

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #1

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WHY DO I WANT TO OWN A GOAT?

Have you asked yourself this question? Do you think that baby goats are cute and might be sort of fun to own? Have you really thought hard about the responsibility of owning and caring for a goat? Well, give it some thought now **before** you rush out to buy a goat.

There are several types of 4-H goat projects. However, regardless of which project you choose, you can count on having to feed and water and check in on your goat at least twice each day. Yes, that's right! In the middle of winter you will probably have to get up while it is still dark to take care of your goat before going off to school. After school you'll need to count on doing your goat chores again as well as homework, any sports and social activities you like to do, and any other household chores you are responsible for. You'll also need to clean your goat's pen and shelter periodically and learn to trim your goat's feet. Do you have the time and energy for a goat? It's a good idea to talk to your family now about how you will arrange your time to care for a goat.

Another thing to check on before buying your goat is whether there are any local laws against having a goat on your property. If you cannot have a goat where you live, you may be able to lease a goat from a goat producer and help care for it on their place. However, check first with your county extension office to find out under what conditions leasing is allowed by 4-H. You may also keep your goat on a friend's farm, but if so make sure that both your families get along well and understand what your duties are and what punishments or actions are to be taken if you do not take care of your goat. Even if there are no local laws against keeping a goat on your land, plan on putting your goat pen where it will not bother your neighbors. Goats can be very vocal at times and may attract flies in the summer, especially if you forget to clean their pen regularly. If you decide to get a goat, be sure to have housing, fencing and everything else you will need ready before the goat comes home with you. You can hardly keep your goat in your bedroom while you build its shelter.

If you and your family are sure that you have the time, energy, and place to care for a goat, the next question to ask yourself is what kind of a goat project do I want to do? Here's a list of goat projects:

1) Dairy goat project - dairy goats are much smaller than cows, cost much less to house and feed, and give family-sized amounts of milk daily. They bond well with the person who milks and feeds them, live about as long as a dog and make great companions. However, you do need to milk them twice a day. If your family consumes a lot of milk and dairy products, dairy goats may be the perfect animals for you. It is easy to make delicious cheeses from goats' milk. Goat milk has a slightly different composition than cow milk, so a family member who is allergic to cow milk can usually drink goat milk. It's a good idea to have your family try some goat dairy products and see how they like them before you buy a dairy goat. Of course, to produce milk a dairy goat must first produce kids. This means you need a shelter suitable for overwintering a goat and kidding in. You must also learn how to dispose of extra kids unless you want to own a whole herd. Actually, one goat alone tends to be a very lonely, unhappy, noisy animal, so most people prefer to own at least two goats.

2) Recreational goat project - castrated male goats (called wethers) can be raised with lots of human contact and trained to either carry packs or pull carts. You do not need to milk them, however they require daily exercise just like a dog although you can usually slack off in the winter months. A goat needs to be about two years old before he is strong enough to carry a full pack or pull a cart. However, basic training starts at about 2 to 3 months of age. By one year of age a wether can easily carry a soft pack with your lunch, spare jacket, and water in it and accompany you hiking. It usually takes two people to train a driving wether so make sure you have a friend

or family member who is willing to commit to helping you out. You should also plan on having to spend money buying packing and driving equipment. Be sure to check out the price of necessary equipment in various catalogs before you buy your wether. There are plans available for making your own soft packs and driving carts. Harnesses used to train goats or to pull sleds or stone boats along the ground are relatively inexpensive. However, the harnesses used in 4-H competitions to pull carts and the rigid packs for serious packing are much more expensive. A wether can live for a long time so you need to make sure you will not eventually tire of him.

3) Meat goat breeding doe project - female goats (does) can be used to raise meat goat kids rather than for producing milk for your family. Just like a dairy goat they require suitable housing for overwintering and kidding. They do not need daily milking. However, you must find a market for their slaughter kids every year. Meat goat does are often grazed on pastures from May through November.

4) Meat goat market wether project - market wether projects are short term projects, unlike the other goat projects. Castrated male goat kids are purchased in the spring when they are old enough to be separated from their mothers (weaned). This occurs when they are about 10 to 12 weeks old. You can also raise a kid from birth from your own meat goat breeding doe. Either way, the goal is to do a good job of raising them through the summer until they are ready to slaughter and weigh anywhere from about 50 to 90 pounds. Because you will not be keeping the goat over the winter, the housing requirements of a market wether are simpler than those of the other goat projects. Before you get a meat goat kid, you need to make sure that you are willing to have it killed for meat even though it will become very tame over the summer. You will also need to find a buyer for the meat unless your family eats goat meat. If you are squeamish about eating your own goat you may be able to exchange the goat meat from your goat with another 4-Her who also prefers not to eat their own goat. Goat meat is very tasty and is a healthy choice for people who want to eat a red meat that is very low in fat. Be sure to check with your county about what age, weight, and vaccination rules they have for market wether projects and to find out if market wethers must have their horns removed.

5) Fiber goat project - Some goats produce special fibers or wools in their coats that can be spun to make yarn for knitting and crocheting clothing. Angora goats produce curly long wool called mohair. All goats produce a fuzzy undercoat of soft wool in the winter to help keep them warm. This wool is called cashmere. Some goats produce so much cashmere that it is worth the time and effort to comb or shear it off them at the end of winter. You can use a female or castrated male goat for a fiber goat project. However, you must keep their fleeces clean all winter and harvest their fleeces every year. A fiber goat project is perfect for someone who likes goats, wants to learn how to spin, and likes to knit or crochet.

It is important to make sure there is a 4-H group and leader in your county willing to take on your project before you go out and buy an animal. For example, if there is a dairy goat project in your county, check with them before you buy a meat goat market wether to make sure they will take on your project.

Now that you've thought more about why you would like to own a goat, here are some activities to help you decide if a goat is really for you.

Suggested Activities

- 1) Find out what local laws might affect your decision to own a goat.
- 2) Volunteer to help a friend who owns a goat or a goat producer with their goat chores one morning or evening (even Cloverbuds can do this one, especially if accompanied by a responsible adult!).
- 3) Make a chart of your daily schedule and add to it a list of your anticipated goat chores and the times at which you would do them.
- 4) Sample various goat products with your family and decide which ones you like best. Goat cheeses can be found in most large supermarkets or purchased direct from local goat dairies, while goat meat is available through butcher shops, specialty meat stores, and from individual producers. Contact the Empire State Meat Goat Producers' Association for further direction if you have trouble locating goat meat.
- 5) Locate an owner of a pack or driving goat and ask them if you can tag along while they work their goat.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #2

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THE DAIRY GOAT BREEDS

One way to learn more about dairy goats is to become familiar with the different dairy goat breeds. A breed is a group of genetically related animals that reliably passes on certain characteristics to their offspring. For example, if you breed two German shepherd dogs to each other you can count on always having their offspring look like German shepherds and not poodles. Just like dog breeds, dairy goat breeds differ in how they look, but they also tend to differ in the amount of milk they produce.

Let's look at average milk yield and butterfat percentage (how creamy the milk is) in 1998 for the six breeds of dairy goats popular in the U.S.

BREED	305 day yield (lb)	305 day yield (kg)	fat percentage
French Alpine	1979	900	3.5
La Mancha	1771	850	3.9
Anglo-Nubian	1618	735	4.6
Oberhasli	1663	756	3.7
Saanen	1998	908	3.5
Toggenburg	1710	777	3.3

Notice that the total milk yield in this table for a goat milking for 305 days in a row is given in both pounds (lb) and kilograms (kg). In the metric system of measuring, milk is weighed in kilograms not pounds (remember 1 kg of milk = 2.2 lbs of milk). If you are used to thinking of milk in quarts, a quart of milk weighs a about 2.15 lbs or a tiny bit less than 1 kg), so you can use the kg column to figure out roughly how many quarts are produced. The French Alpine and the Saanen breeds are very comparable fat percentage. The Toggenburg breed average for milk and butterfat percentage is a little lower. The Oberhasli breed average is also lower for milk yield. These breeds were all developed especially for milk production in a very mountainous region of Europe called the Alps. La Manchas also tend to give less milk than Alpines and Saanens. They are a slightly smaller breed of goat developed in the U.S. from crossing various types of goats that made their way here from all over Europe. In the United States, Anglo-Nubians are referred to simply as Nubians. They were developed during British colonial times from crosses of British, Middle Eastern, and Indian breeds of goats. Nubians are known for their creamy, high butterfat milk and their tolerance to heat. Because their milk is more concentrated , they tend to give less of it. However, you can have individual Saanens that give less than an individual Nubian and vice versa. Within any breed there is a wide range of milking ability represented.

Each of these six breeds of dairy goats tends to look very different from the others. They each have different breed characteristics or traits that help tell them apart. The French Alpine (referred to simply as "Alpine" in the United States), Oberhasli, Saanen , and Toggenburg breeds all have straight or slightly dished faces and erect ears. In contrast, the Nubian has long, pendulous ears and a "roman" or convex nose. The "La Mancha" has a very noticeable trait. It has such tiny earflaps that at first glance it may look like it has no ears. Believe me, it has ears! It hears just as well as the other breeds do.

Nubians and La Manchas come in a wide variety of colors and color patterns. However, the breeds originating from the Alps come in distinct colors and color patterns. Saanens are supposed to be white (or light cream) all over. Toggenburgs range in a brown color from light fawn to dark chocolate and have distinct white markings on ears, face stripes, lower legs and edging their tails. Oberhasli are a light to dark reddish brown with

black trim (facial stripes, stripe along their spine from ears to tail, belly, udder and lower legs). This color is similar to a bay horse. Alpines come in a wide range of colors and distinct patterns which are referred to by French names, such as “cou blanc” or “white neck”. They are not supposed to be Saanen or Toggenburg colored. There are hidden or recessive color genes in each breed so sometimes (very rarely) the breeds do not breed true for color. The Breed Standard available from the American Dairy Goat Association gives the details of what is the correct appearance for each breed and what exceptions to the “normal” coloring and markings are permitted. These specifics are important if you want to show or register your goat. They do not affect how much milk she will produce.

Let’s see what you know about dairy goat breeds:

1) Which nose is “roman”? dished? Write the answer beside the picture and write the name of a breed you would expect to have this trait.

a)



b)



2) Which breed would you be likely to choose if you lived in a hot climate and wanted creamy milk ?

3) Name the breed that has a bay color pattern.

4) Name the breed developed in the U.S.

5) Is a 3,000 lb. herd average above, below or equal to the Alpine breed average for milk yield?

Suggested Activities

1) Study the Breed Standard in the American Dairy Goat Association Handbook or in “Dairy Goat Judging Techniques” by Considine and Trimberger.

2) Search in your public library for magazine articles on the origins of one of the dairy goat breeds or on dairy goat breeds that are popular in another country. Note - past issues of both the Dairy Goat Journal and the United Caprine News are good places to start your search.

3) Have a formal debate in your 4-H club about which dairy goat breed is “best”. To make it extra fun, have the defendants support a breed they don’t own themselves.

4) Visit a goat farm that has several dairy goat breeds or go to a goat show and write down your observations about how the appearances and behaviors compare between the different breeds.

5) Do library research on what breed characteristics or traits of the Nubian would help it out in a tropical climate.

6) Get a world map or globe and pinpoint the areas where each dairy goat breed was developed.*

7) Make a scrapbook of pictures and information about your favorite dairy goat breed.*

* activity is suitable for cloverbuds as well.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #3

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BUYING A DAIRY GOAT

So you've decided to buy a dairy goat. OK -- let's start looking. First, if at all possible, find someone who knows a lot about goats to go "shopping" with you. This way they can help you avoid goats with serious problems and find a goat that meets your needs. They will also have a better idea of what a fair or realistic price is for specific goats. Do not buy your 4-H project goat at an auction. It is much better to buy it directly from the person who raised it. This way you can find out useful information about how it or its relatives have milked, what shots it has had, feed it is used to, and get any pedigree information necessary to register it. If you do not have a 4-H leader with goat experience to guide you, try to buy your goat from someone who is willing to give you advice if you run into problems with your goat. A local goat club or goat breeders' association is a good place to find out about goat raisers who are helpful and have good quality goats for sale. Your local Cornell Cooperative Extension office, the American Dairy Goat Association, or the NYS Dairy Goat Breeders Association, Inc. can give you information about regional goat clubs.

