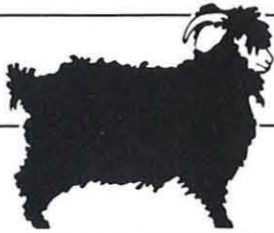


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# Your 4-H Angora Goat Project

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# Your 4-H Angora Goat Project

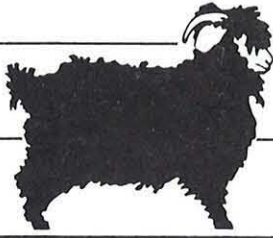
## Contents

<b>Introduction</b> .....	<b>1</b>	Internal Parasites of Goats .....	22
What You Can Learn.....	1	External Parasites of Goats .....	22
Project and Member Objectives ..	1	Other Health Problems.....	23
Records to Keep .....	2	<b>Exhibiting Your Goats</b> .....	<b>25</b>
<b>A History of Angora Goats</b> ...	<b>3</b>	Grooming Your Goats for	
<b>Selecting Goats</b>		Show .....	25
<b>for Your Project</b> .....	<b>4</b>	In the Show Ring .....	26
Sources of Angora Goats .....	4	Suggested Guidelines for	
Angora Goat Prices .....	4	Angora Goat Showmanship ...	29
Where to Get the Money .....	5	Angora Goat Type Scorecard ...	30
Goat Identification .....	6	Angora Goat Mohair Judging	
Evaluating Angora Goats .....	6	Placing and Reasons Sheet .....	31
<b>Care and Management</b> .....	<b>8</b>	<b>Marketing</b> .....	<b>32</b>
The Early Stages .....	8	Selling Your Goats .....	32
The Later Stages .....	8	<b>Other Activities</b> .....	<b>33</b>
<b>Facilities and Equipment</b> .....	<b>14</b>	Demonstrations and	
Housing .....	14	Illustrated Talks .....	33
Fencing .....	14	Public Speaking .....	33
Feeders.....	15	Judging .....	33
Waterers .....	16	Fitting and Showing .....	33
Pasture .....	16	4-H Camp .....	33
List of Equipment .....	16	4-H Trips and Tours.....	33
<b>Nutrition</b> .....	<b>17</b>	4-H Animal Science Week	
Feed Nutrients .....	17	and 4-H Caprine Expo .....	33
Feeds for Goats .....	17	Careers in Animal Science .....	34
Feeding Your Goats .....	19	<b>References</b> .....	<b>35</b>
<b>Common Diseases—Their</b>		<b>Registries and</b>	
<b>Prevention and Control</b> .....	<b>21</b>	<b>Breed Associations</b> .....	<b>35</b>
Infectious Diseases .....	21	<b>Glossary</b> .....	<b>36</b>

This publication was developed by 4-H Program Leader and Goat Specialist Julie Chapin of the Department of Animal Science, Michigan State University. The graphic artist for the publication was Cynthia Alderson. The illustrations were done by Kathryn Darnell. The manuscript was edited by Rebecca McKee, 4-H publications editor.

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# Introduction

Angora goats can be a fun and rewarding 4-H project for young people. Angora goats are smaller than dairy goats, with quiet, friendly dispositions. They can be pastured easily with other animals such as sheep or cattle, and are generally healthy and hardy animals.

Angora goats are very friendly and loving animals that are easy to handle. After working with your goats for a short time, you will find that they'll follow you around, rather than having to be driven to a new site. At feeding time, just rattle a bucket of grain and watch them race to you.

In addition to the learning associated with the everyday care and feeding of an animal, Angora goats also provide a second project area—that of the handling, marketing and uses of mohair. Angora goats are mainly raised for their mohair production. The 4-H Angora goat project can easily be expanded to include spinning or weaving.

## What You Can Learn

In the 4-H Angora goat project you can learn:

- How to select goats for your project.
- Basic management practices.
- Fitting and showing.
- Basic goat nutrition.
- Parasite control.
- Animal health practices.
- Judging techniques.
- Uses of mohair.

- Breeding and genetics.
- Shearing techniques.
- Mohair evaluation.
- Housing and facilities requirements.
- Animal diseases.
- Reproduction.

These are only a few of the many things you can learn. Working with your leader, you may want to make your own list of the things you want to learn from this project. Each year your project activities can and should build on your experiences from the previous year. Activities can be undertaken in any order you wish.

## Project and Member Objectives

The objective of the 4-H Angora goat project is to encourage integrity, sportsmanship, cooperation and an ability to communicate through activities such as demonstrations, talks, judging events, tours and exhibits.

Knowing correct procedures for running and participating in a business meeting will be important to you all of your life. Your 4-H goat club is an excellent place to learn and practice these skills.

Here are some objectives you should keep in mind for your 4-H Angora goat project:

- To acquire information about and an understanding of scientific production and management practices through keeping records and owning and caring for livestock.

- To acquire skills in executing production and management decisions.
- To provide business experience and develop knowledge of the values and principles of purchasing, marketing, record-keeping and securing credit.
- To learn and use efficient procedures and methods in marketing livestock and their products.
- To develop an understanding and appreciation of the livestock and mohair industries and their role in the agricultural and commercial economy of the country.
- To explore the livestock industry as a career.

The 4-H Angora goat project consists of rearing Angora goats and selling their mohair. This same procedure is carried on regularly by adult Angora goat raisers. You will learn much of the same basic information adults engaged in Angora goat production use.

Don't expect to make a big profit on your project. Your profit and loss will depend on the cost of the goats when you start the project, the cost of the feed used, other costs (such as veterinarian, shearing and equipment bills) and the price you receive for your goats' mohair when you sell it.

If you market your goats or mohair at your county or area fair or show, generous people in your community may pay more for your products than their true market value. This increases your chance for a profit. However, it is important that

you know the difference between the regular goat or mohair market price or value of your goat or mohair and the price you receive at your fair or show sale. Your 4-H leader can help you get this information.

If your goats or mohair bring more than the regular market price, you should realize that this difference is a reward for your having participated in the project and for having carried out the practices you learned.

### Records to Keep

The reasons for keeping records on your Angora goat projects are to:

- Help you learn more about animals, their rate of growth, the feed they require and their habits.
- Help you plan future projects.
- Determine if you made or lost money and how much.
- Improve your management practices.
- Give you a record of your project activities.

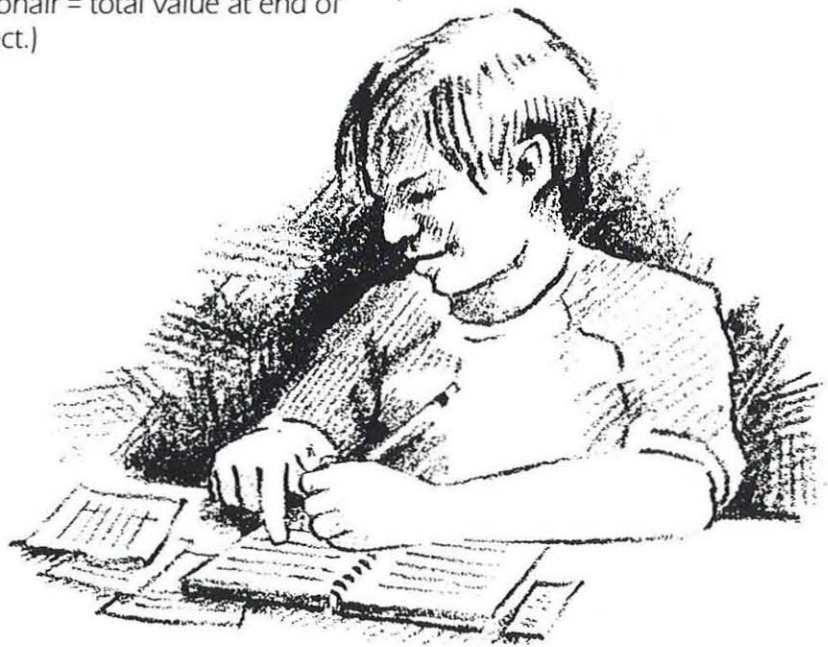
The following information about your Angora goat project will be helpful and interesting. Use the **4-H Market Livestock Record Book for Intermediate and Advanced Members** (4-H 1177) to record it.

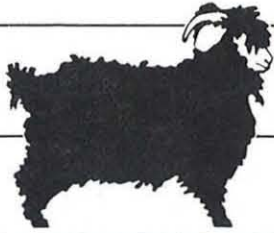
- The total cost or value of the goats at the start of the project.
- The date your goats were sheared and the length of the mohair at 30-day intervals after the shearing.
- The money received from the sale of the goats.
- The money received from the sale of the mohair.
- The amount of feed used.
- The total cost of medicine and veterinary fees.

- Anything interesting or unusual that happened to your goats during the project.

From the above information you can:

- Figure your goats' average daily mohair growth.
- Figure the average cost to raise one animal for one year.
- Figure the total value of the project (your income or loss) at the end of the year. (Beginning value of animal – feed costs and other expenses + dollars from sale of mohair = total value at end of project.)





