

PRODUCER HANDBOOK

TRANSITIONING FROM

CATTLE TO BISON

An Introduction



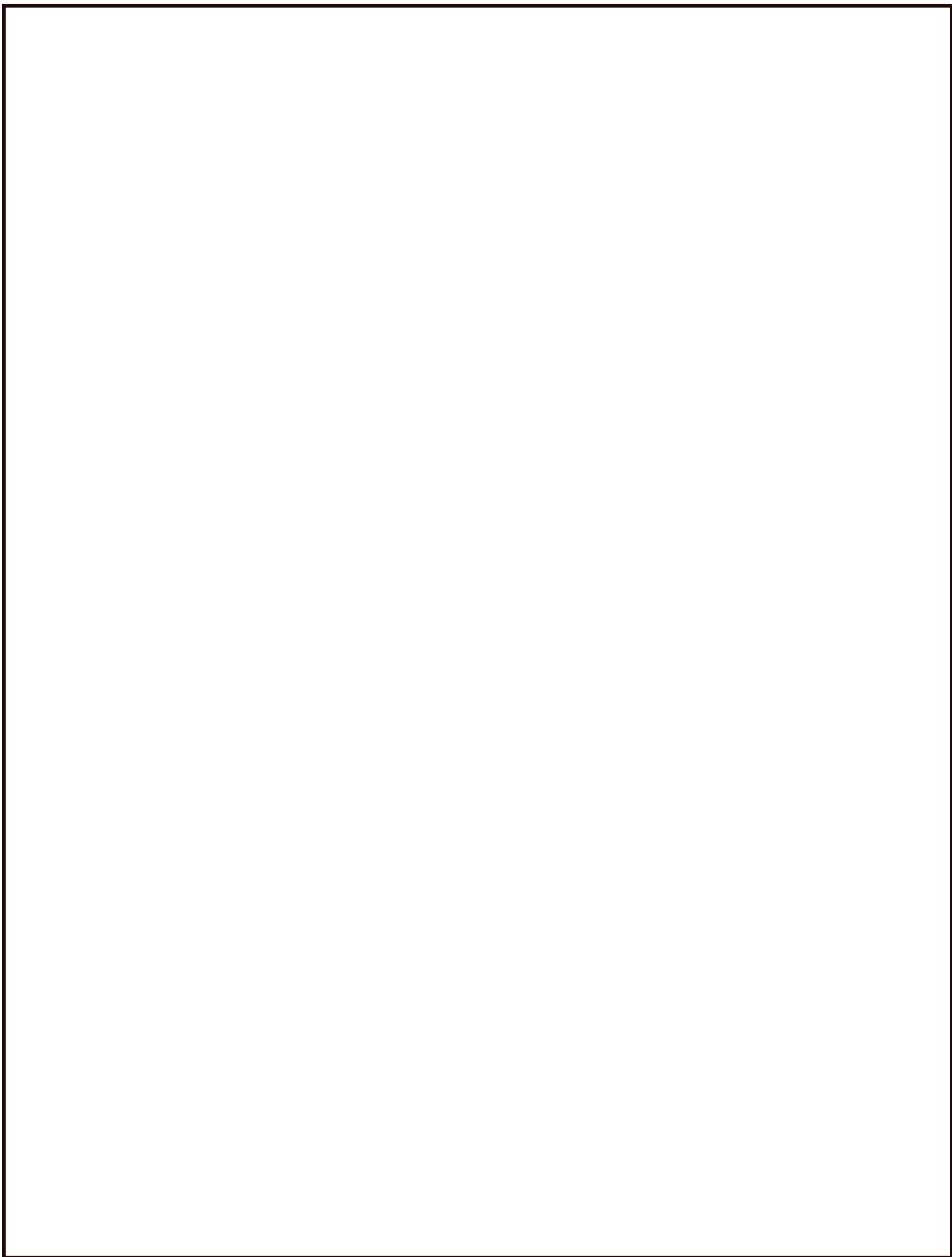


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Purpose of the Handbook

This handbook serves as an introductory tool to inform interested tribal and Native cattle producers about the process, costs, and factors involved in transitioning to bison production.

The goal for this project supports a broader initiative across Indian Country for restoring buffalo to the land, preserving indigenous foodways and their historical, cultural, traditional, and spiritual relationship for future generations. Many tribal and Native cattle producers have indicated an interest in transitioning to bison. This manual supports those interested producers by providing an outline of the variables to consider and prepare.

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Fort Belknap Indian Community (MT) buffalo herd, collection from ITBC.

History of the InterTribal Buffalo Council

One of the lead organizations involved with buffalo restoration and the only national organization focused exclusively on restoring buffalo to tribal lands is the InterTribal Buffalo Council (formerly the InterTribal Bison Cooperative). In 1992, the InterTribal Buffalo Council (ITBC) formed with a mission to restore buffalo to tribal lands for cultural and spiritual enhancement and preservation. In 2009, the organization transitioned from a non-profit to a federally chartered Indian Organization under Section 17 of the Indian Reorganization Act. Current membership continues to grow and consists of 78 federal-recognized tribes in 20 states.

History of Buffalo

Buffalo have long been a part of North America and the way of life for many tribal nations. The prairie ecosystem we see today has evolved largely from how buffalo regulated and grazed the land. Native Americans were the first stewards of the land, and many tribes subsisted on buffalo as a main component of their food systems. With the end of the twentieth century came the near demise of buffalo and a traditional way of life for many tribes. The United States government led a campaign to assimilate American Indians by removing their main food sources. Free roaming buffalo were replaced by other grazers, such as fixed cattle operations. Throughout this period in history, the United States pushed tribal communities and families to abandon their indigenous ways and live on Reservations. With these traditional food systems disrupted, American Indians had to consider adding foreign foods to their diet.

Fortunately, the story of the buffalo and Native Americans does not end there. Tribes, Native and non-Native producers, state and federal government agencies, and partnering organizations have all contributed in restoring buffalo back to their native lands. ITBC and its member Tribes have successfully restored 65 buffalo herds, surpassing 20,000 buffalo on over one million acres within Indian Country. Tribal producers contribute to these buffalo restoration efforts by making the transition from cattle to buffalo or operating new buffalo operations within tribal land.

A variety of motivating factors lend to trends in restoring buffalo to the landscape. Restoring buffalo on Tribal lands stimulates local economies, restores a main component of traditional food systems and nutritional diets for a healthier people, strengthens the cultural significance of the buffalo in

Tribal communities, and revitalizes the native prairie ecosystem. No matter the motivation, what remains is the significance buffalo represent to Native Americans. If we respect and care for these animals for in a meaningful way, buffalo restoration can rekindle our cultural, and ecological relationships and ensure this iconic resource for future generations.

Why Consider Converting a Cattle Ranch to a Buffalo Ranch?

People decide to transition from cattle to bison for a variety of reasons. No matter the underlying reason, the management resources and equipment are similar for both animals. The size and biological processes of buffalo are similar to those of cattle, making conversions more feasible in many situations. Many cattle ranchers have many of the basic tools needed to successfully run a buffalo operation, reducing start-up costs. However, a general rule of thumb is that buffalo handling facilities will work on cattle, but cattle facilities will not work for buffalo without modifications. For example, handling facilities and fencing need to be more robust for buffalo, so there are likely costs associated with modifying current resources.

Motivating Factors for Making the Transition

Some of the reasons cattle ranchers have shared for making the transition to buffalo include:

- **Economic Motivators**
 - You already have the basic tools to run buffalo (land, equipment, resources).
 - Interest in additional marketing opportunities and value-added products such as hides, skulls, hair; niche meat markets; hunts; and ecotours.
 - Buffalo typically cost less to feed and manage because they can be grass fed and field harvested with a 30-40% premium over beef.

- **Ecological Motivators**
 - Interest in restoring a native species to the environment and the broader landscape.
 - Looking for a “lower maintenance” species to raise.
 - Interested in carbon-sequestration.

- Buffalo assist with prairie restoration through seed dispersal, maintaining healthy grasslands, and creating a beneficial environment beneficial for other species (prairie dogs, grassland birds, pronghorn antelope, etc.).
- Buffalo are designed to naturally thrive on the prairie ecosystem, and...
 - Do not require barn/shelter.
 - Can withstand extreme weather conditions.
 - Have lower metabolic rates in winter and have twice as much insulation.
 - Do not usually require assistance in calving.
 - Are compatible with hands-off management – castration, branding, dehorning, or implants are not required.
 - Supplemental feed is usually restricted to native hay and occasional minerals.
- **Ecological Motivators**
 - Interest in restoring a culturally significant animal to Native Americans.
 - Buffalo once provided tribes with everything they needed: food, shelter, clothing, tools, etc.
 - Buffalo are revered and honored in stories, songs, dances and more.
 - Buffalo's returned presence allows the rekindling of many cultural and spiritual traditions and practices.

Per the list above, buffalo are a relatively “low maintenance” animal that can thrive with minimal hands-on care. Management is typically less invasive, since buffalo are worked on average once a year and do not require castration, branding, dehorning, or implants. Because buffalo are a wild animal native to North America, they can typically withstand the overall environmental conditions of the region better than cattle. They do not require barns for shelter and calve with relative ease.

