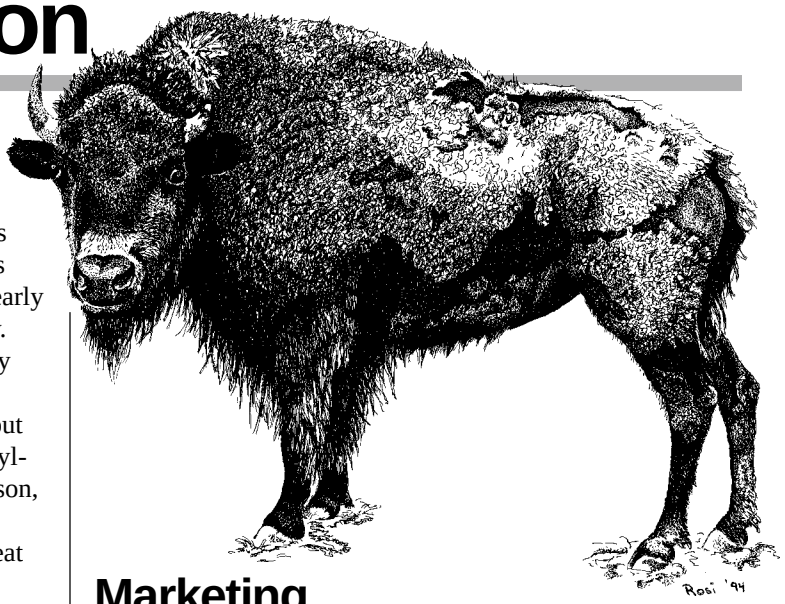
AGRICULTURAL ALTERNATIVES

Bison Production



Bison, commonly referred to as the American Plains Buffalo, are native not only to the Great Plains and the Midwest. They once roamed the mountain slopes and valleys of Pennsylvania. The state's last native bison was shot in 1801. Commercial breeders and bison enthusiasts have since reintroduced bison to Pennsylvania, where nearly 50 domestic herds with a total of 1,000 bison exist today.

About 7.5 million pounds of meat from approximately 15,000 bison are sold annually in the United States. The USDA's *Meat and Poultry Inspection Directory* lists about 100 bison-processing facilities nationwide. While Pennsylvania does not require meat inspection of slaughtered bison, many restaurants and retailers prefer USDA- or state-inspected meat. Also, USDA inspection is required if meat is to be sold across state lines. Three USDA-inspected slaughter plants for bison operate in Pennsylvania, but any meat-processing plant licensed for exotics can slaughter bison. The rates charged by individual plants and USDA inspectors can vary greatly.

Although bison still have many of their wild tendencies and are only semidomesticated, they are an agricultural alternative appropriate for small-scale and part-time farms. Bison adapt to a wide range of environments, feed sources, and management systems. A herd should consist of at least one bull and 10 to 15 cows. In Pennsylvania, herd sizes range from small operations with fewer than 25 bison to large operations with more than 200 bison. However, most Pennsylvania herds (60 percent) have only 10 to 25 animals. Only a few U.S. herds have more than 1,000 animals.

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Marketing

Breeders must create their own markets, but several marketing tools are available. State and national bison associations often have booths and provide marketing information at agricultural events. Pamphlets printed by the associations or individual breeders also give advice on marketing bison products. Breeders can advertise in association magazines, local newspapers, and agricultural publications. In addition, the novelty of bison herds usually attracts attention in the local community through newspaper and television coverage.

Bison are raised commercially for various markets:

- Meat, heads, bones, and hides are sold to restaurants, novelty shops, and individual buyers.
- Both bulls and heifers are sold to other producers for breeding stock.
- Animals are sold for organized bison hunts.
- Bison are sold to public game reserves and zoos.

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In Pennsylvania, bison are sold mainly for meat, by-products, and breeding stock. Most of the meat sold comes from bison bulls slaughtered between 18 and 36 months of age at a weight of 1,100 to 1,200 pounds. Many producers use direct marketing methods to sell bison meat. Major markets include wholesalers, restaurants, custom meat stores, and the general public through mail-order or on-farm sales. The meat usually is custom cut, vacuum packed, frozen, and shipped according to the buyer's specifications.

