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sheep production guide

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A GUIDE TO sheep production

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Extension Animal Husbandman

Sheep production in South Dakota offers farmers an additional means of stabilizing their income and production. The two cash crops per year, wool and lambs, have always been popular. With the necessity of planting more grasses and legumes to conserve our land, the need of putting more emphasis on roughage-consuming animals is evident.

During World War II the sheep numbers in the United States declined about 40 percent from their high peak of 1942. However, since the United States produces only a fraction of the wool that this country consumes, and with sheep numbers likely to stay below the peak number attained in 1942 in the western part of the United States, the law of supply and demand appears to favor the man who maintains a band of ewes. Prices for lambs and wool are likely to be in a most favorable position in respect to other livestock commodities for some time. The number of sheep kept on South Dakota farms does not remain constant, but varies with economic and climatic conditions.

ESTABLISHING A FLOCK OF SHEEP

Wool and lamb production on the farm flock basis should be on such a scale that it will provide a substantial part of the farm income. If sheep are kept mainly as scavengers in small flocks of 10 or 15 head, they usually are more of a nuisance than a source of profit. On the other hand, farm flocks of 50 to 150 ewes are farm



Part of a typical farm Flock

enterprises large enough to receive the care and feed they deserve.

Three plans—There are three satisfactory plans by which one may start a farm flock of sheep. Their success depends upon your experience with sheep and your financial limitations:

1. Purchase a few ewe lambs of good type and quality which may develop into thrifty vigorous yearling ewes to be bred for lamb production.
2. Purchase a few high quality ewes of good breed type from 1 to 4 years of age.
3. Purchase a larger number of ewes of good type, the number depending upon the available pasture, feed and facilities for properly handling the ewes. Under range conditions anyone starting in the sheep business would start with a larger number of ewes, usually from 200 to 500 head.

CLASSIFICATION OF SHEEP BREEDS

Mutton Type Breeds are sheep being bred primarily for mutton, although the ability to produce a good quality fleece is important. There are two classifications of the mutton type sheep, namely:

1. Medium wool: These breeds are of medium size, blocky conformation, with medium length of fleece. The breeds are:
(1) Shropshire (4) Columbia (7) Cheviot
(2) Hampshire (5) Corriedale (8) Suffolk
(3) Southdown (6) Targhee (9) Montadale



A Hampshire Ewe. Note the short legged, low set, mutton type with straight top and underline, deep chest and body, denoting strength and constitution.

2. Long wool: These breeds are more upstanding, have larger deeper bodies and more open fleeces than the medium wool breeds. They are not as active and are more adapted to localities of abundant grass and feed. They are our largest breeds of sheep consisting of:

- | | |
|--------------|------------------|
| (1) Lincoln | (3) Leicester |
| (2) Cotswold | (4) Romney Marsh |

Fine Wool Type Breeds are finer of fleece than the mutton type breeds; in fact the emphasis is placed upon wool production rather than mutton type. The two general breeds are:

- | | |
|---------------------|-----------------|
| (1) American Merino | (2) Rambouillet |
|---------------------|-----------------|

SELECTING THE EWES

Grade ewes are quite suitable and more easily obtained for the beginner in sheep production. In the 4-H sheep club, however, the beginner may want to start with purebred ewes. Whatever the circumstances may be, one should have in mind certain requirements for the ewes needed for foundation stock:

1. Health and vigor.
2. Uniformity in size and type with straight body lines.
3. From 1 to 4 years old.
4. Sound in udder, teats and mouth.
5. An even covering of dense fleece of good marketable quality.

Ewes of the mutton breeds should be replaced as six-year olds unless they are outstanding producers. Mark the lambs so that more definite records of performance may be kept of each of the ewes. In this manner the more profitable producing ewes and their ewe lambs can be retained for the breeding flock and the meat and wool producing qualities for the flock developed to a higher degree. For every 100 ewes it is well to keep from 16 to 20 of the best ewe lambs for breeding flock replacement each year. Such a practice would allow for a closer culling of the ewes and for possible death losses.

SELECTING THE RAM

A sheepman pays for a good purebred ram even though he uses a cheaper grade ram. Use even greater care when selecting the purebred ram than you do for selecting the ewes. Each lamb sired by him will carry 50 percent of his blood lines. With good purebred rams improvement in the flock is possible; if grade rams or inferior purebred rams are used such improvement is not possible.

1. Select a good purebred ram that is vigorous, bold in temperament, wide, deep and heavily muscled. Straight and strong legs and straight in body lines.

2. An even covering of dense fleece, free from dark fibers and high in quality.
3. The number of ewes per ram depends upon the care given the ram. Normally, one ram, 18 months or older, should be provided for each 30 to 40 breeding ewes. A good growthy lamb ram can handle 15 ewes.
4. If you want to use one ram for a larger number of ewes he should be separated from the ewe flock, fed liberally during the day, and turned with the ewes at night.
5. Shear the ram and trim his feet before the first of September. He will be more active.
6. Keep the ram away from the ewe flock except during the breeding season. The gestation period is approximately 146 days. Ewes bred in October should start lambing in late February.

DETERMINING THE AGE OF SHEEP

It is not difficult to determine the age of the sheep up to four years. Lambs have 4 pair of small narrow teeth known as milk teeth. At 12 to 14 months the center pair of milk teeth is replaced by a pair of larger, broader and whiter teeth, known as permanent incisors. At approximately 24 months of age two more permanent teeth appear, one at either side of the center pair. At three years of age another pair of permanent teeth appear, and at four years of age the last pair or corner teeth appear. As the animal advances in age the teeth become shorter and wider apart, usually beginning to spread at 6 years of age and at 7 years the teeth will begin to drop out. The full set of teeth may be kept until the animal is 8 or 9 years old. Changes in teeth are influenced by the type of grazing or feeding and the breed.

MARKING EWES AND LAMBS

Two common methods are used to mark sheep; branding paint is best for the larger bands on range and ear tags for purebred flocks. When branding paint is used it should be of the best quality, being durable enough to retain its identification for a year and of such composition that it will be removed from the wool in the scouring process. In using the branding paint, a mark or number may be stenciled on the back or side of the animal.

In purebred flocks ear tags (sheep size) are essential for proper identification. Such tags carry owner's initials and a numbering system for identification.

care, management

Sheep should have adequate shelter from rain and snow storms. The shelter should include dry comfortable quarters, well ventilated yet free from drafts, where they will not be overcrowded. Overcrowding and poor ventilation often cause colds and pneumonia. The sheep should have plenty of exercise during the winter season and should have access to fresh water, salt and minerals. During the winter season pregnant ewes must have exercise as well as feed to keep them in a good healthy condition. If you scatter their hay or roughage over the ground, some distance from the barn or shed, you force ewes to exercise.

Trimming the Feet. Most ewes keep their feet worn off sufficiently. Some, however, need trimming to avoid lameness. A good shepherd inspects the flock two or three times a year for bad feet and trims them when necessary. Turn the sheep out on damp or wet ground for several hours beforehand. This softens the hoofs and makes trimming much easier. Usually a good, strong sharp jackknife is the only tool that will be required. In some cases a clipper, or pruning knife may be used to advantage. The hoof should be cut down until it is level with the sole of the foot. Trim so the foot will stand straight when placed on the ground. Be careful not to cut the hoof too short. This may cause soreness and lameness.



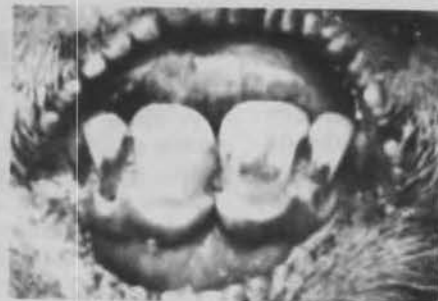
Method of trimming feet

BREEDING THE EWE

Flushing the Ewes—In the fall of the year the breeding ewes should, if possible, be turned into a good pasture 2 to 3 weeks before being bred where they may graze and gain in weight. This practice is referred to as flushing the ewes—the ewes are gaining in weight at breeding time which results in an increase in the number of eggs or ova produced. The result: ewes will come in heat during a shorter period of time and there will be a larger lamb crop because of a greater number of twin lambs. If suitable pastures are not available the same results can be obtained by feeding legume hay



Two Years—4 permanent teeth



One year old—2 permanent teeth



Lambs mouth—8 milk teeth

or by feeding daily $\frac{1}{2}$ pound of oats or grain mixture along with some other roughage to each ewe. Ewes should not be too fat at breeding time as they may not "settle" and will have to be bred again.

Breeding Ewe Lambs—Do not breed ewe lambs. Wait until ewes are about 18 months old so they will lamb at approximately 2 years of age. Breeding ewe lambs will often lead into difficult lambing, more disowned lambs, and unless extra feed and care are provided, the size of the ewe at maturity is reduced and her productive life shortened.

EQUIPMENT

Expensive equipment is not necessary for sheep production or lamb feeding. But sheep producers are often handicapped because of inadequate equipment which may result in higher feed and labor costs and a greater death loss. The barn or shed room should be sufficient to allow from 16 to 20 square feet of floor space for each breeding ewe and from 4 to 8 square feet of floor space for each lamb. A shed with an open front to the south, or with doors opening to the south, which can be closed at night or in cold weather, is very desirable for housing the sheep. The doors should be wide enough so that the sheep will not forcibly jam one another against the sides of the opening as they might be forced to do where smaller doors are used. The sheep yard and pastures ought to be well fenced with woven wire fencing.

Suitable feed racks should be provided. This effects a saving in the cost of the feed. Allow from 14 to 18

inches of rack space for each ewe and from 10 to 12 inches of space for each lamb. A cutting chute for ease in sorting the sheep ought to be a part of the equipment. It may be portable and used in conjunction with a yard gate; if so used construct a chute 4 feet high and 18 inches wide with its two sides boarded up solid. Place it along the fence with one end along the gate opening.