Although many biological characteristics are similar, behavior differences can lead to very distinct management techniques. Differences and ways to manage them will be highlighted in the next section; however, producers should always keep in mind that different management goals lead to different management strategies. These nuances will be discussed in more detail in the **Herd Management Considerations** section.

Buffalo Considerations and Behaviors

The scientific name for the American Bison is *Bison bison*, however, both “buffalo” and “bison” are correct terms for the animal, with “buffalo” being the more common term throughout Indian Country. This handbook will use these terms interchangeably. Similar to cattle, male bison are called “bulls” and female bison “cows.”

Even when raised for production, buffalo are not domesticated animals. They have distinct characteristics and behaviors that differ from cattle that determine their management strategy. **Table 1** provides a quick comparison of common traits between buffalo and cattle.

Table 1
A comparison of common characteristics between buffalo and cattle

TOPIC: REPRODUCTION		
CHARACTERISTICS	BUFFALO	CATTLE
Recommended Sex Ratios	1 bull / 12-15 cows	1 bull / 20-30 cows
Breeding Season	July—September	June—August
Average Reproduction Age of Females	3 years	2 years
Average Number of Calves Females Produce in a Lifespan	17	8
Average Birth Weight	40—50 pounds	60—100 pounds
Gestation Period	275—280 days	285 days

Table 1 *continued*

TOPIC: MANAGEMENT RECOMMENDATIONS		
CHARACTERISTICS	BUFFALO	CATTLE
Fencing Recommendations	Barbed wire, woven wire, electric, or combination. Recommended at least 5 feet high	4–5 strand barb wire
Corrals/Handling Facilities	Welded pipe with solid sidewalls (\geq 10 ga steel or other materials), 6–7 feet tall, squeeze chute with crash gate (often hydraulic), catch pen, cutting pen, crowding pen, sorting pens, load out area	Solid sidewalls, 5 feet tall, working chute with headgate, holding area, crowding pen, sorting pens, loading chute
TOPIC: GENERAL		
CHARACTERISTICS	BUFFALO	CATTLE
Average Productive Life Span of Females	20 years	10 years
Average Size of Adult Cows	1,000 pounds and 5 feet tall	1,200 pounds and sizes variable by breeds
Average Size of Adult Bulls	2,000 pounds and 6 feet tall	1,800 pounds and sizes are variable by breeds
Stocking Rates (1 Animal Unit or AU)	1,000 pound mature cow	1,000 pound mature cow
Optimum Harvest Age	20-30 months	18 months
Regulations Pertaining to Meat Inspection (Federal)	Non-amenable	Amenable
Regulations Pertaining to Meat Inspection (State)	May be Amenable	Amenable

Table 1 continued

TOPIC: GENERAL <i>continued</i>		
CHARACTERISTICS	BUFFALO	CATTLE
Meat	Lean, low in fat and cholesterol	Traditionally cattle are finished on grain to increase marbling, thus increasing fat content. Tends to have higher calories, fat, and cholesterol content than buffalo
Animal Classification	Variable. Some Tribes and States classify them as wildlife hence regulated by Wildlife Departments, while others classify them as livestock and regulations fall under Agriculture Departments.	Considered livestock and fall under regulations pertaining to Agriculture.
TOPIC: BEHAVIOR		
CHARACTERISTICS	BUFFALO	CATTLE
Grazing	Tend to graze an area more evenly, high intensity, low duration. Migratory if given large enough area. Spend less time grazing than cattle	Tend to graze heavily around resources, such as water, mineral, feed. Do not travel far when grazing
Non-Grazing	Wallowing, horning (i.e., rubbing on trees), and interacting socially	Like to scratch, scratching devices often utilized.
Forage Preference	Mainly grasses and sedges	Mainly grasses, however, forbs are also important part of their diet

Table 1 continued

TOPIC: BEHAVIOR <i>continued</i>		
CHARACTERISTICS	BUFFALO	CATTLE
Herd Dynamics	Often have older lead cow, bachelor groups of bulls outside of breeding season, cows protective of young, have strong herding instinct	Herding instinct, however, much more apt to graze individually. Protective of young, however, years of domestication have acclimated them to humans
Responsive to Stimuli	Fight or flight instinct, still maintain wild temperament	Domesticated for centuries and bred for calm dispositions and other traits favorable to handling and domestication

Sources:

- Hatfield, H., T. Ecoffey, and J. Stone. 2013. *A Guide to Managing Tribal Buffalo Herds*. InterTribal Buffalo Council.
- Lammers, D., K. Ogorzalek, T. Olson, J. Flocchini, S. Forrest, B. Anderson, A. Grajal, D. Jorgensen, C. Kremer, T. LeFaive, J. Majerus, D. Montanye, D. O'Brien, S. Sarver, and J. Stone. 2013. *Bison Conservation Management: Guidelines for Herd Managers*. World Wildlife Fund.
- Martin, J. and C. Brooke. 2021. *Getting Started with Bison Ranching*. South Dakota State Extension. Available at: <https://extension.sdstate.edu/getting-started-bison-ranching>.
- Miller, Kristin. 2002. *Planning for Bison Grazing on Native Rangeland*. United States Department of Agriculture Natural Resources Conservation Service, Technical Note 12.
- National Bison Association. 2015. *The Bison Producers' Handbook, Second Edition (2015)*.
- Parish, J. 2010. *Beef Cow Longevity, Cattle Business in Mississippi, November/December 2010, "Beef Production Strategies" article*. Mississippi State University.

Low-stress, bison handling techniques (LSBH) reflect their behaviors and characteristics. Buffalo are a native, wild herbivore that have never been domesticated by humans. They respond to stimuli, including threats, using a “fight or flight” response. In today’s world, predators of buffalo are few; however, humans can elicit a predator response if not careful. Cattle handling methods do not produce the same results with buffalo because of the difference in their wild versus domestic natures.

Buffalo Handling Tips

Some common tips while working buffalo include:

- Buffalo are very herd oriented animals. Do not allow separate herds to share a common pasture fence line.
- Buffalo do not like shadows and prefer to be worked in small groups.
- They like to try to return where they came from; when fleeing from a perceived threat or uncomfortable environment, they try to return to an area where they felt less threatened and more at peace.
- They can easily become stressed by loud noises, hot shots, too many people, and quick movements. Even heavy pressure may lead to stress responses. Offering buffalo their natural preferred escape is a more desirable option.

Stressed or provoked buffalo can become aggressive, which can lead to the animal or workers becoming injured. Numerous resources provide guidance for using LSBH techniques, such as the *Stockmanship Journal*, published annually (<https://stockmanshipjournal.com/>), and the *Bison Handler Tailgate Training Safety Manual* (<https://nasdonline.org/7058/d002351/bison-handler-tailgate-training-safety-manual.html>). This manual not only covers LSBH, but also considers other factors

Another notable behavior of buffalo involves their herd dynamics. Often, herd managers will see an older cow within a herd that leads them to water, grass, and other pastures. Bulls' presence in the main herd is restricted to the breeding season (rut). During the breeding season, bulls can often be seen head-butting and competing for cows.

In general, buffalo spend less time grazing and drink less water than cattle. Historically, they would graze an area with a high intensity and short duration. Although, larger than cattle, bulls are very agile and have been known to run at speeds up to 30 mph and jump fences up to 6 foot tall. They also spend a significant amount of time wallowing and scratching to help remove insects and shedding winter hair. When agitated, both males, and females, if protecting a new calf, will charge. Additional information on buffalo behavior can be found in *The Bison Producers' Handbook* (National Bison Association 2015).

Steps in Transitioning from Cattle to Bison

The following four steps will help make the process of converting from cattle to buffalo production successful.

- 1) **Evaluate Resources and Determine Costs**
- 2) **Determine Markets**
- 3) **Determine Feasibility**
- 4) **Convert to Bison Production**



Blackfeet Nation buffalo herd (MT), Louise Johns

1) Evaluate Resources and Costs

The first step for a successful transition is to determine the resources needed for buffalo production and the associated costs. This section will detail the following resources and cost estimates: **land, fencing, corrals/handling facilities, management resources, associated personnel.**

LAND. Probably one of the most limiting, yet vital factors in buffalo production is land and land management constraints. Pasture management and ownership are two factors to consider when evaluating land as a resource.

Land access is most important from a cost perspective. If you owe money on the land, lease the land, or own it free and clear, each situation must be accounted for when evaluating your operation. In addition, land management issues on Indian Reservations can often vary across regions and consist of different ownership patterns from one Reservation to the next.

Land Tenure. Different types of ownership structures in Indian Country include trust lands, restricted fee lands, and deeded or fee lands. Trust lands are lands owned by the federal government and held in trust for the benefit of the tribe communally or tribal members individually. These lands are not taxed. Similarly, restricted fee lands are owned by a tribe or tribal member but are subject to a restriction against alienation (i.e., sale or transfer) or encumbrance (i.e., lien, leases, etc.) by operation of law. Deeded or fee lands are not held in trust status and are taxed by the state government. They are owned by a person who can freely alienate or encumber the land without federal approval.