The breed you choose is your decision, but you will have more choice and find it easier to locate a buck to breed her to, if you decide on a breed that is popular in your area. It is better to not start out with an extremely expensive or fancy goat. If you wait until you have gained goat experience to invest in a very expensive animal, you will be better able to judge for yourself what sort of goat you would like to spend a lot of money on and whether you really need to. It makes sense to start out with a healthy, sound (sound means free of structural defects) goat whose relatives have good milk production and sound conformation. Goats who are registered as "Purebreds" (all their ancestors trace back to goats that were registered with their breed association when it was started) with the American Dairy Goat Association may cost more than goats that are registered as "Americans" (some of their ancestors come from unknown backgrounds), and Americans usually cost more than "grades" (goats whose pedigrees do not trace back to any known registered parents). Grade goats can usually be recorded as "recorded grades" with the American Dairy Goat Association under the breed they most resemble. Before you go shopping for a goat, you should find out whether your goat will need to be registerable with ADGA in order for you to show it at any 4-H shows you aspire to participate in. Remember that you cannot show dairy does that still have their horns, so be sure any doe kids you buy have been disbudded (had their horn buds burned so that the horns will never grow) and stay away from mature horned goats unless you plan on paying a veterinarian to remove the horns (dehorn). If the goat is milking, taste her milk to be sure that it has no off flavors.

Should you buy a doe kid or an older doe? It depends on what you want. If you want milk as soon as possible, choose a mature doe that is pregnant or already milking, and be sure to learn how to milk before she arrives at your home. If you can wait a year for milk and want the experience of raising your own kid, start with a weaned kid. You can also start with a 2 week old kid that you will need to bottle feed at least twice daily but this will take both a lot of work and a lot of milk. Don't make this choice unless you and your family have discussed and planned it out carefully and have experience caring for very young animals. Try to avoid buying an animal right when it is undergoing a lot of stress. For example, buy your doe at least a few weeks before or after kidding rather than right at kidding. If you must buy a kid right when it is being weaned and it has been bottle raised, ask if you can buy a gallon of milk to take home with it and bottle feed it a small amount of milk twice daily for the first few days you own it until it has adjusted to its new feed and surroundings. Goats are very sociable so it is a good idea to buy two goats rather than just one.

Ideally, the goat you are buying should look long and deep bodied when viewed from the side and wide between her legs when viewed from the front and rear. You want her escutcheon and udder attachment to be high and wide. She should have a shiny coat, level topline, and sharp withers.

Be sure to pick a healthy, sound doe, whatever her age. When you visit the farm, ask about the health status of the herd. Is the herd on a program to prevent a disease called CAE (Caprine Arthritis Encephalitis)? This usually involves raising the kids on pasteurized milk. Ask to see the milk production records for the goat you are interested in buying and her relatives, and ask yourself these questions as you look at her:

Do her eyes look dull or cloudy?	Yes	No
Does she have diarrhea?	Yes	No
Is she standing hunched up with her tail drooping down?	Yes	No
Are her eyes or nose very runny?	Yes	No
Is she coughing or breathing hard without having just done hard exercise?	Yes	No
Is her coat rough and flaky or does she have any bald spots?	Yes	No
Are her gums and insides of her eyelids very pale?	Yes	No
Does she have any unusual lumps or swellings on her body, legs, or udder?	Yes	No
Is she lame or stiff moving?	Yes	No
Does her milk taste bad?	Yes	No
Is she hard to milk or does her milk have milk clots or blood in it?	Yes	No
Is her appetite poor?	Yes	No
Does she seem depressed or weak and uninterested in her surroundings?	Yes	No

A yes answer to any of these questions often indicates a sick goat. Check carefully with the owner if you feel any of these health problems exist. Here are some ways to check how structurally sound the goat is:

- Is she double teated on either side of her udder?
- Are her back knees (hocks) extremely straight so that when viewed from the side she looks as if her back legs are fence posts? This is called "posty legged".
- Are her ankles (pasterns) weak and long so that her dewclaws almost rest on the ground?
- Does her udder have weak muscles that let it hang down low so that it swings when she walks and is easy for her to accidentally step on or urinate on (ideally, her udder floor should be no lower than her hocks)?
- Are her front knees and pasterns crooked (toe in or out) when viewed from the front?
- Are her hocks and pasterns crooked (toe in or out) when viewed from the rear?
- When you open her mouth, are the teeth on her lower jaw way in front of (overshot, monkey jawed) or behind (undershot or parrot mouthed) the dental pad of her upper jaw?
- If she is a kid or has never kidded before, does she show symptoms of being an intersex?

Hopefully, you answered no to all these questions.

Suggested Activities

- 1) Make a list of goat owners in your area and the breeds of goats they keep.
- 2) Attend a meeting of a local goat club or goat breeders' association.
- 3) Make posters of some of the structural defects or health problems to avoid in buying a goat.
- 4) Invite an experienced goat breeder to demonstrate with live goats for your 4-H group what traits they look for in buying a doe and why.
- 5) Have you 4-H leader hold a goat while you and your group discuss how you would answer the above questions on her health and soundness. *

- 6) Draw a picture of a sick goat. *

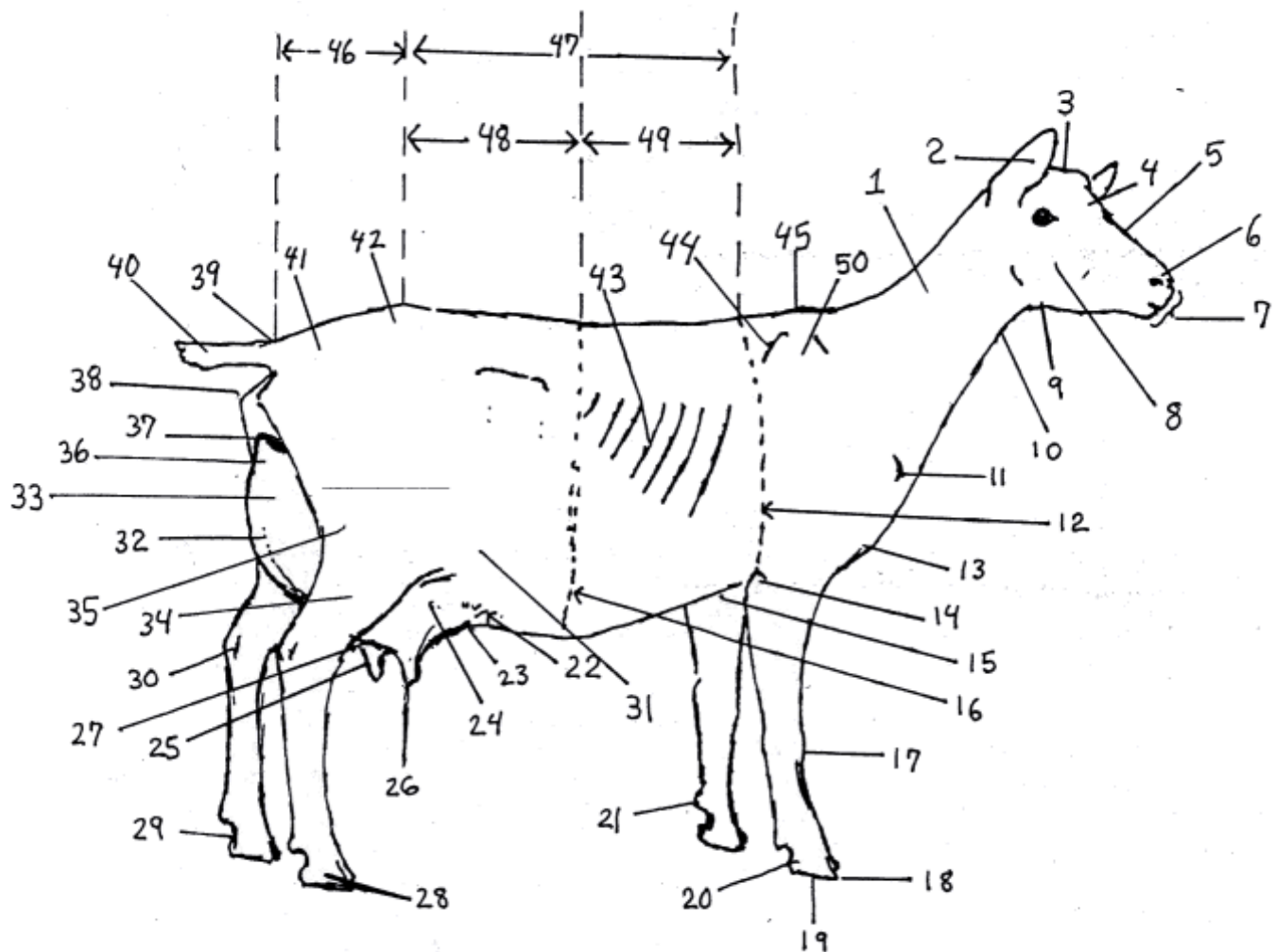
* activity is suitable for Cloverbuds as well.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #4

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PARTS OF THE DAIRY GOAT



NAMES FOR EACH PART

- | | |
|---------------------------|--------------------------------|
| 1) neck | 26) orifice |
| 2) ear | 27) floor of udder |
| 3) poll | 28) hoof |
| 4) forehead | 29) pastern |
| 5) bridge of nose | 30) hock |
| 6) nostril | 31) flank |
| 7) muzzle | 32) median suspensory ligament |
| 8) jaw | 33) rear udder |
| 9) throat | 34) stifle |
| 10) dewlap | 35) thigh |
| 11) point of shoulder | 36) rear udder attachment |
| 12) heart girth | 37) escutcheon |
| 13) brisket | 38) pinbone |
| 14) elbow | 39) tail head |
| 15) chest floor | 40) tail |
| 16) barrel | 41) thurl |
| 17) knee | 42) hip |
| 18) toe | 43) rib |
| 19) sole | 44) crop |
| 20) heel | 45) withers |
| 21) dewclaw | 46) rump |
| 22) milk vein | 47) back |
| 23) fore udder attachment | 48) loin |
| 24) fore udder | 49) chine |
| 25) teat | 50) shoulder blade |

Questions

Test yourselves! See how many of the parts you can name without looking at the answers on this page.

Suggested Activities

1) Draw the outline of the goat on a large board. Put Velcro where the names should go. Make name cards for each part with Velcro on the back. Shuffle the cards, and divide your club into teams. Members take turns drawing a card and placing it on the board. The team scores a point for each correct positioning of a card. When a team member places a card wrong, the other team has a chance to replace it correctly for ½ a point. Teams can alternate turns until all the cards have been used. Then points are tallied up.

2) Make this same activity suitable for cloverbuds by simplifying the terms they are expected to know, holding up the cards and saying the name of the part on the card out loud, and then have them show you where to stick the card with masking tape onto a real live, gentle goat (while an adult tries to keep the goat from eating the card and tape!!!).

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #5

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FACILITIES FOR YOUR DAIRY DOE

Housing - Before you buy your goat you need a shelter and pen for it. Take time to visit other goat farms in your area to see what sort of goat housing works best for them. Whatever shelter you decide on should have a dry, well-drained floor and protect the goat from rain and severe winds. It should have easy access to running water (year round), be easy to put bedding in and easy to rake up and remove soiled bedding from. Locate your goat house far enough from your house that normal goat noises and flies will not bother your family but close enough that you can 1) easily haul water to it if your house is your winter water source, and 2) hopefully, hear if your goat is threatened by dogs.

