



Elk

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Elk is a large species of the deer family. Mature bulls will range in weight from 800 to 1,000 pounds, while cows will weigh 600 to 800 pounds. Elk are predominantly raised for their antlers, which are promoted for use as an aphrodisiac in Korea. Some producers raise large bulls for game hunting. Others maintain a herd for aesthetic reasons. The market for elk meat has not been developed because the animals are more valuable when produced for other uses. As the industry matures and the value of breeding stock declines, meat production will likely become an important market for elk producers.

Feed

Elk graze on grasses and browse on trees and shrubs, depending on availability and nutrient content. Elk tend to prefer grasses. Ranchers have reported success feeding a combination of alfalfa and brome grass hay and 1 to 2 pounds of pelleted corn, oats and screenings during the winter. It may be necessary to mix minerals with the pellets because some problems have been observed with elk refusing block minerals and vitamins. One animal unit month (AUM) is equivalent to three mature elk females. This means that rangeland which is capable of supporting 50 head of beef cow-calf pairs for the season will support 150 elk cow-calf pairs.

Harvesting Antlers

Only the male elk produces antlers, which regrow each year. Antlers which are harvested for sale to Korean consumers should be harvested 70 days after initial regrowth occurs. A yearling spike bull elk will produce 2.5 to 3.0 pounds of antler at 70 days of growth. Harvestable antler weight will double each year until maturity at 4 to 5 years of age. At maturity a bull elk will produce between 15 and 25 pounds of antlers. The elk are generally tranquilized to remove antlers. The area of the antler about 3 inches above the base of the skull is treated with anaesthetic and a tourniquet is placed below the cut. The antler is removed, and the stump is treated with a disinfectant-blood coagulant. Elk treated in this manner recover quickly. The market for antlers is quite variable. In 1990 top grade elk antlers were selling for \$95 per pound in North Dakota; in 1992 elk antlers have been selling for 50 percent less. The main reason for the decline in antler price is the political reorganization in the Soviet Union and the ability of Soviet producers to sell a greater share of production to Korean consumers.

Reproduction

With good nutrition, elk cows may be bred to calve at 2 years of age. Young elk cows will begin to exhibit estrous at about 450 pounds. On average most cows will have their first calf at 3 years of age. Cows and bulls will reach physical maturity at 4 to 5 years of age. Cows breed in late September. The gestation for elk cows is 250 days, which means calves are generally born in May and June. Elk in captivity will have conception rates between 85 and 100 percent. Calves weigh between 30 and 40 pounds at birth, and 225 to 275 pounds at weaning about 6 months of age. Elk bulls may become aggressive during the rutting season. If antlers have not been removed, it is advised to keep bulls separated as they may injure each other fighting over the females.

Diseases and Parasites

Elk and beef cattle are subject to similar diseases. The North Dakota Elk Association will help producers screen their animals for tuberculosis and brucellosis. To command a top price, breeding animals should be guaranteed tuberculosis and brucellosis free. Excellent control of internal parasites can be achieved by treating the elk with Ivermectin.

Markets

Most elk producers raise elk for a combination of three existing markets: antlers, hunting and breeding stock. A common thread of advice elk producers recommend to all prospective elk producers is to become a member of their local elk producers association. The president of the North Dakota Elk Association is Craig Eglund, Rhame, North Dakota. Mature male elk will produce about 20 pounds of antlers at 70 days of growth. The price for elk antler in 1992 is estimated to be \$50 per pound. The consumers of elk antler produced in North Dakota are Koreans. Producers in the state report that Koreans usually contact them over the phone to discuss availability of antlers and price.

Potential breeding stock is generally marketed at 6 to 7 months of age. Buyers are generally put in contact with producers by "word of mouth" through local elk producer organizations. Heifer calf prices range from \$3,500 to \$4,500, depending on health certification and guaranteed purity of bloodlines. Bull calf prices range between \$1,400 and \$1,500. Mature brood cows, 4 years of age, will sell for \$7,500.

Elk producers wishing to sell to hunters report success by advertising in hunting magazines. Producers explained that advertising is usually needed only one year. After that "word of mouth" advertising will generally keep 1 to 2 bulls sold to hunters years in advance. An outstanding 7-point trophy bull may bring as much as \$13,000. Average 5- to 6-point bulls bring \$5,000 to \$6,000.

Facilities

Elk are proficient leapers, so containment fences need to be high and strong. A perimeter elk fence around a pasture should be 7 feet high, with posts every 15 feet. The fence should be of woven wire to keep animals from running through it. Handling facilities and corrals should be 8 feet high, and solid so that the animals cannot see through it. A wintering shed is not necessary for elk if the animals are protected from the wind. Feed bunks and hay racks used for beef cattle are satisfactory for elk.

