1991

Profitable Triplet Lamb Production

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Attitudes change with time, and so it is with attempting to have ewes raise triplet lambs. I well remember seeing western sheep producers reduce sets of twins to a big single lamb. Finally, in the late 1940's, they started to run separate twin bands. If the truth were known, many would now wish that all their ewes dropped twins. The farmer in the East River Country, as distinguished from the West River Rancher, usually prefers twin births. Then the Finn, a much maligned breed of sheep that produced more triplets than singles, came on the scene. While milk replacer has been a godsend to the producer, our attitude now is "if a ewe can 'birth' three lambs, she should raise three lambs." My personal attitude is that she can if the producer will help her. Our problem is that not many of us know how or when or with what to help her.

The best producer of triplet lambs I know is Jim Perkins of Woodstock, MN. He doesn't lose any more triplets than twins, and his triplet lambs rival the twins in weight and condition. His success can be summarized in a few words: a flock that produces 40 to 50% triplets and quads; a feeding program that begins before rather than after the triplets are born; and tender loving care the first few weeks postpartum.

How do you feed ewes with triplets? Do they need more energy and protein before and after parturition? Do they produce 30 to 40% more milk than a single nursing ewe? (Probably not.) Do the lambs gain reasonably well? And, finally, are triplets more profitable than twins?

I'd like to discuss four nutrition experiments with ewes nursing triplets conducted at Minnesota and an excellent British experiment (Anim. Prod. 52:141) comparing twins, triplets, or triplets with one lamb removed at 35 days.

Minnesota Experiments

1985--An Economic Comparison of Triplet and Twin Lambs (Table 1)

Fourteen Hampshire and 1/4-Finn ewes suckling triplets and 40 1/4-Finn ewes nursing twins were used in a 56-day lactation study. Initially, all ewes had a 3.5 body condition score or BCS (1 is very thin and 5 is very fat). Ewes nursing twins were divided into two groups of 20 ewes each, with one group fed 4.1 lb TDN (high energy) and the second group fed 3.3 lb TDN per ewe daily (low energy). Ewes nursing triplet lambs received 4.9 lb TDN per ewe daily. The diet fed all ewes consisted of equal parts of alfalfa hay and concentrates (90% corn and 10% SBM) and was fed at 4.5, 3.8, and 3.0% of BW of ewes nursing (1) triplets, (2) high-energy twins, and (3) low-energy twins, respectively.

Ewe weight changes during the 56-day lactation period were 1.8, -5.7 and -16.7 lb ($P<.05$) per ewe for treatments 1, 2, and 3, respectively. Suckling lambs were initially about 7 to 8 days old and weighed about 12.7 lb. Lamb average daily gains (ADG) were .68. .78, and .71 lb, but total lamb gain per ewe during the 56-day period was 147.8, 113.1 and 106.0 lb per ewe for treatments 1, 2, and 3, respectively.

Ewe and lamb feed costs per day during the lactation period were $.45, $.40, and $.32 or $.22, $.26, and $.22 lb of lamb gain, respectively. If we assume $36 feed and facility costs per ewe for all ewes during the balance of the year, the cost per pound of lamb

Prepared for Sheep Day, June 13, 1991.

TABLE 1. PERFORMANCE AND PRODUCTION COSTS DURING A 56-DAY LACTATION PERIOD OF TRIPLET- AND TWIN-RAISED LAMBS (1985)

Item	Triplets	Twins	
		High lactation feed intake	Low lactation feed intake
No. ewes	14	20	20
Initial wt, lb	169.6	167.67	166.8
Weight change, lb	1.8[b]	-5.7[c]	-16.7[d]
Daily intake, lb			
TDN	4.9	4.1	3.3
Protein	1.1	1.0	.75
Daily feed intake as % of initial wt, %	4.5	3.8	3.0
Number of lambs	42	40	40
Initial age, days	5.9	7.7	8.7
Initial wt, lb	11.2	13.0	13.2
Average daily gain, lb	.680	.779	.711
Daily creep intake, lb	.614	.678	.711
Total lamb weight gained/ewe, lb	114.2	87.1	79.6
Total ewe and lamb feed/day, lb			
Alfalfa hay	3.85	3.17	2.49
Corn, creep, and SBM	4.33	3.85	3.21
Ewe and lamb feed cost/56 days, $[a]	25.20	22.23	17.85
Ewe and lamb feed cost/lb lamb gain, $	.220	.255	.224
Ewe feed costs for balance of year, $	36.00	36.00	36.00
Total feed cost/year, $	61.20	58.23	53.85
Yearly feed costs/lb lamb gain to 56 days, $	.414	.515	.508

