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# Artificial Rearing of Lambs



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#### ABSTRACT

The purpose of this publication is to compare several management options for raising orphan lambs. The information summarized is a two-year study on artificial rearing of lambs. The first year compared a cold-milk vs. a warm-milk system and the second year compared cold-milk/free-choice vs. cold-milk/limited-feeding. On a per lamb basis, lambs raised on a cold-milk vs. a warm-milk system required less labor (2.3 hours vs. 3.6 hours), consumed more milk replacer (25 pounds vs. 17.5 pounds), had faster average daily suckling gains (0.56 pounds vs. 0.45 pounds), had slower average daily post-weaning gains (0.15 pounds vs. 0.26 pounds) and had greater economic returns per hour invested (\$4.96 vs. \$4.35). Comparing a cold-milk/free-choice vs. cold-milk/limited-feeding on a per lamb basis, the limited-feeding group had slower average daily suckling gains (0.59 pounds vs. 0.65 pounds), faster post-weaning average daily gains (0.41 pounds vs. 0.10 pounds), consumed less milk replacer (22.4 pounds vs. 26 pounds) and had a greater economic return per hour invested (\$6.50 vs. \$4.14).

Keywords: artificial rearing, lambs, warm-milk system, cold-milk system, free choice, limited feeding.

## ARTIFICIAL REARING OF LAMBS

Mark Wing, Ralph L. Phillips and Martin Vavra

Historically, many large sheep producers have preferred single lambs because many lambs born as twins or triplets died of starvation. Today the situation is changing; more sheep are being raised under intensive management. The introduction of the high reproduction potential Finnish Landrace breed and higher lamb prices have made raising "bummer" lambs more attractive.

The purpose of this publication is to compare several management options for raising orphan lambs. The information is intended to help the sheep producer decide whether he can afford to raise bidders and if so by what method.

### PROCEDURE

The information summarizes a two-year study on the artificial rearing of lambs.

Station ewes lamb from early January to early February. Table 1 shows the growing ration fed. Lambs are weaned at about 35 pounds and placed on a finishing ration (Table 1) until they reach approximately 100 pounds.

The largest lamb born as a triplet, lambs from ewes that could not rear twins, lambs that ewes would not claim and lambs from ewes that died were raised artificially using a commercial lamb milk replacer. Before being placed on a cold-milk system, lambs to be raised artificially were left with the ewe for 24 hours to ensure at least one feeding of colostrum. Colostrum was given by bottle to lambs

unable to nurse or when the ewe was unavailable.

### First Year Study

This study was designed to compare the performance of lambs raised on a cold-milk system with lambs raised on a warm-milk system. Lambs, randomly allotted in two groups were kept in separate pens. One group was raised on the cold-milk system and the other group was raised on the warm-milk system.

The cold-milk system consisted of a commercially available two-gallon bucket equipped with nipples. The lambs were taught to nurse during a three to four day training period. Milk was always available.

The warm-milk system utilized a conventional "pop" bottle with a rubber nipple. Lambs were offered 12 ounces of warm milk four times a day for 14 days. They were then offered 16 ounces three times a day for the remainder of the study.

Milk for both systems was mixed (as per directions on the package) in bulk and stored under refrigeration. Daily milk intake was recorded on a group basis. The time spent with each system also was recorded. All feeding equipment was cleaned and disinfected daily.

Each pen was equipped with a heat lamp. Lambs always had access to a dry feed (growing ration) and water.

### Second Year Study

This study was designed to compare the performance of lambs raised under two management systems using cold milk. The first system was milk free choice from birth to weaning. The other was milk free choice for about the first two weeks and then limited milk intake until

weaning. All lambs were placed on a cold-milk system and managed the same as the previous year. After about two weeks, lambs randomly allotted into two groups were kept in separate pens. Larger lambs were selected sooner than two weeks and smaller lambs were selected when they reached 15 pounds body weight. Lambs were weighed weekly throughout the study.

The two treatment groups were cold-milk/free-choice and cold-milk/60 percent of the intake of the free-choice group. The free-choice group was managed the same as the previous year and the limited-intake group was fed three times daily using the same type equipment as the cold-milk system. Milk consumption was recorded on a group basis.

#### Weaning Management

Lambs were abruptly weaned both years when they reached a weight about 30 pounds. Lambs were then fed the growing ration until they reached about 70 pounds. Then they were switched to the finishing ration and fed to a weight of approximately 100 pounds.

#### RESULTS AND DISCUSSION

Data comparing the artificial rearing of lambs on a cold-milk and a warm-milk system are presented in Table 2. The cold-milk system required 1.3 fewer hours labor per lamb than did the warm-milk system. Lambs on the cold milk consumed more milk replacer (7.5 lb/lamb) and gained faster (0.56 vs. 0.45 lb/day) than did the lambs on warm milk. However, the lambs on the warm milk appeared healthier during the early part of the nursing period. One lamb did not adjust to the cold-milk system and died. The lambs on warm milk did not consume as much

milk, adjusted to weaning better and consumed more dry feed than the cold-milk fed group. The two-week post-weaning gains were greater (0.26 vs. 0.15 lb/day) for the warm-milk fed lambs.