Another complicating factor in land ownership on Indian Reservations is allotted lands. These lands can be trust lands or restricted fee parcels held by a tribal member. Allotments can be highly fractionated, meaning there could be many landowners—at times hundreds—on one parcel of land. Lease rates and agreements are also variable and often competitive from region to region and Tribe to Tribe. Each factor of land access must be considered and determined what expense it is to your operation.

Forage. Herd managers should be aware of how much forage your herd needs, how much forage is available for your herd to consume, and how long your herd will be on the land, including through rotational grazing. Proper range management is critical in sustaining the land's viability while also seeing livestock and forage gains. You do not want to overgraze your pastures.

Stocking Rates. A key tool in range management is to evaluate stocking rates. Stocking rates are defined as the number of animals grazing a unit of land for a specific time period. Many factors affect stocking rates, such as management goals, animal species, class of animal (cow, bull, yearling), acres available for the grazing season, rainfall, topography, soils/ecological sites, grassland health, water, forage species composition, forage quality, forage productivity, and management practices (animal rotation, cross-fencing, animal density) (Meehan and Sedivec 2018).

Stocking rates are expressed as the number of animal unit months (AUM) supplied by one acre of pasture for one year. For buffalo the animal unit equivalent (AUE) is as follows:

- Bison cow, mature = 1 AUE
- Bison bull, mature = 1.5 AUE

This rate is similar to cattle in a 1,000-lb. cow with calf = 1 AUE and a cattle bull, mature = 1.4 AUE. Stocking rates are used to determine carrying capacity, or estimated forage available for grazing animals in a pasture. Many operations base their stocking rates on tradition, the advice of neighbors, research, or a best guess.

Carrying capacity can be determined using two common methods: 1) field-based methods or 2) stocking rate estimates based on regional production data provided by the USDA Natural Resources Conservation Service (NRCS), Bureau of Indian Affairs (BIA) Land Operations Office, your Tribal Agricultural Department, and Cooperative Extension. Unless you have knowledge in field-based methods, ranchers can utilize the free technical service provided by experts. The following links provide contact information for technical experts who may be helpful in your area.

- USDA NRCS Regional Field Offices:
<https://offices.sc.egov.usda.gov/locator/app?agency=nrsc>
- Bureau of Indian Affairs Regional Offices: www.bia.gov/regional-offices
- USDA NIFA Cooperative Extension Programs:
<https://nifa.usda.gov/land-grant-colleges-and-universities-partner-website-directory>

Water. Water resources are just as important to pasture management as stocking rates and carrying capacities. Buffalo typically utilize water resources differently than cattle, so producers should take steps to identify your current water resources and future needs. Because buffalo tend to congregate, water tanks should be large for many animals to water at once, versus a smaller one that allows only a few to drink at a time. Ensuring that

your water resource is present, consistent, and available throughout the year is important to the health of your herd.

Sources:

- Fitzgerald, T. 2021. *Tribal Land and Ownership Statuses: Overview and Selected Issues for Congress*. Congressional Research Service. Available at: <https://crsreports.congress.gov/product/pdf/R/R46647>.
- Hatfield, H., T. Ecoffey, and J. Stone. 2013. *A Guide to Managing Tribal Buffalo Herds*. InterTribal Buffalo Council.
- Meehan, M. and K. Sedivec. 2018. *Determining Carrying Capacity and Stocking Rates for Range and Pasture in North Dakota*. Available at: www.ag.ndsu.edu/publications/livestock/determining-carrying-capacity-and-stocking-rates-for-range-and-pasture-in-north-dakota.
- Ogle, D. and B. Brazee. 2009. *Estimating Initial Stocking Rates*. Technical Note Range No. 3. USDA NRCS, Boise, ID.
- Ohlenbusch, P.D. and S.L. Watson. 1994. *Stocking Rate and Grazing Management*. Kansas State University Department of Agronomy.

FENCING. Many producers claim to that they can train their buffalo to respect different types of fencing; however, buffalo remain wild animals. Everything from woven wire, high-tensile game fence to electric and barbed wire has been used for buffalo production. A taller, more robust fence than the standard barb wire fence used for cattle, if available, helps ensure your animals are accounted for and can lead to good relationships with neighbors. Similarly, perimeter fences tend to be taller and more resilient for bison than interior fences.

Table 2 illustrates different types of fences used for buffalo, estimated costs, and potential sources to purchase the materials. Please note that this list is not intended to be all inclusive and producers may find a combination of the following examples a fit for their operation. This list may not appropriately reflect recent supply chain challenges producers face in securing equipment.

Table 2
Different types of fences used for buffalo management and associated costs

Construction costs for 6' 3" High-tensile game fence (Based on a 1,320 ft. fence)

Recommended for high stress areas, such as catch pens or perimeter fence near residential areas. H-brace on each end.

Item	Amount	Cost Per Unit	Total Costs
6'3" x 330' Fixed Knot 12.5 ga 17/75/6 (deerbusters.com)	4	\$509.95	\$2,039.80
Wood posts (5 x 10') (spaced 20' apart) (www.menards.com)	66	\$23.89	\$1,576.74
Railroad Ties (8.5') (H-brace at each end) (www.lowes.com)	4	\$27.78	\$111.12
Wood posts (4 x 10) (cut in two for H-brace) (www.menards.com)	1	\$18.99	\$18.99
Staples (www.menards.com)	10 lb.	\$17.98	\$17.98
Labor and equipment (Mayer and Olsen 2012)	42 hr.	\$20.00	\$840.00
Total			\$4,604.63
Total per foot			\$3.49

Table 2 continued**Construction costs for 5.5' Barbed wire fence (6 strands, see BNP specs)**

(Based on a 1,320 ft. fence)

Recommended for interior or perimeter fences. Posts are 16.5' apart with every 3rd post wood. Six strands, 8" between strands, bottom strand 18" above ground: top and bottom strands are smooth wire, middle four are barbed. H-brace on each end.

Item	Amount	Cost Per Unit	Total Costs
Wood posts (5 x 8') (www.menards.com)	27	\$17.79	\$480.33
Steel T-posts 8' (spaced 16.5' apart) (www.ruralking.com)	53	\$5.99	\$317.47
Barbed wire 12.5 GA 4 pt. (www.farmandfleet.com)	4 rolls	\$79.99	\$319.96
12.5 GA barbless wire (www.menards.com)	2 rolls	\$89.99	\$179.98
Staples (www.menards.com)	10 lb.	\$17.98	\$17.98
T-post Clips (www.menards.com)	350	\$0.1198	\$41.93
Railroad Ties (8.5') (H-brace at each end) (www.lowes.com)	4	\$27.78	\$111.12
Wood posts (4 x 10) (cut in two for H-brace) (www.menards.com)	1	\$18.99	\$18.99
Labor and equipment (Mayer and Olsen 2012)	40 hr.	\$20.00	\$800.00
Total			\$2,287.76
Total per foot			\$1.73

Table 2 continued

Construction costs for 4' Woven Wire Fence (18" off ground) (see BNP specs) (Based on a 1,320 ft. fence)

Recommended for interior or perimeter fences. Posts are 16.5' apart with every 3rd post wood. H-brace on each end.

If converting to bison for ecological purposes, woven wire may not be conducive to the same goal as it prohibits native fauna migration.

Item	Amount	Cost Per Unit	Total Costs
4' Woven Wire (www.menards.com)	4 rolls	\$229.99	\$919.96
Wood posts (5 x 8') (www.menards.com)	27	\$17.79	\$480.33
Steel T-posts 8' (spaced 16.5' apart) (www.ruralking.com)	53	\$5.99	\$317.47
Staples (www.menards.com)	10 lb.	\$17.98	\$17.98
T-post Clips (www.menards.com)	350	\$0.1198	\$41.93
Railroad Ties (8.5') (H-brace at each end) (www.lowes.com)	4	\$27.78	\$111.12
Wood posts (4 x 10) (cut in two for H-brace) (www.menards.com)	1	\$18.99	\$18.99
Labor and equipment (Mayer and Olsen 2012)	42 hr.	\$20.00	\$840.00
Total			\$2,747.78
Total per foot			\$2.08

Table 2 continued

Construction costs for 6 Strand Electric Fence (Based on a 1,320 ft. fence)
 Recommended for interior or perimeter fences. Posts are 25' apart. H-brace on each end. Electrify 3 to 4 strands. Energizer is calculated as ¼ cost, assuming the unit would be used to energize at least 1 mile of fence.

