

Goat Production Handbook for Small Producers



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Introduction

This handbook is designed to be a collection of suggestions and reference materials to help the Small Ruminant Certification Program participants and other goat/sheep producers to smoothly run their enterprises and hopefully be more profitable. The Small Ruminant Certification Program is made available through funds acquired from LDAF as part of the Agricultural Education Technical Assistance and/or Training Program.

Basic Information about Goats

Does	Mature breeding female goat
Doelings	Young female ready for breeding, usually less than a year old
Buck	Mature breeding male goat
Kid	Young goat, less than 6 months of age
Wether. . . .	Male goat castrated when young
Breeding season	August to January
Gestation length	145 - 155 days
Estrus period	24 - 48 hours
Estrous cycle	18 - 21 days
Lactation length	Up to 10 months
Number of kids born	1 to 5, commonly twins and triplets
Mature weight	100 - 200 lbs
Weight at birth	5 - 12 lbs
Weight at weaning	30 - 60 lbs
Age at weaning	8 - 16 weeks
Normal temperature	102 - 103°F

There are some important things to remember as you acquire goats and start to manage the herd.

1. Goats are very inquisitive about their environment and to them the grass is greener and tastier on the other side of the fence. They will challenge your fence lines; they will get their head stuck in the fence. Be sure to walk your fences at least once a day. If you hear a goat making a lot of noise, check it out, chances are that one maybe stuck.
2. Goats are very hardy, self-sufficient and healthy animals. They will show subtle signs of illness early on. Observing your goats everyday will help you to quickly identify and treat any animal that is ill.
3. Don't be afraid to ask if you have questions. We want you to be successful and are here to assist you in any way possible. Feel free to call if you have any questions at all.

Is Meat Goat Enterprise for You?

Goat meat consumption and the total number of goats slaughtered at federally inspected plants have moved up substantially since the mid-1980s. This period coincides with the increase of levels of immigration of populations with traditionally meat consuming cultures. There are strong indications that the supply and demand for meat goats is in the rise and that the meat goat industry is growing. The southeastern area of the United States has enough forage to support goat production at relatively manageable costs. The proximity of this area to the east coast ethnic markets is also an advantage. So, there seem to be good reasons to begin goat farming. Before you venture into goat production, however, there are several important questions that you have to ask and get satisfactory answers. In this communication, some major questions and answers are provided to stimulate your thinking and help you make a decision.

Why do you want to raise goats?

You can raise goats for many reasons, some of which are hobby, show goats, breeding stock, goats for slaughter, fiber, milk and many more. If you are planning to raise goats to make money and/or support your living, you have to carefully evaluate your expectations from goat enterprise in terms of economics. How much money do you hope to make? Are you raising goats on a part-time or full-time basis? Are you supplying your own labor or you are hiring somebody to do the job of feeding, caring, and managing the herd? To help you make the decision, you must have some realistic estimates for the following

- the approximate annual costs of rearing a doe and her kids,
- average market value of slaughter goats,
- the carrying capacity of your land and facilities, and
- what sort of productivity you can expect from a doe under your farm conditions.

What size of herd do you want to start with?

The general recommendation is to start small and grow with the business. Goats multiply fast once you get the hang of keeping goat kids alive. If you start with 25 does and a buck, for instance, the growth of your goat herd and animals available for sale are estimated in the table below.

Table 1. Herd growth* and animals available for sale with 25 does as foundation stock

Year	# of Does	# of Female Kids	# of Male Kids	# of Animals for Sale
1	25	20	20	31
2	33	25	25	40
3	44	33	33	52
4	60	45	45	71
5	83	62	62	97

*Assumptions: Weaning rate of 1.5 kid/doe/yr; 5% culling, 50% female replacement

The table shows that the herd can grow by more than 300% in about five years. How small is small? One buck can breed 25 does. So any number of goats in the neighborhood of twenty five does is a good number to start goat operation. One good reason for starting small is you gain

experience and confidence with small numbers without the economic disaster generally associated with losses.

What sort of goats should you look for?

You should look for healthy and young animals as your foundation stock. Generally you should purchase goats that are one to three years old, and preferably, goats that have already kidded once or, at most, twice. Avoid animals with obvious physical abnormalities. There are several highly contagious diseases of goats such as that are foot rot or Caseous Lymphadenitis abscesses that you cannot easily identify. Request for health certificates, if available. You will save a lot of trouble, energy and time if you don't buy goats from infected herds to begin with. You can easily recognize a healthy goat. A healthy goat eats well, chews its cud, has a shiny coat, has strong leg and feet, is sociable, and has bright and clear eyes.

What breed should you choose?

There are several breeds of goats available worldwide. While any breed of goat is a potential meat producer, there are some breeds which have characteristics which make them more suitable for profitable meat production than others for a given management system. Selection of breeds and foundation stock for profitable meat goat production should be based on four primary factors:

- Adaptability to environment
- Reproductive rate
- Growth rate
- Carcass value

Some common breeds and types of goats for meat production available as breeding stock in our area include: Spanish Meat Goat, Tennessee Meat Goat, South African Boer Goat, New Zealand Kiko Goat and the Nubian Goat. From our experience, we chose the Nubian and the Boer goats as the paternal line and the Spanish Goat as a maternal goat.

Do you have adequate land and facilities?

Facilities include shelter (particularly during cold season), fencing (mesh or electric or both), workplace, etc. Seriously consider predator problem whenever you are raising small ruminants.

Goats are very adaptive animals and do not require fancy or expensive housing. They need protection from the basic elements (rain, wind draft, heat). Oftentimes, existing buildings can be utilized to house meat goats, store hay and equipment. Producers can make almost any housing system work. Confinement housing, which can be completely enclosed as needed, is popular in cold climates and for human comfort and convenience. Confinement housing allows close supervision of animals, but is more expensive than most other types of housing. Goats in confinement require 20 square feet of space, plus an additional 30 square feet for exercise, if pasture is not available.

Three-sided or open-sided shelters are suitable in most situations. The open side should face away from prevailing winds, the roof should be sloped to repel rain, and there should be adequate drainage around the building. Goats require 10 to 15 square feet of space in open

housing. Buck housing can be simple, but must be strong. Taller, sturdier fences are needed to keep bucks away from does in heat.

The importance of good fences cannot be overstated. Goat producers need to be concerned with three types of fences: 1) exterior (boundary or perimeter); 2) interior (cross or subdivision); and 3) barn lot (or corral). Woven wire, barbed wire, and high-tensile electric fence are some of the fences that goat producers can use.

Do you have adequate feed supply?

About 70% of your cost will involve feed. The cheaper you feed your goats, the more money you will make from your operation. Goats require all of the five major categories of nutrients: energy, protein, minerals, vitamins and water. Feeding programs in goats can range from letting the goats forage for most or all of their needs to complete control of their intake by the owner. When planning a feeding program, keep it simple and remember that a variety of forages give a more complete diet than relying heavily on grain. This is partly due to goats' unique ability to adapt to various feeding conditions. Goats are natural browsers and weed eaters. In many parts of the United States they are kept mainly for controlling weeds and brush. Goats fed quality feed will reproduce and produce better. This suggests that good forage and some grain supplement during the critical physiological stages of breeding, gestation and lactation should provide the basis for any feeding program. During these stages, the browse and weeds should be considered as 'extra' feed.

When do you want the kids to be born?

Although goats have restricted breeding season, you can still stagger your breeding program to have kids when the price is premium. Female goats (does) are seasonally polyestrous and short-day breeders, which means that they have several cycles and can accept the male only during the fall (August to December). This is an adaptive feature allowing the animals to give birth at a time of year when climatic and environmental conditions are most favorable for the survival and growth of the kids. The extent of this seasonal restriction varies with breed type and geographical location, particularly in the temperate zones. The seasonal nature of goat reproduction leads to seasonal fluctuations of meat and milk supplies. It would be advantageous for the goat farmer to be able to manipulate the breeding season so that meat supplies are ready when the prices are optimum.

How do you keep goats healthy so that they will produce?

Prevention is the key. Generally a sick goat is a dead goat. Follow string deworming and vaccination program. Keep high level of nutrition all the time.

When and where could you market kids?

At present, there are no well organized marketing channels for goats, but there is a niche market for ethnic populations who prefer fresh goat meat or live goats to be slaughtered according to specific cultural or religious customs. Being familiar with the ethnic calendar helps market goats to ethnic populations. There are strong indications that the general public is also purchasing goat meat.

In summary:

So, You Want to Get in The Goat Business, Are you Really, Really Ready?

- Are your fences, pens, chutes goat proof?
- Is your grazing land adequate?
- Do you have sufficient supplemental feed on hand?
- Is your predator controller in place?
- In your medicine cabinet, do you have
 - -Dewormers -Vaccines
 - -Iodine -Antibiotic ointment
 - -Insecticidal powder -Thermometer
 - -Stomach tube -Hoof trimmers
- Do you know the address and phone number of your extension office?
- Do you the names of your extension livestock, forage, and 4-H agents?
- Have you discussed your new venture with your local veterinarian?
- Have you alerted your next door neighbors to the possibility of excessive noises, exotic odors, sexual activity during the breeding season, animals getting out, and allayed their fears of the spreading of diseases?

References

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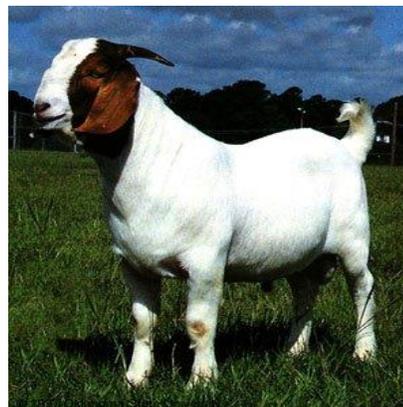
Breeds and Breeding

There are more than 100 goat breeds and a large number of mixed goats in the world today ranging in weight from 20 to 40 lbs for the small tropical breeds to over 200 lbs for the large Europeans and Boer breeds. Most of the purebred animals arrived in the United States in very small importations early in the twentieth century. Today, there are several major purebred breeds and there is a registration system used whereby bucks which are 15/16 purebred and does which are 7/8 purebred can be registered as "American".

Some major breeds and strains available in the southern US are briefly described in the following paragraphs.

The Boer Goat:

The South African Boer Goat, introduced to the United States in the early 1990 is considered to be the only true meat-type goat, bred and selected specifically for superior body conformation, high growth rate, and fertility. Boer goats are large framed with short, white hair on their bodies and black or brown markings on their heads and necks. The Boer goat is primarily a meat goat with several adaptations to the region in which it was developed. Producing weaning rates in excess of 160%, the Boer goat doe has sufficient milk to rear a kid that is early maturing. The mature Boer Goat buck weighs between 240-300 lbs and ewes between 200-225 lbs.



Under relatively good nutritional condition, the Boer goat crossbreeds produce excellent weight gains and muscular carcasses. An average daily gain of over 0.44 lb/day (0.3-0.4 lbs/day) is not uncommon. The ovulation rate for Boer goats ranges from 1 to 4 eggs/doe with an average of 1.7. A kidding rate of 200% is common for this breed. Puberty is reached early, usually about 6 months for the males and 10-12 months for the females. The Boer goat also has an extended breeding season making possible 3 kiddings every 2 years. Boer goats may not be as hardy as other goats under extensive management systems.

