



Mid-Atlantic 4-H Market Goat Project Guide



Virginia Cooperative Extension

Knowledge for the Commonwealth



VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY



VIRGINIA STATE UNIVERSITY



2006

www.ext.vt.edu

PUBLICATION 380-310

Produced by Agriculture and Extension Communications, Virginia Tech

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Facilities and Equipment



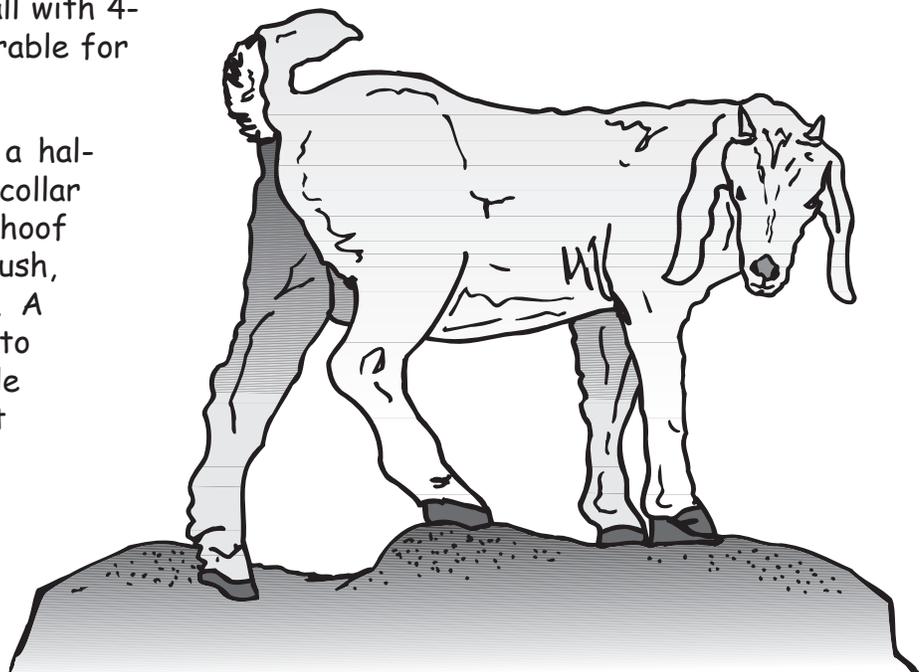
Goats are excellent 4-H project animals because of their limited requirements for space, facilities, and equipment. A goat's primary needs are feed, water, and protection from bad weather. A goat requires 25 square feet of space, so you can make a small pen to hold your project animals. You should provide shelter (about 15 square feet per goat) to shade your animals and for them to take cover under in bad weather. Goats do not like to get wet!

Animals should not be fed on the ground, so you will need a feeder and water tub/bucket for your animals. To ensure that each animal is getting adequate feed, provide 12 inches of feeder space per goat. All feeders should be raised off the ground to prevent the spread of disease. Self-feeders should be at least 6 inches off the ground.

If you hand feed your goats, you should use movable feeders that are at shoulder height of the goats being fed. Always keep feeders and waterers clean and free from mud, urine, and manure. Goats should not be allowed to stand in their feeders. Water containers should be small in size so you can drain and clean them on a regular basis. They should be located in the shade to keep the water cool. Water should always be available to the goat.

Fences and gates should be at least 42 inches, and preferably 48 inches, high to keep goats from trying to jump. Fences should be predator-proof. Net-wire or high-tensile electric wire fences may be used to contain goats. Pens constructed from galvanized livestock panels that are 5 feet tall with 4-inch squares are desirable for pens/lots.

You will also need a halter or nylon dog-type collar to lead your goats, hoof trimmers, a stiff brush, and electric clippers. A fitting stand is useful to hold your animals while you work on them, but you also can tie goats while you groom them.



Health



It is important to provide healthy living conditions for your goats. When you acquire your goats, you should put them in a clean, dry pen with hay and plenty of fresh, clean water. Once your goats are penned, you should treat them for stomach worms and coccidia and vaccinate them for overeating disease. If you have other livestock, keep new goats away from the rest of your herd (quarantine them), with no fence-line (nose-to-nose) contact for at least 30 days. You should extend this period of time if your new goats have any health problems.

The most important thing you can do to keep your goats healthy is to observe them and be able to recognize the difference between an unhealthy and a healthy goat. When you notice symptoms early and treat your goat, the chance for complete recovery can be very high. When a goat stops eating or appears lethargic (sluggish), you should take action immediately. You can gain valuable information by taking the goat's temperature and looking at its mucous membrane color and fecal consistency. Give this information to your veterinarian so he or she can make a diagnosis. You should collect fecal samples from a sick goat and have them checked for the number of parasite eggs. A goat's normal vital signs are listed in Table 2.

Table 2. Goat's Normal Vital Signs

Age	Rectal Temperature	Pulse	Respiratory Rate
Kid	101.5-104.0°F	70-180 beats/min	10-30 breaths/min
Adult	101.5-104.0°F	70-90 beats/min	20-40 breaths/min

Internal parasites (worms) are usually the major health problem affecting goats. Worms can decrease your goat's average daily weight gain (pounds per day) and feed efficiency (feed required per pound of weight gain). If left untreated, worms can kill your goats. The worm that usually causes the most problems is *haemonchus contortus*, more commonly called the "barber pole" worm. It is a blood-sucking worm that causes anemia (loss of blood volume and proteins) in the goat.

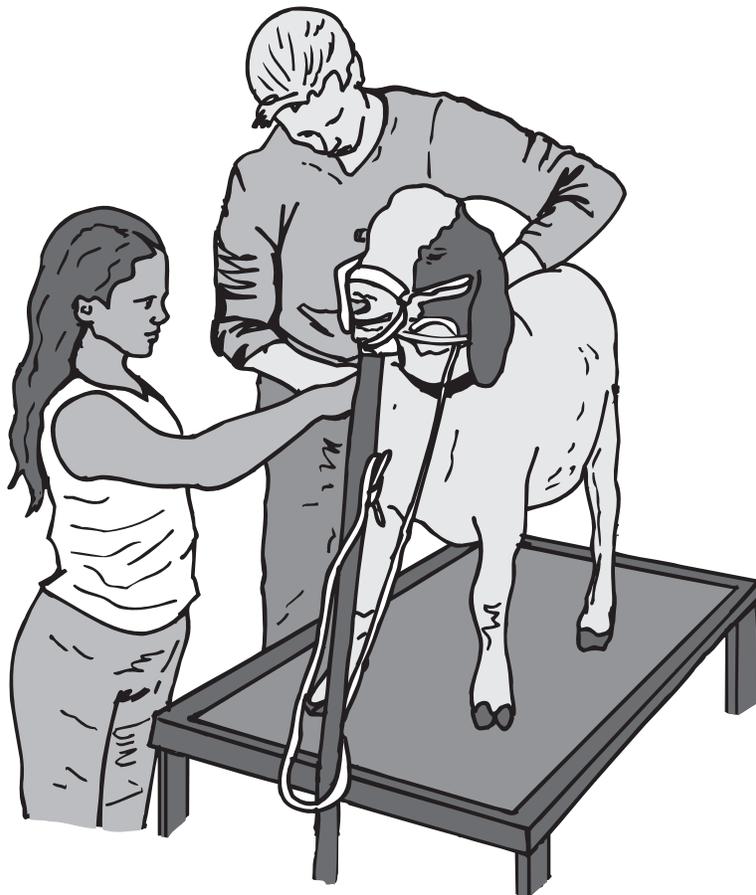
Goats that have large numbers of barber pole worms in their stomachs are unthrifty and have a rough hair coat. They will have pale mucous membranes and may develop "bottle jaw," an accumulation of fluid under their jaws. An easy way to check for anemia is to look at the color of the goat's lower eyelid. The eyelid of a healthy goat will have a healthy pinkish-red color with lots of blood vessels. Goats with lots of barber pole worms will have pinkish-white or white eyelids. There are other stomach worms that can cause digestive problems, such as diarrhea, in your goats.

