Alabama offers several economic and natural advantages for developing a profitable sheep flock: a mild, even climate free from great extremes of temperatures and plenty of green feed. Climatically, Alabama is almost ideal for sheep: there are only a few days of extreme heat in summer and only a few days of below-freezing temperatures in winter. A bountiful supply of green feed can be grown every month of the year, which is essential for developing a profitable flock and industry.

The successful sheep producer, as well as the beginner, can soon adapt to conditions and develop a successful enterprise. But, regardless of previous experience, a successful producer must have a positive attitude about raising sheep.

A review of past figures reveals that in the early 1940s Alabama had quite a number of sheep. It is estimated that the number of sheep in Alabama exceeds 10,000 head today.

**Developing A Successful Flock**

Sheep production can be easily integrated into operations that produce other classes of livestock, especially cattle. In general, the same feeds and almost all of the recommended management practices that are successful in cattle production are also suitable for sheep production.

**Breeds Of Sheep**

Years ago, flocks of sheep were descended from basically a handful of breeds, but today more than thirty-five breeds are in use. The fine-wool Delaine-Merino was developed from the Spanish Merino primarily for the production of wool. At the other extreme are the mutton sheep, comprising the medium- and long-wooled breeds, which were developed primarily for the production of meat.

Breeds of sheep can be grouped in many ways to describe the various types. They are grouped according to wool type, face color, productive function, or adaptability to specific environment or production situations.

There is no "best" breed of sheep. Each has its strong points, and weaknesses are found in representatives of each. There are more differences in the quality of animals within a breed than between breeds.

Choosing the right breed is important because the breed determines the satisfaction the producer receives from the enterprise and may affect economic returns. Some of the factors that should be considered in choosing a breed are:

- The type of operation.
- The availability and cost of breeding stock.
- The breeds prevalent in the area.
- The producer's personal preference.

**Grazing Lands And Stocking Rates**

An adequate level of nutrition is essential for the most economical and successful sheep enterprise. Plenty of good-quality forage during the growing season and an ample supply of good-quality hay during the winter are essential for the highest returns from your flock.
"How many sheep can be carried on my land?" is one of the first questions a potential sheep producer asks. Obviously, the proper stocking rate will vary from flock to flock, since the carrying capacity of pastures varies tremendously according to soil fertility, moisture conditions, forage species, and management. To determine the proper stocking rates for your area and pasture conditions, draw on your experience and observation of your own enterprises as well as those of other producers in your area.

In addition, several other factors can be helpful in determining when the stocking rate should be reduced or increased. The first is the amount of forage or hay available during different times of the year. It has been said that the ideal stocking rate is achieved when there is one less head of livestock on the pasture than the available forage can support. A rule of thumb used in some areas is that five ewes can be maintained on the same land area as one mature cow. Grazing observations show that the most efficient use of forage is obtained when cattle and sheep are grazed together. On small areas of land where only sheep will be kept, a suggested stocking rate would be three to four ewes per acre. The second factor is the level of performance. If performance falls, the stocking rate is too high and should be decreased.

Facilities And Equipment

Time spent planning facilities and handling equipment will pay off in increased profits and satisfaction. It will make handling easier, save labor, and result in fewer injuries.

Some type of shelter is required to provide adequate protection and feed storage for sheep. Several blueprints for sheep facilities are available through your county Extension office or from the Extension Agricultural Engineers at Auburn University.

A good structure for a sheep operation should have these qualities:

- It should provide protection from predators and bad weather.
- It should allow quick and easy sorting of the sheep.
- It should be designed for economy.
- It should be located in a well-drained area and on soil that will absorb moisture readily.
- It should be convenient, strong, and solid enough to hold the flock.

Table 1 shows the space allotments necessary for a sheep-handling facility.

