USAID, World Bank, and LEAD

42 USDA/NCDA&CS FACILITY GUIDELINES FOR MEAT PROCESSING PLANTS, Federal Register Vol. 62, No. 164 / Monday, August 25, 1997, https://www.ncagr.gov/MeatPoultry/pdf/Facility%20Guidelines.pdf

43 Thiboumery, Arion. "Guide to Designing a Small Red Meat Processing Plant: with Two Sizes of Model Designs," Iowa State University, University Extension, April 2009. https://store.extension.iastate.edu/product/13058 https://www.sare.org/wp-content/uploads/Guide-to-Designing-a-Small-Red-Meat-Plant.pdf

Many facilities also harvest byproducts, like organs. Some facilities even harvest more uncommon products, such as pork snouts, pork skins, edible fats, and hormones for use in pharmaceuticals.[44] Byproduct processing often requires specialized equipment that will need to be implemented into the facility design. Figure 1 details the fundamental processes and flow of operations for meat processing facilities.

OPTIONS AND ALTERNATIVES

While every facility will have common needs, as discussed above, how those needs are met are largely determined by the goals of the facility. This variation allows for a significant amount of flexibility across several steps of facility design. Facility areas such as animal pens, storage, and freezers will vary in size based upon the size of the livestock being processed. Other areas, such as the slaughter area, have even greater design flexibility. The actual slaughter of livestock in the United States is regulated by the Humane Slaughter Act,[45] which provides protection for animals by mandating ethical slaughter methods. As long as the baselines provided by the Humane Slaughter Act are met, the method of slaughter depends on the livestock and facility preference. For example, livestock and bison are typically stunned using a bolt stunning system, while hogs are generally stunned using electro-stunning.

Design variations and alternatives will also be found in facilities depending on their desired end-product. Packaging and shipping machinery will vary depending on if the facility will focus primarily on ground beef or basic cuts, or if the facility will manufacture "value-added" products, such as smoked meats, deli meats, and other high-end products.[46] The desired end-product will be a business decision and can vary greatly depending entirely on the preference of the facility owners.

Waste management systems also differ from plant to plant and should be considered carefully by the facility builders. If local, state, tribal, and federal environmental laws are not followed or consulted, an insufficient waste-management system can result in environmental damage resulting in costly penalties for the facility, including potential litigation.[47] One of the first stages of waste treatment usually involves dissolved air flotation ("DAF"). DAF involves dissolving air in wastewater under pressure, then releasing the air into tanks, where the waste can be skimmed from the water.[48] Depending on facility needs and which waste

44 https://www.britannica.com/technology/meat-processing/By-products

45 9 CFR Part 313

46 https://www.unlimitedfuture.org/wp-content/uploads/2019/07/Value_Added_Processing_Business_Plan.pdf

47 Kohler, Judith. "Lawsuit accuses JBS USA of illegal releases of slaughterhouse waste into South Platte tributary near Greeley," Denver Post, May 23, 2019. https://www.denverpost.com/2019/05/23/jbs-usa-lawsuit-waste-south-platte-greeley/;Neighbors complain about Muscogee (Creek) Nation meat processing plant south of Glenpool, Rhett Morgan, March 26, 2021. https://tulsaworld.com/business/neighbors-complain-about-muscogee-creek-nation-meat-processing-plant-south-of-glenpool/article_dfdd6ba4-8e57-11eb-8f61-87dc413af448.html

48 Lawrence K. Wang; Yung-Tse Hung; Howard H. Lo; Constantine Yapijakis (2004). Handbook of Industrial

treatment system best fits the facility site, processing plants can also use a lagoon system, an aerobic system, or an anaerobic system. See "Technical Requirements" below for a discussion on waste treatment systems.

BASIC INFRASTRUCTURE

No matter the specific needs of the facility, the basic infrastructure needs will remain constant. The first need is water. The facility's water supply must have ample pressure to be used throughout the facility and must be potable—meeting the National Primary Drinking Water Regulations by the EPA.[49] Next, the facility must have an adequate power supply to run all the facility's machinery, lights, and freezers. Because temperature control is of the utmost importance in maintaining a sanitary facility, a facility's temperature control must be monitored and well-maintained.[50] Every facility must also maintain adequate employee facilities, to ensure the safety and well-being of each employee and office space in or near the facility to facilitate official site inspections. See "Technical Requirements" below for additional discussion.

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and Hazardous Wastes Treatment (2nd ed.). CRC Press.

49 https://www.ncagr.gov/MeatPoultry/pdf/Facility%20Guidelines.pdf

50 Id.

REGULATORY ENVIRONMENT

USDA REGULATIONS

Federal Meat Inspection Act

The Federal Meat Inspection Act (FMIA) sets a national inspection standard for all commercial sales of meat products[51] in the United States. FMIA applies to both animal slaughter and meat processing, as well as the final meat products offered for sale. Under this law, a meat product is "any product intended for human consumption, wholly or in part, from the carcass or parts of any cattle, sheep, swine, and goat."[52] So, if an operation is slaughtering and processing any of those animals (cattle, sheep, swine, or goat), and any part of the meat will be sold for human consumption, then this law applies. This includes meat processed on Tribal lands unless the facility meets an exemption. Examples of exemptions are provided below.

The federal agency that is responsible for carrying out the provisions of the FMIA is the Food Safety Inspection Service, or FSIS, which is part of the U.S. Department of Agriculture. Generally, FMIA requires that any meat sold commercially within the United States must be inspected before it can be sold—but who can inspect it? Even though FSIS is the main regulator, FSIS may not be the right regulator for every meat processor—the right inspector depends on a few factors, including where products are being sold and who is buying the products. FMIA leaves meat processors with four options for inspections:[53]

a. Federal Inspection by USDA-FSIS. (21 U.S.C. 601, et seq.)

If you want to sell and/or ship meat products outside of Tribal jurisdiction, across state lines, or even internationally, you will most likely have to have federal facility inspection by USDA-FSIS. Once your meat products are USDA-inspected, you can sell them in a variety of different ways, including wholesale, at retail outlets, or even direct to consumer. Because your products have a larger market and can reach more people, your facility will be required to develop and use a HACCP Plan (Hazard Analysis and Critical Control Point Plan) as well as SSOP's (Sanitation Standard Operating Procedures). These documents must be written and kept onsite at your facility, and employees must be trained on them.

51 Federal Meat Inspection Act, 21 U.S.C. et seq.

52 USDA-FSIS, Summary of Federal Inspection Requirements for Meat Products, Sept. 2015, available at https://www.fsis.usda.gov/sites/default/files/media_file/2021-02/Fed-Food-Inspect-Requirements.pdf.

53 The Niche Meat Processor Assistance Network did a short series on meat processing regulations for both meat and poultry that is a great resource for processors. Niche Meat Processor Assistance Network, Beginner's Guide to Local Meat Processing, https://www.nichemeatprocessing.org/beginners-guide-to-local-meat-processing/.

A good example of this kind of meat processing facility from Indian Country is the Quapaw Cattle Company, which was the first federally inspected slaughter facility to be built on tribal trust land. As a USDA-inspected plant, Quapaw's facility had a USDA-FSIS inspector onsite, and animals slaughtered at the facility were under continuous inspection from the time of their arrival all the way through to packaging and distribution of meat products. Meat processed at this facility was also graded at the same time. Quapaw's facility was home to the first Native USDA meat grader in the country.

b. State inspection by state regulators. (21 U.S.C. 661)

Please note: State inspection of facilities on Tribal lands has serious legal implications and could potentially imperil Tribal sovereignty if legal measures are not taken to preserve that status.

Meat products can be inspected by state inspectors instead of federal inspectors when the meat products are not being sold outside of state jurisdiction. If the products are being sold outside of the state, the only way they can qualify for state instead of federal inspection is through participation in the Cooperative Interstate Shipment, or CIS program. It is unlikely that Tribally-owned facilities will meet the criteria for this inspection option or would even want to go this route, but individual Native-owned facilities might if they are located outside of a Tribe's jurisdictional boundaries.

For individual Native-owned meat processing facilities that are not located on Tribal lands and are only selling meat within one state, they will likely only need state inspection. Each state will be a little different. Some states, like Washington, have basically given up their own inspection authority and only have federal inspectors. Other states, like Arizona, maintain a robust state inspection service. USDA keeps a table of which states have their own inspections and which do not, and an individually Native-owned meat processing facility that is not on Tribal lands will want to check that list and then check directly with state regulators about who will conduct inspections.[54]

54 USDA-FSIS, "States With and Without Inspection Programs," available at https://www.fsis.usda.gov/inspection/apply-grant-inspection/state-inspection-programs/states-and-without-inspection-programs.

c. Custom-exempt (but still inspected by FSIS/and or state). (9 CFR 303.1(a)(2)).

Food safety in meat processing is so serious that even facilities that are exempt might still have to be inspected. That's the case with Custom-Exempt facilities. Custom-exempt facilities are able to slaughter and process livestock, but no products from that facility can be sold. The facility processes the meat for the owner of the animal, then returns the processed product to the owner for their own exclusive use. The meat will usually be marked "NOT FOR SALE," and the owner cannot sell that product either.