One of the simplest, cheapest shelters to build is a 3- sided shed. The open side of the shed should face south unless this is the direction your worst storms come from. The roof of the shed should slope away from the open side so rain and snow will slide off to the back rather than making the shed wet at the opening. Locate the shed where there is good drainage. Putting a few inches of gravel on the floor or laying down some old wooden pallets will also help keep the ground dry inside. The dimensions of the shed should provide a minimum of 12 to 15 sq. ft. of floor space per doe assuming she also has a yard to exercise in. For example a shed that is 6 ft long and 4 ft. wide can house two does. The shed should be a minimum of 3 ft high at the back and anywhere from 44 inches to 6 ft tall at the front. A taller shed will tend to be draftier, which is an advantage in the summer but a disadvantage in the winter. If you make the shed tall enough for you to stand up (for example 4 ft. at the back and 6 ft at the front), you will be able to tie your goat in it when you are brushing her and trimming her hooves, etc. In the winter, it is a good idea to board up half the front of the shed to form a 3 1/2 sided shed to give the goat more weather protection while still providing plenty of healthy ventilation. If your goat is going to kid in the cold months of December through March, board up the open side as kidding approaches so that only a small opening remains. This way, you can attach a small, hinged door that you can close shut at kidding if the temperature including wind chill is very severe.

Larger sheds, barns and garages can also be used for goat housing. The advantages of these larger buildings is that you can often arrange them so that you have one stall to keep your goats in and one stall to milk in. It is really nice to be able to milk out of the rain and snow! If you store your hay and grain in the same building, you must make **absolutely sure** your goat cannot break into your grain storage area. Goats do not use common sense when it comes to grain and are easily killed by overeating it. If your goat stays in the shed all winter you need at least 25 sq. ft. of floor space and 1 to 2 sq.ft of window light per goat. Make sure any glass windows are not situated where bored goats can reach and break them. Cement floors are not necessary for goats (though they do make the milking area easier to clean) and should be covered with 6 inches of bedding to help soak up urine and manure.

Pens - As well as a shed, your goat will enjoy a pen to exercise in. Goat pens should be easy to keep goats in and dogs out and provide at least 25 sq.ft. of floor space per goat. If possible, they should be even larger so that your goats can race around and kick up their heels and really exercise if they want to. One of the simplest, but not necessarily cheapest, pens to build is to make a 16 ft square pen using 4 - 6 ft. high steel fence posts (driven 1 1/2 ft. deep) and 4 - 16 ft. long metal livestock panels. The panels can be wired to the posts except at one corner where two sided snaps can be used instead to provide a gate. If you put your posts at the middle of the panel span rather than at the corners, your panels will sag less.

Another good fencing for pens is woven net wire fencing at least 42, and preferably, 48 inches high. An ideal woven fence has a small mesh size at the bottom (to keep kids in) and gets larger at the middle and top.

Horned goats need mesh with 12 inch wide vertical spacing to avoid getting their horns caught in it, otherwise, 8 inch spacing is sufficient. Goats can get their heads hung up in 6 inch spacing. Welded wire fencing tends to break at the welds after a year of goats repeatably standing on it, but can be used if a strand of electric wire is run about 4 inches in from it at the top (use "offset" plastic insulators) to discourage goats from leaning on it. Electric wire fences alone are tricky since at least a few times a year you can count on them malfunctioning and losing their charge. Some goats are very quick to notice when an electric fence stops working and upon escaping may head straight for a busy road or your family's favorite fruit trees or some very poisonous landscaping plants like yew or rhododendron.

Please note - if you plan on pasturing your goat, read over NY 4-H Meat Goat Fact Sheet #5 as well. Remember, goats that are staked out to graze can easily strangle!

Waterers- 5-gallon plastic buckets work fine. Try to hang the waterer high enough (just a little above her tail) so that your goat cannot poop in it. It will save you labor in the summer if you can reach the waterer from the outside of the pen with a hose to fill it. Even so, it will still need to be cleaned out often. In the wintertime, plan on refilling your doe's water twice daily, as it may freeze soon after you bring it to her. Does that are milking will drink and milk more if you give them warm water in winter.

Feed mangers - There are many different designs available for feed mangers. You want a manger that your goat 1) can get her head into easily, 2) not drag hay back out of easily, and 3) not poop or jump in. You will need about 12 to 18 inches of headroom per goat. Mangers should be located where they stay dry. Usually, you need a feed trough that is at least 10 inches wide and 24 inches tall. The walls of it should be solid for the bottom 10 inches. The remainder of the wall should either have "keyhole openings" cut into it for the goat to put her head in or be made of 1 " x 2 " parallel, vertical slats with 7 inches of head space between them (9 inches for mature bucks) and **angled slightly (@ 30 degree slant)**. Some folks like to put their mangers up high and have the goat stand on a toe board with her front feet to eat. However, heavily pregnant does can slip off the toe bar and choke to death before anyone can reach them. Always make sure keyhole openings and slats extend low enough that the goat will not choke if it stumbles to its knees. Your goat's salt can be put in one corner of the manger or in special holders available at most feed stores.

Suggested Activities

- 1) If you are planning to get a goat, plan out a pen and shed for it, price the materials at two or more stores, go and buy them and make your goat's housing (or help a friend who is just getting their first goat).
- 2) If you already have a goat and housing, study your hay feeder to decide if it has any problems. Visit other goat farms or look at hay feeder plans in books and then build plans for a new feeder based on your observations. Make a list of needed supplies and price them at various stores.
- 3) Get together with your 4 - H club and build the feeder you have planned out and priced.
- 4) Visit goat farms with your club and discuss what you like best about their facilities and why. *
- 5) Draw a picture of your dream goat pen and where you would put the waterer, feeder, and shed, and dump the manure. *
- 6) Build a salt block holder out of wood and then stain it with a lead free stain. *

* activity is suitable for cloverbuds as well.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #6

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ROUTINE HEALTH CARE FOR YOUR DAIRY DOE

There are certain practices you can adopt to reduce the chances of your goat getting a serious illness. These include 1) checking your goat twice daily to make sure that she appears healthy, 2) setting up and following a treatment program to prevent or control certain common health problems, and 3) providing her with healthy living conditions.

Checking your goat - Take the opportunity to look over your goat and make sure she is her normal healthy self each time you feed and water her (at least twice a day). This way you can catch most health problems when they first start before they get too serious. Remember the checklist you used in NY State 4-H Dairy Goat Fact Sheet #3 to tell if a goat you were buying looked healthy? Get in the habit of running this checklist through your head every time you feed your goat.

Do her eyes look dull or cloudy? Does she have diarrhea? Is she standing hunched up with her tail drooping down? Are her eyes or nose runny? Is she coughing, wheezing, or breathing hard? Is her coat rough, flaky or bald in spots? Does she have any unusual lumps or swellings? Is she lame, stiff moving or having trouble standing or walking? Is her appetite poor? Is she having trouble chewing or swallowing? Does she seem depressed, weak or uninterested in her surroundings? Does her udder feel abnormally hot, cold or tender when you milk her? Does her milk have blood or milk clots in it or smell or taste bad?

It's also a good idea to keep track of your goat's body condition and hair coat and how they change from season to season. Ask a friend's opinion if you think your doe is getting too skinny or fat on her feed ration. Goat kids should be weighed regularly to make sure they are growing well.

If your doe appears sick, check her vital signs, try to make her comfortable, and then contact a veterinarian or your "consulting goat expert" with your observations and start figuring out what is wrong and what you can do to make her better.

Vital signs -

Rectal temperature - 102 to 103 F is normal for a goat, kids may be higher. Keep in mind that anything that heats your goat up, for example, longhair coat, exercise, or high ambient temperatures (how hot a day it is) will increase her normal temperature. It's good to compare her temperature to that of other goats in your herd, or to let her calm down if you've been chasing her and then take her temperature again. Use a livestock thermometer or a baby's rectal thermometer available in any drug store. Shake the thermometer down, gently insert it under her tail partway into her rectum (some folks put petroleum jelly on the thermometer so it bothers the goat less when it goes in), and hold it there for 3 minutes.

Respiration rate - 12 to 15 breaths per minute, faster for kids. Watch your goat breathe in and out and then count how many breaths she takes in a minute.

Heart rate or pulse - 70 to 80 per minute, faster for kids. Place your fingers on each side of her lower ribcage and feel for her heartbeats. Then count how many heartbeats per minute. You can count her pulse by placing your hand on the inside of her upper thigh on her rear leg and locating the artery there. Then count the pulses per minute.

Rumen movements - 1 to 2 per minute. Put your fist or palm onto the left flank of your goat to feel for rumen movements. Be sure to take note if your touching her there seems to hurt her or if her rumen feels tight as a drum or slushy as if filled with water. These are all signs of health problems.

Health program – first, check with a knowledgeable veterinarian to find out what vaccination, deworming, and Selenium supplementation programs are recommended for goats in your area. Generally,

Vaccines - Enterotoxemia and tetanus are two very common diseases of goats caused by soil borne bacteria. Vaccinating your goat can greatly reduce her chances of getting them. Goat kids are vaccinated with toxoids for Clostridium C, D and tetanus at about 4 weeks of age and then again 3 to 4 weeks later. If they are in a feedlot situation, the vaccine is often repeated every 4 months to optimize protection. In most herds, adult animals are only vaccinated once per year after they receive their two initial kid boosters. The yearly vaccine is given to does 4 to 6 weeks before they are due to kid. This way their newborn kids will be protected against these diseases until they are old enough to receive effective protection from the boosters. Be sure your goat has been vaccinated for these diseases when you buy her. If in doubt, revaccinate her.

Rabies is a deadly disease passed by skunks, raccoons, foxes, etc. to dogs and livestock and eventually to humans. It has been reported in NY. Most 4-H county fairs either require or strongly recommend that you vaccinate your goat for rabies to protect yourself and the general public. The vaccine is given yearly. A licensed veterinarian must give it and your goat must have a permanent tattoo or eartag to identify her for the veterinarian's records. As of May, 1999, there is no labeled vaccine for goats. Instead, the rabies vaccine for sheep is used "off-label". When you use a vaccine or medication for a different livestock species than the ones listed on its label, you need a signed statement from a veterinarian authorizing this "off-label" use. Remember, your goat must be at least 3 months old to get the vaccine and must get the vaccine at least two weeks before any fair in order to be considered protected from rabies.

Parasites - Internal worms can be a serious problem particularly in goats that are pastured and in kids. Dairy does that are kept indoors in barns year round are generally dewormed when dried off and then again at kidding. Be sure to use a dewormer that is licensed for milking animals. You can have a fecal test done to determine the correct dewormer to use. Pastured herds are often dewormed 1) in the cold of winter to eliminate any worms that are overwintering in immature stages in the goats' guts, 2) at kidding when the hormones released at kidding trigger a large release of worm eggs in the goat's manure, and 3) sometimes in the spring before being put out to pasture. They and their kids are then dewormed if they get too "wormy" from mid summer to fall and moved to a clean section of pasture at the same time. Kids are often dewormed at weaning.

Lice can become a problem in early spring as goats start to shed their winter coats. Always look for lice if you see flaky or itchy coats and treat as necessary.

Coccidia is caused by a tiny parasite in a goat's gut. Older goats become resistant to it but it can be deadly in goat kids especially when they go through the stress of weaning or are overcrowded. It is a good idea to treat kids for coccidia immediately prior or during weaning by feeding them a grain mix that contains a preventative or by drenching them 5 consecutive days with a coccidiostat like Sulmet or Corid.

Selenium is a mineral necessary to goats that is lacking in NY soils and, thus, in our hay and grain. Does are usually injected with 1 cc of MuSe or 5 cc of BoSe yearly right before breeding starts to supplement them for selenium and vitamin E. Kids are given about 1 cc of a **BoSe** shot shortly after birth. You can also opt to give a loose salt or feed daily that contains sufficient Selenium and vitamin E or to give the injections twice per year.

Healthy Living Conditions - Hopefully, you've built a clean, dry, well-ventilated shed for your goat that protects her from extreme cold, rain and snow and is spacious enough to avoid overcrowding. Overcrowded goats tend to get sick. Keep her manger and waterer clean and poop free. Wash bottles and nipples for kids right after each use. Use clean milking procedures so your doe's udder doesn't get infected (get mastitis).

