

AGRICULTURAL ALTERNATIVES

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Elk Production

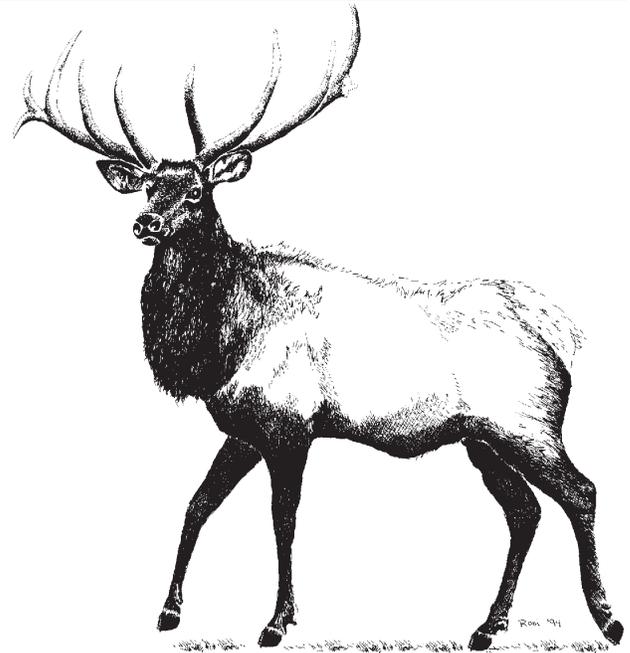
American elk are members of the deer family, but, unlike other deer, they are raised primarily for their velvet antlers. Mature elk typically produce 16 or more pounds of velvet annually, while red deer (another important source of velvet) produce only about 4 pounds. Most velvet sells for \$7 or more per pound. Velvet has been used as an ingredient in Asian medicines for thousands of years, and today it is sold to firms that produce these medicines for various ethnic markets. The North American velvet market has grown rapidly, and 25 percent of the velvet produced in North America is consumed here. While velvet is the primary product from elk, there also are good markets for breeding stock, meat, and other by-products.

Commercial deer farming is a relatively new business that has been growing steadily in the United States because of increasing demand for deer products, minimal acreage requirements for production, and adaptability of deer to marginal pastures. Compared to other livestock enterprises, elk farming has several advantages. Because elk convert forage efficiently into protein, with proper management they can be raised on marginal land. Elk also fit well into an existing grazing operation. Another advantage is the high ratio of lean meat produced per pound of live weight. The labor requirements for elk production are minimal, while the profit potential can be much greater than that of a comparable beef cow-calf operation.

There are almost 40,000 elk in North America. The advantages of producing elk include the following:

- Elk have a high fertility rate and a long reproductive life.
- They calve easily and wean their calves early.

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- Their calm disposition makes them easy to handle and transport.
- They tolerate cold winters and hot summers and have low susceptibility to disease.
- They yield high-quality velvet antler, meat, and by-products.

Marketing

Before establishing an elk operation you should research demand and identify possible markets for your products. Try to acquire a thorough knowledge of existing markets for velvet, breeding stock, and venison. Elk producers can market directly to the consumer or through a distributor. Individual producers can promote their products through county fairs, mail-order businesses, state and national deer associations, agricultural publications, and media outlets. There also are opportunities to participate in marketing cooperatives or marketing pools for selling velvet.

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Elk are raised mainly for breeding stock and their velvet antler, but some specialized slaughter markets also exist. Farm-raised elk venison is a fine-grained, mild, tender meat with a delicate flavor that is distinctly different from wild game venison. It also meets the American Heart Association's guidelines for fat, cholesterol, and calories (Table 1). While sold mainly to gourmet restaurants, venison also can be sold to the general public through specialty shops or mail-order businesses and at special events such as food fairs.

Table 1. Calories, cholesterol, fat and protein content of various types of meat (3-ounce portions).

	CALORIES	CHOLESTEROL (MG)	FAT (MG)	PROTEIN (MG)
Venison loin	139	62	5	22
Beef brisket	223	77	13	24
Ground beef	213	84	12	25
Pork shoulder	207	82	13	22
Beef bottom round	189	81	8	27
Lamb loin	183	80	8	25
Veal outlet	155	112	4	28
Chicken breast	140	72	3	26
Salmon	140	60	5	22

SOURCE: USDA research; venison analysis by The National Food Laboratory, Inc.