The Nubian Goat:

The Nubian is an all-purpose goat, useful for meat, milk and hide production. It was developed in England by crossing British dairy stock with Indian Jumnapuri and Egyptian Zariby types. Outside the United States, it is known as the Anglo-Nubian. Because it is short-haired, heat tolerant and have meatier carcasses than the Swiss breeds, it has been used extensively to upgrade native goats in the tropical countries before the advent of the Boer goat. The Nubians is distinguished by its long and wide pendulous ears and Roman nose. It produces milk of good quality with relatively high butterfat content. It comes in many colors and color patterns and it has a



Provided by Crystal D'Eon

shorter hair coat than the Swiss breeds. A mature doe should stand at least 30 inches at the withers and weigh 135 pounds or over. The males should stand at least 35 inches at the withers and weigh at least 175 pounds.

The Spanish Goat:

The Spanish goats are kept in large number in the open range in the Southwest (mostly in the Edward's Plateau of Texas). Until the arrival of the Boer Goat, the Spanish goat was the standard for meat goat production in the U.S. The Spanish goat descends from goats brought to Texas by early settlers and Spanish explorers. The Spanish goat is not a specific breed, but more a name to differentiate it from fiber-producing goats. Specific ranchers in Texas have genetically selected Spanish goats for better meat production by keeping only the biggest or meatiest bucks for breeding to females, and hence, "Improve Spanish Goats" are now in existence. Spanish goats are well-adapted to the Southwest where at one time their utility for brush control was as important as their role in producing meat. They have demonstrated stronger resistance to parasites and are more likely to breed out-of-season than other goats. They come in almost any color and are usually left horned. Their ears are somewhat pendulous but shorter than a Nubian's. Many of them produce a cashmere undercoat in winter.



The Kiko Goat:

The Kiko is a meat breed that originated from large dairy males crossed with New Zealand base stock and then backcrossed to dairy males. More specifically, the Kiko was developed by crossing the New Zealand feral does with Nubian, Toggenberg, and Saanen bucks. They were then selected for twinning, growth rate and conformation. Kikos have similar ears to Spanish goats but are usually larger framed. They are often white like their Saanen ancestors.



provided by Dr. An Peischel

Tennessee (Myotonic) Meat Goat

The Tennessee Myotonic goat has its origins in Tennessee, descended from Tennessee Stiff-Leg or Fainting goats. These goats have a myotonic condition that causes their muscles to lock up whenever they were startled or frightened. These goats are characterized by heavy rear leg muscling (largely due to the constant muscle stiffing and relaxing), tender meat, and a high meat to bone ratio. The goat has an extended breeding season and, hence, the possibilities of twice a year or three times in two years



kidding. This colorful goat goes by several names including the Tennessee Fainting Goat and Tennessee “Wooden” Stiff Leg Goat. Various ranchers in the Southeast US and Texas have chosen from this population, goats with the largest frames and heaviest muscles to keep for breeding purposes. Gradually they produced a goat that is larger and heavier than the original strain. Some of these selected goats are known as Tennessee Meat Goats.

The Pygmy Goat:

This goat originated in West and Central Africa and was introduced into the U.S. in the early 1960's for biomedical research and petting zoos. It is only 16-23 inches tall in the withers at maturity and weighs only 55 lbs. It is very compact and well muscled. The frame is clearly defined and well angulated; limbs and head are short relative to body length. Full-barreled and well muscled, the body circumference in relation to height and weight is proportionally greater than that of other breeds. This goat



is more likely to have triplets, or even quadruplets than any other breed. The Pygmy goat is hardy, alert and animated, good natured and gregarious. It is adaptable to humid tropics and is resistant to many diseases. Though small and slow growing, the Pygmy has some potential for meat production due to its out-of-season fertility and compact body style.

The Angora Goat:

The Angora goat originated in the Near East. Angora goat has straight or concave nose, thin but short head, pendulous ears and twisted horns on both sexes. It is a small breed, usually white in color. Angora goats have long outer coat (known as mohair) with a valuable fine under wool (cashmere). The top quality fleece of a purebred may weigh 6 - 10 lb. Spring molt is natural and shearing occurs just before it occurs. This goat is not known for its prolificacy, and twinning is less frequent than most other goat breeds. It is also less resistant to heat stress compared to other breeds.

The Swiss Breeds:

The Alpine, Saanen, and Toggenburg are collectively known as the Swiss dairy breeds. The Alpine is a larger and rangier goat and more variable in size than any of the Swiss breeds. Mature females are less than 30 inches at the withers and weigh about 135 pounds. The Alpine females are excellent milkers and usually have large, well-shaped udders with well-placed teats of desirable shape. The Saanen is medium to large in size (weighing approximately 145 lbs) with rugged bone and plenty of vigor. The Saanen is called the Holstein of the dairy goats because of its relatively high milk production, large size and the slightly lower butterfat content of its milk. Slightly smaller than the Alpine, The Toggenburg doe weights 120lb. Toggenburgs perform best in cooler conditions. They are noted for their excellent udder development and high milk production. These breeds are considered less appropriate for meat production due to leggy conformation, large, pendulous udders and large teats. However, their crosses are widely used and they will likely continue to play a large role.

The LaMancha:

The LaManchas are a relatively new breed of dairy goats developed in the United States. The first animals were registered in 1958. Breeders in California crossed goats of the Spanish origin with pure breeds of the Swiss origin. The distinguishing characteristic of the La Mancha is their small rudimentary ears which are genetically dominant. Because good animals were used in the development of this breed, there are some excellent milking herds. They come in all colors and color patterns, and they have no really distinguishing characteristic other than their tiny ears.

The Oberhasli:

These goats are actually Swiss Alpines and were developed near Bern, Switzerland. They are known by different names including Oberhasli-Brienzer, Swiss Alpines, Chamoisee and Brienzen. The color pattern is usually rich red bay coat with black trim. The black includes stripes down the face, the ears, a dorsal stripe, and the belly and the udders. The legs are also black below the knees and hocks. They have erect ears and are very well adapted for high altitude mountain grazing and long hour marching.

Which breed is right for you?

While any breed of goat is a potential meat producer, there are some breeds which have characteristics which make them more suitable for profitable meat production than others. Selection of breeds and foundation stock for profitable meat goat production should be based on four primary factors:

- Adaptability and survival
- Reproductive rate
- Growth and feed efficiency
- Carcass quality and quantity

Adaptability and survival: The goat has the reputation for adapting well to a wide range of climatic areas ranging from the temperate regions of the Mediterranean to the desert and semi-desert conditions of the tropics. It also adapts well to a wide range of management systems. The Boer and Nubian goats are reputed to be hardy, and a wide spectrum grazers of plants, grasses and shrubs. They have low water turnover rates and are relatively resistant to parasitic infestation, and can adapt well under Southern conditions.

Reproductive rate: Reproductive efficiency in a meat goat enterprise is expressed as the weight of marketable product (mutton or caprito) produced per doe per year. It is optimized by increasing the number of offspring born and weaned per breeding female and by improving the growth rate of each. Due to perceived low economic importance of goats, reproductive traits have received little scientific attention.

Growth and Feed Efficiency: The identification and availability of breeds and crosses capable

of producing desirable carcasses when fed to heavy weights will be necessary before optimum doe productivity becomes a reality. The European breeds (Saanen, Alpine, Toggenburg, etc), and the Boer goat have large mature sizes and weigh more than 150 lb. All these are capable of producing kids that could grow faster than 0.4 lb/day. The Boer goat is a large framed animal with mature weights for the males in the range of 250 to 400 lb and for females in the range of 200 to 250 lb. Boer goat kids can grow up to 0.6 lb/day.

Carcass Quality and Quantity: The success of the meat goat industry will depend largely on the acceptability of the carcass to consumers. From the consumer point of view, the quality of the meat is more important than the quantity, as meat is generally sold on per unit weight basis. From the producers point of view, both the quality and quantity are important and should be considered equally. Goat meat is lower in calories, total fat, saturated fat, and higher in iron and comparable in protein to the other major meats. Despite its wholesomeness, the goat meat has not received the scientific and public attention it deserves.

Nutrition Management

The nutrition of your does and buck is very important. If they are not in a positive energy balance, they can't fight off infections, will not reproduce, and will look unthrifty. When planning a feeding program, keep it simple and remember that a variety of forages give a more naturally complete diet than relying heavily on grain. This is partly due to goats' unique ability to adapt to various feeding conditions. Fortunately keeping goats in a positive energy balance is easy. The grazing style of a goat is very similar to that of wild deer. Both prefer browse (leafy plants, trees and shrubs) to grasses, but will graze on grasses. This makes for a nutrient dense and energy rich diet, especially since the goats prefer younger leaves and grasses. This suggests that good forage and some grain supplement during the critical physiological stages should provide the basis for any feeding program in goats.

Monitoring the nutrition, and health, of your goats is fairly simple. Routine body condition score (BCS) evaluations can help you to determine the nutritional status and overall health of your goats. The goats should be able to maintain a BCS between 2 and 4 year round. As breeding season approaches, a BCS between 3 and 4 is recommended for does and bucks. Please refer to the Appendix to find a guide to determining the BCS of your goats.

Feeding Does

Mineral Supplement

Does on good pasture are self-sufficient. They will get the majority of the protein, vitamins, minerals and energy (carbohydrates and fats) from the leaves and grasses they eat. However, they do have a high calcium requirement, which may not be met simply by grazing. This is easily remedied. There are a number of relatively inexpensive commercial supplements available. We recommend mixing loose trace mineralized salt with dicalcium phosphorus, on a one to one basis. This will provide your does with enough supplemental calcium, as well as other minerals. Another option is to purchase trace mineralized salt blocks. They work just as well as the hand mixed mineral and can be more convenient to feed, however they have a lower calcium level.

There is no fancy set up needed to feed either supplement. The mineral block can be placed in a feed bunk, on a piece of wood in the same paddock as the does, or any other way that you can think to put it out. It is a good idea to have a container that will allow water to drain off; otherwise you are left with expensive mineral soup, which the goats won't drink. If you choose to mix your free choice mineral, it's a good idea to have a feeder that has some sort of protection from the elements. You can be elaborate and purchase one that turns with the wind and is protected from the rain, or you can have a box that would hang or sit inside the shelter. The main purpose of the mineral feeder is for easy access to the goats and to prevent them from wasting as much of the mineral as possible.

Adding Energy and Protein

Typically a goat's diet consists of nearly equal amounts of grass and browse (leaves from woody plants) as well as forbs (wildflowers, weeds, etc.). The microbes in the rumen of the goat are well adapted to the high forage diet. Sometimes, however, it's necessary to add additional energy or protein, or both in the form of grain. There are times of the year that supplementing energy and protein is highly recommended. These are:

- ***Breeding:*** One of these times is about two weeks prior to putting the buck in with your does. This is called flushing.
- ***Late Gestation:*** Another time when supplementing a pastured goat with grain is ideal is during late pregnancy. This is particularly important if the pastures at this time are starting to or have died off. The majority of the baby kids' growth occurs during the last month or two prior to birth.
- ***Early Lactation:*** When the doe starts to lactate, there is an added strain on her ability to maintain her own body weight and support the kid(s).

There are a number of feedstuffs that can serve as an energy and protein supplement. The most common is corn. Corn provides a lot of energy, but the protein content is low. It's recommended that if you choose to add corn to your goats' diet, that you also add a protein supplement such as soybean meal, cottonseed meal or whatever is available in your area. This boosts the protein level of the diet and aids in the fermentation of the corn and forages.