Data in Table 3 compare the cold-milk system/free-choice with limited feeding of cold milk. Both groups of lambs spent about equal time (16.40 vs. 17.8 days) on the starter bucket and on their respective treatments (19.4 vs. 19.3 days). During the treatment period, each lamb on limited feeding consumed an average of 5.1 pounds less milk replacer than lambs on the free-choice group. Their average daily gains were only slightly less (.06 lb.). Three-week post-weaning daily gains for the limited-fed lambs were 0.41 pounds vs. 0.10 pounds for the free-choice fed lambs.

Labor, feed costs and return per lamb data for rearing lambs by cold-milk/free-choice, warm milk and limited feeding of cold milk are presented in Table 4. Both cold-milk systems required less labor than the warm-milk system. Milk replacer costs were higher for the cold-milk/free-choice system than for the warm-milk or limited-feeding of cold-milk systems. Feed costs for growing a lamb to 70 pounds were highest for the group fed cold-milk/free-choice when compared to the limited-feeding of the cold-milk group. These costs are a reflection of average daily gains from weaning to 70 pounds. Feed costs, average daily gains and time on feed during the finishing period were similar among all groups.

The warm-milk system had a higher return per lamb than the free-choice/cold-milk system (\$20.65 vs. \$16.43) while the cold-milk/limited-

feeding had a greater return than the free-choice/cold-milk system (\$19.96 vs. \$15.36).

The return per lamb without charging labor against cost and valuing the lamb at birth (\$5.00 per lamb) gives a figure of what the lamb returned. This value divided by hours spent in raising the lamb gives the return per hour invested in the lamb. The cold-milk/limited-feeding system had the highest return per hour invested (\$6.50) of the artificial rearing systems.

#### SUMMARY AND CONCLUSIONS

There are many factors a sheep producer should consider before deciding to raise bummer lambs. One factor is the market value of a day-old lamb. If a day-old lamb is valued at \$10 and labor valued at \$4.50 per hour, the net return would be greater if the lambs were sold at birth. Another factor is the availability of inexpensive labor-- a spouse who enjoys raising bidders, children with interest in sheep or a neighbor child who would be willing to care for the lambs. If labor is available for \$2.50 per hour, it would be economical to raise the lambs. Also, the larger the number of bidders raised at one time, the more efficient the operation becomes.

The cold-milk/limited-feeding system for raising bidders requires more management but will return more per hour invested when compared to a free-choice/cold-milk system. The cold-milk/limited-feeding system would be best to raise a large number of lambs if time is limited. If there is a good source of "cheap" labor, the return may be greater from feeding warm milk. Cold-milk/limited-feeding and the



warm-milk systems appear to be superior to the cold-milk/free-choice system.

Table 1. Ration costs and formulation

	Cost/100#	Growing Ration (Percent)	Finishing Ration (Percent)
Barley	\$ 6.45	66	34
Alfalfa hay	3.25	23	60
Cottonseed meal	11.10	5	--
Molasses supplement	6.00	5	5
Salt	2.50	1	1

Table 2. Inputs and average performance per lamb for cold-milk vs. warm-milk fed groups

	Cold Milk	Warm Milk
Time (hr)	2.3	3.6
Milk replacer (lb)	25	17.5
Days fed milk	32.8	31.1
Birth weight (lb)	10.8	11.1
Weaning weight (lb)	28.7	25.3
Avg. daily suckling gain (lb)	0.56	0.45
Two-week post-weaning ADG (lb)	0.15	0.26

Table 3. Inputs and average performance per lamb for cold-milk/  
free-choice or limited-fed groups

Milk Replacer	Free-Choice Feeding	Limited Feeding
Days on starter bucket	16.4	17.8
Milk replacer/starter period (lb)	12.0	13.5
Days on treatment	19.4	19.3
Milk replacer/treatment period (lb)	14.0	8.9
Birth weight (lb)	8.9	8.9
On test weight (lb)	16.1	17.5
Weaning weight (lb)	28.8	28.9
Avg. daily suckling gain (lb)	0.65	0.59
Three-week post-weaning ADG (lb)	0.10	0.41

Table 4. Average labor, feed costs and return per lamb for three systems of rearing lambs artificially<sup>1</sup>

	<u>System of Rearing</u>			
	<u>Cold Milk vs Warm Milk</u>		<u>Free Choice vs Limited</u>	
	<u>Free choice Cold Milk</u>	<u>Warm Milk</u>	<u>Free Choice Cold Milk</u>	<u>Limited Cold Milk</u>
Labor (hr)	2.30	3.6	2.50	2.30
Milk replacer (\$)	11.62	8.05	12.08	10.12
Feed cost (\$) (growing ration)	12.51	12.65	13.80	11.14
Total feed cost to 70 lb. (\$)	24.13	20.70	25.88	21.26
Feed cost (\$) (finishing ration)	8.31	8.65	8.48	8.65
Final weights (lb)	99	100	100	101
Death loss (\$)	0.63	0	0	0.63
Lamb value (\$)	49.50	50.00	50.00	50.50
Costs (\$)	33.07	29.35	34.36	30.54
Return (\$)	16.43	20.65	15.36	19.96
Return per hr. of labor invested (\$)	4.96	4.35	4.14	6.50

<sup>1</sup>Milk replacer was valued at 46¢/lb., growing ration at 5.9¢/lb., finishing ration at 4.5¢/lb., a lamb at birth is valued at \$5. and market lamb valued at 50¢/lb.