Dewormers, also called "anthelmintics," are used to treat animals for worms. They are available in several forms:

- drench (a liquid that you put down the goat's throat)
- bolus (a big pill)
- pour-on (goes on a cow's back, but should be put down the goat's throat)
- paste (oral)
- injectable (a shot)
- feed additive

The Food and Drug Administration (FDA) has approved only two anthelmintics for goats. They are fenbendazole (SafeGuard®, Panacur®) and morantel (Rumatel®, Positive Goat Pellet).

The use of extra label drugs, such as ivermectin (Ivomec®), albendazole (Valbazan®), and moxidectin (Cydectin®, Quest®) requires a veterinary prescription. You should also consult a veterinarian to determine the proper doses for anthelmintics because goats use dewormers differently than sheep or cattle and typically need a higher dose than what is listed on the label. If your goats do not have access to pasture (grass) or are in a woodland area or large pasture, one treatment for parasites may be enough for the entire length of the project. Goats raised on pasture where they are grazing close to the ground may require more frequent treatment for worms.



Coccidia are another kind of internal parasite that can cause health problems in goats. Coccidia are single-celled protozoa that attack the lining of the goat's small intestine. They can cause death or permanently stunt a goat's growth by not allowing nutrients to be absorbed from the small intestine. Normally, all goats carry a low level of coccidia infection. Disease outbreaks occur during periods of high stress and/or when kids are kept in overcrowded or unsanitary conditions. Goats with high levels of coccidia may have diarrhea that is bloody or smeared with mucous. This condition is called coccidiosis. When young kids have diarrhea, coccidiosis is the most likely cause. The drugs that kill stomach worms have no effect on coccidia. Coccidiosis is treated with sulfa drugs (Albon®) or amprolium (Corid®). You will need to consult a veterinarian for advice on how to treat your goats if they have coccidiosis.

It is much better to prevent coccidiosis in your goats than to treat them for it. This can be done by adding monensin (Rumensin®) or decoquinate (Deccox®) to the feed or by purchasing feed containing one of these ingredients. The normal dosage rate is about 20 grams to one complete ton of feed. It is important to note that Rumensin® is poisonous to equines. You need to make sure that horses, donkeys, and mules do not eat goat feed that contains Rumensin® or Bovatec® (lasalocid) (a similar product that is fed to lambs). You also can add amprolium (Corid®) to the drinking water for periodic control of coccidia.

Overeating disease is caused by the bacteria *Clostridium Perfringens*, and can be a big health problem in goats that are fed grain. The disease is also called enterotoxemia or pulpy kidney disease. It is a common problem in goats. It occurs most frequently when goats are eating a lot of grain (so they will grow fast) or when sudden changes have been made to their diet. The bacteria that causes overeating disease normally lives in the goat's digestive system. Under certain conditions, it will multiply and produce a toxic substance that can kill goats.

Overeating disease can be best prevented by vaccination. The vaccine for overeating disease protects against the bacteria that causes disease: *Clostridium Perfringens* type D. It is common to use a vaccine that includes a tetanus toxoid to also protect against tetanus ("lock-jaw"). Kids should be vaccinated twice - on the day you receive them and then again three to four weeks later. The vaccine is given subcutaneously, which means between the skin and muscle. A good place to vaccinate kids is underneath the front leg. Since the vaccine takes at least ten days to take effect, it is important not to give your goats too much grain until they have had a chance to build up immunity against overeating disease. Tetanus anti-toxin should be used if you are castrating or dehorning (disbudding) kids and you don't know if they have been vaccinated. Anti-toxins provide immediate, short-term protection.

Another problem that can affect male meat goats, especially those eating a lot of grain, is urinary calculi. Urinary calculi is also called "water belly" or kidney stones. Urinary calculi can occur when the proportion of calcium to phosphorus in the diet is improper. The proper proportion of calcium to phosphorus in the diet is at least two parts calcium to one part phosphorus (2 : 1). When the ratio is too low (such as only

1 : 1), kidney stones may form in the goat's urinary tract and prevent the kid from urinating.

Wethers are most likely to get urinary calculi, though bucks are also susceptible. Unless the condition is recognized very quickly, it is difficult to treat and may result in the death or euthanasia of the goat. Urinary calculi can be prevented by adding 1 percent limestone to the ration or by including ammonium chloride in the ration at a rate of 0.5 percent to 1.5 percent of the ration. Leafy legume hays (alfalfa, clover, peanut, and soybean) are good sources of calcium. Grain and soybean meal contain high amounts of phosphorus and are poor sources of calcium. Commercial goat feeds and vitamin/mineral premixes should contain the proper balance of calcium and phosphorus.

When medications, including dewormers and antibiotics, are used to treat your goats, you need to follow the instructions included on their labels or the instructions provided by your veterinarian. Many medications have a withdrawal period listed on the labels. This is the period of time you must allow between giving the medication and marketing the animal (for meat) or consuming its milk. If your veterinarian prescribes a dose higher than that on the medication label, be sure to ask about an adequate withdrawal time. It is extremely important to maintain accurate records so that meat and dairy products entering the human food chain are wholesome and free of drug residues.



