

A Deer Budget

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In about 1970, New Zealand embarked on a new multimillion dollar industry—that of farming deer. Twenty years later, U.S. producers are attempting to duplicate, in a small way, New Zealand's success. The U.S. is not likely to keep one million deer under fence or merchandize \$74 million of deer products per year, as New Zealand has done, but, to put it mildly, "the chase is on." I am very enthusiastic about deer farming prospects, but also very aware of the hazards involved. Deer farming can be characterized as a high-capital, long-term venture. It's the high-capital nature of the business that prompts the development of a deer budget and the prospects of developing a profitable and sustainable enterprise.

Table 1 lists the capital requirements of breeding stock, fencing, and handling and shelter facilities, when the breeding stock costs are either \$500, \$1,000, or \$2,500/head, and fencing costs either \$1.25 or \$2.50/ft, to enclose a 20-acre area (4,560 ft). It has been assumed that all capital bears a 10% annual rate and that total capital costs are to be amortized over 15 annual payments. From these capital costs an annual debt service cost has been calculated (Table 1). Red deer cost \$2,000 to \$2,500/head and fallow deer \$400-\$500 (for captured feral deer) and \$900 to \$1,200 (for farm-raised deer). The breeding stock prices, ranging from \$500 to \$2,500, are my attempt to illustrate the effects of capital expenditures on debt service costs, covering the range of typical prices of fallow and red deer.

In addition to capital costs, annual variable costs (feed, fence repair, veterinarian, etc.) have been estimated so as to arrive at a total annual fixed and variable cost/female (Table 1). The fencing and variable costs are very realistic for the Midwest area. The costs of shelter and handling facilities are arbitrary and depend on modifying an existing barn.

Table 2 focuses on net income attainable when deer and fencing are bought at various prices. In this table, salable deer weight is based on annual production attributable to the dam, rather than yearling sale

weights that are a composite of dam productivity and an additional year of feeding. To simplify the budget, an obvious fault is permitted. The weight of the offspring produced annually (Table 2) is the one typical for red deer, and not for fallow. The reader could divide the calf weights used and the income per female by two, and arrive at values very applicable for a fallow deer enterprise. One can't buy red deer for less than \$2,000/head, and fallow deer are available at \$1,000/head or less.

COMMENTS

To the small producer contemplating the purchase of 50 to 100 breeding females, debt service costs (interest and amortization) are sobering and represent over 85% or 94% of the total annual costs in an enterprise, based upon \$1,000 or \$2,500 females and \$2.50/ft fencing. Furthermore, if the producer amortizes the loan for a hundred head of \$1,000 females and \$2.50/ft fencing over 10 years rather than 15 years, debt service costs increase 29% (from \$14,520 to \$18,755). If the loan were for only five years (as some bankers may insist) as compared with 10 years, the annual debt service costs would escalate from \$188 for 10 years to \$315/head, an increase of about 68%. An annual debt service cost of \$315 about precludes a positive return based upon sale of offspring at meat prices. This is not to imply that breeding stock couldn't be sold at sufficiently high prices to realize a positive cash flow. Over a 15-year period, a change of 1% in interest rates increases annual interest costs by \$645.30/100 deer, and, over a 10-year period, by \$665.50/100 deer.

Interestingly, fencing costs have less effect on costs than initially thought. First off, a 20-acre area fenced at \$2.50/ft contributes only about 10% of total annual debt service costs. Fencing costs of \$1.50/ft versus \$2.50/ft decrease annual debt service costs only about \$8.88/deer. Thus, fencing is not an expense area where significant economies are apt to accrue. Fencing 40 acres rather than 20 acres @ \$2.50/ft increases your annual debt service cost by only about \$4.00/deer, but decreases fencing costs from \$600/acre (for 20 acres) to \$382/acre (for 40 acres).

Irrespective of initial cost of the deer, they will all

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have about the same variable cost/head. Feed represents the largest portion of variable costs. Most producers have little control over feed prices. However, they do have control over feed wastage and composition, and, therefore, the cost/ton of the diet fed. For example, supplementing good alfalfa hay costing \$100/ton with a largely unneeded supplement costing \$300/ton rather than with corn at \$100/ton results in a cost of \$150/ton for the total diet fed. This would be ill-advised nutrition and illogical economics. When four pounds of hay are fed per day, each \$10 change in hay prices changes the cost of wintering by \$2/head. Obviously, costs will be lower if pastureland can be charged at less than \$60/acre or if one can provide good pasture for four or five, rather than three, females and their calves per acre. Fertilizing pasture and introducing long-lived legumes into it offer excellent possibilities.