Item	Amount	Cost Per Unit	Total Costs
Railroad Ties (8.5') (H-brace at each end) (www.lowes.com)	4	\$27.78	\$111.12
Wood posts (4 x 10) (cut in two for H-brace) (www.menards.com)	1	\$18.99	\$18.99
Steel T-posts 8' (spaced 25' apart) (www.ruralking.com)	53	\$5.99	\$317.47
Insulators (www.menards.com)	318	\$0.16	\$50.75
12.5 ga high tensile galvanized wire – 6 strands (www.ruralking.com)	7,920 ft	\$0.024	\$190.08
Energizer (www.ruralking.com)	0.25	\$139.99	\$35.00
Strainers (www.ruralking.com)	6	\$3.99	\$23.94
Springs (www.ruralking.com)	6	\$6.99	\$41.94
Ground/lightning rods (www.ruralking.com)	4	\$16.99	\$67.96
Labor and equipment (Mayer and Olsen 2012)	20 hr.	\$20.00	\$400.00
Total			\$1,257.25
Total per foot			\$0.95

Sources:

- Badlands National Park. 2014. Revised Fencing Specifications. 30 July 2014 BCK.
- Farm and Fleet. www.farmandfleet.com
- Lowes. www.lowes.com
- Mayer, R., and T. Olsen. 2012. Estimated Costs for Livestock Fencing. File B1-75. Iowa State University Extension and Outreach. Available at: www.extension.iastate.edu/agdm/livestock/html/b1-75.html
- Menards. www.menards.com
- Rural King. www.ruralking.com
- USDA NRCS. 2010. Conservation Practice Job Sheet – Fence (Woven Wire).
- USDA NRCS. 2019. Fence Drawings. Available at: www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=nrcseprd884014&ext=pdf.

CORRALS/HANDLING FACILITIES. Most cattle ranchers have a corral system established to work their animals. The major components behind these systems remain similar for working cattle and buffalo. These components typically include a catch pen, cutting pen, crowding alley, scale (optional), squeeze chute, load out area, and sorting pens. However, often a more robust system is needed to work buffalo safely and effectively. Here, most producers focus on establishing a corral system that moves the animals through with the least amount of work and stress for animals and workers. **The main difference between cattle and buffalo systems is the corral height, solid side walls, slam-latching gates, and type of working chute.**

Corral and Walls. Because of buffalo agility and for worker safety, the recommended corral height is between 6'6" to 7' tall. In addition, solid side walls keep buffalo from seeing workers, which reduces stress and supports the well-being of both animals and workers. Closed in walls also reduce the number of injuries associated with damaged/lost horn caps and legs and can be achieved through a few avenues: modification of existing panels/sidewalls, totally new construction, or purchase of a ready-built system. If modifying the existing system, a material such as metal sheeting, plywood, composite, or dark tarps can be added to the current panels/side walls. Once the modifications or new construction is accomplished, worker safety must be maintained. Installation of catwalks and/or foot holds must be completed throughout the corral system. Costs associated with corral modifications and construction are variable depending on what type of materials are used. There are also manufacturers which specialize in buffalo equipment and have complete setups available for purchase. Costs for these systems vary and can range from \$8,000 for a manual squeeze chute to \$200,000+ for a full system.

Gates. Like side walls, gates should also be more robust, such as through a heavy-duty, spring loaded, slam-latching gate. Often, these gates shut securely by pushing them and will open by pulling a light rope which releases the latch. This latching mechanism ensures the safety of workers by eliminating the need for them to be on the ground and in the pens with the animals. Several manufacturers have ready main designs specific to buffalo, and many producers design their own custom-built gates. The preference for

either option is up to each producer, and prices are variable depending on the type of materials used, manufacturer, labor, size, and related expenses.

Squeeze Chute. A squeeze chute helps reduce stress by restraining animals when up-close work is performed (blood drawn, shots, mousing, ear tagging, etc.), however, a crash gate is a necessity because of the size and force of buffalo coming through the chute. Examples of chutes designed and sold exclusively for buffalo are found in **Figure 1**. Note: These examples illustrate what a buffalo chute looks like and are not endorsed or otherwise being promoted by this handbook or any entities it represents

Figure 1. Example of squeeze chutes designed for buffalo management.



Berlinic Manufacturing Inc.
www.berlinicmfg.com/saeuze-chute



Pearson Livestock Equipment
<https://pearsonlivestockequipment.com/product-category/bison-handling-equipment/>



Hi Hog
www.hi-hog.com/products/bison-handling-equipment/bison-squeeze-chutes/



Morand Industries Ltd
www.morandindustries.com/livestock-systems/project-one-8xrjy

Many buffalo ranchers choose to work their animals once a year to reduce stress associated with roundups and to maintain their wild nature. State of the art facilities may exist, however, a successful roundup reflects the knowledge and experience of the individuals working the animals. Take the time to discuss low-stress bison handling techniques with your crew, and remember, **buffalo are not cattle.**

Many different types of corral designs can be incorporated into your operation. Corral systems should be easy access to all pastures and holding pens. Key things to consider are described below:

- **Accessibility.** Think semi-trucks loading out.
- **Site Drainage.** Do not build in a low spot.
- **Water Availability.** Water must be accessible if you need to keep animals in the corrals for a period of time.
- **Corners.** Buffalo do not like corners, so designs should eliminate corners where possible.

Figure 2. Basic components of buffalo corral design

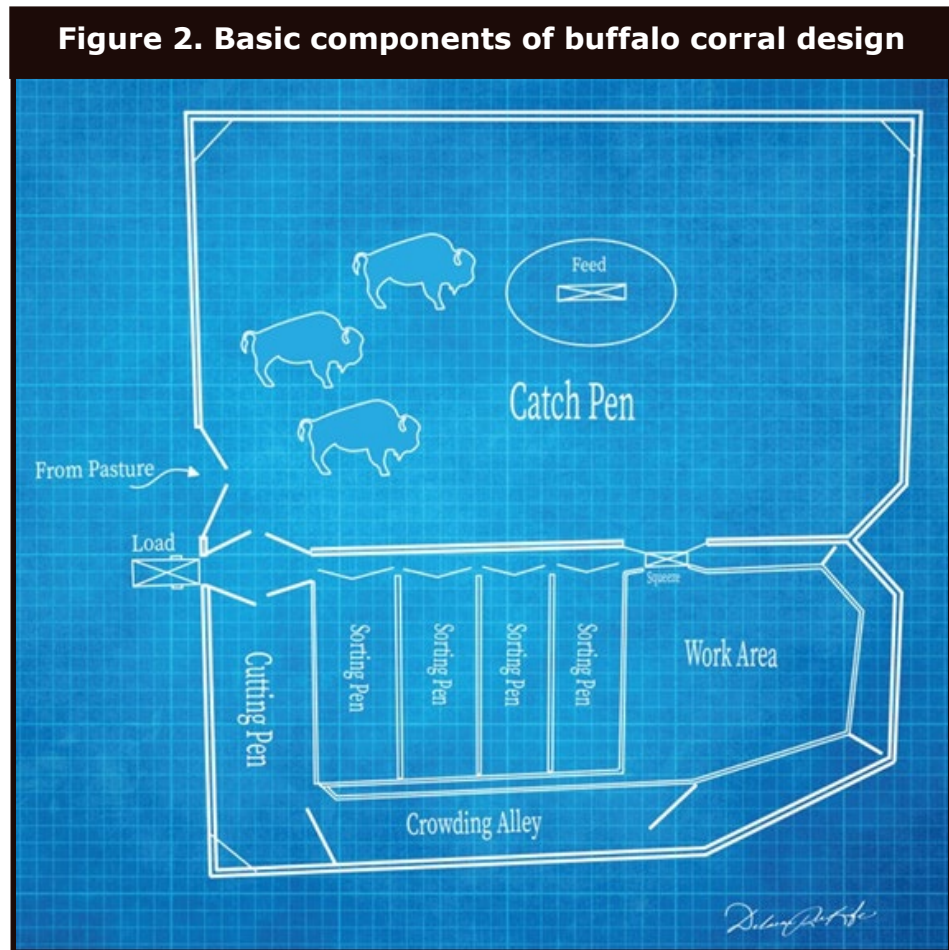


Figure 2 illustrates a basic corral design specific to buffalo.

Sources:

- Ag Health Central States, Center for Agricultural Safety and Health (CS-CASH). No Date. Bison Handler Tailgate Training Safety Manual. CS-CASH, InterTribal Buffalo Council and University of Nebraska Medical Center (UNMC) – College of Public Health, University of Nebraska-Lincoln. Available at: <https://nasdonline.org/7058/d002351/bison-handler-tailgate-training-safety-manual.html>.
- Hauer and Helbig. 2016. Bison Handling Facilities. Alberta Agriculture, Food and Rural Development. Available at: https://archive.org/details/bisonhandlingfac00haue_0.
- Stockmanship Journal. 2021. Volume 7. Available at: <https://stockmanshipjournal.com/>.

MANAGEMENT RESOURCES. Most management resources used for cattle operations will cross over to buffalo: vehicles, tractors, ATV/UTVs, horses, grass hay, trailers, etc. The main difference, as mentioned earlier, is in the handling of buffalo. If a cattle rancher is interested in converting to buffalo ranching, chances are they are already equipped with many management resources needed for buffalo.

ASSOCIATED PERSONNEL. Like cattle, buffalo do not take days off; therefore, buffalo must be cared for year-round. Ranching operations should assign an individual responsible for the daily needs of buffalo, especially if they are in a small pasture and require supplemental feed. A herd manager, for example, holds responsibility for the overall management and care of your operation. Depending on the size of your herd, that person could be you. If you need additional help, consider hiring a herdsman and/or day labor.