Suggested Activities

- 1) Have your 4-H group take each other's oral temperatures and pulse and respiration rates. Then practice together measuring temperatures, pulse, respiration and rumen movements on some goats.
- 2) Make a poster or drawing (good idea for Cloverbuds) of some of the symptoms of a sick goat. You can hang your poster in your shed or room to use as a checklist or use it as part of an oral presentation.
- 3) Take a calendar and write on it when your doe is due to kid or when your doe kid is due to be bred. Based on these dates, calculate what dates you should plan on vaccinating, worming, etc., your goats. You can also write down other dates like when you plan to dry off your doe, disbud her kids or wean kids from milk.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #7

By Suzanne Raupp
Revised April 1999 by Dr. tatiana Stanton
Cornell University, Ithaca , NY 14853



DAIRY GOAT IDENTIFICATION

It is important to be able to identify each of your goats easily and accurately in order to keep accurate records of how they are milking, who has had what vaccines, who was born when, and who their parents were. In a small herd you often know each goat by name and matching description. However, your veterinarian and friends who milk for you when you are on vacation need a simple way to reliably identify your goats. One easy way is by having each goat wear a collar or leg band with their own individual number on it. However, collars and bands can fall off. Most goat associations require your goat to have a permanent form of identification called a tattoo before they will allow you to register the goat and allow it to be recorded in the pedigree files for that association. Veterinarians will also need to be able to identify your animal by a permanent identification when they fill out the rabies slip or health certificates verifying what vaccines and tests your goat has had. Other forms of permanent or semi permanent identification that are easy to read include eartags and freeze brands. However, few people have the equipment for freeze branding and depending on the size of the freeze brand your goat may look like a walking billboard. Eartags can have other problems that will be discussed later.

Tattooing - This is the preferred method of permanent identification (until computer chips get cheap!). Holes are punctured into the skin, ink is worked into them and then the skin is allowed to grow over the ink, leaving a number the color of the ink embedded in the animal's skin. In the old days you would have made the holes with a big needle, now we use tattoo pliers available through most livestock supply catalogs and stores. The small-sized tattoo pliers (also used for tattooing rabbits) work best on goats, especially goat kids. The numbers will grow bigger along with the kid's ear as it grows. You must also purchase a series of metal digits or blocks that can be loaded into the pliers.. Each block has a bunch of tiny metal spikes or pins sticking out from one side of it that form the shape of a number or letter. The pliers can be clamped onto the tail web or ear of a goat and these spikes will press into the skin and leave a pattern of holes in the shape of the numbers and letters. There are two reasons that you might put the tattoo in the animal's tail web, 1) La Mancha goats don't have big enough ear flaps to tattoo, and 2) some dairies that milk from the rear find tail tattoos more convenient to read than ear tattoos when identifying goats in the milk parlor. Here are some simple steps to tattooing -

- 1) Figure out the proper tattoo number for that goat. Be sure to follow the rules for her breed association. For example, as you stand behind your goat, the American Dairy Goat Association requires a herd code (usually made up of 3 letters sometimes followed by a number if more than one herd has the same 3 initials for its herd code) in her right ear, and her animal code in her left ear. The ADGA animal code starts with a specific letter that represents the year of her birth (L= 1998, M=1999, N=2000, P=2001, etc.; the letters G, I, O, Q and U are not used). This letter is followed by a number to distinguish her from other herdmates born the same year. The number used is often her place in the order of kids you had born or registered that year.
- 2) Load the proper tattoo series for one ear into the pliers. It is a good idea to check the number by clamping it onto a piece of paper because it is easy to put in the wrong numbers (for example 2 instead of 5) or to put them in backwards.
- 3) Restrain the goat. Kids can be held in a disbudding crate or towel. Older goats can be straddled and their head held against the attendant's thighs.

- 4) Locate the area that you want to tattoo. Plan on going between the large veins that run lengthwise along the goat's ear. If you hit these, they may bleed and you will not get as good a tattoo.
- 5) Disinfect the area with rubbing alcohol and then rub ink on it with a toothbrush (green ink in paste form works best even on dark skinned goats).
- 6) Lift the bottom edge (farthest from the top of its head) of the goat's ear towards you and clamp the tattoo pliers on it tightly to puncture the ear. Then unclamp and remove the pliers.
- 7) Check the puncture marks and use your toothbrush to push more ink into the holes.
- 8) Be careful not to clean the excess ink off the inside of the ear until the scab has healed over. Otherwise, the tattoo may not "take" well and may disappear.
- 9) Apologize to your goat, but tell her it was necessary.

Eartagging - Large herds need an easy way to identify their goats without having to catch them to look at a tattoo. Neck collars can be dangerous for goats that go out to pasture if they do not break or slip off easily if the goat catches them on something and starts to strangle. Eartags may be much better in such situations. However, goats who wear eartags can get their ears torn if the tags catch on something or are grabbed and pulled on by another goat. Therefore, it is generally not recommended to eartag 4-H dairy goats. Tattooing your dairy goat is sufficient for most situations.

Suggested Activities

- 1) Identify the types of equipment used for identification. Have them available to be handled and discussed.
- 2) Quiz each other using the American Dairy Goat tattooing code to guess what age, order of birth in a specific herd and the imaginary herd name of a specific tattoo series. For example, right ear JKA, left ear M13 might mean the 13th kid born in 1999 at the Just Kidding Around Herd.
- 3) Practice tattooing on a piece of paper.
- 4) Use a flashlight to read tattoos on real goats.
- 5) Get together with your 4-H group and learn how to tattoo a goat. Do your own goat if she still needs to be done. Depending on your age and inclination, you can try doing the actual tattooing, help load the proper tattoo number on the applicator, help apply ink or disinfect the ear, or help restrain the goat.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #8

by Dr. tatiana Luisa Stanton
April 1999
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HOOF TRIMMING

Wild goats travel long distances looking for food and often play on rough rocks and hard ground. All this activity helps keep their hooves somewhat trimmed and cared for. If their hooves do get too long, the tips usually break off naturally. This makes the goat pretty lame for a few days. Too bad for the goat if it encounters a wolf during these lame days (Bye, bye goat!). Tame or domesticated goats count on you to trim their hooves regularly. Otherwise, their hooves will get too long and they may even become lame from the pain. One of your most important duties as your doe's owner is to regularly trim her hooves. Be warned, the first time you trim your goat's hooves, you will probably get exhausted and it may even seem a little scary. But the more practice you get, the easier it becomes. Plan on trimming your goat's hooves about every 6 to 8 weeks. **Remember, the longer you let your goat's hooves get, the harder the job will be.**

Most people use foot rot shears or hoof trimmers to trim goat hooves. You can buy them through livestock supply catalogs and at some feed stores. Pruning shears also work. Pocketknives are pretty dangerous to use since your goat may jump around and you can easily cut yourself. Some people like to use hoof nippers to cut off the tip of the hoof or rasps to file it down. It is generally best for the beginner to invest in shears or trimmers. Even these are very sharp and should be handled with care.

Before you trim your goat, look at the drawings on this page or better yet check out the hooves of a newborn goat kid. See how each hoof of the goat has two toes. The sole of each toe is surrounded by a little wall. This "hoof wall" is what tends to overgrow on most goats. You want to trim this wall down until it is level to the sole and parallel to the foot's hairline. The heels of the hoof and the dewclaws (especially on an older goat) may also develop extra tissue that needs to be trimmed off.

The first time you trim your doe's hooves either put her in her milk stand or position her next to a wall. If she is not locked in a milk stand, have a friend hold on to her or tie her up by a lead rope attached to her collar. Start out with the front leg that is farthest from the wall. This way you can brace her against the wall to hold her still if you need to. Facing your goat's tail, lean down and pick up her front leg at the pastern. Bend her knee so the bottom of her hoof is facing up at you. Try not to twist her leg way out to the side. This will push her off balance and she may squirm a lot trying to get comfortable. Instead, let her knee fold into its natural position. If you want, you can squat down and rest her hoof on your knee. Now,

- 1) with the point of your shears, clean out any dirt that has gotten stuck between her walls and soles;
- 2) carefully cut off the wall at the tip of her toe so that it is even with her sole;
- 3) cut away any bent over or excess wall until it is level to the sole all the way around;
- 4) trim away any rotted out areas between the sole and hoof wall;
- 5) trim the tissue on her heels until the floor of her hoof is parallel to her hairline (this also stimulates her heels to grow and helps prevent contracted heels);

5) if she is an older doe, check her dewclaws and snip them a little if they are getting long.

Great, only three more hooves to go! Some people like to straddle their goat when they reach down to do the back legs. If you are doing a goat whose hooves have been allowed to get very overgrown, you may not be able to cut the wall at the tip of the hoof completely down to the sole without causing the goat to bleed. Instead, trim off small amounts of the tip until you see pink. Stop at that point and don't cut the tip any further. Instead, work on the rest of wall going around the sole. Come back in a week and trim the toe some more. Do this weekly until the hoof looks normal.

If the hoof has a lot of rotten tissue, dip it in hydrogen peroxide or bleach (be careful not to get the bleach on your clothes) when you are done trimming. **Do not use a copper product like Koppertox on a milking doe. It is illegal because it can leave residues in the milk.** If the goat appears to have foot rot or foot scald, set her hoof in a coffee can filled with the proper dilution of zinc sulfate and then isolate her from any other goats or sheep you own.

If the hoof bleeds while you are trimming it, don't panic. Press on the spot where it is bleeding to help the blood clot. You can also sprinkle blood-clotting powder on it (corn starch will work in a pinch). If it is really spurting blood you may want to cauterize the spurting blood vessel with your disbudding iron or pinch it off with some sanitized needlepoint pliers (this rarely, if ever, turns out to be necessary). Give your goat a tetanus booster if her last one has expired.

Suggested Activities

- 1) If you are a beginner, help a friend trim their goat's hooves before tackling your own.*
- 2) If your club feels like you could all use more practice hoof trimming, contact a goat producer with lots of goats and see if your club can trim their goats' hooves. As you are trimming, discuss the differences in leg and feet conformation that you observe among different goats.
- 3) Teach a friend how to trim hooves or prepare a poster explaining how to trim hooves.
- 4) Learn to sharpen shears or trimmers.

* activity is suitable for cloverbuds.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #9

By Dr. E. A. B. Oltenacu
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DISBUDDING

Disbudding the kids in your herd so they will not grow up to have horns is a necessary management practice in most herds. Goats use their horns mainly for fighting. Every day, as a regular practice, the members of a herd will butt their heads together to establish a pecking order. If they are horned, injury may occur to one or both of the goats involved. Horned goats may also injure their handlers. **Always milk a horned goat in a milking stand with a headlock or stanchion.** Otherwise, the goat can accidentally hit your head with her horns if flies bother her and she makes a swipe at her side while your head is against her belly as you milk.

Many goat owners believe that they can eliminate the problem of horns by breeding goats that are naturally hornless (polled). However, some does and bucks that are naturally polled are also infertile and are of no use to the owner, either as breeding stock or milk producers. (See future fact sheet on Genetics).

A good time to disbud your kid is when he or she is 3 to 7 days old. At this age it is easy to do a good job of disbudding and the disbudding process will also be less of a shock. The horn bud (beginning of the horn) on a young kid can be felt with your finger as a piece of immovable skin fixed on the top of the kid's head. If you buy your kid when it is 3 weeks old, you can still disbud it, but you may need to use a larger diameter iron and leave it on longer and there is more chance of doing an incomplete job and ending up with scurs. Scurs are little, tiny horns. They generally have a twisted or deformed appearance and break off easily.

Using an electric disbudding iron

The most common and recommended method of disbudding is with an electric disbudding iron. This is a circular hot iron that is plugged into a wall socket. The circular tip of the iron should be about $\frac{3}{4}$ of an inch to one inch in diameter. After plugging in the iron, heat the rod until it is a cherry red color and easily burns a piece of wood. **If you trim the hair over the horn buds, disbudding will go faster and cause less smoke.** Restrain the kid in a disbudding crate or towel held by a friend. Place the circular end of the iron firmly over the horn buds for 10-20 seconds until you see a "copper ring". This will destroy the horn cells and prevent the horn from growing.

Non-electric ways to disbud a kid

If you do not have electricity available, there are disbudding irons that can be heated by a propane torch or campfire.

You can also use a chemical paste. First, the hair covering the horn bud must be clipped away. Then a paste of potassium hydroxide (KOH) is rubbed over the area of the horn bud, making sure that none gets on your hands or it will burn your skin! Cover the burn area with a thin layer of petroleum jelly to prevent spreading onto the kid's face. The paste will destroy the horn cells and prevent growth. **There are, however, many problems with this method.** It is more painful for the kid and the paste may rub off onto other animals, causing burns and possibly blindness. If this method is used, the kid being disbudded should be isolated from the rest of the herd for one to two days.