Another option for feeding does is a complete pelleted feed. These feeds contain around 12% protein and are more forage based than grain based. They not only add protein and energy to the diet, but they also compliment the pastured goats' diet better than corn.

A third option is to offer a supplement often referred to as range blocks. These are molasses based protein, and mineral supplements that come in 50 pound tubs.

If you do opt to supplement your does with grain, having good feed bunks is important. Feeding the does on the ground is not a good idea. The feed can easily be contaminated, trampled and wasted. In addition, the goats could pick up parasites. As with feeding the mineral supplements, you don't need to be fancy. Your feed bunks can be as simple as cutting a PVC pipe in half and mounting it on the side of a shelter or on 2x4s to sit on the ground. It's a good idea to have some material that is durable, easy to clean, and functional for your needs. Goats also like to climb into and on things, such as feed bunks, and of course they will contaminate the feed. So when you are thinking about feed bunks, keep in mind that it's a good idea to have something that will discourage climbing. (See Appendix on page 27 for more in feed bunks.)

Feeding Bucks

Bucks need a balanced diet just as much as your does do. Some tend to think that since they only work for a few months out of the year, they don't need to be fed as well. This is very untrue. The health (nutritional status) of your buck is vital to his ability to breed your does.

Buck kids also need to be on a good plane of nutrition in order to develop properly. If the young bucks are underfed or overworked, their growth, and possibly their fertility, will be stunted. Your bucks can live and be maintained on good pasture for the majority of the year. As with your does, it's a good idea to provide a free choice mineral supplement. However the bucks do not need as high a level of calcium as the does; excessive levels of calcium may cause kidney stones. During the winter months, it may be necessary to supplement the grazing with hay. This would depend on the amount of green forage in your pasture.

As you move closer to your breeding season, you might consider feeding the bucks a diet similar to what you are using to flush the does. This added boost in energy and protein will make sure your bucks are in good shape for the task at hand. It's important to make sure that the bucks are in good shape, many of them will not eat while they are in with the does.

Reproduction and Management

Breeding season: Female goats (does) are seasonally polyestrous and short-day breeders which means that they have several cycles and can accept the male only during the fall. This is an adaptive feature allowing the animals to give birth at a time of year when climatic and environmental conditions are most favorable for the survival and growth of the kids. The extent of this seasonal restriction varies with breed type and geographical location, particularly in the temperate zones. Photoperiodism (day length) has been known for a long time to influence seasonality, but other factors such as temperature, rainfall and availability of feed play important roles. In the northern hemisphere, the breeding season falls between August and December or January, and kids are born during the winter or spring. Seasonality is almost completely absent in tropical goats. The seasonal nature of goat reproduction leads to seasonal fluctuations of meat and milk supplies. It would be advantageous for the goat farmer to be able to manipulate the breeding season so that meat and milk supplies are ready when the prices are optimum.

Age at first breeding: Doelings are bred for the first time when they are 7 to 10 months of age and/or when they weigh 60 to 70 pounds. As a rule of thumb, it is preferable to breed by weight rather than by age alone.

Signs of heat (estrus): A doe comes in heat (i.e. estrus, which means that the doe is willing to accept the buck for mounting and copulation) several times during the normal breeding season. The length of the estrus period ranges from 24 to 48 hours. Unless the doe conceives, it will come in heat again within 18-21 days, and this is referred to as estrous cycle. A doe that is in heat exhibits one or more of the following behavioral changes; increased bleating, increased frequency of urination, unusual restlessness or higher incidence of interaction with other does in the herd, tag wagging or flagging, mounting other does or standing to be mounted, increased curiosity and attentiveness, swelling around the vulva (opening of the vagina) and change in color of the vulva from pale to bright pink, mucous discharge from the vulva, and decreased milk production

Breeding Ratio: A young, active buck can breed up to 30 or does during the breeding season. The determination of the doe to buck ratio depends on the type of mating practiced. In pen mating a ratio of 30:1 can be safely used. On pasture mating, depending on the area of the pasture a 15-20:1 ratio can be used. As a rule of thumb a 20:1 ratio is sufficient to ensure more than 95% herd fertility.

Management: The plane of nutrition should improve considerably during the three critical physiological stages - breeding, last month of pregnancy and early lactation. During breeding all does must be flushed, i.e. supplemental feeding of 0.5 to 1 lb. of 14- 16% crude protein ration per doe should be provided 21 to 30 days before the introduction of the buck. During the last month of pregnancy, does must receive an increase in the amount of concentrate in the diet, and a decrease in the amount of calcium. This will prevent the incidence of post parturient hypocalcemia (milk fever). The amount of concentrate is monitored so that the does will not become too fat. Two to four weeks before kidding, does are given enterotoxemia, tetanus, clostridium C-D vaccines and selenium/Vit-E injections. During the first month of lactation, the plane of nutrition should increase to support the milk production necessary to feed the newborn

kids. Some goat owners feed an average of 1 to 2 pounds of concentrate during the critical physiological stages. If this practice is too expensive, good forage and only 1/2 to 1 pound of concentrate could be used. The concentrate should contain 14 to 16 percent protein to be satisfactory.

The gestation length of a goat is approximately 5 months or 150 days. Goats typically give birth to one, two or three kids. Quadruplets are not uncommon. Does should kid in a clean environment, either a well-rotated pasture or a stall bedded with straw or other absorbent material. Few does require assistance during kidding, though problems are always a possibility. Normal delivery is the nose between the front legs. A breach birth (hind legs coming out first) is also considered normal. If a doe has made no progress within an hour after hard labor begins (after the water sac breaks), her birth canal should be entered and the status of delivery determined.

Newborn kids should have their navel cords dipped in a solution of tincture of iodine to prevent entry of disease-causing organisms. If necessary, the navel cord should be cut to a length of 3-4 inches. It is important that newborns consume adequate amounts of colostrum during their first several hours of life. The colostrum or "first milk" contains antibodies that are essential to the development of immunity in the newborn kid. It is a good idea to "strip" the doe's teats to make sure the teat canals are open and the flow of milk is adequate.

It is common to wean kids when they are about three months of age. Buck and does should be separated to prevent unwanted pregnancies. If grain is being fed to the does, it should be reduced 5 days prior to weaning, to help prevent mastitis (infection in the udder).

Reproductive Management Calendar

(Times may slightly change depending on geographic location.)

Mid-August to Early September

- Group breeding does
- Introduce male in close proximity to breeding females
- Flush breeding animals by giving them extra feed.
- Deworm breeding animals

Mid-September to End of October

- Prepare breeding assignment.
- Put Boer bucks with does (1:20 ratio).
- Record breeding dates.
- Does are seasonally polyestrus and the estrous cycle is approximately 21 days, estrus is 1-2 days and gestation length is 148 – 155 days.

Early to Late November

- Remove buck from herd.

- Breeding season is generally 42-60 days long, allowing for at least two estrous cycles per female.

Late November to Mid-January

- Monitor nutritional and health status of herd.
- Thoroughly clean barn and disinfect all kidding pens and housing targeted for baby kids.
- Keep birthing areas clean, dry and free of bedding until it is actually time for use.
- Check watering facilities for cleanliness and function.
- Check breeding goats for internal and external parasites. Deworm as needed.
- Check feet and trim if necessary.

Mid-January to End of February

- Increase supplementation to the doe during the last six weeks of pregnancy.
- Monitor nutritional health status of does.
- Deworm does approximately two before and after parturition with anthelmintics that have larvicidal properties

End of February to Early March

Kidding Season begins. See the “Kid Management section” for details.

Disbudding:

Disbudding is the term used to describe the process of removing or burning the horn buds before they actually grow. Kids should be disbudded when they are 4-7 days old. When disbudding, the kid should be locked into a holding box where the head cannot freely move. Using a hot iron tube, 3/4 to 1" in diameter, burn each horn bud for 5 to 10 seconds or until you see a copper colored ring over the horn bud. Detailed disbudding procedures are given on pages XX to XX.

Castration:

Castration is the act of removing the testicles of kids. Male kids that are not kept for breeding purpose should be castrated when they are less than one week of age. It is more convenient to castrate and disbud kids at the same time. The use of Elastrator with rubber bands is the safest way to castrate kids. A rubber band is placed right over the neck of the scrotum. This band cuts off blood circulation and causes the testicles to drop off within 10 to 15 days. This method is completely bloodless and no cutting and crushing is required. Detailed castration procedures are given on pages 26 to 29.

Introduce solids, high protein feed (16%) to kids as early as possible. This stimulates development of the rumen and quickens growth rates.

March to April

- Weigh kids at 14 – 28 days interval (if possible)
- Deworm and vaccinate.

- In general, deworm all kids every 6 – 8 weeks.
- Vaccinations for kids should include enterotoxemia types C & D, tetanus toxoid and/or antitoxin
- Se – Vit . E injections may be necessary
- Routine observation for scours, leg injuries, coccidiosis, etc

Late May-Late June

Weaning

Late June to Early August

- Cull or remove repeat breeders, old animals or those with poor reproductive performances.
- Feed and sell male kids that will not be needed for.
- Prepare does for rebreeding-flushing, introduce male in close proximity, etc.

How to Plan Your Breeding to Target Specific Marketing Date

As discussed earlier, the breeding season for goats can be anywhere from early August to late November or early December depending on your geographic location and the type or breed of goat you have. Within this time period, however, you can plan to breed goats to target specific kidding date. This is useful if you are planning to market your kids for a specific holiday season or ethnic calendar. You need to have a fair estimate and/or knowledge of the following four parameters in order to successfully execute a target date for marketing your kids. These are:

- Length of gestation (pregnancy)
- The average birth weight of your kids (you need to keep records)
- The average growth rate of kids (how fast do the kids grow)
- The target market date

The average gestation period (time from conception to kidding) for most goats is about 150 days.

Birth weights range from around 4 to 8 lbs for Spanish kids and 5 to 10 lbs for Boer and Boer cross kids. Birth weight generally depends on the breed, size in the parents, age of the doe, sex of the kid, size of the litter, and nutritional and health status of the doe during pregnancy.

Daily growth rates for kids from kidding to weaning at about three months of age range from 1/3 and 1/2 lbs. Under intensive management systems, Boer and Boer cross kids may grow up to 2/3 lbs per day. Single kids and male kids tend to grow faster than kids raised as multiples and female kids. The general health of the mothers and her milk producing ability also affect how fast a kid may grow.

Allow 5-10 days for shipping goats to meet the target date.

Estimation of breeding date

Let us assume that you want to raise a 40-50 lbs (selection one) kid for Easter (April 20). Let us further assume that the birth weight is 8 lbs and the kid has the ability to grow about 1/2 lb a day.

The kid will be shipped to the target market 5 days before Easter (April 15). When should you breed the doe to produce the desired kid?

Calculations:

Since the birth weight is 8 lbs, the kid has to grow $(50 - 8) = 42$ lbs from birth to marketing. At 1/2 lb per day, the kid will need 82 days to gain a total of 42 lbs. This implies that the kid has to be born 82 days before April 15 (since you need 5 days for shipping). The kid should be born around January 23 of the same year. The doe has to be bred 150 days before the targeted kidding date of January 23. This puts us to August 26 of the previous year as the breeding date. You should put the buck at close proximity to the doe by the first week of August and with the doe by the second week of August.

Table 1 gives you the general guideline for choosing a breeding date to produce a kid of certain desirable market weight at two levels of average daily gains (1/3 and 1/2 lbs per day).

