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HOW TO GRAFT LAMBS

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About 10% of the annual lamb crop in Idaho (491,000 in 1977) dies from starvation. In recent years, interest has increased in rearing these lambs artificially on liquid milk replacer diets. However, in some cases, the cost of the milk replacer, equipment and labor is so high that there is little if any profit.

While some lambs are starving, other ewes have a large surplus of milk. We believe that the most economical way to raise most of those "extra lambs" is on ewes with surplus milk. The problem is to get the ewes to accept the additional lambs.

Most shepherds and sheep ranchers are acquainted with "slime grafting," "wet grafting" and "skin grafting," often accompanied by tying or haltering. Each has its place and time.

Slime Grafting

Slime grafting can be done easily and successfully immediately after birth while the newborn lamb is still slimy wet. The "extra" lambs must be thoroughly saturated with placental fluids and membranes from the new mother before she has thoroughly identified her own new offspring. The sooner after birth the graft is made, the greater the chance of success. If the graft is made after the newborn lamb starts to dry, the ewe will probably recognize that the new lamb is not her own and reject it.

Wet Grafting

Wet grafting is a technique that takes over where slime grafting leaves off. It can be used when the ewe's own lamb, although still very new, is too dry to provide enough slime for grafting. In wet grafting, both the ewe's own lamb and the "extra" lamb needing a milk supply are completely immersed in a salt water solution. The lambs are then thoroughly rubbed together and the "extra" lamb is also rubbed with any placental membranes that might be available. Some lambs may be rejected even after this procedure. Therefore, the new family must be put in a maternity pen or jug and observed carefully until the ewe establishes a firm mother-offspring bond with both lambs.

Skin Grafting

When a ewe loses her own lamb through accident or disease, the dead lamb can be skinned and the pelt slipped on the "extra" lamb needing a milk supply. The head, legs and tail of the graft are smeared with blood and body fluids from the dead lamb. Some of these skin grafts are quickly successful, but sometimes the ewe must be tied in a pen for several days before she will adopt the new lamb. A few skin grafts are unsuccessful.

English Fostering Pens

Frequently a ewe with only one lamb but adequate milk to rear two lambs is not identified soon enough to use either slime or wet grafting, or a ewe with twins and an adequate milk supply loses one lamb. This is where a fostering system developed in England becomes important.

Dr. A. L. Pope, chairman of the Animal Science department at the University of Wisconsin was introduced to what we call "fostering pens" while visiting farms in England. Dr. Pope found the fostering pens were successful. Several agricultural research stations in other states have since tried them, adapting the recommendations to their own particular situation. The University of Idaho at Moscow and the U.S. Sheep Experiment Station at Dubois have tested the fostering pen method and find that "it works." South Dakota has tested a more elaborate series of fostering pens with equally satisfactory results.

The fostering pens are similar in size to lambing jugs, approximately 4 x 5 feet. At Moscow the University converted a lambing jug equipped with a solid plywood front (Figs. 1 and 2). A stanchion was constructed by cutting an 8-inch opening in the plywood front with an adjustable 2 x 2 inch wooden stake which pivots at the bottom for holding the ewe's head. This provided a 4-inch vertical slot for the ewe's neck, allowing her to stand up and lie down. A 1 by 12-inch drop board at the rear of the pen, or a hinged gate, provided access to the pen when sheep are moved.

Scientists at the Dubois station developed a stanchion type "crate" that fits into a regular lambing jug (Fig. 3). This

Figs. 1. and 2. The view of this Panama ewe is restricted in this fostering pen (left) at the University of Idaho, Moscow. The pen has a plywood front and adjustable stanchion. The fostering pen permits a ewe with adequate milk for two lambs (right) to feed her own lamb as well as the Suffolk lamb being grafted.

portable stanchion was first tested at the Dubois station during the 1977 spring lambing season.

Stanchions were constructed of 3/4 inch square metal tubing and 1/2 inch pipe. They were designed to fit in a 4 x 5 foot lambing jug in such a way that the ewe has access to the PVC (polyvinylchloride) pipe watering device and can be easily fed a pellet diet. The stanchions are 27 inches wide in front, with an adjustable stall 34 inches high and 4 feet long. The stanchions are easily removed from the jugs when not needed.