The miscellaneous equipment for sheep production is small and relatively inexpensive. However, each piece of equipment serves a special purpose, and producers should have them at hand. The necessary equipment includes:

- A 4-ounce rubber-ring drenching syringe with a 3-inch dose pipe.
- Disposable hypodermic syringes (3 to 5 cc and 10 cc) and needles (16 to 18 gauge).
- Hand shears, preferably electric.
- Scales for weighing the flock and the feed.
- Hoof-trimming shears and knife.
- Foot care liquids.
- Docking and castrating equipment: knife, emasculator, and elastrator.

### Table 1. Space Allowances For Sheep-Handling Structures.

<table>
<thead>
<tr>
<th>Area</th>
<th>Ewe</th>
<th>Ewe &amp; Lambs</th>
<th>Feeder Lamb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-front building with lot</td>
<td>10-12 sq. ft.</td>
<td>12-16 sq. ft.</td>
<td>6-8 sq. ft.</td>
</tr>
<tr>
<td>Lot</td>
<td>20-30 sq. ft.</td>
<td>25-35 sq. ft.</td>
<td>15-20 sq. ft.</td>
</tr>
<tr>
<td>Confinement</td>
<td>12-16 sq. ft.</td>
<td>16-20 sq. ft.*</td>
<td>8-10 sq. ft.</td>
</tr>
<tr>
<td>Handling area</td>
<td>4-5 sq. ft.</td>
<td>7 sq. ft.</td>
<td>4-5 sq. ft.</td>
</tr>
<tr>
<td>Feeder space</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand-feeding</td>
<td>16-20 in.</td>
<td>16-20 in.</td>
<td>16-20 in.</td>
</tr>
<tr>
<td>Self-feeding</td>
<td>8-12 in.</td>
<td>8-12 in.</td>
<td>3-4 in.</td>
</tr>
<tr>
<td>Maximum feeder throat height</td>
<td>15 in. (creep feeder)</td>
<td>10 in.</td>
<td>13 in.</td>
</tr>
<tr>
<td>Waterer space</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open tank</td>
<td>15-20 ewes/ft.</td>
<td>15-25 ewes/ft.</td>
<td>25-40 lambs/ft.</td>
</tr>
<tr>
<td>Automatic bowl</td>
<td>40-50 ewes/bowl</td>
<td>40-50 ewes/bowl</td>
<td>50-75 lambs/bowl</td>
</tr>
<tr>
<td>Lamb creep space</td>
<td>1.5-2.0 sq. ft./lamb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lambing jugs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>10% for 100 ewes, 7-9% for 600, 4-6% for 1,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>4'x4'x32&quot; minimum or 5'x5'x36&quot; for large ewes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*For operations with lambing rates higher than 170 percent, increase this space by 5 square feet per head.
Iodine or antibacterial powder or ointment for treating cuts, bites, and navels of newborn lambs.

• Wound spray and dressing for control of screwworms.
• Scourable marking spray or branding paint and temporary or marking chalk.
• Injectable antibiotic and vitamin ADE.
• Synthetic ewe milk replacer.
• Lambing instrument to aid in assisting difficult births.
• Lamb nipple and bottle.
• Injectables for the prevention of clostridial diseases and for immunization against tetanus.
• Eye wound spray.
• Eartags and applicator or tattoo outfit.
• Paint branding numbers (2 1/2- or 4-inch) and scourable branding paint.
• Sheep squeeze.

Building Up The Farm Flock

In choosing the type of farm flock to raise, the producer should consider several factors. The two most important are:

• The adaptability of the land area for production of large amounts of high-quality forage.
• The market outlet for wool and mutton.

The possible flocks may be classified into two general groups, purebred and commercial. Purebred flocks specialize in the sale of breeding stock, and the main function of the purebred producer is to supply breeding stock to commercial producers. Commercial flocks specialize in the production of wool and mutton.

In deciding upon the breed(s) to raise, you should select the breed or combination of breeds that seems best adapted to your local conditions and to the requirements of the particular market. In selecting breeding animals, good body conformation is important. Sheep with good conformation are more desirable for mutton production, so you should select animals with wide, deep bodies; full heart girths; good spring of ribs; and wide loins. The animals should be sound and capable of production throughout their lifetime. Reproductive efficiency probably affects the economic returns from a flock to a greater extent than any other single item.