Table 1. General guides to estimate breeding dates to target specified market dates at three weight ranges and 1/3 and 1/2 pounds daily gain.*

Desired Weight of kid at Market date	1/3 lb gain		1/2 lb gain	
	Breed by:		Breed by:	To market by:
30-40 lbs	July 26		Aug 29	March 1
	August 18		Sept 19	March 22
	Sept 8		Oct 10	April 12
	Sept 29		Oct 31	May 3
	Oct 20		Nov 21	May 24
	November 10		Dec 12	June 14
	Dec 1		Jan 2	July 4
41-50 lbs	June 26		Aug 9	March 1
	Jul 17		Aug 30	March 22
	Aug 7		Sep 20	April 12
	Aug 28		Oct 11	May 3
	Sep 18		Nov 1	May 24
	Oct 9		Nov 22	June 14
	Oct 30		Dec 13	July 4
51-60 lbs	May 27		Jul 20	March 1
	June 17		Aug 10	March 22
	Jul 8		Aug 31	April 12
	July 29		Sept 21	May 3
	Aug 19		Oct 12	May 24
	Sept 9		Nov 2	June 14
	Sept 30		Nov 23	July 4

*Example: If you desire to market a kid between 41-50 lbs for July 4, breed by October 30 (if gain is 1/3 lb per day) or Dec 13 (if gain is 1/2 lb per day).

Kid Management

Healthy kids are the goal of any goat producer. They are an important part of profitability, and the genetic improvement of any herd.

Signs of kidding

- A doe within 12 - 16 hours of kidding will wiggle its tail several times. During this time, the doe will often start "baby talking" and dig and stir the bedding in her pen or isolate herself from the herd. It will be uneasy and may lie down and get up frequently.
- As labor progresses and hard contractions start, the doe will discharge the amniotic sac (or bubble) filled with fluid. The sac will eventually break and release the fluid inside. At this point the doe is about ready to kid. If the doe does not kid within an hour or so, call a veterinarian, an experienced breeder or SUAERC staff.
- When kidding is imminent, confine the does in maternity pens, if available.

Preparation for kidding

- Confine kidding does in maternity pens when kidding is imminent.
- Wash udder and hind parts of the doe at the end of kidding.
- Remove placenta and other discharges as they are expelled by the doe.

Neo-natal Care

New born kids generally have a lot of vigor and for the most part neither the doe nor kid will require assistance. If you have a doe that is kidding for the first time, you may want to check on her every once in a while during her labor and shortly there after. Be careful not to interfere too much, as they will be more concerned with getting away from you than birthing the kid. After the doe has had time to clean and bond with the kid, there are a few things to do to ensure the health and survival of the kid.

- If the umbilical cord did not break on its own, break it by rubbing back and forth between your hands and then pull it apart gently. **NEVER USE SCISSORS OR ANY OTHER SHARP OBJECT TO CUT THE UMBILICAL CORD.**
- To prevent infections, dip the navel in a 7% tincture of iodine. You may also spray the hooves to harden them and prevent spread of disease.
- Open the doe's teats by stripping each one just enough to remove the plug.
- Tie the umbilical cord with a piece of string (dental floss works fine) to prevent passage of microorganisms into the body
- Observe the pair to make sure that the kid is about to suckle. .
- Keep the doe and kid(s) in a dry, draft free area for a few days. This allows the bond between them to strengthen and to recover from the stress of birth.

The kid should be able to stand and suckle within the first 15 - 30 minutes after birth. If it does not:

- Clear the kid's mouth of mucus to assist it in breathing.
- Rub the kid vigorously with a paper towel to help stimulate breathing. If the kid does not start to breathe immediately, gently insert a piece of straw in the nasal passage to cause sneezing and involuntary breathing.
- Some breeds of goat are heavy milk producers and the teats can be too big for the new born kid. If this is the case, simply milk her out, and bottle feed the kid or freeze the colostrum for later use. It is important that the kid gets 1/2 to 1 pint of COLOSTRUM per day during the first three days of life.

Kid Identification

1. Weigh the kid within the first hour after birth.
2. Record the following in the record book as well as on the temporary tag:
 - a. Kid identification (number or name)
 - b. Dam identification (number or name)
 - c. Date kid was born
 - d. Sex of kid
 - e. Type of birth (single, twin, triplet, etc.)
 - g. Remarks (if any)
3. Place the temporary tag around the neck of the kid.

Disbudding

Disbudding is the removal of the horn buds of a kid to prevent the growth of horns. This is done for several reasons. First, dehorned goats are easier to handle, in that they cannot swing their heads around and injure someone as horned goats could. Secondly, dehorned goats will not injure and bully other goats with their horns. If the goats are going to be shown, many require that the goats be disbudded for the safety of the exhibitors. However, one must realize that disbudding goats takes away a method of defending themselves against predators. If you do not have predator-proof fences and your locality has a history of predation, it is probably more advantageous not to disbud kids.

The most common tool for disbudding kids is an electric iron with a $\frac{3}{4}$ to 1 in. barrel. The hot iron is placed over the horn bud to destroy the horn cells. This process can take between 10 and 15 seconds to complete. Extreme caution must be taken because the kids' skull is still fragile and it's possible to severely injure them. A holding box is also needed to disbud kids. This box restrains the kid and restricts the movement of the head. The final piece of equipment needed is an electric shaver to remove the hair around the horn bud. This allows for a better view of the horn bud, as well as less smoke from burning hair.



To the left is an example of a disbudding iron.



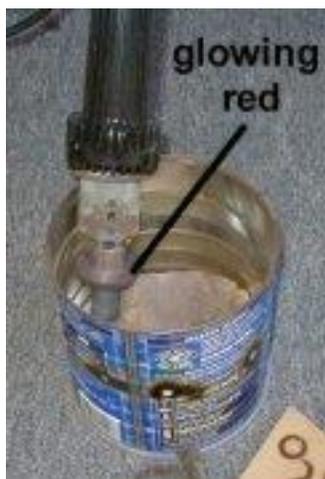
The picture to the left is of a disbudding box. Similar boxes can be purchased or made.

Disbudding is a fairly simple procedure, but it requires attention to detail. Extreme caution must be taken because it is possible to permanently injure the kid. Kids should be disbudded between 3 and 7 days of age. The head of each kid should be examined before hand, as some may be naturally hornless (or polled). The horn bud can be felt at the top of the head, just left and right of center, as a piece of immovable skin. This may be accompanied with a swirling hair pattern. If the skin in the horn area is movable, then the kid is polled; the hair in this area may also lay flat like bangs.

Once it has been determined that the kid is horned, follow the following steps to safely disbud the kid. Please observe carefully the accompanying pictures.

1. Give 2.5 ml of tetanus antitoxin subcutaneously if the dam has not been vaccinated before kidding.
2. Place the kid into the holding pen and securely close the lid of the box.
3. Clip the hair around each horn bud.
4. The disbudding iron should be very hot. (Iron should be 'red' hot when viewed in a dark room).
5. The next crucial step is to start burning the horn buds. This step is a two person job, one person to hold the head very still, while wearing very thick gloves, and another person with a steady hand to burn the horn bud. Hold the iron in place for 5 seconds or less and then check the progress. Remember that there is brain tissue not far from the hot iron. It is recommended that you alternatively burn the horn buds in order not to apply too much heat and (or) pressure to any one horn bud for dangerously long period of time. Keep burning until you see a copper colored ring encircling the horn bud.
6. For horn buds that do not come out easily (in kids 7 days old or older), use bone forceps to remove the buds.
7. Apply violet spray (or other dressing products from your local store) to cauterize the horn buds.

Heating the disbudding iron in a fire proof container. When hot, it should easily leave a black circle on wood.



On the right, the horn bud is more visible after shaving the hair.



When burning the horn buds, make sure to center the iron over the horn bud. Push down firmly, but being care to not to separate the skin. Make sure that the kid's head is restrained. If the kid's head is moving around it will be harder to avoid injuring it or others.



After a few seconds, remove the iron and check to see how the burn is. This will also allow the kid's head to cool, and the iron to reheat.

Notice that the horn bud is highly visible at this point.



The horn bud has been burned again, and now a copper ring has appeared. This indicates that the horn cells have been destroyed.



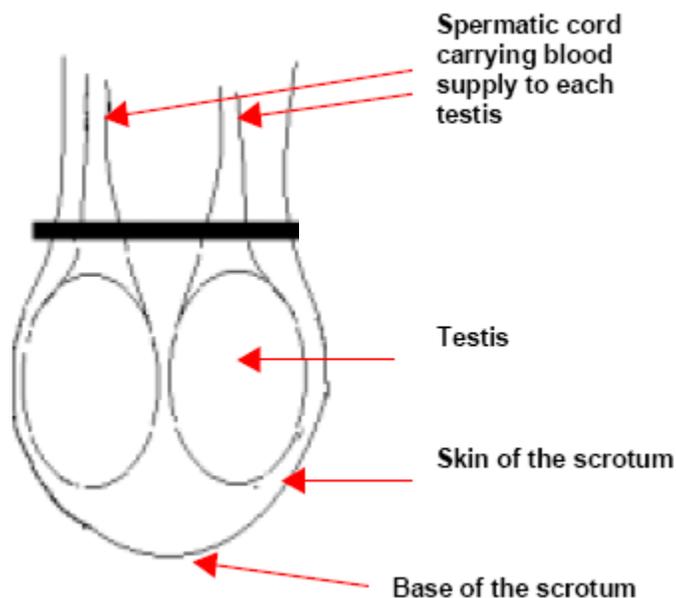
This is how the kid should look after disbudding. There is a distinct and solid copper ring around each horn bud. If the ring is not solid, scurs could grow in place of horns. Scurs grow from horn bud cells that were not destroyed.

Castration

Castration is the act of removing the testicles of kids. Male kids that are not kept for breeding purpose should be castrated when they are less than one week of age. Castration reduces the aggressiveness of the males, making them easier to handle and house, and prevents unpleasant flavors in the meat. Unfortunately, castrating also causes a slight decline in performance, due to the loss of androgen (male hormone) production. It is more convenient to castrate and disbud kids at the same time. The older the kid is at the time of castration, the more traumatic the event is.

There are several methods and tools used for castrating male kids. The bloodless methods include using an elastrator or a burdizzo (emasculatome). Another method of castration is to cut the testicles out with a knife. The use of Elastrator with rubber bands is perhaps the safest way

to castrate kids. A rubber band is placed right over the neck of the scrotum. This band cuts off blood circulation and causes the testicles to drop off within 10 to 15 days. This method is completely bloodless and no cutting and crushing is required. **It is very important to make sure that both testicles are in the scrotum when the band is in place.**



This figure shows the basic anatomy of the scrotum and testicles. The purpose of castration is to cut the blood supply to the testicles and scrotum or to remove the testicles completely. The wide black line shows the proper placement for a band or the crush point for a burdizzo.



The tool on the left is an elastrator. It operates similar to a pair of pliers. The band is placed on the prongs and opened by squeezing the handles together.

When getting ready to castrate, the band should be about half way down the prongs on the elastrator. This makes the band easier to slide off when in place. Holding the kid on his butt with his back to you, place one hand at the top of the scrotum, using the thumb and forefinger, push the testicles up into the scrotum. Double check to be sure there are 2 testicles. If there is only one testicle on a young kid, chances are that the second one hasn't dropped down from the abdomen. It would be a good decision to wait to castrate such a kid. Open the band wide enough to pull the scrotum through. Using your free hand, push the testicles back up into the scrotum and close the band around the top, but **DO NOT** slide the band off yet. **Double check to be sure both testicles are in the scrotum.** It is easier to reopen the band if it is still on the elastrator. When both testicles are in the scrotum, slide the band off the elastrator.



