UNIVERSITY OF MINNESOTA
Dairy Extension
Department of Animal Science
101 Haecker Hall
1364 Eckles Ave.
St. Paul, Minnesota 55108
(612) 624-4995

Dairy Update

ECONOMICS OF THE DAIRY GOAT BUSINESS

Robert D. Appleman
Extension Animal Scientist - Dairy Management
University of Minnesota

Dairy Update No. 78

October, 1986

The dairy goat business may be for fun, food or profit. In any case, it requires extensive management and much labor. Sam Guss said it best: "To consider goat dairying from purely an economical viewpoint is to miss the essence of life." But to embark on a project with no consideration of cash flow or profitability will lead eventually to disillusion. Thus, an understanding of the economics of goat dairying requires a mixture of personal goals; philosophical outlook; an appreciation for liquidity, solvency, and cash flow; a willingness to learn and change; enthusiasm; and an ability to make decisions.

The major focus of this article will be on dairy goats as a source of profit. What is the likelihood of an enterprise being profitable? What are the major problem areas? If the production and sale of goat milk doesn't return a reasonable profit for the labor invested, then the enterprise must be considered a "family fun" project.

CONCLUSIONS

1. The cost of producing 100 lb. of goat's milk may vary from $22 to more than $37. To return a profit, then, a gallon of milk may have to sell for $3.20 or more.

2. The greatest contributor to the high cost of producing goat's milk is labor. Every effort should be made to minimize this input. The greatest opportunity to accomplish this is to mechanize the milking process.

3. Marketing costs can be prohibitive. Any program that will reduce this cost would be very beneficial to the industry.

4. Unless one has a good market for excess offspring (sale of breeding stock), it is not advisable to keep youngstock beyond that needed to maintain the "doe" herd productivity.

---

a Paper presented at National Dairy Goat Conference, University of Minnesota, St. Paul, October 17, 1986.

5. If milk can be sold at a price of $12/cwt. or more, milk-fed kids sold at 25 pounds for 80 cents per pound, is not profitable.

6. There is an economy to size, especially when combined with considerable sale of breeding stock.

7. Emphasize high production per doe. Maintaining dry does (non-breeding does that will have a long dry-period) can quickly eliminate any profit potential.

ASSUMPTIONS

To simplify this discussion, it is assumed that the land required is available and paid for, and that the buildings used are fully depreciated. There is little opportunity for most producers to return a profit if a large debt must be paid off.

To separate the economics of the dairy goat enterprise from any cropping enterprise that may exist, it is assumed that all forages or feed-grains raised are sold (to the goat enterprise) at a fair market price.

RESULTS

I. THE 10-DOE HOBBY FARM

When the goat enterprise is small (less than 30 does), it is at best a part-time job. Extreme care must be given to minimize costs or there will be little profit opportunity. An example of typical expected costs are illustrated in Table 1. Nearly 75% of the cost of producing milk is in three areas, namely: a) fixed operating costs, b) labor, and c) milk marketing costs. Much of this cost is the result of the small business aspect of the enterprise.

Table 1. Hobby Enterprise: 10 dairy goats and 2 yearling replacements per year. Average milk production of 1500 lb (1446 lb sold).

	Amount	% of Total
1500 lb hay, @ $50/T (4.1 lb daily)	$ 37.50	7
700 lb grain mix, @ $6/cwt. (2.3 lb av during lactation)	42.00	8
230 lb bedding, @ $40/T (.6 lb daily)	4.60	1
Breeding fee (see Table 2)	15.85	3
Health costs	15.00	3
Replacement charge (see Table 3)	21.00	4
Other operating expenses - supplies, truck, building, maintenance, utilities: 10% of $1,000 ($83.33/mo)	100.00	18
69.4 hrs of labor, @ $3.00/hr (see Table 4)	208.20	38
Milk marketing cost, @ $6.70/cwt (see Table 5)	96.88	18
Total	$541.03	100
Cost of producing and marketing 100 lb milk =	$ 37.41	
Cost per gallon =	$ 3.22	

Breeding is sometimes accomplished by transporting does to a neighbor's farm where a buck is maintained. If breeding fees are set at $25, it may be advantageous to keep and use a buck on the farm, unless you own fewer than 7 females of breeding age (Table 2).

Table 2. Cost of keeping a buck.

1600 lb hay, @ $50 T (4.4 lb daily)	$ 40.00
365 lb grain, @ $6 cwt (1 lb daily)	21.90
12.2 hr labor, @ $3/hr (2 min. daily)	36.60
	98.50
$300 buck ÷ 5 years	60.00
Annual Cost	$158.50

Cost per doe
10 does = $15.85

Some female youngstock are needed to maintain the desired level of production in the doe herd. An annual replacement rate of at least 20% is recommended (Table 3). High producing cow herds are replacing 30 to 35% of their cows annually.