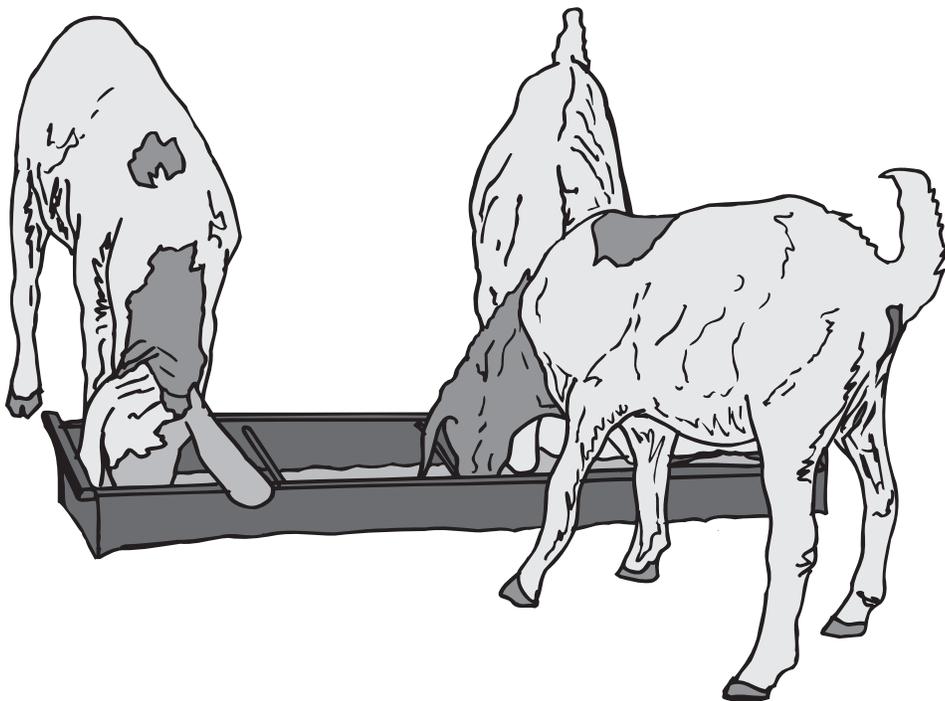
Feeding

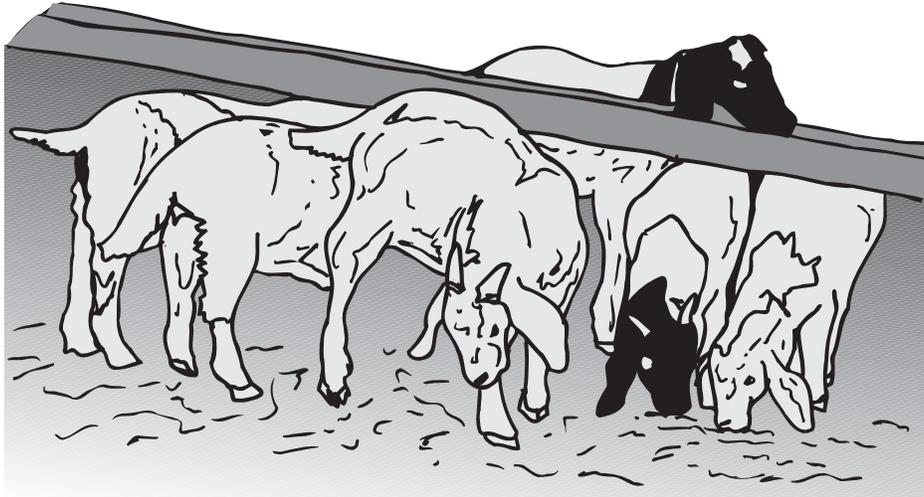


Feed is the second biggest expense of your goat project. You must take care to ensure that your ration is properly balanced with protein, energy, vitamins, and minerals to allow your goats to grow as quickly and efficiently as possible. A goat will require approximately 5 to 7 pounds of feed for each pound of weight it gains. For a goat gaining 0.3 pound per day, this is 1.8 pound of feed per day. A goat will perform better if the ration includes hay or the goat has access to pasture for roughage.

The nutritional needs of market goats can be met by feeding different feeds. The feeds can be categorized into two groups: forages (roughages) and grains (concentrates). Forages are high in fiber. Fiber adds bulk to the goats' diet and keeps their digestive tracts functioning properly. Forages tend to be average sources of energy. They include grass, browse (shrubs and vines), forbs (weeds), hay, and silage. Goats will eat a variety of plants and prefer to eat browse plants when given a choice.

Concentrates tend to be low in fiber and high in energy and/or protein. There are two types of concentrates: energy concentrates and protein concentrates. As the names tell us, energy concentrates are high in energy and protein concentrates are high in protein. Energy (calories) should make up the largest portion of the goats' ration. Higher-energy feeds allow animals to gain weight faster. Corn is the most widely used energy feed. Other energy feeds include barley, oats, and milo (grain sorghum).





Protein is essential for the growth of muscle in your goats. It is the most expensive part of the ration. Protein is made up of amino-acid building blocks. Growing kids require certain amino acids that are supplied by the protein component of the ration. As your goats grow, their protein requirements decrease. The most common source of protein for goats is soybean meal. Hay, pasture, and browse in a vegetative (growing) state are also excellent sources of protein.

There are vitamins and minerals that your goats require for bone growth and essential bodily functions. Calcium and phosphorus are the most important. Your goats also need salt. It is not very practical to buy individual vitamins and minerals to add to your goats' ration. Instead, you can buy vitamin and mineral premixes to add to your ration or you can buy a ration that contains all of the nutrients that your goats need.

Water is one of the most critical nutrients in a feeding program because it regulates the amount of feed a goat will consume. Clean, fresh water is necessary on a daily basis. Water intake should never be restricted.

There are three options for feeding your goats.

1. You can purchase a complete feed from your local feed store or mill. This feed should be specifically formulated for growing and finishing meat goat kids. Most goat feeds are pelleted. Pelleted feeds are good because they prevent goats from sorting feed ingredients. If you cannot find goat feeds, it is okay to feed a ration that has been formulated for lambs or cattle.
2. You can prepare your own ration by mixing farm-raised grains with a pelleted protein, vitamin, and mineral supplement. You can mix whole grain, such as corn, oats, or barley with a pelleted protein supplement (35 percent to 40 percent protein) that contains vitamins and minerals. It is not necessary to grind the grain for goats that are over 6 weeks old. The proper proportion of grain and supplement can be mixed at the time of feeding. This option may be cheaper

than feeding a pelleted complete feed. However, this ration should be hand-fed to prevent the goats from sorting feed ingredients. Hand-feeding is when you feed goats only the amount of feed they will eat in about 20 minutes.

3. You can prepare your own ration by mixing farm-raised grain with soybean meal (or other protein meal) and adding a vitamin and mineral premix. This option requires the most time and effort. You will need to partially grind the grain so that the soybean meal and vitamin and mineral premix will not sift to the bottom of the storage container or feed trough. Hand feeding will prevent ingredient sorting.