Custom-exempt processors do not have on-site federal inspectors, but they do still have to comply with some legal requirements around food safety and recordkeeping. These facilities are not inspected daily, but they are still inspected on a routine basis. FSIS and/or state authorities can do these inspections. For a Tribe, it will likely be FSIS, the federal regulator, unless the facility is not on Tribal land.

d. Retail-exempt (but still inspected by FSIS/and or state). (9 CFR 303.1(f)(iv)(a)(6))

This exemption is for retail outlets, including storefronts and restaurants, only—retail exempt business cannot slaughter livestock, but they can offer raw meat products for sale without daily inspection. The meat sold also must have been inspected properly, either with federal or state inspection.

There are pros and cons to each of these options, and there is no one-size-fits-all answer to a Tribally operated meat processor trying to decide which of these is best—although option #2 is probably a nonstarter for most facilities operating on Tribal lands. For Tribal businesses that are seeking access to larger retail markets, where commercial sales and revenue generation is the goal, it may make more sense to seek federal inspection or even state inspection if the Tribe has a good relationship with that state or could negotiate some kind of Memorandum of Understanding (MOU) with the state to ensure that Tribal sovereignty is both protected and respected. For Tribal businesses that intend to be smaller in reach and serve mostly/only the reservation community, the Retail-Exempt option might be a good fit. For Tribes that are looking to invest in meat processing as a social benefit to the community and not a revenue generator, the Custom-Exempt option might be the best way forward.

SUGGESTED RESOURCES

Niche Meat Processors Association, Beginners Guide to Local Meat Processing. This short, 4-part series covers all the inspection types above, discusses the economics of small plants, and provides a preparation checklist for anyone preparing to enter the meat processing space. While it does not specifically address Tribal Nations, FMIA is a federal law of general applicability and does apply on Tribal lands, so the guidance offered is still very helpful.

FSIS, Summary of Federally Inspected Meat Products. This is a short brochure developed by FSIS that covers different types of inspection and facilities.[55]

Farm to Consumer Legal Defense Fund, Red Meat Map and Chart. This map and chart offers a comprehensive review of every state's custom facility and on-farm slaughter regulations.[56] This will be most useful for individual Native farmers who live on non-Tribal lands and might be interested in on-farm field dressing or other custom slaughter.

55 Summary of Federal Meet Inspection Requirements for Meat Products.
56 Farm to Consumer Legal Defense Fund, "Red Meat Map and Chart," Feb. 25, 2021, available at https://www.farmtoconsumer.org/red-meat-map/.

1 Additional Exemptions

In addition to the two exemptions outlined above (Custom and Retail), there is also a related Personal Use exemption. This is very similar to the Custom Exempt processor, but here, the processor is also the owner of the livestock. This meat still cannot be sold and can only be eaten or served to members of the owner's family or non-paying guests. This will not be an option for any processor that wants to generate revenue but offers protection for livestock operators from any overzealous regulators.

2 HACCP and SSOP's. 9 CFR 417.

Federally inspected meat processing facilities are required to have both a HACCP plan and SSOP's, in addition to other documents. HACCP stands for "Hazard Analysis and Critical Control Points" and is basically a very thorough food safety plan for your facility. It starts with a hazard analysis— looking at every place and process in your facility where there might be food safety concerns— and follows up with critical control points, or points along the processing chain where someone in your facility is responsible for monitoring and recording data that helps you make sure food is safe. This might be checking and recording temperature readings in a freezer or recording cleaning and sanitizing procedures on a particular machine. Every facility's plan will differ, but by definition, a HACCP plan includes these seven principles:

- Principle 1: Conduct a Hazard Analysis
- Principle 2: Identify the Critical Control Points
- Principle 3: Establish Critical Limits for Each Critical Control Point
- Principle 4: Establish Monitoring Procedures
- Principle 5: Establish Corrective Actions
- Principle 6: Establish Verification Procedures
- Principle 7: Establish Recordkeeping Procedures

Because every HACCP plan is different and specific to the meat product being processed, it may be helpful to take a look at the generic HACCP plans that FSIS provides. These are periodically updated when regulations change and can be found on the FSIS website.[57]

Preparing the Plan

By regulation, every facility must have someone trained in HACCP prepare the facility's HACCP plan. That person does not have to be a full-time employee—it could be a paid consultant, or subject matter expert volunteering their services—they just have to be trained in a program that incorporates all 7 HACCP principles.[58] There are a variety of HACCP training programs offered both virtually and in person. Costs for this training may vary.

HACCP plans don't need to be developed by that one person alone, and FSIS actually recommends a team. FSIS includes this and other advice in their resource for developing HACCP plans—the Guidebook for the Preparation of HACCP Plans.[59] The most recent version was released in September 2020 and walked through the entire process of developing a plan, incorporating all relevant regulations.

Elements of HACCP—the SSOP's

Sanitation Standard Operating Procedures, or SSOP's, are required to be developed and included as part of each facility's HACCP plan. These are written plans that outline all of the rules you have developed for your facility that keep your food safe and free from contamination by dangerous pathogens. These are things you will do daily, and your plan has to address that daily management, in addition to other components. FSIS has a guide to developing SSOPs that can be helpful in putting your own plan together.

57 USDA-FSIS, "Guidelines," available at https://www.fsis.usda.gov/policy/fsis-guidelines?keywords=meat%20%2B%20beef%20%2B%20pork

58 9 CFR § 417(b)

59 USDA-FSIS, Guidebook for the Preparation of HACCP Plans, https://www.fsis.usda.gov/sites/default/files/media_file/2021-03/Guidebook-for-the-Preparation-of-HACCP-Plans.pdf.

Poultry Products Inspection Act

Much like meat processors, there is a national standard for poultry slaughter, processing, and sale of poultry products. This is the Poultry Products Inspection Act, or PPIA, a federal law that provides a basis for inspection and sales standards for poultry. Also similar to meat processing, the PPIA is regulated at the federal level by the Food Safety Inspection Service (FSIS) at USDA. Under PPIA, "poultry" means "any domesticated bird, whether alive or dead." Facilities or operations that slaughter, process, or sell poultry for human consumption will need to comply with the PPIA.

Regulations and Exemptions

Just like meat, poultry products must be inspected before sale, and the four options outlined above for FMIA processing (federal inspection, state inspection, Custom-Exempt, and Retail Exempt) are also available for poultry products. Personal Use is also an exemption for poultry, just like meat. Unlike meat processing, a poultry operator may only operate under one of these exemptions during a calendar year.

Producer/Grower—1,000 Exemption

Unlike meat, there are some additional opportunities for exemption for producers who raise, slaughter, and/or process no more than 1,000 birds in a calendar year. For these smaller growers, they can raise, slaughter, and sell birds for human food without any mandatory inspections under PPIA as long as:

- They raise and slaughter no more than 1,000 healthy birds in a calendar year
- They do not buy or sell poultry products other than those they raise on their own operation
- The poultry products they produce are safe for human consumption and produced under sanitary conditions
- They keep all required records
- And they only sell poultry products within one state.
- There is no guidance in PPIA for growers selling only within Tribal jurisdiction meeting this exemption. This would probably be determined on a case-by-case basis, and Tribal attorneys should probably be consulted in the event that a Tribal poultry operation's sales area is within Tribal boundaries, but the Tribal boundaries overlap multiple state jurisdictions.

Producer/Grower—20,000 Exemption

This exemption is similar to the 1,000-bird exemption but incorporates additional criteria that growers must meet. These producers may sell directly to consumers, hotels, restaurants, retail stores, and similar institutions. In addition to all the requirements for the 1,000-bird exemption, growers of no more than 20,000 birds may be exempt from mandatory inspections under PPIA if they also:

Only distribute poultry products they slaughtered under this exemption—no additional processing or poultry sales;
Their slaughter facility used to process their poultry isn't used to slaughter anyone else's poultry unless FSIS grants an exemption (for example, renting the facility may be possible);

Shipping containers must have a label that includes the producer's name, address, and the statement, "Exempt P.L. 90-492" (or, if using a state exemption, the state law number may be used instead).

Producer/Grower or Other Person (PGOP) Exemptions

Sanitation Standard Operating Procedures, or SSOP's, are required to be developed and included as part of each facility's HACCP plan. These are written plans that outline all of the rules you have developed for your facility that keep your food safe and free from contamination by dangerous pathogens. These are things you will do daily, and your plan has to address that daily management, in addition to other components. FSIS has a guide to developing SSOPs that can be helpful in putting your own plan together.[60]

Small Enterprise Exemption

This exemption from PPIA would be for an individual grower, business purchasing live birds that they slaughter, business purchasing inspected birds or birds from a 1000-20000 exemption farm. These small enterprises are able to cut up and distribute poultry products, provided they only sell within state boundaries and only sell to consumers directly, retail stores, hotels, restaurants, or distributors. Similar to the 1,000 grower language, there is no clear guidance on selling within tribal jurisdictional boundaries when the tribal jurisdiction crosses multiple state lines. Tribal operations considering this exemption who are selling in that situation should work with their Tribal attorney to determine the best path forward. FSIS produced a guide to all PPIA exemptions. Although written in 2006, it is still a helpful walkthrough of potential poultry exemptions.

60 USDA-FSIS, Sanitation Standard Operating Plans, https://www.fsis.usda.gov/sites/default/files/media_file/2021-01/Sanitation-SOP-Guide.pdf

SUGGESTED RESOURCES

FSIS produced a guide to all PPIA exemptions. Although written in 2006, it is still a helpful walkthrough of potential poultry exemptions.[61] FSIS staff have also done a detailed walkthrough of four of these exemptions; that presentation can be downloaded from the FSIS website.[62] See Figure 2 for a charted breakdown of regulatory applicability.

