

AGRICULTURAL ALTERNATIVES

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Red Deer Production

Red deer production may be a good option for some small or part-time farming operations, but potential producers should understand that they will need to be very active in marketing their product and be aware of the special handling requirements involved with deer. Compared to other livestock enterprises, however, deer farming has several advantages. Because deer convert pasture efficiently into protein, with proper management they can be raised on marginal land. They 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 deer production are minimal, while the profit potential can be much greater than for a comparable beef cow-calf operation.

Although commercial deer farming is a relatively new business, it generates more than \$100 million in annual income for major deer-producing countries such as New Zealand, Ireland, Great Britain, and Germany. New Zealand alone exports more than 1,000 tons of venison to the United States annually.

U.S. deer production is growing steadily due to increasing demand for deer products, minimal acreage requirements for production, and adaptability of deer to marginal pastures. America produces 20 percent of the venison needed to supply the domestic market and this market has grown 25 to 30 percent annually. More than 200,000 red, fallow, axis, sika, elk, and white-tailed deer are raised commercially

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on game preserves, farms, and ranches. Pennsylvania has about 30 commercial deer operations.

Almost 25,000 red deer are produced annually on U.S. and Canadian farms. The advantages of raising this breed include the following:

- Red deer have a high fertility rate and a long, productive breeding life.
- They calve easily and wean their calves early.
- Their calm disposition and compact body size make them easy to handle and transport.
- They tolerate cold winters and hot summers and have low susceptibility to disease.
- They yield high-quality meat, by-products, and velvet antler.

Due to chronic wasting disease, raising red deer involves a permit process and special considerations when slaughtering animals. On-farm facilities must also be inspected prior to beginning operation.

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Marketing

Before establishing a deer operation, you should research local demand and identify possible markets for your products. Producers can market directly or through a distributor. Individual producers can promote their products through county fairs, mail-order/Internet businesses, state and national deer associations, agricultural publications, and media outlets.

Although they are known throughout the world for their velvet production, red deer are raised mainly for venison and breeding stock. Farm-raised 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 per serving for fat, cholesterol, and calories (Table 1). While venison is sold mostly to gourmet restaurants, the meat is also 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 cutlet	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.

Red deer are either slaughtered between 14 and 20 months of age at a weight of about 200 pounds, or at 24 to 30 months of age at a weight of 240 to 300 pounds. The meat is sold as various cuts, in quarters, and as whole carcasses. Some large producers have their own on-site USDA slaughtering facilities. For smaller operations without on-site facilities, 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.

Red deer produce a large amount of good-quality velvet. The velvet antler is removed in early summer, when it has reached about 55 percent full growth and weighs 2 to 10 pounds. Velvet antler is used to produce traditional Asian medicines and tonics. The market for velvet antler often is unstable and currently is dominated by countries producing large amounts of red deer and elk.

Breeder markets are another specialized outlet for red deer producers. Weaners, yearlings, and older breeders can be sold directly to other producers or at auctions. When sell-

ing breeding stock, you need to have accurate performance and health records readily available. Many customers are looking for stags (males) with high weight gains and high velvet yields and for hinds (females) with high weight gains and good fertility. A calm temperament also is important as the animals are not completely domesticated.

Deer by-products, including hides, tails, leg sinews, antler buttons, and ivories (eye teeth), all have special markets. Stags can be sold as trophy animals to game and hunting preserves.

Facilities and Equipment

Deer farming requires special facilities including grazing land; a fresh water supply; and natural shelter for calving, such as trees, shrubs, or fallen branches. Red deer also enjoy having an open water supply for wallowing. The stocking rate for red deer generally is six adults plus nursing calves per acre of pasture. Grazing areas should be fenced with 17 strands of wire at least 75 inches tall. A high-tensile, woven deer wire is recommended. 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 deer from wind, freezing rain, and the hot summer sun.

You also will need a handling facility with chutes, gates, squeezes, and stalls. A trailer with solid walls and all light sources covered is required for transporting deer. A gutted horse trailer often works well. Before building new facilities or purchasing handling equipment, you should consider visiting other operations to determine what you will need.

Breeding

Red deer hinds are able to reproduce at approximately 16 months of age. Hinds weighing at least 175 pounds have the best chance for a successful pregnancy. Stags reach reproductive maturity at 24 to 30 months of age, and their productivity starts to decline at about 8 years of age. Although a stag's breeding rate depends on his age, one stag typically breeds 40 hinds.

Two types of breeding programs can be used. With single-sire mating, one stag is grouped with a number of hinds. This method is used to improve genetic characteristics and keep more accurate breeding records. When using single-sire mating, you should change stags after two estrus cycles (estrus cycles are 18 days apart) to ensure pregnancy.