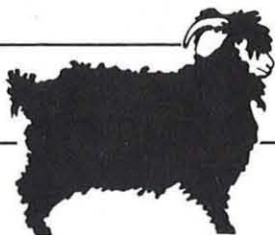
# A History of Angora Goats

Angora goats probably came to the Turkish province of Ankara in Asia Minor from the high Himalayas in the thirteenth century. The province that is now known as Ankara was originally spelled "Angora," and is probably what Angora goats are named for. The Turks originally kept the goats as pets. They clipped the animals' fleeces and spun and wove the mohair for their own use.

In 1835 the English began importing raw mohair from Turkey. They had developed machines to process raw mohair and soon began commercial production of mohair yarns and fabrics. Today, England is still a major processor of mohair yarns and fabrics, along with France, Italy, Germany, South Africa, Turkey and Japan. Other countries which raise Angora goats for their mohair are Canada, the United States, Australia, New Zealand and Argentina.

Several European breeders began exporting Angoras to northern Ontario and Quebec, Canada, in the 1800s. Angora production has spread as far south as Texas in the United States over the past 70 years. The growing American Angora industry is centered in Texas, with offshoots in Virginia and the north central states (including Michigan).





# Selecting Goats for Your Project

When selecting a 4-H project animal, choose the highest quality goats you can afford. Look for productive, sound goats that are capable of producing high quality mohair. (Fig. 1 shows the parts of an Angora goat.) Avoid goats with major body or mohair weaknesses even if they have several other good traits.

## Sources of Angora Goats

You can obtain Angora goats from several sources, including:

- Your own or your parents' herd (also called a trip).
- A neighbor's or friend's purebred or commercial herd.
- Special goat sales.
- Regular goat sales at weekly auctions.

Be sure to buy your goats from a reputable breeder or producer. The producer should be able (and willing) to supply background information on the goats' parents and on their reproductive history and mohair production traits. Look for animals with strong family histories of high quality hair production, no major body faults and good dispositions. Beware of buying animals that don't have ear tags or some other means of permanent identification. This lack could mean that the owner doesn't keep proper records on the animals.

If you start with home-raised goats, weigh them when they start on feed and figure their value using

current market price. You will need this information to complete your livestock record book.

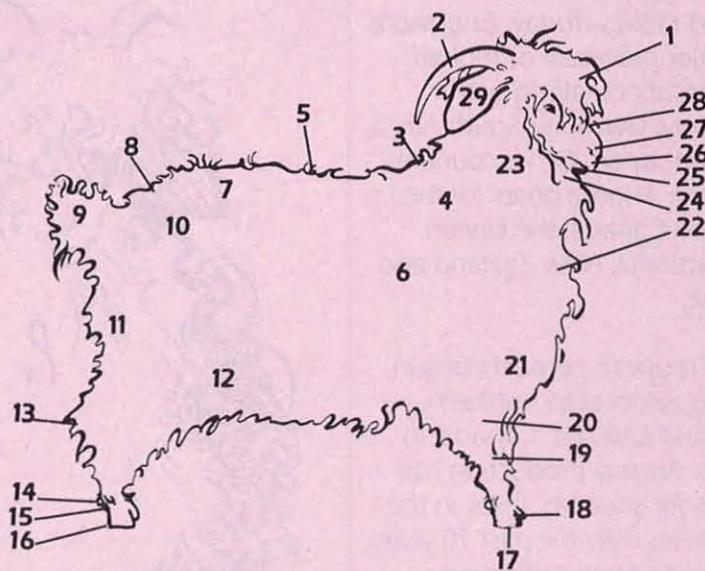
## Angora Goat Prices

Young Angora goat prices depend a great deal on the price of adult Angoras and mohair when you buy your young stock. When you have the privilege of selecting the top

goats from a large group, you should expect to pay some premium in price.

However, do **not** pay a high price for a goat with the idea that this alone will assure you of winning a grand championship. It takes good feeding and a lot of hard work, along with the right kind of goats and good showmanship, to have a grand champion.

**Figure 1. The parts of the Angora goat.**



- |             |              |             |                    |
|-------------|--------------|-------------|--------------------|
| 1. Forehead | 9. Tail      | 16. Heel    | 23. Neck           |
| 2. Horns    | 10. Thurl    | 17. Sole    | 24. Throat         |
| 3. Withers  | 11. Thigh    | 18. Foot    | 25. Jaw            |
| 4. Shoulder | 12. Flank    | 19. Knee    | 26. Muzzle         |
| 5. Back     | 13. Hock     | 20. Forearm | 27. Nostril        |
| 6. Rib      | 14. Dew claw | 21. Chest   | 28. Bridge of nose |
| 7. Hip      | 15. Pastern  | 22. Dewlap  | 29. Ear            |
| 8. Rump     |              |             |                    |

## Where to Get the Money

Your money problems are the same as those of any other goat producer: "Where will I get the money to buy and raise my Angora goats?" and "How much money will I need?"

There are probably three sources of money available to you:

- Your savings account
- Borrowing from your parents
- Borrowing from your bank or credit union

If you borrow the money from your parents, pay them interest as if you were borrowing from a bank or credit union. Keep the transaction on a businesslike basis.

Borrowing from your local bank will give you good business training. Have your parents go with you. The loan officer will need to know three things:

- How much money you will need.
- How long you will need the money.
- How you will repay your loan if your goats die or your project loses money.

If you need to borrow money to buy feed for your project animal, you will need to know how much your goat will eat. Check the information on suggested diets for Angoras on page 20.

Check out current prices of hay and grain mixtures at your local elevator or feed store to figure out your annual feeding cost for each ani-

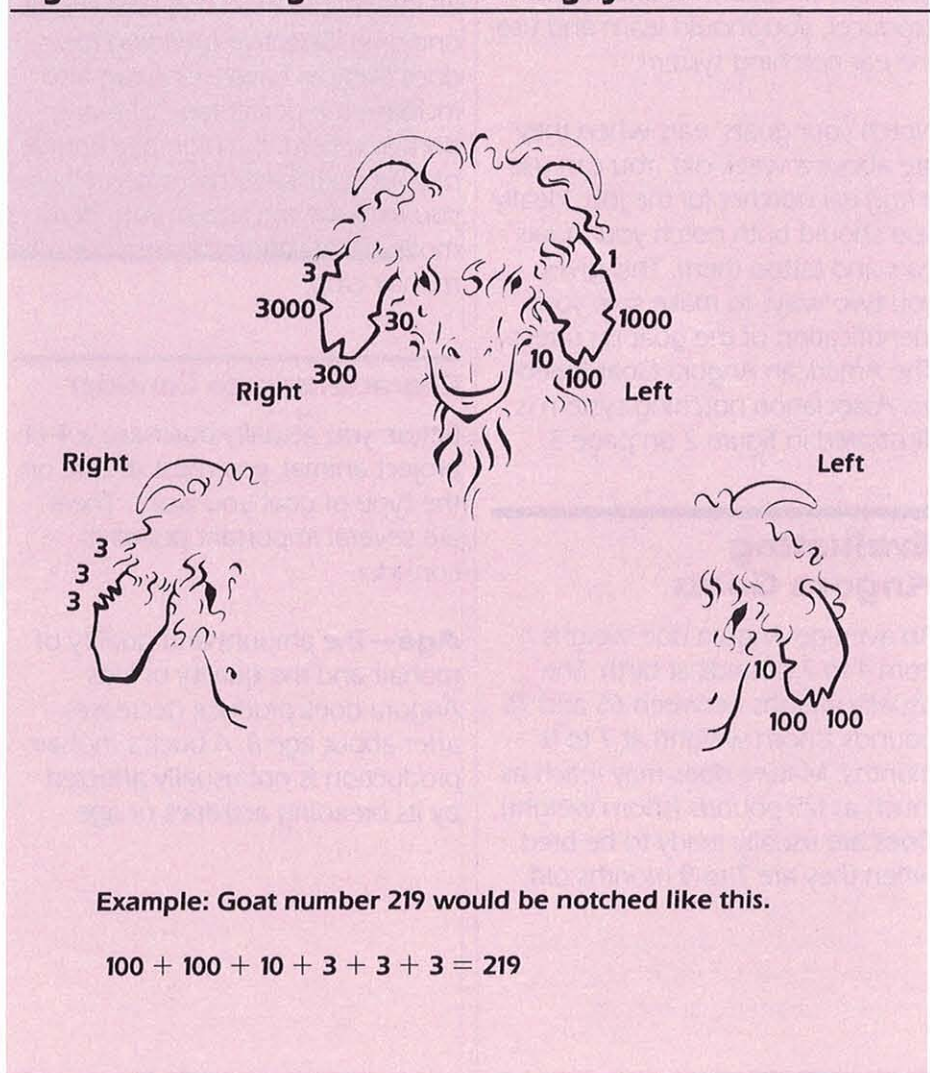
mal. You can reduce these costs by pasturing your goats in the summer. If you have adequate pasture, you won't need to buy as much hay. This can make a big difference in your feed bills. The **Nutrition** section of this book has more information on the nutritional need of Angora goats.

