

MAY 19 1986

ST. PAUL CAMPUS  
LIBRARIESAG-FO-2925  
1986

## T I P S F O R

# Increasing Profitability With Sheep

Minnesota Extension Service  
University of Minnesota

R. M. Jordan, Ken Egertson, Richard Epley, R. A. Robinson and Neal Martin, University of Minnesota, St. Paul, Minnesota.

## SITUATION

With depressed grain prices, very narrow profit margins, and occasional losses, with cow-calf and cattle feeding operations, declining milk prices, and continuing high operation costs, the alternatives available to turn losing forage consuming livestock enterprises into profitable enterprises are limited. One forage consuming livestock enterprise currently not produced in surplus, a relatively low capital user, and one that has recently enjoyed reasonably profitable prices is sheep. A sheep operation will not fit into all farm operations, it will require more labor than some can or are inclined to provide, and it will not respond in a profitable manner if the best management, nutrition, technology, disease control, and marketing programs are not applied. What kind of sheep to raise, what breeding scheme to follow, how to most economically and most productively feed sheep, at what weights and conditions to market, and how to most efficaciously maintain flock health are far different in 1986 than in 1956. To be satisfied with the levels of production attainable 30 years ago would prove unprofitable in 1986.

## PURPOSE

The purpose of this publication is to briefly deal with the issue of increasing profitability of sheep. What is the outlook for sustained favorable market profitability? What management, feeding, breeding, and disease control practices are successful producers following? *How can input costs be reduced and/or production increased per unit costs so as to increase net profit?*

## SHEEP MARKET OUTLOOK

Market prices are not static from month to month or year to year. Per capita consumption of lamb is about 1.5 lb./year, and the industry has not succeeded in stimulating consumption appreciably. Further, the demand is "thin" (few people eating sizeable amounts rather than many people eating modest amounts). Production and consumption patterns are locationally skewed (largely produced in interior and consumed on both coasts). Changes in price from week to week or year to year are almost entirely a reflection of change in supply rather than a fluctuation in demand.

Fed lambs averaged about \$70/100 lb. during the second and third quarters of 1985 and the first quarter of 1979—both peak periods were about \$10/100 lb. above cattle prices. Between those two peaks, prices were comparable to fed cattle prices. The retention of a higher than normal number of ewe lambs for breeding in 1979, low lambing rates in 1978, and severe winter storm losses and severe drought in Texas in 1984 were responsible for lower supplies and the recent high lamb

prices of 1984 and 1985. The 5 percent expansion in ewe numbers from 1979 to 1982 outstripped demand, resulting in mid-\$50/100 lb. prices which triggered another decline in sheep numbers in 1983, 1984, and 1985. What are the chances this production-lamb price pattern will repeat itself between now and 1990?

On balance, it appears that ewe numbers will expand again in the next 2 to 4 years under the influence of favorable lamb prices, release of resources as a result of the dairy herd buy-out, and a lack of suitable profitable alternatives. During the years of expansion, the number of sheep slaughtered will be reduced due to reduced culling of ewes and a higher retention of ewe lambs kept for breeding. If the dairy herd buy-out program causes a switch to sheep, the increase in numbers could exceed the 5 percent expansion that occurred in the early 1980s. Thus, a significant increase in slaughter numbers is less likely until 1987. If the expansion in numbers is as much as 10 percent, the decline in lamb prices post 1987 may be more severe than what occurred in the early 1980s. This expected expansion rate, coupled with the low lamb meat demand growth rate experienced in past years, could put strong downward pressure on prices in the period late 1987 to 1989 after a continuing strong price situation of near \$70 in 1986 and early 1987. The 5 year long-run planning prices for slaughter lambs beginning January 1, 1986, could be in the low to mid- \$60 per cwt. During the last 5 year build up period of 1980 to 1984, the average was near \$60 per cwt. To do better, the sheep industry must increase demand at a rate higher than that established in recent years. Positive steps will have to be taken in the form of new product development, improved merchandizing, and promotion to effect this change.