With multisire mating, several stags are grouped with a number of hinds. This method requires fewer paddocks, but it increases stag aggression and puts younger stags at a disadvantage. Also, with this breeding program, it is impossible to keep records on individual stag performance.

Red deer normally have single births. The breeding season lasts from early September until December, and calving begins in late May. You should plan for the majority of calves to be born in May and June.

Nutrition

The red deer 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. Deer also require supplemental feed when using wooded acreage or when pasture regrowth is slow during hot, dry weather. Hinds need a good-quality feed during lactation to maximize calf growth rates. Because of severe weight loss during the breeding season, stags should receive good-quality feed prior to rutting to maintain prime breeding condition.

Animals raised for venison require grain supplements for increased weight gain and 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 the deer require. Clean, fresh water should be available year-round, and heated systems should be provided to ensure fresh water under freezing conditions.

Health Program

It is beneficial to you as a breeder and to the industry to maintain strict health practices. A good health program is essential. The herd should receive yearly health tests and vaccinations and should be weighed. Deer also should be dewormed periodically throughout the year. Deer are susceptible to many of the diseases found in cattle, and the same vaccinations and dewormers are used. You should always be aware of changes in state and federal health regulations. Pennsylvania regulations require deer to test negative for brucellosis and tuberculosis before they are moved from one farm to another. Deer brought into Pennsylvania must test negative for brucellosis, tuberculosis, and bluetongue within 60 days prior to importation, according to recommended USDA protocol. Imported animals must also be tested for brucellosis within 30 days and tuberculosis within 90 days of receiving the animals in Pennsylvania.

In September, breeding groups should be formed, and calves should be weaned and ear tagged. In early summer, prior to breeding, stags should have their antlers removed to help prevent injuries to other deer and handlers. Although red deer are calmer than many other breeds, stress is still a concern. Frightening or exciting deer can lead to injuries.

Chronic Wasting Disease

Chronic wasting disease (CWD), a contagious neurologic disease of deer and elk, is an issue of concern for red deer farmers. CWD causes small lesions on the brains of infected animals that 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 scrapies affects sheep. Under Pennsylvania Act 190, any deer 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. Deer 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.

Red deer producers must obtain a license from the Pennsylvania Department of Agriculture (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. For more information on CWD management and Pennsylvania Act 190, contact the PDA.

Sample Budgets

The two sample budgets in this publication provide examples of the annual costs and returns for two different red deer marketing programs. Both budgets are based on a herd of 60 breeding-age hinds and 2 stags. The first budget assumes that 23 yearling hinds and 23 stags are sold for venison on the retail market. The stags have an average live weight of 225 pounds and carcass weight of 150 pounds. The hinds have an average live weight of 175 pounds and a carcass weight of 120 pounds. The second budget assumes that 23 of the hinds are sold as breeding stock and 23 stags are sold for venison on the wholesale market. Both budgets assume that an additional 5 stags are sold as breeding stock and 5 hinds are kept for replacement and expansion. Receipts assume a pregnancy rate of 100 percent and a death loss of 4 out of 60 calves. 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 an approximation 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*.

Sample Red Deer Budget—Retail Slaughter (18 months)

Retail market sale of venison from 23 stags at 225 pounds (carcass weight: 150 pounds) and 23 hinds at 175 pounds (carcass weight: 120 pounds). Additional sale of 5 excess yearling stags as breeding stock. Five hinds are kept for replacement and expansion.

Item	Quantity	Unit	Price	Amount	Your Estimate
Receipts*					
Venison (from stags, carcass weight)	3,450	pound	\$4.00	\$13,800.00	_____
Venison (from hinds, carcass weight)	2,760	pound	\$4.00	\$11,040.00	_____
Stag, breeding stock (yearlings sold)	5	head	\$500.00	\$2,500.00	_____
Hides and other by products	46	head	\$10.00	\$460.00	_____
Velvet antler	15	pound	\$15.00	\$225.00	_____
<i>Total Receipts</i>				\$28,025.00	_____
Variable Costs					
Feed					
Pasture (hay equivalent)	36	ton	\$40.00	\$1,440.00	_____
Hay (mixed grass and legumes)	30	ton	\$70.00	\$2,100.00	_____
Grain	33	ton	\$280.00	\$9,240.00	_____
Salt and minerals	72	animal	\$2.00	\$144.00	_____
Total feed costs				\$12,924.00	_____
Health program (slaughter animals)	67	animal	\$10.00	\$670.00	_____
Health program (breeder animals)	5	animal	\$30.00	\$150.00	_____
Transportation	5	animal	\$15.00	\$75.00	_____
Marketing, inspection slaughter, and processing	46	animal	\$115.00	\$5,290.00	_____
Advertising	72	animal	\$5.00	\$360.00	_____
Hired labor	108	hour	\$9.00	\$972.00	_____
Supplies and miscellaneous	72	animal	\$5.00	\$360.00	_____
Interest				\$904.56	_____
<i>Total Variable Costs</i>				\$21,705.56	_____
Fixed Costs					
Labor charge	450	hour			_____
Stag replacement	0.5	stag	\$800.00	\$400.00	_____
Fencing				\$1,200.00	_____
Building and facilities				\$1,000.00	_____
<i>Total Fixed Costs</i>				\$2,600.00	_____
Total Costs				\$24,305.56	_____
Returns					
Returns over variable costs				\$6,319.44	_____
Net returns				\$3,719.44	_____