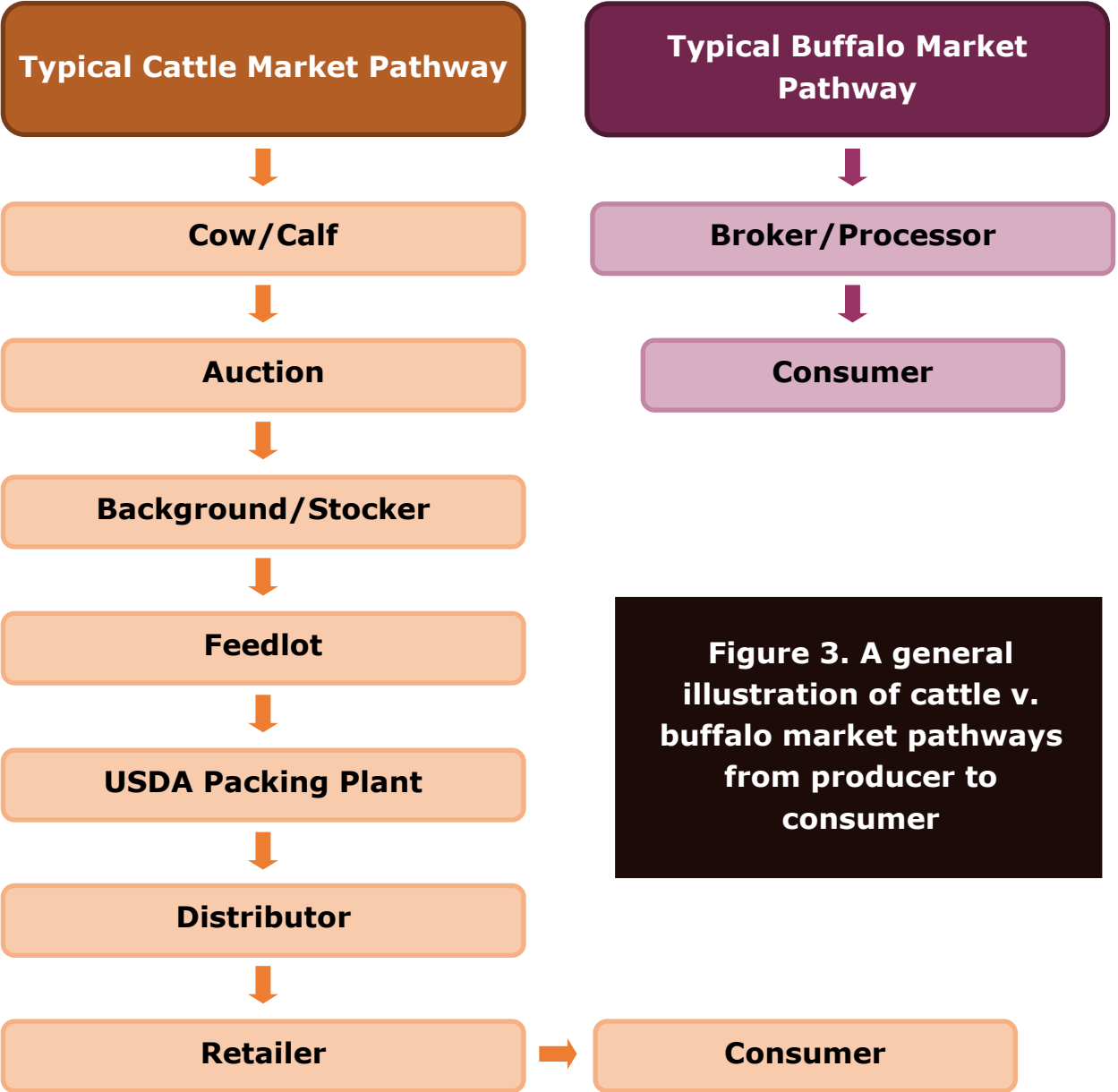
Knowledge of general agriculture and natural resource management is often helpful but not required. On the job training is often one of the most beneficial ways to learn a trade. However, take advantage of opportunities to further education for all associated personnel by becoming active in local, tribal, state, regional, and national buffalo organizations; trainings; webinars; and/or workshops that may be available in your area. Being part of a larger organization helps distribute this information, network among like-minded individuals, and share stories over similar experiences.

Another important relationship to have is with a trusted veterinarian. Although some similarities exist between buffalo and cattle, having a veterinarian knowledgeable about buffalo will be important for your operation. Do not wait until you have a health problem in your herd to become acquainted with a veterinarian. Reach out to a local veterinarian, extension agent, or fellow producers to find out if there is someone in your area you can utilize on health matters and areas of concern for your herd.

2) Determine Markets

Determining your market is an important consideration before shifting into a new production strategy. Unlike the cattle market, which has been one of the nation's top meat markets for years and has a wealth of data and trends to reflect on, the buffalo market is relatively new in comparison. Today's buffalo market has grown and fluctuated over the past 30 plus years to a relatively stable state. Now is a good time to be a buffalo producer. The nation is realizing the many benefits of consuming buffalo meat, producer knowledge has increased, and public support for buffalo restoration is rising to new levels.

Although there are many paths to take to reach the end consumer, in general the following supply chain comparison is observed between cattle and buffalo production.



Buffalo producers typically have a more direct pathway to the consumer. This contracted supply chain can be challenging, due to the lack of national or regional marketing and distribution systems. Most of the marketing is left up to the producer. However, one of the benefits of this process allows the producer to have more say in how their product reaches consumers. Fewer “middlemen” are involved creating an opportunity for higher profit margins.

The following section outlines a general explanation of the different areas of buffalo production and resources to determine current markets. The current markets of buffalo production consist of **live animal sales, meat sales, and value-added products.**

LIVE ANIMAL SALES. Cattle. Cattle operations are traditionally cow-calf operations. For cattle operations, a producer breeds production stock, raises a calf on the cow, weans the calf at about 8 months, transports them to a sale barn, and sells that year’s calf crop less some replacement animals. In traditional cattle supply chains, these animals are typically sold to the stocker market or feedlots. Once they are market ready (about 18 months of age) they go to packing plants, commonly known as processing facilities. Packing plants sell product to distributors, then on to retailers, and finally to consumers (**Figure 3**). The process is repeated each year and market fluctuations are often predictable. There is a wealth of knowledge and history that has gone into cattle market predictions.

Buffalo. This supply chain is not the typical market pathway for buffalo producers. **Figure 3** illustrates a much shorter process where the producer sells directly to a broker or processor where it is processed and then sold to the consumer. Unless you belong to an association or have a private sale, selling calves in the fall will not involve the traditional sale barn or auction ring. Instead, many buffalo producers rely on private treaty sales, which is a direct sale between the seller and buyer. Finding prospective buyers can be done through a variety of ways, such as social media and the internet, fellow producers, and organizations devoted to buffalo producers. Many local, regional, and national organizations exist that are a hub of knowledge on current live sale markets and information.

MEAT SALES. The buffalo meat market has gained popularity over the years. Buffalo meat is a healthy protein, lower in calories, fat, and cholesterol than other meats. Where beef products ship across the US and abroad to meet the needs of grocery suppliers, retail establishments and restaurants, the buffalo meat market has a more direct approach and is often considered a specialty or niche market.

Buffalo producers typically sell their animals to processors or have the animals processed and sell the meat directly to consumers. This transaction could be through direct sales, food hubs, online platforms, farmers' markets, or other market channels. An excellent resource to help determine price points can be found on the USDA Agricultural Marketing Service (AMS) Monthly Bison Report (<https://mymarketnews.ams.usda.gov/filerepo/reports>, Search Slug ID: 2827). This AMS report tracks recent information on prices of bison cuts.

Institutions. Another market channel worth discussing is the institutional market. This market consists of schools, daycares, nursing homes, prisons, federal feeding programs, and all other programs offering food service. It is largely untapped yet has huge potential for incorporating buffalo meat to provide a traditional and healthy protein source and stimulate the local economy. There is a steady movement in Indian Country towards food sovereignty and food security and buffalo producers have the potential to serve this need. Many tribes and states are working to connect producers to institutions. The National Farm to School Network (NFSN), ITBC, First Nations Development Institute, Native American Agriculture Fund, and Intertribal Agriculture Council are among some of the national organizations with resources. See **Table 4** for contact information.

As with cattle processing and sales, regulations also apply to bison which can vary from by state or market channel. Meat buyers can also dictate the type of inspection they require through purchasing specifications for animals. Producers should be knowledgeable of all local, state, tribal and federal food inspection and animal health requirements. Having honest conversations with processors and sellers, including on their labeling and packaging standards, can help ensure there are no surprises.

Currently, three main types of inspection services exist for buffalo meat: federal, state, and custom-exempt from state regulations, where applicable. **Table 3** gives a brief summary of what each type of inspection entails.

Table 3
A summary of the three types of meat inspection

	Federal Inspection	State Inspection	Custom-Exempt Inspection from State
Classification	Buffalo are considered non-amenable under the Federal Meat Inspection Act (FMIA) and are classified as an exotic species	Variable. Some states consider bison amenable, some exotic, and some wild game.	Classification is irrelevant.
Inspection Voluntary or Required	Voluntary inspection available by USDA Food Safety and Inspection Service (FSIS) inspectors. Inspectors perform an ante-mortem and post-mortem inspection of the carcass. Expect inspectors to be on-site each time an animal is slaughtered and processed	Variable. Inspection requirements depend on whether the animal is amenable or non-amenable. The state typically provides an inspector on-site for slaughter and processing if amenable. If non-amenable must request inspection	Inspection is not continuous and occurs once a year.
Slaughter and Processing	Slaughter and processing are typically done on-site. Animals are inspected ante-mortem, so they must be brought to the processing facility alive. Federally inspected mobile processors have nation-wide capabilities.	Variable. Some states have mobile slaughter services that can come to your ranch to slaughter animals.	Variable. Some states have mobile slaughter services that can come to your ranch to slaughter animals.

