

PARATUBERCULOSIS

(Johne's Disease)

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Introduction

Paratuberculosis (Johne's disease) is a chronic contagious disease characterized by persistent and progressive diarrhea, weight loss, debilitation, and eventually, death. It affects cattle, sheep, and goats.

Etiology and Transmission

Mycobacterium paratuberculosis (johneii), the causative organism, is quite resistant and can survive in feces and soil for > 1 yr. It is shed in large numbers in feces of infected animals, and infection is acquired by ingestion of contaminated feed and water. Introduction of the disease into a clean herd is usually by subclinically infected carriers.

Infection is acquired early in life, but clinical signs rarely develop in cattle < 2 yr. old. Resistance increases with age and cattle first exposed as adults are unlikely to become infected. Most calves are infected soon after birth by nursing udders contaminated with feces from infected animals, or when they are housed in contaminated pens. The organism can also be present in colostrum and milk of infected cows. After ingestion, the bacteria localize in the mucosa of the lower small intestine and in associated lymph nodes. If not eliminated, the organisms multiply and initiate development of the intestinal lesions.

Signs of the Disease

The disease is characterized by weight loss and diarrhea, but initial signs are variable and often vague. Over weeks or months the diarrhea becomes more severe, there is further weight loss, coat color may fade, and ventral and intermandibular edema may develop. Animals are alert, and temperature and appetite are usually normal, although thirst may be increased. The disease is progressive and ultimately terminates in emaciation and death. Most cases occur in 2 - to 6-yr-old cattle. The disease in sheep and goats is similar, but diarrhea is less marked than in cattle.

Diagnosis

Fecal culture is the most reliable method of detecting animals shedding *M paratuberculosis*, but requires 12-16 wk incubation before results are available. Positive tests are significant, but because shedding may be intermittent, negative results mean little, and testing of additional samples is required. Serologic tests provide more rapid results than fecal culture, but have some deficiencies. The complement-fixation test is cumbersome and relatively insensitive, and is seldom used. The agar-gel-immunodiffusion test, while easy to perform, has low sensitivity and is used primarily to confirm infection in animals with clinical signs. The ELISA has good sensitivity with somewhat lower specificity, and is useful when applied as a herd test rather than to individual animals.

Control

No satisfactory treatment is known. Control requires good sanitation and management. Herds with confirmed cases should be tested to determine the extent of infection, and positive animals sent to slaughter. Retesting, at 6-mo to 1-yr intervals, should be continued until ≥ 3 negative tests are obtained. Calves should be removed from cows immediately after birth, bottle-fed colostrum that has been pasteurized or obtained from negative cows, and then reared completely segregated from adults until > 1 yr old. Because intrauterine infection can occur, calves from dams that have or develop signs of the disease should be culled. Even if replacements are from herds believed to be free of disease, they should be tested before and after purchase. In many countries, use of vaccines is subject to approval by regulatory agencies, and restricted to infected herds. Vaccination does not eliminate the need for good management and sanitation.

"Floppy kid" Syndrome

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Introduction.

During the 1995 kidding season goat producers suffered from an unprecedented neonatal mortality in kids. Most cases we are aware of occurred in west Texas; however, we received calls from producers in many other states across the U.S. that described the same problem. Although for many goat producers this is a new condition, the disease has been previously reported in several parts of the U.S., Canada and in Europe.

Clinical Signs.

Characteristically, goat producers reported that newborn kids seem to do fine for a few days after birth, beyond which they start to show **depression, weakness and flaccid paralysis** without signs of diarrhea and have normal rectal temperature. One common clinical sign reported is distension of the abdomen. The signs of depression and paralysis seem to affect the animals in waves. At one particular point, kids look so bad that they give the appearance of being dead. After some time they seem to recover spontaneously only to go back into coma 15-20 min latter. Affected animals that are not treated may die within a few days.

The condition does not seem to respond to antibiotic or vitamin E and Selenium treatments. Because the clinical appearance is that of very weak animals "lacking energy" most producers try to solve the problem by force feeding affected kids. This only makes the problem worse since this condition seems to be the result of over-consumption of milk.

Etiology.

The exact cause of the "floppy kid syndrome" is not known. We believe that it is the result of a combination of factors including **consumption of excessive amounts of milk** by the kids as well as the proliferation of an "infectious agent" in the gastrointestinal tract.

All producers that brought affected kids to TAES-SA indicated that they had improved the nutrition of the nannies with respect to previous years. Either they were supplementing the nannies with corn or a concentrate feed or they had put the nannies in irrigated/improved pastures some time before parturition. For this reason milk production by the nannies and the quality of milk seemed to be better.

In addition, some producers started to kid in enclosed pens (as opposed to kidding on the range) giving the kids an opportunity to suckle more often and consume more milk. These observations were supported by the fact that all affected kids that we necropsied at TAES-SA had a stomach full of milk.

The excessive amount of milk in the stomach seems to predispose to the proliferation of microorganisms (probably *Escherichia coli* or *Clostridium*) in the gastrointestinal tract that leads to changes in the acidity (pH) in the digestive tract, intestinal atonia (lack of movement of the intestine) and systemic acidosis. The latter is the cause of some of the signs associated with the disease such as weakness and flaccidity (these signs are not the result of lack of energy).

Necropsy changes.

The most remarkable change found in affected kids was a very dilated stomach (abomasum) that was full of coagulated milk and had a very strong acid smell. The mucosa of the stomach also showed multiple small hemorrhages (petechia). In cases in which kids had been force fed it was common to find the rumen (first stomach) full of milk. The feces in the rectum were very solid and hard in consistency. In some cases, evidence of systemic infections including pneumonia, multi focal abscesses or polyarthritis were found. We believe that for the most part these infections were secondary and occurred late in the

course of the disease. At least in the cases affected with pneumonia, they seemed to have been the result of milk being forced into the trachea during artificial feeding.

Diagnosis.

Confirmation of the “floppy kid syndrome” can only be done by determining the venous blood gas concentration in affected animals. However, in most cases this is not possible. In such cases, the diagnosis needs to be established on the basis of **clinical history and necropsy findings**. Several other diseases need to be ruled out in the differential diagnosis, including white muscle disease (vitamin E and Se deficiency) and enterotoxemia (overeating).

Treatment.

In order to be successful, treatment needs to be initiated as soon as possible after the signs of the disease appear. Under ideal conditions affected kids need to be treated by a veterinary practitioner with isotonic sodium bicarbonate solution intravenously, sufficient to replace the calculated base deficit [$\text{body weight (Kg)} \times 0.5 \times \text{base deficit}$] over 1-3 hrs. However, in most cases a more empirical approach can be taken to solve the problem.

The first thing that we recommend is to **leave affected kids off milk for 24 to 36 hrs.** Again, because the kids look very weak, it has been difficult to convince goat producers that the problem is due to overfeeding and not to lack of energy. However, keeping kids temporarily off milk is probably the single most important thing in treating these cases. **Secondly**, the acidity of the stomach needs to be neutralized by administering a bicarbonate (baking soda) solution. For this purpose, dissolve **1 teaspoon of baking soda in one glass of water** and administer 10-20 ml of this solution orally. **Repeat** this procedure 2 to 3 times in the following 3 to 6 hours. Most kids will show clear improvement with this treatment within the following 6 to 10 hours. Treated kids first become more active and will initially pass very solid feces that subsequently turn into diarrhea. This is a good sign and an indication that the intestines are moving again. The **third** part of the treatment consist of administering **a wide spectrum antibiotic** to prevent secondary infections.

After 36 hours the affected kids can be put back with their mothers if they take them. Otherwise they would need to be raised on a milk substitute. Initially, artificial milk needs to be diluted with water and small amounts of milk (100 ml) need to be given 3 to 4 times a day for the first 2 days, then follow the manufacturers instructions.

Prevention.

There is not a good way to prevent “floppy kid syndrome” other than to **avoid over consumption of milk**. In dairy goats that is done by milking the goats before putting them back with the kids. In meat/Angora goats this is difficult to accomplish. When weather conditions allow, it is probably better to kid in the pasture. On pasture conditions, the constant movement of the nannies prevents kids from ingesting large quantities of milk in a short time.

For further information please contact Dr. Andrés de la Concha at 915/653-4576.

Pregnancy Toxemia in Goats

a metabolic disease of does in advanced pregnancy

At Risk Does:

- ✓ farm herds (vs. goats on native range pasture)
- ✓ those bearing twins, triplets and in advanced pregnancy (last 6 weeks)
- ✓ fat
- ✓ thin

Problem:

intracellular carbohydrate starvation

Fetal Growth

First 15 weeks of gestation 20%

Last 6 weeks of gestation 80%

Fetal glucose demand 70-100 g per day

Doe's production & maintenance demand 85-100 g per day

Glucose-conserving changes available to the doe include:

1. increase feed consumption (if available; if capable)
2. liver converts glycogen to glucose
3. maternal tissues convert amino acids to glucose
4. maternal tissues hydrolyze fat → glycerol → glucose
oxidize fatty acids for energy and in the process form ketone bodies
(acetone, acetoacetic acid, β -hydroxybutyric acid)

Prolonged fat metabolism in the absence of glucose will result in a fat-saturated liver (30% fat vs. the normal 3%). Fat competes with glycogen, a readily available source of glucose, for hepatic storage space.

Ketones are normally metabolized as rapidly as they are formed. However, if the entry of metabolites (acetyl CoA) into their respective "disposal pathways" (citric acid cycle) is depressed, the ability of the tissues to oxidize the ketones is soon exceeded and they accumulate in the bloodstream (ketosis).

The stress and low caloric availability associated with pregnancy toxemia have a profound effect on the kidney and adrenal gland. A significant reduction in renal blood flow results, glomerular filtration rate decreases which in turn raises plasma

renin activity and elevates plasma cortisol. High cortisol levels can further restrict glucose utilization by the tissues. Serum electrolytes (Fe, Mg, K) decrease while blood urea nitrogen (BUN) rises.

Severe metabolic acidosis develops as a result of the H ions being liberated from acetoacetic and β -hydroxybutyric acids. The low plasma pH stimulates the respiratory center, producing the rapid deep respiration described as "air hunger".

The urine becomes acidic; when the kidney loses its ability to replace the plasma cations accompanying the organic anions H^+ and NH_4 , Na^+ and K^+ are lost in the urine. Electrolyte and water loss leads to dehydration.

Acidosis and dehydration depress consciousness to the point of coma. Renal failure, dehydration and severe metabolic acidosis are most often irreversible, causing death of the doe.

Signs & Symptoms

listlessness

loss of appetite

aimless walking, sometimes in circles, isolation from the flock

propping against obstructions, unusual postures, elevation of the head

muscle twitching, especially around the eyes and ears

grinding of the teeth

progressive loss of reflexes

blindness

ataxia (loss of muscle coordination)

sternal recumbency

mucus discharge from the nose

accelerated breathing

coma

death

In women:

blood pressure ↗

swelling of face, extremities

protein in the urine

(usually the first pregnancy)

Prevention

AVOID FAT DOES !!!

If you know your does by name or number -
look out! Good chance they are high risk.

Ultrasound offers the opportunity to determine the number of fetuses, but you can't wait until the last 6 weeks of pregnancy. Day 40-70 of pregnancy is the ideal time to count fetuses.

Adjust body condition. Fat does can be fed a sub-maintenance diet for the first 3½ months of pregnancy without harm. Body condition of thin bred does is most easily, economically and safely adjusted upward during the first 15 weeks of gestation.

Manage the Diet. Do not overfeed does. Does in average body condition should be fed to maintain weight during the first 15 months of gestation. Good pasture or a high quality hay will provide adequate energy intake for the first two trimesters. During the final 6 weeks, does should gain 0.4-0.6 lb/day (16-24 lb total). Forage or browse should provide the base diet. Energy requirements during the last trimester for a doe with twins is about 180% greater than that of a doe bearing a single and approximately 240% greater if she is carrying triplets.

Providing a molasses-based supplement (readily digested energy source) such as a lick, soft block or sweet feed may prevent ketosis in fat does. Do not offer large quantities of cereal grains (corn, wheat, milo or barley) - over consumption of these could result in acidosis and decreased feed intake, further compounding the problem.

Avoid stressors such as:

- interruption of feed intake
- sudden diet change
- weather (if possible)
- pasture change
- transport
- laziness (manager)
- drenching, handling through a chute or pens

other diseases
predators and dogs

Exercise - When the disease breaks in fat does or is suspected, gentle driving for 30 minutes per day can prevent incipient cases from developing. Exercise results in short term elevation of blood glucose level. Driving the does on foot is the preferred method of encouraging exercise.

If possible, design facilities such that does must walk some distance from feed to water and or shelter. Use elevation differences within a pen, paddock or pasture to facilitate exercise.

Treatment

Treatment of pregnancy toxemia is directed toward correction of the energy, electrolyte and acid-base imbalance.

Priority 1 - Correct dehydration with an electrolyte solution like those used for re-hydrating calves with diarrhea. In an emergency, sport drinks designed for athletes can be used.

Priority 2 - Correct the energy imbalance by orally administering a rapidly absorbed energy source. Propylene glycol or corn syrup should be given at a rate of 200 ml 4 times a day.

In more advanced cases involving valuable genetic material, 10-20% glucose solution, electrolytes and buffers should be administered IV. In addition, IV administration of B vitamins can stimulate rumen motility and appetite. Involvement of a veterinarian is strongly encouraged.

Priority 3 - Termination of the pregnancy via induction of labor, caesarian section or intentional abortion will relieve the glucose drain on the doe's system. If the does(s) involved are extremely valuable, perhaps this should be the highest priority treatment option.

The rumen is competing with the uterus for abdominal space, and therefore rumen capacity is severely restricted. As the doe's appetite begins to return, provide a high quality hay free choice. A leafy alfalfa harvested at an immature stage is the most appropriate. Most grass and sorghum-sudan hays produced in the southern US are not good enough to accomplish the task.

If available, pelleted soybean hulls could be used alone or in a mixed ration to provide the needed energy without risking the rumen disturbance caused by feeding cereal grains.

Conclusion

Pregnancy toxemia in goats is the result of human error. Goats were never intended to be an obese animal. Mismanagement, ignorance or a lack of consideration for the doe's well-being result in their being either too fat or too thin - either condition can contribute to the occurrence of this disease. Like many diseases, pregnancy toxemia is much more effectively prevented than cured.

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ARTICULOS DE EXTENSION SOBRE NUTRICION

Nutritional kNowledge for Goat Herders

by Dr. Rick Machen

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Creep Feeding Kid Goats

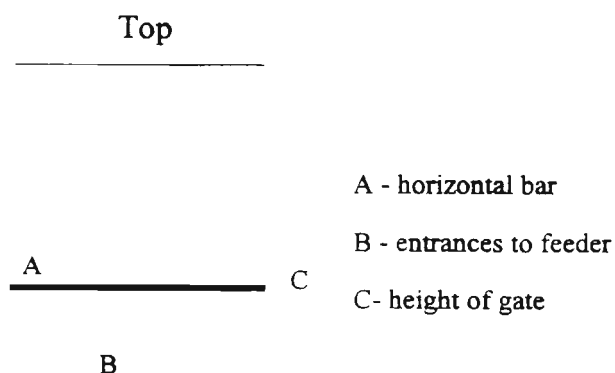
Creep feeding is a means of providing supplemental feed for nursing kids. It is an essential component of an accelerated kidding and/or early weaning management program. Advantages of creep feeding include:

1. It increases preweaning weight gain, especially for kids reared as a twin or triplet. In the competitive marketing environment for marketing show wethers, some degree of creep feeding is almost an essential.
2. The conversion of creep feed to body weight gain is a very efficient process. Creep fed kids will have a greater weight per day of age.
3. Kids will reach a target market weight and can be marketed at a younger age. For spring-born kids, avoiding the heat of the summer and large market runs may have a positive effect on net profit.
4. Creep feeding reduces the stress associated with weaning. Potential breeding animals and show wether prospects make the transition from milk to a dry diet much smoother if creep fed prior to weaning.