The picture illustrates the use of an elastrator. The band is positioned at the top of the scrotum, and is slid in place when both testicles are in the scrotum. Note that the prongs of the elastrator are pointed toward the kid. This allows the band to be slid off easier.

Another bloodless method of castration is to crush the blood vessels and cords to the testicles. For this, a burdizzo (emasculatome) is needed. Using a burdizzo requires attention to detail, if the cords are not completely crushed, the testicles will continue to grow and the procedure will have to be repeated.



The tool on the left is a burdizzo. The top of the tool is used to crush the blood vessels leading to the testicles.

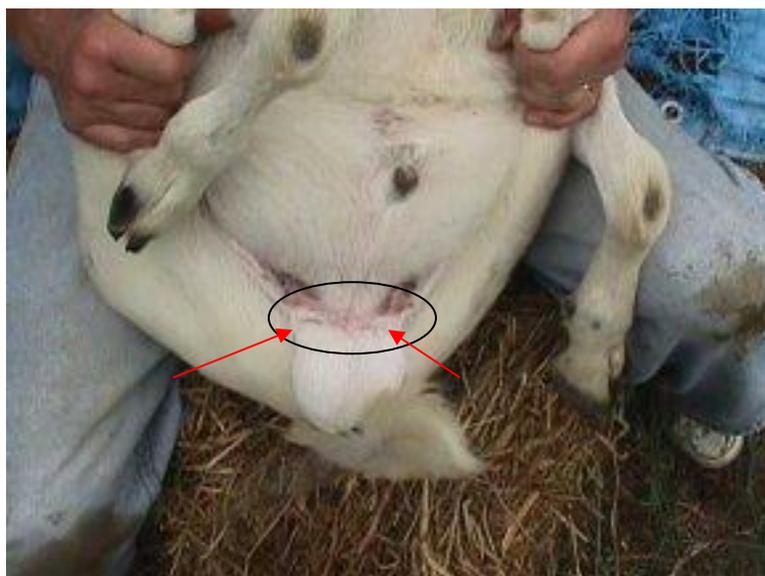
To castrate using a burdizzo, have an assistant restrain the kid, so that the kid is resting on his butt and the legs are immobile. Again it's important to check that both testicles have descended.

Begin by pulling the testicles down into the scrotum. The spermatic cords should be easily felt on either side of the scrotum. Next, place the cut-out (side with the ridges) on the under one side of the scrotum, just below the teats. The spermatic cords should rest between the ridges of the lower jaw of the burdizzo, the ridges are designed to hold the cords in place.



The lower jaw of the burdizzo has 2 ridges, which hold the spermatic cords in place. This jaw is placed behind the scrotum. The upper jaw, which fits into the lower, is used to crush the cords. It is positioned in front of the scrotum.

After positioning the cords in the burdizzo, begin to clamp down, making sure not to clamp down on the teat. Hold the burdizzo closed for 5 seconds. There should be an indentation of a line where the burdizzo was clamped. This tool should not pierce the skin, if the skin is pierced, apply a 7% tincture of Iodine. Repeat this procedure on the other side of the scrotum. Be sure to position the burdizzo so that the crushed sides **will not** connect, i.e. position the burdizzo ½ inch lower than the first side.



Looking closely, there is a dark line visible on either side of the top of the scrotum. This is the line left by the burdizzo. The line is an indication that enough pressure was applied.

If the process was successful, the testicles should shrink in size over time and become hard. If the testicles are bigger, 2-3 weeks after castration, then the cords were not completely crushed and the process must be repeated.

Nutrition

A well balanced diet is important for proper growth and development of your kid crop. There are several stages of growth that kids go through, each having important nutritional requirements.

Birth to Weaning

The most important step in starting a kid off healthy is colostrum. This is the nutrient and antibody dense first milk that the doe produces. Within the first few hours of life, the kid is able to absorb the anti-bodies without breaking them down, this is vital to the establishment of a strong immune system. It's important to monitor new-born kids to be sure that they are nursing as soon as possible (within the first 2 hours after birth).

As the kid gets older, it will start to eat grass, hay, and grain (if offered) just as its mother does. Adding forages to the diet is important in the establishment of a healthy digestive system. Some suggest feeding high quality hay to younger kids. This does have its advantages, higher nutrient

content, and more vitamin A; however this may not always be readily available. So long as you are providing good hay, mineral supplement and the does have enough milk, the kids will be fine.

Another option is to offer creep feed. This is an added source of protein and energy that is offered just to the kids. It does require having a feeder or feeding area that allows the kids to move in and out freely, but keeps the does out. (See page 30 for examples.) If space and resources permit, it may be a good idea to have a creep area for the kids even if you don't plan on feeding them. It would act as a place to escape from mom, and it would be a good place to offer hay (no competition with the other does).

Weaning to Maturity

Weaning the kids off the does is stressful both psychologically and physically. The time that you should wean is at your discretion. The kids tend to grow better while still on the doe, but keep in mind that continued lactation is a strain on the doe. She should be allowed a recovery period of at least 60 days before rebreeding. After weaning the kids, you should provide them with good pastures, mineral supplements and hay (if so desired). Basically, you can manage the newly weaned kids just as you would your does. If you are saving replacement does, be sure that they are getting enough forage to properly mature. You can monitor their growth through monthly, biweekly, or weekly BCS determinations and/or weighing. One thing to note if you take weekly measurements, you may not see big changes week to week, but there should be an increase in weight and an increase or no change in BCS between the first week and the fourth week.

Weaning should be gradual and the kid itself may be a better guide to the right weaning time than you or any advice that you may get from your neighbors or friends. When weaning, always leave kids in old or existing surrounding/pens and move mothers to new area. As a rule of thumb, don't wean kids that are less than 4-6 weeks old unless you can provide artificial means of rearing them. Also, don't wean kids that weigh less than 20 pounds even if you believe they are old enough to be weaned. Always weigh kids at weaning. Weaning time is defined as the last effort/time that the kid is separated from its mother. The following can serve as a guide in weaning kids:

- Encourage kids to consume hay (and grain, if available) and, after feeding, provide plenty of fresh water.
- When the kids show interest in consuming hay (and/or grain), reduce the amount of milk consumption by separating them from their mothers for 4-6 hours (or half a day). Provide a playground where the kids can enjoy and spend time.
- Increase the separation time to 12 hours or so during the day and join them with the mothers during the night time when the kids are eating enough hay and about 1/2 pound of grain.
- Repeat step (3) for about 7 to 10 days, and then completely separate the kids.
- Observe the kids for thriftiness.

After weaning, reduce or terminate supplementation to mothers depending on their physical conditions.

Marketing

The goal of any type of goat producer should be to have high quality animals to market for consumption or replacements to other producers. If selling for consumption, know what the target buyers are looking for. Preferences on kid size vary between ethnic groups and “fad” dieters. The demand for goat meat tends to follow religious holidays of Christians, Muslims and Jews. Having an idea of when they are and having the right size kids for each group can help up your profits.

In addition to selling to niche markets, one can sell in the general market, such as a sale barn, as well. However, there is no control over the price in this setting. The final price may be below market if the goats are not to buyers’ preference. If using a sale barn, only sell slaughter or cull goats. Breeding goats will not bring their true value at a sale barn.

In order to get a good price for breeding stock, producers should consider production sales or private treaty sales. Advertising for private treaty sales can be done via word of mouth, or ads in local farm orientated papers or breeders’ magazines.

For this project, we are asking you to provide us with slaughter animals. You are encouraged to keep replacements out of your kid crop.

Herd Health

Goats are generally very healthy and vigorous animals. They are, however, susceptible to internal and external parasites, infections, and metabolic diseases. For these reasons, it's important to observe your goats daily. This way you'll be able to notice changes in behavior and appearance that can indicate disease. In case your goats happen to get sick, having a first aid kit, of sorts, will come in handy.

Item	What it is	Use
Thermometer		To check rectal temperature
3, 15, and 50 cc syringes		To administer shots and drench
16 or 18 gauge needles, 1 ¹ / ₄ inches		For sub-Q and intramuscular shots
LA 200	Anti-biotic	For various bacterial infections
Vitamin A/D	Vitamin supplement	
Thiamine	Vitamin supplement	Stimulates appetite
Tetanus Antitoxin	Counteracts the effects of <i>Cl. Tetani</i>	Immediate passive immunity, lasting 7-14 days
<i>Clostridium perfringens</i> Types C&D with T	Aid in preventing enterotoxemia and tetanus	Stimulate immunity, booster 2 weeks after 1 st shot and yearly
7% Iodine	Disinfectant	Dip naval, spray open wounds

The normal temperature of a goat ranges between 102°F and 103°F. If the temperature is higher than 103°, that is indicative of an infection. The most common infection is a respiratory infection. The signs include: elevated temperature, depressed appearance, head low with neck extended, difficulty breathing, and depressed appetite. However, there are many other ailments that can cause an elevated temperature such as scours, pinkeye, viral infections, staph infections, heat stroke or exhaustion, just to name a few. If you are unsure how to treat an animal with a temperature, call a veterinarian or an experienced goat producer in your area.

Giving Shots

There are three methods for giving a shot:

- 1) Intramuscular (IM) – in the muscle
- 2) Intravenous (IV) – in the vein
- 3) Subcutaneous (Sub Q or SQ) – under the skin

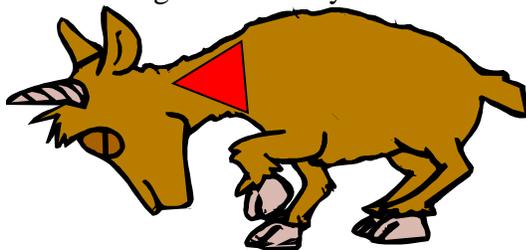
When giving an IM shot, **do not** give it in the back or the hips. This can cause abscesses to form in the meat and decrease the carcass value. A good rule of thumb to have when giving any shot is to picture a triangle on the neck, with the base parallel to the line of the shoulder, extending up

the line of the neck. IM shots should be given in the muscle of the neck, being careful to inject the solution slowly.

Subcutaneous shots should be given within the triangle as well. You want the medication to be placed just under the skin. This is best accomplished by making a “tent” by pulling up on the skin. Place your needle at the base of the tent and push into the center, being careful not to go all the way through. Using shorter needles, $\frac{3}{4}$ or 1 inch, should help to prevent going all the way through the skin.

Intravenous injections are given when it is necessary for the medicine to go directly into the blood stream for a quick response. In these cases, the medication is injected into the jugular veins in the neck. It is recommended that a veterinarian administer these types of injections.

A clean needle should be used for every animal when treating for an illness. When vaccinating, be sure to change your needle when you feel that it’s getting dull or it has been bent. **Do not** simply straighten the needle and keep going. The needle could break off under the skin and can travel throughout the body.



The figure on the left shows the proper place to administer all shots and vaccinations to ensure meat quality.