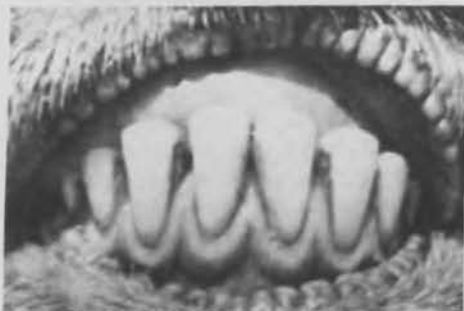
feeding

WINTER MANAGEMENT

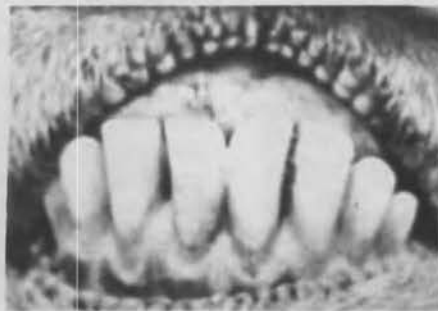
A great deal of the beginners' success with the lambs in the spring depends on the feed and care given the ewes during the winter. If the ewes are to develop strong healthy lambs they must have good feed and plenty of exercise. This does not mean that they should be fat. Keep the ewes in good thrifty condition, gaining from 20 to 35 pounds during pregnancy.

The feed requirements depend largely on the condition and size of the ewe. The average sized ewe requires 3 to 4 pounds of hay per day. Legume hays are excellent for sheep. Alfalfa fed alone will furnish a balanced ration for the breeding ewe. If plenty of roughage is available, the ewes, as a rule will not need a grain feed until about six weeks before lambing. The run of cornstalk fields in the fall and winter helps to lower the cost of winter keep, but this type of feed will supply only a small amount of growth materials. The ewes

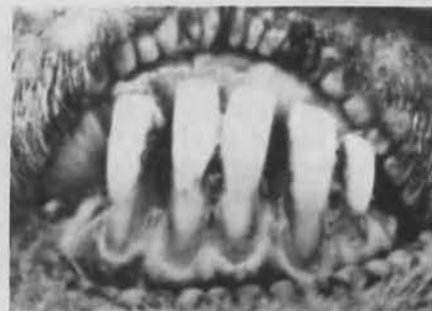
Three years—6 permanent teeth



Four Years—8 permanent teeth



Mouth of older ewe



should not be forced to live on this alone, as weak lambs would likely be the result.

Used in connection with alfalfa or one of the clover hays, cornstalk fields make a good winter ration. If legume hay is not available and grass hay or silage is the roughage fed, the ration can be balanced by feeding one-fourth to one-third pound of linseed meal, or soybean meal or the same amount of a commercial protein supplement.

All of the ewes should be fed grain about the last 6 weeks before lambing. Feed from ½ to 1 pound of corn or oats or a mixture of these. The grain will provide the needed nutrients when the fetus (the unborn lamb) is growing most rapidly. It will also help prevent pregnancy diseases.

FEEDING THE EWES AFTER LAMBING

No grain should be given for 12 hours after lambing and only a little grain the first 2 or 3 days. However, the ewe can be fed the regular roughage ration. After three days the grain ration can be fed until the ewe is eating from 1½ to 2 pounds daily. The same grain mixture as shown in rations I, II or III for the last 6 weeks of pregnancy is satisfactory.

lambing

Lambing time is one of the most vital periods of the entire year for the shepherd. His success or failure with the ewes will depend to a large extent on the number of lambs he saves. If the ewes have been properly fed and given plenty of exercise, there should not be much lambing trouble.

Suggested Rations First 3½ Months of Pregnancy

I		
Alfalfa or other legume hay	4 to 5	pounds
II		
Alfalfa or other legume hay	1 to 2	pounds
Brome grass, western wheat or other native hays	2.5 to 3.5	pounds
III		
Alfalfa or other legume hay	1.5 to 2	pounds
Silage	4 to 5	pounds
IV		
Brome grass hay, western wheat and other native hay	4 to 5	pounds
Linseed or soybean meal	.3 to .25	pound
V		
Linseed or soybean meal	.2	pound
Silage	6 to 8	pounds

The above rations provide at all times a mineral mixture, 1 part of trace mineralized salt and 1 part bone meal.

Suggested Rations Last 6 Weeks of Pregnancy

To get the ewes ready for nursing and to improve their general condition, begin feeding a grain mixture along with the roughage. Feed from ½ to a pound daily per ewe of the following rations, depending on the quality of the roughage and condition of the ewes.

I	
With Hay Alone:	
Ground ear corn	60 pounds
Whole oats	20 pounds
Wheat bran	10 pounds
Linseed meal	10 pounds
II	
With hay and corn silage:	
Whole oats	50 pounds
Ground ear corn	30 pounds
Wheat bran	10 pounds
Linseed meal	10 pounds
III	
With hay and grass silage:	
Ground ear corn	60 pounds
Whole oats	30 pounds
Wheat bran	10 pounds
Furnish mineral mixture at all times.	

"Save every lamb dropped" is a goal worth working towards.

GETTING READY FOR LAMBING

As lambing time approaches, you should be ready for the new arrivals. Pens and equipment should be put in order. Separate the ewes that are going to lamb from others in the flock. If the ewes have not been shorn, trim the wool from their docks. Remove loose and dirty wool tags from the sides, rear, and from around their udders. Generally ewes will exhibit characteristic symptoms as lambing time approaches. The ewe will have a sunken appearance on each side of the rump, the udder fills and teats are enlarged. She is restless, will get up and lie down repeatedly, paw at the bedding and may leave the others to be by herself.



Lambing pens are a good investment. Most run 4 x 4 feet in size; 30 to 36 inches in height.

CARE OF EWES AT LAMBING

Be prepared to move the ewe to lambing pens to help in delivery. See that the lambs nurse soon after they are dropped. They should not become chilled. When the ewe shows signs of delivery, leave her undisturbed for a few hours. Most ewes will deliver within 2 or 3 hours after labor starts.

If you see that the ewe will need help during delivery wash your hands thoroughly with soap and water and then disinfect them with a solution of lysol or some other reliable disinfectant before you help her. Mineral oil helps as a lubricant. Pull down and out in the general direction of the hocks.

CARE OF LAMB AT BIRTH

As soon as the lamb is born remove mucous from mouth and nostrils. Vigorous rubbing and a slap or two will encourage the lamb to start breathing. As soon as the lamb is breathing, his navel cord should be dipped thoroughly in tincture of iodine to prevent infection. Place the lamb near the ewe's head so she can mother it and lick the mucous from it. Remove the plug or obstruction in the end of the ewe's teats by milking out a little milk. A weak lamb often has difficulty in removing the plug.

Hold a weak lamb up to the udder of the ewe and, if necessary force a little milk into his mouth. It is easier to get the lamb to nurse during the first few hours of his life. Some shepherds lay the ewe on her side to allow the lamb to nurse during these few hours after birth, others set the ewe on her rump with the lamb between her hind legs. It is very important that the new-born lamb gets a few swallows of that first milk (called colostrum). The ewe's milk contains colostrum for about 3 days after lambing.

In cold weather a heat lamp suspended over a corner of the pen will help dry the lamb and keeps it from getting chilled. The lamp should be hung 2 feet above bedding. Protect it with several 2 by 4s to keep the ewe from rubbing against the lamp. Lamb brooders are also used. After the lambs are a few days old the heat lamp or brooder is no longer needed.

Watch lambs closely during the first week for signs of constipation. Look for an over-full abdomen and straining. Eight to 12 ounces of warm soap suds enema introduced with a 4 ounce syringe will often bring quick relief.

During the first 4 or 5 days the feces (droppings) from the lambs are sticky and often pin the tail to the body of the lamb, preventing further elimination. Pull the tail up and remove the accumulation.

ORPHAN LAMBS

Lambs that are disowned by their mothers, or lambs that are starving to death because the ewes do not have enough milk can cause the shepherd no end of trouble. However, they will grow into profitable lambs if han-

dled properly. Ewes who lose their lambs should not be allowed to dry up. Put a twin lamb or an orphan lamb on them. Place the skin of the dead lamb on the orphan, the ewe will usually accept the lamb as her own. Leave the skin on a day or two. You might smear the ewe's nose with distillate or rub the ewe's afterbirth on the orphan lamb. These tricks often work. If the ewe refuses to own her lamb, tie her up so she cannot bunt her lamb. The lamb will be able to nurse, and usually in a few days the ewe will give in and accept the lamb.

If all efforts fail, it may be necessary to bottle-feed cow's milk. Be careful, however, not to overfeed the first day or two. Begin by bottle-feeding only 2 or 3 tablespoons every 2 hours. Begin early in the morning and feed until late evening. After about a week, increase the amount and time between feedings. In about 10 days, three feedings a day are usually enough.

DOCKING AND CASTRATING

Dock and castrate lambs between the ages of 3 days to 14 days old. Both operations can be done at the same time. When docked at this age the lambs suffer less from shock and the wounds heal faster. The tail may be cut off with a knife or sharp instrument, or removed with an elastrator or masculator. If a knife is used there sometimes is danger of bleeding. This can be prevented to a great extent by keeping the lambs as quiet as possible. Try not to excite them. The tail should be cut off about an inch from the body.

Castration is easily accomplished with a pair of castration shears, all-in-one castrator or a knife and pliers. Cut off one-third to one-half of the scrotum and pull the testicles with the shears or pliers. The job is rapid and simple.



A creep located in the corner of a pen. The openings are 8 inches apart or they can be adjusted to the size of the lamb.

Before and after castration, apply a solution of a standard disinfectant such as lysol or creolin. Castrating or docking instruments should be sterilized before performing the operations.

CREEP FEEDING

Lambs begin to nibble at grain and hay when they are 10 to 14 days old. They should be fed where they will not be bothered by the ewes. A creep or pen is simple and inexpensive to construct. Several upright openings should be left for the lambs to pass through but they should be narrow enough so the ewes cannot follow. It may be difficult to build the creep to exclude all ewes, because small thin ewes may enter the creep. The creep should be well sheltered and placed in the sunlight if possible. Inside the creep pen there should be a trough for grain, constructed so the lambs can't get into it and spill the feed.

The first two or three weeks the grain mixture should be coarsely ground, cracked or rolled. Provide quality green leafy alfalfa hay. The grain can be fed whole after the lambs are six weeks old. Following are some suggested creep rations.