Table 3 continued

	Federal Inspection	State Inspection	Custom-Exempt Inspection from State
Fees	FSIS charges an hourly rate for inspection.	Variable. If amenable, state provides service free of charge. If non-amenable, producers may be required to pay a fee	No additional costs associated with any inspection
Sales	Meat can be sold intra- and interstate along with internationally.	Variable. Depends on state classification of buffalo.	Meat cannot be sold
Labeling	Labels must be approved and have USDA inspected stamp (triangle).	Labels must be approved and have State inspected stamp.	No label required, however, product stamped "NOT FOR SALE".
More Information	www.fsis.usda.gov/inspection/establishments/meat-poultry-and-egg-product-inspection-directory	www.fsis.usda.gov/inspection/apply-grant-inspection/state-inspection-programs	Check state department of agriculture for listing of facilities

At the federal level, buffalo are defined as a non-amenable species, which means it does not require inspection under the Federal Meat Inspection Act and associated regulations. Bison are federally considered as an exotic species and does not require Hazard Analysis and Critical Control Point (HACCP) or risk assessment plans. Language in the Agriculture Marketing Act of 1946 states USDA Food Safety and Inspection Service (FSIS) can provide voluntary inspection on exotic species on a reimbursable basis, which means the FSIS inspectors must be paid for their service, typically at an hourly rate. Meat inspected at the federal level can be sold interstate (between states) and internationally. Because buffalo meat is not required to be inspected by USDA FSIS, it falls under the Food and Drug inspected establishments can be found at www.fsis.usda.gov/inspection/establishments/meat-poultry-and-egg-product-inspection-directory.

The definition and regulations for buffalo meat inspection vary at the state level. The Federal Meat Inspection Act permits states to have cooperative agreements with USDA/FSIS to have meat inspection programs that equal federal standards. Currently, 27 states have mandatory meat inspection

programs equal to federal programs (www.fsis.usda.gov/inspection/apply-grant-inspection/state-inspection-programs). State-USDA inspection allows the meat to be sold anywhere that USDA inspected meat can be sold (National Bison Association 2015). Many states otherwise mandate the inspection of buffalo under state meat inspection acts as an amenable species. State inspection permits intrastate commerce of meat (within the state); however, this requirement depends on whether the state considers buffalo an amenable or non-amenable species. For example, South Dakota classifies buffalo as an amenable species and provides an inspector for the slaughter and processing of buffalo at no charge.

Custom-exempt establishments are the third type of meat inspection. This type has the most leniency due to the owner of the animal, the owner's family, and nonpaying guests, having exclusive use of the meat. Meat processed at these facilities cannot be sold after processing. One way that producers work through this is by selling a live animal that is market ready. The new owner is then able to work directly with the processor on how they want the animal processed. Sometimes, producers will sell whole, 1/2 or 1/4 of the live animal. There is no continuous inspection, rather a state and federal inspector schedule a yearly inspection of the establishment to ensure regulations and safety measures are being adhered to. Most states have lists of custom-exempt establishments on their state department of agriculture websites.

Sources:

- Barr, A., M. Hardy, A. Alma, H. Hopwood, and J. Studt. 2021. *Frequently Asked Questions (FAQs) About Serving Bison and Beef in USDA Child Nutrition Programs in South Dakota*. South Dakota State University, United States Department of Agriculture, South Dakota Department of Education, and Cheyenne River Sioux Tribe Buffalo Authority Corporation. Available at: <https://doe.sd.gov/cans/documents/BeefBison-FAQ.pdf>
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- Gwin, L. and J. Postlewait. 2016. *Frequently Asked Questions: Using Custom-Exempt Slaughter and Processing Facilities in Oregon for Beef, Pork, Lamb & Goat*. Oregon State University Extension Service.
- National Bison Association. 2015. *The Bison Producers' Handbook, Second Edition (2015)*.

VALUE-ADDED PRODUCTS. In addition to live animal sales and meat sales is the opportunity for a tremendous number of value-added products. Other value-added bison products include jerky and sticks, pet food, hides, heads, hair, tours, and hunts. Value-added meat products are extremely popular and often mimic the traditional way of preserving buffalo meat by Native Americans. These products are typically one of the most expensive meat products per pound and can be a stable money maker. A relatively new idea is marketing the by-products of buffalo, e.g., scraps from processing. Pet food companies have shown an interest in using buffalo in their products and can be a possible way to get rid of all the leftovers from processing.

Buffalo hides and heads have always held their value; however, producers can get a much better price if they can sell them as a finished product, either tanned or bleached and cleaned. Working with a person skilled in traditional tanning, a taxidermist and/or a commercial tannery, can help yield yet another value-added product.

Buffalo hair is another unique product producers can explore. When buffalo shed their winter hair in the spring and summer, producers can collect and blend it with other compatible fibers to produce bison fiber or wool. This new product is beautiful, useful, durable, and pricey. Because the amount of usable fiber per animal is less than a pound, many buffalo will be needed to come up with enough material for a sale. However, if you are eager to market a unique product the effort to collect the hair can be small compared to the price it will yield.

Lastly, hunts and tours provide another value-add opportunity. These may occur together or be offered as totally separate ventures. Hunts are an excellent way to cull out surplus animals, especially old bulls that may be difficult to handle and are less productive. Trophy hunts are popular to big game hunters and range anywhere from \$1,000 to \$15,000. Bundled deals such as a bed and breakfast or tour of the ranch can increase the sales value. Other considerations for hunts include whether the hunter keeps the meat, the hide and the head, transportation to taxidermist and/or meat processor, meals, etc. The hunts can be as basic or extravagant as the producer wants. Tours similarly can be very simple or creative and complex depending on your goals and ranch structure. Many people are interested in learning more about buffalo producers and the Native American connection to the animals. Agritourism is growing in popularity and can be an excellent value-added venture for producers.

Because the buffalo market is relatively small, producers may have to put more effort into marketing their products on their own. Luckily, social media has drastically reduced the cost of advertising while remaining relatively simple and effective. Other organizations have recognized the need to assist with marketing efforts at the producer level and have launched campaigns to help producers. ITBC, Intertribal Agriculture Council (IAC), First Nations Development Institute (FNDI), Native American Agriculture Fund (NAAF), specialty producer groups, buffalo associations, and others have producer-specific resources to help build knowledge of marketing. Specific labeling of products should also be considered when marketing products. Labels such as grass-fed, natural, native raised, and the Made/Produced by American Indians trademark through IAC can add to your efforts and boost sales (<https://www.indianag.org/americanindianfoods>).

3) Determine Feasibility

After evaluating resources and identifying markets, it is the time to put the pencil to the paper and decide whether the conversion from cattle to buffalo production is feasible for your operation. The first step is to develop a business plan which covers the financial management of your operation. Try to determine how each dollar will be generated and how each dollar will be spent. Many resources exist to assist with the development of a plan: Cooperative Extension Programs, local colleges/universities, non-profits, CDFIs (Community Development Financial Institutions), and others. The Minnesota Institute for Sustainable Agriculture provides detailed guidance for developing a comprehensive whole-farm business plan (DiGiacomo et.al. 2010).

The basic components of a business plan are:

1. **Executive Summary:** an outline of the business plan
2. **Company Summary:** a brief depiction of the business structure (corporation, partnership, LLC, etc.) and people involved.
3. **Products or Services:** a discussion on what your business offers and when
4. **Market Analysis:** an evaluation of customer base, purchase specifications, market demands, and related tactics.
5. **Strategy and Implementation:** outline the marketing strategy and sales strategy.
6. **Management Overview:** discuss organizational structures, personnel needs and trainings, and related costs.
7. **Financial Summary:** break down cash flow and break-even analysis

A business plan will be one of the most important documents used to determine whether this conversion is feasible. Take the time to plug in the numbers and analyze the markets you hope to pursue. It is imperative to know who your customers are and will be. A useful tool for budgeting a buffalo cow-calf operation has been developed by Penn State Extension (<https://extension.psu.edu/bison-production>). A sample budget worksheet can be downloaded and allows producers to input numbers for their specific operations. A good business plan can make the difference in securing funding and being financially sustainable for your operation.

Sources:

- Hagberg, J., L. Kime, J. Enfield, and J. Harper. 2018. *Bison Production. Agricultural Alternatives. Penn State Extension. Pennsylvania State University. Available at: <https://extension.psu.edu/bison-production>*
- DiGiacomo, G., R. King, and D. Nordquist. 2010. *Building a Sustainable Business, A Guide to Developing a Business Plan for Farms and Rural Businesses. Minnesota Institute for Sustainable Agriculture (MISA) and Sustainable Agricultural Research and Education (SARE).*
- QuickBooks Intuit. 2021. *What are the components of a business plan? Available at: <https://quickbooks.intuit.com/in/resources/starting-a-business-business-planning/business-plan-components/>*

4) Convert to Bison Production

The fourth and final step in transitioning from cattle to bison production is the actual conversion. This is when producers have assessed every aspect of their operation and are ready to take the leap. The following section covers recommendations associated directly with **Acquiring Animals, Releasing** them onto your lands, and **Herd Management Considerations**.