You will pay interest on the money you borrow from the bank or credit union. If you borrow \$130 for each goat to finance your project, you will need the money for about five months (for example, from April to August). If the bank charges 12 per-

cent annual interest, you will pay a 5 percent interest charge for the period of time you have the money (12 percent annual rate: one percent a month  $\times$  five months = 5 percent interest charge). At this interest rate, you will pay \$6.50 ( $\$130 \times 0.05$ ) in interest. So, when you repay the bank, you will need to pay them \$136.50 (the original \$130 you borrowed plus \$6.50 in interest).

Paying off your loan when it is due will help your reputation as a borrower. This is called your credit rating. Whether you obtain the money from your parents or borrow it from

**Figure 2. The Angora ear notching system.**



a bank or credit union, it is important to pay your debts by their due dates. Honesty and integrity are important to you as a 4-H'er and as a citizen.

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## Goat Identification

Very often Angora goats won't have any easily recognizable markings or traits that allow you to identify them. Consequently, Angora breeders use other methods to identify their goats. You can use ear tags, but they are often lost and may be difficult to read. Many producers depend on ear notching because it is a permanent method of goat identification. As an Angora producer, you should learn and use the ear notching system.

Notch your goats' ears when they are about a week old. You can use a hog ear notcher for the job. Ideally you should both notch your goats' ears and tattoo them. This gives you two ways to make sure your identification of the goat is correct. The American Angora Goat Breeders Association notching system is illustrated in figure 2 on page 5.

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## Evaluating Angora Goats

An average Angora doe weighs from 4 to 7 pounds at birth. She usually weighs between 65 and 75 pounds (shorn weight) at 7 to 9 months. Mature does may reach as much as 125 pounds (shorn weight). Does are usually ready to be bred when they are 7 to 9 months old.

Angora bucks average from 5 to 7 pounds at birth. They usually weigh up to 120 pounds (shorn weight) at 18 to 20 months. Bucks are able to begin breeding at 6 to 9 months old. Bucks continue to gain weight as they age. Depending on their environment and your management practices, they may reach 200 pounds (shorn weight) by the time they are 5 years old.

An Angora doe usually gives birth to a single kid, but twins are not unusual. In some herds, anywhere from 25 to 80 percent of the does may have twins. The doe's physical condition, what she eats, the parasite levels in her body and her age all affect how many kids she has at one time. Selective breeding for does likely to have twins can also increase the percentage of twins born in a herd. If a high percentage of your does have twins it will help you increase the size of your herd more quickly and increase your mohair crop.

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## Characteristics to Consider

Before you actually purchase a 4-H project animal, you must decide on the type of goat you want. There are several important points to consider.

**Age**—The amount and quality of mohair and the quality of kids Angora does produce decreases after about age 8. A buck's mohair production is not usually affected by its breeding activities or age.

You can figure out how old your goats are by checking their teeth. Kids have baby teeth until they are about 18 months old, when they cut their first two permanent front teeth. After these two teeth emerge, an animal is considered a yearling. The goat will cut two more large teeth every 12 months until it has eight large teeth and is aged 4. A goat with all eight large teeth is called a "fullmouth." As goats age, they begin to lose some teeth. At that point, they are called "brokenmouths."

**Uniformity of fleece**—This is one of the most important points to consider when choosing project animals. It is acceptable for the neck hair to be slightly coarser than the mohair on the rest of the goat's body. However, the rest of the fleece should be very similar in texture, curl and density of cover.

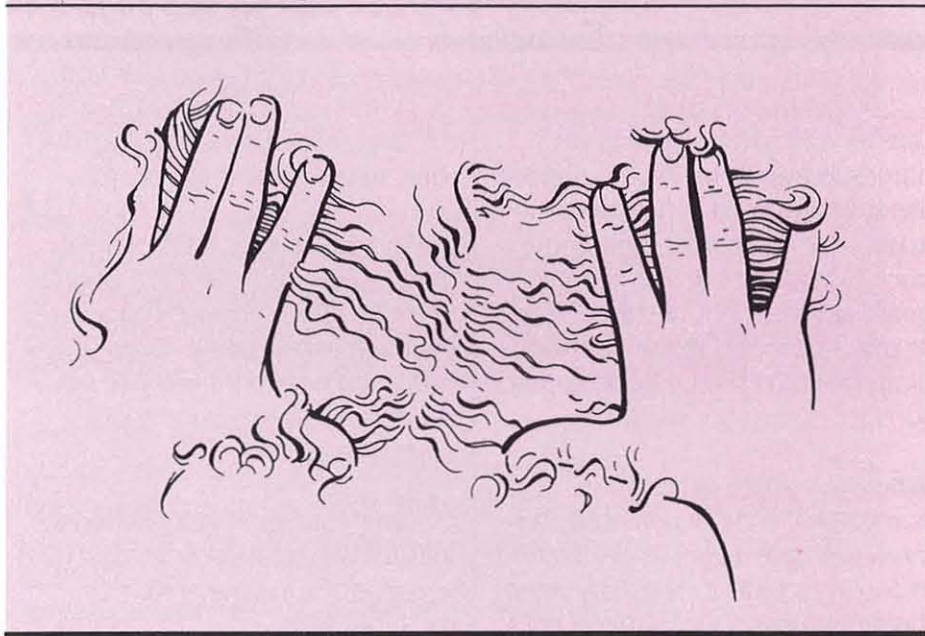
**Conformation**—Weaknesses in structural soundness, and correctness of feet, legs and mouth are important points. Avoid purchasing animals with poor conformation.

**Size**—Compare the animal you are considering with others that are the same age. Many breeders prefer larger goats because such animals tend to be hardier and produce heavier fleeces than smaller goats. Size may also affect a goat's fertility. This means that smaller goats usually are not desirable breeding animals.

**Fertility**—This is another high-priority item to consider when choosing breeding animals. Choose does with a record of producing twins. Avoid does with poor breeding records or those that have



**Figure 3. Checking the density of a fleece.**



trouble conceiving. Does that have aborted several pregnancies may have received inadequate feed, suffer from a variety of diseases or be too old. Good breeders can show you the reproductive records of their animals.

**Staple length**—a good Angora goat should produce about 1 inch of mohair a month. The mohair's staple length is the most important factor affecting the fleece weight. When short mohair is mixed with regular length mohair, the resulting yarn is of poor quality. A short staple length is an undesirable genetic trait, and goats with short staple lengths should be rejected.

**Grease content**—Avoid goats with excessively greasy coats (the fleece looks dark) and those with dry, fluffy fleeces.

**Density**—Density is the number of mohair fibers in a square inch of the goat's fleece. You should choose goats with dense fleeces,

but it's hard to measure density accurately. One way is to part the fleece and check the amount of exposed skin area (see fig. 3). Avoid animals with light, fluffy fleeces because they will produce low total fleece weights (which reduces your profit).

**Kemp**—Animals with kemp (chalky white hair) in their coats should be rejected. Goats with chalky white faces and ears probably have a high percentage of kemp. Check the britch area (under the tail), down the back and around the tail head for kemp. Fleeces with less than 1 percent kemp can be tolerated.

**Colored fibers**—Goats with colored fibers in their coats should be rejected unless you have a market for natural colored fibers.

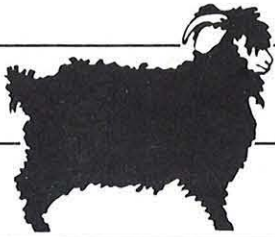
**Mohair quality**—This refers to the fineness, staple length, soundness and purity of the fleece. One way to evaluate a fleece is by measuring the diameter of the individual

fibers. Soundness refers to the "breaks" or thin spots in the fleece. Purity means the amount of kemp and colored fibers in the fleece.

### **Registered or Grade?**

Whether to raise registered or grade animals is up to you. Keep in mind, though, that unless you are raising goats to sell as breeding stock, and as long as the goats are of the same quality, there is no real advantage to choosing registered over grade animals. Registered animals bring higher resale prices, but they will also cost you more in the first place.

You can get information on registered goats by writing to:  
Angora Goat Records  
American Angora Goat  
Breeders Association  
P.O. Box 195  
Rock Springs, TX 78880



# Care and Management

## The Early Stages

### Stress

Though stress is hard to define, it is important that you understand the concept so that you can give your goats proper care. Stress is a goat's physical or psychological reaction to circumstances that frighten, irritate, endanger or excite it. Any time a goat gets scared, it has been stressed.

Hauling, vaccinating, introducing it to strange surroundings and strange goats, and many other things can scare or stress your goat. When a goat is stressed, it will be more susceptible to sickness. It may eat less feed, grow slower and produce inferior mohair. It is important to minimize stress throughout the goat's life, but it is especially important when you first get your goats home.

