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Starting or Expanding Your Sheep Flock

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Sheep numbers are at their lowest level in history (about 10.0 million). Will numbers increase, remain static, or continue to decline? Regardless of the direction of the change, new flocks will be established, and some established flocks will be expanded. Thus, it is essential to understand the significance and magnitude of the effect of initial costs of ewes, interest rates, breed of ewe, and age of ewe on production levels and costs of production.

The high prices of \$100 to \$125 paid for ewes in 1988, followed by lamb prices of \$55 to \$65 per 100 pounds, may not be able to sustain a viable sheep industry. But regardless of the average price range of ewes, it is as important to make the right choices when they cost \$50 as when they cost \$100 per head.

WHAT IS A GOOD EWE WORTH?

Many factors contribute to a ewe's worth. What is her genetic potential to raise twin lambs? Is she sound in the mouth and udder? Is she a yearling or a mature ewe? Has she been sheared, or does she have a full fleece? Is she pregnant or with a lamb at her side? In addition, what

A Hampshire, a quarter-blood Finn cross, and a one-eighth-blood Finn cross ewe lamb — each sufficiently mature to conceive and raise a lamb. Failure to breed them would decrease the number of lambs they would produce in a lifetime

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is her value in relation to choice market lambs, bred cows, corn per bushel, hay per ton, etc.? And will you be able to utilize unused rough pasture, an unused dairy barn, or underemployed labor? It is hazardous to judge a ewe's worth entirely by past price relationships, or to be very certain of future projections. However, in relation to other livestock alternatives, good ewes are not overpriced (1988) when their earning ability and relative profitability are compared with other livestock ventures.

Ewes versus Lambs

For approximately the last 50 years, the Midwest flock producer could purchase good yearling ewes for the value of one choice 100-pound market lamb (marketed in June), i.e., you could sell a choice 100-pound market lamb in June for \$75 and buy a yearling ewe in the fall for \$75 to \$90. (This market lamb/yearling ewe price relationship is critical, when deciding whether to raise or buy replacements.) While this relationship has changed in recent years, in 1987 choice lambs were \$90 to \$94 per 100 pounds, and ewe prices ranged from \$85 to \$120 in the fall of 1987. It may no longer be a 1:1 relationship, but it remains a valuable guideline.



Feed Prices

One of the obvious flaws or omissions of data in attempting to evaluate the profitability of sheep and the value of ewes is the effect of feed prices in relation to lamb prices and the relative lamb/beef prices. Lamb prices per 100 pounds are about equivalent to hay per ton and about 20 times the value of a bushel of corn. Historically, that price relationship is not highly favorable. However, if grain prices decline and hay can be bought or produced for less than \$60 per ton, sheep will become a relatively profitable livestock venture when market lamb prices hover between \$60 to \$70 per 100 pounds, particularly for those with highly productive flocks.

A MONEY MANAGEMENT APPROACH

While a ewe is "worth" as much as you have to pay, in reality her worth must be measured over a period of years, in terms of sufficient production to result in a *profit*. Furthermore, the profit must relate favorably to other alternatives; e.g., if there is as much profit and more glamour in a beef cow, then the ewe isn't "worth" as much as when cattle were less profitable.

Commitment

The capital investment in ewes used to represent 95% of the total fixed capital invested. This is no longer the case. It is difficult at best and labor-inefficient to attempt to produce lambs without adequate facilities and equipment that enable one to lamb at a time that allows one to market lambs advantageously, to feed economically, and to minimize death loss. At current prices, the annual costs of interest and depreciation of the ewe flock (priced at \$100 per head) are virtually equal to the annual interest and depreciation costs of barns, fences, feeders, waterers, and miscellaneous equipment (\$110 capital investment per ewe that is necessary). The total annual debt service costs for ewes, barn (new), and facilities amount to about \$30 to \$35 per ewe. Thus, it is more difficult to get into and out of a sheep venture. A commitment must be made. One must have faith in one's own ability to manage sheep profitably and faith in the sheep's ability to produce at a level that is profitable. To be profitable, sheep must be treated as a business, and the investment in facilities and equipment of about \$100 per ewe should encourage an improvement in all aspects of breeding, feeding, marketing, and health that contribute to making sheep a profitable enterprise rather than a traditional, insignificant sideline.

Capital Costs

In this publication, yearling ewes are priced at \$100. Within a year, the market price of ewes can easily increase or decline 25% to 35%, as it did in 1985. Using an arbitrary price of \$100/ewe makes for an easy conversion of interest and depreciation cost with each price fluctuation. If ewes are \$80/head, multiply \$100 ewe annual costs by .80. If ewe prices are \$145/head, multiply by 1.45.