[a] When alfalfa costs $.04 and corn, SBM, and creep combination costs $.068/lb.
[b,c,d] $P<.05$.

gain was $.414, $.515, and $.508 through 56 days of lactation or 24.4% and 22.6% higher production cost for twin lambs suckling ewes fed at high and low feed intakes than for triplet lambs. The fact that all costs, exclusive of lactation feed costs, are the same irrespective of number of lambs weaned is a major factor for triplet lambs being produced at the lower costs.

1988-1989--Protein Levels for Triplet Ewes (Table 2)

We have considerable data indicating that feeding additional energy to ewes in average condition (3.0 to 3.5 BCS) producing a 170 to 180% lamb crop does not always significantly increase suckling lamb gains. Conversely, additional protein usually increases lamb gains. What effect would amount and source of protein fed ewes suckling triplets have on the performance of their lambs?

During both years, all ewes averaged about 185 lb in weight, with a BCS of 3.6. In 1988, four protein treatments were employed: (1) low protein, no SBM fed, (2) medium protein, .31 lb SBM, (3) medium protein, .15 lb fish meal (low rumen degradability) and (4) high protein, .59 lb SBM per ewe daily). The diets consisted of about equal parts of alfalfa hay and concentrates and provided .47, .51, .52, and .58 lb protein per 100 lb BW, respectively. Energy intake was similar among all treatments.

In 1989, three treatments were employed: (1) medium protein, .29 lb SBM, (2) medium protein, .15 lb fish meal, and (3) high protein, .66 lb SBM per ewe daily. These diets provided .53, .53, and .55 lb of protein per 100 lb BW. Energy intake among treatments was similar.

ADG of the suckling lambs (used as an indirect measure of milk production) did not adhere to a consistent pattern. Lambs suckling ewes fed fish meal gained the fastest ($P>.10$) in one trial and slowest ($P<.10$) in the second trial. The highest level of protein was not consistently superior to the medium protein level. We concluded that the inherent level of milk produced by the ewes was not sufficient to exert sufficient protein stress on the ewes to influence milk production one way or the other.

Energy Levels for Triplet Ewes, Crookston

Research at our Crookston Station (Windels, 1989, 1990) involved triplet- and twin-suckling ewes that were individually fed, milked by hand, and injected intramuscularly with 2 cc of oxytocin to determine the influence of energy intake of ewes on the performance of their lambs. The energy levels fed during both years and for both the twin- and triplet-nursing ewes were 90, 100, 110, and 120% of NRC suggested levels for twin-nursing ewes. Protein intake was similar among all treatments. The diets fed consisted of equal parts of concentrates (corn and SBM) and alfalfa haylage (DM basis). Thus, the design of the experiment involved two types of rearing, twins or triplets, and four energy levels.

In 1989, triplet-suckling ewes lost more weight ($P>.10$) and body condition than twin-suckling ewes, whereas in 1990 weight loss and condition score changes were quite similar among the triplet- and twin-suckling ewes during the 56-day lactation period. Ewes fed at 120% of NRC levels during both years maintained their body condition scores.

Energy level per se had no significant effect on lamb ADG during either year and, over the 2-year period, averaged .64, .66, .64, and .65 lb for the lowest to the highest energy intake (Table 3). Milk yield during the first 2 weeks were also similar among treatments. Average creep intake varied among treatments and, during the 2-year period, amounted to .66, .68, .50, and .58 lb per lamb daily for treatments 1, 2, 3, and 4, respectively. Why lambs in treatment 3 consumed less creep feed each year than lambs in the other treatments may be explained by the higher ($P>.10$) milk yield of that group each year during the first 2 weeks of lactation (Table 3).

