Animal Care Series:

SHEEP

CARE PRACTICES

Sheep Workgroup
University of California ◆ Cooperative Extension

FOREWARD

Sheep Care Practices is one of a series of University of California publications addressing the issue of animal care relating to food animal production in California. This publication is the result of a joint effort between the University of California Cooperative Extension, sheep industry representatives, and members of the sheep workgroup.

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INTRODUCTION

The well-being of sheep is an important component of a sheep ranching operation. Proper management yields benefits to both the sheep and the sheep producer.

The California sheep industry is diverse. Sheep production extends from the southern deserts to the northern coastal ranges. Management practices that incorporate good animal care under these diverse conditions can only enhance sheep production. Sheep breeds are chosen to best meet these conditions, and their genetic diversity enables the sheep to be adaptable. Sheep can utilize rangelands that other domestic animals cannot. This utilization helps maintain the rangelands and reduce the potential for fire hazards.

The number of family-owned farm flocks is on the increase. These farm flocks allow families the opportunity to experience the rewards of raising sheep while providing additional income to the family. Farm flocks and rangeland operations comprise the majority of the sheep industry in California and the rest of the United States.

Science has not yet provided all the answers we need to fully understand animal needs, but the practices presented are based on published data, scientific principles, expert opinion, and experience with the methods and practices for the safe, humane, and efficient production of sheep in California.

This publication explains why and how sheep care practices are used in the diverse sheep operations of California. lt is intended to help producers evaluate their husbandry practices with respect to the well-being of their animals and to outline ethical care practices that maintain production efficiency.

TABLE OF CONTENTS

STRESS

Minimizing of stress is an integral component of proper management. An animal is stressed if it is required to make abnormal or extreme adjustments in its physiology or behavior to cope with adverse aspects of its environment or management. Physiologically, sheep respond to stress initially with increased heart rates, and, if stress is severe enough, with elevated cortisol levels, thereby increasing feed requirements and reducing immunity. Stress may, therefore, adversely influence their well-being. Some acceptable sheep husbandry practices may cause short-term discomfort and stress as necessary management and health practices are performed. Prolonged animal stress is a concern to the conscientious producer, and if severe, may increase costs to both the producer and the consumer.

Sheep can easily be physically abused because they are relatively docile and lack physical defense mechanisms. Flock owners should handle their animals gently and provide well-designed facilities for handling or moving. Indicators of stress include:

- panting or increased respiration,
- increased susceptibility to disease,
- poor reproductive performance,
- high lamb mortality,
- restlessness, nervousness, or other abnormal behavior,
- teeth grinding,
- poor growth rate,
- poor quality fleece,
- increased flight zone.

Gathering sheep into a common area for treating health concerns, sheltering, transporting, feeding, watering, lambing, shearing, identifying, or other acceptable management practices are not considered serious stress related activities, if conducted with the precautions outlined in this booklet.

BEHAVIOR

Knowing and understanding the behavior of sheep allows managers to improve both production and animal welfare. Such knowledge is acquired through years of experience and observation. Behavior traits have also been recorded and studied by researchers. Publications are available which discuss this subject in detail. Some of the most important behavior traits are summarized below

Wide-Angle Vision. Managers should be aware that sheep have a 270-degree visual field and depend heavily on their vision. Therefore managers should use this knowledge to move their sheep effectively and efficiently.

Reaction to Noise. Sheep are more sensitive than humans to high frequency noise, and excessive noise may be stressful. Handling procedures should be conducted as quietly as possible.

Breed Differences. Individual sheep breeds react differently to handling by people and working dogs. Generally, white-faced wool breeds are more gregarious (flocking instinct) than the other breeds.

Flight Distance and Flight Zone. All sheep, regardless of breed, maintain a security zone. If this area, or "flight-zone," is encroached on by a person, predator, or dog, movement away or "flight," by the animal is likely. Size of the flight zone varies, depending on the tameness or wildness of the animal. Sheep that have been raised in a barn and in close contact with people will have smaller flight zones than sheep which seldom see people. Understanding these differences allows a shepherd to manage his or her flock with minimum stress.