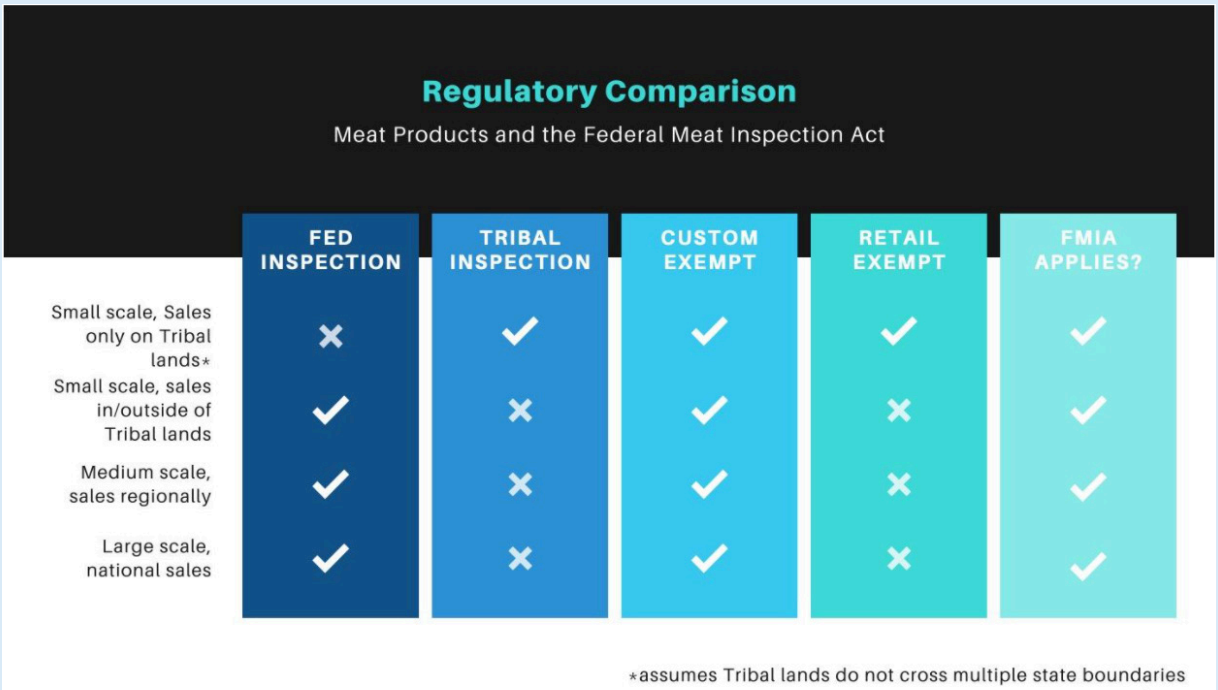

Figure 2. Meat and Poultry Processing Regulatory Comparison Chart (E. Parker 2021)

61 USDA-FSIS, Guidance for Determining Whether a Poultry Slaughter or Processing Operation is Exempt from Inspection Requirements of the Poultry Products Inspection Act, April 2006, https://www.fsis.usda.gov/sites/default/files/import/Poultry_Slaughter_Exemption_0406.pdf

62 USDA-FSIS, FSIS-GD-2010-0006, Poultry Exemptions Under the Federal Poultry Products Inspect Act, January 2010, https://www.fsis.usda.gov/guidelines/2010-0006

Humane Methods of Slaughter Act

The Humane Methods of Slaughter Act (HMSA) is a federal law of general applicability that intends to establish a national standard for the humane treatment of livestock prior to and during slaughter. The HMSA is administered at the federal level by USDA-FSIS. The HMSA only applies to livestock, which by definition in the law are: cattle, calves, horses, mules, sheep, swine, goats, and other equines.[63] To humanely slaughter any of those animals in compliance with the law, you must first render the animal insensitive to pain. This can be accomplished through a variety of methods, including "by a single blow or gunshot or an electrical, chemical or other means that is rapid and effective."[64] Regulations make it clear that this can include gassing using carbon dioxide gas, captive bolt stunners, firearms, and electrocution, but different methods may be more or less humane depending on the animal, so anyone slaughtering any of this livestock should look at the regulations closely before proceeding.[65]

Exemptions and Exclusions

Ritual Slaughter, §1902(b); 1906.

The HMSA specifically exempts religious ritual slaughter, which is defined as slaughter done "in accordance with the ritual requirements of the Jewish faith or any other religious faith that prescribes a method of slaughter whereby the animal suffers loss of consciousness by anemia of the brain caused by the simultaneous and instantaneous severance of the carotid arteries with a sharp instrument and handling in connection with such slaughtering."

Poultry Excluded

The HMSA only applies mandatory humane slaughter methods to certain types of livestock, as discussed above. It does not apply to poultry.

63 HMSA § 1902(a); 9 CFR § 313.15-.16
64 HMSA § 1902(a)
65 9 CFR § 313.1 et seq.

Labeling

There are federal labeling standards that apply to the sale of all meat and poultry products. This section provides a brief overview of these regulations generally but does not go into specific detail about any labeling requirements that may be necessary when a processor is doing business under one of the several exemptions to FMIA or PPIA. Processors should check those exemptions for specific language. This overview also does not offer any specific advice about intellectual property concerns in labeling.

USDA has broad authority under both FMIA and PPIA to regulate product labels, specifically, to prevent "the use of any false or misleading mark, label, or container."[66] Products that are mislabeled may be considered "misbranded" under the FMIA or PPIA. The company selling those products can be subject to a wide range of penalties depending on the severity of the misbrand, including products detained or prohibited from sale or even withdrawal of a grant of federal inspection for the facility, which could have disastrous effects on the business.

Before a meat or poultry label can be used on products for sale, FSIS requires the label to receive prior approval. The Agency reviews thousands of new labels a year, so the process can take some time from submission to review to approval. Third-party label review and audit companies can assist companies in label development and even help expedite review, but it is not a requirement to use these third-party companies, and their services may even be cost-prohibitive for smaller businesses. Regardless of whether or not you choose to use a third-party auditor, your label must be submitted to FSIS for approval before it can be used. Labels can be submitted through their online Label Submission and Approval System (LSAS).[67]

Both meat and poultry labels require certain information to be included. In addition to this mandatory information, the placement of the information also matters, with some information required to be on the product's "principal display panel" and some allowed to be included in the information panel instead. Generally, a meat or poultry label will require: product name, inspection legend (or exemption language, if exempt), address of the seller, handling, net weight or quantity, ingredient statement, safe handling instructions, and a nutrition facts panel. The University of Minnesota Extension provides a good, quick overview of these label components on their Extension website[68], as does the American Meat Science Association's Anatomy of a Meat Product Label, which also helpfully includes a sample.[69]

66 Eds. Post, R., et al, A Guide to Federal Food Labeling Requirements for Meat, Poultry, and Egg Products, Aug. 2007, pg. 5, available at https://www.fsis.usda.gov/sites/default/files/import/Labeling_Requirements_Guide.pdf

67 USDA-FSIS, "Label Submission and Approval System (LSAS)." https://www.fsis.usda.gov/inspection/compliance-guidance/labeling/label-submission-and-approval-system-lsas

68 University of Minnesota Extension, "Understanding a meat label," available at https://extension.umn.edu/beef/understanding-meat-label

69 Dr. Anna Dilger and Martin Overholt, "Anatomy of a Meat Product Label," American Meat Science

EPA REGULATIONS

National Environmental Policy Act

The National Environmental Policy Act (NEPA) establishes federal environmental protection standards and provides remedies for people and communities injured by a project's noncompliance. NEPA is administered and enforced by the Environmental Protection Agency (EPA). Because NEPA is a federal law, facilities located in Indian Country—including on reservations—must comply with NEPA's requirements.[70] Of particular application to meat processing facilities is the Meat and Poultry Products Guidelines and Standards section of NEPA,[71] which establishes standards for wastewater discharges from meat processing facilities.[72]

Any facility planning on using chemicals as refrigerants, cleaners, or for any other purpose must also ensure compliance with the Clean Air Act,[73] which establishes national air pollution standards.