An uncertainty of unknown magnitude are imports of lamb. In 1984, New Zealand exported to the U.S.A. about 6,000 tons of lamb carcass (250,000 lamb equivalent). Their aspiration is to increase exports to the U.S.A. to 98,000 tons of carcass lamb (3.9 mil, or about 40 percent of U.S.A. total production). If this materializes (and it's more likely if lamb prices are high), it will have a very depressing effect on lamb prices. In conclusion, the near term price and profit outlook for sheep flocks appears bright, while the longer term is clouded by the uncertainty of whether demand can expand as fast as expected supply increases. Assuming that some of the bloom will come off from current lamb prices, it will again be extremely important that lamb producers have high level management skills in order to assure profits.

## GENERAL

Lamb prices/100 lb. are not solely responsible for profitable sheep operations. Some individual enterprises are profitable when lambs are \$50/100 and others unprofitable with \$80/100 lamb prices. Aside from lamb selling prices, costs of inputs per enterprise or per ewe and level of production per unit of input (ewe, feed, capital, acres, labor, etc.) are paramount in deter-

mining profitability.

Producers should have a plan of operation or philosophy that provides direction toward a goal.

1. Reduce input costs sufficient to provide a net profit at a preconceived market price.
2. Increase total value of production (quality and amount) in excess of cost of production so as to realize a net profit when sheep are sold at a preconceived market price.

## REDUCING INPUTS

The total yearly costs to produce 150 lb. of lamb/ewe, using current feed and land costs, varies between \$60 and \$120/ewe in Minnesota. If we assume that annual costs average \$100/ewe, they would partition out as follows:

### \$100 Costs/Year/Ewe Weaning 1.5 Lambs

1. Ewe feed	50%
2. Lamb feed	27%
3. Barn costs (interest depreciation)	7%
4. Ewes (interest, depreciation, mortality)	10%
5. Fencing	1%
6. Waterers-Feeders	1.5%
7. Veterinary-Miscellaneous	2%
8. Ram	1.5%

Of the eight items listed, the first four have major effects on costs, and they are the items that the individual can exert the most influence over. A 10 percent reduction in ewe feed costs has a greater impact on reducing cost than the combined effect of waterers, feeders, fencing, and ram costs. Thus, reduce costs in areas where they are *most cost effective* and have the least adverse effect on production. Note the wide range in production costs, \$60-\$120. There is tremendous opportunity for well managed sheep flocks to cut production costs.

### To reduce ewe feed costs:

1. Reduce feed waste, feed so that sheep can neither walk nor lie on feed. Feeding on the ground results in 20-25 percent waste, which translates into 20-25 percent increased costs of feed eaten.
2. Feed no more or no less than necessary to provide the needed nutrients for each stage of production. Other than during late gestation and lactation, the amount is invariably less than the sheep want to eat. To feed as inexpensively as required calls for some simple and easily understood knowledge of feed composition and requirements of the sheep. (Ask your county agricultural agent for help.)
3. Substitute low-cost feedstuffs (corn silage, straw, grass hay, corn stalks, etc.) for part of the alfalfa hay.
4. Reduce the number of days of feeding stored feeds by lengthening the period of field gleaning with the aid of portable electric fencing.
5. Avoid feeding *unnecessary* protein and mineral-vitamin supplements. A green alfalfa hay diet is already high in protein, calcium, and carotene (vitamin A). Unnecessary conveniences usually cost more than the flock can support.