Other factors to consider include:

1. Kids that are creep fed seldom forget what a creep feeder is. If those kids are kept as breeding animals, they sometimes can be a challenge to keep out of a creep feeder.
2. Producers must be conscious of cost of gain. Relatively inexpensive feed and a strong goat market equate to a positive return on the creep feed dollars invested. Feed conversions should be in the 5:1 or less range (1 lb gain per 5 lb feed consumed).
3. Be aware of market conditions and weaning weights. In Texas, kids weighing in excess of 80 lb are discriminated (price) against by slaughter goat buyers.
4. Creep feeding does not facilitate increased stocking rates. Providing creep to nursing kids has minimal effect on the nutrient requirements or forage intake of lactating does. Kids begin to nibble at feed and hay very early. Personal experience indicates that some

kids may have a functional rumen and be "chewing their cud" by two weeks of age. Therefore, if *maximum* growth is expected, creep should be available by the time kids are 3-5 weeks old. Creep consumption will be minimal until kids are 8-10 weeks of age.



Feeder Design. The idea is to allow nursing kids access to feed while precluding access to does and older animals. Most creep feeders are constructed by placing a gravity flow,

self-feeder in a pen or by building a pen around a feeder in the pasture. Either way, the challenge is to design a gate or entrance through which kids can pass, yet will deny entry by older goats.

The schematic included herein is a simple design that works well. Spacing between the vertical bars needs to be 5", no more or less. The horizontal bar (A) is adjustable so the height of the opening through which kids pass (B) can be raised as kids get older. Total height of the gate (C) should be at least 48" or the same height as the creep feeding pen, whichever is taller.

The most durable and long lasting creep gates are constructed out of metal, preferably 1 or 1½ inch square tubing and ½ or ¾ inch round rod or reinforcement steel. Gates constructed with lumber will suffice, but have a shorter life expectancy. Heavy welded wire panel (4 ga., 4" x 4" openings, 48" tall; usually sold in pieces 20' long) can also be used. Simply clip out the second, third and fourth (from the bottom) horizontal pieces between two adjacent vertical rods on the panel.

The fence or pen in which the creep feeder is located must be more durable than a typical pasture or field fence. Older goats will exert significant effort to gain access to creep feed. Polled or disbudded mature goats are more difficult to occlude than horned goats. Mature goats with horns are forever getting their head stuck during a failed attempt to enter a creep feeder.

Creep feeders should be located near water, shade or other places where goats loaf during the day. Kid goats enjoy climbing. Placing stumps, cable spools or large rocks in larger creep pens or near the creep feeder may provide an additional attraction.

Management. The continuous presence of dry, fresh feed is important. Never let a creep feeder get completely empty. Clean out fine particles that accumulate in the troughs at least once per week. Allowing creep fed kids to go without feed for 24 hours then suddenly reintroducing feed can set the stage for enterotoxemia (overeating disease).

Feeders should be protected from moisture (rain, sleet or snow) and typically hold 100 - 1000 lb of feed. Wet feed will likely mold and should therefore be removed from a creep feeder immediately. Gravity flow "self" feeders work very well. Use caution in the design of the trough wherein the feed is presented. Deep troughs or those with sloping bottoms can trap kids and result in suffocation.

Open troughs will suffice, but must be cleaned and filled frequently (at least once a day). However, kids will get in the troughs, urinate and defecate. The end result is wasted feed.

Feed.

Grazing. Creep fed does not necessarily have to be offered in a feeder or poured out of a sack. Creep grazing is a viable option for boosting weight gain by nursing kids. Creep grazing requires a high quality forage such as alfalfa, soybeans, peanuts, clovers, kudzu(?), immature sorghum sudangrass or millet. This list is certainly not all inclusive, especially for producers who live north or east of Texas. Forages offered in a creep grazing program must be high quality. Initially, it may be necessary to allow both does and kids to graze the creep forage, using the does to lead the kids into the creep grazed pasture.

Minimum Specifications for a Meat Goat Creep Feed

- ✓ fresh and palatable
- ✓ minimal dust/fine particles
- ✓ pelleted (<1/4 inch diameter)
- ✓ crude protein $\geq 14\%$ (no urea)
- ✓ Ca:P ratio $\geq 2:1$
- ✓ P content 0.38-0.45%
- ✓ urinary acidifier (0.5%)
- ✓ coccidiostat

Dry Feed. The Great Debate - Which one of the many products offered is best and most appropriate for my goats?

Hopefully, the list of minimum specifications included here will help you determine which feed is the best fit for your operation. Please understand, these are meant to be minimums.

The feed must be fresh and palatable to kid goats. If they won't eat it, the nutrient content is irrelevant. Select a feed that is readily available, kept in fresh inventory and is consistent from bag to bag. Dust and/or excessive fine particles in the feed will reduce intake, aggravate the upper respiratory tract and only result in wastage.

Pelleted feeds maintain the integrity of the ration and prevent goats from sorting ingredients. Goats are like children at a salad bar - they eat the desserts first and leave the lettuce, cole slaw, broccoli and cauliflower for someone else. Whole, rolled, flaked or cracked grains are dessert to a goat. Granular minerals and other fine particles in a ration will often be sorted out and left for disposal. This author prefers either a 3/16 or 5/32 inch pellet diameter.

Crude protein (CP) content should be a minimum of 14% and should be all natural (no urea). The urinary acidifier, either ammonium chloride or ammonium sulfate, will inherently contribute a minimal amount of non-protein nitrogen. Most commercially prepared goat creep feeds contain 15-18% crude protein. Certainly, there is little or no merit for creep feed CP levels above 18%.

A calcium (Ca) to phosphorus (P) ratio of at least 2:1, a P content less than 0.50% and the urinary acidifier are recommended in an effort to prevent urinary calculi, primarily in buck kids and wethers. Two urinary acidifiers are commonly used: ammonium chloride and ammonium sulfate. Both are salts. The sulfate form is less expensive. The chloride form seems to be the industry preference. If the feed is not pelleted, these ingredients will sift out and often be refused. Minimum recommended level of either acidifier is 0.50%. Levels of 0.75 to 1.0% have been fed to populations of goats known to be high risk for urinary calculi.

Precautions.

Coccidiosis. Creep feeds should contain a coccidiostat for the prevention of coccidiosis. This malady is much easier prevented than cured. Two products are labeled for use in goat feeds: decoquinate (Deccox®) or monensin (Rumensin®). These are considered medications. If included, their presence must be documented on the label attached to each bag of commercially prepared feed. Either of these two products is required in very small amounts on a daily basis. Be aware that diluting the coccidiostat concentration in the kid's diet by adding corn or other feedstuffs to the creep feed will lessen the product's efficacy.

Enterotoxemia (Overeating disease). Clostridial organisms (*Clostridium perfringens* type C & D) reside in the digestive system of goats. Under normal conditions, these potential pathogens do not cause harm. However, stress (environmental, physiological or psychological)

can open the window of opportunity, the population explodes, releases a toxin that is usually fatal to the host. Seldom does the herder get an opportunity to treat enterotoxemia and it typically strikes the largest, fastest growing most aggressive eaters.

Vaccines for its prevention are available and, if possible, should be given at 14-17 days before creep feed is provided. In very young kids, maternal antibodies may preclude development of immunity. Read and follow the label - most enterotoxemia vaccines suggest at least one booster 14-21 days after the initial vaccination. Vaccines are like life insurance - if you wait until they are needed, it is too late.

Economics. IF profitability is a concern, pay close attention to feed costs, weight gains and the market value of the additional weight gained. As previously mentioned, if a primary production goal is to produce high quality goats that will command a premium as show prospects or registered breeding stock, creep feeding or grazing is almost a necessity.

In general, as commercial slaughter goats get heavier, their market value decreases on a \$/lb basis. Commercial meat goat producers need to sharpen their pencil, calculate the net return without creep feed, feed, equipment and labor costs involved and compare it to the subsequent market value of heavier, creep fed kid goats.

Nutritional kNowledge for Goat Herders

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Last issue, we discussed protein. This issue, the topic is energy.

Energy is used for basal metabolic processes, body heat, physical activity, tissue maintenance and growth, fat deposition, and lactation. Excess energy is stored as fat.

Energy in feedstuffs is contained primarily in the carbohydrate and fat fractions. Proteins can also supply energy when fed in excess or in times of severe malnutrition.

Remember the old physics rule: *Energy can neither be created nor destroyed, merely changed in form.* Long ago, plants must have studied physics because that's exactly what they do - capture solar energy and through the process of photosynthesis, make carbohydrates.

Carbohydrates make up 65-75% of the dry weight of the plant world and supply most of the energy needed by ruminants. Carbohydrates can be subdivided according to chemical structure into 5 basic groups: sugars, starch, cellulose, hemicellulose and lignin.

Crude fiber is a gross estimate of the energy content of a feed. The higher the crude fiber, the lower the digestible energy content. Energy requirements for goats are expressed in more specific terms such as total digestible nutrients (TDN) or net energy (NE).

Determining the energy content of a forage, feedstuff or mixed ration is more difficult than measuring nitrogen and calculating crude protein. Total digestible nutrients, (TDN) is actually calculated as the sum of digestible crude protein, crude fat, crude fiber and nitrogen-free extract (more soluble carbohydrates).

TDN does not account for the energy lost in the urine or gas production or that lost as body heat.

TDN is an adequate energy expression for most goat producers, especially when considering supplements for goats grazing native pasture. Since TDN is not listed on feed tags, the relationship between crude fiber and TDN content is listed in the table below.

Crude Fiber, %	TDN, %
8	73
12	67
16	61
20	55
24	49
Individual feeds can vary considerably from these values. Estimates are not valid for skat-limited feeds or liquid supplements. (From TAEX Pub. L-2163)	

Net energy (NE) values account for energy losses and represent the energy that is actually available for maintenance of body functions or production (growth, fattening, lactation). NE is the preferred value to use when formulating a complete balanced diet for goats.

Microorganisms in the rumen use the plant fibers cellulose and hemicellulose as energy. Because of this bacterial fermentation, ruminants can utilize forage as a source of energy

much better than monogastrics (swine, humans). In fact, feeds high in cellulose can furnish most of the ruminant's maintenance energy needs. High quality hays (alfalfa, peanut, immature sorghum sudangrass) often meet or exceed the energy and protein requirement of mature, non-lactating does.

Lignin is essentially an indigestible fiber. Young growing plants contain very little lignin. However, lignin content of plants increase with age. Old, dry, mature, weathered forage will have a high lignin content and be of limited use to grazing animals. In fact, in older plants, lignin can bind the more digestible fibers and preclude them from microbial digestion.

The fermentation of fiber is a relatively slow process. Ruminal digestion of the starch contained in grain is a much more rapid and volatile process. Bacteria in the rumen are job specific - some are effective fiber digesters while others handle starch more efficiently.

Normal pH of the rumen (forage diet) is 7.0-7.4; at this pH the fiber digesters are very comfortable and working at max productivity. Small quantities of starch (grain) are not a problem. Large doses of grain can be serious.

If large meals of grain are consumed, the starch digesters take over. A by-product of their digestion is lactic acid. As lactic acids levels in the rumen build, pH drops. A pH of 6.8 and falling means certain death for the fiber digesting bacteria in the rumen. If pH continues to fall, acidosis develops and can be fatal. Excessive starch fermentation can also result in bloat. Herein lies the reason for gradual shifts from one diet to another, especially when moving toward a more energy dense diet.

Fat is an excellent source of energy, but is generally low in forages and roughages. Compared to carbohydrates, fats contain 2.25 times as much energy on a weight:weight basis. This energy density is an asset when formulating rations for high producing dairy goats or cows. By adding fat, the energy content of the diet

can be elevated well above the reasonable limit for a diet limited to grains and roughage only. Fat level should not exceed 5% of the diet. Higher levels will limit consumption and can result in gastrointestinal disturbance.

Fat in a ration aids in the absorption of the fat-soluble vitamins (A, D, E, K). In addition, added fat minimizes dust in a mixed or pelleted feed. Cubes or pellets made with solvent processed oilseed meals (cottonseed meal) often require added fat as a softener and to improve palatability.

The table below shows the TDN content of a limited number of hays and feeds. Several points are noteworthy:

	TDN, %*
Alfalfa	58
Sorghum sudangrass	56
Bermudagrass	46
Whole shelled corn	90
Oats	77
Whole cottonseed	96
Cottonseed meal	76
Soybean meal	84
Cane molasses	72
*100% dry matter basis.	

Cereal grains and oilseed meals have a greater energy content than forages, hence the term concentrates.

Significant differences exist between types of hay. Weathering of hay reduces its nutrient content. In general, bermudagrass hays are significantly lower in energy content than

legume or well prepared sorghum sudangrass hays.

On a dollar per unit of energy basis, corn is typically the best buy. Two reasons: **relatively low price and high energy content.**

Whole cottonseed is unique. The lint on the outside is pure cellulose and 100% digestible. The hull or seedcoat is digestible and an excellent fiber source. In addition, it acts as a “sustained release capsule” in the rumen. Inside the hull is fat, protein and phosphorus.

Although usually thought of as protein sources, the oilseed meals also contain a respectable amount of energy. However, when compared to corn or other cereal grains, oilseed meals are an expensive source of energy.

Molasses provides a readily available source of energy and is very palatable. However, consideration must be given to the moisture content (25% water) when formulating a supplement or balanced ration.

For comparison, the following table shows the daily TDN requirement for a 130 lb doe at different physiological stages and a 44 lb kid gaining 0.33 lb per day.

*Medium activity - typical of goats on small farms or in slightly hilly, semiarid pastures.
(From Nutrient Requirements of Goats, NRC 1984)

Energy Requirements 130 lb doe, medium activity*	TDN, lb daily
maintenance, early gestation	2.0
maintenance, late gestation	2.9
lactation	3.5
Energy Requirements 44 lb kid, medium activity*	
maintenance	0.9
maintenance + 0.33 lb/d gain	1.5

Nutritional Knowledge for Goat Herders

Question: What is protein?

The five major categories of nutrients are:

- water
- protein
- energy
- vitamins
- minerals.

Protein consists of the elements carbon, hydrogen, oxygen, nitrogen and sulfur. These elements are assembled into links called amino acids. Amino acids are then hooked together, like links in a chain, to form proteins.

The most common and economical sources of protein for goats in the Southern US are the oilseed meals: cottonseed, soybean, peanut and sunflower. The cereal grains and forages also contain protein (Table 1).