### Trucking Your Goats Home

Handle your goats quietly during loading to avoid getting them too excited. Before you leave the producer who raised your goats, try to find out as much as possible about your goats. Ask about their bloodlines and age, how long they have been weaned, and whether they've been treated for internal and external parasites. It would also be very helpful to find out what feeds or diet they have been fed previously. If possible, buy a sack of this feed and start your goats on it in their new home.

Take care in getting your goats home. To avoid chilling your goats, always haul them in a covered truck. In cold weather, bedding the truck with dry straw will keep your goats warm. In hot weather, sand or sawdust makes good truck bedding. Don't park your truck in direct sunlight during hot weather.

When you arrive at the goats' new home, have a clean pen ready for them with the feeder and waterer in place. Provide a clean, dry sleeping area under a roof. During cold weather, bed the sleeping area with straw. Try to familiarize your goats with their new home so that they know where the feed, water and shelter are located. Remember, you want to minimize stress on your goats during this adjustment period.

### General Health

It's important to maintain the health of your newly acquired goats. The first 2 or 3 weeks are critical, so you should check your goats several times each day during this period. Frequent observation allows you to detect any small problems before they grow into big ones. Strong appetites, body temperatures of 101.5°F to 104°F and silky, supple haircoats are all signs of healthy goats. Healthy goats are active and alert with bright looks in their eyes.

A goat will give you many clues when it isn't feeling well. Some of the clues are poor appetite, gauntness, rough hair coat, a dull look in

the eyes, excessive coughing, diarrhea, inactivity and lameness.

If you think a goat is sick, take its rectal temperature. If it is 2 degrees or more above normal, call a veterinarian immediately. Quick diagnosis and treatment will pay big dividends. Always handle sick animals with care.

Contact your local veterinarian for information on recommended goat vaccinations in your area.

## The Later Stages

### Wethering (Castrating) Bucks

Bucks can be neutered any time after they are born. Many breeders wait until the young bucks are about 6 months old before deciding which to castrate. The producers decide based on the quality and amount of the bucks' mohair and their physical development. The young males that have not been castrated are evaluated again when they reach 9 or 10 months old.

Some wethers (castrated male goats) produce as much as 12 pounds of mohair from one shearing. This makes them attractive to many producers because the animals produce a great deal of mohair, don't have the kidding or lactating problems that does do, and don't need as much feed as bucks or does.

## Shearing

Angoras are normally sheared (see fig. 4) twice a year, usually in March or April and again in September or October. Keep your goats inside for 2 days before shearing so that their fleeces are as dry as possible. Wet mohair can be almost impossible to shear. In fact, most shearers refuse to shear wet goats. If you do manage to shear your wet goats, the mohair may actually mold in storage.

After your goats have been sheared, provide them with plenty of shelter for about 6 weeks or until their hair grows out about 1 inch. During the summer, newly sheared goats must have shade or their skin may sunburn.

Kids usually produce from 6 to 10 pounds of mohair in their first year. The mohair production of adult goats ranges from 12 to 32 pounds a year. Large bucks produce even more than that.

Kid hair is usually the finest and highest grade of mohair. As animals age, their mohair becomes coarser. If you feed your goats a proper diet and keep them relatively free of parasites, the amount of mohair your herd produces should increase. You can also help increase the amount of mohair by culling poor producers.

Mohair is graded primarily on its fineness and the variation in fiber diameters. After the herd is sheared, the mohair should be sorted into the grades listed below and packed in burlap bags. Stained mohair or mohair with a lot of burrs or weeds in it should be packed separately. There are 12 grades of mohair, but

**Figure 4. Shearing an Angora goat.**



the most general categories for grading hair are:

- Adult
- Young adult
- First shearing kid
- Second shearing kid
- Coarse
- Stained
- Burry
- Contaminated (with such things as hay, seeds and thistle heads)

### Mohair Facts

Mohair is the long, strong, lustrous fiber produced by the Angora goat. People have prized the fiber for its many uses for centuries. Mohair was woven into the robes of Biblical characters. It probably played its biggest fashion role during the Victorian era. Recently mohair has been combined with synthetic materials, which has increased its popularity tremendously.

Mohair lends a special feeling of luxury to fabric, whether it is used alone or in a blend. Mohair works well in blends with natural (such as wool, cotton and silk) and synthetic fibers (such as rayon and acrylic). Because it holds dye well, mohair can produce more brilliant color than almost any other fiber. Mohair's sheen gives it a reflective glow with a halo-like quality.

Tests have shown that, unlike many synthetic fibers, mohair won't burn. In fact, even sparks won't ignite mohair fabric. Partly because of this quality, mohair fabrics were used in furniture coverings, draperies, airplane seats and other commercial uses before synthetic fabrics were invented.

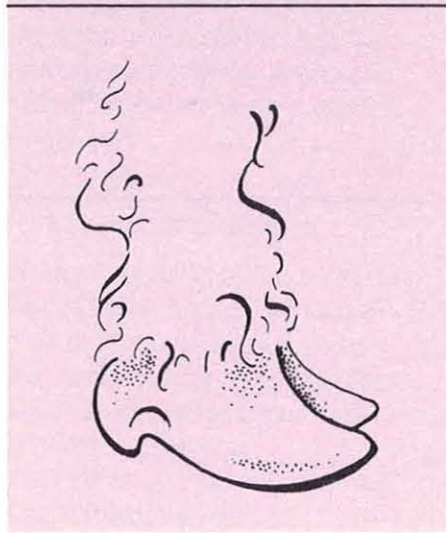
Adult Angoras that are sheared twice a year can produce from 12 to

32 pounds of mohair annually. Some top quality bucks produce up to 40 pounds of mohair in a single year; the best does produce 25 to 30 pounds. Bucks and wethers usually produce more mohair than does. This difference is caused by the strain that pregnancy and milk production places on does. Another reason is that bucks and wethers are usually larger than does.

### Hoof Trimming

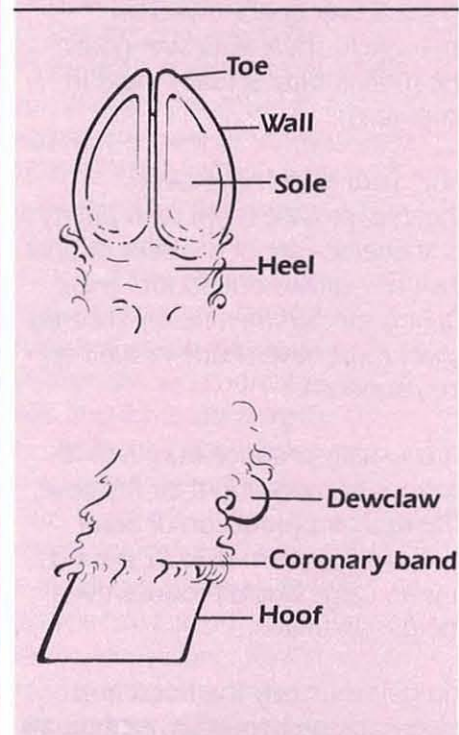
Strong feet and legs are very important to your goats. If the animals develop hoof or leg problems they'll have trouble moving around to feed and may have to be destroyed. Angora goats' hooves are relatively soft and grow rapidly. Wild goats wear off their hooves by running over rough terrain. Your goats, however, rely on you to make sure their hooves are in good shape. Do this by trimming the goats' hooves regularly (about every 3 or 4 months) before they become too overgrown or misshapen (see fig. 5). A well-trimmed hoof looks like that of a newborn kid.

**Figure 5. An overgrown, misshapen hoof.**

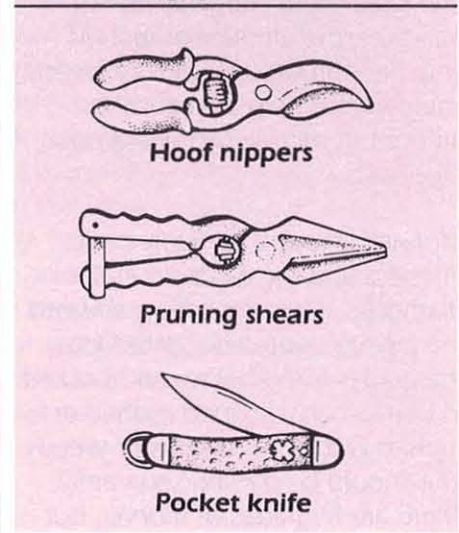


Before you trim any goats' hooves, study and learn the parts of the hoof (see fig. 6). Many producers prefer to use hoof trimmers on their goats, although you can also use small nippers, a pocket knife or good pruning shears (see fig. 7).

**Figure 6. The parts of the hoof.**



**Figure 7. Tools for trimming goat hooves.**



To position a goat for hoof trimming, set the animal back on its rump with its head between your legs (see fig. 8). The goat will usually relax and lie quietly while it is being held this way.