Because bison meat has a low fat content (less than 3 percent) and a cholesterol content that is lower than that in beef, organizations such as the American Heart Association and Weight Watchers recommend bison meat as a healthy alternative (Table 1). Bison also is classified as an "organically" grown food because producers rarely use antibiotics or hormones. As a result of society's increased nutritional awareness, the demand for bison meat has grown faster than the supply. Bison meat therefore sells at a higher price than beef. The heads are sold as mounted bull heads or as cleaned or uncleaned skulls. Manufacturers of leather goods purchase the untanned hides. Some producers even find a market for the hooves, bones, and hair. Breeding stock is sold at consignment sales and auctions or through personal contacts.

Getting Started

If possible, before purchasing any bison, observe several herds and visit farm sales and auctions. The best strategy usually is to start small and grow. Raising bison is similar, but not identical, to raising beef cattle. Bison are larger, stronger, and more excitable than cattle and thus require special fencing and handling facilities. You should plan a strong corral-chute system appropriate for your location and expected herd size. Allow for the same amount of pasture per bison as is required for cattle in your area, usually 2 to 3 acres per cow and calf in the eastern United States. In addition, know the state laws concerning liability and trespass because your herd is likely to draw the attention of the public. Bison raised for agricultural purposes are currently in the same category as cattle under state and federal law, but they are slaughtered under the regulations for exotic animals. Before purchasing your bison, you must understand these distinctions. Contact a lawyer for clarification of local ordinances and regulations. Bison are not domesticated animals and must be handled with caution if they get loose.

Table 1: Nutrition information for bison meat (research conducted by independent producers, 1988)

THREE-OUNCE SERVING	CALORIES	FAT	CHOLESTEROL
Bison[a]	93	1.8 g	43 mg
Turkey	125	3.0 g	59 mg
Chicken	140	3.0 g	73 mg
Beef	183	8.7 g	55 mg
AHA recommendations[b]	177	7.7 g	77 mg

[a]Based on bison fed corn rations for 90 days prior to processing.
[b]American Heart Association daily recommendations for intake of calories, fat, and cholesterol from the meat food group.

Fencing and Housing

Because bison can jump fences and break through almost any barrier, a strong containment system is essential. Fences around the pasture should consist of eight high-tensile wires, three of which carry a high voltage of electricity, or equivalent fencing. A corral-chute system with no sharp turns or corners and with sides 7 to 8 feet high is recommended. The system should include catwalks, feed bunks, water, lighting, tractor access, plenty of space for each animal, and spring-loaded, locking slam gates. The squeeze chute should have a crash gate and palpation cage. A crowding circle, alley-way(s), and sorting pens also are necessary. For more information, refer to the *Buffalo Producers Guide to Management & Marketing*, published by the National Bison Association.

Ideal land for bison would have boulders, rocks, rugged areas, woods, and thickets, but the only requirements are adequate pasture and a water source. Running water is preferable, but a pond will suffice. If you satisfy a bison's food and water requirements, it will stay within the fenced area. Otherwise, almost no barrier can stop a hungry bison.

Breeding

Mature cows weigh between 1,000 and 1,500 pounds, reaching peak physical maturity at 8 to 10 years of age. They can live to be 30 years old or longer. With good management, cows can reproduce every year and can begin breeding at 2 years of age. The normal gestation period is 280 to 285 days. The breeding season begins in August and continues into October, while the calving season begins in May and continues into July. Bulls weigh about 2,000 pounds at maturity and can be used for breeding at 2 years of age. One bull can breed 10 to 15 cows.

Some producers are trying artificial insemination, but natural breeding methods are safer because of the bison's unpredictable temperament and the scarcity of bison semen. To prevent inbreeding and improve the herd, new young bulls should be brought into the herd every two or three years. Do not keep any one bull in the same herd for longer than three years. The goal of the producer should be to improve the performance of the herd by breeding and selecting bigger animals that gain weight faster. The following practices are recommended for a herd breeding program:

- Keep accurate health and reproduction records.
- Cull cows that are difficult to breed and animals that are slow to recover from sickness or injury or that gain weight slowly.
- Cull all but the best bulls, and bring new young bulls into the herd for breeding.