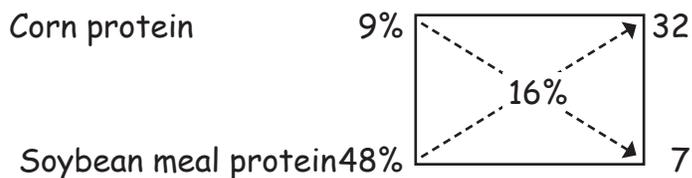
Balancing your own concentrate ration for goats

Since corn (or barley) will be the primary energy source in a concentrate ration, the ration will need to be balanced for protein because corn is low in protein. After balancing the ration, the energy level of the ration will still be at a desirable level. A recommended level of vitamin and mineral premix is then added to make the ration complete.

Below are two examples of how to balance a ration using corn and two different sources of protein. One source is soybean meal which is 48 percent protein and will require that vitamins and minerals be added. The other source of protein is a 40 percent pelleted protein supplement that already contains the necessary vitamins and minerals.

Market goats require 16 percent protein in their ration. We can calculate the proper pounds of corn and soybean meal by using a Pearson Square.

Using soybean meal



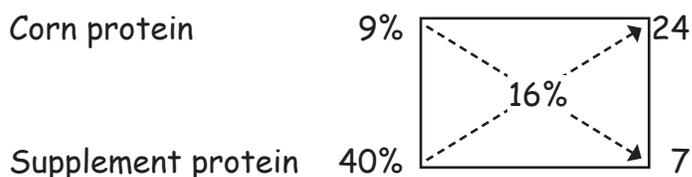
Total = 39

Take the difference between 9 percent and 16 percent and put it in the lower right hand corner. Take the difference between 48 percent and 16 percent and put it in the upper right hand corner. Add the two right hand values together, and then divide the total by the two individual values and multiply by 100.

$$32/39 \times 100 = 82 \text{ lbs. corn} = \sim 4 \text{ lbs. corn}$$

$$7/39 \times 100 = 18 \text{ lbs. soybean meal} = \sim 1 \text{ lb. soybean meal}$$

Using pelleted protein supplement with vitamins and minerals



Total = 31

$24/31 \times 100 = 77$ lbs. corn = ~ 3 lbs. corn

$7/31 \times 100 = 23$ lbs. protein supplement = ~ 1 lb. protein supplement

There is no need to add vitamins and minerals to this ration.

How to feed goats

Goats do not deposit external fat as rapidly as other species of livestock. Some goats will become too fat on high-energy diets and/or a self-feeding (all they can eat) program. Fat deposition should be monitored throughout the feeding program. Rations not producing enough finish can be bolstered by feeding more grain during the later stages of the feeding program.

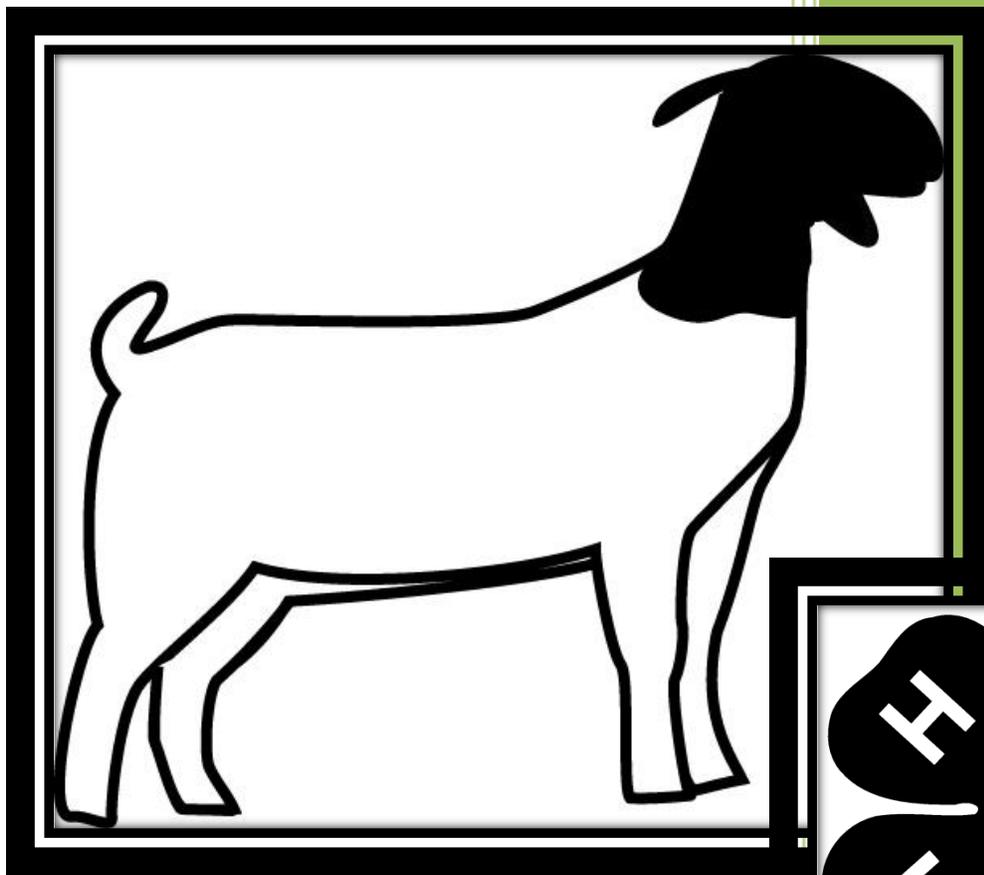
You can control the amount of feed that your goats eat by hand by feeding them twice daily. After adjusting them to full feed, feed them all the grain that they will eat in 20 to 30 minutes. Then, remove excess feed. This will reduce feed wastage (goats will often reject damp or dirty feed) and allow you to observe their eating behavior to monitor their health.

Goats are ruminants and require forage (or roughage) in their diets in order for their rumens to function properly. Pasture, browse, and/or hay will also keep your goats happy and prevent most serious health problems. Goats should be fed at the same time each day. You should never make abrupt changes in your feeding program. Make gradual changes so that your goats will stay on feed and continue to develop.