ACQUIRING ANIMALS. Buffalo can be acquired through a variety of methods and from a variety of sources. Auctions at sale barns are probably the most familiar and widespread way to acquire livestock. However, the frequency and location of buffalo auctions is somewhat different than traditional cattle auctions. For instance, most buffalo auctions are 1) sponsored by buffalo associations and held in conjunction with annual conferences or 2) conducted on-site at private ranches. The latter is comparable to cattle producers' bull sales.

Often producers who have many animals to sell will elect this method to save on transportation costs and show off their animals and operation. Sales sponsored by buffalo associations have a more traditional way of consigning several producers at one convenient sale location.



Standing Rock Sioux Tribe (ND) buffalo bull, ITBC Collection

Buffalo association sales may hold special shows and judging for added marketing. For information on buffalo auctions in your area, the National Bison

Association is a great resource, as well as local/regional associations or livestock auction services. Private ranch sales could take place by private buffalo herds, public herds (state or federal), tribal herds, and non-profit herds.

Animals can also be acquired through private treaty sales. This type of sale is a closed sale involving a private negotiation between the seller and buyer. Successful treaty sales can lead to long-lasting business relationships between the seller and buyer. These sales allow buyers the opportunity to see how the animal being considered for purchase is raised. This added benefit provides an idea of the overall health of the seller's herd and their accustomed environment.

Age and Location. Two important things to consider when acquiring animals involve each animal's age and location. Starting an operation with young animals can be beneficial. Calves or yearlings can more readily adapt to new surroundings, whereas older animals may not adjust as well. This maladjustment can lead to escapes, fence repairs, and even injury. Starting a herd with younger animals can avoid a lot of headaches in the long run. This consideration applies to young bulls as well as heifers. Heifers will not typically start breeding until they are two years old, so the return on them may take time. Old bulls may look spectacular but may come with problems, such as being hard to handle and not as productive. Exercising patience with younger animals will give them room to recognize their surroundings and get settled into a new environment.

Animal Rearing. The second important thing to consider is where and how the animals were reared. Research and asking the right questions helps ensure you have the information you need to effectively manage your herd. Some questions to ask initially might include the following considerations:

- What types of vaccination or deworming (if any) programs were they on?
- Were they exposed to any types of outbreaks?
- What type of feed or mineral were they receiving?

Ask these questions and for any herd health records the seller is willing to share. Similarly, examining the animal's initial geographic location is important because the animals may experience a difference in feed and

minerals if they are being moved from very different geographic areas. Buffalo often adjust well to new environments, but producers can still do their part to make these transitions even easier.

Genetics. A third consideration when starting a new herd is in the animal's genetics. Some producers have interbred cattle and bison for a beefalo. While these animals may carry more domesticated traits, their benefit to the land and market access is quite different from either bison or cattle supply chains. Producers that are looking to start or expand a herd should always be mindful of their herd.

Transportation. Transportation is a crucial aspect of acquiring animals. Thinking through transportation includes both how the animals are transported and any relevant health requirements of the new location. The former requires thinking about logistics. For example, the trailer must be adequate to handle buffalo and inspected for any issues before the sale is final. The last thing a person wants to deal with is a blowout on the trailer with a full load of buffalo. Loading buffalo tightly actually reduces chances of injury and leads to a calmer experience. Health requirements for transporting animals can be tricky as the classification for buffalo is not universal across the nation. Some jurisdictions recognize buffalo as wildlife, others as livestock.

Depending on the classification, they may be under the jurisdiction of the department of agriculture or wildlife. In addition, more confusion arises depending on where the trip starts in relation to the final destination. State versus Federal versus Tribal all have varying rules and regulations pertaining to livestock import/export.

The best thing to do is to do your homework. Work with other producers, agencies, and even truckers who have had experience with these issues, and do not be afraid to ask questions.

RELEASING ANIMALS. All the hard work of acquiring the foundation stock has been done. Now is finally the moment to release the animals. All new animals should undergo a quarantine/isolation period for at least a couple of weeks prior to a soft release into their new environment. Have an

area set up that is large enough to allow the animals to move around and has adequate room for feed and water. Also ensure the perimeter fence is secure. This space will give the buffalo time to settle down from being transported and become familiar with their new surroundings. These precautions also lower the risk of inadvertently releasing unhealthy animals. After the quarantine/isolation period is over, simply open the gate into the larger pasture(s). Giving buffalo a space to become acclimated encourages them to quietly enter into a larger pasture and not stampede across the range in search of their former home.

HERD MANAGEMENT CONSIDERATIONS. Buffalo production is not one size fits all. Many producers have found over the years that management is directly related to the goals of your herd. Holistic versus conventional, conservation versus economic, cultural versus development – these each have unique aspects. Each producer must determine what their goals are for their herd. For example, a producer interested in restoring native grasslands may have different management strategies than a producer interested in focusing on buffalo as a commodity.

Different management strategies may overlap depending on the overall goals of each herd and producer. That is the uniqueness of buffalo production. Producers can make a good living with buffalo and at the same time sustain the species, conserve our native rangelands, and restore the spiritual connection with Native people. Every producer should develop a management plan that includes goals and objectives and strategies for their herd. ITBC has some excellent tools for buffalo management considerations that can be found at: <http://itbcbuffalonation.org>.

General considerations for a herd management plan include the following components:

1. Personnel and Training.
2. Pasture Management.
3. Herd Health and Monitoring.
4. Cull Options.
5. Outreach, Education and Professional Development.

1) **Personnel and Training.**

The management plan should clearly identify who will do work, when, and why, including training plans as needed. Key positions and job descriptions should be included along with an organizational chart. If everyone working with the herd knows their job, things will run smoothly and efficiently. Trainings and orientations on LSH (Low stress handling) techniques and bison handler tailgate safety trainings on a routine basis provide your team with the tools necessary to accomplish your vision. Maintaining appropriately trained and knowledgeable workers is what makes an operation great.

2) **Pasture Management.**

From holistic resource management and regenerative agriculture to rotational grazing and cover crops, there exist many strategies for grazing. Research what strategies are most effective for your operation. In addition, be sure to consider what supplemental mineral and feed (if any) will take place, if water resources are adequate, and if baseline data for your pastures is available. Entities such as ITBC, NRCS, IAC, the Society of Range Management, and Holistic Research Management can be helpful resources and guide the journey of effectively managing your grassland resources.

3) **Herd Health and Monitoring.**

This topic is of ultimate importance, however, depending on your goals and beliefs, strategies can vary widely. Many buffalo producers consult with veterinarians (primarily dealing with cattle) and develop vaccination and deworming programs for their herds; however, this is a controversial topic. Not many vaccines have been developed specific to buffalo, so the practice of using cattle vaccines that have not been tested on buffalo is largely unknown as to its efficacy (or need).

In addition, buffalo are more susceptible than cattle to some diseases and are less susceptible than cattle to others. Continued research is needed to provide clarity and ensure the effectiveness and safety of vaccines in buffalo. One thing producers can do is educate themselves on the different issues facing herd health and use their best judgement on how to protect their herds.

There are several diseases to consider for buffalo herd health management that can be grouped into the following categories:

- **Diseases of the digestive system** (ex: calf scours and Johne's Disease)
- **Diseases of the respiratory system** (ex: Bovine Respiratory Disease Complex, Mycoplasma Pneumonia, Bovine Tuberculosis)
- **Diseases of the reproductive system** (ex: Listeriosis, brucellosis, Bovine Virus Diarrhea)

- **Parasitic diseases** (ex: internal parasitism, coccidiosis, liver flukes)
- **Nutritional diseases** (ex: copper deficiency)
- **Diseases causing sudden death** (ex: Clostridial diseases, Blackleg, Anthrax)
- **Miscellaneous diseases and toxicity** (ex: Pinkeye, Bluetongue and Epidemic Hemorrhagic Disease, toxic plants)

For a more complete list of bison diseases and information pertaining to causes, clinical signs, occurrence, diagnosis, treatment, and prevention, refer to The Bison Disease Field Guide (Berezowski et.al). In the event your herd is struck with a health emergency understanding the cause of death is one of the first steps in treatment, prevention, and spread. Necropsies (autopsy performed on an animal) aid tremendously in determining cause of death. Although veterinarians are trained to perform this type of work, there are steps producers can take to help with this process. The Bison Field Necropsy Guide (Hunter et.al) is an excellent resource to assist producers. Determining the cause of death can also help dictate how animals are disposed of and how to mitigate losses.