One hundred ewes at \$100 each represent \$10,000. If five die, the remaining 95 head no longer cost you \$100

but \$105 apiece; and for one reason or another, about four out of every 100 die each year. Since the four ewes can die anytime, on the average for the year you must feed two more ewes than the number that actually lamb. Over a 6-year period you will lose about 24 ewes out of 100. The difference between what you paid for them initially (\$10,000) and what you realize for them as 76 old, worn-out slaughter ewes at \$20 a head is \$8,480 — or a depreciation cost per year of \$14.13 per ewe. Actually, death loss at 4 percent per year, with ewes valued at \$100 a head, costs you \$2,440 over a 6-year period or about 30 percent of the total difference between what you initially paid for the ewes and the amount that must be written off as depreciation.

Death loss or flock size reduction for one reason or another is paramount from the standpoint of yearly earning power. For example, if during the course of 6 years your death loss had been 12 ewes or 2 percent per year, rather than 24 ewes or 4 percent per year, the 12 additional ewes could have produced 18 more lambs per year or 108 more lambs during the 6-year period. Furthermore, if death loss had been 2 percent rather than 4 percent, you would have had to retain 12 fewer ewe lambs for replacements, resulting in about 2 percent greater income each year.

Now consider interest. One hundred ewes at \$100 each would represent (at 10% interest) \$10 interest cost per ewe the first year. If the loan was amortized, as most banks would expect, the amount you would owe the bank would be reduced yearly. The payback on a \$10,000 loan in six equal installments amounts to \$1,667. Therefore, while your interest would represent \$1,000 the first year, it would be \$167 the last year. On the average, over a 6-year period it would amount to about \$5.83 per ewe (table 1). Interest plus \$13.50 depreciation per ewe totals \$19.33 per ewe annually, as the cost to service the \$10,000 investment in 100 ewes. At 12% interest, a rate more current than 10%, annual interest costs per ewe would increase from \$5.83 to \$7.00, and interest and depreciation would total \$20.50 per ewe on \$100 ewes. Thus, an additional 2% in interest rate increases the costs of producing 100 pounds of lamb per ewe by nearly \$1.17. That is a sizable amount and points out the significance and magnitude of interest rates to the costs of producing lamb.

In addition to interest and depreciation costs, some other expenditures can be estimated. Thus, total debt service (interest and depreciation on ewes and equipment) plus ram and veterinary costs total \$23.92 per ewe annually (table 2).

Table 1. Interest and Depreciation Costs per Yearling Ewe at Various Initial Costs

Initial cost/ewe	\$60	\$70	\$80	\$90	\$100
Interest 10%	\$ 3.50	\$ 4.08	\$ 4.66	\$ 5.25	\$ 5.83
Depreciation (6 years) and removal @ 4%	\$ 7.47	\$ 9.13	\$10.80	\$12.47	\$13.50
TOTAL ¹	\$10.97	\$13.21	\$15.46	\$17.72	\$19.33

¹ Returns from wool and cull ewe sales @ \$20 per head approximately will cover value of replacement ewes @ 18-20 percent annually.

Table 2. Nonfeed Costs (Interest and Depreciation) per Ewe Annually, with \$100 Ewes¹

Barn, new, \$7.70; remodeled, \$4.65	\$ 6.00
Fencing	3.70
Ram costs	1.25
Interest (@ 10%) on ewes	5.85
Feed bunks, waterers, etc.	1.50
Vet/drugs	2.50
Depreciation and death loss of ewes	13.50
TOTAL	\$34.30

¹ Adopted from Animal Science Fact Sheet AG-FS-0977, Minnesota Extension Service, University of Minnesota, 1985.

After determining the capital costs of \$100 yearling ewes, your next questions are, logically, "How much can I afford to pay for mature ewes?" and "Would they result in a lower annual interest and depreciation cost than yearling ewes?" Three factors have a major bearing on interest and depreciation costs of mature ewes: a) cost per head, b) mortality, and c) number of years of good production remaining. We estimate that the yearly attrition of a group of 5- to 6-year-old ewes is twice that of yearlings, or about 8 percent. The number of years a set of purchased mature ewes can produce profitably depends to a great degree on your feeding and management program, plus how old the ewes actually are. Obviously, an 8-year-old solid-mouth ewe has less chance of producing for 2 or 3 years than a 6-year-old solid-mouth ewe; yet the condition of their teeth may be similar. Few ewes remain productive after 7 years.

A comparison of capital costs of yearling and mature ewes is presented in table 3.

The capital costs (interest and depreciation) tend to favor mature ewes, even when kept for only two years with an anticipated mortality of 10%. This is true because the resale value of the remaining cull ewes is so close to the original cost of the ewes purchased as short-term breeding ewes. However, table 3 considers only investment costs and not production levels. Short-term ewes often require more feed and often produce inadequate milk, resulting in high lamb mortality. Furthermore, replacing ewes every other year magnifies the risk of bringing in disease.