Economics

Unlike, beef and pork, elk are not raised for their meat. In the future elk may be produced for their meat, but at the moment the relatively high price of breeding stock requires that producers sell high value products from elk. The high value products include breeding stock, antlers, and mature bulls for hunting. Female elk calves, 6 to 7 months of age, sell for \$4,000, while mature females sell for \$7,500. Male calves generally sell for \$1,500.

Economic and cash flow budgets shown below were developed for a 25-head elk herd comprised of equal proportions of males and females. A herd maintained in this manner allows antlers to be harvested from the males, while the females

produce replacements and breeding stock for sale. The interest rate on borrowed capital was assumed to be 9.75 percent. The opportunity cost of equity capital was 4 percent. The enterprise was assumed to be 50 percent leveraged. Addition of an elk herd as an alternative enterprise would require investment in fence, corrals, working chutes, and feeding and water equipment. For purposes of this analysis, additional investment in fence, corrals, etc. was assumed to be \$60,500. Depreciation was calculated on a straight line basis, over 10 years, with no salvage value. The 25-head herd was assumed to be worth \$150,000. All feed was purchased except for the pasture. Pasture was assumed to be owned.

Table 1. Production Coefficients For North Dakota Elk Herd

Mature animal death loss (%)	1
Calf death loss (%)	2
Culling rate (%)	10
Weaning (%)	80
Harvestable antler (lb)	16
Heifer calf selling price	\$4,000
Bull calf selling price	\$1,500
Antler selling price per lb.	\$50
Brood cow value	\$7,000
Mature bull value	\$5,000
Grass hay price per ton	\$50
Wheat screening price per ton	\$40
Corn price per bu.	\$2.30
Pelleting cost per ton	\$25
Mineral cost per ton	\$240
Pasture cost per AUM	\$10
Feed requirements	
Pasture-AUM's (6 months @ 1 AUM per cow & bull)	2.0
Roughage-grass hay	
(lbs per 6 months per cow)	3,240
Pellets to cows (lbs)	60
Mineral per cow (lbs)	124
Pellet composition (per ton)	
Wheat screenings (lbs)	1,700
Corn (lbs)	300

Table 2. Estimated annual economic and cash flow enterprise budgets for an established elk herd comprised of 25 head of mature animals

	Economic Budget		Cash Flow Budget	
	Per cow	Per herd	Per cow	Per herd
Returns				
Bull Calf receipts	\$450.00	\$5,625	\$450.00	\$5,625
Heifer calf receipts	1200.00	15,000	1,200.00	15,000
Sales of antlers	736.00	9,200	736.00	9,200
Sale of hunting bull	400.00	5,000	400.00	5,000
Gross Revenue	\$2,786.00	\$34,825	\$2,786.00	\$34,825
Variable costs				
Feed	223.70	2,796	178.28	2,228
Veterinary and medical	130.00	1,625	130.00	1,625
Breeding expense	11.46	143	11.46	143
Utilities and fuel	20.00	250	20.00	250
Interest	37.55	469	0.00	0
Total Variable Costs	\$422.71	\$5,284	\$339.74	\$4,246
Fixed costs				
Machinery ownership	128.00	1,600	128.00	1,600
Fencing ownership	48.00	600	48.00	600
Handling and feeding equipment	32.00	400	32.00	400
Depreciation on fixed assets	520.00	6,500	xxxx	xxxx
Depreciation cows	660.00	8,250	xxxx	xxxx
Breeding stock ownership	480.00	6,000	480.00	6,000
Cost of replacements	40.51	506	40.51	506
Insurance	120.00	1,500	120.00	1,500
Total Fixed Costs	\$2,028.51	\$25,356	\$848.51	\$10,606

TOTAL LISTED COSTS/COW	\$2,451.22	\$30,640	\$1,188.25	\$14,852
Returns over variable costs	\$2,363.29	\$29,541	\$2,446.26	\$30,579
Returns to labor, manage. & equity	\$334.78	\$4,185	-----	-----
Cash flow (debt service, family living)	-----	-----	\$1,597.75	\$19,973

Assumed for 25-head herd of an equal ratio of males to females

The economic budget is generated by charging market rates for all resources needed for production. It helps answer the question "Is this enterprise profitable?" The bottom line represents a return to labor and management.

The cash flow budget is an estimate of the out-of-pocket cash needed to run the enterprise, including not only direct costs but indirect cash costs such as principle and interest payments, insurance and taxes. It helps answer the question "Can I make meet my cash obligations if I go into this enterprise?" Total cash expenses are subtracted from total cash receipts to calculate the net cash which is available for family living and other needs.

References for Further Information

Craig Egland, president of the North Dakota Elk Association, Rhame, N.D. Personal communication, October 29, 1992.

Pete Lies of the Elk Ranch, New Rockford, N.D. Personal communication, October 29, 1992.

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