### Reducing lamb feed cost is more difficult than reducing ewe feed costs.

Usually the least costly and most efficient lamb production is one of uninterrupted growth rate in which the majority of the feed is used for gain rather than mere maintenance. Choice of grains, amount of grain fed, level of protein fed, efficacy of feed additives, and form of diet (whole or pellets) are the usual areas where successful producers make lamb feed savings. For example, in contrast to corn, oats are usually a more expensive source of energy; lambs eat less of it; it's less well digested; and weight gains (what you intend to sell) are 15-25 percent slower. Creep-fed or finishing lambs have a requirement for protein

varying from about 11 to 20 percent, depending on their age, weight, and projected feed intake. To feed 18 percent when 12 percent protein is all that's needed is pure waste, just as adding a feed additive to cure and prevent from happening a condition that isn't likely to occur is money ill-spent. Pelleted diets that contain all the needed ingredients, that minimize labor and storage space and promote rapid gains are most convenient. But if they cost 25 percent more per ton, they must increase production or reduce other costs 25 percent. *Knowing what is cost effective and when it is cost effective* are the hallmarks of successful producers. The two tables provide specific information as to the ewes' daily TDN and protein requirements, and the amount of feed needed daily and totally during each production stage. The lamb data includes production data and specific nutrient requirements. Both tables provide a guide to design a sheep feeding program.

### Year-Round Nutrient and Feed Requirements of a 150-pound Ewe Weaning 1.3 to 1.5 Lambs<sup>(a)</sup>

Production stage and feed type	Per ewe, in lb.				Percent of total ewe feed costs
	No. days	TDN/day	Protein	Feed DM Daily Total	
Maintenance	135	1.5	.25		24
Hay equivalent				2.6	350
Flushing	35	2.3	.36		10
Hay				3.5	125
Grain				.5	15
Early gestation	100	1.7	.29		25
Hay				2.9	295
Grain				.15	15
Late gestation	35	2.7	.42		11
Hay				3.4	120
Grain				.6	20
Lactation	60	3.7	.80		30
Hay				4.3	260
Grain				1.7	100
Total	365	Hay equivalent		1150 lb.	100%
		Grain		150 lb.	

<sup>(a)</sup>A marked departure from these values suggests a re-evaluation of the existing program is needed. Note: Feed amounts are in dry matter (DM).

### PROVIDING NUTRIENTS TO LAMBS<sup>(a)</sup>

Body wt., lb.	Avg. Daily Gain, lb.	Feed DM intake, lb.	Pro-TDN, %	Pro-tein, %	Calcium, %	Phos-phorus, %	Vitamin I.U./lb.DM	Lamb feed DM/lb. gain
Early weaned lambs								
22	.55	1.1	80	26	.82	.38	430	9 2.0
44	.70	2.2	78	17	.54	.24	430	9 3.0
66	.80	2.8	78	15	.51	.24	500	7 3.5
88	.90	3.2	78	14	.55	.28	570	7 3.6
5- to 7-month feeder lambs								
66	.65	2.9	72	15	.51	.24	500	7 4.0
88	.60	3.5	76	12	.42	.21	550	7 6.0
110	.45	3.5	77	10	.35	.19	680	7 8.0

<sup>(a)</sup>A marked departure from these values suggests a re-evaluation of the existing program is needed. Note that amounts of feed are in dry matter (DM).

## FORAGE

Forage production and its utilization influences sheep net profits in two ways: input costs of producing lamb and level of

performance of the sheep fed the forage. Yield of nutrients per acre has a major influence on costs of these nutrients per unit of input (crop establishment, machinery, and labor costs).

Aside from weather and fertilization, tons of forage DM produced are going to be determined by variety planted, number of plants/sq. ft., stage of cutting, and harvesting and storage losses. Yields from test plots and less than 5 percent of Minnesota alfalfa fields yield 6-7 tons of DM/acre. The 45 percent remaining yield less than 3 tons of "feed bunk" DM/acre. Basically, this doubles production costs on an annual basis.

#### The major pitfalls include:

1. Poor variety choice—There are disease-resistant, persistent varieties available that yield 15-20 percent more DM/acre than the common varieties of the 1960s (Vernal). If the seed cost 20 percent more and you planted 20 percent less/acre (very false economy), you would still produce more forage DM/acre.

2. Inadequate plant population—A firm seed bed, 12-15 lbs. of seed/acre, and adequate moisture will assure you of 20-30 plants/sq. ft., provided annual grassy weeds are controlled, and, thus, provide the potential for 6 tons DM/acre.