The Clean Water Act[74] limits the discharge of pollutants into navigable waters of the United States without a permit. Many meat processing plants access discharge permits for point source wastewater disposal through the National Pollutant Discharge System.[75]

Association, 2015, available at https://meatscience.org/docs/default-source/publications-resources/fact-sheets/anatomy-of-a-meat-product-label.pdf?sfvrsn=aa518eb3_0#:~:text=The%20USDA%20requires%20nutrition%20labeling,pork%20loin%20or%20beef%20ribeye

70 Compliance & Enforcement in Indian Country | Environmental Protection in Indian Country | US EPA

71 40 CFR 432

72 Meat and Poultry Products Effluent Guidelines | Effluent Guidelines | US EPA

73 42 U.S.C. §§ 7401-7671

74 33 U.S.C. §1251 et seq. (1972)

75 NPDES Permit Basics. EPA website, https://www.epa.gov/npdes/npdes-permit-basics

FDA REGULATIONS

As indicated above, in accordance with the Federal Meat Inspection Act, USDA is responsible for inspection of amenable species, which include cattle, sheep, swine, goats, horses, mules, or other equines, including their carcasses and parts. It also covers any additional species of livestock that the Secretary of Agriculture considers appropriate.[76] The Food and Drug Administration (FDA), is responsible for regulatory oversight and inspection for nonamenable species intended for consumption, including non-specified red meats (bison, rabbits, game animals, zoo animals and all members of the deer family including elk (wapiti) and moose) and all non-specified birds including wild turkeys, wild ducks, and wild geese.[77] Chapter 5 of the FDA Investigations Operating Manual sets out the protocol for inspections of establishments handling the above nonamenable species.[78] While amenable species under USDA regulation may be federally inspected without additional cost, at this time USDA only provides fee-for-service inspection for products prepared from reindeer, elk, deer, antelope, water buffalo, bison, rabbits, migratory waterfowl, and game bird products.[79]

The Current Good Manufacturing Practice, Hazard Analysis, and Risk Based Preventive Controls for Human Food section of the Code of Federal Regulations sets standards against which food safety is measured.[80] This section is also commonly referenced as the Preventive Controls for Human Foods rule under the Food Safety Modernization Act. Owners and operators must build a food safety plan under these regulations. The FDA offers guidance and a plan-building tool to assist with that task (See citation for link).[81] FDA also oversees recalls, a method of removing or correcting consumer products that are in violation of laws administered by the FDA. Information on recall guidance, policy, procedures, and industry responsibilities can be found in the FDA's enforcement policy.[82]

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76 U.S. Food and Drug Administration, (2021). Investigations Operations Manual (p. 3-24). https://www.fda.gov/media/76769/download

77 U.S. Food and Drug Administration, (2021). Investigations Operations Manual (p. 3-24). https://www.fda.gov/media/76769/download

78 U.S. Food and Drug Administration, (2021). Investigations Operations Manual. https://www.fda.gov/media/76769/download

79 USDA, (2019). What animals are inspected by the United States Department of Agriculture? https://ask.usda.gov/s/article/What-animals-are-inspected-byUSDA#:~:text=Livestock%20products%20amenable%20to%20the,geese%2C%20ratites%2C%20and%20squabs.

80 Current Good Manufacturing Practice, Hazard Analysis, and Risk Based Preventive Controls for Human Food, 21 C.F.R. 117. https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm?CFRPart=117.

81 USDA, (2020) Food Safety Plan Builder, https://www.fda.gov/food/food-safety-modernization-act-fsma/food-safety-plan-builder.

82 Recalls, 21 C.F.R. §§7.40-7.42, 7.45-7.46, 7.49-7.50, 7.53, 7.55, 7.59.

CERTIFICATIONS

SKILLED LABOR

While no labor certifications are required to work in a processing facility, the American Meat Science Association (AMS) has a Meat Evaluation Certification available, though certification is not required for processors.[83] Likewise, some colleges and universities, like the State University of New York's (SUNY) Agriculture and Technology School and Eastern Oklahoma State College in Wilburton, Oklahoma on the Choctaw Nation Reservation have meat processing and food safety programs,[84] however, the coursework is also not required for meat processors. Applicable regulations may generally require that workers (including staff, temporary workers, and volunteers) have the education, training, and expertise necessary to complete their designated role.

FEDERAL INSPECTION REQUIREMENTS

The Federal Meat Inspection Act (FMIA) requires that all meat sold commercially be inspected.[85] The USDA Food Safety and Inspection Service (FSIS) is responsible for providing inspections, and inspection personnel must be present at all times during livestock slaughter operations and for at least part of each shift during which there is further processing of meat products.[86] In addition to inspecting the meat products, inspection personnel inspect the facilities and equipment to ensure sanitary conditions are maintained.[87]

Federally inspected facilities must maintain and follow written Sanitation Standard Operating Procedures (SSOP).[88] FSIS publishes information on requisite sanitation performance standards.[89] Facilities must also have Hazard Analysis and Critical Control Point (HACCP) plans in place.[90] Guidance on these plans can be found in the corresponding regulations[91]

83 Certified Meat and Poultry Programs | Agricultural Marketing Service (usda.gov)
84 Meat Processing and Food Safety Certificate Program (cobleskill.edu)
85 Federal Meat Inspection Act, 21 U.S.C. § 601, et seq.
86 USDA. (2015). Summary of Federal Inspection Requirements for Meat Products, https://www.fsis.usda.gov/sites/default/files/media_file/2021-02/Fed-Food-Inspect-Requirements.pdf.
87 USDA. (2015). Summary of Federal Inspection Requirements for Meat Products, https://www.fsis.usda.gov/sites/default/files/media_file/2021-02/Fed-Food-Inspect-Requirements.pdf.
88 Sanitation, 9 C.F.R. §416 (2020). https://www.govinfo.gov/content/pkg/CFR-2011-title9-vol2/pdf/CFR-2011-title9-vol2-part416.pdf
89 Food Safety and Inspection Service. (2016, March 4). Sanitation Performance Standards Compliance Guide | Food Safety and Inspection Service. https://www.fsis.usda.gov/inspection/compliance-guidance/sanitation-performance-standards-compliance-guide.
90 Hazard Analysis and HACCP Plan, 9 C.F.R. §417.2 (2018).
91 Hazard Analysis and Critical Control Point (Haccp) Systems, 9 C.F.R. §§417.1—417.8.

and on the FSIS website.[92] In addition to the above resources, FSIS also publishes directives[93] and guidelines[94] for inspections.

STATE INSPECTION REQUIREMENTS

The Federal Meat Inspection Act and the Poultry Products Inspection Act each delegate authority to states to enter into cooperative agreements with FSIS to develop and administer state inspection programs solely for distribution within their borders.[95] Some states have also entered into cooperative agreements with FSIS to administer federal inspections for products intended for interstate commerce.[96] State inspections, in accordance with FMIA, must operate in manners that are "at least equal to" FSIS standards for inspections, sanitation, recordkeeping and enforcement provisions of FMIA and PPIA.[97]

REGIONAL TRAINING FACILITIES AND PROGRAMS

Native American Agriculture Fund's publication "Reimagining Native Food Economies: A Vision for Native Food and Agriculture Infrastructure Rebuilding and Recovery" envisions a Regional Hub network for Tribes and Native producers to leverage to develop and expand capacity for processing operations.[98] While some state-based training programs for meat processing operations exist, none are currently developed to specifically serve Indian Country. However, collaborative efforts by Tribes, Native producers and operators, and strategic partners could develop training programs through the conceptualized regional hubs. Additionally, tribal land grant colleges could also provide a conduit for meat processing operation training and education as well as inspection and food safety in support of Indian Country protein supply chain development.

92 Food Safety and Inspection Service. (2017, April 28). HACCP Guidance. https://www.fsis.usda.gov/inspection/compliance-guidance/haccp

93 Food Safety and Inspection Service. FSIS Directives. (2021, June). https://www.fsis.usda.gov/policy/directives-notices-guidelines/fsis-directives?keywords=meat+%2B+beef+%2B+pork.

94 Food Safety and Inspection Service. FSIS Guidelines. (2021, June). https://www.fsis.usda.gov/policy/fsis-guidelines?keywords=meat+%2B+beef+%2B+pork.

95 Garcia-Diaz, Daniel, GAO Letter to Senate Committee on Agriculture, Nutrition and Forestry and House Committee on Agriculture, May 30, 2013. Accessed June 30, 2021. https://www.gao.gov/assets/gao-13-332r.pdf

96 Id.

97 Administrator, Food Safety and Inspection Service, 7 CFR § 2.53

98 Hipp, Janie and Givens, Maria. "Reimagining Native Food Economies," https://nativeamericanagriculturefund.org/wp-content/uploads/2020/10/NAAF_NativeFoodEcon_Spread.pdf

PERMITS

Jurisdictional

Depending upon the location of the processing facility, the jurisdiction where the facility is located may require a license to engage in animal slaughter. Many municipalities place restrictions on animal slaughter activities within city limits.

Business Permits

See local jurisdiction code to determine necessary business permits. Formal business organization of the enterprise under tribal law may have beneficial tax implications depending upon the location of the operation, restricting the ability of non-tribal and non-federal to levy a tax against the revenues of the organization.

Building Permits

See local jurisdiction code to determine what building permits are necessary prior to development and construction.

Waste Disposal Permits

The National Pollutant Discharge Elimination System issues permits to applicants meeting criteria to discharge pollutants into waters of the United States in accordance with technology-based limits and water quality-based limits. Under the Clean Water Act, Tribes, through NPDES, may perform much of the permitting, administration, and enforcement components of the NPDES program. Current information available at EPA.com does not reflect that any Tribe is currently engaging in administering NPDES permitting.[99]

If seeking discharge to a municipal or other sewage systems, there may be an application required to connect to the system for discharge as well as a service fee, usually billed monthly.

99 https://www.epa.gov/npdes/about-npdes#types

MODEL TRIBAL FOOD CODES

MODEL TRIBAL FOOD CODES

The Model Food and Agriculture Code developed by Indigenous Food and Agriculture Initiative provides a sample code for tribal adoption tailored to facilitate food systems development through tribal sovereignty. The Model Code addresses meat processing in Chapter Five.[100] While federal food safety provisions are uniformly applicable to Tribes and non-Tribal entities alike, the Model Food and Agriculture Code has been developed to incorporate mandatory compliance provisions into tribal code for adoption to streamline access to markets and support economic and food system development while preventing undue regulatory encroachment by non-tribal authorities.

100 Future versions of the Code will be updated to reflect more flexibility for Tribes that prefer to opt in to state inspections in lieu of or in addition to federal inspections. Additionally, sections regarding humane slaughter will be updated regarding exemptions for ceremonial and personal use.