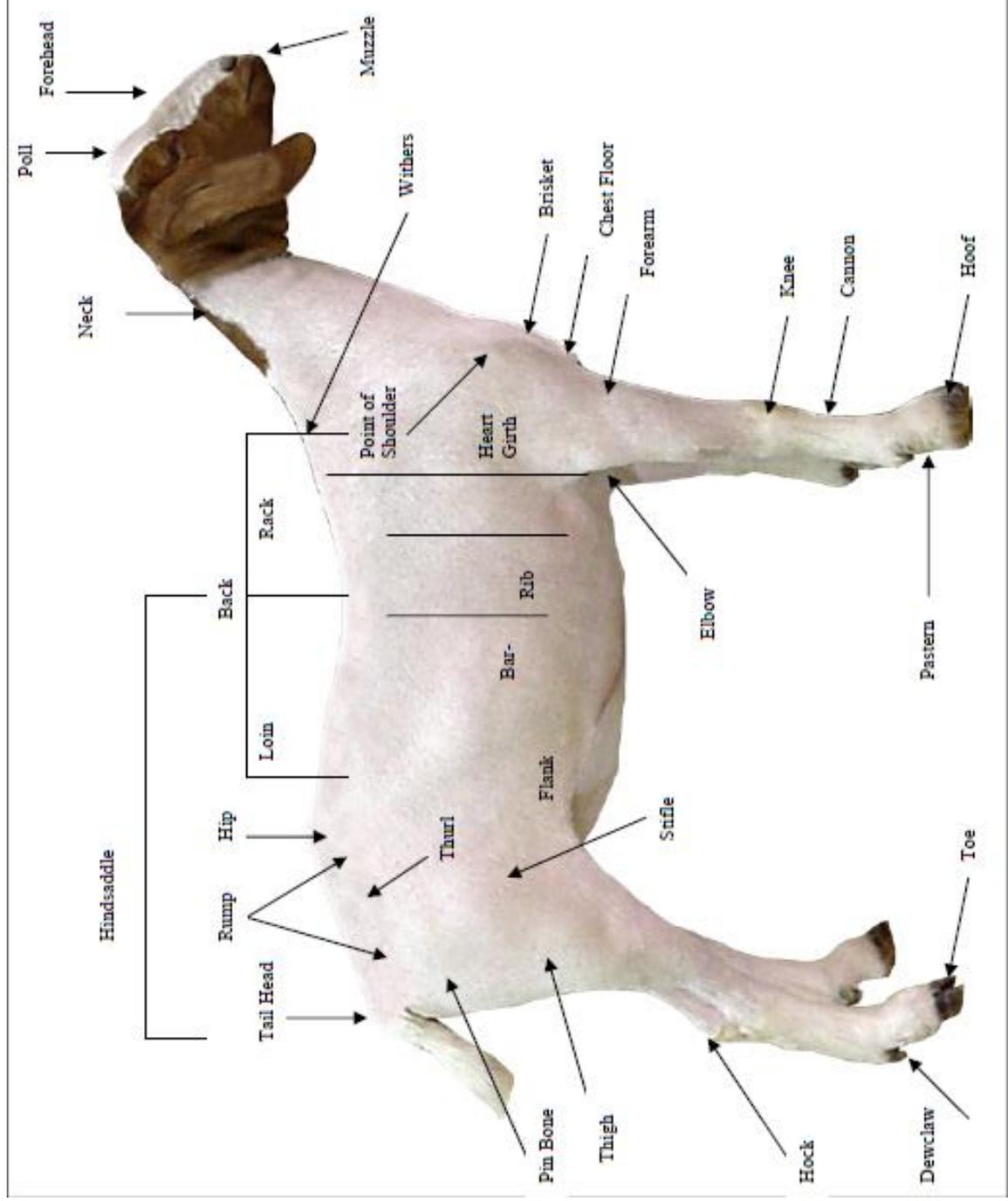
Table 4. Sample rations

1 - complete meat goat ration 16% CP				
2 - Whole grain + 40% CP pelleted supplement				
3 - Whole grain + 48% soybean meal (vitamins and minerals must also be added)				
Ration #	Complete ration	Whole grain	Protein	Hay
1	3 lbs.			1 lb.
2		2.25 lbs.	0.75 lbs.	1 lb.
3		2.40 lbs.	0.60 lbs.	1 lb.