Suggested Creep Rations	
I	
With Alfalfa Hay Free Choice	
Cracked Corn	20 pounds
Whole or Rolled Oats	20 pounds
Wheat Bran	20 pounds
Linseed Bran	10 pounds
After lambs are six weeks to two months old the grain can be fed whole.	
II	
With Alfalfa Hay Free Choice	
Corn (Cracked)	60 pounds
Oats (Rolled or Whole)	20 pounds
Wheat Bran	10 pounds
Linseed or Soybean Meal ..	10 pounds
After lambs are six weeks to two months old the grain can be fed whole.	
III	
With Alfalfa Hay Free Choice	
Corn (Cracked)	45 pounds
Oats	45 pounds
Soybeans or Linseed Meal	10 pounds
Feed grain whole after lambs are six weeks to two months old.	

It is important that fresh feed be provided daily in the creep. What grain the lambs do not clean up daily should be removed from the troughs and fed to the older sheep.

Lambs born from December until the middle of March should be creep fed to take advantage of an early market. It does not pay to creep feed lambs born late in the spring. Generally they will be out on early pasture and will not benefit from the creep.

SUMMER CARE

Put ewes and their lambs on good pasture on bright sunny days at the first opportunity in the spring. Continue feeding grain. Grass is watery and doesn't contain much strength until later in the spring. Also provide a little hay each day during early spring. After the ewes have been sheared, dip or spray both the ewes and lambs to control ticks. A change of pasture every two weeks will help control stomach worms. All ewes should be treated for stomach worms before going on pasture. Follow the recommendations on page 14. When the weather gets warm, ewes and lambs should have free access to cool shade during the heat of the day. Shade may be provided in the pasture, where necessary, by movable sheds.

WEANING

Wean lambs when they are four to five months old. At that time they should be provided with a good legume, or other lush pasture. Pastures that have been grazed by sheep will generally carry a large number of internal parasites. Use one that has not had sheep grazing on it if possible. Some lambs may be ready for market and they should be sold.

The best way to wean lambs is to simply take them away from their mothers and not let them mix with them again. Care should be taken to prevent the udders of the ewes from caking after the lambs are taken away. By observing the ewes one can generally tell by the size of the udder whether or not the ewe should be caught and milked out. Put the ewe on scant pasture at this time and a few days before weaning to help stop the milk flow.

pastures

Sheep excel in the utilization of grass and its conversion to saleable products. About 90 percent of the various kinds of weeds growing on our farm pastures and ranges are eaten readily by sheep. Weeds along fence rows and the new growths in harvested grain fields furnish cheap sources of feed for sheep.

While pasture, weeds, and grain aftermath should provide feed needed during the summer months, sheep will not respond well to coarse and unpalatable feed. They like short grasses that are growing actively. If they are forced to exist on a dry, dead pasture, the lambs will lose weight. Don't expect to sell them as fat lambs.

The amount of pasture required to carry a ewe and her lamb depends on the type of pasture, the amount of rainfall during the growing season and the age of the lamb. Five ewes and their lambs require about the same amount of pasture as one cow and her calf. Grasses and legumes are an excellent source of protein and all essential minerals. Lambs and ewes on grass will gain faster than those grain-fed in a dry lot with the ewes. Nursing lambs running with ewes on good

grass usually gain one-third to two-thirds pound a day. They will be fat enough to top the market at about 4 to 5 months of age.

Rotate pastures to help control parasites such as stomach worm and tape worm. This practice will also increase the carrying capacity of the pastures. Divide the field with a temporary fence into about four different pastures. Move the sheep from one field to another. Change the pasture often during the damp rainy weather, as parasite infestation is more severe under those conditions.

Contrary to popular opinion, cattle and sheep can be pastured satisfactorily in the same field at the same time. The carrying capacity is actually increased. Cattle feed on the taller grasses that sheep do not relish, and the sheep eat the grasses that are too short for the cattle to pick up. Clip the entire pasture when tall weeds and rank grass dominate. This will maintain a steady rate of growth of forage. It will hold the palatability high. And more rapid gains on the lambs will result.

SELECTION AND TYPE

Many flock owners rely on their poorest piece of land for pasture. Often that land is poorly drained and is suitable only for growing permanent pasture of poor quality. Sheep that must live on such pasture during the entire summer are subjected to liver fluke infestations whenever the pasture is wet and boggy; and they are subjected to stomach worms when it is dry. Permanent pastures dry up during summer dry periods and only provide a place for the sheep to exercise.

Permanent Pasture: Permanent pasture (which usually contains blue grass, brome grass, and quack grass in this area) can contribute a great deal to the sheep enterprise. If the land is high and well-drained, this type of pasture provides excellent feed during May and June. They become dormant and woody during the hot summer months, but produce good feed again in the fall, usually from September until it freezes up.

Legume Pasture: Alfalfa and sweet clover are the two most common legumes in South Dakota. This pasture fits in well with most crop rotation systems and can restore the fertility of run-down pastures. A combination of legumes and brome grass makes an excellent sheep pasture. While these pastures cannot be grazed as early as our tame grass pastures, such as blue grass and straight brome grass, it has greater carrying capacity and will furnish feed through the hot months. Its greatest disadvantage is that legumes cause bloat. If sheep are filled up with hay before they are turned into a legume pasture they will have little bloat trouble. There should be at least 50 percent brome grass in the stand. This also helps reduce the incidence of bloat. Sweet clover, if grazed before it becomes too rank, makes good sheep pasture and is less apt to cause bloat. However, it is not as palatable as alfalfa.

Temporary Pastures: Rape, sown with oats the latter part of May and early June, furnishes an excellent summer and fall pasture. The rape will remain green and palatable and can be pastured safely long after all other pastures are frozen. It is excellent for ewes during the breeding season.

Sudan grass, planted in late May and allowed to reach 6 to 8 inches in height, makes a very succulent and palatable feed for ewes and their lambs during the hot summer months. It can be pastured down many times during the summer. Give it a rest each time until new growth reaches 6 inches again. Sudan can supply more palatable green feed per acre than any other type of forage grown in South Dakota.

Make use of permanent pastures during May and early June. Use a legume and brome pasture or Sudan grass from late June to September; and graze rape or permanent pasture during late September and October. This assures the best feed possible for keeping a ewe in condition and maintaining a milk flow. Lambs will continue to grow and fatten with a minimum of expense and a maximum of profit. Experiments have shown that properly managed pasture land can be as profitable as land used for small grain.



Practical type grain trough for feeding sheep. Bottom is a foot wide; 12 to 14 feet long. Sides are 1 x 4's and a 2 x 4 extends full length of trough.

fattening lambs

Feeder lambs should be uniform in size, type and breeding. Such lambs will finish at more nearly the same time and will require topping out for market at less frequent intervals. Thrifty lambs that are reasonably free of parasites will finish at more nearly the same time. Lambs that are strong and vigorous will ordinarily show a lower death loss, make faster and cheaper gain, be easier to keep on feed and make more money for the feeder than lambs costing less but lacking these desirable characteristics.

HANDLING FEEDER LAMBS

When feeder lambs are obtained in the late summer or early fall, turn them on to a pasture for a while before dry-lot feeding begins.

Drench lambs for worms before they go on feed. If necessary spray or dip for ticks and vaccinate for overeating disease. Lambs should be started on grain gradually. At the beginning, continue to feed the lambs on hay or other roughage to which they may be accustomed. Bring them up to grain gradually over about a three-week period; until they receive a full feed of grain one and one-half pounds daily per head.

If both hay and grain are finely chopped or coarsely ground, they may be mixed in equal parts and you may self-feed from the start. If hay and grain are to be fed whole, they must be hand-fed separately. Begin with a very small amount of grain, perhaps a quarter pound daily per lamb at the start.

Rations are for lambs that need to be fed for varying lengths of time to reach a market weight of 90 to 110 pounds.

I

Corn or barley (whole or cracked)	1.5	pounds
Alfalfa hay	1.5	pounds

II

Corn or barley (whole or cracked)	1.5	pounds
Linseed meal or soybean meal	0.10	pounds
Mixed hay made up of legume and grass	1.5	pounds

III

Corn or grain sorghum (whole or cracked)	1.5	pounds
Alfalfa hay	1.5	pounds

Corn is our best grain for fattening lambs. Oats, because of its bulkiness and tendency to promote growth rather than fat, should be fed sparingly. Oats can be used to get lambs on feed. It should seldom be used to make up over one-third of the grain ration by weight.

FEEDER SPACE

A sufficient number of feed troughs or bunks should be provided for hand feeding. Troughs should have a flat bottom, 12 inches wide; should be set on legs, and so constructed that the feeder can be tipped for cleaning. A 2" x 4", running lengthwise about 12 inches above the trough, will prevent lambs from climbing into the trough. Such a trough 8 feet long will accommodate 16 lambs.

GRAINS and ROUGHAGES

Corn. The most palatable of all grains, corn is an excellent feed for fattening sheep.

Oats. Oats is a high-fiber feed and provides bulk. It is especially good for breeding flocks and for starting lambs on feed.

Barley. Barley is another fattening feed and, though less palatable than corn, is widely used. It has about 90 percent of the feed value of corn and usually is a good addition to a fattening ration.

Wheat. As a rule wheat should only be fed when it is about equal to corn in cost per pound. It is not as palatable as corn. It is comparable to barley for fatten-



Five sided hayrack. Sides are 24 inches wide and 30 inches high. Plans for this and other feeding racks are available from the Extension Service Agricultural Engineers, South Dakota College. Ask for Plan No. 5807.

ing lambs and when used it is desirable to mix it with other grains in the ration.

Grain Sorghum. Grain sorghums are equal in feed value to corn, except in the case of the sweet sorghums such as cane. Sorghum can be used either alone or mixed with other grains for fattening.

Rye. When fed alone, rye usually will not provide a satisfactory grain feed for fattening, but in combination with other grains in the ration it can be economically used. It has a feed value about equal to barley.

Wheat Bran. Wheat bran is fed, to a limited extent, to purebred flocks for its laxative and conditioning effect. It is especially suitable when bulk is needed in the ration.

PROTEIN SUPPLEMENTS

Soybean oil meal, linseed meal, and cottonseed meal are rich in protein. They are commonly used for balancing sheep rations. Either the pellets or pea-size cake is preferred because of the ease of mixing with whole grain.

Legume Hay. The best roughage for sheep, it is high in protein, mineral content (particularly calcium) and is slightly laxative. Good quality hay will supply some of the essential vitamins and lower the grain requirements. It is not necessary to feed a protein supplement when high quality alfalfa hay is fed.