Certain federal regulations have been updated since the drafting of the code.[101] At present, federal law does not allow Tribes to develop and administer their own inspection program. As a result, Tribes must rely on federal and state programs. This issue requires a statutory fix in the form of enabling language specifically designed to enable Tribe to develop their own inspection programs. Another option for tribal self-administration of such programs might take the form of an Inspector who is both a tribal employee and also tied to the federal system. In either instance, Congressional action is a prerequisite.

Examples of adopted tribal code provisions that were used in drafting The Model Food and Agriculture Code can be found for reference in the discussion of tribal codes preceding the model code language in Chapter Five.

101 1)The Food Safety and Inspection Service (FSIS) is amending the Federal meat inspection regulations to eliminate the requirements for both ready-to-eat (RTE) and not-ready-to-eat (NRTE) pork and pork products to be treated to destroy trichinae (Trichinella spiralis) because the regulations are inconsistent with the Hazard Analysis and Critical Control Point (HACCP) regulations, and because these prescriptive regulations are no longer necessary 2) FSIS is establishing January 1, 2022, as the uniform compliance date for new meat and poultry product labeling regulations that will be issued between January 1, 2019, and December 31, 2020. 3) FSIS is amending the Federal meat inspection regulations by removing the provision requiring the cleaning of hog carcasses before any incision is made preceding evisceration. Other regulations require carcass cleaning, the maintenance of sanitary conditions, and the prevention of hazards reasonably likely to occur in the slaughter process. Removal of this unnecessary provision will enable official establishments to adopt more efficient, effective procedures under other regulations to ensure that carcasses and parts are free of contamination. 4) FSIS is amending the Federal meat inspection regulations to eliminate the requirement that livestock carcasses be marked with the official inspection legend at the time of inspection in a slaughter establishment, if the carcasses are to be further processed in the same establishment. 5) FSIS is amending the Federal meat inspection regulations to establish an optional new inspection system for market hog slaughter establishments that has been demonstrated to provide public health protection at least equivalent to the existing inspection system. Market hog slaughter establishments that do not choose to operate under the new swine inspection system may continue to operate under their existing inspection system. The Agency is also making several changes to the regulations that will affect all establishments that slaughter swine, regardless of the inspection system under which they operate or the age, size, or class of swine. These changes will allow all swine slaughter establishments to develop sampling plans that are more tailored to their specific operations, and thus more effective in monitoring their specific process control, unlike the current requirements in the regulations. 6) FSIS is amending the Federal meat and poultry products inspection regulations to eliminate prescriptive requirements governing the manufacture of uninspected products, such as pet food, in edible product areas of official establishments and to allow official establishments to manufacture such products outside the hours of inspection. These prescriptive regulations are no longer necessary and are inconsistent with the Hazard Analysis and Critical Control Point (HACCP) and sanitation regulations. Removal of these unnecessary provisions will provide establishments the flexibility to be innovative and operate in the most efficient, cost effective manner.7) The Food Safety and Inspection Service (FSIS) is establishing January 1, 2024, as the uniform compliance date for new meat and poultry product labeling regulations that will be issued between January 1, 2021, and December 31, 2022. FSIS periodically announces uniform compliance dates for new meat and poultry product labeling regulations to minimize the economic impact of label changes. 8) FSIS is removing from the Federal meat inspection regulations a requirement for the defibrination of livestock blood saved as an edible product. Defibrination is the process for removing the protein fibrin, which causes blood to clot. Removal of the defibrination requirement will not affect food safety, but it will allow the industry to meet a demand for non-defibrinated blood products.

STARTING A LOCAL MEAT PROCESSING FACILITY

CONSIDERATIONS

In considering whether to start a meat processing operation, developers should take a review of goals and intent. Practical considerations should include:

1. **What species are going to be processed?**

Different species have different operational processing requirements. While many amenable livestock species will have similar equipment needs, the infrastructure needed to process bison, while very similar to beef, will be very different from that of poultry. Larger animals require additional space for pre-harvest staging, cutting, storage, freezing, etc. Additionally, facility change-overs for cleaning and sanitation are required when transitioning between species, especially from amenable to non-amenable species. The revenue differences between beef cattle processing and deer processing may not be lucrative enough to justify a shutdown to process deer for a certain amount of time. There may be a need for a separate facility or mobile unit for non-amenable custom processing like deer during deer season.

2. **Where will the processing facility be located?**

Site selection is an important consideration. The minimum parcel size should be considered to meet the needs for the intended operation. Larger volume processors will require additional space even beyond the footprint of the building to accommodate animals in lots waiting to be processed. Smaller operations that will process smaller lots will not require as much onsite corral infrastructure. Zoning requirements should be reviewed in accordance with the controlling jurisdiction to ensure compliance. Space needs for wastewater discharge should also be considered as well as potential impact to adjacent landowners depending on the type of system.

Accessibility and goals of the operations should also be considered. Will the location be able to accommodate truck traffic hauling cattle trailers or distributor vehicles? Utility infrastructure should also be considered. As water access and use are of significant concern for meat processing operations, connecting to a water source can present additional costs. If on site retail is going to be offered, is there good proximity to retail consumers? If retail offerings will not be available on-site, does the proximity to other markets or end users justify one site selection over another?

Additionally, the legal status of the land where the intended processing plant will be developed should be known. Tribal land held in trust will trigger different regulatory compliance requirements than off-reservation fee land. Restricted land will have similar implications. The jurisdiction of the land is also important to consider as some jurisdictional laws may be more controlling than others.

3 What volume of livestock is to be processed?

A small red meat processing operation is considered to be one that processes less than 100 head per week. A medium-sized operation is one that processes between 100-1000 head per week. The volume differences between the two categories or even within the medium-sized operation alone will require significantly different labor, square footage, and equipment needs. When deciding the target volume, developers should consider what volume would result from the Tribe's processing needs for its own herd if it has its own herd intended or available for processing, what volume would result from the tribal or local populations demand for processing of non-tribally owned animals, and what capacity should be considered for the volume of operations resulting from potential custom processing contracts from non-local/non-tribal partners. Meeting the needs of the tribal community while ensuring a sustainable or even profitable revenue model will help identify what volume will be processed and determine further operational development needs.

4 How big should the processing facility be?

The square footage of the facility should be sufficient to meet processing capacity goals. Most tribal meat processing operations will likely fall within the medium-sized processing plant designation. Those medium-sized plants can range from 2,500 square feet to 25,000 square feet or more like the Quapaw Tribe's meat processing facility.[102] The square footage considerations should take into account volume of processing, sanitation infrastructure needs, value-added opportunities like custom product smoking, grinding, blending, packaging and labeling, regular and cold storage needs, line operations, and labor accommodations. Additionally, office space for plant management and inspectors should be included. Some developers may also desire test or development kitchens, reception areas for visitors and vendors, or even retail space.

102 Givens (2020).

5 How will labor be sourced?

Labor is a major concern across agricultural sectors. Tribes and tribally owned businesses are able to leverage some existing tribal programs to meet labor demands beyond just running an ad in the paper or word of mouth hiring solutions. Many Tribes already operate federally funded programs like Employment and Training programs, Vocational Rehabilitation, and Reintegration. Programs that offer training opportunities for tribal citizens can assist in developing employees through certification programs, subsidizing the cost of labor, and ensuring skilled staffing. As processing plant labor averages wages from $12 to $15 per hour, the position can be an attractive opportunity in rural and tribal communities for workers that does not require formal education or extensive training. As transportation can be a barrier to access to employment, tribal transportation programs may also alleviate transportations concerns that tribal citizens can leverage.

Tribal Colleges and Universities and other accredited institutions may also offer meat processing certifications or an Associates in Applied Sciences (A.A.S). Tribes or tribal meat processing businesses may be interested in offering internship opportunities or direct-hire options for students completing the programs.

6 Should community support be considered?

As tribal food sovereignty movements continue to evolve, community involvement in food systems is becoming more prevalent. Feedback from stakeholders, policymakers, neighbors, and tribal citizens could be relevant in ensuring success of the operation. Tribal meat processing operations can be responsive by addressing product demands, operational concerns, input sourcing, and stewardship.

Open discussion with the community can aid in generating operation and brand awareness, publicizing labor and sourcing opportunities, assure community members of environmental and regulatory compliance, and influence operational decision-making to better fit the practical logistics and ideological goals of the operation.

BUSINESS PLANNING

Developing a business plan is critical to development, successful operation, capital sourcing, and long-term success. A business plan is a document describing the goals, objectives, and activities that an operation will engage in, detailing market opportunities, organization, management, the products produced, marketing and sales, funding and finances, as well as a description of the company and an executive summary.[103] The Small Business Administration website offers examples of traditional and streamlined business plans for reference.[104] This section will focus on funding/finances, organizational structure, and market considerations.