Yearlings are slaughtered at 14 to 20 months of age and at a weight of around 425 to 450 pounds. Two-year-olds are slaughtered at 24 to 30 months of age and at a weight of 575 to 600 pounds. The meat is sold as various cuts, in quarters, and as whole carcasses. USDA has a voluntary inspection program that for a fee offers live inspection on the farm and a postmortem inspection at a USDA-inspected slaughtering facility.

The large amount of high-quality velvet produced by elk is removed in early summer when the antler has reached about 55 percent full growth and weighs between 6 and 30 pounds. The market for velvet antler often is unstable and currently is dominated by countries that produce large amounts of velvet (such as Russia and New Zealand). Forming a cooperative with a group of producers or selling your velvet through a marketing contract can help you market your velvet more effectively.

Breeder markets are another specialized outlet for elk producers. Weaners, yearlings, and older breeders can be sold directly to other producers or through auctions. When selling breeding stock, you need to have accurate performance and health records readily available. Many customers are looking for bulls (males) with high weight gains and high velvet yields and for cows (females) with high weight gains and good fertility. A calm temperament also is important as the animals are not completely domesticated.

Elk by-products, including hides, tails, leg sinews, antler buttons, and ivories (eye teeth), all have special markets. Limited opportunities are available to sell bulls as trophy animals to game and hunting preserves.

In Pennsylvania, you may raise elk for custom hunts on your or another game farm for fee hunting. If you are producing elk for this type of business, you will need to obtain a license from the Pennsylvania Game Commission. Breeders and slaughter animals will be licensed by the Pennsylvania Department of Agriculture (PDA).

Facilities and Equipment

Elk farming requires grazing land, a fresh water supply, and natural shelter, such as trees, shrubs, or fallen branches, for calving. Elk also enjoy having an open water supply for wallowing. The stocking rate for elk generally is two to three adults with nursing calves per acre of pasture. Grazing areas should be fenced with high-tensile, woven deer wire that is at least 6.5 feet tall. To keep calves and predators from getting under fences, add either a strand of barbed wire at ground level or an electrified wire just above ground level. Provide some form of shelter (such as a stand of trees or a three-sided shed) to protect the elk from wind, freezing rain, and the hot summer sun.

You also will need a handling facility with chutes, gates, squeezes, and stalls. When it is necessary to transport elk, you can use a standard stock trailer. Before building new facilities or purchasing handling equipment, you should visit other elk operations to determine what you will need.

Breeding

Elk heifers (young females) are able to reproduce at approximately 16 months of age. Heifers weighing at least 400 pounds have the best chance for a successful pregnancy.

Bulls reach reproductive maturity at 24 to 30 months of age, and their productivity starts to decline at about 8 years of age. Although a bull's breeding rate depends on his age, one bull typically breeds 25 to 30 cows.

Two types of breeding programs can be used. With single-sire mating, one bull is grouped with a number of cows. This method is used to improve genetic characteristics and keep more accurate breeding records. When using single-sire mating, you should change bulls after two heat cycles to ensure pregnancy. With multisire mating, several bulls are grouped with a number of cows. This method requires fewer paddocks, but it increases bull aggression and puts younger bulls at a disadvantage. Also, with this breeding program, it is impossible to keep records on individual bull performance.

In August, breeding groups should be formed and calves should be weaned and ear tagged. The breeding season lasts from mid-August and until December, and calving begins in early May. You should plan for the majority of calves to be born in May and June. Elk normally have single births.

Nutrition

The elk diet consists mainly of pasture, trees, and brush. Grasses should be varieties that withstand close cropping and constant trampling by hooves. Rotational grazing systems can reduce parasite levels and help utilize pasture to its fullest potential. Hay, grain, silage, haylage, vitamins, and minerals are fed during the winter months (November to April) to maintain nutritional requirements. Elk also require supplemental feed when using wooded acreage or when pasture regrowth is slow during hot, dry weather. Cows need a high-quality feed during lactation to maximize calf growth rates. Because of severe weight loss during the breeding season, bulls should receive high-quality feed prior to rutting to maintain prime breeding condition.

Animals raised for venison require grain supplements for increased weight gain and body conditioning before slaughter. Mineral-fortified salt blocks also should be available in pastures year-round. Routine soil and blood tests should be conducted to determine what mineral supplements are required. Clean, fresh water should be available year-around, and heating systems should be provided to ensure ice-free water under freezing conditions.