Health Program

Bison are closely related to cattle, so they are susceptible to many of the same diseases. However, bison have stronger immune systems. Because they live in the open, they are less likely to infect one another. You should vaccinate your bison herd for common cattle diseases. As a precautionary measure, test and quarantine all new animals for three months before allowing them to enter the herd. Because of the bison's rugged nature and calving ease, a veterinarian's assistance is rarely needed; however, you should locate a veterinarian for vaccinations and emergencies.

Bison should be on a routine deworming program for tapeworms, roundworms, lungworms, flukes, and other parasitic worms. The deworming program should be developed with a local veterinarian, and should take into account climate, regional and farm parasite problems, and grazing intensity. External parasites, including flies, louses, mites, and ticks, should be controlled with strips, baits, sprays, foggers, dust bags, and liquid products.

Nutrition

In the wild, bison eat twigs, leaves, and grasses. An intensive-grazing program will help you make the most use of your pasture. Bison continue to graze through the winter by rooting under the snow. Grasses that stand up through the snow and retain a high protein percentage in the stems are best for winter pasture. Hay should be available when the snow is coated with ice. Grain rations should be included in the winter or when pasture conditions are poor.

For a good feeding program, salt, vitamins, and minerals should be added to the diet as needed. The extra nutrition gained from these supplements increases reproductive efficiency and weight gain. Selenium is especially important for reproduction because a deficiency of this mineral causes an increased number of aborted calves. The soils in the East have very little selenium, and since bison get most of their nutrition from forage, it is important to supplement selenium.

Bison require 1 pound of roughage per 100 pounds of body weight for digestion and 2 pounds of dry matter per 100 pounds of live weight for energy. Clean, fresh water should be available at all times. For added weight gain and to improve meat texture and flavor, you should begin feeding grain 90 to 120 days prior to slaughtering. The meat of bison finished on corn has a taste similar to beef, which many consumers prefer.

Budgeting

Included in this publication are two bison production budgets. The first summarizes the receipts, costs, and net returns of a bison cow-calf operation in which the offspring are sold for slaughter. The second summarizes the receipts, costs, and net returns of a bison cow-calf operation in which the offspring are sold for breeding stock. These sample budgets should help ensure that all costs and receipts are included in your calculations. Costs and returns are often difficult to estimate in budget preparation because they are numerous and variable. Therefore, you should think of these budgets as an approximation and then make appropriate adjustments in the "Your Estimate" column to reflect your specific production and resource situation. More information on the use of livestock budgets can be found in *Agricultural Alternatives: Enterprise Budget Analysis.*

Initial resource requirements

- Land: 32 acres
- Labor: 160 hours
- Capital
  - Livestock: 15 cows and 1 bull: $32,000
  - Buildings, equipment, fencing: $20,800
  - Total capital invested: $52,800

Sample Bison Cow-Calf Slaughter Budget (One Cow)

Bulls sold at 1,100 pounds and heifers at 700 pounds; hay-pasture program.