Funding

Leveraging funding for capital to develop, construct or remodel a facility for a meat processing operation is often a primary concern. Federal opportunities for grant funding and loans exist under a variety of USDA programs:

1. **USDA Value Added Producer (VAPG) Grant**

   A VAPG Grant is available for ag producers to scale up their operations to include value-added activities. Grant funds may be requested for planning, research, construction, equipment, marketing, and working capital. Up to $200,000 may be awarded for working capital applications, up to $75,000 for planning. A 100% match is required but special COVID-19 funding allocations are offered at a 10% match requirement.[105]

2. **USDA Local Food Promotion Program (LFPP) Grant**

   This grant is available for tribal governments and other producer groups or non-profit entities that support local and regional food businesses. TLFPP grants are available for processing, aggregation, distribution, and storage of local and regional food products that are marketed locally or regionally, including value-added ag products. A 10-25% match is required. A tribally owned operation cannot be the only beneficiary of the project. It must also include opportunities as an intermediary connecting buyers to consumers, i.e., offer processing capacity to other producers.[106]

103 https://www.sba.gov/business-guide/plan-your-business/write-your-business-plan
104 Id.
105 https://www.rd.usda.gov/programs-services/value-added-producer-grants
106 https://www.ams.usda.gov/services/grants/lfpp

3 USDA Regional Food System Partnership Program

A relatively new program authorized under the 2018 Farm Bill provides planning and implementation support to develop local and regional food systems by aligning partner interests. For Tribes interested in developing an intertribal cooperative or for an intertribal consortium serving multiple tribal communities, this grant program provides for ongoing collaboration within local and regional food systems.[107]

4 USDA Rural Development Guaranteed Loans, now 'OneRD'

Rural Development Business and Industry Loan Guarantees are typically $10M-$40M for construction, land, equipment, working capital for rural infrastructure and agriculture projects, with USDA guaranteeing up to an 80 percent guarantee for banks issuing these loans. Lending institutions apply for relending funds from USDA Rural Development which encourages private investment in rural areas. Loans can also be allocated for business conversion/ remodeling, land/building purchase and development, machinery, equipment, supplies, and inventory, vertical agriculture integration, and debt refinancing.[108]

5 USDA Rural Development Rural Business Enterprise Grant:

Grant funds are available for Tribes to receive technical assistance and training for their small rural business grossing less than $1M annually and under 50 employees. Funds may be used for planning/research, construction, land, equipment, working capital, and training. There is no maximum award and smaller projects get priority points.[109]

6 Meat and Poultry Inspection Readiness Grant:

This grant is only for currently operating processing facilities, those seeking federal grant of inspection, or currently state inspected and seeking eligibility for federal inspection through FSIS Cooperative Interstate Shipment program. A tribal custom processing or state inspected facility seeking to become federally inspected would be a good fit for this program.[110]

Non-federally backed loans are also an option for new meat processing facilities from commercial lenders. Tribal revenues may also be considered to fund the project either from tax collections, gaming revenues, enterprise revenues, etc. and may be required to provide the match for any of the federally administered programs listed above as federal funds are often exceptions for tribal governments.

107 https://www.ams.usda.gov/services/grants/rfsp
108 https://www.rd.usda.gov/onerdguarantee
109 https://www.rd.usda.gov/programs-services/rural-business-development-grants
110 https://www.ams.usda.gov/services/grants/mpirg

Organizational Structure

In Indian Country, meat processing plant ownership and organizational models can vary. Enterprises can be organized under state, federal or tribal law.[111] Tribally held enterprises can be of particular nuance as they are frequently held and operated by tribal governments. That quasi-government, quasi-business status can often be difficult to conceptualize for non-native entities interacting with the enterprise. The organization and holding of a meat processing plant will have differing implications related to access to federal programs, access to capital, taxation, regulatory oversight, and asset preservation.[112] Meat processing facilities may be owned/operated in the following formats:

1 Owned and operated by Tribe

Tribal commerce is often conducted through a department of tribal government.[113] This format provides access to federal funding for capital development and operating activities in addition to regularly available financing opportunities. Tribes will generally have stronger control in preserving sovereign immunity through this format.

2 Owned by Tribe, contracted operation

This method of organization preserves the ownership of the facility and assets by the Tribe and allows for access to tribally enabled programs for capital development and durable equipment/machinery acquisition and maintenance. Operations, when contracted out, can address inexperience in meat processing activities and possibly reduce overhead costs associated with labor and management.

3 Owned/operated by tribally held business

Tribally held (as opposed to individually held) businesses are organized under the laws of the Tribe and held by the Tribe. These structures allow avoidance of state regulation and taxation for activities conducted on the reservation.[114]

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111 Atkinson, Karen and Nilles, Kathleen. (2008). "Tribal Business Structures Handbook," Indian Affairs, Department of the Interior. https://www.irs.gov/pub/irs-tege/tribal_business_structure_handbook.pdf

112 Tribal Economic Development Principles at a Glance Series, "Choosing a Tribal Business Structure." US Department of Interior, Office of Indian Energy and Economic Development, accessed June 30, 2021. https://www.bia.gov/sites/bia.gov/files/assets/as-ia/ieed/bia/pdf/idc1-032915.pdf

113 Atkinson. I-5.

114 "Choosing a Tribal Business Structure" p7.

4 Owned/operated by tribal citizen business or entrepreneur

This type of business structure may be organized under state or tribal law. Organization under state law will subject the business organization to state regulatory schemes and could have potential tax implications. Businesses operating under tribal law would be subjected only to tribal and federal tax laws for operational and tax purposes. Businesses owned by a tribal owner or held in majority by tribal shareholders would be eligible for TERO Certification. TERO stands for Tribal Employment Rights Office or Ordinance.[115] TERO certification recognizes tribal contracting and hiring preference for tribal businesses on and in some cases near reservations. An entity seeking to contract with a Tribe to provide processing services or meat products would obtain preference for sourcing through a TERO certification.

Individually held businesses may be organized as a corporation, LLC, Partnership, or Sole Proprietorship. There are benefits and constraints to each designation and should be researched prior to selecting a formal organization format. The Indigenous Food and Agriculture Initiative offers a fact sheet through their "EATS Academy" titled "Identifying Business Structures for Tribal Citizens" for more information about selecting a business organization structure.[116]

115 http://www.councilfortribalemploymentrights.org/tero-faq/#2
116 https://Indigenousfoodandag.com/eats-academy/

Break-even Timeline

A break-even point or payback period is a calculation performed to determine when an operation's revenues will cover costs of capital and operation overhead. In other words, the point where total cost and total revenue are equal.[117] A break-even analysis will determine how much revenue through goods or services sold will be required to recover all fixed and operational costs. Fixed costs will exist regarding whether the operation is in production or not. Examples include mortgage costs, certain taxes, equipment costs, etc. Operational costs occur when an enterprise is engaging in operational activity. Examples include labor, materials, utilities, supplies, transportation, etc.

A break-even timeline is important to calculate in order to determine the viability of the operation. Depending upon the goals and intent of the meat processing operation, there can be a variability of tolerance for when a break-even point is reached. If a tribally held operation is intended to support local tribal producers, vertically integrate tribal government or tribally held business operations, or provide products for service programs, there may be more tolerance for a program to reach break-even as the goal of the operation is not to be primarily revenue-generating. Other stakeholder perspectives may expect an economically efficient, revenue-generating operation to cover the costs of investment and operation and return monies to the business or to tribal coffers, depending on who owns the enterprise.

A break-even calculation can be used as a metric for performance, comparing targeted projections to actual operations. It can also assist in setting sales or production goals, aid in making informed business decisions, mitigate risk through realistic analysis and is frequently required to obtain the support of investors or stakeholders and solicit financing for the operation.[118] Many break-even analysis templates and calculators exist online and through university extension programs, including spreadsheet-based templates with macros and customizable options.

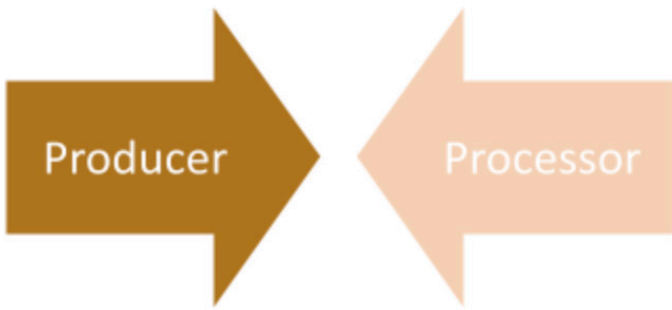
117 https://www.sba.gov/breakevenpointcalculator

118 Id.

Market Access

As a part of business planning, developers should seriously consider market implications. The "if you build it, they will come" perspective is not conducive to a model of intentional practices resulting in success and long-term viability.[119] Tribal meat processing facilities serving tribal producers and tribal communities should be aware of market opportunities to maximize operational success.