As I view the budget, there appears to be little opportunity for economies in capital costs. When females cost \$1,000 or more per head, financing costs are bound to be high. The major way to meet high capital debt costs is to increase production per hind in the form of high weaning rates and high calf weights and sale price/calf sold. Weaning rate does not influence annual gross returns per hind as dramatically as some people (including the author) may think. Based on \$1,000 hind cost and \$2.50/ft fencing costs, annual debt service costs and annual variable costs totaling \$218/hind (Table 1), a 4% change in weaning rate (84% to 88% to 92%) changes profit per hind bred by only \$16/hind when stag calves sell for \$200/head and weanling hind calves sell for 60% of the original hind costs. A change of 5% in weaning rate changes gross returns by about 5%, and a change in calf weaning weight of 10 lb changes gross by about 10%. By contrast, a change in selling price of \$.50/lb on only the stag calves would influence income per hind by \$25/head. Thus, selling price/lb, as influenced by quality of deer sold and demand, has a tremendous influence on gross returns per hind.

Since variable costs (feed, vet, etc.) and costs of fencing, shelter, and handling facilities are the same per deer, the annual gross returns per female deer, as a percent of the capital costs of the female, decrease as the cost of breeding stock increases. Based on the annual fixed and variable costs of deer costing \$500, \$1,000, or \$2,500/head (Table 1), it appears that an annual return per deer of 40, 30, or 25%, respectively, of the cost of the breeding stock is required in order to return 8.8, 8.2, or 8.8%, respectively, of the capital invested in the breeding stock.

Three schemes for pricing calves are presented in Table 2. Schedule A is based on a simple price/lb. Thus, the greater the cost of the original hinds, the

smaller the return. Schedules B and C are based upon a percentage of the original hind costs. Schedule B involves selling stag calves for \$200/head and hind calves for 60% of the hind's value. Schedule C is based on 30% gross return for all calves if the hinds cost \$1,000, or 25% for \$2,000 or \$2,500 hinds.

What selling prices/lb are necessary to realize a \$300 gross income per hind exposed to the stag (i.e., a 30% return from each \$1,000 hind)? If 100-lb stag calves sell for \$2.75/lb live weight (LW) and 88-lb hind calves for \$5.00/lb (\$440/head), income amounts to \$300.30/hind exposed to the stag. If only 84 calves are weaned and a gross income of \$300 is required for each \$1,000 hind bred, each female that does wean a calf must have a gross return of about \$357 to make up for those hinds that did not wean calves. If stag calves sell @ \$2.00/lb LW and hind calves @ \$6.00/lb LW (\$528/head), a \$305.76 income/hind exposed is realized. In a seller's market, the second alternative may be the easiest to accomplish.

If the initial breeding stock was purchased at \$2,000/head (requiring a \$500 gross return/hind, or 25% of each \$2,000 hind's cost), your return depends primarily on what the hind calves sell for as breeding stock. Regardless of breeding hind costs, the stag calf selling price will be rather fixed (\$2.00/lb LW). To realize a \$500 return/hind when stag calves sell for \$2.00/lb, hind calves have to sell for about \$11.50/lb (\$1,012/hind calf) and realize a \$509.04 return/hind bred and a \$595 gross return/hind that has actually weaned a calf.

I believe that good hind calves would sell for possibly 60-75% of yearling hind prices, but the point is that the majority of income must come from the sale of hind calves. How many hind calves one sells depends on whether one wishes to expand the herd. If you retain 20% of hind calves weaned and sell 34 hind calves rather than 42, a selling price of about \$11.75/lb (or \$1,034/hind calf) brings a gross income of \$518 return/hind bred.

It is assumed that debt service cost/hind is the average amount owed over the period of the loan rather than a monstrous interest cost the first year and small cost the last year (when the debt has been largely amortized). Length of the loan, or years amortized, has a tremendous bearing on the annual return/hind bred that is required in order to break even. If the loan is for only five years, a loss will occur when income is based upon 30% of a \$1,000 hind or 25% of a \$2,000 hind. A five-year loan on a \$1,000 hind, with the income based upon 30% of the hind's cost, results in an 18.8% loss on capital invested. If the loan is amortized over 20 years, the return on the capital invested per hind increases to 10.3%.