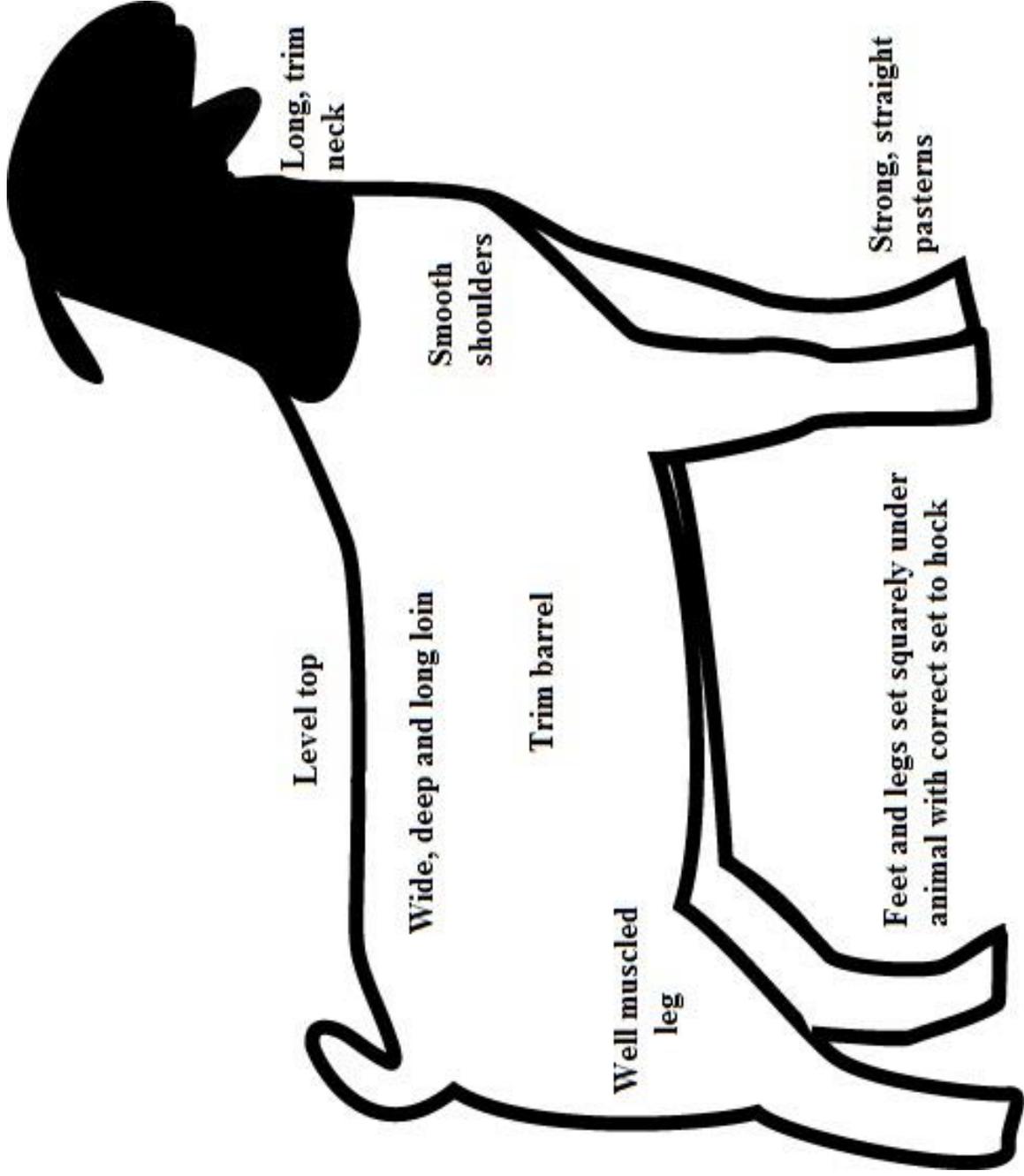
Market Goat Showmanship



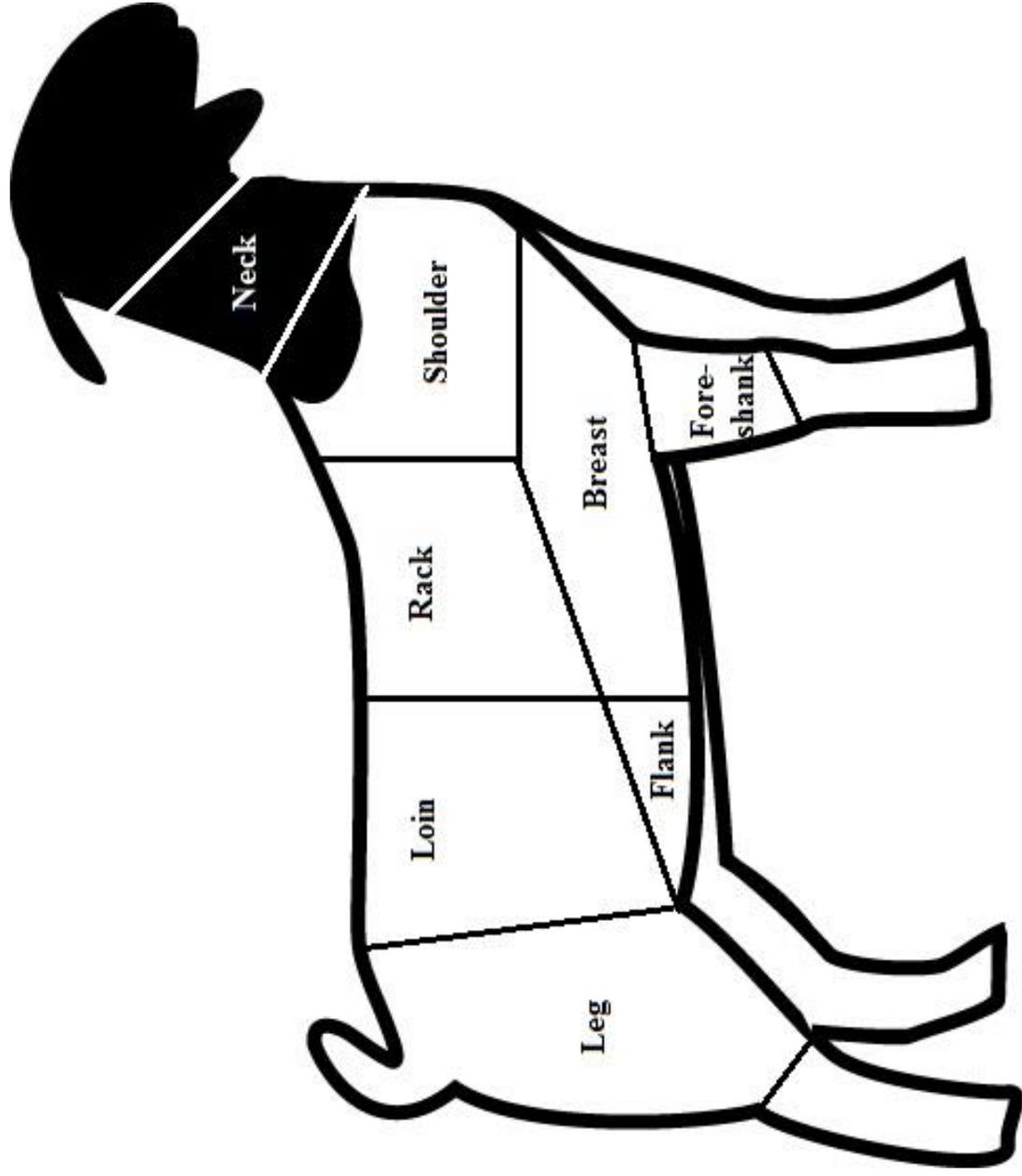
Parts of a Market Goat



Ideal Market Goat



Cuts of a Market Goat



Breeds of Market Goats



Boer



Spanish



Tennessee Fainting Goat



Kiko



Pygmy

Market Goat Showmanship

Evaluate the show ring prior to showmanship, paying close attention to where low spots are located. You want to make sure the goat's front feet don't end up in the low spots. You always want to set the goat going uphill.

Enter the ring going clockwise. Lead the goat from the left side with the right hand when possible. Keep the goat between you and the judge. Keep the goat's front shoulder even with your leg and the goat's head in front of your body. Showmen should hold the collar using their right hand palm facing upward and toward the goat's head (Figure 1). Showman should let their left arm and hand relax at their side. There is no need for the showman to place their left arm behind their back.



Figure 1. Hold the collar with your right hand palm up.

If you must encourage the goat to lead by pulling its tail, change hands and hold the collar with the left hand, lightly pull the tip of the goat's tail with the right. As the goat begins moving, change your hands to their original position.



Figure 2. Pull tail lightly to encourage the goat to move.

If the judge pulls you into line, your goat's shoulder should line up with the shoulder of the first goat in line. Keep your goat parallel to the other goats. If the judge lines you up head-to-tail, always line up straight behind the goat at the front of the line. **KEEP THE LINES STRAIGHT**—this will make it easier for the judge to evaluate and compare goats.