3. Lack of soil fertility—A big forage yield removes soil nutrients; it doesn't increase soil fertility. Producers of 6 tons DM/acre treat alfalfa or clover as a crop that responds tremendously to correct soil pH, sulfur and boron, and phosphorus and potassium. The sheep producer's goal should be to produce enough alfalfa or clover hay/acre to feed during the winter 10-15 ewes rather than 5 or 6 ewes.

4. Harvest at correct maturity—Since the energy content of legume and grass hays are similar, it is apparent that the protein, calcium, and carotene content of legumes is what makes them 25-75 percent more valuable than grass hay. Delaying harvesting two weeks beyond its peak stage reduces nutrient digestibility, protein, and carotene content and *reduces voluntary feed intake by 35 percent*. At that stage, legumes are no longer superior to grass hay.

5. Reduce storage losses—A nutrient loss of 8-10 percent is typical, but 25-45 percent is intolerable. Store hay under cover and make certain it cannot absorb soil moisture.

6. Persistence—Varieties, soil conditions, and cutting management that reduces a stand to 40-50 percent necessitating re-seeding each 3-4 years rather than 5-7 years, at a cost of \$100/acre, increases costs. Using it as pasture the last two years should reduce bloat and input costs.

## CAPITAL COST

Use it up,  
Wear it out,  
Make it do,  
Or do without.

The above old adage about frugality may well be applied to some sheep enterprises regarding capital and debt service costs for sheep. Sheep returns are not so great they can pay for costly facilities. However, the space requirement for ewes during lambing is 15 to 20 sq. ft./ewe, so building costs are appreciable.

Successful producers minimize barn costs by maximizing its use. They lamb at two distinct periods, so they use the lambing area twice. The jugs, heat lamps, creep area, and even the rams receive double duty. This virtually cuts capital needs in half. Others simply lamb during warmer months, thus avoiding chilled lambs and costly barns.

The best designed feed bunk is a flat-bottomed, 20" wide, 12-14' long bunk with a 10" bottom side board and a 9-10" space between the top of the bottom side board and the bottom edge of the 6" top board. This keeps sheep from walking on feed, and it can be used for grain, hay, or silage. Fence-line bunks, consisting merely of a 12" board, head space to eat through, and a fence barrier above, are inexpensive but require

much snow-free space for feed and roadway and permit young lambs to escape.

Adequate feeding bunks, year-round water facilities, adequate gates and hurdles, automatic syringes, heat lamps, drench guns, shears, etc., cost less than \$1.50/ewe annually; but they will save ten times that in labor and feed, and, most important, permit *timely* care and treatment. Interest rates should be shopped for. While the difference between 10 percent and 15 percent interest is 5 percentage points, the interest paid on a 15 percent note is 1/3 greater than on a 10 percent note.

Investments in the ewe flock can be sizeable. If they are debt-free, they add to one's net worth. If they were purchased with borrowed money, the yearly debt service costs are a debit and add to the costs of lamb production. At 10 percent interest, an increase or decrease of \$10 in the cost of a yearling ewe changes the production cost/100 lb. lamb about \$2.25. At 15 percent interest rather than 10 percent, an additional \$1.90 cost would be added per 100 lb. lamb produced. (Minnesota Extension Service publication AG-FS-0977, "Capital Requirements For a Flock of 100 Ewes," provides more detail on this subject.)

## EWES SELECTION

A far more important factor in determining net profit or the costs of producing 100 lb. of lamb is the *bred-in*, or genetic, potential of the flock to wean lambs at a high level. The necessary break-even selling price/100 lb. of lamb with 100 percent weaning rate is about \$6.75/100 lb. higher than with 120 percent weaning rate and about \$3.65/100 lb. higher at 140 percent weaning rate than at 160 percent weaning rate.