Your goal should be to trim the hoof flat on the bottom, parallel with the hair along the top of the foot (see fig. 9). Remove any part of the hoof that has grown down from the sides and is folded under.

**Figure 8. Proper goat hold while trimming hooves.**

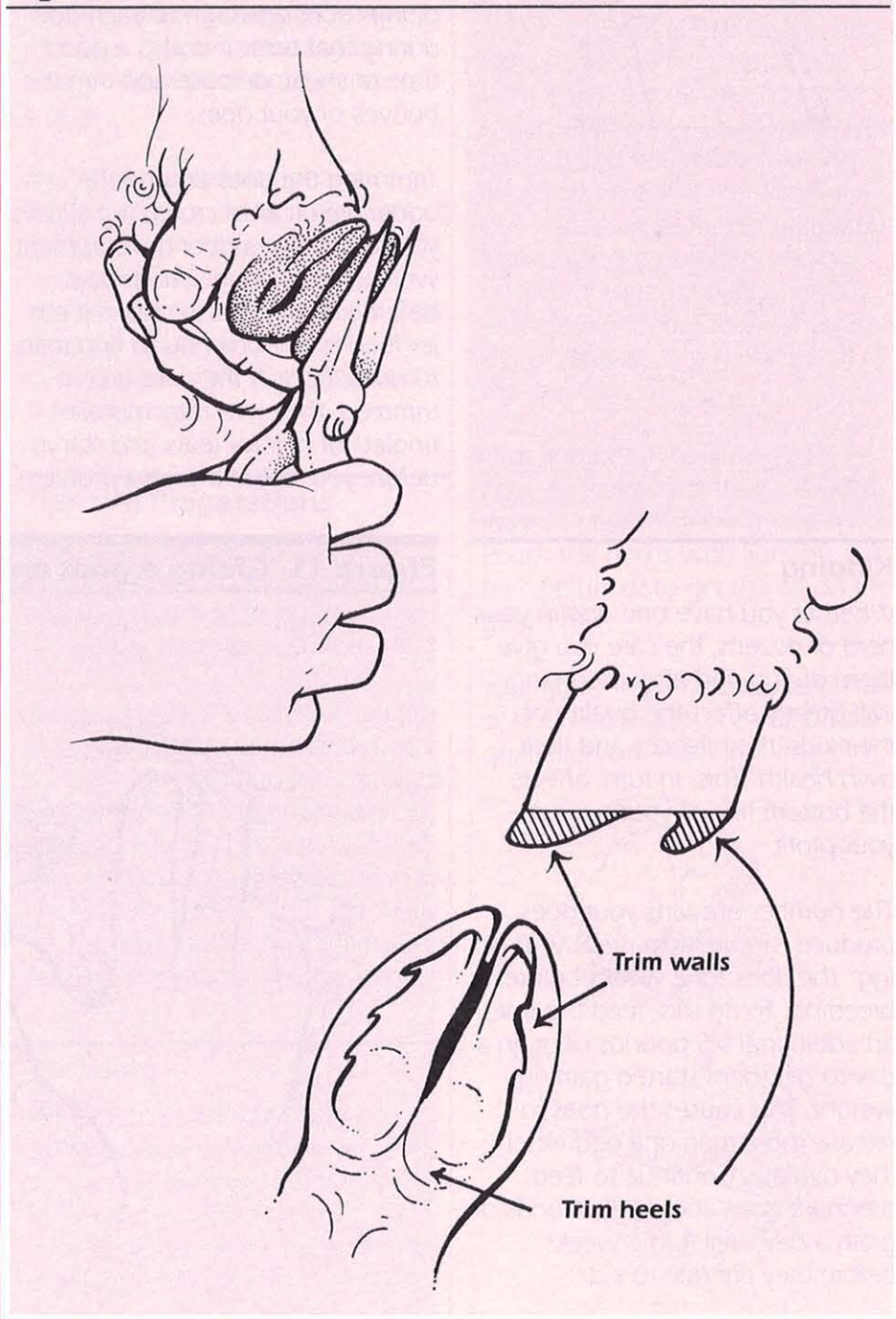


When you are finished, the heel should be level and the hoof flat (see fig. 10) on page 12.

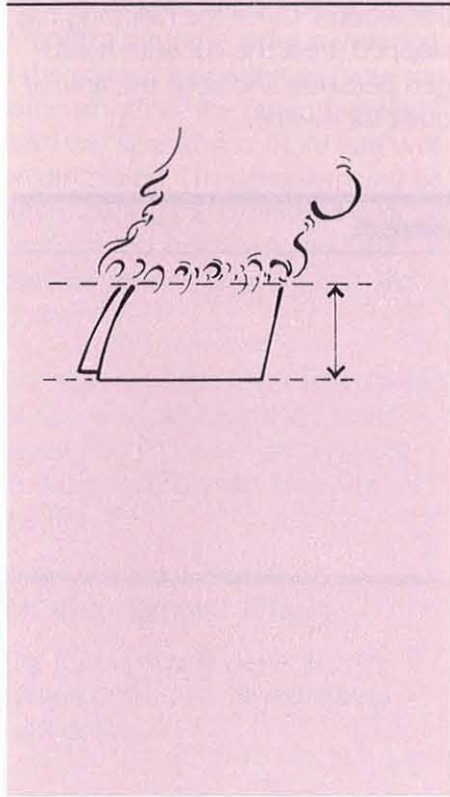
Take little bits of the hoof off at a time. When you begin to see pink in the hoof, **stop!** If you cut too

deeply, the hoof will bleed and the animal will be lame. Stop any bleeding by applying pressure to the wound. Once the bleeding has stopped, treat the cut with hydrogen peroxide and keep the animal quiet for awhile.

**Figure 9. Hoof areas to be trimmed.**



**Figure 10. A correctly trimmed hoof.**



The gestation period for an Angora goat is 150 to 155 days. During this time you need to watch the does carefully for signs of problems. Four to six weeks before the does are due, increase their grain rations to 1 or 1.5 pounds a day and give them the best hay you have. Some producers also administer a dose (1 cc for each 40 pounds of body weight) of injectible selenium to each doe during that time. It is also a good time to shear, delouse and trim the hooves of your does.

Trimming the does around the udder area (called crotching) allows you to spot the udder development which occurs a week to 10 days before kidding. It also makes it easier for the newborn kid to find teats to nurse from. If the does aren't trimmed, their kids may mistake ringlets of hair for teats and starve before you realize there's a problem.

As kidding time approaches, it is important that all the equipment you will need is on hand and in good repair. You will need:

- 4-foot by 4-foot pens (one for each doe and her kid or kids)
- 7 percent tincture of iodine
- Heat lamps
- Injectable selenium
- Feeders
- Waterers
- Injectable vitamin A, D and E solution
- Paper towels
- Cotton string (for tying off the umbilical cord)

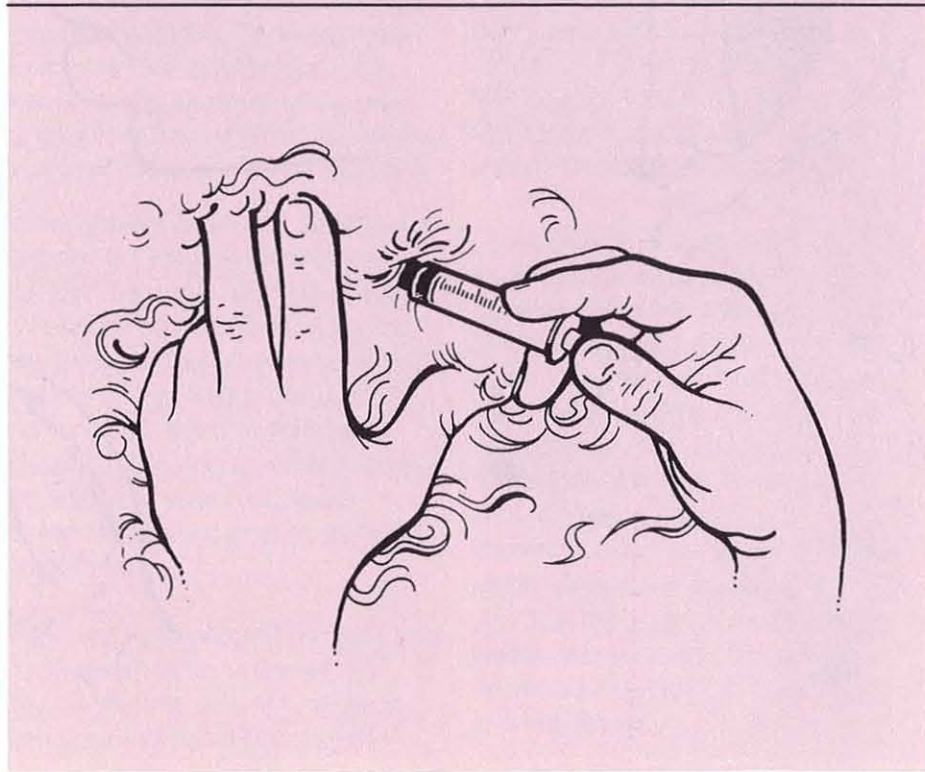
When a kid is born, dip its navel in the iodine solution. Give it a shot of 0.5 cc injectible selenium under the skin and 0.25 cc of the vitamin solution in a muscle (see fig. 11). Dry the kid off and (if the weather is extremely cold) place it and its mother in a pen with a 60-watt

## Kidding

Whether you have one doe in your herd or dozens, the care you give them during and after pregnancy will greatly affect the quality of their kids, their fleeces and their own health. This, in turn, affects the bottom line of your project—your profit.