Table 3. Cost of raising replacement females.

270 lb unmarketable milk, 0-3 mo.	$ 00.00
.37 T hay, @ $50, 2-14 mo. (2 lb daily/kid)	18.50
340 lb grain mix, @ 6/cwt, 3-14 mo. (1 lb daily/kid	20.40
153 lb bedding, @ $40/T (.3 lb daily/kid)	3.06
21 hr labor, @ $3/hr (3 min. daily/kid)	63.00
	$104.96

Cost per doe:
1 replacement/5 does = $21.00

Nearly 80% of the labor used on a small dairy, where does are milked by hand, is related to the milking process and sanitation procedure required to produce a high quality product (Table 4). More milk per doe (good genetic potential, excellent nutrition, and milking at regular hours) is very helpful in reducing costs by producing more milk per hour of labor expended.

Table 4. Labor use per doe on 10-doe goat dairy.

	Hours Annually	% of Time
Milking, 305 days (15 does/person/hour)	40.7	59
Set-up and clean-up (20 min. daily)	12.2	18
Manure handling and bedding (10 min. daily)	6.1	9
Feeding hay and grain (6 min. daily)	3.7	5
Heat detection (10 min./day for 6 months)	3.0	4
Breeding (20 min. x 2 breedings)	.7	1
Miscellaneous (.5 min. daily per doe)	3.0	4
Total hours =	69.4	100

Milk marketing costs (Table 5) are variable, depending on size of herd (volume of milk), location, labor required to process or transport milk, etc. Profitability is not determined solely by the marketing costs. For example, assume 700 lb of milk/week was pasteurized, put in cartons, delivered to and sold at stores in town. Assume another 475 lb/week was sold at the farm as raw milk; and that another 700 lb/week was sold as cheese milk (see Table 5).

Table 5. Calculating milk marketing costs.

		Cost/Cwt.
A. Pasteurized milk (700 lb/week)		
Processing cost	$ 40.00	
Cartons	20.00	
Trucking expense	30.00	
Labor, 6 hr @ $3/hr	18.00	
	$108.00	$15.43
B. Raw milk (475 lb/week)		
Labor, 2.5 hr @ $3/hr	$ 7.50	$ 1.58
C. Cheese Milk (700 lb/week)		
Stop charge	$ 11.00	$ 1.58
Average marketing cost (37% x $15.43) + (63% x $1.58)	=	$ 6.70

The estimated cost of producing milk shown in Table 1 is considered to be typical, but by no means representative of that expected by all producers. The effect of a change in unit price for each "cost" item included in this study is shown in Table 6.

Note that any dairyman desiring to include a return on investment, whether it be goats, buildings, equipment or land, may do so by estimating his total investment and applying the 6% factor shown in the last item listed.

Table 6. Influence of change in cost of specific items on cost of producing 100 lb milk.

Item	Change in price	Effect on cost of producing 100 lb milk
Hay	$10/ton	$0.52
Grain	$ 1/cwt	0.48
Bedding	$10/ton	0.08
Breeding fee	$10	0.69
Health costs	$10	0.69
Replacement charge	$10	0.69
Other operating expense	$25	1.73
Labor costs	$1/hr	4.80
Milk marketing costs	$1/cwt	1.00
Return on investment (1,000 @ 6%)	$60	0.41

Many goat breeders are successful because of their reputation and ability to reap considerable income from the sale of breeding stock. It is important, however, that one does not keep many animals that cannot be profitably marketed (Table 7). For example, in our 10-doe example herd, keeping 6 surplus female stock that are not sold increases the cost of milk production by $8.29/cwt milk ($5.68 + $2.61) or 71 cents/gallon.

Table 7. Influence of selling registered yearling replacement females on cost of producing 100 lb milk*

Raise 6 extra females, sell	Cost of extra females	Effect on cost of producing 100 lb milk
0	+ $822	+ $5.68
1	+ 622	+ 4.30
2	+ 422	+ 2.92
3	+ 222	+ 1.53
4	+ 22	+ 0.15
5	- 178	- 1.23
6	- 378	- 2.61

* Note: Assume 8 female offspring weaned annually, 2 are used as replacements. The remaining 6 are fed 270 lb (each) of surplus milk (assumed to sell at $12 per cwt). This $32.40 milk charge is added to the costs shown in Table 3, totaling approximately $137.00 per replacement. Further, assume each replacement animal sold brings $200.00

Kid bucks, other than those few needed as herd sires, are costly to maintain. One potential use is to milk-feed them and attempt to obtain additional income from the premium sale of this specialty product. Our cost estimates (Table 8) suggest this program may not be particularly profitable unless surplus milk (beyond that needed for fluid or manufacturing use) is available and considered of low value.