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Table 1.	
Feedstuff	% Crude Protein
Cottonseed meal	41
Soybean meal	44
Peanut meal	52
Corn	10
Oats	10
Grain sorghum	10
Wheat	14
Alfalfa hay	17
Prairie hay	5

In contrast, young, green, growing plants are made up of active, growing cells that contain proteins and other nutrients. The fiber to cell content ration is now very low.

How are proteins digested?

When feed is ingested by a goat, salivary enzymes initiate the digestion process immediately. Upon arrival in the rumen (the largest of the four stomachs), the feed is greeted by literally millions of microscopic bacteria. **These bacteria are the key to the nutritional well-being of a**

Nutritional kNowledge for Goat Herders

ruminant. In fact, it is these cellulose-digesting bacteria that enable a goat to digest leaves from woody plants, forbs (weeds) and grass.

Bacteria in the rumen break down dietary proteins into individual amino acids. These amino acids are then used by the bacteria to construct bacterial protein and make more bacteria.

Bacteria are continuously being flushed out of the rumen, through the reticulum, to the omasum (where moisture is removed from the digesta) and finally to the abomasum or fourth “stomach”.

The abomasum is similar to a monogastric (meaning one stomach; human, pig, chimp, etc.) stomach. It is a very acidic environment. In the abomasum, the bacterial proteins are broken down into amino acids, which pass through the small intestine and in to the bloodstream.

What is by-pass protein?

By-pass protein, more appropriately known as escape protein, is that portion of the dietary protein that escapes degradation in the rumen and arrives in the abomasum in its intact dietary form. Obviously, there is some efficiency to be gained by avoiding the bacterial breakdown and reconstruction previously mentioned.

Feedstuffs differ in their escape protein values: protein from plant sources (soybean meal, cottonseed meal, wheat midds, etc.) generally has a lower escape value than that of animal origin (feather meal, blood meal, fish meal, etc.).

Caution: The bacteria in the rumen have a well defined nitrogen requirement. If

too much of the dietary protein escapes degradation in the rumen, the available N in the rumen will be deficient and the bacterial population will suffer.

The minimum crude protein content of a goat's diet is thought to be 7-8%. Below that, rumen bacteria suffer and so does performance of the goat.

Most commercially prepared goat feeds contain 12-17% crude protein - enough to support those itty, bitty, all-important bacteria and the productivity of their hosts, your goats.

Bottom line: Most goat owners need not concern themselves with the escape protein content of their precious darling's diet.

Nutritional kNowledge is written by Dr. Rick Machen, Associate Professor & Extension Livestock Specialist, Texas Agricultural Extension Service, Uvalde. If you have questions or comments, please submit them to the editor of The Goat Magazine at editor@goatmagazine.com.

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Nutritional Knowledge for Goat Herders

Question: What is protein?

The five major categories of nutrients are:

- water
- protein
- energy
- vitamins
- minerals.

Protein consists of the elements carbon, hydrogen, oxygen, nitrogen and sulfur. These elements are assembled into links called amino acids. Amino acids are then hooked together, like links in a chain, to form proteins.

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STANDARDS FOR THE IMPROVED BOER GOAT AS RECOGNIZED BY THE AMERICAN BOER GOAT ASSOCIATION

OVERVIEW:

In describing those traits that constitute "standards" for the Improved Boer Goat, we are leaning heavily on the standards which have evolved during the development of this breed over the past 70 years in South Africa. The standards that they have developed have the explicit objectives of improving the breed for economic production. The South African Boer Goat is recognized breed in its country of origin, and many experts throughout the world consider this to be the premier goat meat producing breed. Three selection criteria have contributed to this recognition:

1. Large frame size
2. High carcass yield grades
3. Uniform visual appearance

Visual uniformity exists not only in the color patterns that the animal carry, but also in the uniform stature and yield grades. The lack of one or more of these traits in other breeds that have been used for meat production has held back the development of the meat goat industry in the US and abroad.

The South African Boer Goat was developed by natural selection practices of the breeders in Africa, under the often stressful conditions of the African environment. These breeders demanded that only the best, commercially viable animals be recognized as superior. On July 4, 1959, the South African Boer Goat Breeders Association was formed. One of the first undertakings was to establish breed standards that have been introduced and assisted in improving the Breed.

Information available from the South African Boer Goat Association indicated that five types of Boer goats are recognized in South Africa. These include:

1. **THE ORDINARY BOER GOAT** - which is an animal with good meat conformation, having short hair and a variety of color patterns, including brindle, gray, dark brown and white. Occasionally animals have brown heads and necks.
2. **LONG HAIR BOER** - heavy coat, matures later and said to have coarse meat. Long hair reduces value of skins, making this type undesirable.
3. **THE POLLED BOER GOAT** - is naturally hornless, with conformation that is usually less than desirable.
4. **THE INDIGENOUS BOER GOAT** - which has long legs, a variable and poor conformation and a variety of color patterns. This line has not been highly selected or managed.
5. **THE IMPROVED BOER GOAT** - This type has been the primary line which breeders have been selected for. The specific desired traits which have been stressed, and form the basis of the breed standards include: good conformation, rapid growth rates, high fertility and fecundity, color and type uniformity, and hardiness and adaptability to varied environmental conditions.

The Improved Boer Goat is the only line or type which the South African Boer Goat Association will register as a breeding quality animal. The South African Boer Goat Association does not maintain or use pedigrees to register goats. Trained inspectors assess animals by viewing them personally, crediting all characteristics to the whole.

The ABGA provides the following standards as a guide to owners and breeders of Improved Boer Goats in the US. These standards describe what an Improved Boer Goat should be, citing the most desirable traits as making up the ideal individual. When evaluating an animal's value and desirability, the best balance of all the standards should be sought after. In summary, the animal who possessed the greatest conformity to the breed standards when viewed as a complete package, is the best representative of the Boer breed as it was developed to be.

The ABGA registry has been developed to document and maintain bloodlines through pedigree only. Owners and/or breeders should use the standards to evaluate animals when establishing desirability and value. Only animals who meet or exceed these standards will be eligible to advance to performance evaluations and ultimately attain recognition in the Ennobled book certified by the ABGA beginning September 1, 1994 (criteria for performance evaluation is being developed).

IMPROVED BOER GOAT STANDARDS

Overall Quality, Size, Appearance and Type

The overall objective is for a goat to have suitable size with maximum meat yields, good structural conformation which meets environmental and production requirements, high adaptability to environmental conditions and production requirements, high adaptability to environmental conditions and high fertility.

Ideally, this is an animal with short glossy hair with fine luster. The major portion of the body should be white with dark coloration around the head and pigmented skin in hairless areas around the head and under the tail to reduce sunburn, cancers, and skin diseases. A loose, supple skin helps the animal adapt to wide climatic conditions, and possibly provides resistance to external parasites.

In general appearance, a Boer goat has a dark head and horns which curve backwards. Animals should be strong, vigorous, and symmetrical, with well balanced muscling. Bucks should be masculine and well proportioned, but not overly developed in the head, neck and forequarter, making it out of proportion with the rest of the body. Does should be feminine, yet strong, and have a slightly more angular chest than bucks. They should be able to breed easily and have the conformation and constitution to easily raise fast growing kids.

Overall, the ideal is rapidly growing, well proportioned goat of suitable size with the ability to maximally produce prime cuts of meat to meet consumer demands. A desirable relationship between the length of leg and depth of body should be achieved at all ages with kids and young goats being slightly longer in the leg.

FAULTS: Cull characteristic or defects which decreases the value of the goat for breeding purposes and will ultimately affect an animal's eligibility for Ennobled status.

I. CONFORMATION

A. HEAD

A prominent, strong head with brown eyes and a gentle appearance. Nose with a gentle curve, wide nostrils, and well formed mouth with well opposed jaws. Two tooth (1-1.5 years of age) can have no over or under-bite; the jaws must be perfectly opposed. Four tooth and older (the second pair of permanent incisors erupt at 1.5 to 2 years of age) animals can have 1/4 inch overbite. All permanent front teeth (goats have four pairs of front teeth in their lower jaw, with the fourth pair erupting at about 4 years of age) must be in the anatomically correct positions. The forehead must be prominent, and form an even curve, linking the nose and horns. Horns should be strong, of moderate length, positioned well apart, and have a gradual backward curve before turning outward symmetrically. Horns should be as solid as possible and dark in color. Ears should be broad, smooth, of medium length and hang downwards. Short ears are unacceptable. Disbudded or denorned animals should have that noted on their registration papers and should not be discriminated against in the show ring.

FAULTS: Concave forehead, straight horns, jaws protruding or too short, jaw too pointed, overshot or undershot jaws, blue eyes.

B. NECK AND FOREQUARTERS

Neck of moderate length and in proportion with body length. Forequarters full, well fleshed, and limbs well jointed and smoothly blended. The breast should be broad with a deep broad brisket. Shoulders should be fleshy, well proportioned with the rest of the body and smoothly blended and fitted into the withers. Withers should be broad and well rounded and not sharp. Legs should be strong, well placed of medium length and in proportion with the depth of the body. Pastern joints should be strong, and hoofs well formed and tight and as dark as possible.

FAULTS: Neck too long, too short, or too thin; shoulders too loose, any structural foreleg, muscle, bone, joint or hoof deformities or abnormalities.

C. BODY (barrel)

Body should be long, deep and broad. Ribs must be well sprung and muscled. Loins should be well muscled, wide and long. The top line should be straight and the shoulder well rounded.

FAULTS: Concave or swayback; chest too cylindrical or flat, shoulders weakly attached; poor muscling through the back and loin.

D. HINDQUARTERS

Rump broad and long, with a gentle slope. Britch and thighs well muscled and rounded. Base of the tail must be centered, straight and curved upwards to one side. Legs should be strong and the leg should have a straight axis from the hip through the hock, fetlock and pastern. Hoofs should be well formed and as dark as possible.

II. SKIN AND COVERING

Skin loose and supple, with sufficient folds over the neck and chest, especially in bucks. Eyelids and other hairless areas must be pigmented. Hairless areas around anus should be at least 75% pigmented; 100% is ideal. Short glossy hair is desirable. A limited amount of winter down or under coat will be tolerated during winter, especially in colder environments.

FAULTS: Hair too long or too coarse.

III. REPRODUCTIVE ORGANS

The does should have well formed udders and good attachment and no more than two functional teats per side. Ideally, all goats should have a single functional teat on each half of the udder. A split teat with two distinctly separated teats and openings with at least 50% of the body of a teat separated is permissible.

The bucks should have two large well formed equal sized testes in a single scrotum. The apex of the scrotum with a split no longer than 2" is acceptable. Scrotal circumference increases up to maturity and varies slightly between the breeding and non-breeding season, and with usage. Large scrotal circumferences are inheritable and are directly related to high libido and fertility in other species. One should use approximately 9 3/4" as bottom cut off point at 8 months of age and/or 100 pounds. Adult bucks 2 years old or older should measure at least 11 1/2" but preferably 12 1/2" or larger.

FAULTS: Udder and teat abnormalities or defects, other than those specified above; small or abnormal testes, scrotal splits larger than 2".

IV. COLORATION

The ideal Boer Goat is an animal with red hair on the head and ears and white on the remainder of the body, and has fully pigmented skin. A face blaze must be evident. Hair coloration varying from light to dark red or brown is permissible. Hair coloration of the head is most desirable if it extends down to an imaginary line connecting the point anterior to the shoulder blades and the point of the brisket. Although this is the ideal,

50% non coloration of the head/neck are acceptable. Ideally, the ears should be 90% colored and pigmented.

FAULTS: Skin too lightly pigmented (less than 50% coloration of the head and neck are combined).

BREED STANDARDS OF THE BOER GOAT

The following are the breed standards as drawn up and accepted by the Boer Breeders Association of South Africa. The aim of the breeding standards are to improve the breed and to increase the economy value.

CONFORMATION

HEAD: A strong head with large soft brown eyes and without an untamed look. A strong slightly curved nose, wide nostrils, strong well-formed mouth with well-fitted jaws. Up to 6 tooth must show a 100% fit. Eight tooth olds and older may show 6 mm protrusion. Permanent teeth must cut in the correct anatomical place. The forehead must be prominently curved linking up with the curve of nose and horns. Horns should be strong, of moderate length and placed moderately apart with a gradual backward curve. Horns have to be as round and solid as possible and coloured darkly. Ears are to be broad, smooth and of medium length hanging downwards from the head. Too short ears are undesirable.

Characteristic cull defects: Concave forehead, horns too straight or too flat, pointed jaw, ears folded (lengthwise), stiff protruding ears, too short ears, over- or undershot lower jaw and blue eyes.

NECK AND FOREQUARTERS: A neck of moderate length in proportion to the length of the body, full and well fleshed and well-joined with the forequarter is essential. The breastbone should be broad with a deep and broad brisket. The shoulder should be fleshy, in proportion to the body and be well-fitted to the withers. The withers should be as broad and as well-filled as possible (not sharp). The front legs should be of medium length and in proportion to the depth of the body. The legs should be strong and well placed, with strong pastern joints and well-formed hoofs which are as dark as possible.

Characteristic cull defects: Too long, thin neck, too short neck, shoulders too loose.

BARREL: The ideal is a long, deep broad barrel. The ribs must be well sprung and fleshed, and the loins as well fitted as possible. The goat should have a broad, fairly straight back and must not be pinched behind the shoulders.

Characteristic cull defects: Back too concave, too slabsided, too cylindrical or pinched behind the shoulder.

HINDQUARTERS: The Boer Goat should have a broad and long rump, not sloping too much, well fleshed buttocks which are not too flat, and have fully fleshed thighs. The tail must be straight where it grows out of the dock and then swing to either side.

Characteristic cull defects: A rump that hangs too much or is too short. A too long shank or flat buttocks.

LEGS: Emphasis should be placed on the legs which should be strong (of good texture) and well placed. Too fleshy legs are undesirable. Strong legs imply hardiness and a strong constitution, which are absolutely essential characteristics of the Boer Goat.

Characteristic cull defects: Knock knees, bandy legs, "koeisekel of regophak". Legs too thin or too fleshy. Weak pasterns and hoofs pointing outwards or inwards.

SKIN AND COVERINGS: A loose supple skin with sufficient chest and neck folds, especially in the case of rams, is essential. Eyelids and hairless parts must be pigmented. The hairless skin under the tail should have 75% pigmentation for stud purposes with 100% pigmentation the ideal. Short, glossy hair is desirable. A limited amount of fur will be tolerated during winter months.

Characteristic cull defects: Covering too long and coarse or too furry.

SEXUAL ORGANS: Ewes: Well-formed udder firmly attached with no more than two functional teats on a side. Permissible defects: a) If there is no indication that the teat is separating, but there are two milk openings, this is acceptable. b) Double teats: the front 50% should be split. Rams: Two reasonably large, well formed, healthy and equal sized testes in one scrotum. A scrotum with no larger split than 5 cm is permissible. The scrotum must be at least 25 cm in circumference.

Characteristic cull defects: Bunched, calabash or double

teats. Too small testes; a scrotum with more than a 5 cm split.

QUALITY: Is indicated by the following characteristics: This is achieved with short glossy hair and a fine lustre, an ennobled appearance with especially a strong head, well backward bent, round horns, loose thick, supple, pleated skin (particularly with rams) and short smooth hair with a gloss. Combined with the above mentioned qualities, the goat must have a vigorous appearance.