If the horns are allowed to grow on your goat for a time before being removed, you must dehorn the goat rather than disbud it. Dehorning is much more involved and must be done by your veterinarian. The animal is given an injection to numb the area around the horns. Then the horn is removed by using a small wire saw. This procedure usually involves a lot of bleeding. Where each horn was, a hole is left going down into the goat's head into its sinus cavities. These holes can take a long time to heal. Dehorning is done in late fall or winter to prevent flies from attacking the open holes and laying eggs in them. The eggs will hatch out into little white worms called maggots that will feed on the open sores. Gross!!!!

PLEASE keep in mind that the faster the disbudding is done after birth, the less pain it will cause both you and the kid. **So...DON'T WAIT!!** Do it as soon as you can distinguish the horn buds.

Dairy goats with horns are not allowed to enter shows in the United States. However, some shows will allow you to show meat goats that have had their horns **tipped** rather than removed. Tipping means the top few inches of horn have been cut off. Hoof nippers used for trimming horse hooves work well for tipping. Tipping should be done at least a month before exhibiting the goat to give the tips time to heal.

Suggested Activities

- 1) Have members take turns locating the horn buds on a few kids of different ages, and identifying polled versus naturally horned kids.
- 2) Have someone demonstrate to your club how to use an electric disbudding iron and methods of restraining kids.*
- 3) Disbud goat kids or assist in the process.
- 4) Examine a goat horn that has been removed from an older goat.*

* Activity is suitable for Clover Buds.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #10

By Dr. tatiana Stanton
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ALL ABOUT CASTRATING AND URINARY CALCULI

Male goat (buck) kids that are not being kept as future herd sires are usually castrated so that they will no longer be fertile. Fertile male goats have a very strong smell during the breeding season and do unpleasant things like urinate on their beards to impress the females. In contrast, a castrated goat (a wether) will not gross out your friends or the general public when you take him to a show. He will also be unable to accidentally breed other goats you own. It is less traumatic to castrate the kid when he is very young but this will make him more susceptible to urinary calculi because his urethra (the tube that carries his urine from his bladder to the opening in his penis) will not develop to its full size and is easier to clog up. Urinary calculi is a life threatening condition that occurs when the urethra gets blocked up with mineral deposits and urine cannot pass through it. If the deposits or “stones” are not somehow passed or dissolved, the kid’s bladder will burst and he will die. Ideally, you should wait until your kid is 10 weeks old to castrate him but this is not always possible. Other preventions for urinary calculi that you should practice include 1) feeding a ration with a 2:1 calcium to phosphorus ratio, 2) adding ammonium chloride to his feed at a rate of about 10-15 lbs. per ton of feed or 1 ounce per day unless his feed already contains it, 3) making sure he gets plenty of exercise and drinks lots of water (keep his water in the shade if hot and unfrozen if cold, always have salt available to him), and 4) check daily to make sure he is urinating easily without straining and has no blood in his urine.

There are many ways to castrate a goat. Make sure your kid is protected against tetanus before you castrate him (remember those vaccines you need to be sure he gets!) and castrate him at least a month before you plan to show or market him. Here are some common methods of castration,

Use an elastrator to place heavy rubber rings on the scrotum (the loose sac of skin that holds both of his testicles) - Place a special rubber ring on the elastrator. Push the testicles down into the scrotum. Pass the testicles and the scrotum (**but not the teats!**) through the rubber ring. Make sure both testicles are descended through the ring and then remove the ring from the elastrator so that the ring squeezes down on the scrotum. The scrotum will “die” or gangrene from lack of blood and fall off in about 2 weeks. An elastrator is relatively lightweight and cheap and easy for a young person to use. It does have a higher risk of tetanus than the other methods. It must be done while the scrotum is still very small, i.e. from 3 days to 3 weeks of age depending on breed size.

Use a burdizzo clamp to rupture the cords - Do one cord at a time. Push the cord to one side of the scrotum and clamp the burdizzo over it being careful to leave the teats above the crushing point. Close the burdizzo and count to 25. You should hear a crunch as you do it. You can also tug on the testicle to see if the cord feels ruptured. Open and shut the burdizzo one more time and then repeat the same procedure on the other side of the scrotum. Do not apply the burdizzo over the entire scrotum to attempt to break both cords at one time. You do not want this large a scrotum to gangrene. Instead, the testicles will gradually shrink and your wether will be left with a small empty scrotum sac. This method is the best to use during fly season because it leaves no big open wound. Goats must be between 4 weeks to 4 months of age with 8 to 12 weeks being ideal. Burdizzos are very heavy and may be difficult for a young person to use. It is not as reliable as the other methods because you cannot tell for sure if the cords have been crushed.

Using a disinfected knife - Push the testicles high up into the scrotum. Scrub skin with alcohol or iodine. Cut off the bottom third of the scrotum with a sharp knife. Use your hands or teeth to grasp the testicles and pull them down. Do not let them slip out of your hands and back into the scrotum as this can cause infections. Scrape the cords of the testicles with the flat of your knife to gradually cut them or stretch them between two hands until they break. You can also tie them off with fishing line or dental floss and then cut them below the tie off point. You want to avoid cutting the cords abruptly because this will cause more blood loss.

Whatever method you use, you will probably need two people, one person to hold the goat while the other one castrates. The person holding the goat sets the goat on its tail and then stands, kneels or sits behind it. If the goat is small enough you can hold it on your lap. You should then grasp the front legs of the goat and bend them around the back legs at the knees. Hold on to the legs at this joining point and let the other person know when you are ready for them to castrate the goat.

After castrating, spray the scrotum with an antibacterial spray that also repels or kills flies. The kid will be very unhappy or depressed for a few hours and then gradually recover. Exercise will help keep any swelling down so try to avoid confining him in a tiny area. Keep him out of the mud and rain though

Suggested Activities

- 1) Learn to identify bucks, wethers and does. * This is also a good time to talk about hermaphrodites or intersexes and what their private parts sometimes look like (intersexes sometimes have a round structure protruding from their vagina -from pea to marble sized. They may act “bucky” and have shaggy thick hair on their topline like a buck. If you try to examine their vagina with a speculum, you will often find that their vagina is much too small for the speculum to fit in).
- 2) Draw the reproductive organs of a male goat and label them.
- 3) Learn how to castrate goats with your 4-H group and then do your own buck kid.
- 4) Find out at your local feed stores which feeds contain ammonium chloride.
- 5) Calculate the calcium to phosphorous ratio of your goat’s diet.
- 6) Measure your goat’s water consumption daily for a week by marking off quarts and gallons on his plastic water bucket and compare it to other goats in your 4-H group. Discuss the results with your group.

* Activity is suitable for Cloverbuds

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #11

By Dr. E. A. B. Oltenacu
Revised April 1999 by Dr. tatiana Stanton
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TEETH AND AGE OF THE GOAT

The eight teeth in the lower front jaw of your goat can help you to tell her age. They are not an exact or perfect guide, as various factors such as diet will influence the growth of teeth. Also, every goat is an individual just like you and your friends. Remember, not all your baby teeth fell out at the same time as those of other children in your classes. A goat's teeth may grow and fall out at slightly different ages than the teeth of any other goat. There are no upper front teeth in the goat's mouth, instead your doe has a tough toothless "dental pad". Your goat does have teeth on the top and bottom of her jaw further back in her mouth. These back teeth help her to chew his cud. We do not use these to tell her age.

First year (kid)

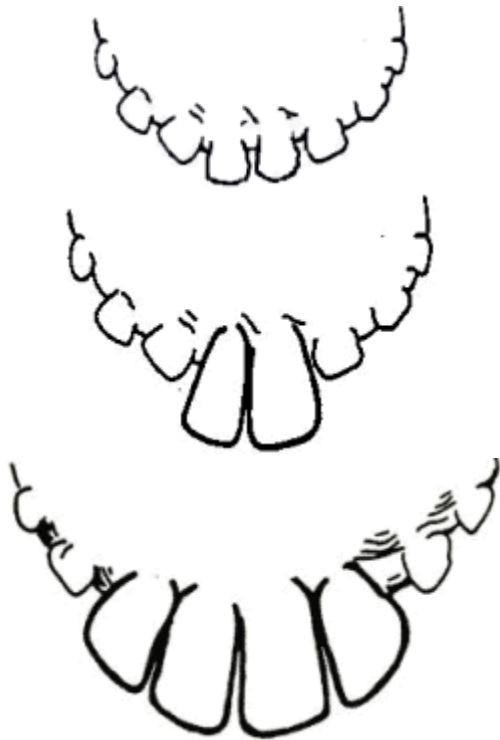
All teeth are small and sharp. They will gradually be replaced by larger, permanent teeth, and this process is used to help determine the age of the goat.

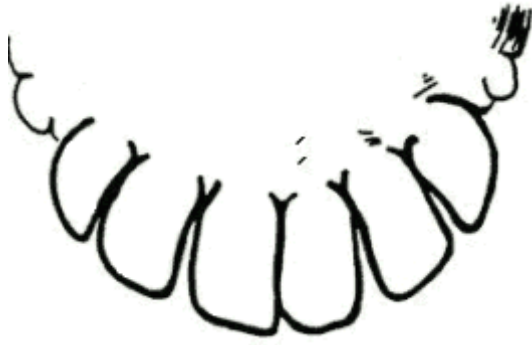
Second year (yearling)

The goat loses the two middle front teeth when it is around 12 months old, and they are replaced by larger, permanent teeth.

Third year (2-3 year-old)

The teeth next to the middle pair are replaced by permanent teeth when the goat is about 24 months old.





Fourth year (4 year-old)

The goat now has six permanent teeth, with only one pair of kid teeth remaining.



Fifth year (4 year-old and over)

The set of 8 front teeth is complete. The age of the goat beyond 5 years must be guessed at from the amount of wear on the teeth. This is very variable, and diet has a big effect. Goats on a rough, coarse diet will grind their teeth away faster than does on an easily eaten diet. Does grazing on rough pasture will show considerable wear sooner than barn-fed does on a better quality ration. Teeth spread, loosen and finally drop out as the goat ages.

Suggested Activities

- 1) Visit a local goat breeder's herd and estimate the ages of animals in the herd. Then check your estimates against the records that show each goat's actual age.
- 2) Make a collection of lower jaws (properly prepared) from goats that have died or been slaughtered for meat. Prepare an exhibit to show at, for example, county fair.
- 3) Discover how the teeth of the goat compare with other species (cattle, sheep, etc.) as they age. What about people?

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #12

By Dr. E. A. B. Oltenacu
Revised April 1999 by Dr. tatiana Stanton
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FEEDS FOR GOATS

The feeds that are fed to dairy goats can be broken up into two different groups. Basically, these two groups are roughages and concentrates.

Roughages are high in fiber (18% crude fiber or more). Fiber adds bulk to the goat's diet and keeps his digestive tract working well. Fiber has a laxative effect. It can also influence the butterfat content of a mother goat's milk. Diets that are high in fiber tend to increase butterfat content resulting in creamy milk, while low fiber diets decrease butterfat content. Most roughages are forages, that is, they come from the green vegetative parts of the plant, for example, blades of grass. Forages tend to be low in energy.

In contrast, concentrates are low in fiber and high in either energy or protein. They often come from the seeds of a plant. Examples of concentrates include corn, oats, brewers' grains and soybeans.

Feed groups

1) Dry forages - these feeds are cut and cured, usually in the sun. This way they can be stored for later use. Hay is forage that is cut before or at maturity. It is either cut before it has formed seeds or while the seeds are still on it. Straw is forage that is cut after it is past maturity and the seeds have already dropped or been harvested from it.