The reason for this should be obvious. At 100 percent weaning rate, there are invariably fewer pounds of lambs sold to cover all the costs entailed in keeping the ewe. Annual barn and ewe capital costs/ewe, fencing, vet costs, waterers, feed bunks, jugs, ram, and even ewe feed costs are virtually the same whether one lamb or two lambs are weaned. (Minnesota Extension Service publication AG-FO-0608, "Economic and Management Considerations For Lamb Production Through the 1980's," deals with this subject in more detail.)

Our most successful sheep producers are using *part-Finn ewes* in their flocks to *guarantee a larger lamb crop*. For each 1 percent Finn blood in the flock, lambing rate increases 1 percent. A 1/4-Finn ewe bred to a large, meaty, black face ram produces about 25-35 percent more lambs that gain about 95 percent as rapidly as the ram breed. Since the lambs produced are only 1/8-Finn, they are well accepted in the trade as finished lambs or as feeder lambs. There is no net profit in a flock that lambs at 125 percent. The producer's goal should be to *market* a 150-200 percent lamb crop.

## DISEASE AND PARASITES

Contrary to some thinking, "a sheep can get sick more than once." However, we have the capability to prevent them from ever getting sick. Disease and parasites reduce net profit in sheep by outright death (reduced number to sell), and, more important, reduced productivity of the entire flock. Producer surveys indicate that "too few pounds of lambs marketed/ewe" is the major bottleneck to increased sheep profits. Pneumonia and internal parasite plagued lambs, urinary calculi, prolapse, coccidiosis, abortion, enterotoxemia, mastitis, footrot, and pregnancy disease all take their toll. Minnesota Extension Service publication AG-FO-1877, "Sheep Diseases," discusses diseases more adequately than space here permits. Therefore, parasites will receive our major attention.

Pasture rotation in itself likely aggravates internal parasite concentration more than it alleviates it. Grazing sheep and cattle together reduces sheep concentration/acre and alleviates the problem somewhat. Raising sheep in drylot virtually eliminates

internal parasites. That leaves us with anthelmintics (drugs), and we do have very effective drugs that, when administered in a timely way, are very effective.

The most damaging group of sheep nematodes is Trichostrongylids, which includes the species *Haemonchus contortus* (large stomach or barber pole worm), *Ostertagia circumcincta* (nodular worm), and *Trichostrongylus colubriformis*. The infective larvae are consumed along with the grass. The parasite life cycle may either continue to produce fertile eggs (thus adding further parasite contamination to the pasture) or enter an arrested stage of development, or hypobiosis, which guarantees their survival through the winter.

The summer worm population explosion is due to the eggs produced by the overwintered larvae and the reinfestation from eggs shed by infected sheep early in the grazing season. Late June and early July are ideal for the third stage larvae to develop rapidly.

Treatment with Levamisole (8 mg/kg) one to two weeks prior to lambing is the most effective, as it kills hypobiotic larvae that contribute heavily to pasture contamination. Larvae that wintered over on grass are also a major problem.

The most important time to drench is prior to turning on pasture. Keep pasture contamination low. Late summer drenchings are too late. The pasture is badly contaminated by then, and if sheep are left on the same pasture they become reinfested in a day or two. Following drenching with an anthelmintic, always move sheep to a clean pasture.

Liver fluke (*Fascioloides magna*) can be a serious problem in sheep raised in northern Minnesota. The fluke is a natural parasite of deer. A new drug, "Curatrem," is currently under evaluation for treatment. Contact your veterinarian for further details. Ectoparasites (primarily keds and lice) are flock problems manifested by itching and loss of wool. They often are the cause of wool picking. The optimum time to treat is following shearing (preferably prior to lambing), and a number of dusts, sprays, and dips are available. Provided all sheep are treated at one time, there is no reason that a flock cannot be kept permanently free of ectoparasites.

A synthetic pyrethrin compound (trade name Ectrin) that has 12- to 15- day residual control and thus kills nits hatching after treatment is effective against lice and keds. Famfur (Warbex) has also provided good control. Each of these are poured along the sheep's back, thus eliminating spraying equipment.