Item	Quantity	Unit	Price/unit	Total	Your Estimate
Receipts (per cow)					
Bull calf	495	lb	$2.25	$1,113.75	_____
Heifer calf	74	lb	$1.60	$118.75	_____
Heifers (cull replacements)	75	lb	$2.50	$187.50	_____
Price for uncleaned skull (slaughtered bull)				$29.00	_____
Price untanned hide (culls/slaughter animals)				$39.00	_____
Cull cows	120	lb	$1.25	$150.00	_____
Cull bulls	32	lb	$1.50	$48.00	_____
Total receipts				$1,686.00	_____
Variable costs					
Feed requirements for cow and calf					
Pasture (hay equivalent)	3.5	ton	$40.00	$140.00	_____
Hay (mixed grass and legumes)	0.9	ton	$80.00	$72.00	_____
Soybean meal	0.5	cwt	$12.00	$6.00	_____
Salt and minerals	90	lb	$0.12	$10.80	_____
Feed costs				$228.80	_____
Feed for finishing bull and replacements					
Pasture (hay equivalent)	2.8	ton	$40.00	$112.00	_____
Hay (mixed grass and legumes)	0.9	ton	$80.00	$72.00	_____
Corn	11	bu	$3.20	$35.20	_____
Soybean meal	2	cwt	$14.00	$28.00	_____
Salt and minerals	90	lb	$0.12	$10.80	_____
Feed costs, bull and replacements				$258.00	_____
Total feed costs				$486.80	_____
Health program	1	cow	$14.00	$14.00	_____
Hired labor	6	hour	$6.00	$36.00	_____
Transportation	1	cow	$5.00	$5.00	_____
Marketing and inspection	1	cow	$75.00	$75.00	_____
Supplies and miscellaneous	1	cow	$15.00	$15.00	_____
Interest on operating capital				$9.93	_____
Total variable costs				$641.73	_____
Fixed costs					
Labor charges	10	hour	$6.00	$60.00	_____
Bull replacement costs				$22.00	_____
Interest on investment				$75.60	_____
Fencing				$50.00	_____
Buildings and handling facilities				$30.00	_____
Total fixed costs				$237.60	_____
Total costs				$879.33	_____
Returns					
Returns over variable costs				$1,044.27	_____
Net returns				$806.67	_____

Sample Bison Cow-Calf Breeder Budget (One Cow)

Bulls and heifers sold as breeding stock; hay-pasture program

Item	Quantity	Unit	Price/unit	Total	Your Estimate
Receipts (per cow)					
Bull calf	0.45	head	$2,000.00	$900.00	_____
Heifer calf	0.11	head	$2,000.00	$220.00	_____
Heifers (cull replacements)	75	lb	$2.50	$187.50	_____
Uncleaned skull (slaughtered bulls)				$29.00	_____
Untanned hide (culls/slaughtered animals)				$39.00	_____
Cull cows	120	lb	$1.25	$150.00	_____
Cull bulls	32	lb	$1.50	$48.00	_____
Total receipts				$1,573.50	_____
Variable costs					
Feed requirements for cow and calf					
Pasture (hay equivalent)	3.5	ton	$40.00	$140.00	_____
Hay (mixed grass and legumes)	0.9	ton	$80.00	$72.00	_____
Soybean meal	0.5	cwt	$12.00	$6.00	_____
Salt and minerals	90	lb	$0.12	$10.80	_____
Feed costs				$228.80	_____
Feed for finishing bull and replacements					
Pasture (hay equivalent)	2.8	ton	$40.00	$112.00	_____
Hay (mixed grass and legumes)	0.9	ton	$80.00	$72.00	_____
Corn	11	bu	$3.20	$35.20	_____
Soybean meal	2	cwt	$14.00	$28.00	_____
Salt and minerals	90	lb	$0.12	$10.80	_____
Feed costs, bull and replacements				$258.00	_____
Total feed costs				$486.80	_____
Health program	1	cow	$14.00	$14.00	_____
Hired labor	6	hour	$6.00	$36.00	_____
Transportation	1	cow	$5.00	$5.00	_____
Marketing and inspection	1	cow	$75.00	$75.00	_____
Supplies and miscellaneous	1	cow	$15.00	$15.00	_____
Interest on operating capital				$9.93	_____
Total variable costs				$641.73	_____
Fixed costs					
Labor charges	10	hour	$6.00	$60.00	_____
Bull replacement costs				$22.00	_____
Interest on investment	1	cow	$75.60	$75.60	_____
Fencing	1	cow	$50.00	$50.00	_____
Buildings and handling facilities	1	cow	$30.00	$30.00	_____
Total fixed costs				$237.60	_____
Total costs				$879.33	_____
Returns					
Returns over variable costs				$931.77	_____
Net returns				$694.17	_____

For More Information

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