Good mothering qualities in the ewe are essential. They should be thrifty, vigorous, and free from diseases. At times, wool-type ewes can be purchased more cheaply than mutton-type ewes. Provided they are healthy and thrifty, wool-type ewes make desirable foundation stock for building up a farm flock with the use of purebred mutton rams. The key factor in a profitable sheep enterprise is the total pounds of lamb produced per ewe per year.

Breeding

Regardless of the type of flock, the producer must pay careful attention to breeding. Considerations such as the age and condition of the rams and ewes, the length of the breeding season, and proper management of the ewes during gestation and lactation all affect the future of the flock.

Puberty

The age at puberty is influenced by breed, genetic selection, body size, and date of birth. As a result, sheep reach puberty usually during their first season, at 4 to 9 months of age and 70 to 100 pounds, but under some conditions puberty may occur as late as 16 months.

Heat, or estrus, is the period of time when the ewe will accept the ram. Ewe lambs born during the fall and winter will come in heat at 9 to 12 months of age. Ram lambs are usually fertile at 7 to 9 months of age and could be bred to fifteen to twenty-five ewes. Yearling and older rams can successfully breed thirty to sixty ewes during the breeding season.

Breeding Season

Most ewes start cycling, or coming in heat, in early August and continue cycling every 17 days for 5 to 7 months if they are not bred. Some breeds begin coming in heat in late April. Ewes that have a longer breeding season are very desirable.

The age of the ewe at breeding influences the length of the breeding season. Ewe lambs have a much shorter breeding season than mature ewes. Geographic location, which affects the number of daylight hours and the intensity of the sunlight, also affects the length of the breeding season.

The gestation period varies between 140 to 155 days; 148 days is the average.

Breeding Management

Several management practices can help to optimize the lamb crop. Hauling the ram has caused, at times, temporary sterility. The exact distance of the haul which could be detrimental has not been determined. This condition is usually corrected without any special treatment in 4 to 6 weeks. To prevent this problem, plan to move the ram at a time that does not interrupt the breeding season.

Careful management of the ewes is, of course, of primary importance. Moving the ewes to a strange
place just before the breeding season can cause a 15- to 20-percent reduction in the lamb crop. Flushing, or increased feeding, usually with grain, 2 weeks before the start of the breeding season results in more multiple births. Energy feeds such as corn are likely to have the greatest effect. The amount of corn per day depends on the size and the condition of the ewes and may vary between 0.5 and 1.0 pounds of grain. Flushing can also be accomplished by grazing ewes in good-quality pasture. Use caution if flushing ewes on legume pasture. Some clover varieties produce excessive amounts of estrogen, which causes breeding problems in sheep. Flushing the ewes is most important, but the rams should also be on a good feeding program and conditioned before breeding.

The presence and odor of the ram, when he is introduced into the ewe flock, will stimulate the ewes to go into heat. Some ewes might be in heat immediately, but most breeding activity will start 11 to 14 days later. This occurs most frequently during the August-September breeding period.

Night breeding, when the ram is placed with the ewes at night and removed during the day, increases the lambing rate. Rams easily adjust to being removed each morning and fed and returned to the breeding flock at night. This practice enables the ram, especially a young ram, to breed a larger number of ewes during the breeding season.

Management Of Newborn Lambs

At lambing time, the producer can no longer influence the percentage of lambs born alive. Your management up to lambing has a great influence on the number and the size and thriftiness of the newborn lambs.

Causes Of Lamb Losses

The trend in sheep production is toward a hardy animal requiring less care, particularly at lambing time. However, field observations suggest that ewes' failing to raise their newborn lambs is a major source of loss in the lamb crop. Some of the factors that contribute to a low lamb crop at weaning time are:

- Poor mothering or abandonment of lambs.
- Predatory animals.
- Cold stress at lambing.
- Small, weak lambs.
- Lack of milk because of poor body condition or damaged udders on ewes.