The number of twins your does produce can be increased by “flushing” the does for 2 weeks before breeding. To do this, feed the does an additional 0.5 pounds of grain a day to get them started gaining weight. This causes the does to release more than one egg when they ovulate. Continue to feed pregnant does about 0.5 pounds of grain a day until 4 to 6 weeks before they are due to kid.

**Figure 11. Giving a goat an injection.**



light bulb. Kids born in February and March generally need more help to stay warm than kids born from April to June.

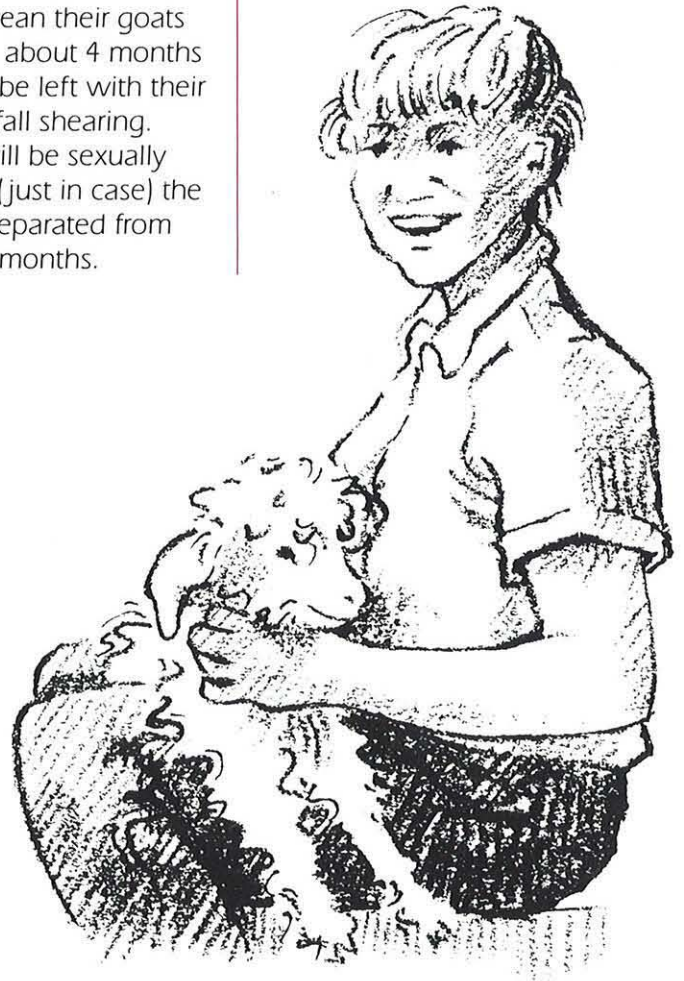
Keep the doe and kid together in the same pen for 24 to 48 hours to ensure that they have mothered up properly. Be sure to strip out the doe's teats to clear out any waxy plug in the teat canal (such a plug could prevent the kid from getting milk). While the doe and her kid are penned together, identify the kid with whatever permanent marking system you use (such as ear tags, tattoos or ear notches).

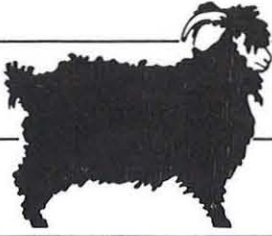
After the kids and their mothers are released into your regular pen or pasture, you may want to set up a creep feeder for the goat kids. This feeder arrangement is usually set up in a corner and blocked off so

that the adult goats can't get to it. A 60-watt light bulb in the creep area will help attract the kids. You can stock the creep feeder with your regular grain ration or any good lamb pellet that contains 16 percent crude protein.

Continue to feed the does 1 to 1.5 pounds of grain a day for at least 6 weeks after kidding, when you can again lower the amount of grain to 0.5 pounds.

Most producers wean their goats when the kids are about 4 months old. Doe kids can be left with their mothers until the fall shearing. Some buck kids will be sexually mature by fall, so (just in case) the bucks should be separated from the does at age 4 months.





# Facilities and Equipment

## Housing

Many farms have barns or buildings that can be converted very inexpensively into pens for raising Angora goats. A barn that is or can be enclosed is ideal. Angora goats can be housed in the same facilities as those used for sheep. A three-sided barn with a southern exposure is adequate for all but kidding does.

The goats need to get outside to exercise even during cold weather. Goats that are confined tend to butt each other more. This increases the chances that your goats will wind up with injured ribs and lameness. Because they will seek shelter on their own during rain or snow, you don't have to run them inside at the first sign of bad weather.

Goats need clean, dry, draft-free shelters. The shelter doesn't need to be an elaborate building for the goats to survive and thrive. An effective goat facility should include the following features:

- Well-drained lot. Lots that slope to the south or east dry out quicker and are easier to maintain than lots that slope to the north or west.
- Protection from rain and cold weather.
- Adequate, draft-free ventilation (subzero temperatures won't bother your goats).
- Protection from predators such as dogs and coyotes.
- A separate area for grain, hay and medicine storage.
- Areas for isolating sick goats, shearing and kidding.

- Windows (goats like sun in winter and shade in summer).

An ideal goat facility has a barn with access to several pasture lots. The fences are made with electric wire. The temperature in the barn stays below 40°F or 45°F all winter. On this ideal goat farm, the animals have free access to the barn or a shaded area at all times. Remember that goats like trees for shade, and even a woods to browse in.

A mature goat needs about 8 to 10 square feet inside a building, and 20 square feet for outside lots. In a loose housing system, the animals are given free access between the barn and outside lot. The goats may be grouped by size, sex, age or some combination of those factors. One advantage of loose housing is that it gives the animals the chance to exercise.

Loose housing systems also allow the build-up of manure packs for bedding (such packs also generate heat in winter). Hay racks, waterers and grain feeders should be distributed around the building to cut down on the competition for access to food and water.

If you house your goats in a two-story barn, you can drop hay directly into racks from second floor storage areas. This saves you time and keeps the impatient, hungry goats from bruising your shins.

You may need to convert an older building to house your goats. Many older buildings are poorly venti-

lated. They often have small or no windows and no fans. Evidence of condensation (water) on the walls, odors and heavy cobwebs are all signs of poor ventilation. Adding more windows, exhaust fans and doors can cut down on this problem.

When designing housing for your goats, always consider the chance that you may need to expand the facility somewhere down the line. As your herd grows you may need more room, or at least a different layout.

## Fencing

Fences are an important part of every goat housing facility. Many farms have fences in place, and others have no fences at all. Angoras are docile, group oriented animals that usually stay with the goats or other animals they're pastured with. Angora goats don't normally jump fences, but they can crawl under them if the bottom wire is too high. Remember, fences have one main purpose—to keep goats and other livestock in their proper place.

A 3- to 4-foot fence is usually high enough to hold Angora goats because they don't jump like dairy goats. Your goats may get their legs or horns caught in woven wire fence, and may pull out or damage their hair on barbed wire fence. High tensile, multistrand electric fence works best if the wires are no more than 4 inches apart to a



height of 3 feet, and 7 inches apart above that.

Barbed wire fences are not recommended for use in Angora goat pastures. However, existing barbed wire fences can be adapted by installing porcelain offset brackets and insulators and stringing two or three smooth electric wires along the inside of the barbed wire.

When installing electric fencing, be sure to use insulators on the posts. Make sure no brush or weeds touch the fence. These objects can short out the fence, and in dry seasons may catch fire. You may want to ground the middle wire of any electric fence you install. This increases the fence's effectiveness during dry weather when the goats have long hair. Once a goat has been shocked, it usually leaves all types of fencing alone.

One or two electric wires also make a good temporary pasture fence. Electric fence can be installed quickly and moved fairly easily. This gives you the option of rotating the goats among several lots to make your pasture last longer. If you have limited pasture space, rotate your goats into a different pasture at least once a week. They can stay in one larger pasture for longer periods. Rotating your goats among several pastures can help cut down on the outbreak of some infectious diseases and may reduce your herd's parasite problems.

A line fence is a permanent fence usually found on the outside boundary of a pasture. One excellent type of line fence is made of woven wire with one strand of electric wire about 10 inches from

the ground inside the main fence. If you decide to use this type of fence, be sure the posts are on the outside of the fence. This cuts down on the amount of fleece the goats will pull out as they rub against the fence.