* Receipts assume a pregnancy rate of 100 percent and a death loss of 4 calves out of 60.

Initial Resource Requirements

- Land: 25 acre
- Total labor: 550 hours per year
- Capital
 - \$500 x 60 breeding-age hinds = \$30,000
 - \$800 x 2 stags = \$1,600
 - Existing buildings, equipment, and fencing, \$20,000 to \$30,000

Sample Red Deer Budget—Breeder/Wholesale Slaughter (24 months)

Sale of 5 mature stags and 23 hinds as breeding stock. Additional wholesale market sale of 23 stags for venison at 225 pounds (carcass weight: 150 pounds). Five hinds are kept for replacement and expansion.

Item	Quantity	Unit	Price	Amount	Your Estimate
Receipts*					
Venison (from stags, carcass weight)	3,450	pound	\$2.00	\$6,900.00	_____
Hind breeding stock (sold)	23	pound	\$500.00	\$11,500.00	_____
Stag, breeding stock (stags sold)	5	head	\$800.00	\$4,000.00	_____
Hides and other by products	23	head	\$10.00	\$230.00	_____
Velvet antler	15	pound	\$15.00	\$225.00	_____
<i>Total Receipts</i>				\$22,855.00	_____
Variable Costs					
Feed					
Pasture (hay equivalent)	42	ton	\$40.00	\$1,680.00	_____
Hay (mixed grass and legumes)	35	ton	\$70.00	\$2,450.00	_____
Grain	33	ton	\$280.00	\$9,240.00	_____
Salt and minerals	72	animal	\$2.67	\$192.24	_____
Total feed costs				\$13,562.24	_____
Health program (breeding stock)	28	animal	\$30.00	\$840.00	_____
Health program (slaughter animals)	44	animal	\$10.00	\$440.00	_____
Transportation	51	animal	\$15.00	\$765.00	_____
Advertising	10	animal	\$5.00	\$50.00	_____
Hired labor	108	hour	\$9.00	\$972.00	_____
Supplies and miscellaneous	72	animal	\$5.00	\$360.00	_____
Interest				\$1,293.94	_____
<i>Total Variable Costs</i>				\$17,843.18	_____
Fixed Costs					
Labor charge	450	hour			_____
Stag replacement	0.5	stag	\$800.00	\$400.00	_____
Fencing				\$1,200.00	_____
Building and facilities				\$1,000.00	_____
<i>Total Fixed Costs</i>				\$2,600.00	_____
Total Costs				\$20,443.18	_____
Returns					
Returns over variable costs				\$5,011.82	_____
Net returns				\$2,411.82	_____

* Receipts assume a pregnancy rate of 100 percent and a death loss of 4 calves out of 60.

For More Information

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Yerex, D., and I. Spiers (1990). *Modern Deer Farm Management*. Wellington, New Zealand: GP Books.

Periodicals

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

The Deer Farmer
P.O. Box 11092
Wellington, New Zealand
<http://www.deerfarmer.co.nz/>

The North American Deer Farmer
NADeFA
1720 W. Wisconsin Avenue
Appleton, WI 54914-3254

The Stockman Grass Farmer
282 Commerce Park Drive
Ridgeland, MS 39157

Web Sites

Deer Digest
<http://www.deer-digest.com/>

Deer and Elk Farmers Information Network
<http://www.deerfarmer.com/>

Deer Farm Directory
<http://www.deerfarms.com/>

Jake's Lake Farm and Ranch
<http://www.jakeslakefarm.com/>

Morgan's Birchwood Links, Information and Resources on Deer Farming
<http://deerfarmer.net/Birchwood/resources.htm>

North American Deer Farmers Association
<http://www.nadfa.org/>

Associations

Exotic Wildlife Association
216 Highway 27 West
Ingram, TX 78025

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

Pennsylvania Deer Farmers Association
RR 1, P.O. Box 348D
Huntington, PA 16653
<http://padfa.com/>

Tri-State Branch of NADeFA (PA, MD, DE.)
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