Sheep Movement. Sheep have a strong instinct to follow the leader, and this behavior can make handling easier. They must be able to see a pathway of escape, and should be able to see other sheep moving in front of them. (See *Environment* section.)

ENVIRONMENT

Because of their adaptability, sheep are comfortable and productive in many environments. They can be humanely managed on open range lands, in farm flocks, feed lots, or any combination of these management systems.

Predator Control

Predators are an increasing problem in the sheep industry. Sheep lack aggressive behavior and are nearly defenseless to predators. Depredation from dogs and wild animals causes stress, suffering, and death for large numbers of sheep each year.

Wild species. Coyotes, mountain lions, bears, grey fox, red fox, Russian boars, feral hogs, eagles, and other predators prey upon sheep. If they do not kill the sheep outright, they may cause death from stress, fright, and injury. Non-lethal tools such as electric fences, guard animals, and other methods can help deter predators. Lethal, approved methods used by knowledgeable individuals may also need to be employed.

Domestic free-roaming dogs. Domestic dogs, when allowed to roam free, can kill and maim sheep. As more people move into traditionally rural areas, increasing problems with dog attacks are likely to occur. Public education, workgroups, implementation, and enforcement of leash laws would help to reduce depredation problems. The welfare of both sheep and domestic dogs will be improved if owners are aware of the danger their dogs pose to sheep and are encouraged to keep their dogs under control.

Guarding Animals

Under some management situations, guard dogs, donkeys, and certain other protective animals can be kept with the sheep to deter predation from both wild animals and domestic dogs. Guard animals are not effective in all situations and should be monitored to insure that they do not harm the sheep.

Facilities

Facilities depend on the sheep operation and the environment. Not all the facilities discussed below are necessary in every sheep operation to ensure the safety and well-being of sheep and their shepherds.

Selecting the best site for sheep handling and working facilities is not always easy, and a number of items should be considered. Generally, a sheep working facility should be convenient for access by both the sheep and the shepherd. It should be free-draining and sheltered, if possible. A permanent facility should occupy a

central location on the farm or ranch to avoid long drives for the sheep. Temporary facilities on leased or rented land should have similar characteristics.

If the ranch or farm is large, the facility should be within easy herding distance from the main pastures or sources of feed. When herding sheep on roads, provide for their safety as well as that of shepherds and motorists.

Corrals and barns. The corral whether permanent or temporary, should allow free movement and have no sharp projecting objects that could cause harm. A site with a slope of 1/8- to 1/4 inch per foot for drainage is ideal for corrals. Corrals on a steep slope should be avoided whenever possible to prevent undue crowding. Barns used for shed lambing protect animals from rain, wind, and snow but are not necessary in all operations. When housed inside, newborn lambs need a dry and draft-free environment with proper ventilation. If ammonia can be smelled in the barn, ventilation is inadequate. Ridge openings, adjustable wall openings, adjustable ceiling air intakes, and exhaust fans can improve ventilation.

Barn layout should allow natural movement of sheep from one area to the other. This reduces stress on both the sheep and their handlers. A shed lambing system might include an area for ewes one to three weeks from lambing, a drop pen for ewes one week or less from lambing, lambing pens for ewes with lambs less than 72 hours old, and mixing pens for ewes with lambs from 3 to 30 days old. (See *Lambing* section.)

Chutes. Topography is important in facility design. Sheep work best into a chute on a slight (1%) up-grade. If the crowding pens and chute run up a slight incline, the rest of the facility can be on level ground.

Stress is reduced if sheep are handled in shade, but they may not move freely when facing bright sunlight. Therefore, the orientation of the facility, particularly the sorting chute, should prevent working sheep into bright sunlight.

A curved chute works better than a straight chute. It prevents the sheep from seeing the truck or dip vat until they are almost in it. A curved chute also takes advantage of the natural tendency of sheep to circle around their handlers. Solid chutes are more desirable than open-sided chutes.