The openings in a woven wire fence should be 10 or 12 square inches so that the goats don't get their horns stuck in the openings. If the openings in your fence are smaller than that, string one or two strands of electric wire inside the fence. Use brackets to attach it to the main fence every 20 or 30 feet. Heavy-duty wire works best because it is durable and the goats can see it easily.

There will be times during the year when you need to separate the does in your herd from the kids, bucks and wethers. You may also need to place small or thin animals in a separate pen to begin an improved feeding program. You can do this inside your barn by putting up a 16-foot panel fence. This type of fence is relatively inexpensive, easy to install or move, and makes a good temporary or permanent fence.

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## Feeders

Several types of feeders work well in Angora goat herds. Just remember that any feeder you buy or build must be strong and sturdy, because goats love to rub and butt against everything within their reach.

Goats are notorious hay wasters, so the trick to building hay feeders is to make the openings small enough that the animals can only pull out one mouthful of hay at a time. This helps conserve hay and keeps the

goats out of the feed. It also keeps them from dragging hay across the backs of their neighbors. This cuts down on the number of sticks and leaves that get caught in the fleece. Hay filled fleeces bring lower prices at shearing time.

You can make a good, inexpensive hay rack using slatted or small woven wire fencing tilted against a barn wall at a slight angle. Don't use snow fence for your hay feeders, however, because the red paint will rub off and stain the goats' fleece. If your goat housing arrangements don't allow you to build hay racks, you can stack hay bales along the outside of gates and let the animals reach through to eat the hay.

You'll also need to set up some sort of grain feeder for your goats. If you only have one animal, a single bucket will do. If you have several goats, it's important to make your feeder big enough that all the animals in the pen can eat at the same time. If your grain feeders are too small, the bigger goats will push the smaller ones out of the way and eat all the grain.

Goats won't eat hay or grain that has been laid on or walked on, so make sure your goats can't climb in your feeders or pull large amounts of feed from them. Goats also won't eat old or dirty grain, so you'll need to be able to clean out the grain feeders regularly. Your feeders should also be placed high enough that the goats can't get their feet into the feeders. If your goats are able to stand in the grain feeders, the manure from their feet is liable to get mixed into the grain. That's a common way for coccidiosis to be spread.

Ideally you should be able to store your grain feeders somewhere out of the way when the goats aren't actually eating. This saves wear and tear on the feeders and cuts down on the chances of your goats getting hurt or caught on the feeder. It also keeps the goats from damaging their fleece.

## Waterers

Standard livestock waterers work very well for Angora goats. As with any type of waterer, it is important to keep the waterer clean of debris such as hay or grain, and to drain it completely and wash it down if algae builds up in the waterer. Heated waterers are nice to have in the winter. Be sure the heater temperature isn't set too high (above 80°F) or the animals won't drink the water and algae will grow in the tank.

## Pasture

When good pasture is available, most goats will ignore your hay in favor of the fresh grass. Angoras do well when pastured with sheep or cattle, and will usually eat the vegetation that other species leave (such as thistles). If you want to save the evergreens, trees or shrubs in your pasture, you'll have to fence them off. If you don't, the goats will clear them out along with the weeds you don't want.

One advantage to pasturing Angoras that many producers overlook is the goats' land clearing ability. Angora goats do well on steep hill-sides and along streams and fence rows. One word of caution is necessary, however. Clear out any stands of burdock, stick-tights or

other burrs before pasturing your goats on a piece of land. The seeds from these weeds can quickly turn a goat's fleece into a tangled mess.

One way to clear off these unwanted plants is to turn the goats out into a burr infested pasture just after they've been sheared. Then the goats can eat the damaging plants before their mohair grows enough to allow the seeds to stick.

Even if you take advantage of your goats' land clearing ability, you must also pay attention to pasture management. This means rotating pastures before they are so over-browsed that the goats cause erosion damage.

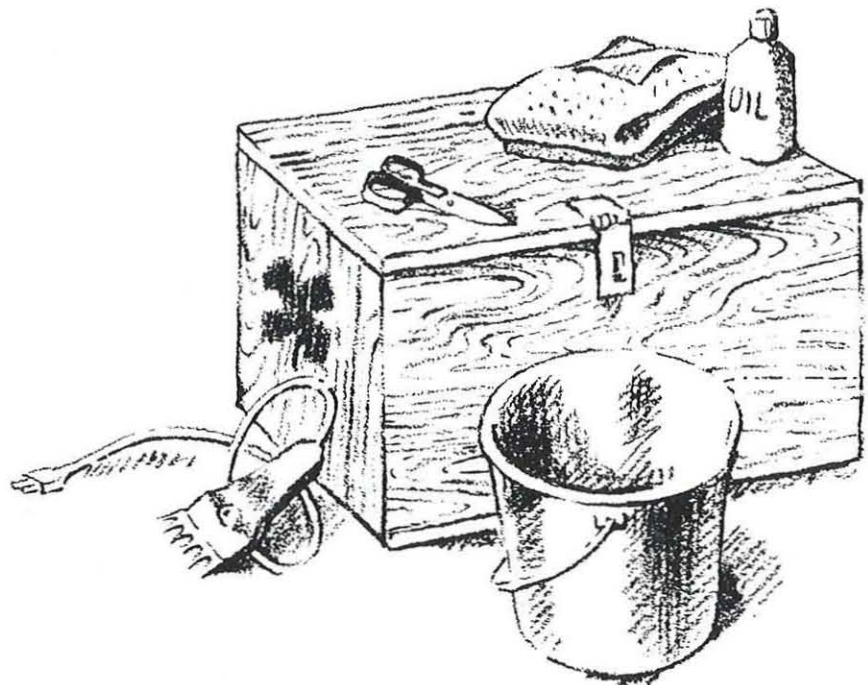
## List of Equipment

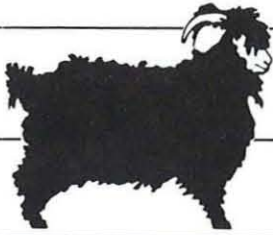
The 4-H Angora goat project doesn't require a great deal of expensive equipment. As a beginner you won't need all of these items right away; you can buy them as needed. You can purchase equipment from livestock supply companies. Your county Extension staff should be able to help you locate equipment. Below is a list of equipment you will need:

- Feeders
- Waterers
- Hay racks
- Movable fencing sections
- Syringe and hypodermic needle

Below is a list of equipment you will need for fitting and showing Angora goats:

- Soft cloths or rags
- Oil or polish for horns and hooves
- Clippers
- Scissors
- Water bucket and feed pan
- Show box





# Nutrition

## Feed Nutrients

To properly feed your Angora goats, you need to know what the various feed nutrients are and how they contribute to the growth and health of your goats.

## Water

Water is the most important part of a goat's diet. Strictly speaking, water is not a nutrient. However, without it many of your goat's important body functions can't happen. One-half to two-thirds of a goat's body is made up of water. Therefore, goats should be supplied with as much clean, fresh water as they will drink.

The goat needs water to properly digest its feed and carry nutrients to the body cells. Water carries away waste products, lubricates joints and is a built-in cooling system. A goat can live longer without feed than without water.

## Proteins

The protein a goat eats as part of its feed is called dietary protein. It is broken down by the goat's body into amino acids. These amino acids are then used by the goat to build body proteins, which make up muscles, internal organs, bones and blood. Body proteins are also part of hair, hooves, skin and many other body parts.

There are two kinds of amino acids: those the goat's body can manufac-

ture, and those the goat's body can't make on its own. The second group of amino acids is called essential amino acids, and they must be included in the goat's diet.

If you feed more dietary protein to your goats than they need, the extra protein is used for energy. Grains such as corn supply part of the goat's protein (amino acid) needs. A commercial protein supplement or soybean meal is used to balance the protein (amino acid) content of the diet.

## Carbohydrates

Carbohydrates are to a goat what gasoline is to an automobile. They supply the energy or fuel the goat needs to walk, breathe, stand and grow. Carbohydrates also produce heat to keep the body warm. Energy nutrients not used right away are stored as body fat until the body needs them.

Sugars and starches are carbohydrates. Grains such as corn and wheat contain much sugar and starch. Cellulose is one of the more complex carbohydrates. Grasses and hays are high in cellulose.

## Fats

Fats are of little importance in the ruminant diet. Practically all feeds contain small amounts of fat and adding fat is not practical. A level of 1.5 to 2.5 percent fat in the grain mixture is normal.

## Minerals

Minerals build bones and teeth and support other life processes in goats. Calcium, phosphorous, sodium and chlorine are called macrominerals because they make up the largest percentage of the minerals in your goat's body.

Minerals that are needed in very small amounts are called trace minerals or microminerals. Some examples of trace minerals are copper, iron, zinc and iodine. Minerals can be added separately to goat diets if you mix your own ration, or they can be supplied in a commercial protein supplement.