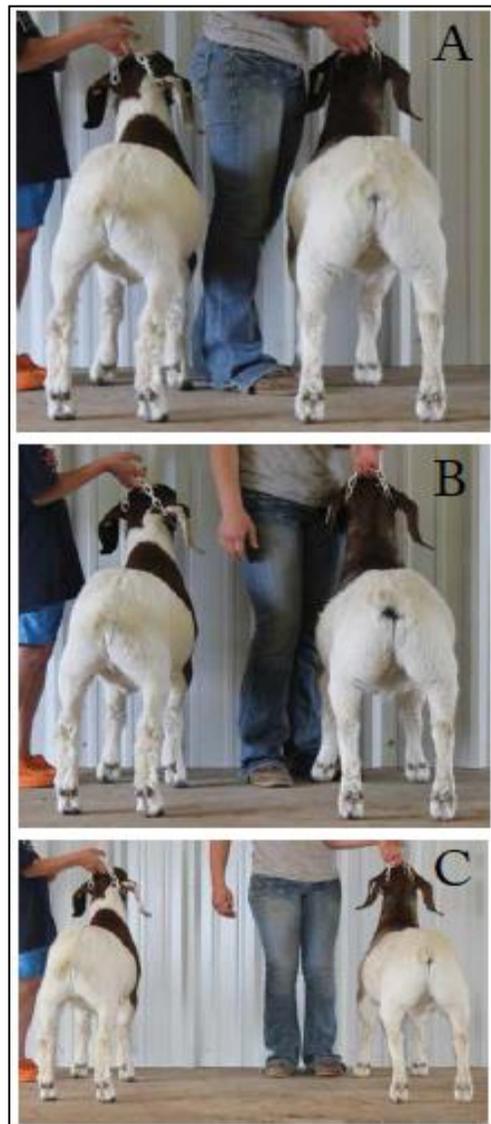
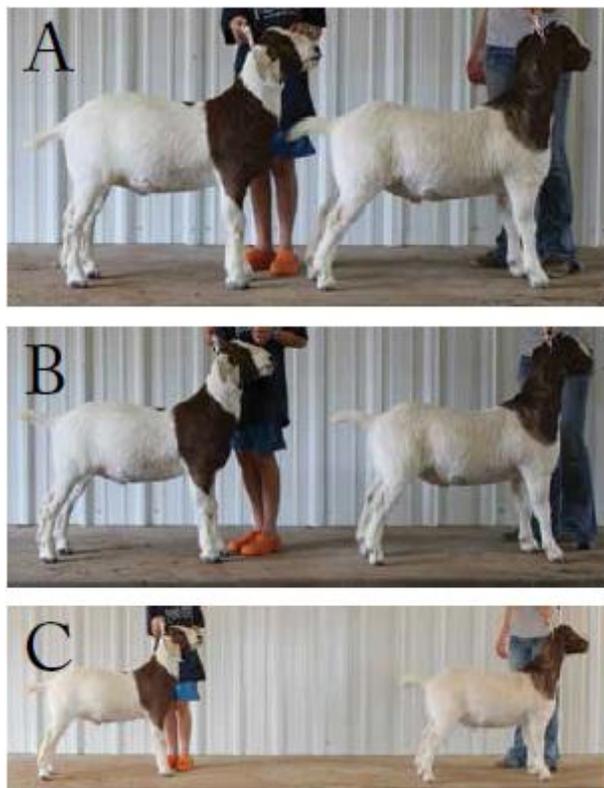


Figure 3. Animal spacing, profile
A = too close together, B = perfect,
C = too far away

Setting Up: A goat's feet should be placed on the four corners of its body, and the goat should not stand too wide or narrow on either the front or the back legs. On the profile, goats should not have their hind legs pulled forward too far underneath them or stretched backward too far behind them. Keep the goat's head straight over its body. The goat should look eye appealing and alert. You should remain standing at all times.

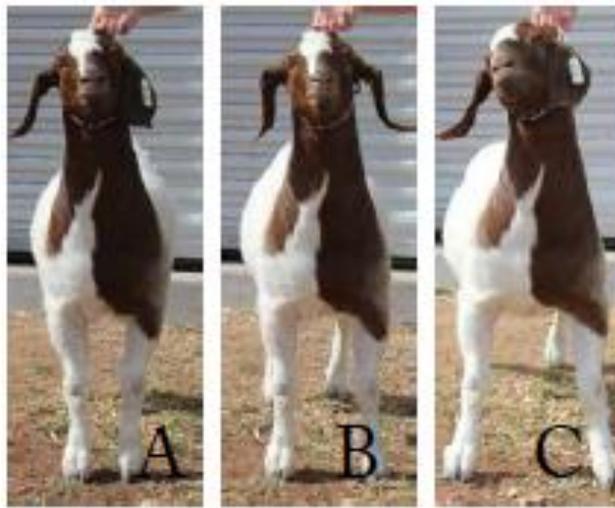
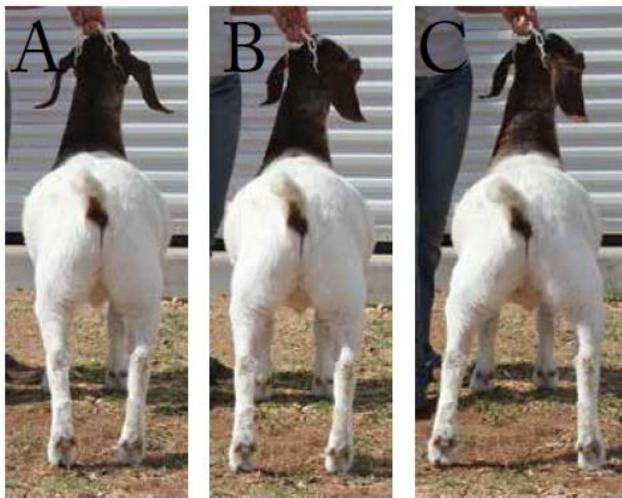


Figure 4. Leg placement, profile A = legs too close, profile B = perfect leg placement, profile c = legs too wide

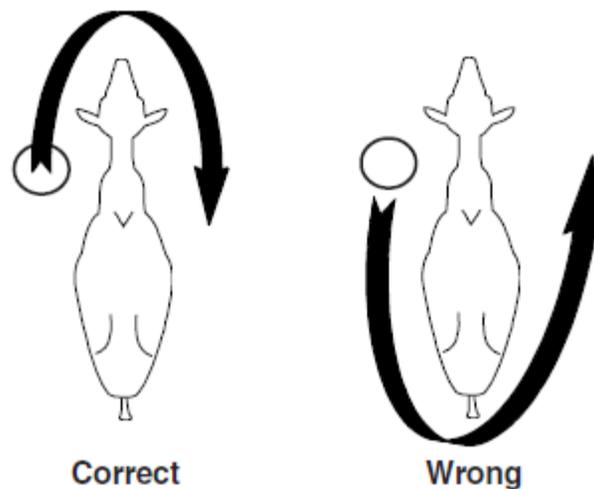
To properly brace an animal, the showman's hands, knees, and feet must be positioned correctly. This may differ based on the showman's size and what feels natural (Figure 5). Use the combination of hand, knee, and foot positioning that works best for you and the goat. Techniques may change as the showman becomes taller and stronger. The most effective way to brace a goat is to use what feels most comfortable to the showman while getting the best possible brace from the goat. The goat's front feet can be lifted slightly off of the ground to set them or cue the beginning of a brace. All four feet should remain on the ground while bracing (Figure 5). Holding an animal off of the ground can be uncomfortable for the goat. In addition this technique often makes a goat look worse structurally because the animal will usually have a "dip" in front of its hip, causing it to lose loin shape.