Be sure that the ewe has taken to her lamb and that the lamb nurses within 30 minutes after birth. Most lambs stand on their feet and nurse shortly after birth.

Lambs born to ewes that lamb in the open are especially susceptible to chill or cold stress. The ewes should be sheared before they lamb or at least crutched out (shorn around the udder, between the legs, and around the dock). This way, it is easier to spot ewes that are near lambing and those with udder problems. It is also more sanitary and makes nursing easier for lambs.

Problems with cold stress can be minimized by planning breeding so that lambing does not occur during the coldest months and/or by providing protection from the elements. Protect the newborn lamb from cold, wind, and moisture. Protection may consist of shelter or a pasture with substantial natural protection.

Environmental factors are important, but underlying all causes of death loss in lambs is the problem of low birth weight and vigor. The main factors affecting birth weight are the size of the ewes and nutrition during late gestation. When the ewe subsists on dry or cured hay, adding supplemental energy and protein will almost always increase birth weight and newborn survival. Where there is an ample supply of green, good-quality forage, protein should not be lacking, but ewes will benefit from supplemental energy during late pregnancy, lambing, and lactation.

Proper care for the newborn lamb can save those that are not strong and thrifty at birth. However, do not handle newborn lambs more than necessary, because it may cause ewes to reject them. If lambs are weak, they may need help in nursing the first time.

Ewes sometimes fail to claim their lambs because of poor physical condition or other circumstances. When this happens, try to graft onto other ewes any lambs that are not receiving enough milk from their own mothers. Ewes that have lost their lambs can often be persuaded to accept another lamb. Orphaned lambs can also be raised on a bottle using milk replacer.

It is essential for lambs to get colostrum (first milk) as soon as possible after birth because it provides energy, protein, vitamins, and minerals as well as antibodies that help lambs resist infection. Lambs are born with a low level of vitamin A. Colostrum, which is rich in vitamin A, is essential to build up the lambs' vitamin A reserve.

Weaning

The age to wean the lambs depends on many factors, including:

- The season of birth.
- Whether the birth was single or multiple.
- Whether creep feeding is used.
- Parasite problems.
• Predators.
• The type of sheep.
• Market prices.
• Price outlook.

At 3 or 4 months after lambing, most ewes will be producing very little milk. In Alabama, most lambs are born during December, January, February, and March. These lambs will be marketed in the fall. Forages can provide 100 percent of the nutrients required to produce a good lamb; however, supplemental creep feeding might be necessary in order to develop them for replacement breeding animals.

Docking And Castration
The time for tail docking and castration varies among sheep producers. Lambs should be docked between 3 and 10 days of age. Several instruments can be used for this task, including a pocketknife, a burdizzo (emasculatome), an emasculator, an elastator (rubber rings), or an electric docker. The tail is cut to a length of 1 to 1½ inches from the body. Try to push the skin on the tail toward the body before cutting to allow for enough loose skin to cover the exposed bone in the stub.

Castration is usually done with a pocketknife, a burdizzo, an elastator, or an ‘all-in-one.’ Late-born ram lambs and those that will be older than 5 months when marketed should be castrated, preferably at an early age (2 weeks or less).

Shearing
Wool receipts could account for as much as 5 to 35 percent of the gross receipts of a particular sheep enterprise, depending on the type of sheep and the goals of the producer. Sheep are usually shorn twice each year. Spring shearing starts in February and lasts through March. Fall shearing begins about August and lasts until early October.

Management Of The Sheep Flock
Careful management of the flock is essential for a profitable sheep operation. Even the very best genetics cannot make up for poor management practices on the part of the producer.

Nutrition
Proper feeding and year-round management of sheep are essential for profitable production. Feed accounts for the largest single cost in every phase of sheep production. Both excessive and inadequate nutrition is expensive. Therefore, to avoid these costly extremes, sheep producers must know something about proper sheep nutrition. Producers must be alert to the changing nutritional needs of the flock.