Mixed Hay. The value of mixed hay depends on the percentage of legumes in it, the time of cutting and the method of curing. More protein is needed to balance

the ration if legumes make up only a small percent of the mixture.

Small Grain Hay. Well cured oats hay, cut when the grain is in the dough stage, is a good emergency hay. It should be fortified with a protein supplement.

Corn Silage. Corn silage can be used to reduce the cost of the ration for growing or breeding sheep without lowering its efficiency. Feed it in a ration that includes some legume hay. Feed 2 to 3 pounds of silage to each pound of legume hay. Corn silage may be used as the only roughage, if it is fortified with adequate protein supplement and minerals. Use silage as the only roughage in the ration only when a shortage of hay exists.

Hay Crop Silages. Legume-grass silage is a very satisfactory succulent feed for sheep. It is used widely as a portion of the roughage. Large ewes will often consume from 5 to 6 pounds per head each day. Be sure to give ewes at least a pound of dry roughage along with this.

MINERALS

Salt. Sheep should have access to salt at all times. The salt should contain iodine to prevent goiter in lambs. Trace mineralized salt is recommended and should be fed in granulated form. It is easier to eat than block salt.

Mineral. As a rule, complex mineral mixtures are not required and the following mixtures should prove adequate.

40 pounds	steamed bonemeal
40 pounds	ground limestone
20 pounds	salt (Trace mineralized)

shearing

The average price of wool in South Dakota could be raised 2 to 5 cents per pound if the wool producers would give proper attention and care to the wool their sheep produce.

Wool is purchased on an average price basis for a given territory. Average shrinkages are computed from past years, and the grease price for the area is determined by the price of scoured wool. The value of wool in a given territory may vary as much as 15 cents per pound in the grease.

Dealers find it impossible to maintain volume when they make a price differential as great as should be made in buying wool. Most people like to know about how much their wool is worth before they even bring it in for sale, and, because they do not understand what determines the price, they prefer an average price rather than a fair price based on the merit of the wool. Obviously the average price will not raise until the average merit of the wool is raised.

IMPROVING THE CLIP

Improving the Wool Clip: In addition to breeding for an improved crop of wool there are several handling methods that can be used to improve the value of the wool placed on the market. Some of the more important points include:

1. Prevent straw or chaff from getting into the fleeces while you feed hay or bed the pens. Keep sheep out of burr infested fields at all times. Burry, seedy, or chaffy fleeces generally are classified by wool graders as off grades or rejects and sell for considerably less than fleeces of the same quality that are free from vegetable matter. Fleeces with excessive vegetable matter content must be subjected to extra chemical or mechanical treatment before the wool can be processed into a high quality, finished material.
2. Make sure the sheep are dry when they are sheared. Damp or wet wool deteriorates rapidly if it is packed in that condition, it becomes musty and develops an odor that is very noticeable and easily recognized by the wool graders. Wool that is musty sells at a heavy discount and consequently the producer loses money on this type of wool.
3. Have a careful, experienced shearer shear the sheep. Proper shearing is an important step in preparing a clip attractively for marketing. The value of the wool is determined partly by the uniformity of length of staple, and fleeces with a large amount of short wool resulting from second cuts during shearing, will be reduced in value. A clean floor or canvas should be provided for the shearer to work on so that the fleece can be kept as clean as possible.
4. The manner in which a fleece is rolled and tied after shearing will affect its value. The purpose of this operation is to provide a fleece package with the most attractive and valuable parts of the fleece exposed. The first step is to take the shorn fleece and spread it flesh side down on a clean floor or table. Then remove all dirty and wet tags and package these separately. If they are left in the fleece they may stain some of the good wool which eventually will be removed and placed in a lower grade. If they are not removed they lower the total value of the clip.

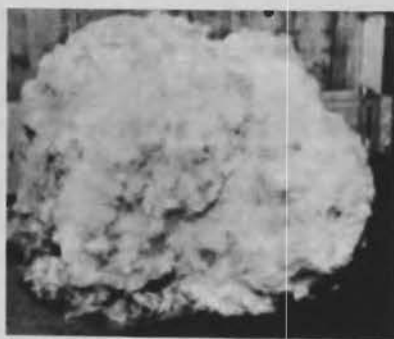
Next, turn in all the loose ends such as the neck and leg pieces and the belly part. The fleece at this stage should present a neat rectangular appearance. Fold the fleece lengthwise one-third the width of the fleece and then fold this double portion over with the remaining third. Then roll this folded part tightly together. If such a procedure is followed the clean, flesh-side of the fleece will be on the outside of the bundle and the weathered and frowsy ends on the inside of the bundle. A loss of one grade of wool in a good clip is often made if the fleece is not tied with the flesh side out. Tie the fleece securely with about 8 feet of wool twine (twisted

paper twine). The use of sisal twine or binder twine for either tying up the individual fleeces or sewing the wool sack shut will reduce the value of the wool materially. **Don't use this twine under any circumstance!**

5. When wrapping the fleece do not pull the twine so tight against the fleece that it will compress it into a small bundle! This will give the wool buyer the impression that you have a heavy shrinking fleece, and you will get a lower price per pound for it.

6. If the wool clip must be stored, select a clean dry building and make certain that hay or straw chaff and bird droppings cannot contaminate it.

It is the large, bulky fleece, free from burrs, hay, and tags, tied with paper twine with the flesh side out that sells for the high price on the wool market.



A shorn fleece, properly folded, rolled and tied.

internal parasites

Healthy sheep are essential to profitable sheep production. When the owner's efforts fail to maintain the flock in a vigorous condition, the services of a licensed veterinarian should be sought.

Internal parasites are more difficult to handle than external parasites. The larvae of many worms that infect the digestive tract may be picked up from the pastures since sheep are by nature close grazers. Other internal parasites, such as lungworms, may be acquired from stagnant ponds or water holes. Few flocks are free from parasites. While mature sheep and well-fed lambs can support a heavy infection without much physical evidence of it, their droppings can and will contaminate a clean pasture.

Young lambs and thin sheep may suffer severely from a relatively mild infestation. To be successful with sheep a definite, systematic, and regular program of parasite control must be employed. Punctuality in drenching and pasture rotation is a must. Often a delay of only a few days means a million more worms in a single flock.

Sometimes sheep heavily infected with worms show no external symptoms. Such sheep spread infection without the owner being aware of it. Good feeding will

cover up symptoms of a moderate infestation. Neglect, scanty rations, or the presence of worms in large numbers will cause sheep to have external symptoms that are quite characteristic of all worm infestations.

General symptoms. The mucous membranes of the eyes, nose and lips become pale. The skin loses its healthy appearance and becomes white and papery or harsh to the touch. The wool becomes dry, and loses its natural sheen or luster. Extreme weakness is characteristic, and diarrhea may be present if the infection is heavy. Sheep that are severely parasitized generally have difficulty in keeping up with the flock.

How Sheep Get Worms. Female worms lay enormous numbers of eggs in the digestive tract of the sheep. The eggs pass out to the ground in the droppings. Under favorable conditions of temperature and moisture these eggs develop in a few days into larvae which crawl onto vegetation. Sheep eat these larvae while grazing. Under favorable conditions the entire life cycle of the worm from egg to larvae to adult can be completed in from 3 to 4 weeks. One badly infected sheep may pass several million worm eggs in a day. It can be readily understood, therefore, the sheep become severely parasitized in such a short time.

Infection does not readily occur in the barn or drylot. Closely grazed areas such as old orchards, shady lots, lanes and barnyards are dangerous.

Adequately fertilized permanent pastures, grazed to capacity by sheep may present a serious parasite infection. Thorough control measures for internal parasites and rotational grazing with other farm livestock are a must. The worm infestation can also be checked by periodically moving the flock to supplemental forage crops. Contrary to popular opinion, companion grazing of sheep and cattle (usually the sheep following the cattle) is highly desirable.

Parasitic Damage. The most damaging parasites are the small, round, blood-sucking worms. There are several kinds that infest the fourth compartment of the stomach and the intestines. These parasites attach themselves to the lining of the digestive tract and suck their nourishment from the blood. They release a deadly substance into the blood which may cause a reduction in its oxygen carrying capacity. At the point of attachment on the walls of the digestive tract small hemorrhages develop.

Control

Control is accomplished by preventing serious worm infestation in any member of the flock. Provide non-infected pastures such as meadows or temporary grazing crops like rape, sudan grass, or closely drilled corn. Avoid continuous use of old permanent sods.

Areas seeded to small grains furnish clean late fall and early spring grazing. Meadows are usually productive when bluegrass becomes dormant and of low feeding value in late summer. Other forage crops grown on

plow land are excellent. Legumes or legume and grass mixtures are especially valuable.

Temporary fence, used to promote uniform grazing pays big dividends in two ways. It assures better use of the feed and reduces the parasite control problem.

Avoid infection by moving the flock to new pasture at intervals of not more than 2 weeks.

On many farms sheep are required to pass through a lane or a small lot each day to reach shelter or their water supply. This is reason enough for owners to follow a regular treatment program. The administration of anthelmintics (worm expellents) should be timed so it will prevent the development of a serious infestation of worm larvae on the pasture. Never wait until sheep become run down in health and appearance before you worm them. Prevent worm damage rather than attempt to restore thrift and vigor.

Know the latest developments in parasite control. Parasitologists of the U.S.D.A. and our agricultural experiment stations are constantly searching for more effective control measures. New and more efficient drugs are sometimes discovered. When purchasing prepared products for worm control be sure that you follow the printed directions on the package or container carefully. Avoid giving oral instructions to other flock owners. They may misunderstand you. Printed instructions for dosages are also available at your county extension office.

The larvae of many of the most damaging worms cannot survive continued freezing temperatures. Each spring lambs pick up larvae that developed on the pasture after the end of cold weather. These larvae come from the eggs of worms that wintered over in the sheep. Every effort should be made to eliminate worms in the flock before it goes to pasture.



When drenching a sheep, use care. Don't tip the muzzle of the sheep above its eye level.

Phenothiazine, a synthetic chemical, is the most effective single drug for the removal of many different kinds of round worms in sheep. When combined with small amount of arsenate of lead it will control most roundworms and the common tapeworms of sheep.