## Vitamins

Vitamins are just as important as other feed nutrients, but they are needed in smaller amounts. Vitamin A is needed for the health of the eyes, nasal passages and lungs. Vitamin D is necessary for strong bones, and vitamin K for blood clotting. Goats need other vitamins to aid other body functions. Most of the grains fed to goats contain all or part of the necessary vitamins. One vitamin, vitamin D, can be manufactured by goats that are exposed to sunlight. If a goat diet made from grains contains only part of the needed vitamins, extra vitamins must be added.

## Feeds for Goats

Feed will represent about 70 percent of the cost of your 4-H Angora

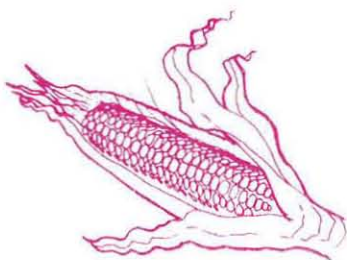
goat project. This fact, along with the rather specific requirements of growing goats for certain essential nutrients, makes it very important for you to understand a few basic rules for selecting the proper feeds in the right proportions for your goats.

It's a good idea to learn and use proper terminology when referring to goat feeding programs. Your 4-H Angora goat project is a good place to begin. Often, the terms diet and ration are used to refer to the same thing, but there is a difference between the two. A goat **diet** is a nutritionally balanced mixture of feed ingredients. A **ration** is the amount of feed a goat is allowed to eat in a 24-hour period.

Goats are ruminant animals. Like cattle and sheep, they have stomachs that are divided into four compartments. Because of this feature, ruminants can digest large quantities of fibrous feeds such as hay and pasture.

### Energy Feeds or Concentrates

Farm grains are the most common and the best source of energy feeds for goats. The following tells how farm grains can be used and how they compare as feeds for goats.

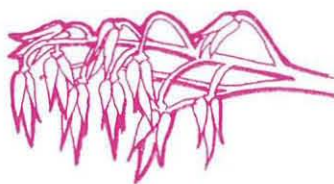


**Corn** is an excellent energy feed for all classes of goats. It is an ideal feed because it is high in digestible carbohydrates, low in fiber, and is a

very palatable, safe feed. Corn can be fed rolled, ground or cracked. Grains such as corn should not be fed whole because in that form, they tend to pass straight through the goats' digestive system with little absorption of nutrients.

In spite of its virtues, corn alone won't keep goats growing and healthy. Corn contains 7 to 9 percent protein, but the protein is lacking in almost all of the essential amino acids required by the goat. It is also deficient in calcium and other minerals, and so inadequate in vitamin content that goats will perform very poorly if they are limited to a diet containing only corn.

Corn must be supplemented with a protein that makes up its amino acid deficiencies. It is equally important to supply the needed minerals and vitamins. When corn is properly supplemented, it is an excellent feed for all classes of goats except young kids.

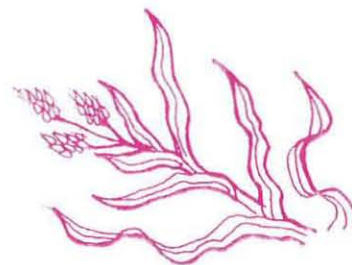


**Oats** are not a good energy feed for goats because of their high fiber content. This bulk makes oats a better feed for breeding animals than for young goats where high energy diets are needed for maximum growth.

The feed value of oats ranges from 70 to 80 percent that of corn. Fine grinding or removal of the hull improves the feed efficiency. When ground oats comprise no more

than 20 percent of the total diet, the growth rate of growing goats will not be reduced.

**Brewer's grain** and **whole cottonseed** are two low-cost by-product feeds that are excellent energy sources for goats. They are available from your grain elevator or feed store.



**Grain sorghums (milo)** have many of the same virtues and deficiencies as corn and can replace corn in all goat diets. The kernel is hard and small and should be ground before mixing with other ingredients. The feeding value of grain sorghums is approximately 95 percent that of corn.

### Protein Supplements

After reading about the common farm grains fed to goats, you should recognize that all are deficient in both the quantity and quality of protein they provide. Therefore it is necessary to supplement the grains used in goat diets with protein-rich feeds. Usually, 4-H members will find it more convenient and cheaper to purchase a commercial protein/vitamin/mineral supplement prepared especially for goats.

The commercial supplement should contain all the required minerals and vitamins along with the protein (amino acids) missing in the grain ingredients.

## Feeding Your Goats

### Nutrient Requirements

The nutrient requirements of Angora goats vary with the animals' age and physical condition. Table 1 gives the recommended protein levels for various animals. "Maintenance" animals are non-pregnant and nonlactating does, and bucks and wethers. "Pregnant does" are in the last 6 weeks of pregnancy. "Growing kids" are animals 6 months old and up, "weaned kids" are aged 3 to 6 months. Goats from birth to age 3 months are called "young kids."

Table 2 contains information on the average nutrient composition values for feeds commonly grown

in the northern United States and Canada and two common mineral supplements. The figures are on an "as fed" basis. "As fed" means the amount of feed which is measured out of the bag or bin.

### Suggested Diets

Several suggested diets for Angora goats are presented in tables 3 and 4 on page 20. Almost any diet (whether homegrown or purchased) that meets the nutrient requirements of your animal is acceptable. If you or your parents figure up goat rations using your homegrown feeds, it's important to have the feedstuffs tested so that you know their exact crude protein (CP), total digestible nutrients (TDN), calcium (CA) and phosphorus (P) levels.

Goat kids should have alfalfa hay available free-choice. Their grain rations should include the percentages of nutrients listed in table 2.

Michigan soils are low in an essential mineral called selenium. Because of this, all Angora goat diets should include trace mineral salt with 20 to 30 parts per million of selenium. "Sheep salts," trace mineral salt that contains selenium but little or no copper, work well for goats. (Copper can be toxic to sheep and goats.) Sheep salts can be mixed in the diet or fed free-choice.

### Pasture

Angora goats are browsers, which means they feed on bushes, shrubs and tree leaves, as well as pasture. They can be pastured successfully with grazing animals such as sheep or cattle. Cattle and sheep spend about 75 percent of their time grazing. Angoras spend less than 40 percent of their time grazing and more than 50 percent of their time browsing.

One acre of good pasture has enough grazing material for about 15 Angora goats. You can extend the life of your pasture by rotating the animals around small sections of it. If you have enough good pasture, mature goats don't need extra grain in the summer. Weaned kids do need supplemental grain when on summer pasture so that they get enough energy and protein to grow well. All Angora goats require some grain each day (about 0.5 pounds) during the winter.

**Table 1. Recommended Protein Levels for Goats**

Physical Condition	Percentage of Crude Protein Required
Maintenance	10
Pregnant Does	11
Lactating Does	12-13
Growing Kids	12-15
Weaned Kids	16
Young Kids	18-20

**Table 2. Average Nutrient Composition Values**

Feed	Crude Protein*	Total Digestible Nutrients (TDN)*	Calcium*	Phosphorus*
Alfalfa-Grass Hay	14	50	1.35	0.22
Barley	12	75	0.09	0.47
Corn	09	80	0.02	0.35
Oats	11	65	0.10	0.35
Soybean Meal	42	75	0.30	0.70
Limestone	—	—	32.00	—
Dicalcium Phosphate	—	—	32.00	18.00

\*In percentages

**Table 3. Suggested Diets for Adult Angora Goats**

Physical Condition	Alfalfa-Grass Hay	Mineral Salt*	Corn	Soybean Meal
<b>Maintenance Animals</b> (2.5 lbs. feed daily) (50% TDN, 14% CP, 1.35% CA, 0.22% P)	2.50 lbs.	Free choice	—	—
<b>Pregnant Does</b> (3.0 lbs. feed daily) (59% TDN, 12.5% CP, 0.94% CA, 0.25% P)	1.75 lbs.	Free choice	0.75 lbs.	—
<b>Lactating Does</b> (3.8 lbs. feed daily) (63.8% TDN, 13.4% CP, 0.73% CA, 0.35% P)	1.80 lbs.	Free choice	1.70 lbs.	0.2 lbs.

\*With selenium.

**Table 4. Suggested Diets for Angora Goat Kids<sup>A</sup>**

Physical Condition	Mineral Salt <sup>B</sup>	Corn	Soybean Meal	Oats	Liquid Molasses	Limestone	Aureomycin Crumbles	Vitamin Mix <sup>C</sup>
<b>Nursing Kids</b> (68% TDN, 14% CP, 0.42% CA, 0.38% P)	2	50	20	20	5	1	1	1
<b>Growing Kids</b> (65% TDN, 13.5% CP, 0.42% CA, 0.36% P)	2	38	14	38	5	1	1	1

<sup>A</sup>All figures in percentages.

<sup>B</sup>With selenium.

<sup>C</sup>Premixed supply of vitamins A, D and E.