Health Program

Maintaining strict health practices is beneficial to elk producers and the industry. A good health program is essential. Elk are susceptible to many of the diseases found in cattle, and the same vaccinations and dewormers are used. Make sure you are aware of changes in state and federal health regulations. You must have a propagation permit from the Pennsylvania Game Commission to raise elk in Pennsylvania. Pennsylvania regulations require elk over 6 months of age to test negative for brucellosis and tuberculosis within 180 days of being transported from one farm to another. Elk brought into Pennsylvania that are over 6 months of age must test negative for brucellosis and bluetongue within 60 days of importation and tuberculosis within 90 days of importation, according to recommended USDA protocols. The herd should receive yearly examinations and vaccinations and be weighed. Elk also should be dewormed periodically throughout the year.

Chronic Wasting Disease (CWD)

Chronic wasting disease (CWD) is a contagious neurological disease of deer and elk, as well as an issue of concern for elk farmers. CWD causes small lesions on the brains of infected animals, which result in loss of body condition, behavioral abnormalities, and death. CWD affects deer and elk in a similar way that mad cow disease affects cattle and scrapie affects sheep. Under Pennsylvania Act 190, any elk raised in Pennsylvania must be tested for CWD at slaughter. This involves sending a brain sample to the Pennsylvania State Veterinary Laboratory for testing. Permits are required before importing any animals into Pennsylvania. Elk

imported into the Commonwealth must come from a herd that has participated in a state-approved CWD-monitoring program for at least three years. However, if the animal is from a state with CWD (Colorado, Illinois, Nebraska, New Mexico, South Dakota, Utah, Wisconsin, or Wyoming), the herd must have participated in a state-approved program for five years.

Elk producers must obtain a license from PDA. Before the license is granted, production facilities must be inspected. The license process governs the size of pens, shelters, and enclosures; be sure to contact PDA before beginning construction of your facilities. Animals must be identified with an approved ear tag, tattoo, breed registration, or other approved identification method. In-state shipping of animals is also governed under Act 190. Contact PDA for more information on CWD management and Pennsylvania Act 190.

Local Regulations

All agricultural operations in Pennsylvania, including small-scale and part-time farming operations, function under the Pennsylvania Clean Streams Law. A specific part of this law is the Nutrient Management Act, portions of which (e.g., Act 38) may or may not pertain to your operation due to the number and/or size of animals you have. However, all operations may be a source of surface or groundwater pollution. Because of this possibility, you should contact your local Soil and Water Conservation District to determine which regulations may pertain to your operation.

Risk Management

You may wish to consider several risk-management strategies for your operation. First, you should insure your facilities as well as your animals. This may be accomplished by consulting your insurance agent or broker. Second, you may want to insure your income through a crop insurance program called AGR-Lite. To use AGR-Lite you must have five years of Internal Revenue Service (IRS) Schedule F forms. If your business structure is either a C or S corporation, the necessary information can be entered into a Schedule F for crop insurance purposes. You can then contact an agent who sells crop insurance and insure the income of your operation. For more on agricultural business insurance, see *Agricultural Alternatives: Agricultural Business Insurance*. For more information concerning crop insurance, contact a crop insurance agent or check the Pennsylvania crop insurance education Web site at cropins.aers.psu.edu.

Sample Budgets

The three sample budgets in this publication provide examples of the annual costs and returns for elk production. The first budget is based on a herd of 25 cows and 2 bulls (the second bull being a backup breeder). This budget is a typical startup budget for a person who wants an elk cow-calf enterprise. It assumes that 8 yearling heifers are sold for breeding and all bulls are sold for antler production or breeding. The remaining heifers are kept for replacement and expansion. The second budget is based on expansion from the first budget. It assumes producers have expanded as much as their land, labor, and capital limitations allow, and that they sell all offspring (except for replacements). The numbers in this budget are for one cow, but the facilities are based on a 44-elk cow-calf enterprise. The third budget is an antler production enterprise based on net present returns for one bull. Net present value allows producers to look at an investment (the money spent at the present time and its returns discounted by interest rates). The facilities for this enterprise are based on a 50-bull facility. These sample budgets should help ensure that all costs and receipts are included in your calculations. Costs are often difficult to estimate in budget preparation because they are numerous and variable. Therefore, you should think of these budgets as approximations and then make appropriate adjustments using the "Your Estimate" column to reflect your specific resource situation. More information on the use of livestock budgets can be found in *Agricultural Alternatives: Enterprise Budget Analysis*.