If shades are used above working, sorting, and shearing facilities, they should be solid rather than slatted. Slatted shades are fine in facilities that are familiar to the animals. However, when sheep come into the working area, the "zebra-stripe" pattern cast by a slatted shade will cause balking.

Handling Sheep in Chutes and Raceways

- Traffic in chutes should be in one direction only. Sheep should not be allowed to see individuals traveling in the opposite direction or the animals behind them.

- Curved pathways facilitate movement through chutes. Corners should be gradual rather than at right angles.

- Solid side-walls facilitate movement through chutes. See-through side-walls distract the sheep.

- Allow sheep to see beyond temporary barriers. Gates in the chute should be constructed with see-through materials. Sheep tend to stop short of a dead-end or blind alley if they can't see animals ahead of them.

- Eliminate projections on side-walls to avoid injury to animals.

- Facilities should be uniformly lighted. Avoid shadows, particularly "zebra stripes." Sheep move better from darkened to lighted areas. They will balk at reflections, light shining through slats, gratings, or holes in side-walls.

- Inclines should be gradual and provide good footing. Movement is better going up slopes than down.

- Entry points to chutes should gradually "funnel in" animals. Exit points should abruptly "funnel out" animals.

- Artificial noise-makers facilitate movement but lose their effectiveness if they are overused.

Handling Sheep in Corrals and Pastures

Practices that facilitate the movement of sheep reduce stress.

- Sheep move more readily uphill than downhill.

- Sheep move more readily into the wind

- Sheep are easier to move if they have a lead animal or a person to follow.

- When moving sheep along a fence or barrier, stay to the side and rear of the flock. If you position yourself directly behind the sheep, they will veer away from the fence in an effort to locate you. (See *Behavior* section.)

- Use well-trained herding dogs that can move sheep quietly and comfortably. Well trained and managed dogs can reduce overall stress by gathering and moving the sheep more smoothly and effectively.

Space Needs

Sheep need adequate space to meet their feed and water requirements with room to move freely and comfortably. The *SID Sheep Producer's Handbook* outlines suggested space requirements for sheep (see *References* section).

Shelter

Shelter needs will vary depending on the environment. Shelter is not always necessary because sheep are naturally insulated and can adapt to a broad range of climactic conditions. A hill, a patch of shrubs, or a windbreak planting can break the force of winds, dust, and snow. Trees for shade are useful but they are not necessary. Trees, however, provide valuable shade within a working facility, especially when sheep are handled in warmer weather.

For more information, refer to the Midwest Planning Service's *Sheep Housing and Equipment Handbook*. This handbook can be obtained through local University of California Cooperative Extension offices.

TRANSPORTATION

The commercial transportation of sheep is regulated by state and federal governments.

Loading facilities should be designed to ensure safe and comfortable movement of sheep from the corrals into the truck or trailer.

Space, or sheep density, is critical when hauling sheep. Sheep should have enough space to enable them to stand up if they fall. Sheep loaded too loosely can be injured if the vehicle makes a sharp turn or sudden stop. Divider panels in a large vehicle are useful in maintaining proper sheep density.

The vehicle should be well ventilated to prevent the buildup of ammonia and exhaust fumes. Ventilation is more critical than temperature when transporting sheep during cold weather. Truck exhaust fumes should be directed above or away from the sheep. Good ventilation minimizes heat stress during hot weather.

HEALTH

Good nutrition and husbandry are the basis for raising healthy sheep. Healthy sheep are alert, move freely and have a good, even fleece. They will eat and drink well and ruminate, defecate, and urinate normally.

The best way to prevent disease is to prevent it from entering the flock. Purchase healthy stock from reputable sources. When possible, quarantine new sheep for at least three weeks before introducing them into an existing flock. Develop a preventive medicine program by consulting veterinarians, farm advisors, and sheep producers.

Vaccination against diseases that are present in the area protects sheep from death, illness, and suffering and increases profitability. Common times to vaccinate are before breeding, before lambing, and at weaning. Proper storage and administration of vaccines are essential if they are to be effective.

Controlling internal and external parasites promotes flock health. Producers should read and follow the label directions to assure an effective program and to avoid residues. A good time to treat for external parasites, if necessary, is at shearing when the wool is short.