SIZE: The ideal is an average sized, heavy goat with maximum meat production. A desirable relationship between length of leg and depth of body should be achieved at all ages. Lambs should tend to be longer in the leg.

Characteristic cull defects: Goats too large or too small (pony).

COLOURING: The ideal is a white goat with a red head and ears, and a white blaze and fully pigmented skin. Shadings between light red and dark red are permissible. The minimum requirement for a stud animal is a patch of at least 10 cm in diameter on both sides of the head, ears excluded. Both ears should have at least 75% red colouring and the same percentage pigmentation.

The following is permissible for stud purposes:

HEAD, NECK AND FORE-QUARTERS: A total red colouring is permissible not further than the shoulder blade and on the shoulder it must exist not lower than level with the chest junction.

BARREL, HINDQUARTER AND BELLY. Only one patch not exceeding 10 cm in diameter is permissible.

LEGS: The term "legs" is taken to mean that portion below an imaginary line formed by the chest and the underline. Patches with maximum of 5cm in diameter are permissible.

TAIL: The tail may be red, but the red colour may not continue onto the body for more than 2,5 cm.

RED HAIR AND COVERING: Very few red hairs are permissible at the 2-tooth stage.

PIGMENTATION: Discriminate against too light pigmentation.

FLOCK GOAT: A flock goat is a Boer goat which does not comply with the stud standards, but has no cull faults. At least 50% of the colour must be white; the other 50% must be red. Under the tail the flock goat must be at least 25% pigmented. Rams may not be more than 25% red.

EXPLANATION OF BREED STANDARDS: In applying standards, there are many aspects which cannot be fully defined. In such cases the inspector or judge must use his discretion. In spite of the breed standards being clear and to the point, it is never the less necessary to supply additional information in respect of certain descriptions. The major part of the body of the goat must be white to make it conspicuous and to facilitate the rounding up of goats in dense terrain. A pigmented skin on the hairless parts, e.g. under the tail, round the eyelids and mouth etc., is absolutely essential, because it offers resistance to sunburn which may result in cancer. A pigmented skin is also more resistant to skin disease. A loose, supple skin is essential for adaptability to climatic conditions. In South Africa, which is a warm and sunny country, an animal with a loose skin and short hair is better adapted. In addition a skin of this kind provides additional resistance to external parasites.

GENERAL APPEARANCE AND TYPE: In appearance it is a goat with a fine head, round horns bent backwards, a loose, supple and pleated skin (especially in rams) with different body parts well fleshed and in perfect balance. The ewe must be feminine, weging slightly to the front, which is a sign of fertility. The ram, never the less, appears heavier in the head, neck and forequarters. The upgraded boer goat is an animal with symmetry, with a strong, vigorous appearance and enough quality. In the ewe there is strong emphasis on femininity; in the ram one of masculinity.

FERTILITY a) Shows: All ewes 6 teeth and older must be visibly in kid or with suckling kids. b) Auctions: 6 tooth and older ewes must be visibly in kid or be certified in kid by a veterinary surgeon. Certificate to be handed in during inspection.

ARTICULOS DE EXTENSION SOBRE
SELECCIÓN, MEJORAMIENTO GENETICO
Y REPRODUCCION



Texas Agricultural Extension Service

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SOUTH E X RANGELANDS S

Selection, Management and Judging of Meat- Type Spanish Goats

Edmundo E. Martinez, Joe C. Paschal, Frank Craddock and C. Wayne Hanselka*

The term "Spanish goat" is unique to the U.S. and more especially to Texas. In this context, the term is used as a breed, but Spanish goats do not qualify as a breed in any technical sense. Other terms sometimes used to refer to the Spanish goat are "brush goat," "meat goat" or simply "common goat" to distinguish them from Angora and dairy goats.

The lack of well-defined, distinct, and perhaps superior meat goat breeds in the U.S. has adversely affected meat goat production. However, genetic improvement through selection and breeding programs can produce a more desirable animal with a quality carcass that would improve the demand for the product. This bulletin discusses several points for the selection, care and judging of meat goats. It is designed for use by producers and youth interested in producing, raising and showing meat-type Spanish goats.

Selecting Spanish Goats

Selecting Spanish goats for growth rate and meat qualities has not been widespread in the industry, primarily because meat goats are not usually the major livestock enterprise on the ranch. In selecting goats for meat goat production, the following traits should be considered: (1) adaptability to environmental and production conditions; (2) reproductive rate; (3) growth rate; and (4) carcass value.

The best way to increase adaptability is to select for the desired traits under actual production conditions. Breeding stock should be selected from animals maintained under the same natural conditions in which their progeny will be raised.

Reproductive efficiency is a major factor contributing to efficient meat production, but it is difficult to select for under range conditions. In order to increase reproductive efficiency, improved management of the breeding herd including selection for twinning rate and culling non-producing nannies is necessary and will yield good results.

Selecting for growth rate should be among the easiest selection goals to achieve due to the fairly high

heritability of growth rate. Once selection for growth rate is emphasized, one of the Spanish goats' major weaknesses, slow growth rate, can be corrected. Selection based on higher post-weaning gains or yearling weights is recommended to increase growth rate.

Selecting for carcass merit offers the best opportunity for improvement. Compared to lamb, pork or Angora goats, the Spanish goat carcass has a lower dressing percentage, a lighter carcass weight and lower percentages of kidney and pelvic fat, with little or no subcutaneous fat. Spanish goat meat does have a high lean content (Tables 1 and 2).

Table 1. Percent Wholesale Cut Composition of Goat and Lamb Carcasses

	Goat	Lamb
Hindsaddle		
Leg	32	32
Loin	8	12
Shank	7	4
K&P Fat	1	3
Total	48	51
Foresaddle		
Rack	8	14
Shoulder	35	24
Breast	9	8
Total	52	46

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meatiness in Spanish goats. It should be wide with a symmetrically oval shape on each side of the backbone. This muscle should carry forward over the ribs or rack.

Shoulders. The goat's muscling should increase from the withers to the point of the shoulder with the thickest muscle occurring immediately above the chest floor. The circumference of the forearm is the second most important indicator of meatiness, so the forearm muscle should exhibit a prominent bulge and should tie in deep into the knee.

Neck. The juncture of the neck and shoulder should be free of excess tissue. It should gently slope to indicate muscling. Smoothness and quality are important in this area. A long clean neck with muscling in balance to the remainder of the animal is desired.

Condition

The term condition refers to the amount of finish or fat the animal is carrying. Goats deposit fat inter-

nally before they do externally. The ideal condition is a thin, but uniform, covering over the loin, rib and shoulder. The external fat thickness over the loin at the 13th rib should be between .08 to .12 inches or an average .1 inch.

Miscellaneous Conditions

Occasionally, some conditions are found in Spanish goats that need to be noted to properly describe an animal. These include winged shoulder, sickle legs, over-refined bone and weak or broken pasterns.

Winged Shoulder. This is looseness in the attachment of the goat's shoulder blades to the chest wall, especially at the point of the elbow. A winged shoulder makes movement more difficult.

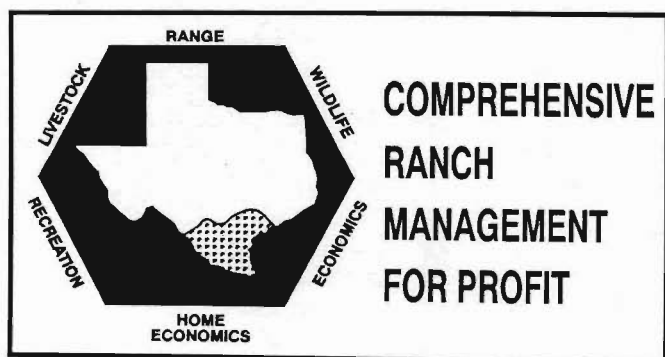
Sickle Leg. In this case the hind leg has too much "set," or angle, and puts more strain on the leg structure. It is the opposite of a "posty" or "post legged" condition where there is not enough "set" and the leg is too straight.

Over-Refined Bone. This is an indication of frailty; the goat's bones are too weak to carry the body weight. Usually, most goats have enough bone and this is not a problem.

Weak or broken pasterns. This condition occurs in goats when the cannon bone of the lower leg and the digits or phalanges of the foot do not meet in a 45° angle. The muscles and tendons of this joint are weakened and the angle is increased, reducing mobility of the animal. If the angle is less than 45°, the pastern becomes too straight and a post-legged condition occurs.

Acknowledgments

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A SOUTH TEXAS INTEGRATED RESOURCE MANAGEMENT PROGRAM

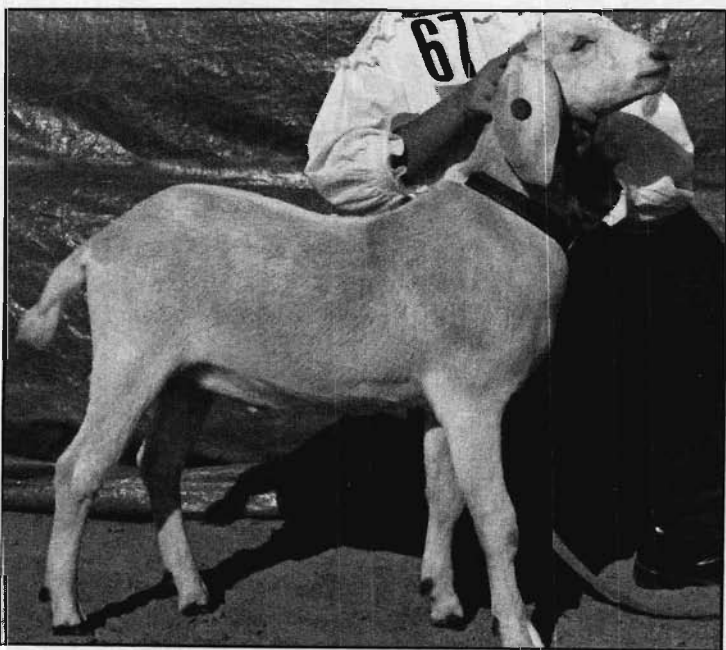
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20M-11-96, Reprint

AS 2-2



Meat goat with good body conformation and muscling.

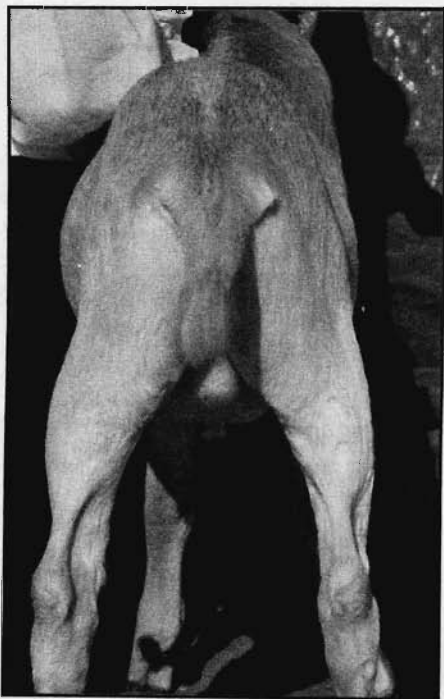


Meat goat with poor body conformation and muscling.

Figure 4. Examples of body conformation and muscling.



Meat goat with good leg conformation and muscling.



Meat goat with poor leg conformation and muscling.

Figure 5. Examples of leg conformation and muscling.

Table 2. Comparison of Carcass Yields From Spanish Goats and Rambouillet Sheep

	Young Males		Aged Females	
	Goats	Sheep	Goats	Sheep
Live Weight, lb.	70.8	90.2	72.5	95.0
Carcass Weight, lb.	36.6	45.9	35.9	47.5
Dressing Percent, %	51.7	50.8	49.5	49.9
Pelt, %	11.8	12.2	9.8	9.7
Lean, %	64.4	57.7	57.7	52.7
Fat, %	13.5	21.4	19.5	29.2
Bone, %	22.1	21.3	22.8	18.1

condition. Bucks should be kept separate from does except during the breeding season in order to breed during the desired time. Bucks should also be prepared for the breeding season by feeding them 1-2 pounds of grain plus 3-4 pounds of hay or forage daily.

If does are thin at breeding time, kidding percent can be increased by "flushing." Flushing is the practice of increasing nutrition during breeding which puts the animal in a weight-gaining condition and causes an increase in ovulation rate. Flushing can be done by turning goats on a fresh, lush pasture if it is available or by feeding grain. Corn is most often fed for flushing at the rate of 1/2 to 3/4 of a pound per head per day. Feeding should be initiated 2 to 3 weeks before the bucks are turned in with the does and continued for 2 to 3 weeks after the introduction of the bucks, for a total period of 4 to 6 weeks. Flushing will generally result in a 10 to 20 percent increase in kid crop. Does that are in good condition will generally not benefit from flushing.

The gestation period in goats is 148 to 150 days. The expected kidding date may be calculated by counting forward 5 months from the date of breeding. Maintaining good records of all heat periods and breeding dates is important to maximize reproductive efficiency.

Raising The Kids

It is important that the kid goat receive colostrum, the first milk, as soon as possible after birth for a period of at least 2 days. Colostrum provides antibodies for resistance to disease and is high in nutrients, including energy, vitamin A, the B-vitamins, protein and minerals. Overfeeding colostrum or other milk can cause scours. Extra colostrum may be saved, refrigerated and even frozen and fed at body temperature at some later

Managing Spanish Goats

Feeding The Does

Goats do well on good pasture or browse. However, the mature goat will require 3 to 4 pounds of hay daily unless she is getting plenty of good pasture or browse. In addition, a grain-based supplement may be required during periods of high production such as flushing, late gestation and early lactation. The amount of supplement needed will vary with pasture and/or hay quality and the quantity fed. The crude protein (CP) content of the supplement will also vary with the forage quality.

Two simple grain supplements are as follows:

1. 50 lbs. corn or milo
20 lbs. oats or barley
20 lbs. wheat bran
10 lbs. cottonseed meal
2. 40 lbs. corn or milo
20 lbs. oats or barley
25 lbs. wheat bran
15 lbs. cottonseed meal

The first ration provides approximately 14 percent CP and the second approximately 16 percent CP. Goats dislike finely ground, dusty feeds so grains should be either coarsely ground, rolled, crimped or pelleted.