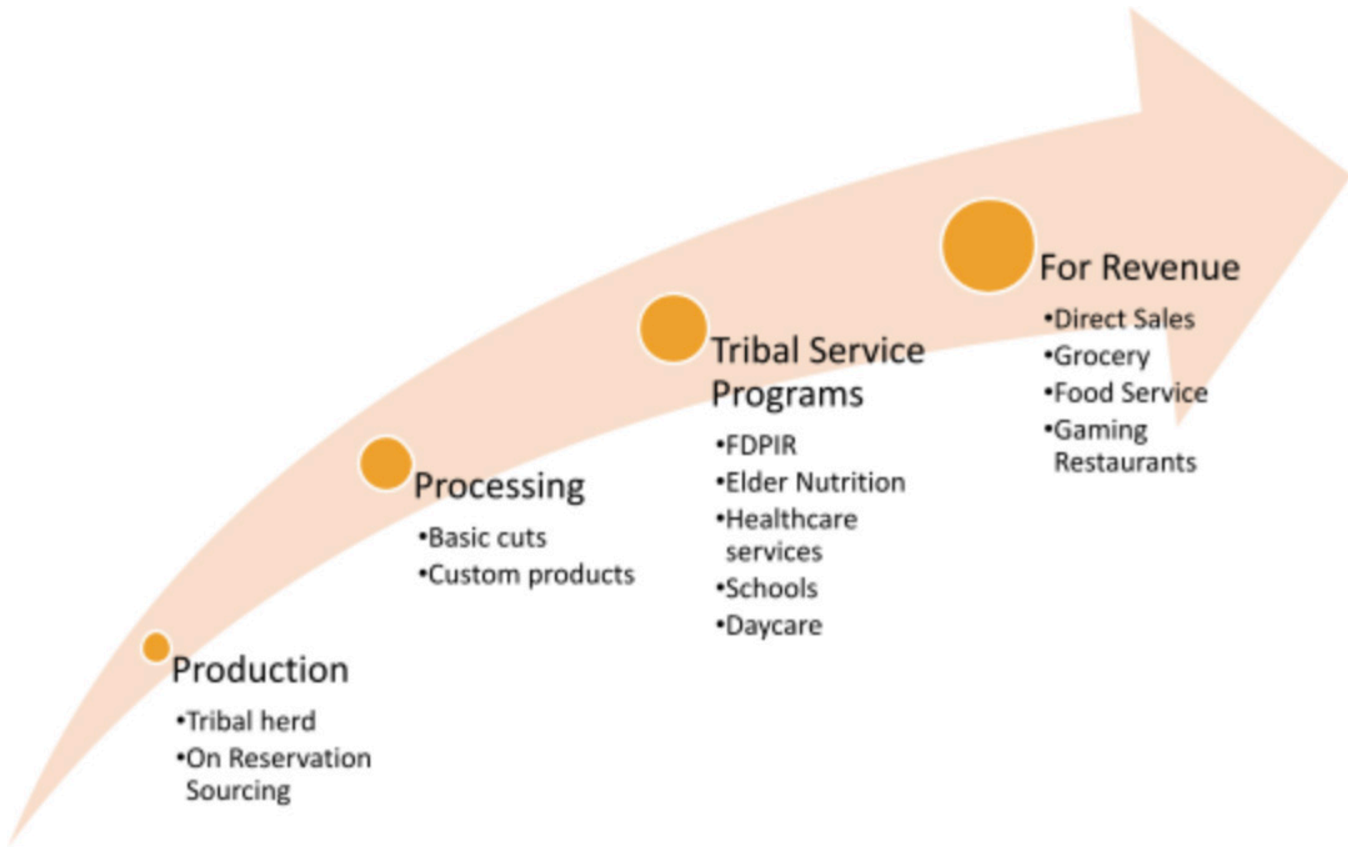
The most basic, most local market is custom processing for tribal or local producers. Farmers and ranchers deliver animals to the facility for processing for a fee, and processed products are returned to the producer, either generically packaged or with custom value-added processing, packaging, and labeling.[120] The producer then retains the product for personal use or sells the product to another entity or end-user/consumer often on farm locations, farmers markets, CSA hubs or even restaurants and retailers.



Another iteration of the producer-controlled product would see processed products directly distributed to a down-chain entity directly from the production facility. This graphic also reflects an aggregating opportunity where ownership of the product transfers to the processor, who then directly contracts the product for sale to a distributor, retailer, or consumer. The processor may also directly market from the processing facility either through a virtual/online format or an on-site retail space.

119 Gwin, Lauren and Thislethwaite, Rebecca. (2019). "Lessons Learned from Public Investment in Local and Regional Meat and Poultry Processing Activities." USDA Agricultural Marketing Service Research Publication. https://www.nichemeatprocessing.org/wp-content/uploads/2019/07/Briefing-Paper_NMPAN_72219.pdf
120 Gwin, Lauren; Thiboumery, Arion, and Stillman, Richard. (2013) "Local Meat and Poultry Processing: The Importance of Business Commitments for Long-Term Viability." USDA Economic Research Service.

Some Tribes that are seeking vertical integration opportunities may focus on meeting the demands of internal programs and operations. A fully internal market can be an option if subsidizing the meat processing facility would be justified through other programs sourcing requirements.



Tribes may envision a closed loop food system wherein the market accesses are wholly internal. This model would follow the product from production to consumption completely on the reservation/ within the tribal community. When a Tribe has its own herd or stock of animals to process or can source from tribal producers with end products intended for distribution to tribal program, Tribes can create a food system reflecting food sovereignty where all components of the process are tribally directed for the benefit of the Tribe and tribal citizens.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Market opportunities may also present in contracts to regional aggregators like large or regional retailers, food service providers, distributors, and direct sales/internet sales.[121] One particular self-serving market model would leverage FDPIR self-sourcing opportunities, allowing Tribes to use federal dollars to source food products for commodity foods offered through the program. This would allow Tribes to use federal monies to buy aggregated products from the processor, injecting off-reservation dollars into the processing facility and creating guaranteed market opportunities, and supporting self-sufficiency and capacity development for meat processing operations.[122]

Costs

Construction and development costs can vary, but a recent review of tribal processing facilities reflects that most facilities cost upwards of $10M to build, ranging in size from 19,000 square feet to 25,000 square feet. While there are significant variables in construction, equipment, and location resulting in variable overall costs, new construction of a meat processing facility is upwards of $400/square foot, and the cost to refurbish or repurpose an existing building can run from $150/sq ft to $450/sq ft or more.[123]

121 Id.

122 https://www.indianag.org/post/exploring-the-possibilities-fdpir-638-self-determination-demonstration-project

123 Newlin, Lacy. "So you want to build a slaughterplant?" High Plains Journal, June 12, 2020. https://www.hpj.com/livestock/so-you-want-to-build-a-slaughter-plant/article_a033a44e-acaf-11ea-a32d-63beecbd5f05.html

TECHNICAL REQUIREMENTS

WATER ACCESS/CONSERVATION NEEDS

Adequate water supply and pressure are critical, with most of the water required being used for wastewater flow. If access to a public water system connection is available, it's important to discuss anticipated water demands with an operator or manager early in planning. If the location requires a private well, the owner will be responsible for not only ensuring adequate supply, but also water quality testing requirements and possible treatment to meet the National Primary Drinking Regulations.

Sustainability of your water supply is also an important consideration. Meat processing plants have some of the largest water demands in the agricultural sector due to strict sanitation requirements.[124] If groundwater is the source of water, the United States Geological Survey (USGS) has some available groundwater studies, but a more in-depth exploration may be required to ensure the aquifer is recharged at a rate that matches or exceeds anticipated future demand. The same sustainability consideration should be taken into account for surface waters. Tribal entities may also have treaty rights considerations regarding access to water, especially for agricultural provisions.

Estimates in literature for the water demand for meat processing are highly variable. Literature from South America has a range from 800-3000 L/head of cattle (211-793 gal/head).[125] One study from the U.S. in 1993 estimated 405 gal/head based on communication with one processing plant.[126] It is advised that any estimate is an overestimate, and that future growth of the operation is considered.

ADDITIONAL UTILITY INFRASTRUCTURE

Power will be required on-site for adequate lighting to maintain cold temperatures, ventilation, and processing equipment, but the demand is highly variable depending on equipment efficiency, location, plant size, and processes. Electricity through a local utility is one option, but solar energy may be considered for some or all electricity demand and to reduce the carbon footprint and cost of power over time. If natural gas is available, it may also be a more economical choice for some applications. It's highly recommended to consider energy efficiency in construction considerations like insulation, equipment, and hydraulic design. Broadband internet will also be required for telemetric monitoring of processes and communication needs.

124 Bailone, R., Roça, R., Fukushima, H., & De Aguiar, L. (2021). Sustainable water management in slaughterhouses by cleaner production methods—a review. Renewable Agriculture and Food Systems, 36(2), 215-224. doi:10.1017/S1742170520000083

125 Bailone, R., Roça, R., Fukushima, H., & De Aguiar, L. K. (2021, April 1). Sustainable water management in slaughterhouses by cleaner production methods - A review. Renewable Agriculture and Food Systems, Vol. 36, pp. 215–224

126 Beckett, J. L., & Oltjen, J. W. (1993). Estimation of the water requirement for beef production in the United States. Journal of Animal Science, 71(4), 818–826. https://doi.org/10.2527/1993.714818x

DISPOSAL/WASTE MANAGEMENT SYSTEM

The high volume of organic waste produced will require on-site treatment. The extent and method of treatment will depend on whether there's access to a municipal sewer system, the quality of the wastewater produced, the amount of available land, precipitation, nearby water bodies and their status, proximity to other businesses and residences, and permitting requirements.[127]

If municipal sewer services are available, work with the wastewater operator or industry compliance officer to determine acceptable loads (typically measured as biochemical oxygen demand or BOD) for the wastewater system in compliance with state or national pretreatment programs. As waste discharge from meat processing will likely have heavy loads of total suspended solids, biochemical oxygen demands, fats, oils, and greases, some onsite treatment may be required to reduce the loads prior to entering a municipal system.[128] Pretreatment methods may be as simple as a screen to remove solids but could also require more extensive treatment to remove BOD and fats, oils and grease. Depending on the amount of waste produced and the size of the wastewater treatment plant, this waste stream could have a significant impact on the operation of the wastewater treatment plant, so it is advisable to develop a close working relationship with the utility and notify them of extreme changes in the waste leaving the site.