Other considerations for herd health include identification of animals, pregnancy checking, age ratios, sex ratios, overall veterinary resources and relationships, and monitoring. Part of herd health is being able to identify specific animals in the herd. Some producers utilize ear tags, ear clips, and even microchips. Pregnancy checking can be done by rectal palpation, with an ultra-sound, and/or not at all. Animals can also be aged by tooth wear, and producers have even been known to have bull semen tested. Whatever methods are chosen or not is again based on herd goals. In general, most producers prefer to work their animals once a year at most. This check-in is a very stressful event, so decide what the herd goals are, if they will be worked, how they will be worked, and when they will be worked.

4) **Cull Options.**

Culling, or removing animals from the herd, is a part of every operation. Culling methods can be very different, however. If the herd is being managed as wildlife and as a tool to promote ecological restoration, a random selection model for harvesting may be employed. Producers may elect to cull every fifth animal that is run through the chute, for example. On the other hand, if production is a goal open cows may be selected for removal or bulls to maintain certain sex ratios.

Producers may choose to cull bulls through hunts, which can provide for a value-added product in their operation. Other methods of removal include field kills, donations, feedlot finishing, taking animals straight to slaughter/processing facilities, and live sales. Field kills are a great option that

bring respect to the animal and can be done in a very low-stress way. Producers also have the option of having a mobile processor process the animal after the kill and/or deliver it to a facility to be further processed.

Donations typically include not only a field kill, but also a field harvest. USDA issued guidance for donating traditional foods to public facilities such as for school meals (<https://www.fns.usda.gov/cn/service-traditional-foods-public-facilities>), and the 2014 Farm Bill even waived some civil liability around the donation of traditional foods to these facilities. These field kills involve a crew willing and ready to assist with processing.

Although ITBC does not promote feedlot finishing, some producers utilize this method. Buffalo have not evolved on a grain diet and are traditionally grazing animals. Taking animals directly to a slaughter/processing facility removes many steps in marketing meat and is preferred for producers with an established relationship with a processor and focused on meat sales.

The final method of removal is live sales. Producers must carefully consider how this is executed. Many producers cull young animals, including calves. Producers typically work bison herds sometime between October and February. At that time calves are weaning, although some producers may leave them on the cow and let them wean on their own. If animals are weaned it is recommended to have a plan in place, so they do not sit too long.

5) Outreach, Education, and Professional Development.

No one spreads the word about something better than the people who are directly involved. That is why every producer should do their part in promoting buffalo production. Because buffalo production is so unique in restoring and sustaining a species, promoting ecological conservation, and restoring cultural connections with Native peoples, its message should be spread far and wide. Many opportunities exist for producers to share stories, resources, and contacts. These can especially be leveraged through local, regional, and national buffalo organizations. Find the ones that meet your goals, become involved, and learn from others. In addition, conferences, events, and trainings are often part of these organizations. Networking is a very important part of each producer's journey. Take advantage of furthering your knowledge at every opportunity.

APPENDIX

USDA Programs and Resources

The United States Department of Agriculture (USDA) has many resources available for producers, ranging from technical assistance for beginning farmers/ranchers and conservation management to disaster assistance and debt relief. Depending upon your situation there may be a program that applies to you. Although buffalo are recognized as being more than a commodity to be sold or traded, in the context of federal programs available, buffalo fall under the definition of livestock for USDA farm financing programs.

The two main agencies of the USDA that assist livestock producers directly are the Farm Service Agency (FSA) and the Natural Resource Conservation Service (NRCS). FSA implements agricultural policy, administers credit and loan programs, and manages conservation, commodity, disaster and farm marketing programs through a national network of offices. NRCS provides leadership in a partnership effort to help people conserve, maintain and improve our natural resources and environment.

Great strides have been made recently to not only recognize buffalo producers as eligible for some existing programs, but also narrow the gap between USDA programs and Native producers. To get started with FSA and NRCS, producers should visit their nearest Service Center and request a farm number.

While the below list offers some initial USDA programs for consideration, navigating USDA programs is now even easier. Farmers.gov provides an online window for USDA farm programs and the location of your nearest USDA Service Center (<https://www.farmers.gov/>). Similarly, the USDA Office of Tribal Relations consolidated a list of all USDA resources and services for Indian Country through the *USDA Resource Guide for American Indians & Alaska Natives 2022* (<https://www.usda.gov/sites/default/files/documents/usda-resource-guide-american-indians-alaska-natives.pdf>). The Intertribal Agriculture Council also offers free technical assistance to Indian Country producers on navigating USDA programs and land management practices (<https://www.indianag.org/technicalassistance>). These entities can help connect producers with a suitable program. The following list gives examples of some of the programs available to producers through USDA.

FARM SERVICE AGENCY

www.fsa.usda.gov

- **Farm Loan Programs**—offers loans to help farmers and ranchers get the financing they need to start, expand or maintain a family farm. (www.fsa.usda.gov/programs-and-services/farm-loan-programs) You already have the basic tools to run buffalo (land, equipment, resources).

- **Conservation Programs** – several voluntary conservation-related programs are administered under FSA (www.fsa.usda.gov/programs-and-services/conservation-programs). These programs work to address many farming and ranching related conservation issues, such as drinking water protection, reducing soil erosion, wildlife habitat preservation, preservation and restoration of forests and wetlands, support of grazing operations, and aiding farmers and ranchers whose farmland and conservation structures are damaged by natural disasters. Programs include:
 - **Conservation Reserve Program (CRP)**
 - **Conservation Reserve Enhancement Program (CREP)**
 - **Emergency Conservation Program (ECP)**
 - **Emergency Forest Restoration Program (EFRP)**
 - **Farmable Wetlands Program (FWP)**
 - **Grassland Conservation Reserve Program (Grassland CRP)**
 - **Source Water Protection Program (SWPP)**

- **Disaster Assistance Programs** – a variety of programs to help farmers, ranchers, communities, and businesses hit hard by natural disaster events are also administered by FSA (www.fsa.usda.gov/programs-and-services/disaster-assistance-program). These include:
 - **Livestock Forage Disaster Program (LFP)**
 - **Livestock Indemnity Program (LIP)**
 - **Emergency Assistance for Livestock, Honey Bees, and Farm-raised Fish Program (ELAP)**
 - **Noninsured Crop Disaster Assistance Program (NAP)**
 - **Tree Assistance Program (TAP)**
 - **Farm Loan Emergency Loan Program (EM)**
 - **Farm Loan Disaster Set-Aside Program (DSA)**

NATURAL RESOURCES CONSERVATION SERVICE

www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/

This list is not extensive, but rather includes programs specific to livestock and/or buffalo producers.

- **Environmental Quality Incentives Program (EQIP)**
- **Conservation Stewardship Program (CSP)**
- **Conservation Technical Assistance Program and Activities**
- **Community Assistance Programs and Activities**

Additional Resources

TECHNICAL ASSISTANCE	FINANCIAL ASSISTANCE	GENERAL INFORMATION
<p>InterTribal Buffalo Council (Tribes) 520 Kansas City St., ste 300 Rapid City, SD 57701 605-394-9730 www.itbcbuffalonation.org</p>	<p>First Nations Development Institute (Tribes and Individuals) 2432 Main Street, 2nd Floor Longmont, CO 80501 303-774-7836 www.firstnations.org</p>	<p>Indigenous Food and Agriculture Initiative (Tribes and Individuals) 534 W. Research Center Blvd, Suite 219 Fayetteville, AR 72701 479-575-5528 www.indigenousfoodandag.com</p>
<p>Intertribal Agriculture Council (Individuals) PO Box 958 Billings, MT 59103 406-259-3525 www.indianag.org</p>	<p>Native American Agriculture Fund (Tribes & Nonprofits) PO Box 1427 Fayetteville, AR 72702 479-445-6226 www.nativeamericanagriculturefund.org</p>	<p>National Wildlife Federation (Tribes and Individuals) 11100 Wildlife Center Drive Reston, VA 20190 1-800-822-9919 www.nwf.org</p>
<p>National Bison Association (Individuals) 8690 Wolff Ct. #200 Westminster, CO 80031 303-292-2833 www.bisoncentral.com</p>	<p>Tanka Fund (Individuals) 287 Water Tower Road Kyle, SD 57752 605-441-0358 www.tankafund.org</p>	<p>World Wildlife Fund (Tribes and Individuals) 1250 24th St., N.W. Washington, DC 20036 www.worldwildlife.org</p>
<p>Center of Excellence for Bison Studies South Dakota State University (Tribes and Individuals) Rapid City, SD 57701 605-394-2236 www.sdstate.edu/center-excellence-bison-studies</p>	<p>Local Banks and lending institutions (i.e., Community Development Financial Institutions) (Tribes and Individuals)</p>	<p>Defenders of Wildlife (Tribes and Individuals) 1130 17th St. NW Washington, DC 20036 1-800-385-9712 www.defenders.org</p>
<p>Educational Institutions (Colleges, University, Vocational Institutions)</p>	<p>USDA FSA Loans, Conservation Programs, and Disaster Assistance Programs (Individuals and Tribes) www.fsa.usda.gov/programs-and-services/farm-loan-programs</p>	<p>Government entities: Tribes, States, Federal (Tribes and Individuals)</p>
<p>Local and National Organizations (Tribes and Individuals)</p>	<p>USDA NRCS Programs (Individuals and Tribes) www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/</p>	<p>Books, Magazines, Blogs, etc.</p>

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