Table 8. Influence of marketing kid bucks on the cost of producing 100 lbs of milk (10 goat herd).*

150 lb milk, @ $12/cwt (2.5 lb/day for 60 days) =	$18.00
Initial value of buck	0
Total cost =	$18.00
Value of 25 lb buck, @ 80 cents/lb	$20.00

Profit = $2.00 x 8 kid bucks = $16.00
Reduction in cost of producing 100 lb milk = 11 cents

* Assumes that kid is nursing, no labor charged.

While the cost of producing milk in the small herd may seem high with virtually no chance to become profitable, there is the possibility that the "right" combination of cost inputs would occur simultaneously, resulting in low production costs. An example of this potential is illustrated in Table 9. Nearly 90% of the $228.95 annual savings per doe are concentrated in the last 3 items listed.

Table 9. Cost of producing 100 lbs milk when all conditions are favorable (10 goat herd).

	$ Amount	Normal (From Table 1)
1500 lb hay, @ $40/T (4.1 lb daily)	30.00	$ 37.50
700 lb grain mix, @ $5.50/cwt. (2.3 lb av during lactation)	38.50	42.00
230 lb bedding, @ $30/T (.6 lb daily)	3.45	4.60
Breeding fee	10.00	15.85
Health costs	10.00	15.00
Replacement charge	15.00	21.00
Other operating expenses	70.00	100.00
60 hrs of labor, @ $2.00/hr	120.00	208.20
Milk marketing cost, @ $1.05/cwt	15.13	96.88
Total	$312.08	$541.03
Cost of producing and marketing 100 lb milk =	$ 21.58	$ 37.41
Cost per gallon =	$ 1.86	$ 3.22

II. THE 100-DOE COMMERCIAL OPERATION

Some economies can be achieved from size, provided a sufficient market is available. While treatment of this section is short for the sake of brevity, it is clearly evident in Table 10 that most of the savings in the cost of producing milk is achieved through the reduction of labor costs and sale of breeding stock.

Table 10. Commercial Enterprise: 100 dairy goats, 8 bucks, and 20 replacement females. Production of 1500 lb (1446 lb sold)

	Amount	% of Total
1500 lb hay, @ $50/T (4.1 lb daily)	$ 37.50	11
700 lb grain mix, @ $6/cwt. (2.3 lb av during lactation)	42.00	12
230 lb bedding, @ $40/T (.6 lb daily)	4.60	1
Breeding fee: $158.50 ÷ 12.5 does (see Table 2)	12.68	4
Health costs	10.00	3
Replacement charge	21.00	6
Other operating expenses: 1% of 2,400 ($200/mo)	24.00	7
34.7 hrs of labor, @ $3.00/hr (see Table 11)	104.10	30
Milk marketing cost, @ $6.70/cwt (see Table 5)	96.88	26
Total	$352.76	100
Cost of producing and marketing 100 lb milk =	$ 24.40	
Cost per gallon =	$ 2.10	

Credit for share of registered breeding stock sold:
($63 profit x 60 head (all animals sold) = $3,780 = $37.80/doe
$352.76 - 37.80 = $314.96

Cost of producing and marketing 100 lb milk =	$ 21.78	
Cost per gallon =	$ 1.87	

Most of the labor savings obtained is the result of improved milking labor efficiency (Table 11). This savings occurs not only because of the use of a milking parlor and machine milking, but also because of the rather constant time factor involved with set-up and clean-up of the milking equipment and milk handling utensils, both of which tend to be independent of the number of does milked or amount of milk obtained.

Table 11. Labor use per doe on a 100-doe goat dairy.

	Hrs. Annually	% of Time
Milking, 305 days (25 does/person/hr)	24.4	70
Set-up and clean-up (40 min. daily)	2.4	7
Manure handling and bedding (25 min. daily)	1.5	4
Feeding hay and grain (30 min. daily)	1.8	5
Heat detection (30 min./day for 6 months)	.9	3
Breeding (20 min. x 2 breedings)	.7	2
Miscellaneous (.5 min daily per doe)	3.0	9
	34.7	100

The 100-doe herd illustrated here is essentially a family operation (about 1.5 full-time equivalents). The labor requirement (does = 3,470 hours, bucks = 98 hours, youngstock - 1,445 hours), totals 5,013 hours. At $3 per hour, this is hardly sufficient to maintain a satisfactory level of family living. To increase the family income to the $20,000 level, the selling price of all milk produced would have to exceed the $21.78 cost of milk production indicated by $3.43 per 100 pounds. Thus, a gallon of milk must bring an average price of $2.17.