Phenothiazine may be given to sheep as a drench, in the bolus or pellet form, or in the salt as a salt mixture. In most instances control will be the most effective and economical when both the drench and the salt

mixture are used. Phenothiazine may be purchased as a powder, as a drench with the phenothiazine in suspension, or as a drench that also includes arsenate of lead in the proper concentration for tapeworm control. Where phenothiazine powder (drench grade) is to be mixed at home one pound of the powder to 1½ pints of water is the concentration generally used. Remember these points when worming sheep with phenothiazine or phenothiazine and arsenate of lead:

(1) Unless purchased as the suspension be sure to mix according to the manufacturer's directions.

(2) Keep the drench thoroughly stirred while treatments are given.

(3) Do not keep sheep from either feed or water when phenothiazine is used as a treatment. There is no need to fast them.

(4) Worm all sheep in the flock. This applies to lambs over a month old and to pregnant ewes within 4 weeks of lambing. Be sure to handle pregnant ewes carefully to prevent injury or abortion.

(5) Do not give them too much. Lambs under 50 pounds should get one ounce of the drench—sheep over that weight, 2 ounces. For extremely large sheep 3 ounces of the solution are used.

(6) The easiest method of administering the drench is with a 2-ounce metal dosing syringe that has the 6 inch dose pipe. Stand astride the sheep, insert the dose pipe into the mouth, gently pushing it clear up to the bottom of the syringe, then firmly clamp the jaws and nose shut with one hand and discharge the syringe as fast as possible. When done carefully there is no injury and no loss of medicine. The entire dosing operation requires little time.

(7) Do not excite the sheep when worming. Confine them to a narrow chute or a small pen. This saves labor, time, and patience. Mark each sheep on the back with marking crayon to prevent double dosing.

(8) A considerable amount of the staining of wool due to the phenothiazine can be eliminated, if the sheep are not closely confined for a day or two after they are treated.

(9) Keep sheep off a clean pasture for at least 24 hours after worming to reduce infestation from droppings.

All Season Worm Control

(1) Before turning the ewes and lambs to pasture in the spring, worm them with phenothiazine and the arsenate of lead drench. Be sure to treat any lambs over 30 days of age, if they have had access to old lots.

(2) At weaning time (usually 120-150 days of age) dose the lambs with phenothiazine and arsenate of lead. Worm the ewes too; but you can lower the cost of treat-

ing them by using the combination drench (copper sulfate plus nicotine sulfate) or cunic mixture instead of the phenothiazine.

(3) Worm the entire flock at the start of the breeding season (usually September to November). Treat any lambs that are to be kept for flock replacements or to be marketed later. Use the phenothiazine drench.

(4) At the end of the grazing season or in early December worm the entire flock with phenothiazine and arsenate of lead.

(5) Throughout the entire pasture season keep a phenothiazine and salt mixture before the sheep at all times. Commercially prepared mixes may be used or you may make up your own by adding 1 pound of phenothiazine to 10 or 12 pounds of salt. When a higher proportion of phenothiazine is used, sheep do not always consume as much salt as they need. Use a covered box that cannot be upset easily and one that will protect the salt and phenothiazine from the sun and rain.

(6) During the winter, feed the ewes and young breeding stock liberally. Strong, well-fed sheep can harbor fairly large numbers of internal parasites with little apparent damage to themselves.

Combination Drench

This treatment, while less effective than the phenothiazine or phenothiazine-arsenate of lead drench, is frequently used. It is particularly valuable for the control of stomach worms and the common tapeworm. It is inexpensive and reasonably safe to use if the following precautions are taken:

(1) Dissolve 1 ounce of copper sulfate (bluestone) and 1 ounce of 40% nicotine sulfate in 3 quarts of soft water.

(2) Use a china, glass, or earthenware container for this drench because it has a corrosive action on metals.

(3) Keep thoroughly stirred while drenching by using a wooden paddle for stirring.

(4) Give to sheep only after they have been kept off feed and water for from 12 to 18 hours before worming.

(5) Fast sheep 6 to 8 hours after treatment.

(6) Keep the sheep in a standing position and discharge the contents of the syringe slowly so that more of it will bypass the rumen or paunch and go directly to the fourth compartment of the stomach. The more concentrated the drench when it reaches the true stomach where the stomach worms are located, the more effective it will be.

(7) Measure doses accurately. Test syringes by discharging them into a bottle graduated in ounces.

(8) In case of an overdose of drench, immediately give the sheep $\frac{1}{2}$ to 1 pint of milk or $\frac{1}{2}$ pint of raw linseed oil.

Dosages

Lambs under 40 pounds.....	$\frac{1}{2}$ ounce
Lambs 40-60 pounds.....	1 ounce
Lambs 60-80 pounds.....	1 $\frac{1}{2}$ ounces
Sheep or lambs 80-100 pounds.....	2 ounces
Sheep 100-120 pounds.....	3 ounces
Large sheep	4 ounces

TAPEWORMS

Although phenothiazine is highly efficient in controlling many intestinal parasites, it does not successfully combat tapeworms. Scouring, that sometimes persists after phenothiazine dosing, may be caused by the flat-bodied common tapeworm. Diagnosis is difficult unless segments of the worm are observed in the feces or the animal is posted. Tapeworms are greedy feeders, growing nearly a yard per month, and under some conditions may cause considerable damage to the host.

Lead arsenate is an effective treatment. It is administered without fasting in a one-gram dose to sheep or lambs weighing 60 pounds or more. The usual method is to give it in a hard gelatin capsule.

Another method: Mix 64 grams of the lead arsenate with a small amount of water. Thoroughly mix this with 1 gallon of phenothiazine drench. Before doing this, be absolutely sure that the phenothiazine drench does not already contain lead arsenate.

There are several other treatments for tapeworms but when properly used, the lead arsenate is reasonably safe and very effective.

HOOKWORMS

These worms are about $\frac{3}{4}$ to 1 inch in length, dark gray or brown in color, and are found in the small intestine. Their roving, blood-sucking feeding habit makes them one of the most destructive parasites, though very large numbers are seldom found in a sheep. Bleeding persists from the point of attachment for some time after they move. The poisons they release, together with the many hemorrhages they promote, cause the sheep to run down rapidly in condition.

The symptoms and the life cycle are similar to nodular worm and stomach worm, except that the young larvae may enter the blood stream through the skin or any part of the body coming in contact with contaminated ground.

STOMACH WORMS

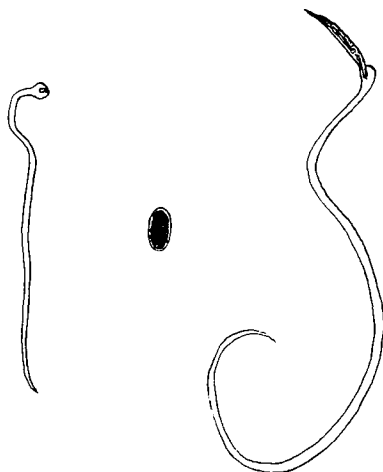
The common stomach worm is the most familiar internal parasite of sheep. This worm is very small, reddish brown in color, from 1 to 1 $\frac{1}{4}$ inches in length, with a diameter similar to a thread. The female is larger than the male and may be distinguished by the spiral red and white stripes which run around her body.

Another species of stomach worm, the *Ostertagia*, is sometimes found encysted in the mucous lining of the stomach.

Stomach worms inhabit the fourth or true digestive compartment of the stomach. Here they attach themselves to the mucous lining and suck blood for nourishment. At the same time damaging poisons are discharged into the blood stream. Several thousand worms may infect a single sheep.

The female lays her eggs in the fourth compartment of the stomach. These pass to the ground in the droppings. Six thousand eggs have been recovered from a single pellet of manure. The eggs hatch in a few days under favorable conditions. If the larva is not promptly taken up by sheep, it enters a resting stage. Meanwhile it is protected from drying and extreme temperatures by a sheath-like covering. The life cycle is completed in from 18 to 21 days.

Symptoms are similar to those of other internal parasites. The programs of phenothiazine drenches plus the phenothiazine and salt mixture along with recommended pasture changes has given satisfactory control for many flockowners.



Stomach worms in sheep.

NODULAR DISEASE

Nodular worm disease or "knotty gut" is very prevalent. It is caused by the larval stage of the nodular worm. This stage of the life cycle is passed in the wall of the small intestine although other organs of the body may also be infected. The young larvae burrow into the tissues where they become imbedded. Later they emerge and cause the hard cysts or nodules to form. These contain pus which later changes to a semihard, cheesy-like material.

Lambs or sheep showing heavy nodular worm infection may have the liver and intestines condemned when the animals are slaughtered. Carcasses from such badly infected animals may also be rejected for the Kosher trade.

The adult nodular worms are from $\frac{1}{2}$ to $\frac{3}{4}$ inch long, about as large in diameter as a common pin and whitish in color. The larvae are picked up from the pasture by grazing sheep. Phenothiazine is the most effective treatment. Avoiding short, permanent pastures in the summer is also an effective aid in control of nodular worms.

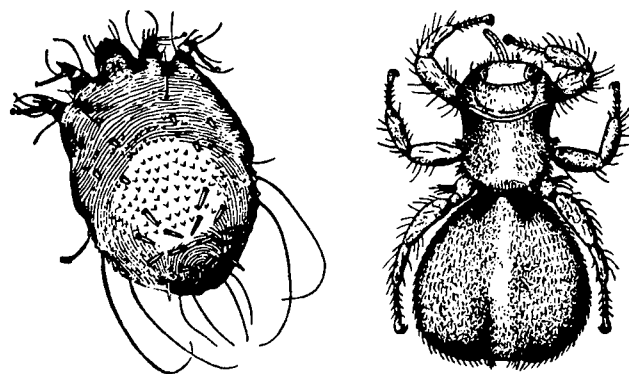
external parasites

The thin skin and warm fleece make the sheep a good host for a number of external parasites. Generally these parasites can be easily spotted and proper control measures taken.

TICKS

The common sheep tick or ked is probably the most common external parasite of sheep flocks, although lice can be a serious problem. The sheep tick is an external parasite $\frac{3}{16}$ -inch long and copper brown in color. In sucking its nourishment from the skin of the sheep it causes an irritation that sometimes causes the sheep to pull its wool. Infested animals can be treated in small groups (up to 25) using 0.5 percent ronnel or 0.06 percent diazinon in 6 gallons of water per 25 sheep. Do not use diazinon if there are lambs less than 2 weeks old and otherwise observe label precautions.