In spite of good preventive medicine programs and proper care, animals may still become sick or injured. Accurate diagnosis allows selection of the proper treatment and helps in deciding what management steps, if any, are needed to prevent the spread of disease in the flock. Diagnostic services can be obtained from local veterinarians and through the California State Veterinary Diagnostic Laboratory System. Sick animals should be isolated to minimize the spread of disease. Isolation also makes it easier to observe and treat affected animals. When using health care products, it is essential to read and follow the label instructions. A record of health care product usage can be useful in developing and documenting an adequate health care treatment plan. Prompt and appropriate disposal of dead animals is important for herd health.

NUTRITION

Sheep diets will vary, depending on location and management practice. Sheep are ruminants, and use a wide range of plants to meet their nutrient needs. Diets include native forage grazed from range land in the mountains or desert; crop aftermath from grains, vegetable crops, or alfalfa; alfalfa hay; irrigated pasture; and rations that contain a high proportion of grains and by-products from the human food chain. All of these feeds, in the proper proportion, provide adequate amounts of nutrients for sheep.

Nutrients

The nutrient needs of sheep depend on age, sex, and the stage of production. Young animals require a diet high in energy and protein for proper growth and good health. The requirements for energy and protein gradually decrease as an animal reaches maturity. However, nutrient requirements increase for ewes in later stages of pregnancy and increase even more in the early stages of lactation. The energy and protein requirements for a mature lactating ewe with twins is about two times that of a mature ewe that is not pregnant or lactating. The nutrient requirements for sheep at the various stages of production are given in detail in the National Research Council Publication, *Nutrient Requirements for Sheep*, 1985.

The following nutrient groups are required by sheep:
Water. Water is an essential nutrient. Sheep should have a clean, abundant supply -- approximately one gallon of water per day per mature animal. If succulent, high moisture feed is available, sheep may not need supplemental water.

Energy. Energy requirements are affected by such factors as age, level of production and activity of sheep. Sheep get most of their energy from range forage, pasture, hay and other roughages. By-products and crop aftermath can also provide energy for sheep.

Protein. Because sheep are ruminants, protein quality is not as critical as it is with monogastric species such as pigs and humans. Rumen microorganisms (bacteria and protozoa) convert poor-quality protein in the diet into high-quality protein. The ruminant animal can even convert non-protein nitrogen into high quality protein when sufficient soluble carbohydrates are available. Certain by-products are an excellent source of protein. Roughage can provide adequate protein, depending on the stage of maturity of the plants and the sheep's level of production. Protein is required for growth, reproduction, lactation, and maintenance of the body.

Essential Fatty Acids. This nutrient group is of little concern for ruminants, because of their diet and the rumen microorganisms. Rumen microorganisms can produce the major portion of essential fatty acid requirements.

Minerals. Minerals are inorganic elements that are required for normal body function and growth. Most diets meet the requirements of this nutrient group. However, some geographic areas are low in some minerals. Generally, growth and production is reduced by mineral deficiencies, and producers should supplement deficient minerals to insure animal health and an adequate level of production.

Vitamins. Vitamins are essential organic compounds that are usually supplied in the diet. These compounds are essential for good health and production. There are two types of vitamins, fat soluble (A, D, E, K) and water soluble (B-complex). The rumen organisms will produce enough B vitamins to meet animal requirements. Sheep consuming green roughage will receive adequate amounts of fat soluble vitamins.

Feeding

Grazing sheep should have ample forage to meet their daily feed requirements.

Sheep that are fed in mangers should be provided adequate space while feeding. The space requirements for different ages of sheep and different feeding conditions can be found in the Sheep Industry Handbook.

The nutritional status of sheep can be monitored by observing expected growth rates and size of sheep for a given age. These two factors are important in evaluating the nutritional status of sheep. Slight deficiencies in minor nutrients will retard growth. Also, over-feeding can reduce production and jeopardize good health.

Producers should be able to recognize the symptoms of toxicity. Poisonous plants or an excess of certain nutrients can cause toxicity.