Vaccinations

Routine vaccinations will keep your herd protected against a few common ailments. The most common vaccination is against *Clostridium prefringins* Types C and D. This vaccine is produced separately or with Tetanus anti-toxin. *Clostridium prefringins* is a bacterium that is native to the gut of goats and is harmless in low numbers. Type C usually affects kids during the first few weeks of life, causing bloody scours. It’s associated with an increase in feed, starting creep or increase in milk intake. Type D, more commonly known as overeating, affects kids over a month of age, and occurs with a sudden change in feed. Preventing both is simple; the does can be vaccinated with enterotoxemia Type C & D with T about one month prior to birth. This will pass the immunity through the colostrum. The kids should be vaccinated with enterotoxemia C&D-T around 6 weeks of age, followed by a booster shot 2 weeks later. The vaccination should be boosted yearly.

The following is a suggested vaccination schedule that you could serve as a guide.

Class	Schedule	Vaccine/Disease
Does	Annual	Clostridium Tetanus Soremouth Leptospirosis
Bucks	Annual	Clostridium Tetanus Soremouth Leptospirosis Vibrio
Kids	Weaning Annual	Clostridium C & D Clostridium C & D Tetanus Soremouth Leptospirosis

Note: Does and bucks should be vaccinated 30 days prior to breeding season and include Vit. E/Se injection.

Parasite control

Internal and external parasites are a common problem in goats. They are ingested or picked up while grazing. Goats tend to be more susceptible to worms when they graze as opposed to browsing trees and bushes.

There are a couple of suggested methods for identifying affected animals as well as the best ways to de-worm. The signs of a goat with a worm problem are subtle at first, but can become very severe in a short amount of time. The first sign of an animal needing de-worming is the pale color of the inside of the eyelids and the gums. Normally these membranes are a pink color, however when the animal becomes anemic, as in the case of stomach worms, these membranes look white. Other signs of worms include: bottle jaw, collection of fluid under the jaw; consistent weight loss, even though the goat is eating well; and the hair coat appears very rough and shaggy. Animal exhibiting these symptoms should be de-wormed right away.

There are other strategic times to consider de-worming. One of these times is prior to birth. This will enable the doe to pass immunity on to the kid through the colostrum. Another time is before turning out (at least 48 hours) into spring pasture. This will help to reduce the potential contamination of that pasture.

Knowing which de-wormer to use can be tricky. There are several that have been shown effective for use with goats. These include; Fenbendazole (SafeGuard/Panacur), Albendazole (Valbazen), Oxybendazole (Synanthic), Levamisole (Tramisol/Levasol), Pyrantel (Strongid), Moratel (Rumatel), Ivermectin (Ivomec), Doramectin (Dectomax), and Moxidectin (Cydectin/Quest). Rotating the de-wormer that you use is important as well. The parasites can build-up a tolerance to a particular de-wormer if you use it all the time. If you have concerns, ask a local veterinarian which de-wormers are most effective in your area or an experienced goat producer.

In addition to drench, injectable, and pour-on de-wormers, there are feed additives that are supposed to have the same effect. The problem with feed additives is that you can't control the exact dosage to each individual. Most likely you will have animals who are over dosed, but more importantly you will have animals who are under dosed. Under dosing can lead to a buildup of tolerance by the parasites.

Coccidiosis

Coccidiosis is caused by a parasite that is specific to goats. All livestock harbor species of coccidia, but there is no crossover between species. For example, if you have pastured poultry in the same paddock as your goats, the coccidia of the goats will not affect the chickens and vice versa. Coccidia most often affect younger kids, and can be picked up in their environment: contaminated water or feed, manure covered udder, or just nosing around and accidentally eating manure. Sub clinical infections are common (infections that show no outward symptoms). These can lead to immunity against coccidiosis. The most common sign of coccidiosis is diarrhea. This can range from being mild scours to being severe watery and bloody diarrhea.

There are preventative measures that can reduce the risk of kids getting a severe case of coccidiosis. The does are the main source of coccidia in the kids' environment, as they shed many eggs, but will not have an infection. Feeding a coccidiostat prior to birth will reduce the amount of fecal egg shedding. The most common coccidiostat is Deccox. It can be purchased as a loose additive for feed or mineral. Another option is to treat the weaned kids, preventive or as a remedy, through the water. There are sulfonamides that are added to the water to fight off coccidial infections. The medication can also be added to creep feed, such as Deccox. Both are equally effective.

Scrapie

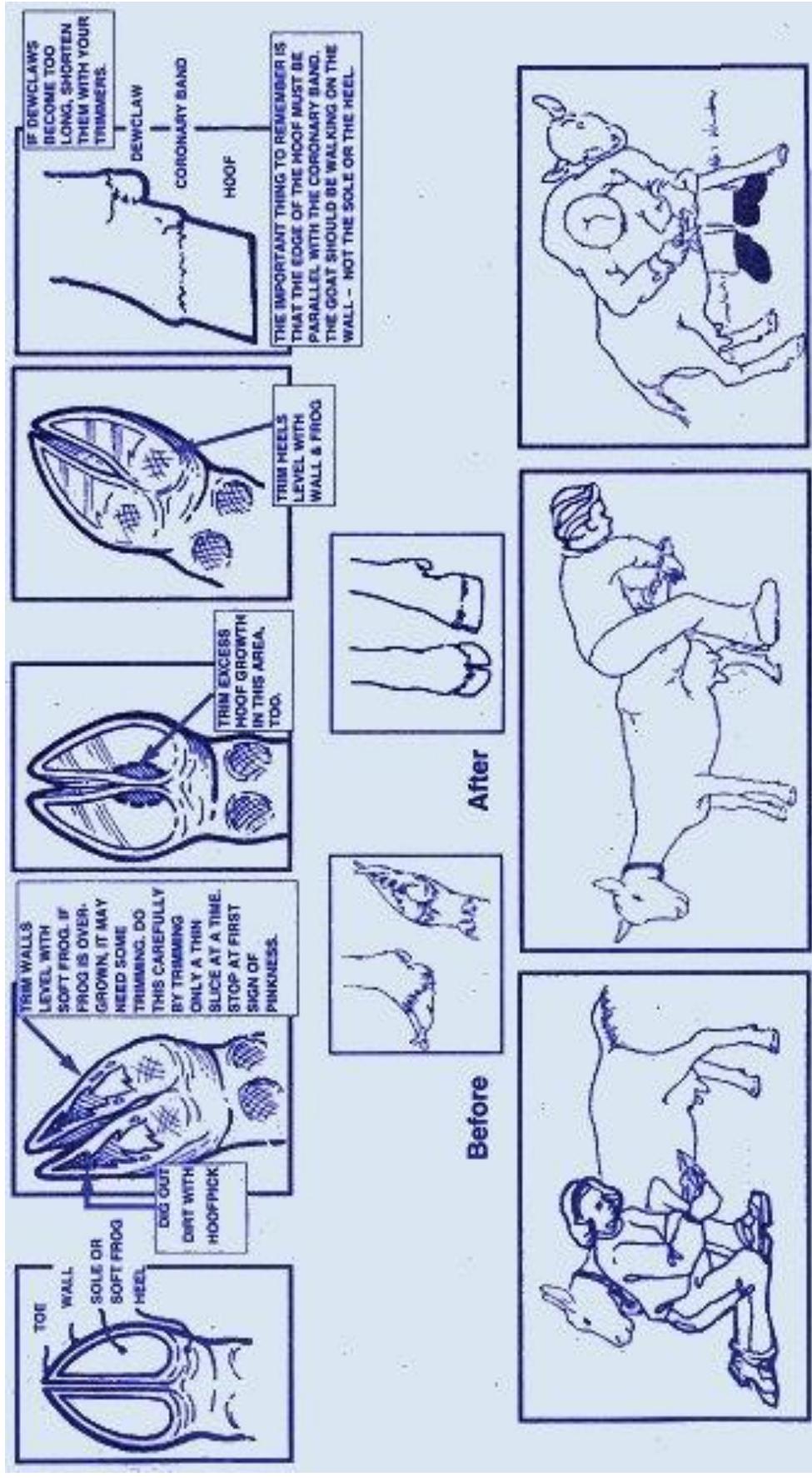
There is a growing awareness of Scrapie, a brain disease of sheep and goats similar to BSE, within the goat industry. It's important to remember that it is more common in sheep than goats at this point, and that the incubation period for the disease is very long, about 5 years. The USDA Veterinary Services has brochures that are available to producers. These brochures explain the optional and mandatory flock and herd identification programs that are now in place. This program mainly consists of identifying, through ear tags or microchips, the farm that a particular animal originated from.

Currently, the program is optional, in the state of Louisiana, for goat producers, but it is encouraged. There is one stipulation in that any and all animals that are sold for breeding stock or exhibited in a show must have a Scrapie tag. For more information, contact Dr. Dale Hollier at the LA Veterinary Services. (See page 20.)

Hoof Trimming

Proper hoof care is important to your goat's health. Overgrown hooves can cause goats pain, so much so that they may not be able to move to the feed. In the wild, goats are able to wear their hooves down on the rocks, however domesticated goats require that their hooves be trimmed every 3-4 months. For a clear idea on how goats hooves are supposed to look, reference a kid's hoof. The line of the hoof is parallel to the hair line of the foot. In addition, the bottom of the hoof is level. Keep this in mind when you are trimming.

There are a few tools that you can use to trim hooves, a hoof nipper, a sharp pocket knife or a pruning shear. We recommend a hoof nipper or trimmer, they are light weight and easy to control and use (about the same size as a kitchen scissors). When trimming, it's best for you and the goat to have the goat restrained in some manner; in a head catch, dumped on its butt or having someone hold on to them. Always bend the legs the way they normally would, and if the goat needs to lean on you a little bit, let them, they will fight less. Trim any part of the hoof that has grown down and folded under the foot. When you see a pinkish color stop, cutting deeper will cause it to bleed. The point of the hoof will tend to grow outward and rollover on itself. Start by trimming from the outer part in. The point of the hoof should make about a 45° angle with the bottom, but it's not necessary for it to do so. Some suggest using a hoof rasp to smooth off the bottom of the hoof. This is optional; a good trimming job is the most important part.



The figure above illustrates the proper way to trim hooves. Proper hoof care is essential to the health of your goats. Untrimmed hooves can lead to lameness and other health problems. Trim the goat's hooves at least twice a year, before breeding and at weaning. It may also be a good idea to check hooves when you work your animals.

Record Keeping

Good record keeping practices are beneficial to any production scheme. They can be as simple as keeping notes on the maternal performance of your does, to very elaborate containing the date each doe was bred, her weight through gestation, etc. It's important to remember that record keeping is not a one-size fits all operation. Producers should tailor their record keeping program to fit their production goals.

There are numerous different types of records that can be kept. The two important general categories for sheep/goat farm records are production and financial records.

Production records: Production records for a sheep and goat enterprise should, for example, consist of information on herd health, performance of the herd as well as the performance of the individuals within the herd over successive years. These records should also include information on fertility, prolificacy, rearing or mothering ability and milk production directly or indirectly estimated through lamb/kid growth rate to a given age. Examples include:

Mating records: Sire, dam and progeny identification is important in breeding, sale, and culling decisions.

Health records: including morbidity, mortality, signs and symptoms, diagnosis, treatments and vaccinations, etc.

Feed consumption: This is difficult to estimate on farms where animals graze, but for capital-intensive farm businesses, such as finishing or fattening operations, the amount of concentrate fed should be recorded to calculate profitability

Lambing/kidding records: which include identity, dam ID, birth weight, date of birth, type of birth and sex.

Milk production records: recording once weekly may suffice as this gives an indication of total milk production. Therefore, in dual-purpose sheep and goats, or even in meat types, a random sample of lactating females may be selected for recording their once-a-week milk production.