Scab—There are four species of mites which affect sheep. These are the psoroptic or scab mite, the chorioptic or barn itch mite, the sarcoptic or face scab mite and the psorergates mite which lives between the layers of skin. The one that usually causes the greatest damage to flocks is the psoroptic or the so-called common sheep scab mite. This parasite is only about $\frac{1}{50}$ of an inch in length and burrows into the skin. The sheep rubs itself and pulls at the wool to relieve the irritation and itching. Hard scabs form in the affected areas and the sheep loses condition rapidly. As sheep scab is such a highly infectious disease, prompt and effective treatment must be carried out.



A scab mite . . . and a sheep tick

Cases of sheep scab should be reported immediately to the county agricultural agent or to the State Veterinarian's office. Trained veterinarians will inspect suspected animals and, if necessary, will take complete charge of dipping the sheep. The flock will be quarantined so that no sheep may be moved from the premises

until a complete cure has been established. Shipping infected stock can mean heavy expense to the grower for disinfecting stockyards, trucks, and cars.

THE BLOW FLY

In warm, wet weather, the blow fly is apt to deposit its eggs in any befouled place or wound on a sheep. Ewes especially should be kept free of tags and dung locks. In Merino sheep, the maggots often work at the base of the ram's horns, or they may get under the folds or wrinkles. An afflicted sheep will display much uneasiness and a desire to reach the affected part with the mouth or by rubbing.

If sheep are badly infected, shear the wool from around the injured parts. Sheep dip diluted with 20 parts of water or straight kerosene applied directly to the infested area will remove the maggots. Pine tar may then be applied as it is a healing agent and also acts as a repellent. For most effective control of "wool maggots" (blow flies and screw worms) spray thoroughly, or dip, with 0.03 percent diazinon or $\frac{1}{8}$ percent Co-Ral. If control is not achieved, animals should be re-treated. Co-Ral should not be used on animals under 3 months of age and should not be used in conjunction with other medication. In some areas a Korlan smear is available and is excellent for treating navals, etc. of late lambs. In all cases observe label instructions.

disease and common ailments

One of the important limiting factors in sheep production is the matter of disease control. When disease occurs, find out as quickly as possible what the trouble is. Consult your local veterinarian. He is the best qualified man in your area to make a diagnosis. If the local veterinarian needs specialized laboratory services, he will usually refer the case to the Veterinary Department, South Dakota State College, Brookings.

Sheep disease problems are prevented more easily and successfully than they are cured. Sanitation plays an important role in prevention. Shelters, sheds, and other housing places are not sanitary when they are not dry and clean. In cold weather wet sheep may develop pneumonia and severe cases of nasal discharge. Dampness in any shelter, or closed barns with poor ventilation, will cause trouble. Manure and wet filth in sheds and yards will lead to foot ailments, dirty fleeces that sell for less, scours, navel ills, sore eyes and respiratory troubles.

PREGNANCY DISEASE

Known as ketosis or lambing paralysis, many ewes die of this disease, within two to three weeks before they are to lamb. It develops later in pregnancy, and often occurs in ewes carrying twins or triplets.

Causes are not yet clearly understood. Inadequate nutrition is generally suspected. The condition can be prevented by correct feeding and management.

Signs. The affected ewe lags behind the flock, goes off feed, appears nervous. The ears may twitch for a short period; the animal may seem frightened. Later, dullness and a staggering gait may develop; the ewe falls and finds it difficult to get up. She may live from one to 10 days after the appearance of the symptoms. Blindness, grinding of teeth and coma indicate that death is near.

Prevention and Control. No treatment producing good results has yet been found. But the disease can be effectively prevented by good feeding and management. (1) Make sure that ewes are in good condition at breeding time and during pregnancy. (2) Feed sufficiently; there should be a steady gain of 30 pounds from breeding to lambing. Pregnant ewes should be well fed but not fat. Feed regularly; don't make sudden or unusual changes in feeding. Never reduce feed during late pregnancy. Healthy ewes are more likely to eat enough to prevent pregnancy disease. Healthy lambs cannot be expected unless ewes are well-fed and healthy. (3) See that ewes get exercise, clean water, good dry housing and freedom from parasites. (4) Refer to feeding ewe last 6 weeks of pregnancy, page 7.

LAMB DYSENTERY (SCOURS)

There are two kinds of lamb scours, depending on the lamb's age and the prevalence and nature of the disease.

Scours appearing during the first four days after birth nearly always cause death. Scours of this type are a distinct disease caused by a bacterium known as *Clostridium perfringens*. In older lambs however, diarrhea may be caused by different bacteria, parasites or unsanitary practices. The scours are not generally so severe in younger lambs.

Signs. A profuse diarrhea tinged with blood; depression and weakness; failure to nurse; signs of pain. If the disease is true lamb dysentery (caused by *Clostridium perfringens*) the animal will likely die in a few days.

Prevention and Control. Scours can be prevented by the use of modern drugs and by holding strictly to the best management practices.

The highly fatal lamb dysentery (caused by *Clostridium perfringens*) can be prevented by vaccinating the ewe before lambing; or by giving the lamb antitoxin immediately after birth. The ewe's udder should be swabbed with chlorine water before the lamb nurses to prevent contact with these bacteria. There is no sure-fire effective treatment for this type of dysentery although various drugs such as sulfonamides or astringents may save a few.

To prevent the less severe type of scours occurring in older lambs, extremely careful management and thorough parasite control are needed. For treatment, once scours like this have set in, sulfonamides, antibiotics or intestinal astringents are quite effective.

TETANUS (LOCK JAW)

Tetanus is a violent disease caused by an infectious agent widely distributed in soil or manure. Any wound becoming contaminated may bring on tetanus. Puncture wounds are especially dangerous. In sheep, tetanus commonly follows routine operations such as docking, castrating, ear tagging, or shearing. It can also develop from infections of the umbilical cord.

Signs. First signs of tetanus in sheep are stiffness of limbs, difficulty in getting up, and walking with a straddling gait. Later, the tail and jaw may become rigid; the animal may not be able to open its mouth to eat. Sudden noises may cause spasmodic jerking of muscles. Death usually follows in three days to a week.

Prevention and Control. Because the germ is always likely to be present, prevention begins with extreme cleanliness in all surgical operations. Sterilize all instruments used in docking, castrating, ear-tagging or shearing before use by placing them in boiling water for 25 minutes. After the operation, turn the animal out on clean grass, or hold in well-bedded pens.

Tetanus can also develop after castration or docking with rubber bands. In fact, it has been observed to occur more frequently when this method is used in place of the surgical method.

On farms where tetanus contamination is heavy, it may be necessary to vaccinate before operations are done. Treatment for tetanus is seldom satisfactory. Hence, prevention is the only sensible approach to tetanus control.

WHITE MUSCLE DISEASE (STIFF LAMBS)

This is a muscular disease of lambs associated with a deficiency, (or improper body use) of Vitamin E.

This disease usually occurs in two to eight week old lambs, either on pasture or on dry-lot feed.

Signs. Look for "tucked up" flanks and arched back. The lamb may be slow to move and hesitates to jump over small things. Gradually the hind legs stiffen, the lamb goes down and cannot get up without help. In the end, all four limbs are paralyzed and the animal dies.

Prevention and Control. To prevent this disease, ewes must be healthy. Since the most abundant source of Vitamin E is good legume hay, the ewes should receive ample quantities for the first 2 months of lactation. Good hay should also be available in the lamb's creep. Exercise seems to aggravate this condition.

Treatment using the pure form of Vitamin E (alpha tocopherol) is effective. Five hundred milligrams of alpha-tocopherol should be administered by mouth fol-

lowed by 300 milligrams every other day to each affected lamb. Injecting 200 milligrams of injectible Vitamin E into the muscle usually gives faster response than feeding. Reduce the injection by one-half each day until improvement occurs. Treatment must be given immediately after lamb shows first symptoms. It is also desirable to treat affected animals for pneumonia, often a secondary complication.

PNEUMONIA

This is one of the most common sheep diseases. Chilling, over-exposure and fatigue play a big part in bringing on pneumonia. Exposure connected with dipping and shearing may be enough to allow this infection to develop. Healthy sheep may carry pneumonia bacteria or viruses of various kinds in their lungs or other parts of the respiratory tract. However, the disease develops only after the animal becomes "run down" from poor feeding, parasites or prolonged exposure.

Signs. These include fever, labored breathing and refusal to eat. Later the animal becomes depressed and may have a discharge from eyes and nose. Sometimes older sheep die without showing any symptoms at all.

Prevention and Control. Because exposure and chilling are so important in causing pneumonia, do everything possible to prevent these conditions. Provide warm, sanitary lambing pens. Do not dip or shear in cold, raw weather unless you have warm housing. Grow big, healthy lambs with more resistance to pneumonia. Sound parasite control, together with proper feeding and management, will also do much toward pneumonia prevention.

Watch your flock constantly for signs of pneumonia; call your veterinarian early if symptoms in one or a few sheep look suspicious. Early treatment is quite effective. Sulfonamides and antibiotics like penicillin, aureomycin, or streptomycin give best results in most cases.

ENTEROTOXEMIA (OVEREATING DISEASE)

The bacterium causing this disease is usually present in the intestines of normal sheep. Heavy feeding of highly nutritive feedstuffs or luxuriant pasture causes the bacterium to become active and produce a powerful poison which is absorbed in the bloodstream and often kills.

Losses are greatest among feeder lambs because of the practice of feeding heavily to get rapid gains.

Signs. Lambs or older sheep die suddenly. Usually the animal is found dead in the field or feedlot without having shown any signs of illness. (It is often the biggest lamb with best appetite.) When there are signs, the disease may be expected to develop rapidly. The animal becomes weaker and weaker—with nervous disturbances such as circling, butting or throwing the

head backwards. Finally, the animal collapses and may go into convulsions before dying.

Prevention and Control. Prevention begins with proper feeding. It is never advisable to make a sudden change from poor pasture to rich, luxuriant pasture. Likewise in dry lot, never increase the amount of concentrate or good quality legume hay suddenly. Furthermore, if concentrate feeding is pushed to the limit, even though the daily increase is gradual, the lambs are likely to die from enterotoxemia.