IDENTIFICATION

Depending on the type of sheep operation, sheep may need to be identified. Paint branding is used for identification under some types of management. When this type of identification is needed, scourable paint is used. Ear tags, ear marking, ear tattoos, flank tattoos, and nose brands provide more permanent identification. Tattoos and nose branding are the most permanent type of individual identification.

SHEARING

Shearing sheep contributes directly to the welfare of both animal and owner. The obvious return to the owner is the marketable product, wool. Shearing is necessary to enhance the physical welfare of the animal, as domestic sheep do not shed their wool naturally. Immediate returns include greater comfort, particularly in hot weather, and the correction of "wool blindness" in closed-faced breeds. Other benefits include:

- improved cleanliness and health
- greater production efficiency,
- better reproductive efficiency
- improved bonding between ewe and lamb and increased survival and performance of the lambs.

Some of these benefits do not require full shearing and can be obtained through crutching (tagging) or facing. (See *Lambing* section).

Facilities and Equipment

Shearing practices vary. Some needs, however, are universal:

Holding areas, crowding chutes, and alleyways. These should be clean and dry and should provide for free-flow and easy catching of the sheep without physical injury or undue stress to animal or handler.

Shearing floor. A firm, non-slick surface will enhance the shearer's comfort and control. Even if this "floor" is only a sheet of plywood, it should be kept clean. If plywood is used, you may want to provide your own rather than allow use of one that has been used for other flocks. This will cut down on disease introduction. Shade and good ventilation are also beneficial to both sheep and shearer.

Sanitary shears. The shearer should disinfect all shears before starting on a flock to prevent disease transmission, especially of boils (caseous lymphadenitis). Even within-flock, blades should be changed and disinfected after shearing a sheep with boils before starting on the next animal.

Shearers. Adequately trained and experienced personnel shearing and handling sheep will improve the value of the wool clip and contribute to the animal's welfare. Ability to properly position the sheep and maintain

control is important. Selecting a reputable sheep shearer or a shearing crew is important to insure that the sheep are handled properly during shearing.

Sheep Management

Before shearing. Sheep may be held in a drylot away from feed and water before shearing begins. A 12-hour fast to reduce stomach fill is common practice. This increases the animal's comfort during shearing, makes handling and control easier and may prevent injury. A full stomach puts pressure on such vital internal organs as the heart, lungs, and liver. This pressure can be increased during handling for shearing.

- Sheep should not be shorn when the fleece is wet. Wet sheep are difficult to handle and control and the wool value can be reduced.

- It may be beneficial to group sheep for shearing, separating young sheep and shearing them before the older ewes. This helps reduce disease transmission, especially boils.

Post-shearing. In harsh environments it may be necessary to provide shade or shelter for two or three days after close shearing. Sheep are very adept at finding their own protection using natural terrain and objects such as ravines, rocks, and trees. If these are not adequately available, protection may need to be provided. The need for added protection may be reduced by using a rake comb on the hand piece of the shears, to leave about 1/4 of an inch of wool on the sheep. This requires greater care and skill during shearing.

HOOF TRIMMING

Under conditions where the terrain does not provide sufficient wear to keep the hooves properly shaped, periodic hoof trimming improves comfort and movement and prevents lameness from overgrown hooves.

Hoof trimming can also be a useful method of early diagnoses and treatment of foot rot. Foot rot is a disease that is caused by the bacterium, *Bacteroides nodosus*. The disease requires the interaction of this bacterium, found in the sheep's foot, with another bacterium in the soil. Hoof trimming can expose the bacterium, then chemicals and medications are applied to the hoof for treatment. In flocks free of foot rot, regular trimming may not be required. Some terrain and soil conditions provide enough natural wear to keep hooves properly shaped. If excess hoof material is present, it should be removed to prevent structural unsoundness and discomfort, even in the absence of infection. Thorough discussion of foot rot and its control can be found in many publications, including those listed in the *Reference* section.

All additions to a flock should follow a trimming-treating-isolation program to prevent introducing the disease into the flock. Periodically re-examine the animal during the quarantine period, which should last for at least two weeks.

