
AGRICULTURAL ALTERNATIVES

Red Deer Production

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. Americans consumed about 1.2 million pounds of commercially produced venison in 1992, and this market has grown 25 to 30 percent annually. Twenty-five percent of this venison is raised domestically, and the balance is imported primarily from New Zealand.

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. More than 200,000 red, fallow, axis, sika, elk, and white-tailed deer are raised in national parks and on game preserves, farms, and ranches. Pennsylvania has about 30 commercial deer operations.

Compared to other livestock enterprises, 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.

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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 breed 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.

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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 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 also is 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 cooked portions).

	CALORIES	CHOLESTEROL (MG)	FAT (G)	PROTEIN (G)
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.

Yearlings are slaughtered between 14 and 20 months of age at a weight of about 200 pounds. Two-year-olds are slaughtered 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 selling 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 visit 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 will meet the deer's needs. 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. 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. The herd should receive yearly health tests and vaccinations and should be weighed. Deer also should be dewormed periodically throughout the year.

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 deer and humans. Although red deer are calmer than many other breeds, stress is still a concern. Frightening or exciting deer can lead to injuries.

Sample Budgets

The two sample budgets in this publication provide examples of the annual costs and returns for two different red deer production and marketing programs. Both budgets are based on a herd of 60 breeding-age hinds and 2 stags. The first budget assumes that 23 young hinds are sold as breeders and 5 are kept for replacement and expansion. The second budget assumes that 23 of the hinds are sold for slaughter at 175 pounds live weight and 5 are kept for replacement and expansion. Both budgets assume that 5 of the stags are sold as breeding stock and that 23 are sold for slaughter at 225 pounds live weight. 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*.

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Initial resource requirements

- Land: 25 acres
- Total labor: 550 hours per year
- Capital
 - Livestock (per head)
 - \$2,000 x 60 breeding-age hinds = \$120,000
 - \$3,000 x 2 stags = \$6,000
 - Existing buildings, equipment, and fencing:
\$22,000
 - Total capital: \$148,000

Sample Red Deer Budget—Breeder

Selling 23 breeding hinds and keeping 5 for replacements and expansion; selling 5 breeding stags, and selling stags for venison at 225 pounds live weight.

Item	Quantity	Unit	Price	Amount	Your Estimate
Receipts					
Venison (from stags, carcass weight)	2,723	pound	\$4.25	\$11,572.75	_____
Hind breeding stock (sold)	23	head	\$1,200.00	\$27,600.00	_____
Stag breeding stock (sold)	5	head	\$800.00	\$4,000.00	_____
Hides and other by products	23	head	\$50.00	\$1,150.00	_____
Velvet antler	15	pound	\$55.00	\$825.00	_____
<i>Total receipts</i>				\$45,147.75	_____
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	7.5	ton	\$200.00	\$1,500.00	_____
Corn silage	7.5	ton	\$24.00	\$180.00	_____
Salt and minerals	150	pound	\$4.00	\$600.00	_____
Total feed costs				\$6,410.00	_____
Health program	72	animal	\$30.00	\$2,160.00	_____
Transportation	72	animal	\$15.00	\$1,080.00	_____
Marketing and inspection	23	animal	\$85.00	\$1,955.00	_____
Advertising	72	animal	\$25.00	\$1,800.00	_____
Hired labor	108	hour	\$6.00	\$648.00	_____
Supplies and miscellaneous	72	animal	\$5.00	\$360.00	_____
Interest				\$223.90	_____
<i>Total variable costs</i>				\$14,636.90	_____
Fixed costs					
Labor charge	450	hour	\$0.00	\$0.00	_____
Stag replacement	0.5	stag	\$800.00	\$400.00	_____
Fencing				\$1,200.00	_____
Buildings and facilities				\$1,000.00	_____
<i>Total fixed costs</i>				\$2,600.00	_____
Total costs				\$17,236.90	_____
Returns					
Returns over variable costs				\$30,510.85	_____
Net returns				\$27,910.85	_____

Sample Red Deer Budget—Slaughter

Selling 5 breeding stags, and selling stags for venison at 225 pounds live weight and hinds at 175 pounds live weight; keeping 5 hinds for replacement and expansion.

Item	Quantity	Unit	Price	Amount	Your Estimate
Receipts					
Venison (from stags, carcass weight)	2,723	pound	\$4.25	\$11,572.75	_____
Venison (from hinds, carcass weight)	2,310	pound	\$4.25	\$9,817.50	_____
Stag breeding stock (sold)	5	head	\$800.00	\$4,000.00	_____
Hides and other by products	46	head	\$50.00	\$2,300.00	_____
Velvet antler	15	pound	\$55.00	\$825.00	_____
<i>Total receipts</i>				\$28,515.25	_____
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	6	ton	\$200.00	\$1,200.00	_____
Corn silage	6	ton	\$24.00	\$144.00	_____
Salt and minerals	130	pound	\$4.00	\$520.00	_____
Total feed costs				\$5,404.00	_____
Health program	72	animal	\$30.00	\$2,160.00	_____
Transportation	72	animal	\$15.00	\$1,080.00	_____
Marketing and inspection	46	animal	\$50.00	\$2,300.00	_____
Advertising	72	animal	\$10.00	\$720.00	_____
Hired labor	108	hour	\$6.00	\$648.00	_____
Supplies and miscellaneous	72	animal	\$5.00	\$360.00	_____
Interest				\$198.75	_____
<i>Total variable costs</i>				\$12,870.75	_____
Fixed costs					
Labor charge	450	hour	\$0.00	\$0.00	_____
Stag replacement	0.5	stag	\$800.00	\$400.00	_____
Fencing				\$1,200.00	_____
Buildings and facilities				\$1,000.00	_____
<i>Total fixed costs</i>				\$2,600.00	_____
Total costs				\$15,470.75	_____
Returns					
Returns over variable costs				\$15,644.50	_____
Net returns				\$13,044.50	_____

For More Information

Alexander, T. L. *Management and Diseases of Deer*. London, England: Veterinary Deer Society, 1886. (Available from NADeFA for \$45.00 plus shipping.)

Australian Deer Farming Manual. Red Deer Society of Australia Inc., 1993. (Available from NADeFA for \$48.00 plus shipping.)

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Periodicals

Animal Finders Guide
PO Box 99
Prairie Creek, IN 47869

Alternative Livestock Monthly
PO Box 882
Fort Dodge, IA 50501

The Deer Farmer
Freeport 502
PO Box 11092
Wellington, New Zealand

International Hoofstock News
Rt 2 Box 247
Lampasas, TX 76550

The North American Deer Farmer
NADeFA
9301 Annapolis Road
Lanham, MD 20706

News Round Up
NADeFA
9301 Annapolis Road
Lanham, MD 20706

The Stockman Grass Farmer
PO Box 9607
Jackson, MS 39286

Associations

Exotic Wildlife Association
216 Highway 27 West
Ingram, TX 78025

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

Tri-State Branch of NADeFA (Pa., Md., Del.)
John Behrmann
RD 3 Box 296
Dallastown, PA 17313

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