Initial Resource Requirements (cow-calf herd)

- Land: 25 acre
- Total labor: 550 hours per year
- Capital:
 - Livestock (per head):
 - 25 breeding heifers: $\$7,000 \times 25 = \$175,000$
 - Main breeding bull: \$10,000
 - Secondary breeding bull: \$6,000
 - Existing buildings, equipment, and fencing:
\$22,000
 - Total capital: \$197,000

Initial Resource Requirements (antler production)

- Land: 25 acre
- Total labor: 550 hours per year
- Capital:
 - Livestock (per head):
 - 50 bull calves: $\$2,000 \times 50 = \$100,000$
 - Existing buildings, equipment, and fencing:
\$22,000
 - Total capital: \$122,000

Sample Start-Up Elk Cow-Calf Herd Budget (based on a herd of 25 cows and 2 bulls)

Selling breeding heifers and keeping 3 heifers for replacements and expansion; selling all yearling bull calves.

Item	Quantity	Unit	Price	Amount	Your Estimate
Receipts					
Heifers sold for breeding stock	8	head	\$1,000.00	\$8,000.00	_____
Bulls sold for breeding or velvet	11	head	\$1,500.00	\$16,500.00	_____
Velvet antler	24	pounds	\$7.50	\$180.00	_____
<i>Total Receipts</i>				\$24,680.00	_____
Variable Costs					
Feed					
Pasture (hay equivalent)	38	tons	\$45.60	\$1,732.80	_____
Hay (mixed grass and legumes)	34	tons	\$120.00	\$4,080.00	_____
Grain	24	tons	\$250.00	\$6,000.00	_____
Salt and minerals	977	pounds	\$2.00	\$1,954.00	_____
Total feed costs				\$13,766.80	_____
Health program	46	animal	\$30.00	\$1,380.00	_____
Transportation	46	animal	\$15.00	\$690.00	_____
Advertising	46	animal	\$25.00	\$1,150.00	_____
Hired labor	69	hours	\$10.00	\$690.00	_____
Supplies and miscellaneous	46	animal	\$5.00	\$230.00	_____
Interest on operating capital				\$716.27	_____
<i>Total Variable Costs</i>				\$18,623.07	_____
Fixed Costs					
Labor charge	450	hours	\$0.00	\$0.00	_____
Bull replacement	0.5	bull	\$2,000.00	\$1,000.00	_____
Fencing			\$2,700.00		_____
Buildings and facilities			\$2,000.00		_____
<i>Total Fixed Costs</i>			\$5,700.00		_____
Total Costs				\$24,323.07	_____
Returns					
Returns over variable costs				\$6,056.93	_____
Net returns				\$356.93	_____

Sample Established Elk Cow-Calf Herd Budget (based on a herd of 44 cows and 3 bulls)

Selling all yearling bulls and heifer calves (except heifer replacements)

Item	Quantity	Unit	Price	Amount	Your Estimate
Receipts					
Yearling heifers sold for breeding stock	18.81	head	\$1,000.00	\$18,810.00	_____
Yearling bulls sold for breeding or velvet	19.80	head	\$1,500.00	\$29,700.00	_____
Velvet antler	35.20	pounds	\$7.50	\$264.00	_____
<i>Total Receipts</i>				\$48,774.00	_____
Variable Costs					
Feed					
Pasture (hay equivalent)	66.88	tons	\$45.60	\$3,049.73	_____
Hay (mixed grass and legumes)	59.84	tons	\$120.00	\$7,180.80	_____
Grain	33.00	tons	\$280.00	\$9,240.00	_____
Salt and minerals	1,719.52	pounds	\$2.00	\$3,439.04	_____
Total feed costs				\$22,909.57	_____
Health program	85.36	animal	\$30.00	\$2,560.80	_____
Transportation	85.36	animal	\$15.00	\$1,280.40	_____
Advertising	85.36	animal	\$25.00	\$2,134.00	_____
Hired labor	128.04	hours	\$6.00	\$768.24	_____
Supplies and miscellaneous	85.36	animal	\$5.00	\$426.80	_____
Interest on operating capital				\$1,203.19	_____
<i>Total Variable Costs</i>				\$31,283.00	_____
Fixed Costs					
Hired labor	450.00	hours			_____
Bull replacement	0.88	bull	\$10,000.00	\$8,800.00	_____
Fencing				\$4,752.00	_____
Building and facilities				\$5,280.00	_____
<i>Total Fixed Costs</i>				\$18,832.00	_____
Total Costs				\$50,115.00	_____
Returns					
Returns over variable costs				\$17,491.00	_____
Net returns				\$(1,341.00)	_____