REPRODUCTION

Several husbandry practices improve sheep reproductivity, as well as their health and well-being.

Marking Ewes

Rams may be equipped with devices that mark the ewe's rump at breeding time. These devices enable the producer to estimate when the ewes are due to lamb. Accurate lambing dates will enable the producer to have equipment and health care products available, to ensure proper care of lambs upon delivery.

Several devices can be used to mark ewes. They all work well if managed properly. The breeding, or marking, harness is strapped to the ram's brisket and is equipped with a piece of marking chalk. The harness should be checked frequently for proper adjustment and prevention of skin irritation. Another method of marking ewes is to cover the ram's brisket with a light oil mixed with a pigment or dye.

Breeding Ewe Lambs

Ewes can be bred to lamb at approximately one year of age if they are fed to meet the nutrient requirements for a growing ewe, developing fetus, and lactating ewe. These young ewes require more attention than more experienced ewes at lambing, to insure the health and well-being of ewe and lamb. Ewes that lamb as yearlings tend to be more fertile and produce more lambs in a lifetime than ewes that are bred to lamb as two-year-olds.

LAMBING

The relationship between animal care and production is probably most crucial during lambing.

Preparing for the Lambing Season

Tagging or shearing. About one month before the lambing season begins, ewes may be tagged or shorn to benefit both shepherd and animal. The choice of which practice to use, or whether either is needed, will be dictated by both environmental and management considerations. Both ewe and fetus are more susceptible to injury during late pregnancy, so animals should be handled with care during shearing or tagging.

Tagging (crutching) is the shearing or clipping of wool from around the ewe's vulva, udder and flanks. Some advantages of tagging are listed below:

- makes it easier to observe the signs of approaching birth and allows the shepherd to be prepared to assist ewe and lamb, if needed;
- provides for a more sanitary birth by reducing sources of contamination as the lamb leaves the birth canal;
- makes it easier for the newborn lambs to locate a teat and ingest the critical first meal, rather than mistakenly sucking on a lock of wool that may be contaminated with dung or other foreign material;
- makes it easier for the shepherd to tell if the lamb has begun nursing.

Shearing the entire ewe before lambing is practiced by some, particularly if lambing sheds or barns are used. Shearing provides all of the benefits of tagging. In addition, it:

- keeps the lambing shed cleaner and drier;
- makes shed-lambing ewes less likely to lie on their newborn lambs;
- reduces the likelihood of heat stress experienced by some shed-lambing ewes;
- causes the ewe to be more sensitive to the weather and to seek a sheltered place to lamb. However, it requires the manager to make sure that shelter is available, and may, in cold weather, require additional feed to produce body heat.

Ewe band management. In large flocks, it is advisable to group ewes by expected lambing date. The groups closest to lambing can then be provided any special care needed. As lambing approaches, the drop band may be penned at night for close observation. Illustrated descriptions of these signs can be found in various publications and media, such as those listed in the *References* section.

Preparing the facilities. For range or pasture lambing in a harsh environment, shade, shelter or windbreaks may have to be provided, if natural terrain and objects (trees, rock outcroppings, etc.) do not provide needed protection. If lambing is to take place in sheds or other confined areas, it may be necessary to clean and disinfect the area and facilities. Old bedding materials should be removed and the surfaces allowed to dry before spreading new bedding.

Lambing pens should be in good repair and large enough to allow the sheep to turn around, preclude injuries, and provide a good environment for ewe-lamb bonding. Feed and water troughs or buckets should be located so that lambs will not fall in or be trapped.

Care Practices During Lambing

Unassisted lambing is preferable for both the animal and shepherd. However, if the delivery does not proceed normally, intervention may be needed. It is important to know and understand all aspects of a normal delivery to be able to recognize deviations that might dictate intervention. These considerations include the correct presentation of the lamb in the birth canal, the sequence in which events should occur, and the expected time lapse between these events.