2) Green forage and browse - examples of these are pastures or shrubs that your goat grazes fresh. As well as grazing, goats can browse like deer and giraffes. They can take a woody plant like a raspberry bush and use their mobile upper lip to select the tender, highly digestible new leaves from it and leave behind the less digestible branches and thorns. Because of this ability to select and reject different parts of the plant, goats are called **selective eaters**. Sheep and cows do not have mobile upper lips and thus, have less ability to pick and choose the parts of a plant they want to eat. Goats can get sick if they get too much green forage too suddenly. Always introduce your goat to fresh pasture and cuttings gradually. Do not feed her yew clippings, rhododendron clippings or prunings from cherry, apricot or peach trees (these are toxic when they wilt). All of these are very deadly to her but she will eagerly eat them. Before you cut and carry any fresh feed to her make sure it is not poisonous. You can order an excellent pamphlet (Information Bulletin #104) on **Common Poisonous Plants** from Cornell University Media Services by calling (607)255-2080.

3) Silages - these forages have been cut and then "pickled" rather than dried to store them. They are cut and then stored without air. In the absence of oxygen, certain bacteria are able to ferment the forage and preserve it this way. Silage can be made from grasses and legumes and also from corn plants. Goats that have not grown up on silage take a little while to develop a taste for it. If improperly fermented or stored, the silage can develop molds that are deadly to goats.

4) Energy concentrates - as the name suggests, these feeds are high in energy. They include feeds that have less than 20% protein and less than 18% crude fiber. Energy concentrates include grains, flour mill by-products and certain root crops.

- 5) Protein concentrates - these concentrates contain at least 20% crude protein. They are often also high in energy. They can be of plant or animal origin. Examples include soybean meal, buckwheat middlings, dried whey, cottonseed meal and soybean meal.
- 6) Trace mineral supplements - come in various chemical forms depending on what mineral is being added to the diet. An example of a trace mineral supplement that humans use is table salt. Minerals should be added carefully to the feed as excesses can be toxic (poisonous) to your goat. Some minerals, for example, Selenium, Copper, Magnesium, and Cobalt are best fed as salt blocks or mixed into the grain ration or complete diet as the goat may eat too much of them if fed free choice in the form of loose salt.
- 7) Urea - is a source of nitrogen just as proteins are. However, it is not a dietary protein and can be highly toxic if used to substitute for too much protein. Always introduce goats to it gradually. It should not make up more than 1% of the complete ration or 3% of a concentrate fed separately. Commercial dairy concentrates that contain 1 to 2% urea are safe for goats.

Suggested Activities

- 1) Have everybody in your 4 - H group bring different samples of goat feeds to a meeting. Put the feed samples in numbered containers, keeping a list of what is in each container. Then test yourselves to see if you can identify the feeds and which of the 7 feed groups mentioned above they belong to. You can also divide your 4 - H group into teams and make this into a team competition using a time limit.
- 2) Make a feed board to use as part of a public display or presentation. Cut out a 16" x 20" piece of plywood or paneling. Paint both sides of the board. When the paint is dry, paint on your name, address and club name. Select six or more feed samples for your board and put each of them in thick plastic bags that you can fold over and staple to board. You can make your board up in several different ways, for example, "The Feeds I Use in my Herd", "Energy Concentrates for Goats", or "An Example Feed Ration for a High Producing Dairy Doe". Type or print up a 3"x 5" index card for each feed that tells what feed it is, what group of feeds it belongs to, and what nutrients it provides. Staple or glue each card to the board next to the feed it describes.
- 3) Visit a local feed mill.

* All these activities are suitable for Cloverbuds if presented in a simple form that asks them to identify feeds that are very obviously different. For example, help them to see the differences between straw and hay or a timothy hay compared to alfalfa hay, and to understand that corn or popcorn has more energy than cornstalks, but that corn stalks have more fiber. Let them examine and scrape fresh forages with a serrated plastic knife to identify the fiber (stringy stuff) in it.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #13

By Suzanne Raupp
Revised April 1999 by Dr. tatiana Stanton
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DIGESTIVE SYSTEM OF THE GOAT

The goat is a member of a class of animals called ruminants. These animals ruminate (chew their cud). Unlike us, they have special four-compartment stomachs especially designed to digest roughage (food high in fiber) such as grass, hay and silage.

The goat's stomach has four chambers: 1) the rumen, 2) the honeycombed reticulum, 3) the omasum, and 4) the abomasum or true stomach. The size relationship of the four chambers changes as the animal grows up. The abomasum gets proportionally smaller. To understand why this happens, let's consider the function of each compartment and then review the goat's diet.

1) The rumen acts as a big fermentation vat. Bacteria and protozoa in the rumen supply enzymes to break down the fiber in the goat's feed. This is similar to how bacteria can ferment the sugars in grape juice to make wine in big wine barrels. The tiny organisms in the rumen also help to build proteins from the feed and manufacture all of the B vitamins needed by the goat. Many nutrients that help provide the goat with energy are also absorbed here. The fermentation process produces heat that helps to keep the goat warm.

When roughage is eaten by the adult goat, it is chewed on, soaked with saliva, and then swallowed. This bolus of food is called "the cud". It goes down into the rumen to be attacked and broken down or digested by the microorganisms. At regular intervals the cud is brought back up to the goat's mouth to be chewed on some more and then swallowed again. This entire process is called rumination. If you watch the goat's neck carefully, you can see her swallow and later regurgitate her cud. The goat will often burp to get rid of the gas produced by all the fermentation going on in her rumen. You can really smell the fermentation process on her breath. If something causes the goat to stop being able to burp up the gases, the gas will build up and bloat or swell up her rumen and she may become very sick with "bloat".

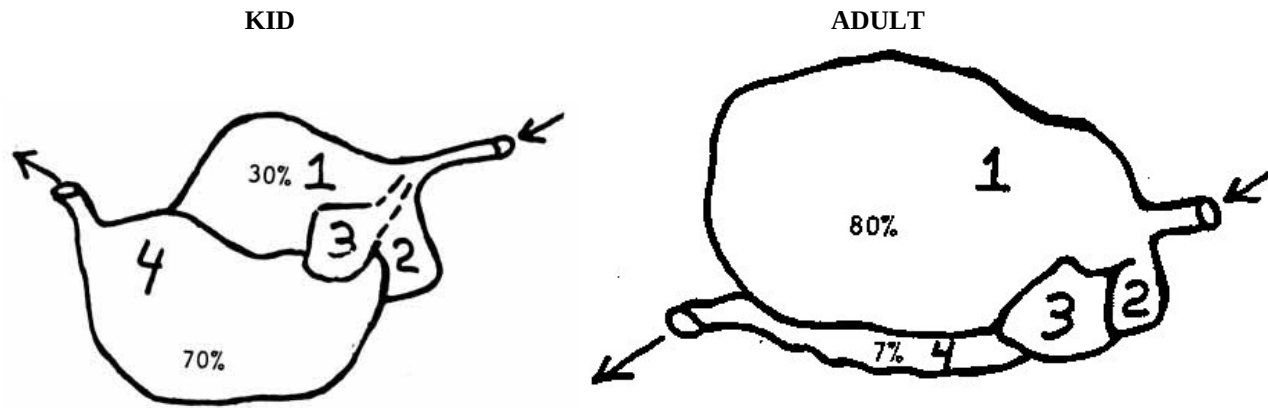
2) Once the food particles of cud become small enough, they pass to the second compartment or reticulum. Here any foreign objects that may have been accidentally swallowed with the feed settle out in the honeycomb structure of the reticulum's walls. Another name for the reticulum is the "hardware stomach".

3) The fermenting particles then pass on to the omasum. The omasum removes the water from them and also absorbs more nutrients called volatile fatty acids that help supply the goat with energy.

4) The particles are then forced into the abomasum or true stomach. Here, the particles are digested by the stomach acid, hydrochloric acid (HCl). This form of digestion is the same as what occurs in our stomachs. The remaining particles are then passed on to the small intestine where most of the nutrients are absorbed by the body and made available to the goat.

When a goat kid is born, its rumen, reticulum and omasum are very tiny and not useful. The goat kid depends on a liquid, milk, not roughage for its feed source. When the kid swallows milk, the milk goes directly to the

abomasum through the esophageal groove. Every time the kid swallows, a flap of skin at the entrance to the rumen folds over to form a groove that bypasses the rumen and sends the milk straight to the abomasum to be digested by stomach acid. As the kid gets older, she starts trying to consume roughage. The rumen becomes active and starts to enlarge. Its population of microorganisms increases. The reticulum and omasum also respond to the changes in diet by getting bigger. By the time the kid is an adult goat, roughage is her main source of food and her rumen is far larger than his abomasum.



1- rumen, 2 - reticulum, 3 - omasum, 4 - abomasum

Suggested Activities

1) Get some human foods (for example, baby food, yogurt, rice krispies, shredded wheat, celery, spinach). Put a 1/4-cup of each in a separate unstarched cotton spice bag or square of cotton cloth. Boil them covered in a solution of 1 tablespoon of neutral detergent soap (i.e., baby shampoo) per cup of water in a saucepan for one hour. This will digest all the nutrients but the fiber from them. After boiling, rinse the bags in cold water, gently squeeze dry, and open. Which foods had more fiber? Which would be easiest for a kid to digest? *

Do the same experiment using milk replacer, a complete pelleted calf or lamb ration, various grains, hays, and straws. Which ones have more fiber? For more advanced 4 - H er's, weigh out 100 grams each of the feed samples rather than a 1/4 cup. After boiling, oven dry them at 500 F and reweigh them to compare fiber content.

2) Watch a goat chew her cud. * Try to count how many times a goat brings up her cud in 15 minutes.

3) Invite a veterinarian to come talk to your 4 - H group about bloat and other metabolic diseases that can occur when something goes wrong with your goat's digestion.

4) A rumen fistula is an artificial opening that allows scientists to look inside the rumen of an animal. Contact an agricultural college that has a fistulated cow, sheep or goat and take turns examining the animal's rumen.

5) Obtain a clean and rinsed out digestive tract of a sheep or goat from a slaughter house and lay it out on a lawn to examine and identify the different parts. Measure the length of the different parts including the small intestine.

* Activity is suitable for Cloverbuds.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #14

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VITAMINS AND MINERALS FOR GOATS

Vitamins and minerals are usually present in very small amounts in feeds. Mammals do not need a large amount of them. However, they are extremely important to animal health. Too much or too little of them can make an animal sick.

Vitamin

A - is produced in the goat's body from beta-carotene which in turn is found in green plants. The goat stores vitamin A in its liver and fat and use this source if green feed is lacking. A goat is unlikely to suffer a vitamin A deficiency unless it goes without beta-carotene for a long time. Good green, leafy fresh hay is an excellent source of beta-carotene unlike older hay that has bleached out and yellowed with age. Vitamin A helps your goat to have good eyesight, be fertile, and fight infections. It also helps keep the surfaces of her skin and internal organs healthy.

B - unlike us, goats do not need to be fed the B vitamins. This is because microorganisms in the rumen can manufacture all of the B vitamins. However, if the goat gets a digestive problem like acidosis from eating too many concentrates, the healthy microorganisms that make Thiamine (Vitamin B₁) may be killed off. Thiamine is so important that if the goat is not quickly injected with it, she may suddenly appear blind and start to stagger, convulse, and die from a metabolic disease called polioencephalomalacia.

C - this vitamin is also made in the rumen of a ruminant like a goat!

D - this vitamin is produced in the skin of goats that are out in sunlight. It should be provided in the diet of goats that are kept indoors. Fresh, sun cured hay is an excellent source of vitamin D. Vitamin D is needed for proper bone growth and health. Ricketts in goat kids (weak, small bones resulting in a stunted, hunchback look) and brittle bones in adults are possible signs that vitamin D is lacking (deficient) in the diet. The goat needs the proper balance of the minerals, calcium and phosphorous, and adequate vitamin D in order to have healthy, strong bones.

E - works with the mineral, selenium, to allow normal growth. "White muscle" disease is a degeneration of the muscle tissue that affects young kids. It can be prevented or improved with vitamin E and selenium treatment.

K - is made by the microorganisms in the rumen. It is also plentiful in many feeds. It is needed to help blood to clot.

Minerals

Calcium (Ca) - is critical to the goat and must be supplied by her feed. Like other minerals rumen microorganisms cannot manufacture it. It has many uses in the body and is crucial for bone health and growth. Calcium is constantly being added to and removed from bones so it must always be present in the goat's diet. Legume hays like alfalfa are higher in Ca than grass hays like timothy.