Figure 5. Leg bracing position.

Goats' ears should always remain in their natural position. Some may feel that raising the ears gives an illusion of a longer neck, but anything other than a natural look distracts from the animal's appearance (Figure 6) and offers no advantage.

General: Know where the judge is and stay alert. The judge may handle your goat at any moment or ask you to move to another place in the show ring. Moving goats from one point to another is just as important as correct positioning of their feet and bracing (Figures 8.1-8.9). When a judge asks a showman to move to another location, take the most direct path available. Goats should be turned slightly and pushed out of line if on a rear-view or pushed out of line before proceeding to the desired location with the goat between the showman and judge. Do not push the goat straight back or it will think you are signaling it to brace, and it will not move backward as desired. The showman should maintain eye contact with the judge while occasionally looking at the desired destination. When the showman is required to change sides, he/she must move around the front of the goat always facing the animal (Figure 7). Never change hands behind your back. Do not step behind the goat.



Cross in the front, never in the rear

Figure 6.

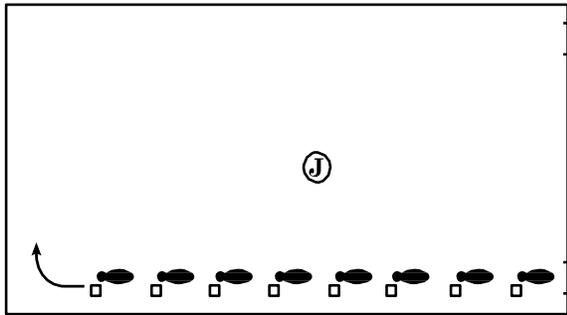


Figure 8.1. Animals entering the show ring on a profile. Notice the animal is always between the showman and judge.

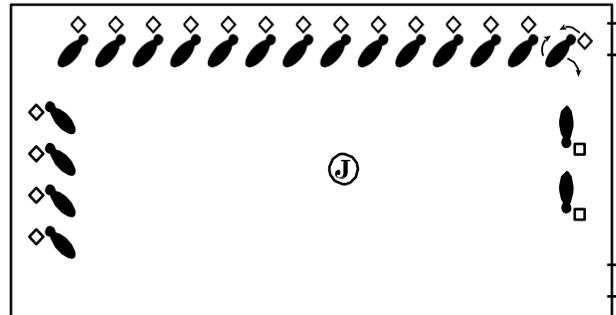


Figure 8.4. All animals begin to move to a profile or side-view. Move to the animal's left side, push their front end away from you, and

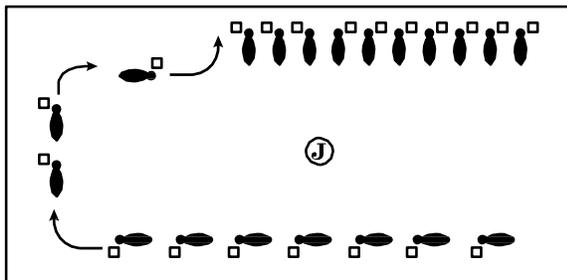


Figure 8.2. Animals entering the show ring and line up on a rear-view. Notice the position of the judge and showman.

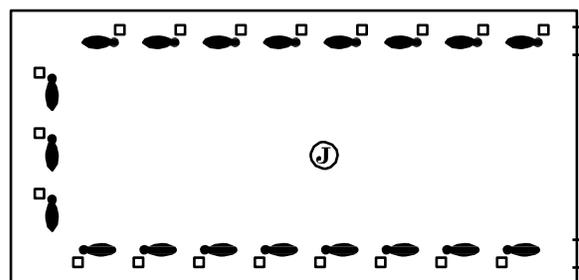


Figure 8.5. All animals lined up on a profile or side-view.

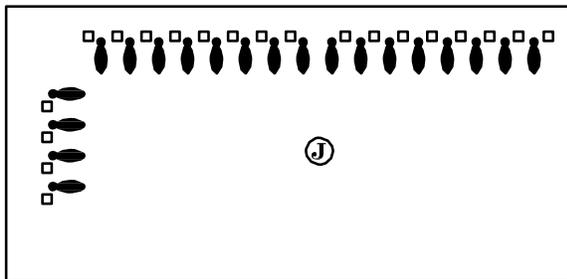


Figure 8.3. All animals lined up on a rear-view.

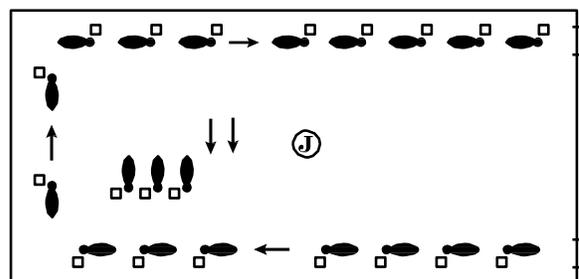


Figure 8.6. As animals move out of line to another location, move animals forward to fill gaps.

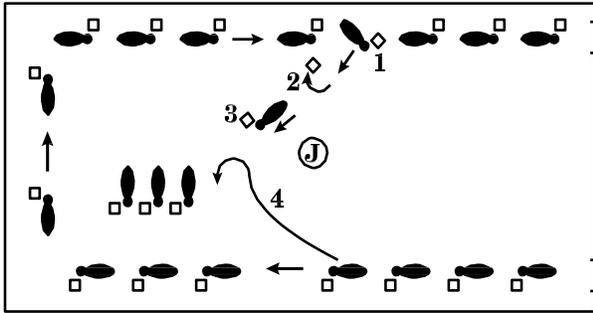


Figure 8.7. Showman 1 (top) 1) Push the goat out of line, 2) move around the front of the goat to change sides, and 3) proceed to the designated location.

Showman 2 (bottom) 4) Push the goat out of line and proceed to the designated spot in line.

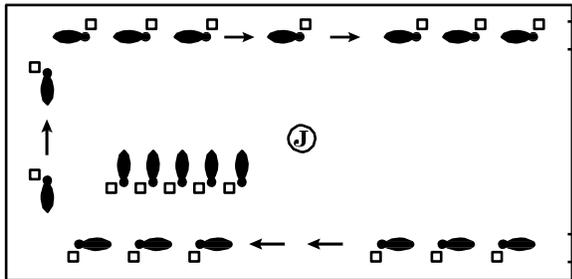


Figure 8.8. Completed moves from Diagram 7. Arrows show the need to fill gaps that have been left by the goats in the middle.