Assistance during delivery. The birth process is normally completed approximately one hour after the water bag appears. Delayed lambing may be due to improper presentation of the lamb, the lamb being too large for the pelvic opening, entanglement of twin lambs in the uterus or vagina, or inability of the ewe to contract due to exhaustion.

In such instances, intervention by the shepherd is essential to the welfare of both ewe and lamb. An excellent illustrated description of a normal birth, of abnormal presentations, and of how assistance should be given, can be found in A *Handbook for Raising Small Numbers of Sheep.* (See *References* section.)

Assistance immediately after lambing. The natural instincts of ewe and lamb are usually adequate. The lambing procedure that will cause the least amount of stress to the ewe and the best survival rate for the lambs will vary, depending on weather conditions, the breed of sheep, and the management system being used. The management level required during lambing will

range from ewes giving unassisted birth with little monitoring, to intensely managed systems where the ewe will be monitored, and assisted when needed, through the entire birth and post-birth process. Shepherds may have to assist in the following procedures:

- Clean the birth membranes away from the lamb's nose and mouth if the ewe fails to do so. Check that airways are open and that the lamb is breathing properly.

- Place the ewe and lambs in a lambing pen after lambing. This is normal procedure for shed lambing and may be necessary in pasture or range lambing if ewes or lambs need assistance.

- Early nursing is important, both for nutrition and for the disease resistance provided by antibodies in the ewe's colostrum. Ensure that all lambs nurse soon after birth. It may be necessary to check the ewe for open teat canals and milk production, ability to stand to be nursed and acceptance of her lamb. The lamb should easily stand and locate the udder. If lambs are not able to nurse, assist them with the ewes, or use a bottle or esophageal probe. If necessary, "borrow" colostrum from another ewe, or keep a supply in your freezer to be thawed and used if needed. Cow colostrum, although not ideal, will work when nothing else is available.

- Trim the lamb's navel cord and treat the stump with a seven percent iodine solution. This will minimize infection entering the newborn through this still-open channel.

- Promote bonding between the ewe and her lambs. Often "granny" ewes will attempt to steal a newborn lamb and break that bond. In multiple births, the ewe may fail to claim one or more of her lambs. Lambing pens may help prevent or cure this. Restraint of the ewe may be needed for lamb acceptance. Methods of restraint may cause temporary discomfort, but are beneficial to the overall welfare of ewe and lamb. Twin-tying may also be used to promote this bonding. Tying one leg of one twin to a leg of the other with a short piece of soft rope will allow free movement, but prevent one twin from being abandoned and starving to death on open range or pasture situations.

CARE OF YOUNG LAMBS

Raising Orphan Lambs

It may be necessary to raise a lamb away from its natural mother. Death of the ewe or her inability or unwillingness to nurse any, or all, of her lambs, requires that a substitute be found. This may be done by "grafting" the lamb to another ewe that has recently lambed, or by artificial rearing on a bottle or lamb bar facility. For both economic and welfare reasons, grafting may he the most desirable.

There are many acceptable ways to accomplish a graft. These include stanchion grafting, hide grafting, slime grafting, wet grafting, and stocking grafting. All have their advantages and drawbacks, but all are preferable to lamb starvation or ewe health problems resulting from udders not being nursed. More details can be found in the publications listed in the *References* section.

Lamb Marking

Lamb marking is a management practice that may involve castration, docking, identification, vaccination, and other health procedures. These processes should be performed by a skilled individual. Good hygiene should be practiced for the sheep and equipment used during docking and castration, and for several days after the operation. These practices should be performed at an early age. However, weather conditions may dictate the timing of these practices. Marking may be delayed because of extreme weather conditions such as a heat-wave, cold rain, or snow. Postponing marking until conditions are more favorable will reduce the likelihood of health problems. More details can be found in the publications listed in the *References* section.

Docking. Docking can be done using several techniques. Docking should be performed by or under the supervision of a skilled person. Cleanliness of the animal is the main reason for docking. Sheep with long wool and long tails become contaminated with urine and feces. Wet wool is a good breeding site for flies. Fly maggots can invade the sheep's flesh and become life-threatening if they are not controlled. Docking drastically reduces the incidence of maggots in sheep.