Sample Antler Production Budget

Income per bull from a spiker to ten years of age; facilities based on 50 bulls

Item	Velvet	Unit	Total Price	Net Present Receipts	Your Value	Estimate
Receipts						
Spikers	2	pounds	\$7.50	\$15.00	\$13.89	_____
Two-year-old bulls	7	pounds	\$7.50	\$52.50	\$45.01	_____
Three-year-old bulls	11	pounds	\$7.50	\$82.50	\$65.49	_____
Four-year-old bulls	15	pounds	\$7.50	\$112.50	\$82.69	_____
Five-year-old bulls	18	pounds	\$7.50	\$135.00	\$91.88	_____
Six-year-old bulls	22	pounds	\$7.50	\$165.00	\$103.98	_____
Seven-year-old bulls	23	pounds	\$7.50	\$172.50	\$100.65	_____
Eight-year-old bulls	24	pounds	\$7.50	\$180.00	\$97.25	_____
Nine-year-old bulls	25	pounds	\$7.50	\$187.50	\$93.80	_____
Ten-year-old bulls	25	pounds	\$7.50	\$187.50	\$86.85	_____
Net present value					\$781.48	_____

Item	Quantity	Unit	Total Price	Cost Over Yearly Costs	Ten Years	Estimate
Variable costs						
Bull calf	1	calf	\$1,500.00		\$1,500.00	_____
Feed						
Pasture (hay equivalent)	1.52	tons	\$45.60	\$69.31	\$465.09	_____
Hay (mixed grasses and legumes)	1.36	tons	\$120.00	\$163.20	\$1,095.09	_____
Elk grain mix (pelleted)	0.75	tons	\$250.00	\$187.50	\$1,316.92	_____
Salt and minerals	39.08	pounds	\$0.50	\$19.54	\$131.11	_____
Health program	1	bull	\$30.00	\$30.00	\$201.30	_____
Supplies and miscellaneous	1	bull	\$30.00	\$30.00	\$201.30	_____
Interest on operating capital				\$19.98	\$134.08	_____
Total variable costs					\$5,044.90	_____
Fixed costs						
Labor	18	hours				_____
Fencing	1	bull	\$30.00	\$30.00	\$210.71	_____
Buildings and facilities	1	bull	\$30.00	\$30.00	\$210.71	_____
<i>Total fixed costs</i>					\$421.41	_____
Total costs					\$5,466.31	_____
Returns						
Returns over variable costs					\$(4,263.41)	_____
Net returns					\$(4,684.83)	_____

For More Information

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Periodicals

Animal Finders Guide
P.O. Box 99
Prairie Creek, IN 47869

The Deer Farmer
P.O. Box 11092
Wellington, New Zealand

The North American Deer Farmer
North American Deer Farmers Association (NADeFA)
9301 Annapolis Road
Lanham, MD 20706

News Roundup
NADeFA
9301 Annapolis Road
Lanham, MD 20706

The Stockman Grass Farmer
P.O. Box 9607
Jackson, MS 39286

Associations

North American Elk Breeders Association
P.O. Box 1640
Platte City, MO 64079
Phone: 816-431-3605
Fax: 816-431-2705
E-mail: info@naelk.org

Exotic Wildlife Association
216 Highway 27 West
Ingram, TX 78025

North American Deer Farmers Association (NADeFA)
9301 Annapolis Road
Lanham, MD 20706

Pennsylvania and Maryland Branch of NADeFA
John Behrmann
R.D. 3 Box 296
Dallastown, PA 17313

Pennsylvania Elk Breeders Association, Inc.
R.D. 1, P.O. Box 179A-1
Spring Mills, PA 16875
peba.net/index.cfm

Web Sites

Alternative Farming Systems Information Center
www.nal.usda.gov/afsic/afslinks.htm#cropsan

Deer and Elk Farmers Discussion Forums: Business Aspects of Deer and Elk Farming
www.deer-forums.com

The Elk Breeders Home Page
www.wapiti.net

National Association of Agricultural Journalists
www.ag.ohio-state.edu/~naaj/elk.htm

North American Elk Breeders Association
www.naelk.org

Prepared by Lynn F. Kime, senior extension associate; Robert S. Burry, Bugle Ridge Farm; and Jayson K. Harper, professor of agricultural economics.

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