Along with proper feeding, special drugs (biologies) may materially help to control the disease. Two substances may be used to make lambs immune to enterotoxemia—one, bacterin and the other, an antitoxin. However, for successful results, both products must be thoroughly understood and used according to the advice of a veterinarian. Lambs satisfactorily immunized with the bacteria may be fed safely in grain fields, rich pastures and in dry lots for six months.

FOOT ROT

This is a serious condition associated with rot of the tissues just beneath the horn of the sheep's hoof. Severe lameness results; if not adequately treated, deformity of the feet is often followed by wasting away and death.

Signs. At first, only a few sheep will be lame. A reddening may show at the bulb of the heel and between the toes. Later the disease extends under the sole and the horn of the hoof becomes loosened. One or more of the animal's feet may be affected.

Prevention and Control. To keep foot rot out of your flock, use the utmost care when selecting new animals. The history of the flock from which a ram is to be selected must be free from even the slightest suspicion that foot rot has been, or is, present.

Control of foot rot is difficult, laborious and time-consuming. The bacterium may live for several weeks in low, wet soil and become a constant source of re-infection, even though the affected flock is replaced with healthy animals.

Treatment means paring each affected hoof to trim it down to the diseased tissues and immersing the foot in 30% copper sulfate solution (or 5% formalin) for two minutes. This procedure will probably have to be repeated several times before the affected foot is cured. Recent work has shown that chloromycetin applied to the infected area is helpful. Some sheep are constant carriers, and should be disposed of.

Warning. Care must be observed in the disposal of the copper sulfate solution. If dumped or allowed to drain into the pasture, copper poisoning may result when the animals eat the grass or legumes growing in these areas.

LISTERIOSIS (CIRCLING DISEASE)

A highly fatal disease of both lambs and older sheep is produced by the bacterium *Listeria monocytogenes*,

which invades the brain causing nervous symptoms. The disease is most common in spring and summer but may occur whenever new sheep are brought in. The danger here is that the new sheep may be healthy carriers of the infection; animals in the home flock are thus exposed and may become infected. Or the situation may be reversed; the home flock may contain carriers that threaten the newly purchased animals.

Signs. Affected sheep incline to sluggishness and lag behind others when flock is moved. They may stand off in a corner while rest of flock feeds; or they may feed restlessly, only partially chewing. A nasal discharge and "circling" usually follows. In "circling" the head is held to one side and the animal moves in a circle, always in the same direction. Not all animals "circle" but most do. When not circling, they may stand next to fences, building or feed-boxes, holding their heads against these objects. Finally, the animal goes down, and is unable to rise. Death usually occurs within 48 to 72 hours, although some animals live as long as a week.

Prevention and Control. Once "circling" disease enters a flock, nothing can be done, either by prevention or treatment through vaccines or drugs. The closed flock, i.e., raising all replacements, is one way of minimizing the threat of this disease.

ENTOPIAN (TURNING OF EYELIDS)

One or both eyelids may be "turned in." Most frequently, it is the lower lid. The eyelashes irritate the eye, resulting in blindness if not corrected or treated.

Signs. The condition occurs in new-born lambs, in one or both eyes. If not promptly treated, the eyes become infected and a discharge will be noticed. Cloudiness of the eye and eventual blindness or death can follow.

Prevention and Control. Examine the eyelids of each new-born lamb. If "turned in" corrective treatment will be necessary. Unless the condition is too serious, daily rubbing of the eyelids until they "turn out," followed by application of eye ointment, will suffice.

If this method does not work, minor surgery will be necessary. This consists of picking up a fold of skin sufficient to draw the edge of the eyelid to a normal position and placing one or two sutures through the fold.

Another method uses metal wound clips to hold the fold of skin in place. In a few days, the clips drop off; however, sufficient irritation will have developed to hold the edge of the lid in normal position.

CONTAGIOUS ECTHEMA (SORE MOUTH)

This is a highly contagious and infectious virus disease of sheep and goats. Animals under one year of age are most commonly affected.

Signs. Blisters appear on lips, gums, tongue, around nostrils and eyes. Blisters fill with pus, finally rupture, leaving raw, granulating sores which bleed readily. Heavy grayish-brown scabs then form. They remain for three to four weeks, drop off, leaving no scars. Animals nurse or graze with difficulty and lose weight. Similar lesions may be transferred to ewe's udder by infected, nursing lamb. Mastitis often follows.

Prevention and Control. Treat lesions with local anti-septic such as iodine after removing scabs. Preventive vaccination is quite effective. Consult veterinarian about medication and vaccination. Thorough clean-up and disinfection are important as scabs are infected for long periods.

MASTITIS (BLUE BAG)

This is a disease of the udder caused by bacterial infection. Contributing causes are bruises, shear cuts, and rough handling.

Signs. In the acute stage there is a high fever, loss of appetite, stiffness, swollen bluish udder, and sometimes death. Later, in chronic stage, abscess formation in udder is common. Abscesses rupture and heavy scar tissue forms, destroying all milk secreting tissue.

Prevention and Control. Maintain strict sanitation in sheds, corrals and bed grounds. When additional sheep are purchased, examine udders closely to avoid "buying the disease." Avoid clipping udder while shearing. Remove high door sills or other obstructions which might bruise ewe's udder. Remove infected ewes from flock and disinfect the area. Treatment must be immediate. Apply hot packs to infected udder, lance abscesses. Sulfa drugs and antibiotics are of value in treatment.

range sheep production

*This section taken from "Sheep Production in South Dakota," Experiment Station Circular 82, written by Robert Jordan, formerly of the Animal Husbandry staff at SDSC. (The publication is out of print.)

This part of the circular is intended primarily for those interested in going into the range sheep production. General information of interest to both farm and range operators has been provided in the first part of the circular. It will be referred to specifically when modifications for range conditions are necessary.

Practices may differ considerably within an area as large and varied as the range area of South Dakota. Basic requirements for successful sheep production remain the same, but such factors as the size and location of the ranch, the number of type of ewes maintained, whether rams are produced for sale, and whether both

cattle and sheep are raised on the same ranch all require modification in management practices.

During the past years, the sheep industry has shown marked changes. Modern transportation and road systems make it easier for ranchers to get their products to market. Competition from abroad, and changes in our tariff program have both contributed to the change in emphasis from wool to the production of fat lambs and feeder lambs during the past 30 years. At the present time in South Dakota, the sale of fat and feeder lambs constitutes from 60 to 80 percent of the gross income from range sheep, whereas 25 to 50 years ago wool was the major product on many ranches. Consequently there has come a change in the type of sheep and management. This circular will discuss briefly practices that may be of some help to men who are interested in entering the sheep business.

TYPE OF EWE

There is no ewe that will meet the requirements of all the various range conditions. However, many experienced sheepmen doubt that there ever will be a breed that will surpass the Rambouillet for general adaptability.

Remember, the type or breed of ewe that will be most desirable in the Black Hills area may be quite different from the type that thrives best under the drier conditions that exist in the northwestern part of this state.

Large ewes usually wean more pounds of lamb than lighter ewes. This is due to a higher percentage of twins, and the fact that the individual lambs weigh more. However, if the range is of low carrying capacity, there is a limit to the size of the ewe that the range will carry. Large ewes must cover a larger area in order to find feed to maintain themselves. Ewes weighing from 115 to 135 pounds normally will find sufficient feed for themselves and their lambs on range with a low carrying capacity. However, 115 pounds should be the lower limit for range ewes. This usually will mean Rambouillet sheep, and the production of wool and feeder lambs will predominate. Ranges that produce more abundant feed will support larger sheep and it may be possible to wean a high percentage of fat lambs each year. In this case the white-face, cross-bred types of ewes, weighing 150 to 175 pounds, and producing three-eighths or one-half blood fleeces, will be most satisfactory. It may be desirable to cross such ewes with mutton breed rams to produce even a higher percentage of fat lambs and more weight per individual lamb. An additional advantage of such a cross is found in the improvement in type and conformation that can be obtained.

For the most part, range sheep operators in western South Dakota raise their own replacements, but those that follow the practice of crossing with mutton breed rams either have to run separate bands for producing replacement stock or purchase their replacement stock.

This is because crossbreeds carrying Down-breed blood (Hampshire, Suffolk and Shropshire) are not suitable as breeding females under range conditions. All lambs must be sold, but the producer usually can sell these cross-bred ewe lambs as fat lambs for considerably more than it costs to buy white-faced replacement ewe lambs of fine-wool breeding. Under this system, replacement ewes are raised by producers operating on range that will produce fat lambs in the fall. One disadvantage: there is no opportunity for the producer, who sells all his lambs, to improve his flock through selection and the continuous use of good rams. This is compensated by the benefits of cross-breeding which increases the general over-all thrift, vigor, and weight of his lambs. This practice is followed with a great deal of success in some parts of the inter-mountain region and particularly the park areas of Colorado.

The Rambouillet still constitutes the basis for sound range sheep. In recent years new breeds such as Columbia, Panama, and Targhee, which have been developed from crosses of long-wool breeds on Rambouillets, have gained favor in many areas. These newer breeds are larger than the Rambouillets and the limitations already discussed will apply. The comparative advantages of the Rambouillet and these other breeds, often referred to as cross-bred types, may be summarized as follows:

Advantages of the white-face cross-bred types:

1. They are more prolific.
2. They are better mothers.
3. Where feed conditions are favorable, they will produce more milk.
4. They produce longer stapled, lighter shrinking wool and usually more wool.
5. They produce more pounds of lamb and lambs of more desirable conformation.

Advantages of the Rambouillet:

1. They have a longer productive life.
2. They are hardier, better rustlers, and have lower maintenance requirements.
3. They are better travelers and have harder hoofs.
4. They do not lose as much wool in sage brush areas.

CULLING THE FLOCK

In culling the flock the lambs should be separated from the ewes. After the ewes and lambs have been separated, the wether and ewe lambs should be separated. It is a simple matter to gate-cut the wethers from the ewe lambs if one ear of each wether lamb has been cropped.