It is important that the sheep producer have a dependable and economical source of feed. In developing a feeding program, the producer must take advantage of available pastures and should include maximum use of high-quality hay.

The ideal sheep nutrition program supports optimum production, is efficient and economical to feed, and minimizes related problems. To achieve these goals, the producer must know the nutritional requirements of the animal at its particular stage of production, the quality of available feedstuffs, the age of the animal, and other factors such as the size and condition of the animal. Without proper nutrition, it is impossible to produce a high percentage lamb crop, develop satisfactory flock replacements, optimize wool production, and grow out feeder and market lambs. The genetic potential of high-quality sheep cannot be expressed without proper nutrition.

Sheep producers must work out their own forage programs to accommodate their particular situations. The lambing date, the type of lambs produced, pasture availability, and other livestock on the farm are a few of the factors that affect an individual program.

Feeding The Ewe
The ewe’s nutritional requirements change according to the time of year. The breeding season, gestation, lambing, and lactation all place different requirements on the ewe, so your feeding program should change in response to those needs.

Breeding. ‘Flushing’ the ewe means feeding her so she is gaining weight just before breeding. This practice may increase the lambing percentage by 10 to 20 percent. Ewes already in high condition will not respond as well to flushing as those in poorer condition. To flush the ewes, graze them on a good pasture and feed them 0.5 to 1.0 pound of corn, milo, or oats per head per day.

Gestation. The pregnant ewe can feed on perennial and annual pastures as long as they are available. When a pasture can no longer maintain the ewe’s weight, supplemental feed must be provided. The most critical feeding time is the last 4 to 6 weeks of gestation, when two-thirds of the fetal growth occurs. At this time, both the energy and the protein requirements are significantly higher than early gestation requirements.

Probably the first nutrient required would be protein to supplement the remaining warm-season perennial grasses, bahiagrass, bermedagrass, and dallisgrass. The protein may be supplied by feeding one-third of the roughage required by the ewe as good-quality hay. As these grasses become limited, the primary ingredient in feed supplements should be an energy source with supplemental protein. Feed an
80-percent/20-percent corn/soybean meal mixture fed at 1.0 to 1.5 pounds per head per day during the last 4 to 6 weeks of pregnancy. This mixture will help to meet the needs of the rapidly growing fetus. Start by feeding 0.25 pound and gradually increase the supplement allowance. Ewe lambs may be offered 0.75 pound per day.

Ewes that have access to good-quality cool-season perennial grasses or cool-season annual grasses may require very little supplemental feed during late gestation. However, pasture conditions caused by severe drought or winter weather may make supplemental feeding necessary. Offer free-choice a mineral mixture formulated for sheep. The ewe should gain 20 to 30 pounds during the gestation period.

Lambing. At lambing time, provide clean, fresh water to the ewe immediately after the birth. Feed only a moderate amount of good-quality roughage for the first 2 days. Gradually increase the hay intake for 4 to 7 days and introduce some grain into the ewe’s diet.

Lactation. Feeding during lactation is very important because lactation places a greater demand on the ewe than pregnancy. The ewe is not only feeding her lambs, but she is also growing wool and, if she is young, should be growing herself.

The ewe reaches peak milk production about 4 weeks after lambing; production drops after this point. She will yield from 1 to 4 quarts of milk per day and will maintain adequate milk production if properly fed. How much you feed the ewe during the first 60 days of lactation depends on several factors:

- Whether she is nursing a single or twins.
- Her size and body condition.
- Her level of nutrition during late gestation.
- Her age.
- The time of year the lambs were born.

A weight loss of approximately 0.1 pound per day is normal during the first 60 days of lactation. Separate the ewes with twins from those with singles for feeding during lactation.

Plan ahead for weaning by removing supplement from the ewe’s diet at least 1 week before weaning. Feed ewes a low-quality roughage at this time. Reducing the ewes’ feed intake prior to weaning is the most important step in reducing the chance of mastitis problems.