TABLE 1. BUDGETING A DEER FARM
(100 Females at Three Prices/Head and Fencing at Two Costs)

Breeding Stock Costs/Head	\$500		\$1,000		\$2,500	
Breeding Stock						
100 females	\$50,000		\$100,000		\$250,000	
4 males	\$2,000		\$4,000		\$10,000	
Total	\$52,000		\$104,00		\$260,000	
	<u>Cost/ft.</u>		<u>Cost/ft.</u>		<u>Cost/ft.</u>	
Fencing, 20 Acres	\$1.25	\$2.50	\$1.25	\$2.50	\$1.25	\$2.50
3960 ft. plus 600 ft. raceway = 4560 ft.	\$5,700	\$11,400	\$5,700	\$11,400	\$5,700	\$11,400
3 gates @ \$200 each	\$600	\$600	\$600	\$600	\$600	\$600
Total Fence Costs	\$6,300	\$12,00	\$6,300	\$12,000	\$6,300	\$12,000
Shelter-Handling	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Total Capital Invested	\$63,300	\$69,000	\$115,300	\$121,000	\$271,300	\$277,000
Capital/deer	\$633	\$690	\$1,153	\$1,210	\$2,713	\$2,770
Amortization over 15-year Period						
Average annual amortization	\$4,220	\$4,600	\$7,687	\$8,067	\$18,087	\$18,467
Annual Interest @ 10%	\$3,376	\$3,680	\$6,145	\$6,453	\$14,466	\$14,773
Total Annual						
Debt Service Costs	\$7,596	\$8,280	\$13,831	\$14,520	\$32,553	\$33,240
Annual Debt Cost/Deer	\$75.96	\$82.80	\$138.31	\$145.20	\$325.53	\$332.40
Variable Annual Costs/Head						
Veterinary	\$10	\$10	\$10	\$10	\$10	\$10
Fence maintenance	\$5	\$5	\$5	\$5	\$5	\$5
Pasture, 165 days @ \$60/acre (3 females/acre)	\$20	\$20	\$20	\$20	\$20	\$20
Non-pasture feed, 200 days, 4 lb. hay/day @ \$60/ton	\$24	\$24	\$24	\$24	\$24	\$24
1 lb. grain suppl./day @ \$140/ton	\$14	\$14	\$14	\$14	\$14	\$14
Total Variable Costs/Head	\$73	\$73	\$73	\$73	\$73	\$73
Total Annual Fixed and Variable Costs/Head	\$148.96	155.80	\$211.31	\$218.20	\$398.53	\$405.40

TABLE 2. DEER FARM INCOME

I. Based on the sale of 84 6-month-old weaner calves/100 hinds.

Total Income

Schedule A.	42 stag calves, weighing 100 lb, sold @ \$2.00/lb LW	\$8,400.00
	42 hind calves, weighing 88 lb, sold @ \$5.00/lb LW	<u>\$18,480.00</u>
	(Mix of meat and breeding stock sales)	
TOTAL		\$26,880.0
	per hind	\$268.80
Schedule B.	42 stag calves, weighing 100 lb, sold @ \$2.00/lb LW	\$8,400.00
	42 hind calves, sold at 60% of cost of initial hinds (\$1000)	\$25,200.00
	TOTAL	<u>\$33,600.00</u>
	per hind	336.00
Schedule C.	All calves (84) sold at various % of initial hind costs	
	(30% of \$1,000 hind)	
	TOTAL	\$25,200.00
	per hind	\$252.00

II. Initial Breeding Stock and Fencing Costs

Breeding stock/head	\$500.00	\$1,000.00	\$2,500.00
Capital investment/hind	\$690.00	\$1,210.00	\$2,770.00
Fencing costs/ft	\$2.50	\$2.50	\$2.50
Total annual fixed and variable costs/hind	\$156.00	\$218.00	\$405.00

III. Annual Income

Schedule A: 42 stags and 42 hinds			
Income/hind	\$269.00	\$269.00	\$269.00
Profit(loss)/hind	\$113.00	\$50.00	(\$136.60)
Net return (loss) on capital investment, %	16.4	4.2	(4.9)
Schedule B: 42 stags and 42 hinds			
Income/hind	\$210.00	\$336.00	\$714.00
Profit/hind	\$54.00	\$118.00	\$309.00
Net return on capital investment, %	7.8	9.7	11.1
Schedule C: 84 calves sold			
Income/hind	\$200.00	\$300.00	\$625.00
Profit/hind	\$44.00	\$82.00	\$220.00
Net return on capital investment, %	6.4	6.8	7.9

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