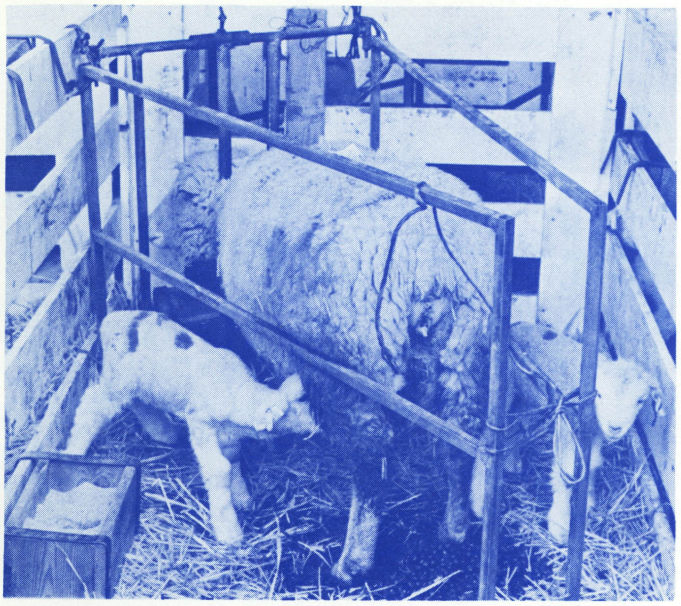

Fig. 3. This metal restraining stanchion used at the U.S. Sheep Experiment Station in Dubois, Idaho, sets in the lambing jug. The Targhee ewe has adequate milk for her own lamb and for the Suffolk lamb being grafted.

The stanchion is designed so the ewes can lie down or stand as they desire, but their heads are held so they can not turn to see or smell the lambs. However, the lambs were free to walk in front of the ewes. The view of one group of ewes was completely blocked so that they could not see the lambs but no effect of this treatment could be detected. The unblocked ewes accepted the grafted lambs just as readily as the blocked ewes. This pretty well disproved the theory that the secret to successful grafting is for the fostering pen to have a solid front so the ewe can not see or smell the lamb(s) being grafted.

Constant association of the two lambs in the same pen-mother environment and drinking the same milk will probably result in both lambs "smelling" alike. Thus, with dimmed visual memory and forced adaptation to two nursing lambs that have the same smell, the ewe is not able to distinguish one lamb from the other. So she accepts both.

Establishing a good graft usually requires 4 or 5 days. The younger the lambs and the more recently the ewe has lambed, the less time required. Relatively old lambs may require 5 to 10 days. The ewes and lambs should be observed closely for acceptance behavior and thriftiness. As soon as a good relationship exists, the ewe and lambs should be placed in a trial jug or the ewe turned loose in the fostering pen where she is free to observe and suckle her lambs. The new family should be left in this trial situation for 1 or 2 days. If acceptance appears good, the ewe and lambs can be turned into a small mixing pen with 2 or 3 other ewes and their lamb. If no problems develop within a day or two the new family can be managed the same as all other sheep. With good management, one can expect a success rate of about 85%.

At Dubois, two shepherds assigned to suckling and grafting duties grafted as many lambs as possible by using slime, wet and skin grafting techniques. In addition, they

identified ewes that had only one lamb but adequate milk for two lambs and that could not be successfully grafted by use of other techniques. These ewes were placed in stanchions as quickly as they were identified, and the "extra" lambs needing a milk supply were matched for size and vigor with the ewe's own lamb to get the best possible match. Shepherds did not attempt to suckle or to modify the smell of the "extra" lambs. They were required to fend for themselves.

A total of 120 grafts was attempted. The ewes and lambs were observed closely for acceptance behavior and thriftiness of the lamb. When a good relationship developed, the ewe and lambs were placed in a trial jug where the ewe was free to observe and suckle her lambs. The new family was left in this trial situation for 1 or 2 days. If acceptance appeared good, the ewe and lambs were then turned out into a mixing pen with other ewes and lambs.

The results are shown in Table 1. About one-third of the failures were due to lamb death. Lambs died from being laid on and from scours and pneumonia. This death loss was about equal to that in non-grafted lambs and was probably less than the normal percentage in artificially reared lambs.

The average time required to make a successful graft was 4.8 days.

Table 1. Response to stanchion grafting at U.S. Sheep Experiment Station, Dubois.

	Grafted lambs	
Graft results	**No.**	**%**
Success	102	85
Failure*	13	11
Insufficient milk	5	4
Total	120	100

*Failure includes death of lamb as well as rejection.

Summary

Successful grafts of single or twin lambs onto ewes that had sufficient milk have been made in trials at South Dakota University, the University of Idaho and the U. S. Sheep Experiment Station, Dubois. Early slime and wet grafting are the preferred and the most efficient methods. Skin grafting has its place in special situations. If these three techniques are not possible, "force" grafting using a specially designed stanchion provides an additional proven technique so that all ewes can raise as many lambs as their milk production will allow regardless of natural lamb losses and single births.

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