In the fall of each year, selection should be made for future breeding stock within the band. Since this usually means that from five hundred to two or three thousand head of ewes and lambs must be examined,

it is absolutely essential that a good set of corrals and cutting chutes are available. These should be arranged so that the band can be cut two or three ways. For the most part, sheep move better when they are moved up a slight incline, so wherever it is possible, the corrals should be arranged so that the sheep are run through the chute in that manner. Some operators prefer to have the cutting chute just wide enough for the ewes to pass through so there is no chance for them to turn around. Others prefer the chute wide enough for a man to work in the chute alongside of the ewes.

The University of Wyoming has developed a system of culling ewes that makes it possible for the sheep operator to cull large numbers in a short period of time and still do a good job of culling. This system is called the "touch system" and is based on fleece length and density and general over-all size and thriftiness of the ewe. (Ewes that have fuzziness or breechiness about the flanks and wool-blind ewes are culled as well.) The operator handles each sheep in the chute by poking his fingers into the wool in the hip region and estimating approximately the density and length of the staple of the fleece. At the same time he gets a visual estimate of the size and conformation of the ewe and marks for culling those that do not fulfill his requirements. While this system may not be as accurate as individual handling of the sheep, it does make it possible for the sheep operator to cut out about 20 percent of his low-shearing ewes. Mouthing to determine the age of the sheep and the condition of the teeth, and handling for udder soundness can be done at the same time.

BREEDING SEASON

In South Dakota the breeding season on the range commences about the middle of November for those who want April lambs, and about December first for those who want May lambs. The type of range and management practices followed will determine largely the breed of ram used.

From weaning time through the breeding season the ewes should be grazed on good range saved for this purpose. This will enable the ewes to put on some weight and be better able to stand the adverse conditions that often exist during the winter months. During this same period the breeding rams should receive supplemental feed to get them into good breeding condition. This is often a problem during the breeding season under range conditions where the ewes are not corralled each night. If such is the case, the rams should be divided into two groups and the two groups should be used alternately for about a week or ten days at a time. Where ewes are corralled at night, the rams can be cut out and fed separately. If either of these practices is followed, a higher percentage of the ewes will be bred and the ewes will lamb during a shorter period of time the following spring. Three rams per hundred ewes is the recommended number of rams to be used under range conditions.

WINTER FEED REQUIREMENTS

The feeding and management of ewes under range conditions is quite different from the practices followed under farm conditions, since the number maintained in a band is many times that maintained under farm conditions. Transportation is difficult and available roughage often limited; consequently, the amount of grain or concentrate fed in proportion to hay is quite different from that fed to farm flocks. Wintering range ewes on the available grass and the ewes own body reserve is unprofitable. Make the best use of grasses on the winter range to cut down operating costs and obtain maximum profits.

Larger, stronger, and thriftier lambs usually are associated with good winter rations. When ewes are given adequate feed during gestation period to keep them in good condition, they lamb with a better milk supply and have more mothering instinct than those that are thin and have an inadequate milk supply.

The amount of feed required to maintain the ewe band varies considerably depending upon the following conditions: when the ewes are to lamb, the quality of roughage, the size of the ewes, the amount of available winter range and most important, the amount of snow cover.

The last four to six weeks of the gestation period is the most critical since the unborn lamb is making the greatest growth and development at that time. As the winter advances the amount of nutrients, particularly protein, in the grass declines, consequently the greatest amount of protein supplement is required at that time.

Pregnant ewes should receive the equivalent of 3 to 4 pounds of good quality roughage per head daily. This may be furnished largely by winter grazing, or combinations of winter grazing, hay or concentrates. Regardless of the form in which the ewes receive their feed, it should be adequate to keep them from becoming thin and weak. Protein is usually the limiting factor in the winter ration, and should be given the greatest consideration when purchasing supplemental feeds. Many of the difficulties of feeding the ewe band during the winter can be alleviated if arrangements are made during the summer and fall to have hay and other feed hauled to the area where the ewes will be wintered.

A brief discussion of some typical rations is given in order to further clarify this subject. If good winter grazing is available during the entire winter period, .15 to .2 pound of 40 percent concentrate per ewe daily usually is fed from December first until about six weeks before lambing.

During the last six weeks of the pregnancy period, the concentrate should be increased to about .5 to 1 pound per ewe daily. If the winter grazing is poor, .3 to .5 pound of corn or a pelleted feed with a high percentage of carbohydrates should be added to the amounts of feed already mentioned for the early portion of the gestation period. In case no winter grazing is possible, 3 pounds of good quality wheatgrass or

alfalfa hay should be provided per ewe daily during the early part of the gestation period. Add about .2 pound 40 percent concentrate if the hay is wheatgrass or some other non-legume hay. Feed an additional quarter to a half pound of concentrate during the last six weeks of the gestation period.

If hay is not available, or if it is impractical to feed, as is often the case during the severe weather, three-fourths to 1 pound of concentrate should be provided per ewe daily. One pound of 40 percent concentrate is equivalent to 3 to 4 pounds of alfalfa. Bear in mind, however, that sheep need bulk in their ration and cannot live indefinitely on concentrates alone, though straight concentrate feeding for a week or two will cause no ill effects.

If preparations are made during good weather to have hay near the sheep, the feeding of concentrates alone should not have to be continued over too long a period.

It should not be implied that ewes must be kept in a high condition. Thrifty, strong ewes in moderate condition will do as well as ewes that are carrying an excess of fat. Iodized salt and water are very essential, and in some areas the feeding of a mineral supplement in addition to the salt may be advantageous.

LAMBING TIME

The range operator should be just as concerned about the percentage of lambs born and weaned as the farm flock owner. In order to wean a higher percentage of lambs, special attention must be given to the raising of both twins and singles.

Two systems of lambing usually are practiced under range conditions: shed lambing and range or open lambing. Under both systems the drop band is grazed during the day. Under the shed lambing system, which is used mainly when lambing occurs in late March or early April, the ewe band is corralled at night and the ewes lambing at that time usually are put in individual pens. During the day the ewes that lamb are picked up as soon as they lamb and placed in a wagon or truck with individual pens in it. The ewes and lambs are hauled back to the shed and put in pens for about 24 hours. Then small bands of ewes with young lambs are turned out to graze if the weather is moderate. Proper sanitation methods must be followed under shed lambing conditions to prevent outbreaks of disease.

As the lambs get older, two small bands are thrown together to make a larger one. This is repeated over and over during a three or four week period until bands of four or five hundred ewes are accumulated. These ewes are kept separate from the drop bands. Supplemental feeding is provided. The best range is used for the ewes and their young lambs.

Range operators who plan to lamb their ewes during the latter part of April or in May, usually follow the open range system of lambing. Basically this system does not differ greatly from shed lambing, but

temporary corrals are used instead of a permanent corral for holding the drop band and no protection is provided, other than the protection that might be available in canyons and bluffs. The ewes lambing during the night are put in small pens by the night man. The rest of the band is turned out to graze during the day.

Ewes that lamb during the night usually are turned into small groups and allowed to graze for a day or two before being combined into larger groups for grazing. During the day, the ewes that lamb may or may not be brought back to traps depending on the weather, and also upon whether or not any other artificial shelter such as tepees are provided.

With the uncertainty of the weather during the latter part of April or early May, lamb jackets or blankets are kept available by many of the ranch operators in order to prevent heavy death loss due to inclement weather. A lamb jacket is nothing more than a blanket-lined canvas that is slipped over the lamb. It has elastic leg bands and an elastic band across the breast.

Small canvas tents, called tepees, which are 3' x 3' x 3½', are a type of shelter often used. During severe weather a ewe and her lambs are put under these tepees for about a 24-hour period. They are then released into small groups and kept separate from the drop band.

Both the tepees and the lamb blankets are excellent insurance against the heavy death losses that can occur from chilling during inclement weather.

The practice of opening the teat to aid the lamb in getting milk, the assistance that is sometimes needed by the ewe during lambing, the care of sick lambs with sore eyes or of constipated lambs, have all been discussed.

Docking and castrating done under range conditions does not differ greatly from that done under farm flock conditions.

In South Dakota the range operator, who lambs in April and early May, will find that creep feeding is not advantageous, unless the range is of such poor quality that extra feed is necessary in order to keep the lambs from becoming stunted in growth.

SHEARING

Practically all of the commercial shearing in western South Dakota is done by large shearing crews who travel through the western states. The range operator, of course, must provide facilities for holding the ewe band, as well as cutting chutes and holding pens needed during shearing. Shearing plans differ as much as any other phase of the sheep operation and the new operator should visit some of the successful sheepmen, and notice their sheep shearing set-up. In that way, one can benefit from the other man's experience.

RANGE MANAGEMENT

Proper range management implies the use of the range in such a manner as to provide maximum returns without damage to the plant life on the range.

Range management is dependent mainly on two factors, proper stocking rate and proper distribution of grazing. A thorough knowledge of grass and other range plants found on a particular range, topography, climatic conditions, and length of the grazing season are all necessary in determining correct stocking rates. The distribution of grazing is often a problem. A portion of the range should be allowed to rest at some season of the year to give it a chance to recover and store plant food for the coming season. Further, a portion of the range should be allowed to reseed itself at least once every four or five years. This prevents areas from thinning out, and encourages growth of several varieties of grass. It encourages even grazing distribution and more palatable grasses.

Provide well distributed watering and salting places. Then have the herder move the sheep to a different part of the range every week or two. This will help distribute the grazing as well as control internal parasites. Whether the range is fenced or the sheep are herded, the above mentioned factors, accompanied by proper stocking, will provide greater range returns.

Lengthen the grazing season to cut operating costs. This entails the planting of varieties of grass that will start growing earlier in the spring than many of the established species of range grasses.

One of the best grasses for early grazing in the west river country is crested wheat-grass. Crested wheat-grass greens up about three weeks to a month earlier than other range grasses. Planting crested wheatgrass is sound range management. It will make it possible to decrease the winter feeding costs and increase the carrying capacity of the range.

Most range operators follow the practice of selling their lambs during the months of October and November. An earlier sale of lambs should be made when the range is poor and the lambs have stopped gaining. The slight increase in weight made during the months of October and November may not be enough to offset the greater cost of production and the depletion of the range. In addition, many lamb feeders in the corn belt are willing to pay a premium for early lambs that can be delivered in the month of September. This makes it possible to turn the lambs on rape pasture and make cheap gains or to condition them for lambing-off corn or going into the feedlot for fattening.

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