Growth/ weight records: kept periodically (possibly on a monthly basis) by recording the body weight of animals.

Inventory: Inventory of available animals on the farm and other assets.

Financial records: relate primarily to money or economic interactions on the farm. There are some lending institutions that will require detailed business and personal information on all farm assets as well as the status of unpaid financial obligations. Financial records justify or prove farm income or expense transactions. Examples of financial records are product sales, operating expenses (feed cost, veterinary expenses, forage seeds etc.), equipment purchases, accounts payable, inventories, depreciation records, loan balances and price information.

Goat Housing, Equipment and Facilities

General Considerations

Goats do not require elaborate or complex housing. There are, however, five basic housing requirements that goat owners should be aware of when housing goats. These are:

1. The building should be well ventilated, but not drafty. One square foot of window area for every 20 sq. ft. of floor area provides adequate ventilation and sunlight.
2. The bedded area must be clean and dry.
3. The walls and air should be dry and free from moisture condensation.
4. Receptacles for hay, grain and water should be provided so that feed and water are not contaminated from animal waste.
5. Provide a floor area of about 15 to 20 sq. ft. per goat if the purpose of housing is confinement only, and 20 to 30 sq. ft per doe if feeding and other activities are done within the building.

General Housing and Fencing Requirements

The following could serve as a general guide for housing and fencing requirements.

Description	Requirement/doe	Requirement/buck
Housing space	15 - 20 sq. ft.	30 - 40.sq. ft.
Stalls	6 x 6 ft	7 x 7 ft
Stall partition height	3 -4 ft	4 - 5 ft.
Yard	200 sq. ft.	70 - 100 sq. ft.
Minimum exercise area	50 sq. ft.	50 -60 sq. ft.
Fence height	4 - 5 ft.	6 -8 ft.

Doe Housing

There is no need to provide warm housing for does (except perhaps for those with newly born kids) in the winter months. They are comfortable in the coldest weather if they are provided draft-free quarters and dry bedding. Any attempt to close doors and windows to increase temperature in the barn is usually accompanied by respiratory problems resulting from excessive moisture, noxious odors, and increased carbon dioxide in the air.

Provision for plenty of sunlight from the southern or south-eastern aspect is highly desirable for any type of goat barn. This provides maximum sunlight (with its warming and drying properties) in the winter months and a minimum of inside sunlight during the hot summer days.

There are basically two systems of housing used for goats:

1. Loose-housing, where the animals run loose in large pens or sheds
2. Confinement housing or stall barn, where goats are confined in stalls or small pens.

Loose housing is an old system with many desirable features. There is less labor required in caring for animals because daily cleaning of manure is not necessary; group feeding and bedding are possible; construction is easier and cheaper; and plenty of exercise room is available. The bedding pack is usually allowed to ferment and if kept clean and dry on top, makes a comfortable bed on chilly nights and hot summer days. Confinement housing allows the operator greater flexibility and control over the day-to-day management of the herd but it usually is expensive to construct and maintain.

Buck Housing

Housing for bucks should be simple, yet it must be strong and safe. Mature bucks can sometimes become vicious (particularly during breeding season) and should be confined. A three-sided shed or barn, opening to the south or southeast, provides housing for bucks. A strong corral fence 5 to 6 feet high, must be around the barn to let the buck(s) roam freely and exercise. Bucks should be housed at least 200 feet away from the main herd during the non-breeding season.

Kid Housing

Any housing system that can keep kids dry and draft-free is acceptable for kids. A 3 x 3 foot box in the middle of a pen with a flat top and one side removed provides kids with a warm protected spot to rest. During kidding, maternity and kidding pens are a must. Kids should be penned with their mothers in small groups for at least the first week of life. This gives the kid good opportunity to get colostrum during early life. As the kids grow older, they can be penned in larger groups until they are four to six months of age. They should be provided with large exercise area during this time.

List Of Basic Equipment and Approximate Costs

Equipment	Approximate Cost
Disbudding iron Rhinehart X50 (or X30)	\$65.00
Kid holding box	36.50
Hair clipper	155.00
Hoof trimmer	15.00
Small tattoo outfit (with numbers and letters)	60.00
Animal scale (min 60 pounds)	36.50
Weigh sling	21.50
Elastrator	25.00
Kid puller	10.50
Balling gun (for deworming)	8.50
Wheel barrow	50.00

Facilities

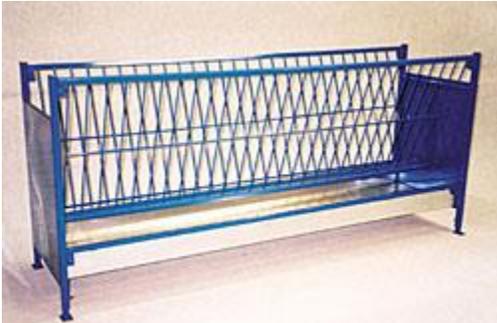
Fed and Hay Bunks

The design of your feed bunks doesn't need to be complicated, they just need to keep the feed off the ground and keep the goats from stepping into them. When it comes to materials for feed bunks, the sky is the limit.

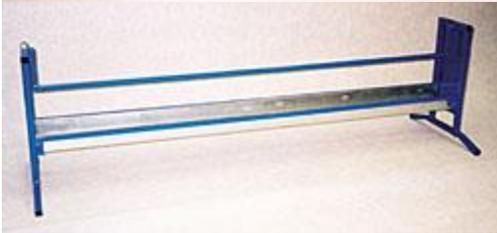
Wooden bunks are the old standby, they are fairly cheap to build, easy to move around, easy to customize, but the goats tend to chew them up. Another benefit of wooden bunks is that you can easily modify them to feed hay as well. The simplest design for a wooden bunk consists of a few lengths of 2x4 and 4x6, 2 small pieces of plywood and a box of nails. This very simple, X-shaped, bunk can be made to any length and height. There are more examples of simple grain bunks on the following pages. If you plan to feed grain and hay in one particular area, you may want to consider a combination bunk. These tend to be more complicated, and less portable. However they can be very convenient as fence line or walk-thru bunks. Building plans for these types of bunks are available for downloading on the Premier Supply website, www.premier1supplies.com. They are also included in this handbook.

Plastics are very durable, lightweight and easy to clean. PVC pipe can be cut in half and mounted in a number of ways to make an excellent feed bunk. If possible, it's a good idea to cap the ends to help prevent wasting feed or supplement.

Feed and hay bunks can also be purchased from a number of companies. There are many styles of feed, hay and combination grain/hay bunks that can be purchased ready to assemble. Please refer to Appendix for a list of suppliers.



This is an example of a combination grain and hay bunk. It is available in 4 or 8 foot lengths, has a galvanized steel feed pan and is very sturdy.



The picture on the left is of a simple feed bunk. It is available in 8 foot sections, and has a galvanized steel pan. The bunk is not too heavy and can be moved around fairly easily.



This is another example of a combination bunk. It is not as tall as the first and there is no separation between the hay and grain. The top part of the bunk can be removed for just feeding grain.



Here we have a simple feed trough. It is very portable and durable. The drawback for these types of feeders is they are easy for the goats to stand in, and kids may even lay down in them.

The designs of hay bunks are unlimited as well. Goats do tend to waste a lot of hay and having a bunk or feeder that restricts the access to the hay is beneficial. There are many styles of hay bunks that can be ordered from numerous companies. Of course, as always, one can build their one to suit their needs. The bunks pictured above designed for sheep and goats, however, one may find that they still will waste some hay.

If feeding hay from small square bales, a feed bunk that only allows the nose, rather than the entire head to have access is ideal. This can be accomplished in a number of ways. The combination bunks that Premier 1 Supplies offer have wire panels that only allow the animal's nose through. This way the goats can only pull out a little hay at a time. Using this basic design concept, one can modify it using what is on hand. For example, a manger-style hay feeder can be constructed using scrap lumber, and mounted on the side of a building. To restrict access, simply construct the front of the manger using 1x1s or

1x2s placed 4 to 5 inches apart. This will allow the goats to get their nose in the hay, but limit how much they can pull out.

If feeding big round bales, a collapsible feeder is the most practical type of feeder to use. The collapsible feeder controls access to the hay and helps to keep the older goats from climbing on the bale. However, they are not designed to help prevent wasting hay. These types of feeders are manufactured in smaller, somewhat lighter weight panels for sheep and goats. There is a chance that a goat, young or old, may get a head caught in the feeder, be sure to check it daily.



This is an example of a collapsible round bale feeder. The feeder consists of four panels, 2 stationary and 2 sliding.

Creep Areas

As mentioned before, the main idea of a creep area is to let the kids in and keep the does out. The easiest way to do this is with a creep gate. A creep gate has vertical bars spaced to allow smaller bodied animals, i.e. kids, to pass thru. They can be purchased from a few of the suppliers listed above, modified calf creep gates, or made from lumber.



The picture to the left is an example of a creep gate. The vertical bars are adjustable at the top and bottom to accommodate growing kids. The horizontal bar (3rd from top) adjusts up and down to discourage does from trying to enter.

Using the picture above, one can make a creep gate. When doing so, keep in mind the size of the does currently on the farm and the size of the kids that are typically born. One major advantage to making a creep gate is that it can be customized to fit into the operation perfectly.

Even if the kids will not be feed creep feed, having a separate area for them is beneficial, especially if the herd is kept in a barn yard or other small area. To attract the kids into the area, hang a lamp, i.e. a heat lamp or a regular lamp. Kids are curious about their environment and will be attracted to the lighted area. This works especially well if the area was previously dark.

Keep in mind that creep areas are optional.

Body Condition Scoring

Note: This is an extension publication from Oregon State for determining BCS in sheep. However the principles are the same for goats.

Throughout the production cycle, sheep producers must know whether or not their sheep are in condition (too thin, too fat, or just right) for the stage of production: breeding, late pregnancy, lactation.

Weight at a given stage of production is the best indicator, but as there is a wide variation in mature size between individuals and breeds, it is extremely difficult to use weight to determine proper condition. Body condition scoring describes the condition of a sheep, is convenient, and is much more accurate than a simple eye appraisal.

A body condition score estimates condition of muscling and fat development. Scoring is based on feeling the level of muscling and fat deposition over and around the vertebrae in the loin region (Figures 1-3). In addition to the central spinal column, loin vertebrae have a vertical bone protrusion (spinous process) and a short horizontal protrusion on each side (transverse process). Both of these protrusions are felt and used to assess an individual body condition score.

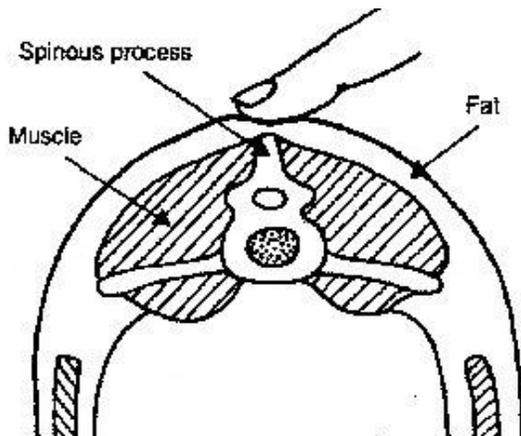


Figure 1 - Feel for the spine in the center of the sheep's back, behind its last rib and in front of its hip bone.