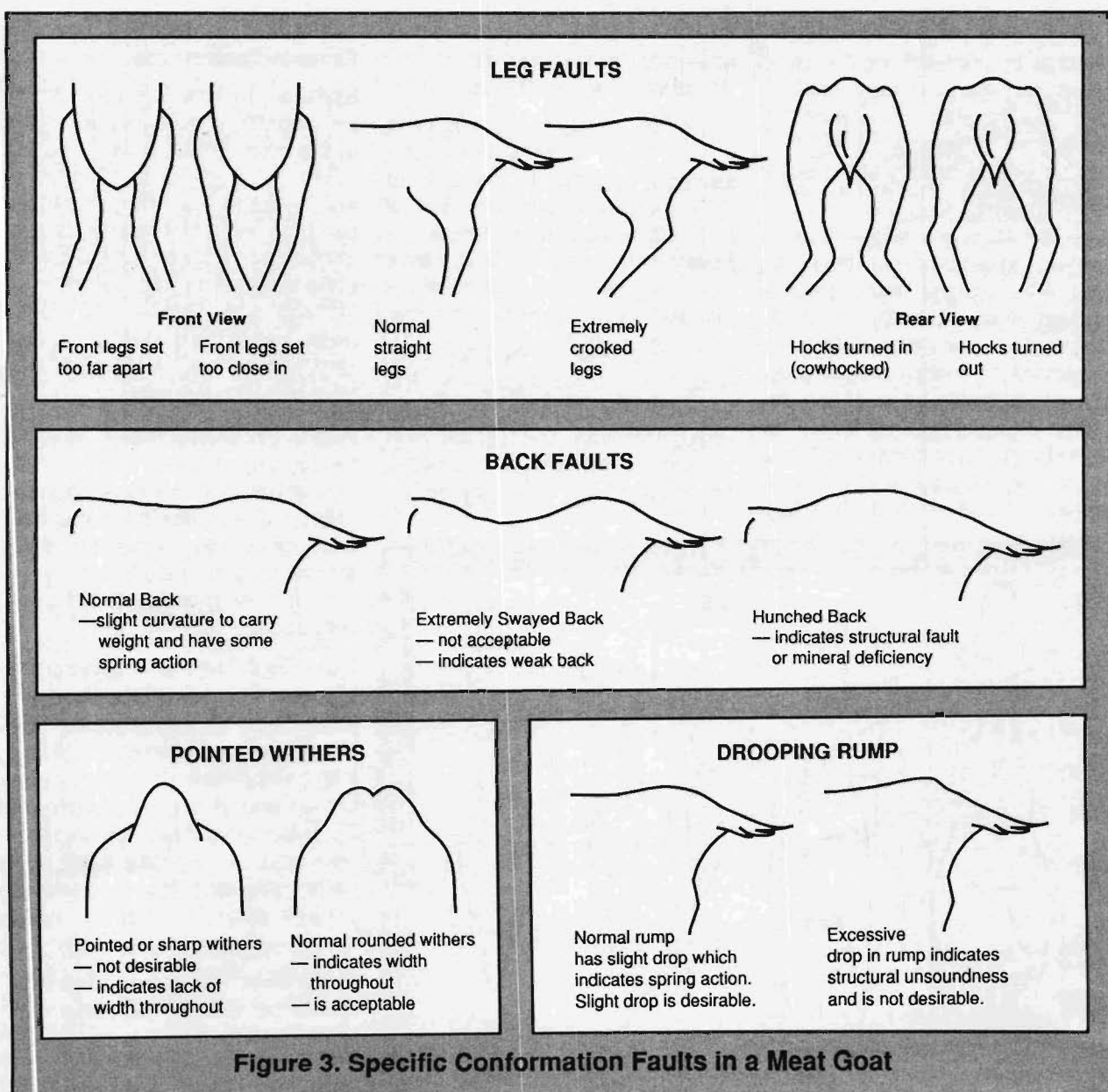
It is recommended that a trace mineralized salt and a balanced, 12 percent calcium: 12 percent

phosphorus supplement be added to any ration. Also, salt should always be available to the goat. Molasses may be added to the supplement (5 to 7 percent usually is recommended) to reduce dust and enhance palatability.

Breeding The Does

Most goats are seasonal breeders, and their season is initiated by decreasing daylight hours. The breeding season will vary and some will breed during any season of the year, but reproductive activity is highest from August through January. Does come in heat, called estrus, at intervals of 20 to 21 days and usually remain in heat from 1 to 2 days. Signs of estrus are easily detected and include uneasiness, an unusual amount of tail wagging, frequent urination, an abnormal amount of bleating, reddish and swollen vulva, and mucus under the tail. Riding other animals or standing for riding is not seen as often in goats near estrus as in cows. Conception is highest from the middle to the latter part of the heat period 24 to 36 hours after onset of estrus. If signs of heat are first noticed in the morning, goats should be bred late in the afternoon; if heat is detected in the afternoon, goats should be bred late the following morning.

Young does tend to reach puberty or sexual maturity at 5 to 9 months of age provided they have been well grown out and are in good



potential udder attachment in does (Figure 3).

Hind Legs. The goat's rear legs should be wide apart and straight when viewed from the rear, with clean hocks and a good combination of bone refinement and strength. Observed from the side, a plumb line originating at the pin bone would fall parallel to the leg bone from hock to pastern and touch the ground behind the heel of the foot. The resulting angles produced at the hock and stifle

joint will be most ideal for easy walking and a minimum of joint problems (Figure 5).

Feet. Meat goats need strong pasterns and strong, well-formed feet with tight toes, deep heel and level sole. Such feet are highly resistant to injury or infection and easy to keep trimmed. Goats with uneven toes and extremely weak pasterns should be culled (Figure 2).

Muscle

Meat characteristics of Spanish goats can be visually determined by examining the animals hindquarters, loin, shoulders and neck.

Hindquarter. A long, deeply attached muscle, relatively thick at the thigh and stifle is desirable in meat goats. Heavier muscling on the outside of the leg is acceptable. Muscle over the thurl and rump should be obvious.

Loin. The loin eye or ribeye is typically the best indicator of

date. Orphan kids may be left on goat's milk or changed to cow's milk or a commercial milk replacer after the first few days on colostrum.

Kids must have a warm, dry place to sleep when they are taken from their mother. A deep wooden box with a slanted floor that is raised off the ground to provide drainage makes a good bed for new kids. The box should be well bedded and draft-free.

For the first 3 to 4 days after birth a kid should receive 2 to 3 pints of milk in 3 to 4 feedings per day. Kids can be fed twice per day thereafter. A creep feed containing approximately 20 percent CP and a high quality hay should be made available to kids at about 2 weeks of age. Clean, fresh water and salt should be available at all times, especially when the kids are weaned from milk at 8 to 12 weeks of age.

As soon as the kid begins eating a little grain and hay, the rumen will begin to develop which allows the kid to utilize roughage materials. The kid will begin chewing its cud at this time. When the kid is eating hay and grain well, usually at about 4 to 6 weeks of age, milk feeding can be discontinued. The rumen will be fully developed at approximately 8 weeks of age.

The kid should have plenty of exercise and as much sunshine as possible. Older kids should have something on which to climb and jump. Boxes or barrels can be provided for this purpose. Buck kids should be separated from the does at about 2-4 months of age to avoid premature breeding.

Dehorning. Horn development is a recessive trait of goats and is found in most breeds. Horns should be removed for safety purposes while the animals are very young, between 3-14 days. There are several ways to dehorn goats

such as dehorning pastes or similar caustic compounds, burning irons, or physically removing the horns. Veterinarians can perform this procedure.

Castration. Bucks develop musk glands when they reach puberty. These emit a telltale odor which often taints the taste and odor of the meat. Once an animal reaches puberty, they are more active and are harder to feed to an acceptable level of eating quality. Male goats not to be used for breeding must be castrated as soon as possible (2-4 weeks). Like dehorning, this can be done in several ways. Consult your veterinarian for best results.

Internal and External Parasites. The roundworm, stomach worm and coccidiosis are the most significant internal parasites affecting goats. Animals become infested by grazing on pastures contaminated with droppings from other infested goats. Several pastures should be used in rotation because parasite carry-over can be markedly reduced by resting pastures for 30-60 days between grazing. Newly purchased animals should be treated for internal parasites. Isolating animals because of internal parasites is of no value. Coccidiosis can cause severe problems in goats, especially those managed in confined or dry-lot conditions. Goats managed under these conditions should receive a coccidiostat regularly in their feed. Treatment of coccidiosis with anthelmintics is not effective. If coccidiosis is suspected, consult your veterinarian.

Symptoms of parasite infestation are general unthriftiness, a run-down condition, rough hair coat, loss of weight, poor appetite, diarrhea and anemia. If animals are suspected of being infested with internal parasites, a fecal sample should be collected and taken to the local veterinarian. Examina-

tion will determine the type and degree of infestation and recommended treatment.

External parasites, including lice, ticks, mites, horn flies, stable flies, horse flies, deer flies and mosquitoes may present serious problems. These pests are most prevalent during the spring, summer and fall months, but may be a problem throughout the year.

Common Diseases

A number of diseases occur in goats. When a problem occurs in your herd, consult your veterinarian. Information is readily available concerning these diseases, their diagnosis and treatment. The most significant diseases are soremouth, tetanus, overeating disease, foot rot and bloat.

Soremouth. Soremouth is a contagious disease that causes the formation of scabs on the lips and around the mouth of goats. This virus can affect humans so care should be exercised when working with goats with soremouth. A live virus soremouth vaccine, available as a preventative measure, is applied to a small scratched area in the fore or rear flank or in the ear. Few medicines help in the actual treatment of soremouth. Iodine can be rubbed into lesions after the scabs are removed to help dry up the area and reduce the infection. If you don't have soremouth, don't vaccinate for it or you will introduce it in your herd.

Tetanus (Lock Jaw). Tetanus is a disease usually resulting from a wound infection. The disease is caused by a powerful toxin produced by a bacterium that grows in the absence of oxygen. The first sign of tetanus is a stiffness about the goat's head; the animal often chews slowly and weakly and swallows awkwardly. Also the goat's third or inner eyelids protrude over the forward surface of the eyeballs. The animal shows

violent spasm reactions with the slightest movement or noise, and usually remains standing until close to death. All ages are susceptible, but kids weakened due to castration or dehorning are more susceptible to tetanus. Tetanus is hard to treat and death occurs in over 50 percent of the cases. The animal should be placed under the care of a veterinarian immediately and kept as quiet as possible. Tetanus antitoxin may be helpful if administered early. Prevention is the best policy by reducing the incidence of wounds, applying sanitary and proper wound treatment, and vaccinating with tetanus toxoid immediately after dehorning or castration surgery.

Overeating Disease (Enterotoxemia). Overeating disease generally results in death and seldom exhibits symptoms. This disease is caused by a clostridial organism which is normally present in the intestine of most goats. Goats which have their feeding schedule abruptly changed or consume large amounts of grain are the most susceptible to overeating disease. These changes cause the clostridial organism to grow rapidly and produce a powerful toxin which causes death within a few hours. There are two types of enterotoxemia, C and D. All goats should be vaccinated with the combination C and D vaccine and multiple vaccinations are recommended. Two or 3 vaccinations are preferred, with the booster doses coming at 3 to 4 week intervals following the first vaccination. A good vaccination program should eliminate losses from overeating.

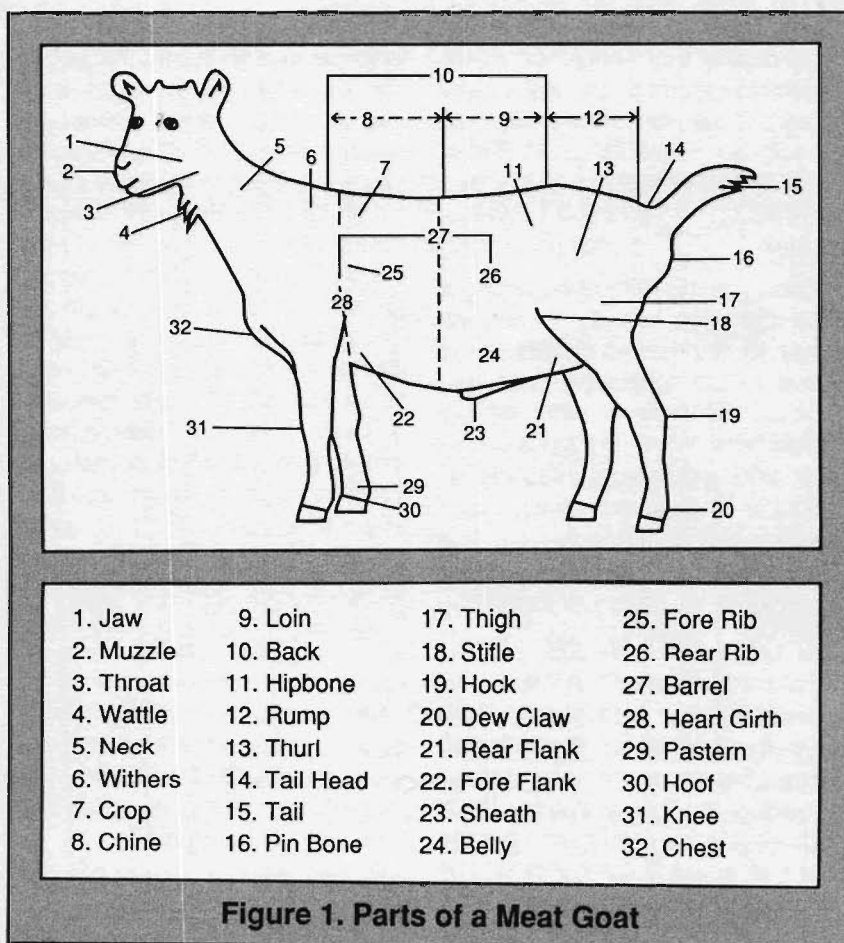
Foot Rot. Foot rot is not often seen in goats, but it may occur if animals spend considerable time in wet, unsanitary yards or barns. The first symptom will be lameness, followed by a swelling of the foot which becomes hot to the touch. The rotten area should be

carefully trimmed away and the foot treated with 10 - 30 percent copper sulfate solution or other medication prescribed by a veterinarian.

Bloat. Bloat is the accumulation of an excessive amount of gas in the rumen. This may result from overeating tender, young, high-moisture legumes or other green forages still wet with dew. Bloat animals may lie down and get up at frequent intervals, kick at the abdomen, make loud grunting noises or otherwise show distress. Prevention consists of making sure the animals have a good fill of

Judging Spanish Goats

Several criteria should be considered when selecting and judging meat goats. These include conformation (structural correctness), general appearance (size and scale, capacity, and depth and width of body), muscling (growth and weight per day of age) and condition or finish (fatness). Spanish goats must be able to survive under unfavorable conditions, convert poor quality roughages to lean meat and maintain a meaty, conditioned body. The parts of a wether meat goat are shown in Figure 1.



dry hay before turning them onto moist pasture. Animals may die very suddenly with bloat; therefore, don't wait too long before calling the veterinarian for assistance.

Conformation

Meat goats should be evaluated on "type" and "market desirability." These terms refer to frame size, skeletal correctness and how these blend in the market animal.

"Market desirability" relates how much finish the goat has in relation to its weight, size and age and is sometimes referred to in terms of USDA quality and yield grades used for lambs.

A good market goat should be rectangular in appearance from the side with straight, level top and bottom lines. Length of rump, length of body and length of leg are important to market desirability. The rump should be level and the overall body should be trim. The legs should be straight and placed square under the body, not post-legged or cow-hocked. The fore

and hind legs should show evidence of muscling (Figure 2).

From the front, a market goat should show width between the forelegs, muscling in the forearm and shoulders, trimness in the brisket or breast area and soundness and correctness in the front feet and legs. The head should be in proportion to the neck and body.

From the rear, the hindquarter should be muscular and long and the back, loin and rump should be uniform in width. The feet and legs should be straight and spaced square and wide under the goat.

General Appearance

Stature. The term stature refers to the overall skeletal size and length of the goat. Goats must have an adequate length of cannon bone from knee to pastern and should be above average in overall length of body and general size. Cannon bone length is a good indication of skeletal size. The goat's height measured at the withers should be slightly more than at the hips, and bones must be of good size.