Phosphorous (P) - is also important on a daily basis. It must be fed in the correct proportion to Ca in your goat's feed. The ratio of Ca to P should never drop below 1.2 : 1 and vitamin D must also be available. Calcium and P are very important for lactating does and growing kids. They require a Ca:P ratio of ~2:1 (two times as much Ca as P). Too much P compared to Ca can lead to urinary calculi in male

goats. Pregnant does should not be fed a Ca:P ratio that is very high in Ca as this can predispose them to a metabolic disease called milk fever. In contrast, a doe needs a high Ca to P ratio once she is milking. This is because she is excreting lots of Ca everyday in her milk. Most grains are high in P and low in Ca.

Sodium (Na) and Chlorine (Cl) together make common table salt. Salt is an important supplement for goats, although just like humans some goats will eat more salt than they really need. Salt is important for many bodily functions.

Potassium (K) - is present in good, fresh forages so you usually don't have to add it to goat feed.

Iron (Fe) and Copper (Cu) are important ingredients in blood. A lack of either can lead to anemia. Usually the small amounts of these minerals present in a goat's regular diet are enough. Therefore, deficiencies are rare except occasionally in those goat kids that are fed exclusively on milk for a prolonged time. This is because milk is lacking in iron. If needed, iron can be given in an injectable form. Some soils are very deficient in Cu. Goats grazing on these soils may become anemic and have dull, washed out coats. These goats may benefit from Cu in their trace mineral blocks. However, too much copper can easily poison sheep and goat kids especially if they are getting very little molybdenum (another mineral) in their diet. Avoid giving these animals a salt block containing Cu that has been made for horses or dairy cattle. It may contain too much Cu. Instead give them a sheep trace mineral block. Adult lactating goats have a greater tolerance for Cu and can generally tolerate a cattle block.

Iodine (I) is deficient in some soils in the US. It is needed by the thyroid gland which produces hormones to help regulate the body. Iodized salt can be fed in deficient areas.

Sulfur (S) is an ingredient or component of many proteins. Rumen microorganisms need it to build proteins. Most feeds contain sulfur but if you are feeding urea or some other non-protein nitrogen source, you may not be providing enough sulfur to your goat.

Magnesium (Mg) - there is usually enough Mg in goat feeds. However, lush, fast growing, green pastures that have been heavily fertilized with Nitrogen and K or are high in nitrates because of cool, wet, overcast conditions can become very deficient in Mg. This can lead to a condition in goats called grass tetany or grass staggers. The goat will become very excited and may convulse and die. Grass tetany is treated with intravenous injections of Ca and Mg. Too much Mg can predispose a wether to urinary calculi.

Selenium (Se) - most soils in NY are lacking in Selenium. Selenium and vitamin E work together to prevent nutritional muscular dystrophy (commonly called white muscle disease), retained placentas and to reduce susceptibility to worms and disease.

Zinc (Zn), Manganese (Mn), Fluoride (F) and Cobalt (Co) are all needed in trace (very tiny) amounts by goats and are usually sufficient in a regular diet. However, Co is deficient in many soils of central NY. Cobalt may need to be added to the goat's diet in her salt or concentrate. Without Co, the rumen microorganisms cannot make the B vitamins, vitamin C or vitamin K.

Suggested Activities

- 1) Check with your county Cornell Cooperative Extension office to find out what mineral deficiencies are common in soils in your area. Come up with ways to supplement these minerals in a goat's diet without providing too much of any of these minerals.
- 2) Make an informal display board of the vitamin and mineral content of the feeds you give your goat.
- 3) Find the labels from various trace mineral salt blocks and loose salt mixes and compare the differences in the amounts of various important minerals listed on the labels.
- 4) Plan a feed ration with the proper Ca:P ratio to help prevent milk fever in a lactating doe.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #15

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USING MATH TO SEE HOW WELL YOUR GOAT IS GROWING

Math can really help you figure out how well your herd is doing and what management changes you need to make. One of the important uses of dairy goat math is for evaluating the growth of your kids. How well is your kid growing compared to other kids and other herds in NY? You can weigh her and record her weight in your records and then do the proper math to see how she is doing.

For the first three months of age, most healthy goat kids in NY herds grow from 1/3 lb. to 1/2 lb. per day. Kids from the smaller breeds will tend to grow more slowly than kids from the big breeds. Kids from triplet litters will tend to grow more slowly than kids that are singles. Bucks will tend to grow more rapidly than does. There are many reasons why a kid may grow very slowly. Some common reasons are, the kid may 1) have an internal parasite problem like worms or coccidia, 2) not be getting enough milk from their dams or bottles, 3) be on a poor quality milk replacer, or 4) have some sort of disease problem. We usually feed bottle kids about 1 to 2 quarts of milk per day (less the first few days of their lives) and offer them a creep feed that is high in crude protein (14 to 18%) and energy, as well as some alfalfa or grass/legume mix hay. Kids that are on the lower amount of milk will usually investigate their other feeds sooner and eat more of them. Because of this, their rumens may develop earlier. However, if you have plenty of goat milk, it often makes the most sense to feed 1 1/2 to 2 quarts of milk daily. Otherwise, you will need to spend a substantial amount of money on a good quality creep feed. Plan on weaning your kid from milk by 10 weeks to 3 months of age. Your kid should weigh at least 30 lbs then and be readily eating hay and grain.

How fast is my kid growing? First, weigh her. You can either use a hanging scale or you can weigh yourself on your bathroom scale and then stand on it again holding her and calculate the difference. For example, you weigh 70 lbs. but with her you weigh 82 lbs, ($82 - 70 = 12$) so she weighs 12 lb. You can also use a goat weight tape to estimate her weight but these tapes are not as accurate as scales.

Let's say you have two measurements written on the kid's record sheet:

birth	date 4/15/1999	weight 7.5 lb
one month	date 5/15/99	weight 23.5 lb

Figure out how many days there were between the weighings so that you can express growth rate as daily weight gain. For this kid,

April ($30 - 15$) = 15 days

May = 15 days so the total number of days is 30 days

How much weight did the kid gain in 30 days? $23.5 - 7.5 = 16$ lbs

So daily weight gain was $16 \text{ lbs} / 30 \text{ days} = .533 \text{ lbs per day}$ or $\sim 1/2 \text{ lb per day}$. NICE GROWTH!

You can do this for any time period. If you check on growth each month, you will find that the rate of growth slows as the kid gets more mature.

How much milk did your kid need to drink to produce 1 lb of weight gain ? note - a quart weighs a little more than 2 lbs.

Let's say you fed this kid about 1 lb of milk (really colostrums!) the first 3 days of its life, 2 lbs of milk from 4 to 9 days of age, 3 lbs from 10 to 14 days of age, and 4 lbs from then on until May 15th. $(1 \text{ lb} \times 3) + (2 \text{ lb} \times 6) + (3 \text{ lb} \times 5) + (4 \text{ lb} \times 16) =$
 $3 + 12 + 15 + 64 = 94 \text{ lbs.}$ In other words she drank 94 lbs of milk in 30 days, or a little more than 3 lbs daily

Of course, not all her growth came from milk because you probably started to offer her a creep feed and some good quality hay starting at 1 to 2 weeks of age. But let's just look at milk alone.

She drank 94 lbs of milk and grew 16 lbs, so $94 \text{ divided by } 16 = 5.9 \text{ lb.}$ It took about 6 lbs or almost 3 quarts of milk to produce 1 lb of growth.

How much does your kid grow per lb of milk drunk?

Let's say your kid grew @ $1/2 \text{ lb}$ per day the following month drinking @ 4 lbs (or ~2 quarts) of milk daily:

$1/2 \text{ divided by } 4 = 1/2 \times 1/4 = 1/8 \text{ lb of growth per lb of milk consumed.}$

There are 16 oz in a lb so she grew around 2 oz for each lb of milk drunk.

How many lbs of milk did she need to drink to grow one lb?

$2 \text{ oz} \times 8 = 16 \text{ oz}$ or 1 lb of growth, and $.1 \text{ lb of milk} \times 8 = 8 \text{ lbs of milk}$

How many quarts were needed this month to produce 1 lb of growth?

There are ~2 lbs in a quart so $8 \text{ lb} / 2 = \sim 4 \text{ quarts.}$

Try these for yourself -

- 1) A kid gained 20 lbs in 60 days. How fast was its daily rate of growth?
- 2) Your kid eats 10 lbs of a 15% crude protein feed in a month. How many lbs of protein did it eat in total that month?
- 3) Which has more protein, 20 lbs of a 15% crude protein feed or 15 lbs of a 20% crude protein feed?

Suggested Activities

- 1) Use your records from your own goat kids to calculate their daily weight gain. How do they compare to each other? How well do you think they are growing?
- 2) Make a graph that shows the weight of your kid per week or per month of age (depending on how often you weigh her). What does his or her growth curve look like? Is it very straight or starting to flatten out?
- 3) Make a graph of her average daily weight gain for the same time period.

Answers:

- 1) daily gain $= 1/3 \text{ lb,}$
- 2) $10 \times .15 = 1.5 \text{ lb of crude protein eaten in a month,}$
- 3) they both have 3 lbs of crude protein ($.15 \times 20 = 3$ and $.20 \times 15 = 3$).

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #16

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WHEN WILL MY GOAT KID

The most important item that tells you when a doe can be expected to kid is an accurate record of her breeding date. Without this, you are using pure guesswork, and could lose kids if a doe needs help during the birth process and you weren't there when needed. Most does are bred during September to December, although it is possible to breed does at other times of the year, especially with light-controlled housing. After the doe is bred, record the date, then watch her at the time she would be expected to return to heat. This is approximately 21 days later, but individual does may have longer or shorter cycles, so watch her closely for the next month or two after breeding. If you miss doing this, you might waste time and feed on a non-pregnant doe. A doe bred late in the natural breeding season might not cycle again, so it could be difficult to determine whether she is truly pregnant.

Pregnancy testing can be done several ways. One is by your veterinarian with ultrasound, which is a way to picture the insides of a doe without using x-rays, which could damage the unborn kid. Another method is by milk progesterone testing. Progesterone is one of the hormones of reproduction. A milk sample taken on the day of breeding and another 21 days later can be used to tell if the breeding was unsuccessful. Assuming your doe is safely pregnant, when can the kids be expected to arrive? A doe's pregnancy (gestation) lasts about 150 days. To save you calculating the expected kidding date the hard way, there are gestation tables available. One of these is shown on this Fact Sheet.

To use the Gestation Table: say your doe is bred on September 10. She will be due to kid (or "freshen") in February. To decide which day, you take the day of breeding (the 10th in this example) and subtract the number in the table (-3 for February). So her due date is February (10-3) = 7.

GESTATION TABLE FOR DAIRY DOES

Doe Bred In	Will kid on Month	Number to take away from calendar breeding day	Take this number away instead in a leapyear
Jan	June	subtract 1	subtract 2
Feb	July	0	subtract 1
March	August	subtract 3	
April	Sept	subtract 3	
May	Oct	subtract 3	
June	Nov	subtract 3	
July	Dec	subtract 3	
August	Jan	subtract 3	
Sept	Feb	subtract 3	
Oct	March	subtract 1	subtract 2
Nov	April	subtract 1	subtract 2
Dec	May	subtract 1	subtract 2

Of course, most does will not kid precisely when you expect them to. You should be alert to signs of kidding before the doe's due date. Make sure that does close to kidding are housed in a way that makes regular close observation easy. You ought to have improved the doe's nutrition steadily throughout gestation. Keep her shed clean and freshly-bedded when she is due to kid. Don't isolate her totally from the rest of the herd, as this will distress her if she is not used to being alone. Watch for changes in the doe's behavior. Close to kidding, she will become restless and distracted. She may bleat frequently, and paw at the bedding. Her tailhead ligaments will sag and her udder may get shinny. The udder may fill with milk some days before. This is a highly variable sign of kidding, though. Some udders fill with milk a week before kidding, some not until the day of kidding. Don't milk the doe even a little unless she is in obvious pain from a swollen udder. You will lower the quality of the first milk (colostrum) which is essential for raising a healthy kid. The udder will drip on its own if it gets too full.