Castration. Young, intact (not castrated) ram lambs will mount or ride ewes in estrus, causing stress for both the ewes and rams. These lambs are castrated to reduce stress on ewes and young males. Indiscriminate breeding by young rams makes it impossible for the producer to maintain breed integrity and to prevent the inbreeding of animals.

WEANING

Lambs can be weaned at an early age, if they are eating harvested feed. Early weaned lambs should receive a ration high enough in nutrients to meet their growth maintenance requirements. Under some conditions, early weaning is in the best interest of the welfare of the ewes and lambs.

To minimize stress, lambs should be left in the area they're accustomed to and ewes moved to a different area. Lambs should be fed a high-quality feed before, during, and after weaning. The ewe's feed and water should be restricted at weaning to reduce the chance of udder damage.

After weaning, lambs should be placed on the best pasture or feed available, to maximize growth. Ewes should be placed on a lower quality pasture. This will allow the ewes carrying harmful, excessive fat at weaning to loose the weight before breeding.

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GLOSSARY OF SHEEP TERMS

Black face breeds - Meat breeds of sheep.
Booster vaccination - A second or multiple vaccination given to increase an animal's resistance to a specific disease.
Breech birth - A birth in which the hind feet of the young are presented first.
Breed - Animals of like color, body shape, and wool grade similar to those of parents.
Bummer or orphan - A lamb not raised by its mother, usually it is fed from a bottle.
Castration - Removal of male sheep testes.
Colostrum - First milk a ewe gives after birth. High in antibodies, this milk protects newborn lambs against diseases.
Condition - Amount of fat and muscle tissue on an animal's body.
Creep - A feeding area where lambs can feed but ewes are excluded.
Crossbreed sheep - A sheep resulting from the mating of two different breeds.
Crutching or tagging (verb) - Removing wool from the inside of a sheep's back legs and belly.
Crutchings (noun)- Wool removed from the sheep during the crutching or tagging process. This wool usually is free of manure, as opposed to tags which contain a lot of manure.
Dam - A female parent.
Dock (noun) - Stub end of the sheep's tail.
Docking (verb) - To remove the sheep's tail.
Drench - A means of giving liquid medicine by mouth.
Energy - A nutrient category of feeds usually expressed as TDN (total digestible nutrients).
Estrus - The time that the ewe is receptive to the ram and can conceive.
Ewe - A female sheep.
Farm flocks - smaller numbers of sheep raised on a family-owned farm.
Feedlots - an area where sheep are kept and fed harvested feeds.
Fleece - Wool as it is shorn from the sheep.
Flushing - Increasing the nutrition of a ewe before and during the breeding season.
Fly strike - When green and blue blowflies lay eggs in wet and stained wool and maggots develop.
Gestation - Pregnancy.
Graft - A procedure to get a ewe to accept a lamb that is not her own.
Granny ewe - A pregnant ewe close to lambing that tries to claim another ewe's newborn lamb.
Lactation - The period when the ewe is giving milk.
Lamb marketing - husbandry practices which may involve castration, docking, identification, vaccination, and other health procedures.
Lamb - Young sheep of either sex under one year of age.
Lambing pen - A small pen where a ewe and her lambs are put after birth.

Larvae - Immature stages of a parasite. The term applies to insects, ticks, and worms.
Ovulation - When an egg is released from the ovary.
Parturition - Act of giving birth.
Protein - A nutrient category of feed used for growth, milk, and repair of body tissue.
Puberty - When a sheep becomes sexually mature.
Quarantine - To isolate or separate an animal from other sheep.
Range land operations - larger numbers of sheep raised on open range lands and/or large acreage.
Ram or buck - Male sheep of any age that has not been castrated.
Ration - Total feed given an animal during a 24-hour period.
Seasonal breeders - Ewes only showing estrus during part of the year; estrus season depends on breed and climate.
Tags - Heavy, manure-covered locks of wool.
Wether - A male sheep castrated before the development of secondary sex characteristics.
White face breeds - Wool breeds of sheep.