Head. The head should combine the beauty of eyes, nose, ears, and overall form with strength and refinement. It should have a balance of length, width and substance that insures an ability to consume large amounts of forage with ease.

Front End. The front end is a combination of chest and shoulder features. The goat should have a wide chest floor and prominent brisket with a smooth blending of shoulder blades and sharp withers (Figure 2). This insures room for the heart and lungs to do their work with ease and also is evidence of proper muscle and ligament strength (Figure 3).

Front Legs. The goat's front legs should be straight, perpendicular to the ground, sound in the knees and full at the point of the elbow. The legs should move with the front feet pointing straight ahead (Figure 3).

Back. A back that is straight, strong, wide, long and level is desired in goats. This denotes a strong body build with good muscling and is indicative of strength to carry large quantities of feed (Figure 4).

Rump. The goat's rump should be long, wide and level from thurl to thurl, cleanly fleshed and have a slight slope from hips to pins. The shape of the rump is important as it affects leg set, kidding ease and

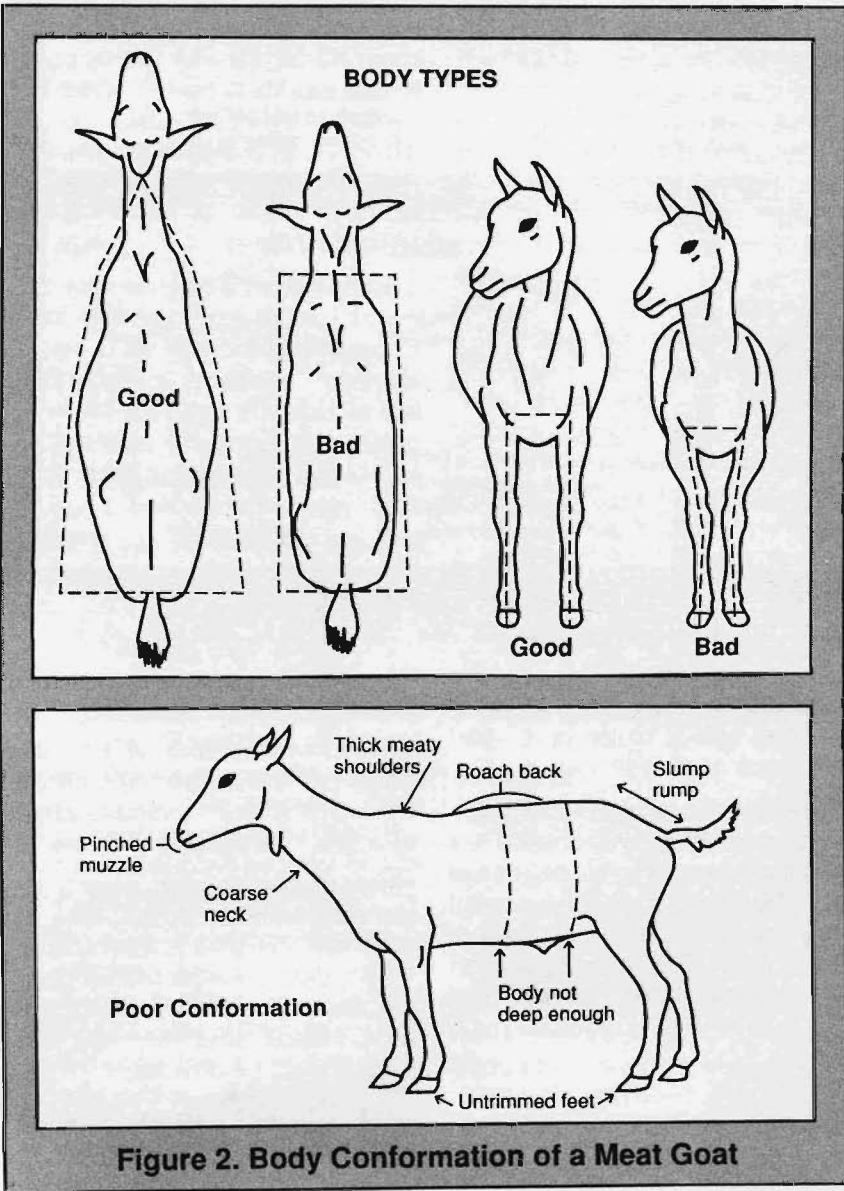


Figure 2. Body Conformation of a Meat Goat

Experiencing Long-Term Success as a Meat Goat Producer

Everyone has their favorite season of the year. School children and their teachers anxiously await the beginning of summer. Those who avidly pursue the whitetail deer long for the turning of the leaves and the cooler weather soon to follow. Goat breeders impatiently count the days until spring kidding begins. For some, the period from buck turnout until kidding commences rivals the length of the school year as perceived by a child. Spring brings new life and a first glimpse of the results of a carefully planned mating program - breeding the best to the best with great expectations of producing something better.

The meat goat industry continues to boom. The value of imported genetics has declined and stabilized at "real world" prices, but the interest and activity within the industry is far from status quo. Breeding stock inquiries, both domestic and international, continue to surface and the youth market wether industry has experienced growth unlike any other youth livestock program in the memorable past.

A diversity of opportunities exists; purebred seedstock, commercial replacement animals, show wethers and the list goes on. In order to experience long-term success, meat goat producers must focus on four determinants of success in a livestock enterprise. These four fundamentals must be considered in their order of priority.

#1. Must have a VIABLE MARKET for your product.

A lack thereof precludes consideration of points 2-4.

Webster defines viable as *capable of developing under favorable conditions; capable of success or continuing effectiveness*. Synonyms include: alive, feasible, practical, workable. When used in context with goat markets, terms such as accessible, stable and dependable also come to mind.

Unlike most other animal protein industries, demand for goats and goat meat far exceeds our domestic ability to supply. In some instances, demand escapes the realm of viable markets. How? Look back at the synonyms; practical, feasible, workable. Our supply is sporadic and we are some distance from being able to fill long-term monthly requests for 10-15,000 goats or 35-40,000 pounds of meat. We need not forget the existence of these markets. However, in the short-term, conditions are not favorable for their development (limited supply) so we must press on in other areas.

A neighborhood lemonade stand offers little relief to a convoy of soldiers in mid-July.

#2. Market price must exceed COST OF PRODUCTION.

We must focus on the cost of production, not market prices.

What is a good price?

A. It depends. (standard Extension answer). In this discussion, it is assumed good and profitable are synonymous. If so, a good price is an amount greater than the cost of production on an equal unit basis (i.e. \$/cwt, ¢/lb, \$/head).

B. It differs across operations. Seldom could one find two meat goat operations with an identical cost of production. Therefore, neighbors discussing the market across the fence is a little ambiguous without inclusion of costs of production.

C. It is relative to the current cost of production not historical/projected market data. Most of the costs associated with producing a commercial kid are incurred by its dam: major categories include land, labor, feed and vet/health. Land and labor tend to be fixed costs while feed (including hay and cultivated forage production) and vet/health costs are more variable. The cost of doing business goes up a little each year and with each subsequent kid crop. Characterization of the price received (good or bad) implies consideration of the expense incurred to produce the product marketed.

It matters not that gross income from a group of 40 lb kids is \$40 per head IF it cost \$45 per head to produce and market them. Subsequent experiences of similar magnitude will jeopardize long-term enterprise profitability/success.

#3. The goal for REPRODUCTIVE PERFORMANCE is at least one merchandisable unit per exposed female.

Brood does in a meat goat operation are the production units. The costs associated with their production or purchase and their maintenance cost (supplemental feed, hay, vet/health, equipment, facilities, etc.) represent a major portion of the cost incurred in the production of meat goats. Breeding age does generate income to offset these annual costs in one of two ways: 1) through sale of their offspring or, 2) the sale of barren/non-productive females.

The relationship between reproductive performance and the break-even price required to cover production costs is demonstrated in Table 1. Note: The true measure of reproductive performance is

$$\% \text{ kid crop} = \# \text{ kids weaned} / \# \text{ does exposed to a buck}$$

NOT # kids weaned/# does present at weaning. An admirable goal for an extensive production system (goats grazing larger native range, brushy or wooded pastures) would be 150% or 1.5 kids weaned for every doe bred. On the other hand, most profitable

intensive production systems (does in small pens or paddocks, being fed from a sack or bale) average 175 to 200% kid crops annually.

Table 1. Relationship Between Cost of Production and Reproductive Performance							
Doe Cost	Kid Crop Weaned						
\$/hd/yr	70%	80%	90%	100%	125%	150%	200%
	Breakeven Price, \$/lb*						
10	0.32	0.28	0.25	0.22	0.18	0.15	0.11
15	0.48	0.42	0.37	0.33	0.27	0.22	0.17
20	0.63	0.56	0.49	0.44	0.36	0.30	0.22
25	0.79	0.69	0.62	0.56	0.44	0.37	0.28
30	0.95	0.83	0.74	0.67	0.53	0.44	0.3
35	1.11	0.97	0.86	0.78	0.62	0.52	0.39
40	1.27	1.11	0.99	0.89	0.71	0.59	0.44
45	1.43	1.25	1.11	1.00	0.80	0.67	0.50
50	1.59	1.39	1.23	1.11	0.89	0.74	0.56
60	1.90	1.67	1.48	1.33	1.07	0.89	0.67
* Assumed market weight: 45 lb. Does bred to kid once a year.							

Should one doubt the significance of overlooking reproductive performance in a goat enterprise, take a brief look at the Angora industry in the absence of incentive payments.

#4. Match GENETIC POTENTIAL FOR GROWTH with productivity of the environment.

Big, stout, fast growing, thick muscled, heavy boned, eye appealing kids - certainly an admirable goal high on the list of most meat goat producers. Why then, is it last in this prioritized list of four? Because a viable market, low cost of production and efficient reproduction are more critical to the long term success of a meat goat operation than how “good” the kids look.

In the environments where meat goats have a *competitive advantage* (native ranges, brush,

etc.) and the *lowest cost of production*, genetic potential is usually not the first limiting factor for growth. Nutrient availability is typically the first limiting factor for growth.

In order to optimize production efficiency, meat goats, especially replacement females, should be selected under the conditions in which they will be expected to produce. Optimum nutritional conditions (ad libitum feeding, generous supplementation or grazing warm/cool season annual forages) favor an animal with later maturity, larger mature size and greater genetic potential for growth than can be supported by the browse, forbs and grasses available in most pastures. Successful beef producers do not select their replacement heifers at the feedlot. Perhaps there is a lesson to be learned therein.

The distance a rocket can travel is directly related to the fuel beneath it.

SUMMARY

The future of the U.S. meat goat industry is exciting. The challenge of supplying high quality goat meat to an ever increasing population that prefers goat over other animal proteins is significant and its magnitude unique. The consumer is patiently waiting at the meat counter with cash in one hand. The challenge - putting goat meat in the other for less than what they are willing to pay.

Dr. Rick Machen
Associate Professor & Extension Livestock Specialist
Uvalde

AMGA Director

Meat Goat Production in Texas

Where are we going?

Dr. Rick Machen
Extension Livestock Specialist
Uvalde

Introduction

During an encounter with inclement weather, a young, rather inexperienced airline pilot came over the intercom of his plane and said, "Ladies and gentlemen, the storm has thrown us off course. We are not sure where we are, but let me assure you, we are making excellent progress."

In some respects, the meat goat industry is much like the pilot - making excellent progress in spite of being unsure about the destination. Perhaps the same is true for any industry in its infancy. In the development of an industry, early definition of the destination (product) facilitates development of production goals, improves the efficiency with which those goals are achieved and strengthens the possibility of prosperity.

Define Production Goals

Presently, the single greatest need of the meat goat industry is a production target on which to focus. Currently, the demand for goat meat so greatly exceeds supply that essentially all product is being consumed at a premium, relative to the other red meats. In the presence of a high demand:supply ratio, few consumer signals as to quality, fabrication and packaging are sent back down the production chain.

Unlike beef, lamb, pork and poultry, a significant portion of the goat meat produced never enters a formal production chain (i.e. feeder, packer and retailer) prior to consumption. In the absence of consumer input as to desirable attributes of the retail product, the industry must focus primarily on production efficiency and the cost of production, not market prices.

Production goals must be established. During the planning and goal-setting process, the following questions warrant consideration.

1. Is profit (return on investment) a priority or is this a "recreational venture"?
2. What forage resources/feedstuffs are available?
3. Which type of production system, extensive or intensive, will best utilize the available facilities, forage and labor resources? Is brush management a priority?

4. What is/are the anticipated product(s) of this goat enterprise?
 - meat
 - fiber
 - milk
 - breeding stock
 - other
 How will these products be marketed?
5. What are the primary selection criteria for developing a goat capable of efficient production in this environment?
6. Will replacements be purchased or raised?

Production Systems

Like all other species in the livestock industry, production/management systems range from the most extensive (Spanish goats on native range) to very intensive (a dairy). Meat goat operations are described relative to labor and pasture requirements and animal attributes in Table 1.

Table 1. Comparison of Extensive and Intensive Meat Goat Production Systems

Essential Considerations	Production System	
	Extensive	Intensive
Forage base	Pasture	Semi-confinement
Labor required	minimal	significant
Breeding program	kid annually	kid every 8 months
Animal attribute	low requirements moderate size avid foragers	high productivity prolific good disposition
<u>Key to Success</u>	LOW input production cost	HIGH output production cost

Obviously, all goat operations are not polarized at either end of this scale. While some can be found at either extreme, most meat goat enterprises will find a suitable medium between the two extremes. Therein lies the challenge for every profit driven meat goat producer - to find that happy medium that balances available resources with animal production potential to yield profitable results. Perhaps observations from other livestock industries can offer some guidance for meat goat producers during this development process.

frame size contributions from some dairy breeds, will allow goat breeders to build a goat that is too big and too productive for many extensive production systems. Therefore, it is imperative that breeders define a production system and breed a goat which can efficiently produce therein. The wrong approach is to develop a goat and subsequently attempt to build a production system for support.

Matching Breed Composition & Production System

Once the available resources are defined and an appropriate production system is identified, the next step is selection or development of the production units - meat goats. Specifically, the task is to identify a breed or combination of breeds that will efficiently utilize available resources to achieve production goals. A short list of important characteristics and the relative ability of the four major meat goat breeds to contribute is shown in Table 2.

Table 2. Relative production characteristics of the four major breeds of meat goats in Texas.

Characteristic	Spanish	Angora	Dairy	Boer
Longevity	+++	++	+	?
Durability/Thriftiness	++++	+	+	?
Frame size	+	+	++++	+++
Muscle	+	++	++	++++
Milk Production	+	++	++++	+++
Udder Conformation	+++	++	+	+++
Disposition	+	++	++++	++++
Appetite	+	+	+++	++++
Nutrient Requirements	+	+++	++++	?
+ less potential				
++++ greater potential				
? not enough data/observations in Texas for comment				

Cattle

If history repeats itself across animal species, the meat goat industry can learn a lesson and avoid a significant pitfall by studying the beef cattle industry. The U.S. beef cattle industry has floundered over the past 30 years in search of the "ideal" cattle type. Prior to the 1960's, cattle were small and early maturing. Then, in the late 60's and through the 1970's, new germplasm was introduced that afforded greater milk production, rapid growth, thicker muscle structure and larger mature size. Bigger became better until we passed the "ideal" size and productivity per additional unit of input began to decline. Finally, in the 1990's, the beef industry has defined production targets (with significant help from the consumer) and is on track toward moderate size and improving production efficiency.