If no municipal sewer system is available, on-site treatment should be designed to meet federal standards for discharge into a nearby water body or land application in compliance with the National Pollutant Discharge Elimination System (NPDES). If discharging into surface waters, total maximum daily load (TMDL) of the water body will also factor into treatment considerations. Land availability will be an important factor in choosing a treatment method as well, with a lagoon system ending inland application having the largest land-use footprint.

Typical treatment following preliminary screening of solids includes land application, lagoon systems, or coagulation and flocculation. Anaerobic digesters could also be considered, especially for methane capture, but are usually followed by another treatment process. Other treatments could include constructed wetlands or advanced oxidation.[129] Human waste disposal will have to be considered separately and plumbed to protect production areas from possible backflow contamination.

127 Niche Meat Processor. (2015). Wastewater Treatment for Meat Processors . https://www.nichemeatprocessing.org/wastewater-treatment-for-meat-processors/#Wastewater%20treatment%20options.
128 https://www.nichemeatprocessing.org/wastewater-treatment-for-meat processors/#Wastewater%20treatment%20options
129 Bustillo-Lecompte, C. F., & Mehrvar, M. (2015, September 5). Slaughterhouse wastewater characteristics, treatment, and management in the meat processing industry: A review on trends and advances. Journal of Environmental Management, Vol. 161, pp. 287–302. https://doi.org/10.1016/j.jenvman.2015.07.008

ENVIRONMENTAL MITIGATION CONSIDERATIONS

Aside from the NEPA requirements (see above section Regulatory Environment "EPA") and NPDES, other environmental considerations may include the control of odors, carbon offsetting, water recycling, methane capture, and heat recovery. If waste is ultimately discharged into a surface water body, regular monitoring and active management may be required for the protection of ecosystems and downstream recreational, and drinking water uses.

EQUIPMENT AND MATERIALS

Some equipment requirements include sinks, coolers, freezer, fans, power washers, conveyor belts, hoses, screens, grinders, mixers, saws and tables, and adequate lighting. Stainless steel and other corrosion-resistant materials are suggested in all equipment possible to reduce rust and corrosion due to hydrogen sulfide production and cleaning (see NC equipment guidelines), and should be easily cleaned and sanitized.

LAYOUT/WORKFLOW

Employee traffic patterns and workflow should be considered carefully to optimize efficiency. The use of a relationship chart like that in the Iowa State University "Guide to Designing a Small Red Meat Plant"[130] is advised to incorporate relationships and activities of work areas to help guide the layout of the plant. Ensure floors and wet surfaces slope toward drains and the general hydraulic path of wastewater flows by gravity.

BUILDING REQUIREMENTS

Heating and cooling requirements will be dependent upon what's being produced and the external temperature. Ventilation is especially critical to ensure the safety of employees and efficient removal of odors. After slaughter, all processing rooms should be kept cool.

Refrigeration and freezing are required and will need to be designed with careful consideration of the temperature of incoming products and desired temperature of the product after refrigeration and food safety requirements. Design should also take anticipated future growth into account.

Building materials should also be chosen to avoid corrosion, for easy cleaning, and be impervious to water.

130 Thiboumery.

MODELS IN TRIBAL COMMUNITIES

BUTCHER HOUSE MEATS

FACILITY INFORMATION

Distribution Model

At present, Butcher House Meats has a retail location where customers can purchase their products. It also works with individuals for custom processing.

Geographic Region Served

Producers from as far as Colorado and Kansas, as well as producers across the state of Oklahoma make use of this facility. In addition, other tribes with their own herds utilize the Osage Nation's facility.

Labor

Eleven people are presently employed at this facility. The staff consists of 1 plant manager, 4 coordinators, 4 meat technicians, and 2 clearners. The facility is looking to add positions in the near future.

Intent for Development

The tribe's intent for this facilty was for it to fill a gap that they perceived in their food system, and enable the tribe to vertically integrate their system. It is also intended to help supply food for its citizens and sure up the supply chain that was so strained by the COVID-19 pandemic.

PROCESSING CAPACITY

Square Footage: 19,000 sq. ft.
Acreage: Trust Land
Species Processed: Cattle, Pork, Bison, and Seasonal Deer
Quantity/Head Per Day: 5
Any Value-Added Processing: No

PROCESSING LOGISTICS

Labor: 11 employees
Peak Times: Consistent throughout the year
Own Herd: Yes

FUNDING SOURCES

The Osage Nation was able to leverage funding from the CARES Act in the amount of roughly $9 million in constructing its facility. Operational costs, however, are derived from tribal funds that are obtained through a budget approved by the Osage Nation's legislative branch.

CHALLENGES

One of the greatest challenges that the tribe has faced is finding individuals who have expertise in the field. To remedy this issue, the Osage Nation is working with a local educational facility to create a meat science training program. The tribe is also leveraging one of its own programs that places tribal citizens looking for employment within the facility for a 6 week trial period in which they can do some on-the-job training.

MAKOCE AGRICULTURE DEVELOPMENT: MOBILE POULTRY PROCESSOR

FACILITY INFORMATION

Distribution Model

Makoce Agriculture Development grants diversified farm operations poultry and equipment that will be processed on-site. From chick to chicken, this timeframe is generally 6 weeks. Through this cost and price-share partnership, farms sell processed poultry products direct to consumer at farmers' markets.

Geographic Region Served

The Makoce Agriculture Development mobile processing unit services 80 miles of the Pine Ridge Indian Reservation in South Dakota.

Labor

At any time, the processing unit typically maintains 5 to 9 staff, including an inspector. Staff roles support the following areas: kill floor, scalding, plucking, processing, cleaning, and inspecting.

Intent for Development

Makoce Agriculture Development intends to build an integrated food hub with a training center and dedicated commercial space. No poultry processing facility exists within 80 to 100 miles in a three-state area. Poultry requires less land and maintenance, promoting economic opportunity, entrepreneurship, and food access. Makoce Agriculture Development president's sons raised 75 birds, leading to 260 pounds of locally processed meat, on 5,000 sq ft.

PROCESSING CAPACITY

Square Footage: 648 sq ft. (54 x 12 ft.)
Species Processed: Chicken, Turkey, Duck
Quantity/Head Per Month: 750 this year
Any Value-Added Processing: No

PROCESSING LOGISTICS

Labor: Between 5 and 9 staff
Peak Times: July
Own Flock: Poultry granted to farms to raise

MESSAGE FROM THE PROCESSOR

Having a processor equipped with the necessary modern, state-of-the-art equipment is very efficient and will make smoother access and opportunity for local community members and businesses in attaining locally-sourced, value-added product. Creating a healthier relationship for the community, producer, and the economy.

CONTACT INFORMATION

Nick Hernandez (Oglala Lakota), President
Makoce Agriculture Development
E-mail: nick@makoceag.org
Website: www.makoceag.org

WEST SIDE MEATS, INC.

WESTSIDE MEATS
West Grand Crossing • Mobridge

FACILITY INFORMATION

Distribution Model

Facility includes a retail store, with plans to open another location on the Cheyenne River Sioux Reservation. Primary distributors are restaurants, butcher shops, and meat markets.

Geographic Region Served

Bison products are shipped nationwide, while all others are sold across the state of South Dakota.

Labor

The labor force includes seventeen (17) employees from butchers to retail employees.

Intent for Development

While it is important to provide a service to the citizens in the form of reasonably priced meat processing services, the business model must remain profitable in order to best serve the Tribe and its citizens.

CONTACT INFORMATION

Jayme Murray (Cheyenne River Sioux)
CEO, Cheyenne River Sioux Tribe Buffalo Authority Corporation
E-mail: broken.arrow.management@gmail.com

PROCESSING CAPACITY

Square Footage: 11,250 sq ft.
Acreage: 9,000 acres
Species Processed: Cattle, Bison, Pig, Elk, Deer
Quantity/Head Per Day: 14 beef; 4 bison
Any Value-Added Processing: All bison

PROCESSING LOGISTICS

Labor: 17 full-time employees
Peak Times: Seasonal/hunting seasons
Own Herd: Own bison herd

TRIBAL BUSINESS MODEL

West Side Meats is owned and operated by the Cheyenne River Sioux Tribe through a tribally chartered business corporation, overseen by a Board of Directors who were appointed by the tribal council.

ADVICE FROM DIRECTOR JAYME MURRAY

Developing and retaining a strong and reliable Workforce is key in running a successful meat Processing facility. Additionally, establishing a Clientele can be challenging, especially for new Brands and facilities—so patience and marketing Will be paramount to facility and brand growth.

REFERENCES AND RESOURCES

Iowa State Extension "Guide to Designing a Red Meat Plant" (2009), available on Iowa State Extension website: store.extension.iastate.edu

FSIS "Guidance for Preparation of HACCP Plans," available on the FSIS website: fsis.usda.gov

FDA Food Safety Plan Builder (for compliance with Current Good Manufacturing Practice, Hazard Analysis, and Risk-Based Preventive Controls for Human Food regulation, available at www.cfsanappsexternal.fda.gov/scripts/foodSafetyPlanBuilder/

Niche Meat Processors Association, Beginners Guide to Local Meat Processing, available at https://www.nichemeatprocessing.org/beginners-guide-to-local-meat-processing/

Niche Meat Processor Association, Meat Processing Plant Case Studies, available at www.nichemeatprocessing.org/niche-meat-processor-case-studies/

INDIGENOUS FOOD AND AGRICULTURE INITIATIVE

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