During the 8-week period, weight changes of triplet- and twin-nursing ewes were similar. Average lamb birth weights were 10.3 and 11.6 lb, and ADGs during the 56-day period were .59 and .72 lb ($P<.01$) for the triplet and twin lambs, respectively. The average 2-year milk production during the first week was greater ($P<.01$) for the triplet-nursing than twin-nursing ewes (7.6 vs 6.2 lb of milk) but not during the second week (7.6 vs 7.0 lb of milk). However, total lamb weight gains per ewe were 99.8 compared to 81.3 lb ($P<.01$) or

TABLE 2. EFFECTS OF PROTEIN LEVEL AND SOURCE FED EWES SUCKLING TRIPLET LAMBS (56 DAYS)

	1988 Supplementation				1989 Supplementation		
	No SBM	Med. SBM	Med. fish meal	High SBM	Med. SBM	Med. fish meal	High SBM
No. ewes	3	3	3	4	5	5	4
Initial wt, lb	183.0	186.3	173.1	188.8	183.9	189.6	207.2
Initial condition	3.6	3.6	3.5	3.7	3.8	3.6	3.7
Weight change, lb	6.4	3.1	2.9	3.1	.2	7.5	-5.7
Daily intake, lb							
Alfalfa hay	3.60	3.70	3.39	3.70	3.50	3.70	3.70
Corn	3.70	3.50	3.39	3.19	3.30	3.60	3.10
SBM	--	.31	--	.59	.29	--	.66
Fish meal	--	--	.15	--	--	.15	--
TDN/head	4.75	4.84	4.51	4.84	4.62	4.80	4.82
TDN/100 lb BW	2.60	2.60	2.60	2.56	2.51	2.53	2.32
Protein/head	.86	.95	.90	1.10	.97	1.01	1.12
Protein/100 lb BW	.47	.51	.52	.58	.53	.53	.55
Protein as % low protein/100 lb	100	114	109	124	100	100	104
Total feed as % BW, %	4.0	4.0	4.0	4.0	3.9	3.9	3.9
Lamb Data							
No. lambs	9	9	9	12	15	15	12
Average initial age, days	10	10	7	8	13	12	11
Initial weight, lb	13.4	13.9	12.3	13.0	16.7	14.7	14.7
Weight change, lb	30.8	33.9	35.0	34.8	33.2	28.6	32.1
ADG, lb	.550[a]	.605[ab]	.625[b]	.620[b]	.594[c]	.510[d]	.574[c]
Daily creep feed intake, lb	.79	.86	.64	.70	.55	.62	.68

[a,b,c,d] $P<.10$.

TABLE 3. LACTATING EWE PERFORMANCE AS AFFECTED BY ENERGY INTAKE AND TYPE OF REARING (WINDELS, 1989, 1990)

	Energy, % of NRC				Type of Rearing	
Item	90	100	110	120	Triplets	Twins
No. ewes	17	18	17	17	36	34
Initial wt, lb	182	180	191	186	182	188
Weight change, lb	-10.2	-5.0	-6.6	-2.7	-7.3	-4.0
Initial body condition[a]	4.4	4.4	4.6	4.3	4.2	4.6
Final body condition	3.4	4.2	4.4	4.6	3.8	4.6
Change in body condition score	-1.0	-.2	-.2	.3	-.4	0.0
No. lambs	43	45	45	43	108	68
Average birth weight, lb	10.6	11.2	11.0	10.6	10.3	11.6
4-week gain/lamb, lb	15.9	15.9	16.7	16.0	14.4[b]	18.7[c]
8-week gain/lamb, lb	36.0	36.8	35.8	36.4	33.3[b]	40.6[c]
ADG, 8 weeks, lb	.64	.66	.64	.65	.59[b]	.72[c]
4-week gain/ewe, lb	39.8	40.0	42.1	40.9	43.4[b]	37.4[c]
8-week gain/ewe, lb	91.9	91.2	90.0	93.4	99.8[b]	81.3[c]
Creep intake/lamb, lb	.66	.68	.50	.58	.60	.61
Average milk yield/day, lb						
Week one	6.6	7.1	7.2	6.8	7.6[b]	6.2[c]
Week two	7.2	7.0	7.8	7.3	7.6	7.0
Week three	--	--	--	--	7.1	--

a Body condition score: 1-3, thin; 4-6, average; 7-9, fat.
[b,c] $P<.01$.

about 20% greater for triplet- than twin-nursing ewes (Table 3).

Ewes nursing triplets one year conceived as early, had as many triplets, and had no higher attrition rate the second year than ewes that raised twins.

These data lead us to conclude that ewes in average condition at lambing and fed within 10% of NRC energy levels are not apt to be stimulated to produce more milk by increasing their energy intake. While there is much evidence to indicate that ewes nursing twins produce 20 to 25% more milk than ewes nursing singles--largely due to more complete udder evacuation by two lambs rather than one--it appears that twin lambs can evacuate the udder as completely as triplets, and, thus, triplet nursing ewes do not necessarily produce more milk than twin nursing ewes. Triplet lambs almost invariably gain more slowly than twins. This appears to be due to about the same amount of milk divided among three lambs rather than two.