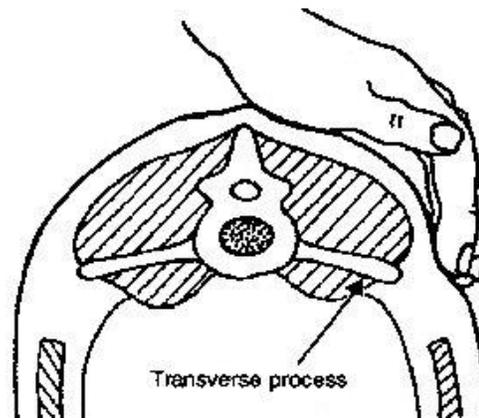


Figure 2 - Feel for the tips of the transverse processes.

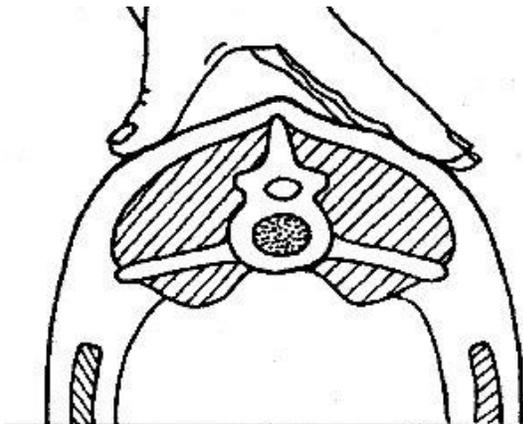
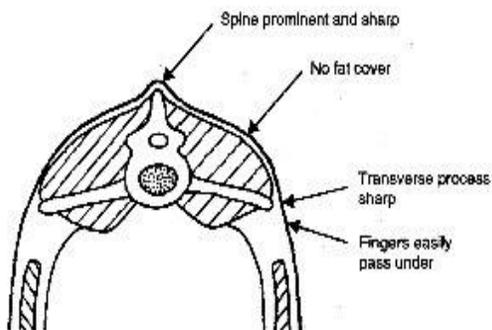


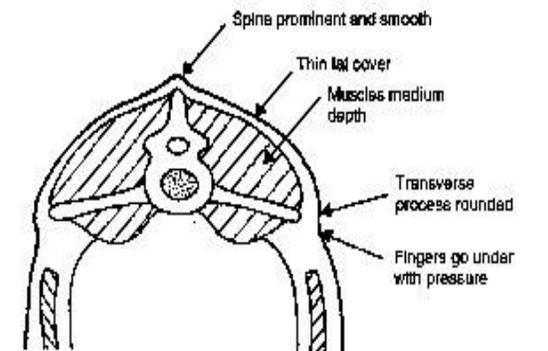
Figure 3 - Feel for fullness of muscle and fat cover

The system used most widely in the United States is based on a scale of 1 to 5. The five scores (Figures 4-8) are:



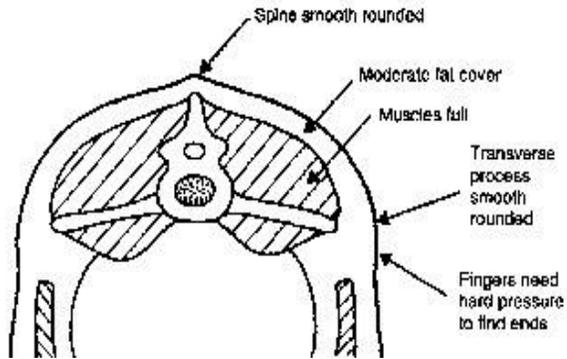
Condition 1 (Emaciated)

Spinous processes are sharp and prominent. Lion eye muscle is shallow with no fat cover. Transverse processes are sharp; one can pass fingers under ends. It is possible to feel between each process.



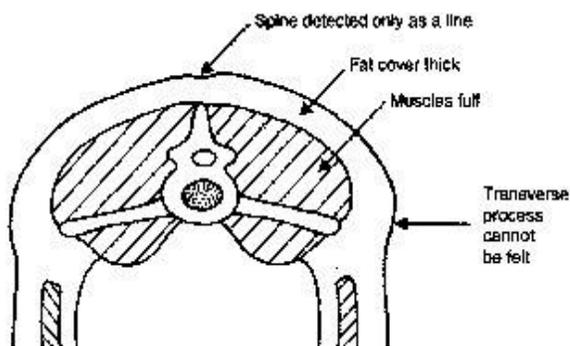
Condition 2 (Thin)

Spinous processes are sharp and prominent. Lion eye muscle has little fat cover, but is full. Transverse processes are smooth and slightly rounded. It is possible to pass fingers under the ends of the transverse processes with a little pressure.



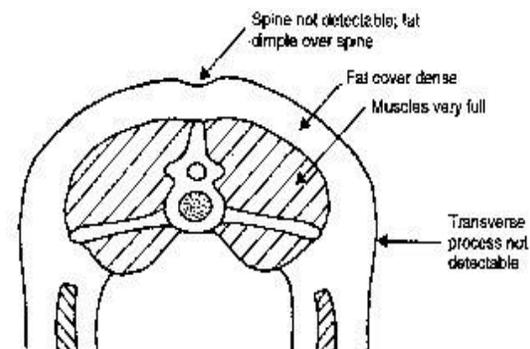
Condition 3 (Average)

Spinous processes are smooth and rounded and one can feel individual processes only with a little pressure. Transverse processes are smooth and well covered, and firm pressure is needed to feel over the ends. Loin eye muscle is full with some fat cover.



Condition 4 (Fat)

Spinous processes can be detected only with pressure as a hard line. Transverse processes cannot be felt. Loin eye muscle is full with a thick fat cover.



Condition 5 (Obese)

Spinous process cannot be detected. There is a depression between fat where spine would normally be felt. Transverse processes cannot be detected. Loin eye muscle is very full with a very thick fat cover.

The system contains everything from emaciated sheep to those that are grossly obese due to over feeding or being nonproductive. In most typical sheep flocks, over 90 percent of the sheep should have a body condition score of 2, 3, or 4. It is recommended that half scores be used between 2 and 4, giving the following scores: 1, 2, 2.5, 3, 3.5, 4, and 5.

The intermediate half scores are helpful when an animal's condition is not clear. Keep in mind that placing an exact score is not as important as being able to assign a relative

score. A body condition score of 3 versus a 3.5 is not such a big deal, but the relative difference between a 2.5 and 4 certainly is of concern.

Other than practical experience, there is little available research comparing condition scores with performance. The majority of the research reported has dealt with the relationship of body condition score at breeding to ovulation rate and subsequent lambing percentage. Generally, the better the body condition score at mating, the higher the ovulation rate and therefore the higher the potential lambing percentage. However, ewes with a condition score greater than 4 at breeding tend to have a higher incidence of barrenness. Ewes with a condition score less than 3 at breeding will be more responsive to the effects of flushing than those with condition scores at 3.0-3.5 at mating.

Two research trials conducted by Oregon State University found that ewe body condition score at lambing had an effect on total pounds of lamb weaned per ewe. Ewes with a body condition score of 3 to 4 at lambing lost fewer offspring and weaned more pounds of lamb than those with a condition score of 2.5 or less.

In one study, ewes with a body condition score of 4 at lambing had a total weight of lamb weaned per ewe that was 82 percent greater than ewes with a body condition score of 2.5. The total weight weaned was 113 pounds versus 62 pounds per ewe. The increase in total weaning weight was due to improved lamb survival and heavier weaning weights.

In the other study, there was a 33 percent difference in total weight of lamb weaned (64 versus 85 pounds per ewe) between ewes with pre-lambing body condition scores of 2.5 to 3.5. This increase in pounds of lamb weaned was primarily due to improved lamb survival for offspring from the ewes with the higher body condition score.

Some suggested (optimum) condition score values for the various stages of the production cycle are:

Production	Optimum stage score
Breeding	3 - 4
Early - Mid Gestation	2.5 - 4
Lambing	
(singles)	3.0 - 3.5
(twins)	3.5 - 4
Weaning	2 or higher.

The scores suggested above should allow for optimum productivity in highly prolific ewes. On average, a difference of one unit of condition score is equivalent to about 13 percent of the live weight of a ewe at a moderate (3 - 3.5) body condition score. Thus, a ewe with a maintenance weight of 150 pounds would need to gain approximately 20 lb to go from a body condition score of 2.5 to 3.5.

Body condition scoring is a subjective way to evaluate the status of a sheep flock--a potential tool for producers to increase production efficiency in their flocks.

References

Khan, K., H.H. Meyer and J.M. Thompson. 1992. Effect of pre-lambing supplementation and ewe body condition score on lamb survival and total weight of lamb weaned. Proc. W. Sect. ASAS 43:175

Russel, A. 1991. Body condition scoring of sheep. In: E. Boden (Ed.) Sheep and Goat Practice. p 3. Bailliere Tindall, Philadelphia.

Appendix

Sources of Goat Supplies

American Livestock Supply P.O. Box 8441 Madison, WI 53708 1-800-356-0700 www.americanlivestock.com	Goat General Supplies Caprine Supply P.O. Box Y 33001 West 83rd St. DeSoto, Kansas. 66018 (913) 585-1191 1-800-646-7736 1-800-646-7796 (FAX orders)	Hoegger Supply Co. P.O. Box 331 Fayetteville, GA 30214 (770) 461-4129
Mid States Wool Growers 9449 Basil-Western Road Canal Winchester, Ohio 43110 1-800-841-9665 www.midstateswoolgrowers.com	Premier 1 Supplies 2031 300 th St. Washington, Iowa 52353 1-800-282-6631 www.premier1supplies.com	D.M. Peifer Supplies P.O. Box 503 Herndon, PA 17830 (717) 758-8464
Northwest Pack Goats & Supplies Rex & Terri Summerfield 2050 Wilson Creek Road Weippe, ID 83553 Phone: 1-888-PACKGOAT Fax: (208) 435-4529	Jeffers Vet Supply P.O. Box 948 West Plains, Mo. 65775 (800) 533-3377	Omaha Vaccine Company 3030 L St. P.O. Box 7728 Omaha, NE 68107 (800) 367-4444
Nasco 901 Janesville Ave Fort Atkinson, WI 53538-0901 414 563-2446 Fax 414 563-8296	Pipestone Veterinary Clinic 1300 So. Hwy 75/P.O. Box 188 Pipestone, MN 56164 1-800-658-2523 www.pipevet.com	PBS Livestock Health P.O. Box 9101 Canton, Ohio 44711- 9101 1-800-321-0235
KV Vet Supply Co. David City, Nebraska 1-800-423-8211	Sydell, Inc. 46935 SD Hwy 50 Burbank, SD 57010 1-800-842-1369 www.sydell.com	

American Meat Goat
Association
P.O. Box 333
Junction, TX 76849
(915) 835-2605 phone
(915) 835-2259 fax

Goat Associations

American Boer Goat
Association
P.O. Box 248
Whitewright, Texas 75491
1-800-414-0202
FAX: (903) 965-7229

American Tennessee
Fainting Goat
Association
Route 1, Box 111
Curreyville, MO
63339
(573) 324-5698

Ranch Publishing
P.O. Box 2678
San Angelo, Texas 76902
(915) 655-4434

Meat Goat Publications

The Goat Magazine
2268 CR 285
Gillett, TX 78116
830-789-4268
830-789-0006 fax

The Stockman Grass
Farmer
P.O. Box 2300
Ridgeland, MS 39158
800-748-9808

Countryside & Small Stock
Journal
W11564 Hwy 64
Withee, WI 54489
800-551-5691