Feeding The Ram

Feeding the ram depends on the breed and individual growth rate. Rams should be in moderate flesh going into the breeding season. Watch throughout the breeding season for general health, vigor, and activity.

Plenty of good roughage should be provided for the ram. Pasture is an important source of feed for the flock. Rams can achieve adequate growth on a high-quality pasture. If the pasture is not high-quality, both protein and energy supplementation will be needed.

Usually, additional energy supplementation in the form of grain may be needed to maintain the ram’s body weight and performance throughout the breeding season. An 80-percent/20-percent corn/soybean meal mixture fed to supplement your forage program will help meet the ram’s energy and protein requirements.

The ram should be sheared when used in late summer or fall. Do not allow the ram to run down at breeding time through insufficient feed or over-use. On the other hand, he should never become too fat, either. You should offer free-choice a mineral formulated for sheep.

Health Management

It is much more productive and economical to prevent diseases than to treat sick animals. Maintaining a healthy flock and reducing the incidence of disease should be a high priority for every sheep producer. A successful health-management program involves close cooperation between the owner and veterinarian and should include superior nutrition, timely year-round management practices, and appropriate health practices. Your local veterinarian can help you design an immunization program for your area.

Immunizations

Many contagious and infectious diseases can be prevented by proper immunizations. Timing is important, and most immunizations require a booster 2 to 4 weeks after the first injection.

If the flock has experienced abortion problems attributed to chlamydia, vibrio, or leptos, vaccinate the ewes for these diseases 30 days before breeding. These vaccinations may be given to ewe lambs twice before breeding. Give the ewes annual boosters for enterotoxemia, blackleg, and tetanus 1 month before the lambing season so that colostral antibodies will be elevated by lambing time.

Check with your local veterinarian for possible selenium deficiency in the soil in your area. A combined deficiency of selenium and vitamin E results in white muscle disease. Injecting the lambs subcutaneously [under the skin] with selenium-vitamin E at birth and again at 30 days of age is a common practice to lower the chance of the lambs’ developing this disease. Ewes may be injected with vitamin E and selenium 3 to 6 weeks before lambing.
Other immunizations may be recommended by your local veterinarian.

**Controlling Parasites**

Parasitism is a continuing problem in a flock. A heavy burden of parasites can severely affect growth, health, and productivity, particularly in lambs.

Good management is the best treatment for the control of parasitism and cannot be accomplished simply with the indiscriminate use of drugs. Many control efforts must be used to help break the life cycles of both external and internal parasites. Proper management of pastures, feed, and water and a good working relationship with your veterinarian can effectively reduce parasite problems.

Recommended management practices for dealing with parasites are listed below.

- Isolate newly acquired animals so they will not contaminate those already on your management program. This step is especially important for preventing the spread of external parasites.
- Prevent overstocking for long periods of time. Overstocking increases the internal parasite contamination rate and increases ingestion of infective larvae.
- Put animals on clean pastures after treatment, if possible. Do not return them to the same pasture.
- Use clean, rested pastures for lambs after weaning. Lambs are more susceptible to internal parasites than older sheep.
- Do not feed supplements and roughage by spreading them on the ground. Use feed bunks, or make sure that you use a clean area for feeding if bunks are not available. If ground feeding is necessary, use a clean sod and rotate frequently.
- Proper nutrition is essential to control internal parasites. Thin animals are more susceptible to parasitism than are sheep in good condition.
- Use drylot feeding, if available, to help break cycles and prevent contamination of weaned lambs. However, be aware that prolonged close confinement can be detrimental as well.
- Plan treatments to control external and internal parasites with your local veterinarian ahead of time.

**Internal Parasites.** Internal parasites are a serious problem with sheep. Controlling them is a never-ending battle. It is difficult, if not impossible, to completely eliminate internal parasites from the environment. But you can effectively control their number by managing the environment. A successful program of parasite control can increase the animal's productivity, improve feed efficiency, and lengthen life span.