Another noteworthy observation from the cattle industry is the phenomenon of **genotype-environment interaction**. Examples of this principle are given below.

Longhorns are a genotype that fit a specific environment; low forage availability, relatively poor forage quality and adverse topographical conditions. Production (birth, weaning and yearling weight) is relatively low but so are requirements (labor, supplemental feed).

Brahman cattle are adapted to tropical environments where heat tolerance, insect resistance and the ability to consume larger amounts of less nutrient dense forages are essential to survival and productivity. Further from the equator, in colder climates and higher elevations these cattle are less productive.

Attempting to produce Holsteins under range conditions is an example of a negative genotype-environment interaction. Mature size, rumen capacity and milk production potential exceed the potential support of a range pasture environment. The same can be said about the larger breeds of dairy goats in an extensive production system.

Sheep

Attempting to include blackface, medium wool sheep in an extensive range ewe/lamb enterprise is also an example of a negative genotype-environment interaction. While these breeds function well as a terminal sire for feeder lamb production, their relatively high nutrient requirements, susceptibility to heat stress and low tolerance of internal parasites severely limit their participation in range ewe/lamb operations.

Similar genotype-environment interactions exist among meat goat breeds and their respective production environments. Domestic meat goats are well adapted to an extensive production environment (small mature size, low requirements). Introduction of goats with greater muscle mass, especially when combined with large

Attributes, limitations and a brief comment about possible contributions or limitations of each breed are listed below.

Spanish

Attributes: small body size
low nutrient requirements
hardy/thrifty
environmentally adapted
prolific

Limitations: disposition
growth rate
least muscular

The Spanish goat is the best suited for survival and production under extensive range conditions. As such, they remain the base of the Texas meat goat industry. Crossbreeding with any of the other breeds improves growth rate, carcass merit and production potential. The disposition and eating behavior of many Spanish goats make them undesirable for more intensive programs.

Angora

Attributes: hybrid vigor (crossbreds)
largest population
acceptable disposition
mohair

Limitations: unthrifty (young)
pelt desirability
seasonal breeding

As long as there is a demand for mohair, Angora goats will be a significant part of the meat goat industry in Texas. The ability to market fiber in addition to meat warrants serious consideration by breeders in areas suited for Angora goats. When crossed with any of the other breeds, significant hybrid vigor is expressed, frequently resulting in a more marketable meat goat. Producers of crossbred goats must make every effort to keep crossbred hair (if harvested) separate and apart from the mohair clip.

Dairy breeds

Attributes: large frame size
excellent disposition
good appetite
prolific
mothering ability

Limitations: nutrient requirements
heavy lactation
udder structure
large teats
loss of suspension

The Nubian and Saanen appear to have the greatest influence (of the dairy breeds) on the meat goat industry at this time. Both breeds can add frame size to a breeding program. Under intensive management, dairy breeds are very prolific and offer the potential to market goat milk. In a more typical meat goat production environment, the potential for lactation and accompanying nutrient requirements may be a detriment to a breeding program. The possible breakdown in udder structure and its effect on longevity of breeding females should be considered.

Boer

Attributes: excellent disposition
high muscle:bone
body capacity & mass
excellent appetite
prolific
good udder structure

Limitations: availability
nutrient requirements?

The impact of the Boer goat on the meat goat industry has been the topic of great speculation. Disposition, udder structure and appetite are certainly admirable. No doubt, the Boer has the potential to add significant quantities of lean tissue to goat carcasses. However, to date, no clear signal has come from consumers to indicate that thicker, meatier goat carcasses are in demand. In addition, more meat per carcass could ultimately result in demand for fewer carcasses (i.e. beef industry, 1994).

Conclusion

In terms of lean product produced per unit of input, goats cannot compete with the other meat producing species on grasslands, improved pastures or in a feedlot scenario. However, because of their preference for browse, goats are most efficient in the conversion of browse to lean tissue. The long term viability of the goat industry hinges on breeders ability to develop a prolific, fast growing animal with desirable carcass characteristics that can be sustained and productive on a browse diet.

Until desirable carcass characteristics are specified, breeders must focus on suitability for the production environment, production efficiency and the cost of production. Before breeders progress too far in the pursuit of any trait, clear indication regarding product attributes is needed from the goat meat consumer. While waiting on that indication, breeders must work within the confines of mother nature to determine the boundaries of production.

Like the young pilot, the Texas meat goat industry is making excellent progress. If it continues at this speed with success as a goal, the destination must soon be defined.

SELECTION OF BREEDING MEAT GOATS

Frank Craddock
Extension Sheep and Goat Specialist
San Angelo, Texas

Visual Appraisal

Soundness - mouths, testicles, udders

Frame Size, Growth Potential

Structural Correctness

Volume and Capacity

Muscling

Breed and Sex Character

Records

Time and Frequency of Kidding

Number of Offspring

Born

Weaned

Growth Rate of Offspring

Pre-weaning

Post-weaning

EVALUATION OF SLAUGHTER MEAT GOATS

Frank Craddock
Extension Sheep and Goat Specialist
San Angelo, Texas

Points

30	Structural Correctness, Style and Balance <ul style="list-style-type: none">- up-headed with neck extending out of top of shoulders- strong level top- long rump with slight slope from hips to pins- front and rear legs should be straight and placed square under the body- strong pasterns; strong, well formed feed; quality of bone- proper blending of all body parts
25	Volume and Capacity <ul style="list-style-type: none">- length of body- depth of body- width of body (spring of ribs, width through chest floor)
35	Muscling <ul style="list-style-type: none">- deep, thickly muscled leg and rump, stifle thickness- broad, thick back and loin- bold shoulders, wide chest floor, prominent forearm- width between the front and rear legs
10	Condition <ul style="list-style-type: none">- thin, uniform covering of fat over the loin, rib and shoulder
—	
100	

ACCELERATED LAMBING/KIDDING PROGRAM

Frank Craddock
Extension Sheep and Goat Specialist
San Angelo, Texas

An accelerated lambing or kidding program constitutes lambing or kidding more frequently than once per year. In an accelerated lambing and kidding program one must breed out of season. In a conventional lambing and kidding program a ewe or doe is pregnant for 150 days, lactates for approximately 120 days and is idle or dry for approximately 95 days.

Characteristics of Accelerated Lambing/Kidding Program

1. Decreased maintenance cost per offspring reared.
2. Generally increased net return.
3. More uniform supply of lambs/kids throughout the year to take advantage of low supply and high prices.
4. Lower fertility (% females lambing/kidding that were exposed to males).
5. Lower prolificacy (number offspring born / female lambing/kidding).
6. Lower birth weights.
7. Increased management, labor, feed, facilities (confinement).
8. Not recommended for range operations.
9. Females must breed any season of the year and breed while lactating.
10. Use teaser rams/bucks.
11. Increased nutritional requirements.
12. Control light/dark ratio - 16 hours dark : 8 hours light.

Example of Conventional vs 3 Lamb/Kid Crops / 2 Years

Conventional - bred October / born March	125%
3 Crops / 2 Years - bred October / born March	125%
bred June / born November	75%
bred February / born July	<u>100%</u>
	300% / 2 years
	150% / year

Advantage - 25 % per year

MAPAS

Farmer's Stock Exchange

Jim & Lynn Farmer

PO Box 57
County Road 517
Mullin, Texas 76864
US

Phone 915 985 3626
Fax 915 985 3620
Email lynfar@ccentex.net
www.farmerstockexchange.com

March 26, 2001

From Brownwood:

South on 183/84 through Zephyr to Mullin

From Mullin Cafe, go 3.9 mile and watch for highway billboard on your right that says *South African Boers*

Turn right (CR 520) and follow signs:

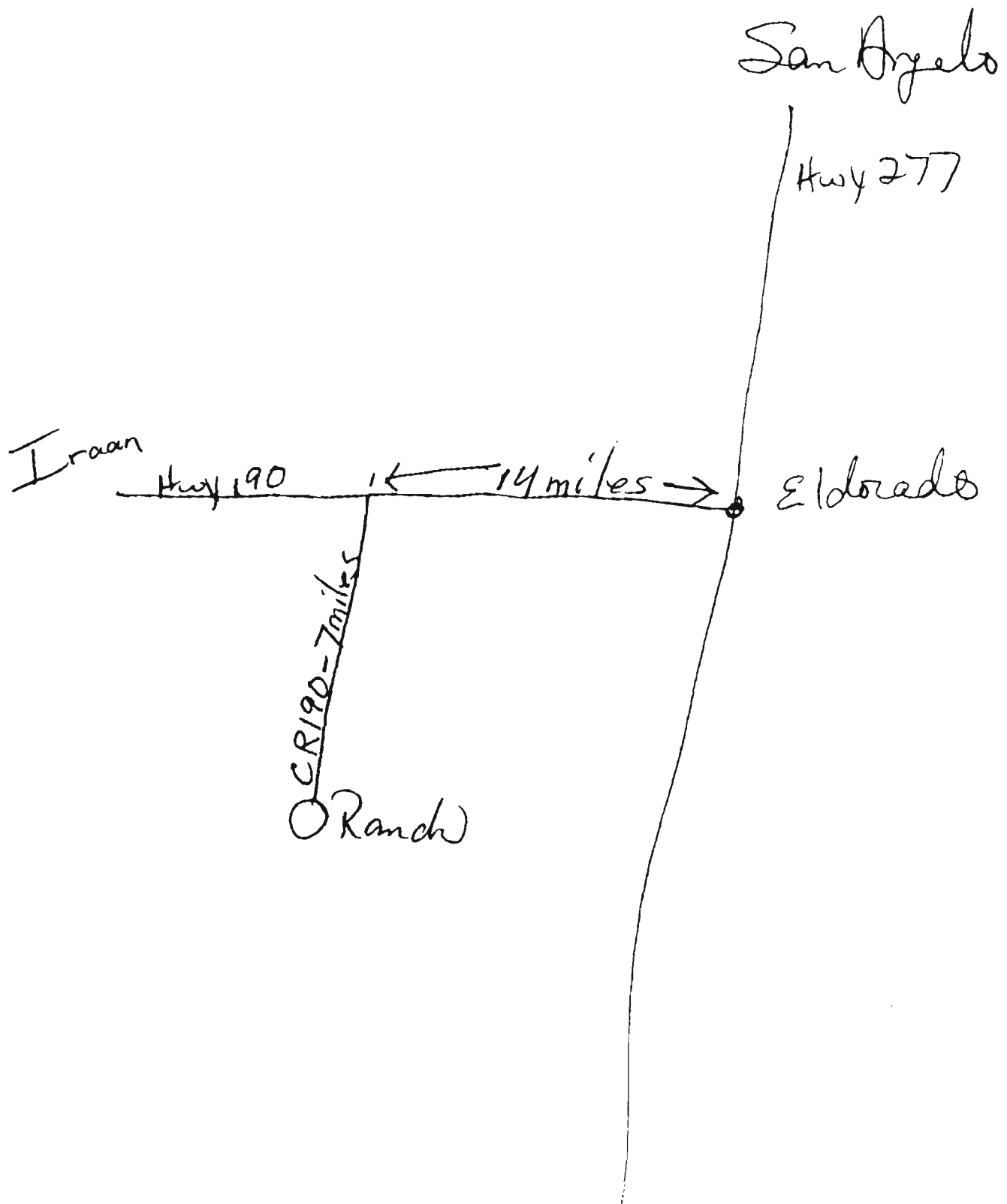
"Farmer's Stock Exchange" and

"Farmer's" (at County Road 517.)

First house on your right (west side of road)

Red headed goats and the Farmers will be visible to welcome you to our ranch.

Powell Ranch



DIRECTIONS TO T4 RANCH

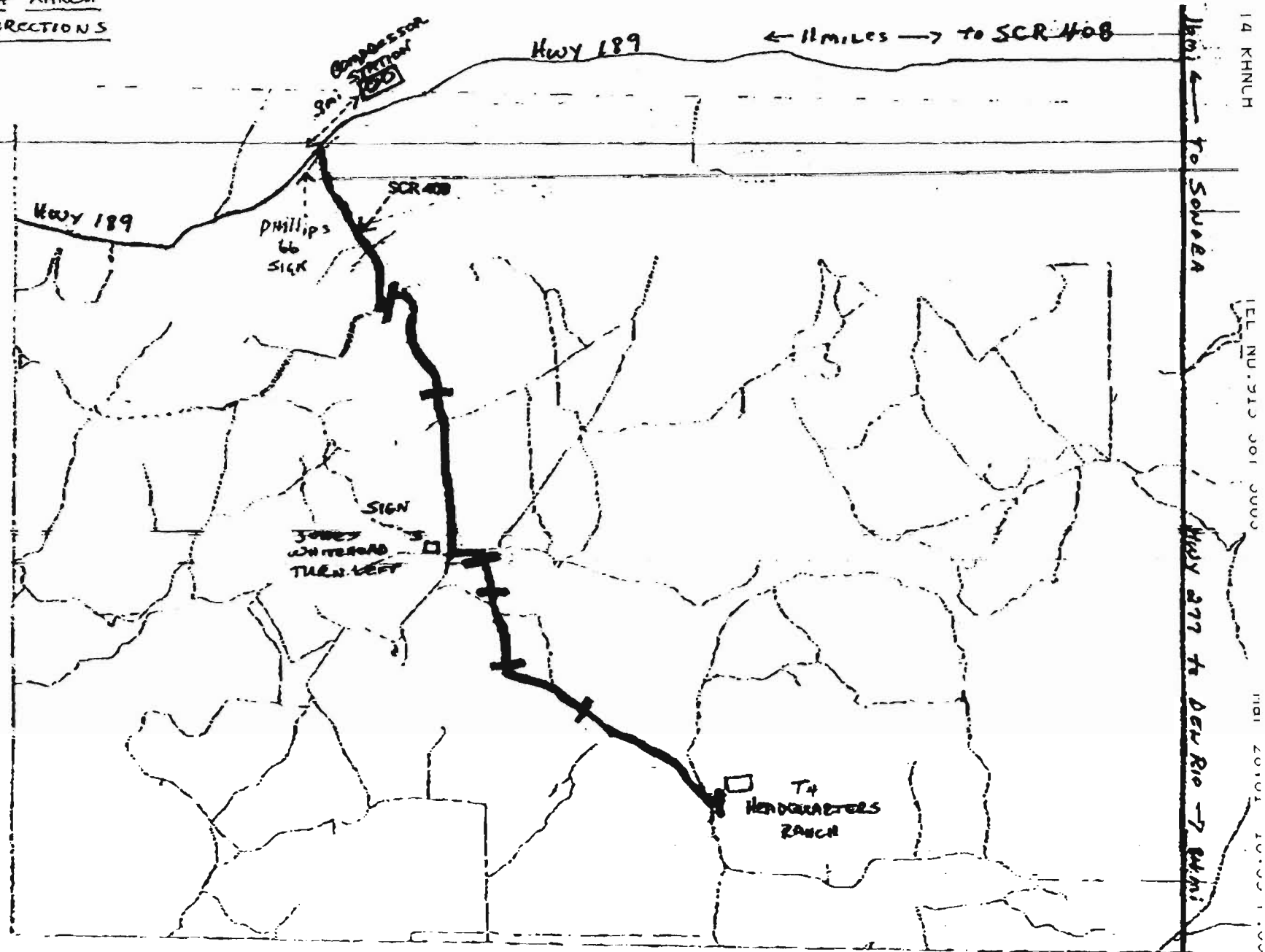
THE RANCH IS LOCATED APPROXIMATELY 35 MILES SOUTH OF SONORA, TEXAS WHICH CAN BE FOUND ON INTERSTATE 10 BETWEEN SAN ANTONIO AND EL PASO, TEXAS.