The doe is in the kidding process once mucus and membranes begin to show at the vulva (opening of the reproductive tract) or once she starts pushing. A kid should be born shortly after the placental sac breaks and the doe starts pushing in earnest.

Questions: Calculate the due dates for does bred on:

1) May 18, 2) September 2, 3) November 20, and 4) December 30 (answers below)

Suggested Activities

- 1) Record breeding dates for your own does and calculate due dates.
- 2) Draw a plan of your barn, showing where does are housed and what you need to do to prepare pens for kidding.
- 3) View slides or a film showing a doe kidding.*
- 4) Watch a friend's goat kid being sure to stay quiet and out of the way.*
- 5) Take slides of a goat kidding and prepare your own presentation.

* Activity is usually suitable for Cloverbuds with parental consent or company.

Answers: 1) Oct.15; 2) Jan. 30; 3) April 19; 4) May 29

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #17

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REPRODUCTIVE PROBLEMS OF THE DOE

A variety of health problems may be associated with reproduction in the doe. This fact sheet will cover:

- 1) ketosis
- 2) retained placenta
- 3) milk fever
- 4) genetic infertility
- 5) metritis

Ketosis (acetonemia, pregnancy toxemia). This is a metabolic disease, which means that it is a disturbance in the normal body processes, not something "catching". It is most likely to occur just before kidding or within the two to four weeks after. Does that are extremely overweight or underweight, carrying several kids, or lacking exercise are all susceptible to developing ketosis. A correctly balanced diet during pregnancy and in early lactation, exercise, and no stressful situations are all ways to avoid ketosis in does. Never diet a doe in late pregnancy. Good management can largely control metabolic diseases.

The doe with ketosis loses her appetite, becomes weak and may have muscle spasms. Advanced ketosis results in rapid breathing, frequent urination, coma, and death. Treatment is with oral propylene glycol to raise blood sugar levels. Be sure not to overdose her with propylene glycol as this can cause acidosis.

Milk fever is another metabolic disease. It is poorly named as the doe often has a lower (92-96°F) than normal temperature. Good management can also largely control milk fever. It generally occurs shortly after kidding, and is the result of a calcium imbalance as lactation begins. First signs are listlessness and lack of appetite. Then the doe becomes uncoordinated and goes down. Death can happen quickly after this, so the doe needs help fast. The veterinarian will treat her with intravenous (into the veins) calcium solutions, to raise her blood calcium quickly.

The best control for milk fever is to limit calcium in the feed during pregnancy, then to increase it once lactation begins. The doe needs lots of calcium as soon as she starts producing milk, but not before. High calcium feeds to avoid in late pregnancy are legume hays and soybean and linseed meals. These dietary rules do not apply to yearling does. Yearling does rarely if ever get milk fever. This is because their bodies have a high requirement for calcium throughout their pregnancy due to the fact that they are still growing themselves. To prevent milk fever, it is also best to wait until 24 hours after kidding to milk a heavy producing doe out completely. Instead, milk her just enough to release the pressure on her udder.

Retained placenta can occur after kidding. The afterbirth is not delivered, but remains in the uterus, or partially inside. Do not pull at the exposed parts. Simply clip them off or tie them in a knot and wait. The doe should be started on antibiotics to combat any infections from the afterbirth rotting inside her. You can also get hormone injections from your vet to help her push.

Metritis is a uterine infection that may occur after kidding. The temperature will be high (106-108°F), and immediate and severe antibiotic treatment will be needed. Does with retained placenta or dead kids, or one you had to put your hands in to, are most likely to develop metritis. This is because disease organisms will have had a chance to gain entry in to the uterus. Do not neglect metritis. Serious uterine infections can be fatal or make your doe permanently sterile.

Infertility can have many causes. Goats that never seem to conceive should have their vagina examined with a speculum to make sure it is not abnormally small (infantile) or that the cervix opening does not look infected. Does that come into heat constantly with very short cycles may have cystic ovaries and require hormone treatment.

Suggested Activities

- 1) Invite your veterinarian to talk to your group about some of these reproductive problems and their treatments.
- 2) Make a public presentation or develop an exhibit dealing with reproductive problems.
- 3) Plan out a feed ration for a pregnant goat and for the same doe after kidding.
- 4) Be a quiet observer at a kidding. Be sure to observe what the placenta looks like.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #18

By Dr. E. A. B. Oltenacu
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BEHAVIOR OF GOATS: PART I – HERD BEHAVIOR

Raising your goat requires more than a knowledge of feeding, breeding and management. Goats are social animals, so you should also understand how goats interact with each other and react to you on a social basis. Getting to know your individual goat or herd takes a lot of practice. Observation and knowledge of a few facts should help you get started.

Under natural conditions, goat herds will establish a “pecking order” or dominance pattern. This pecking order helps to limit aggression among the herd members and may change from day to day.

Dominance of a herd member is determined by three factors: age, sex and the absence or presence of horns. The doe will always be dominant over her female kids, even after several years! The buck is usually dominant over the female when bucks and does are allowed to run together. The presence of horns as a dominance factor becomes obvious when goats in a herd go through their daily ritual of butting heads. The goat that doesn’t back down after this ritual is considered dominant. A goat with horns will usually dominate a goat with no horns.

Once a herd pecking order is established, two special goats become responsible for the herd’s welfare. The most dominant buck becomes what is called the “Top Buck”. This buck is responsible for the protection of the herd and will usually guard the rear when the herd is moving. He is also allowed to breed any doe in the herd before the other bucks. If the Top Buck is taken away, the rest of the herd adapts quickly and another Top Buck is chosen from among the remaining bucks.

The most dominant doe is called the “Flock Queen”. She is responsible for leading the herd to the best grazing areas. When she finds a suitable spot to graze, the other goats will graze in the same area. If the Flock Queen is taken out of the herd, the other goats will show confusion until another Flock Queen is chosen.

A very interesting ritual occurs when the Flock Queen comes upon a plant that is poisonous or inedible. She will sniff the plant and then snort and show obvious dislike for it. All the goats in the herd will take turns smelling the same plant, using its scent as identification of that particular plant. After they have all taken a turn memorizing the plant’s odor, the Top Buck will trample the plant.

In domestic herds, herd members are not allowed to interact naturally. For this reason, you may not observe many of the behavior patterns shown under natural conditions. However, by realizing what behavior patterns exist, you can understand how your herd or individual goat relates to you.

First, you must understand that goats are not truly domesticated animals. They tend to treat humans as one of them. For this reason, the goats in your herd will relate to you in different ways depending upon the roles you play.

Feeding

If you are responsible for feeding your herd, they will associate you with the Flock Queen. The herd may attempt to follow you wherever you go and may be in a state of confusion when you are not around. This becomes a problem when you try to send the herd out to pasture and they keep trying to follow you home.

Driving

If you move your herd by driving them from the rear, they will come to think of you as the Top Buck. However, this only occurs when bucks are allowed to run with the does. If you hold this position, you may have trouble handling the other bucks in the herd who are constantly challenging your authority. To show any troublesome bucks you are in control, it is recommended that you lay the buck on the ground and rub his nose in the dirt. This will show him who is boss!

To avoid any confusion within the herd structure, it is helpful to leave your goats in a group so that natural bonds and roles can be established. However, it is usually desirable to separate males and females for management purposes, and does and kids for disease control.

Suggested Activities

- 1) Using no more than four does, establish a dominance pattern. Place two does together in a roomy area with a container of grain, large enough for only one doe to eat at a time. Note which goat is allowed to eat first. Repeat, using all possible combinations of goats. (If four goats are used, you should have a set of six results.)

Example: Goats A, B, C & D are tested

<u>Pairs</u>	<u>Dominant</u>	<u>No. of times appearing dominant</u>	
A,B	B	A	1
A,C	C	B	2
A,D	A	C	3
B,C	C	D	0
B,D	B		
C,D	C		

In this case the order of dominance, starting with most dominant, is: C B A D

- 2) Analyze some noted behavior in a herd and try to explain your observations.

NEW YORK STATE 4-H DAIRY GOAT PROJECT FACT SHEET #19

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BEHAVIOR OF GOATS: PART II – MATING AND MATERNAL BEHAVIOR

An understanding of your goat's mating and maternal behavior is necessary to ensure a good breeding program. Your doe's behavior will change during the breeding season and you should be able to recognize these changes.

Mating Behavior

During the normal mating season (fall), bucks and does begin to show signs that they are ready to breed. At about 21-day intervals, a doe will come into estrus or "heat". At this time she will accept the buck. There are a few signs that will tell you when your doe is ready to be bred. It is important to be able to recognize these signs so that you can breed your doe at the correct time. In most cases, the doe's activity level will increase. She may pace along the fence line and bleat frequently. Her appetite and milk yield may also decrease.

During the breeding season, the buck will try to attract does to himself by urinating on his front legs and chest. The does in heat are attracted to the odor of the buck's urine. The buck also has scent glands located in front of his horns. These give off another attractive odor to the females in estrus (not very attractive for humans!).

A good way to find out which does in your herd are in heat is to use a "buck rag". This is made by rubbing a rag over the scent glands and urine-soaked beard of the buck. This rag is then placed in a jar. Let your does smell the rag at least twice daily. Does in heat will tend to follow the rag and flag (wag their tails rapidly). On closer inspection, their vulvas may appear swollen and have a discharge. The jar should be kept tightly closed and out of the sun when not in use.

Once a buck has found a doe in estrus, he will begin to court her before the actual mating takes place. He begins by sniffing the doe's vulva and urine. He then raises his head, extends his neck and raises his upper lip while moving his head from side to side. This is called the "Flehmen reaction". The buck may then nudge the doe with his shoulder while pawing with a foreleg. During the courting the doe will remain still and may bleat.

After courting, the buck will mount the doe for copulation or mating. The doe acknowledges this by turning her head back to look at the buck.

Maternal Behavior

Once your pregnant doe is close to kidding, she will try to separate herself from the rest of the herd. She will show restlessness and may bleat frequently. When the doe begins to kid she will first try to hollow out a nest on the ground to lay in. She will then proceed to deliver her kid or kids. (You may have to help at this point. See Dairy Goat Fact Sheet#20, Delivering Kids).

After kidding (and after she has passed the fetal membranes), the doe will begin to lick and smell the placenta and then lick and smell her kid. This is called “bonding” and will help her identify her own kids. If another kid has been orphaned, you can sometimes get a foster mother to accept it by first rubbing her own kid’s placenta over the alien kid.

After the newborn kid is strong enough to stand, it will immediately search for the doe’s udder in hopes of finding food. When suckling, the kid will wag its tail quickly and the doe will sniff under the kid’s tail. This also aids in the bonding process.

When the doe returns to the herd, she becomes very protective of her kid and will butt away any intruding kids that try to nurse. Under natural conditions, the doe will automatically wean her kid at 6 months to a year of age. She accomplishes this by grazing in areas where she can consume more roughage and this change in diet will decrease milk production. She also actively rejects suckling attempts by her kid.

In many dairy goat herds, the kids are weaned at birth for a variety of management reasons and fed on pasteurized colostrum and milk. One of the most important of these is to avoid the spread of CAE (Caprine Arthritis Encephalitis) from a carrier doe to her offspring through her infected milk and colostrum. The doe may object to this and become very restless. To ease the doe’s distress, you may pen the kid near the doe so she can see it and smell it, but not allow it to nurse. The kid will also show displeasure at being separated. If the doe and kid are separated, you will need to milk the doe out by hand. If you regularly milk your doe, she will come to think of you as her kid and will treat you as such. This means you may have difficulty getting her to go where you want her to. She may be too busy trying to herd you around!

Suggested Activities

- 1) Make a buck jar. Be sure to protect any nice clothes you are wearing with a smock or overalls to keep the buck smell from contaminating them. Plan on taking a shower or bath and putting on clean clothes when you are done handling the buck.
- 2)
- 3) Observe a kidding, noting the behavior of the doe and kid. Take the kid away after bonding has occurred and watch the reaction of the doe. Replace her kid with another kid and note the results.
- 4) Using the buck jar (or just observation), try and pick out the does that are in heat in a herd.*
- 5) Observe does and bucks during the mating season and again out of season. Note the difference.
- 6) Observe a mating demonstration. Note the courting behavior of the buck.

* Activity is suitable for Cloverbuds.