The sheep producer must develop a program that will meet the needs of his or her particular flock. The most effective way to control parasites is to interrupt their life cycle and thereby prevent larvae from entering and infecting the sheep.

Careful observation of the flock is necessary to determine when treatment is needed. Monitor the parasite load, including tapeworms, by fecal exam, and deworm using the appropriate compound. Internal parasites can build up a resistance to certain anthelmintics. Your veterinarian can best advise you about which drugs to use and when to administer them. A recommended practice is to change anthelmintics occasionally to keep the parasites from building up a resistance. Veterinarians can also help you with obtaining periodic fecal samples, 7 to 10 days after worming, to assess the effectiveness of the program.

**External Parasites.** Several kinds of lice, keds (sheep ticks), sheep bot flies, wool maggots, and other flies can cause great economic losses in sheep. A variety of chemicals and treatment techniques are available. The three main types of preventive formulations are sprays, dips, and pour-ons. Sprays and dips are most effective after shearing.

Sprays, dips, and pour-ons help control parasites, help treat and provide protection from infection and fly strikes on shearing cuts, help seal the tips of the wool fibers to provide some warmth, and help reduce the labor needed to put the animals back in the pen for treatment at a later date.

Use pour-on treatments when sheep have fleece regrowth which reduces the effectiveness of spraying. You may use pour-on treatments about a month before shearing if parasite problems have become epidemic.

Different chemicals and management practices are effective for different parasites. Preventive measures will minimize wool maggot infestations. Shearing in late winter or early spring before fly activity starts will reduce the potential for infestations. Spray, dip, and pour-on formulations are approved for keds and lice.

Lice can live on sheep year-round. They spread among individuals or flocks by contact. A clean flock can become infested by grazing on a pasture previously grazed by lousy sheep. Lice can survive off sheep for 3 to 18 days and are more abundant in winter and spring, when they usually do the most damage. Heavy infestations of lice will result in poor-quality fleeces at shearing time.

Two types of spray materials, chlorinated hydrocarbons and organic phosphates, are used to control lice on sheep. Lice have been known to build
up resistance to certain sprays. When this occurs, switch to a different type of spray. These parasites usually concentrate on the under parts of the sheep, in the fore flanks, around the udder or scrotum, on the belly, and under the neck. Spraying or dipping with the recommended livestock sprays usually will control the lice. Dipping is more effective in controlling lice because the animal is completely immersed. Dipping treats the under-portion of the animal, which is difficult to reach by spraying.

Many livestock sprays are dangerous to humans, so follow these safety rules:

- Do not exceed the recommended strength of the solution.
- Do not mix spray solutions with your hands.
- Spray with the wind, not against it.
- Do not spray in a shed or building.
- Bathe and change clothes as soon as possible after spraying.

**Predator Control**

Sheep are vulnerable to predatory animals and dogs. Lambs are the most susceptible; they may be killed by coyotes, domestic dogs, bobcats, foxes, vultures, and, at times, even smaller mammals such as raccoons.

Control measures may differ for each predator species. Even the use of net-wire and electric fences and guard dogs has not totally solved the problem.

In practice, most net fences in good repair will provide enough protection. Ordinary seven-wire, barbed-wire fence can offer some protection if stays are used between posts. Position the wires 6 inches apart near the bottom, increasing the distance between the higher wires. To provide reasonable assurance against predators that can jump, a fence should be at least 5½ feet high.

Electric fencing offers a more economical approach, but maintenance is often a problem. This type of fencing will not give you a complete solution to the problem of predators.

Producers have begun using working sheep dogs, along with well-designed and well-constructed fences, with good results. Some of the more popular breeds are the Anatolian Shepherd and the Great Pyrenees.

**Marketing**

The marketing phase of sheep production consists of **lamb marketing**, or selling live animals, and **wool marketing**, or selling the harvested wool. These two sheep enterprises earn profits.