What is clear from these data is that, with good management, a reasonably high percentage of ewes (50 to 70%) that give birth to triplets can raise triplets and when they do so triplets can be produced at lower costs than twin lambs.

British Experiments

Two additional papers dealing with triplet lambs by Gallo and Davis (Anim. Prod. 47, 1988; 52:141, 1991) provide some enlightening production data (Table 4). In the first study, twins grew faster than triplets during the first 35 days but not faster thereafter when ewes and lambs were on pasture. Triplet-nursing ewes produced more milk after 35 days but ate no more feed than twin-nursing ewes and, thus, lost more body weight. Diets containing 25% hay rather than 40% hay had no effect on milk composition or lamb performance. Gallo and Davis also summarized six other triplet lamb studies indicating that growth of triplet lambs averages about 81% of that of twins (3 x 81 lb = 243 lb vs 2 x 100 lb = 200 lb).

TABLE 4. EFFECT OF REARING AND EWE DIET ON EWE AND LAMB PERFORMANCE (GALLO AND DAVIS, 1987)

	Rearing		Ewe diet	
Item	Twin	Triplet	25% hay	40% hay
No. litters	16	16	16	16
Ewe dry matter intake, lb	8.7	8.7	9.0	8.3
Weight change, lb	1.0	1.2	1.1	1.2
Milk yield, lb				
20 day	9.1	9.5	9.4	9.3
30 day	8.1	9.1	8.7	8.4
70 day	4.9	5.0	4.8	5.1
Total creep intake, lb	3.3	6.4	4.2	6.2
ADG, day 1 to market, lb	.70	.64	.66	.69

In their second study, 36 ewes were individually fed for 35 days and then raised on pasture until marketed (Table 5). Basically, four treatment groups were involved: (1) 12 ewes suckled twin lambs (Tw-Tw), (2) 12 ewes suckled triplet lambs (Trp-Trp), (3) 13 ewes suckled triplet lambs for 35 days at which time one lamb was removed (Trp-Tw), and (4) the lambs removed from the 13 Trp-Tw sets were raised in drylot and fed concentrates (AR). Prior to placement on pasture, all ewes received a diet containing 32% forage, concentrates (including 6% fish meal and 7% SBM), and minerals and vitamins at about 8.8 lb per ewe.

Type of rearing had no effect on ewe fed intake. Trp-Trp and Trp-Tw ewes produced more milk than Tw-Tw at 10 days of age, and Tw-Tw ewes tended to decline in milk yield more rapidly thereafter. As expected, Tw-Tw lambs grew faster during the first 35 days than Trp-Tw or Trp-Trp lambs (.739, .649, and .643 lb per day, respectively). After 35 days, however, Trp-Tw, Trp-AR, and Tw-Tw lambs grew similarly (.766, .770, and .766 lb per day, respectively), whereas Trp-Trp gained .682 lb per lamb daily. The AR lambs raised on concentrates carried the most body fat at slaughter and Trp-Trp lambs the least fat.

Weaning one lamb from a triplet set at 35 days enables one to minimize milk replacer feeding without unduly reducing the performance of Trp-Tw or Trp-AR lambs. "Low cost lamb production" must be applied more vigorously to our production scheme, and triplet lamb production is a highly effective way to accomplish that end.

TABLE 5. EFFECT OF TYPE OF REARING ON EWE AND LAMB PERFORMANCE (GALLO AND DAVIS, 1991)

	Twin-Twin	Triplet-Twin	Triplet-Triplet	Artificial Rearing
No. ewes	12	12	12	--
Dry matter intake/day, lb	8.8	8.9	8.5	--
Daily milk, lb				
10 day	8.0	9.3	9.6	--
20 day	9.1	9.5	8.9	--
30 day	8.8	9.2	9.0	--
50 day	5.8	6.0	6.8	--
70 day	4.0	4.4	5.0	--
No. lambs	24	39	36	12
ADG, day 1 to 35, lb	.74	.65	.64	--
Total creep intake/litter, lb	3.1	6.1	5.4	--
ADG on pasture, lb	.77	.77	.68	.77
ADG, day 1 to market, lb	.76	.73	.67	.72