Table 3. Relative Interest and Depreciation Costs of Yearling and Mature Ewes Kept for 2 or 3 Years of Production

Cost/head	Yearlings		Mature Ewes			
	\$100	\$120	\$50	\$70	\$60	\$80
Years kept in production	6	6	2	3	2	3
Interest (10%) cost/ewe annually	\$ 5.83	\$ 7.00	\$ 3.75	\$ 4.66	\$ 4.50	\$ 5.32
Deprec. cost/ewe ¹ plus 4% mortality/yr.	13.50	16.20	—	—	—	—
plus 8% mortality/yr.	—	—	—	13.20	—	16.54
plus 10% mortality/yr.	—	—	9.00	—	17.40	—
Total Capital Costs/ewe/yr.	\$19.33	\$23.20	\$12.75	\$17.86	\$21.90	\$21.86

¹ Starting with yearling ewes, after 6 years you sell 76 ewes for slaughter @ \$20 per head; with mature ewes (8% mortality/year) you sell 84 or 76 ewes, when kept for 2 and 3 years, respectively.

Breeding

A third alternative remains for those wanting to expand their current flock or just starting a sheep enterprise. Because ewe lambs can be bought weighing 75 to 80 lbs., they cost about 65 to 75% the cost of yearling ewes. To make this alternative economically sound, the ewes must be bred to lamb at 12 to 14 months of age. Ideally, they should be mated with a breed of ram that will result in a smaller-than-average lamb at birth to minimize difficulty at lambing time. While several breeds might be chosen (Cheviot, Dorset, Shropshire), a half-blood Finn ram would not only reduce the birth weight by 1 to 2 pounds but result in very prolific replacement ewes.

The ewe lambs should weigh 100 to 125 pounds when bred and be fed so they gain 35 to 40 pounds during gestation. With the down breeds (Suffolk, Hampshire, and Shropshire) and Finn-cross ewe lambs, you may expect 90 percent to lamb. Quarter-and half-blood Finn-cross ewe lambs rather consistently have produced a 140 to 175 percent lamb crop. Columbia, Corriedale, and Rambouillet ewe lambs are not as sexually precocious. About 40 to 60 percent will lamb at 12 to 14 months.

Their wool and the 60 to 100 percent lamb crop you sell will more than pay for their year's keep, and you will have a set of yearling ewes a year later that cost less than if you initially purchased yearling ewes.

A Production Budget

With these basic figures, let's develop a production budget and arrive at the projected necessary break-even selling price for lambs. The data in table 1 show that increased capital expenditures for ewes — and the effects on interest, depreciation, and mortality costs — significantly influence lamb production costs (approximately \$2.25 per 100-pound lamb for each \$10 increase in ewe costs).

The nonfeed costs (table 2) are not necessarily out-of-pocket costs, but they are charges that should be made against the sheep operation.

With high-cost ewes and inflated building and equipment expenses, nonfeed costs now represent about 35% of the cost of lamb production.

More importantly, these fixed costs are independent of the level of production and are the same whether you sell 80 pounds or 180 pounds of lamb per ewe.

In order to develop a realistic budget, two hypothetical but realistic feeding programs and three levels of lamb production have been used in table 4. In one case, a high level of lamb production theoretically is attained via a feeding program that includes little salvage feed. The other case involves considerable feed savings by maximizing salvage feed usage (corn stalks, small grain aftermath, etc.).



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Table 4. Sheep Feed Production Annual Budget Using Two Levels of Hay Feeding

Expected Feed Costs for Various Levels of Production	
Scheme 1: Minimal use of pasture or salvage feed — high lamb production	
4 lb. hay equivalent/ewe daily — 1,550 lb. @ 3¢/lb.	\$46.50
120 lb. grain/ewe @ 5¢/lb.	6.00
350 lb. lamb feed/100 lb. lamb gain @ 7¢/lb.	24.50
Total	\$77.00
Scheme 2: Maximum use of salvage feed — economize on hay — high lamb production	
3 lb. hay equivalent/ewe daily — 1,100 lb. @ 3¢/lb.	\$33.00
120 lb. grain/ewe @ 5¢/lb.	6.00
350 lb. lamb feed/100 lb. lamb gain @ 7¢/lb.	24.50
Total	\$63.50

The feed cost data per 100 pounds of lamb from table 4 have been combined with the nonfeed cost data from tables 1 and 2 to develop table 5. Amounts of feed fed ewes and feed efficiency values (table 4) are based on figures taken from Minnesota research. The 350 lb. feed/100 lb. lamb gain is valid for lambs during their first 150 days of life but not valid for 5- to 8-month-old lambs. Table 5 makes four important points:

- (1) The so-called fixed nonfeed costs of \$34.30/ewe for \$100 ewes (table 2) or \$38.35/ewe for \$130 ewes place a tremendous burden on the costs of producing lamb. It is recognized that these fixed nonfeed costs are about 1/3 less for the established producer who has no debt service costs on barn, fencing, and equipment.
- (2) Reducing ewe feed costs by utilizing inexpensive salvaged feeds and feeding prudent amounts of feed to the ewes is an area of management the individual producer can utilize that greatly influences cost of lamb production. In the example cited in table 5, reducing ewe feed cost by \$14.50/ewe (450 lb. hay equivalent) by using salvaged feeds reduced costs of lamb production \$14.50, \$9.65, and \$8.44/100 lb. when 100, 140, or 160 pounds of lamb/ewe, respectively, was produced. Too many producers feed too much hay, which results in it being hauled out as manure. Even a 175- to 180-pound ewe needs only 3½ pounds of good hay daily for about 3½ months of gestation. If you feed much above that level, the ewe will get picky and waste hay she should eat.
- (3) At equal lamb production levels, paying \$130/ewe compared with \$100/ewe increased costs of producing 100 pounds of lamb by \$4.05, \$2.90, and \$2.50 when 100, 140, or 160 pounds of lamb/ewe, respectively, was produced. However, while ewe costs/head have a bearing on lamb production costs, price per ewe is not nearly as significant in affecting production costs as the ewes' ability to produce at a high level. Irrespective of the ewes' age or nutrient intake during the year, there is good evidence that vast differences exist in the ewes' genetic potential to wean a high percentage of lambs (Finn cross vs. Hampshire or Columbia). Data in table 5 indicate that genetically superior ewes that consistently produce 140 pounds of lamb yearly but

cost \$130/head are more able to produce lamb at a lower cost per 100 pounds than genetically inferior ewes that cost \$100 but consistently produce 100 pounds of lamb per year.

- (4) At high levels of lamb production (160 pounds vs. 100 pounds of lamb per ewe), the effect of initial cost (\$100 vs \$130) per ewe becomes a smaller factor in influencing lamb production costs; i.e., at 100 pounds of lamb produced per ewe, ewes that initially cost \$130/head produced lamb at \$4.05 higher price per 100 pounds than ewes that cost \$100, but when ewes of each price produce 160 pounds of lamb the difference in lamb cost decreases to \$2.53/100 pounds.

Table 5. Effect of Ewe Costs, Level of Lamb Production, and Feed Costs on the Break-even Selling Price for 100 Pounds of Lamb

Ewe costs/head	\$100			\$130		
	100	140	160	100	140	160
Lbs. lamb sold/ewe						
Total nonfeed costs/ewe ¹	\$ 34.30	\$ 34.30	\$ 34.30	\$ 38.25	\$ 38.35	\$ 38.35
Total ewe and lamb feed costs/ewe ²						
Scheme 1	\$ 77.00	\$ 86.80	\$ 91.70	\$ 77.00	\$ 86.80	\$ 91.70
Scheme 2	\$ 63.50	\$ 73.30	\$ 78.20	\$ 63.50	\$ 73.30	\$ 78.20
Total ewe and lamb costs/ewe						
Scheme 1	\$111.30	\$121.10	\$126.00	\$115.35	\$124.15	\$130.05
Scheme 2	\$ 97.80	\$107.60	\$112.50	\$101.85	\$111.65	\$116.55
Total nonfeed and feed costs/100 lb. lamb						
Scheme 1	\$111.30	\$ 86.50	\$ 78.75	\$115.35	\$ 89.39	\$ 81.28
Scheme 2	\$ 97.80	\$ 76.85	\$ 70.31	\$101.85	\$ 79.75	\$ 72.84
Wool value/ewe	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00
Break even selling price/100 lb. lamb						
Scheme 1	\$103.30	\$ 78.50	\$ 70.75	\$107.35	\$ 81.39	\$ 73.28
Scheme 2	\$ 89.80	\$ 68.85	\$ 62.31	\$ 93.85	\$ 71.75	\$ 64.84

¹ Values adopted from Table 1.

² Values from Table 4.

SUMMARY

Ewe prices may vary considerably from year to year. High ewe prices often occur during and/or following years of high lamb prices. When lambs sell over \$75 per 100 pounds, ewe prices may be inexpensive, only to turn dear or overpriced when lamb prices decline to \$60 per 100 pounds. It's evident that debt service costs on ewes and facilities are a sizable burden on lamb production costs. Table 5 suggests that when ewes are capitalized into a sheep enterprise at \$100, it requires high lamb production (140 pounds or more per ewe) and maximum saving in feed cost to remain profitable, and at current (1988) feed costs and lamb prices, chances of profitability are marginal.

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