## MARKETING

If the general price for lambs is \$64 to \$68/100 on a given day, why did you receive \$64 and your neighbor \$68/100? The three dominant factors affecting price variation are weight, whether they are sheared, and whether they are wethers or rams.

**Weight**—Supply of a given weight class significantly affects price. There is a demand each day for a given number of 90-pound, 100-pound, 110-pound, and even 130-pound lambs. If there is a dearth of 120- to 130-pound lambs, as is often the case in late summer, they often bring higher prices than 105-pound lambs. However, in late fall and winter when fed lambs weighing 110-150 lbs. predominate, the discount on lambs weighing over 105-110 lbs. may be \$5-20/100 lb. At these dis-

counts, you have literally given away 10- 12 lbs. of lamb.

The producer must be aware of when a premium or discount on weight is being applied. The major demand is for 105-pound lambs, but if no discount is being applied, marketing lambs at 110-120 lbs. will increase producer profits. This is because the more pounds of lamb sold at a given price, the more able it is to cover all production cost. Furthermore, with lamb feed costing 5-7 cents/lb., the cost of producing the additional 5-10 lbs. is less than its market value.

Big-framed lambs weighing 110 lbs. produce carcasses no fatter than small-framed lambs weighing 100 lbs. There is no question that excessively fat lambs will be discounted. But most packers are still in "love" with high dressing percent (DP) when buying on a line weight basis and prefer lambs with adequate finish to assure carcass yields of 52-55 percent.

**Sheared Lambs**—Lambs sheared 45-60 days prior to marketing produce a No. 1 pelt that enhances its value over pelts that have either more or less wool. The value of the carcass is higher than wool/lb., and unshorn lambs produce 2-4 percent less carcass weight. In addition, full-fleeced lambs are more apt to carry excessive moisture, manure tags, and mud, which lowers the DP and, consequently, the live price/100 lb.

**Ram Lambs**—Packers dislike ram lambs because it is more difficult to remove their pelts; and, after about 6 months of age, regardless of how they are fed, they become "bucky" (heavy shoulders, coarse, and usually lacking finish). Some packers automatically discount ram lambs \$2/100 lb. Others buy on merit. If the rams are young (under 5 months of age) and well finished, no discount is imposed. Ram lambs gain about 10 percent faster than ewes and wethers, have larger loin eyes, and have less waste fat; so if they are young, they should deserve a premium rather than a discount.

## ADDITIONAL KEYS TO TOPPING THE MARKET

1. Numbers sold—A group of 50-100 uniform lambs will bring \$.50- \$1.00/ 100 lb. more than 3-7 lambs. It costs no more to buy, yard, or drive 100 lambs than 5.

2. Fill—Lambs with big middles, suggesting the gut is full of feed and water, indicates a lower DP and, consequently, a lower price/100 lb. live weight. Lambs shipped 100-200 miles would lose the feed and water in their gut and would have a higher DP.

3. Undocked lambs, lambs with heavy manure tags, black fleeces, and burr-infested fleece have less value.

4. Uniformity of breed, weight, and condition tend to sell for higher prices. Aside from conformation, 100 white-face, finished lambs may bring a slightly higher price than 100 lambs, part of which are white- face, part black-face, part feeders, and part "fats."

5. Feeder vs finished lambs—One can "go broke" by "topping the market" with 60-pound feeders or 90-pound "fats." If commercial lamb feeders can "put the gain on" for less than it's sold for, obviously they can and do pay more per 100 lb. for a 65-pound feeder lamb than an 85-pound feeder. But the producer of the 65-pound feeder, sold at 75 cents/lb., grossed only \$48.75/lamb to cover his yearly costs. The 85-pound feeder sold at 58 cents/lb. would also gross \$48.75 and, at a more logical selling price of 65 cents/lb., would gross \$55.25. Lamb weight sold per unit of input largely determines profitability.