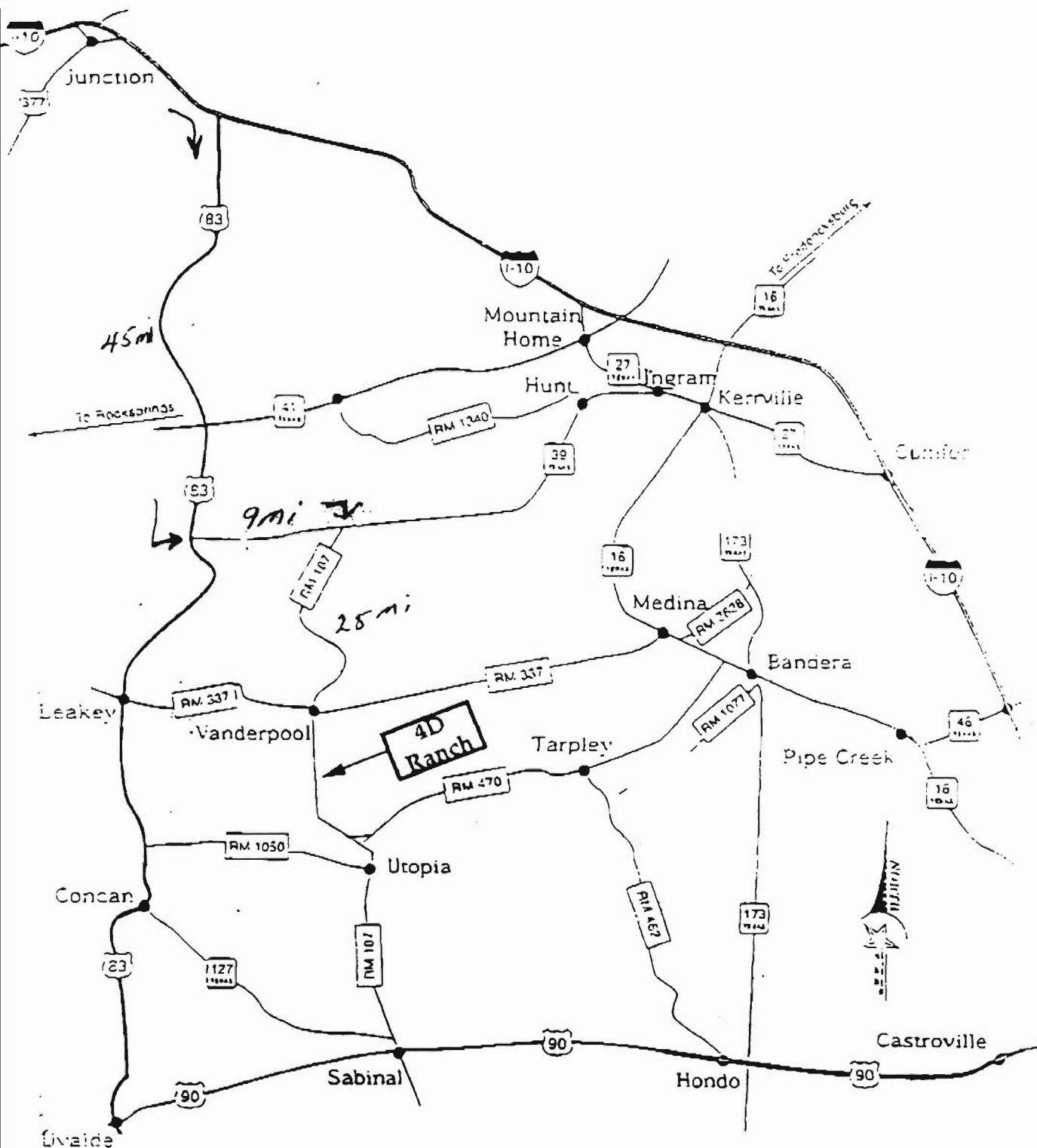
LEAVING SONORA TAKE HIGHWAY 277 TO DEL RIO. TRAVEL 16 MILES AND TURN RIGHT ON HIGHWAY 189 GOING TO JUNO. APPROXIMATELY ELEVEN (11) MILES FROM THIS TURN YOU WILL MAKE A LEFT TURN ONTO SUTTON COUNTY ROAD #408. YOU WILL KNOW YOU ARE THERE WHEN YOU SEE THE LARGE PHILLIPS 66 SIGN ON THE LEFT SIDE OF HIGHWAY 189.

AFTER TURNING IN ON SCR 408 YOU WILL TRAVEL (APPROX. 1.5MI) AND THE ROAD WILL "Y" AND YOU WILL TAKE A LEFT CURVE AND GO THROUGH THE BUMP GATE (WHICH CAN ALSO BE OPENED BY HAND). TRAVEL THEN UNTIL YOU REACH ANOTHER BUMP GATE AND THEN STILL GO STRAIGHT UNTIL YOU REACH THE SIGN ON THE RIGHT HAND SIDE OF THE ROAD THAT SAYS "JONES, WHITEHEAD RANCH". AT THIS POINT YOU WILL MAKE A HARD LEFT TURN. THIS SIGN IS LOCATED IN AN OPEN AREA SO BE SURE NOT TO MISS IT OR YOU WILL END UP ON ANOTHER RANCH. AFTER TURNING YOU WILL GO STRAIGHT UNTIL YOU **MUST** TURN RIGHT AND GO THROUGH THE WHITE (PAINT IS PEELING) GATE. KEEP ON THIS SAME ROAD THROUGH THREE MORE GATES (WHICH DIVIDE PASTURES) IF THERE IS A CHOICE IS THE ROAD THERE WILL BE A SIGN THAT MARKS DIRECTIONS TO HEADQUARTERS. THE ONLY EXCEPTION WILL BE A RIGHT TURN THAT LEADS TO THE DEER CAMP. STAY ON THE MAIN ROAD AND IT WILL LEAD DIRECTLY TO THE HOUSE AND BARN.

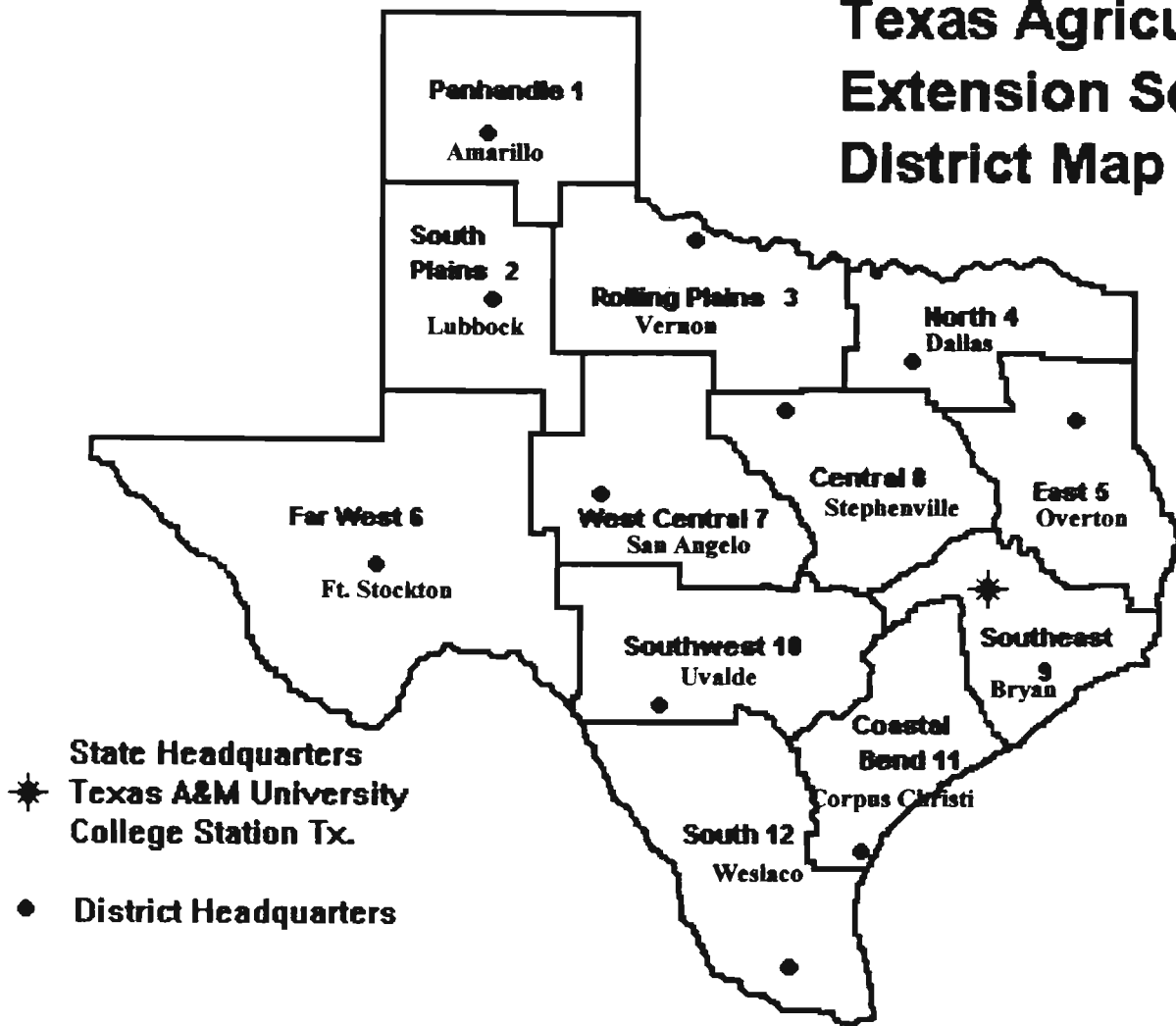
ATTACHED WITH THESE WRITTEN INSTRUCTIONS IS A MAP DEPICTING THE ABOVE DIRECTIONS FROM SONORA. IF YOU ARE COMING FROM DEL RIO, THE HIGHWAY TO JUNO IS LOCATED APPROXIMATELY 5.9 MILES FROM THE INTERSECTION OF HWY 277 AND HWY 55 (TO ROCKSPRINGS). AT THAT POINT YOU WOULD BE TURNING LEFT ONTO HWY 189.

DIRECTIONS





Texas Agricultural Extension Service District Map



**TEXAS A&M UNIVERSITY
AGRICULTURAL RESEARCH AND EXTENSION CENTER**

**West Central District 7
7887 US Highway 87 North
San Angelo, Texas 76901
Phone: 915/653-4576**

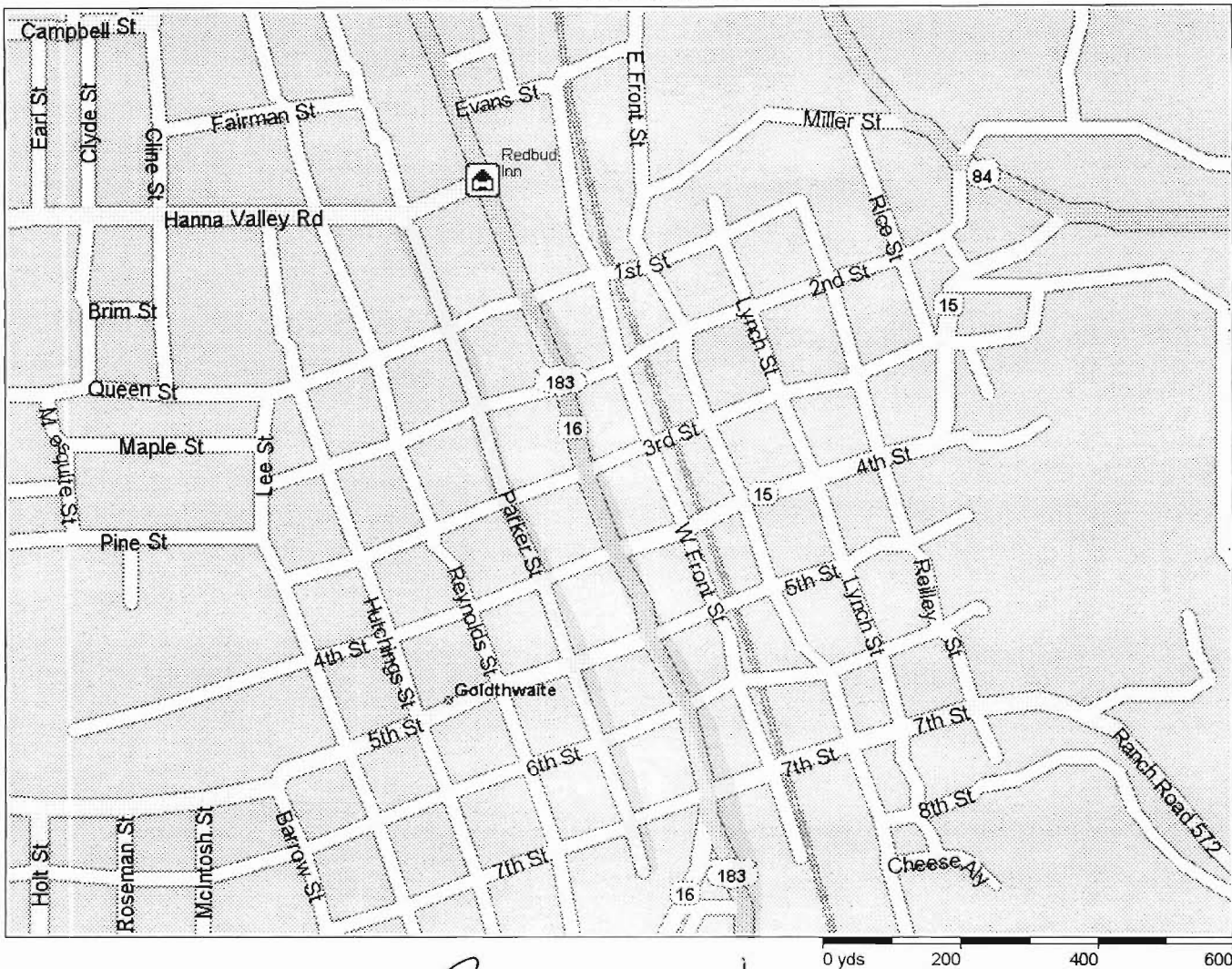
TEXAS AGRICULTURAL EXPERIMENT STATION - FAX: 915/658-4364

Dr. John Walker - Resident Director of Research
Dr. Millard Calhoun - Sheep and Goat Nutrition
Dr. Andres de la Concha - Veterinary Pathobiology
Dr. Ed Huston - Range Nutrition
Dr. Chris Lupton - Wool and Mohair
Dr. Charles Taylor - Rangeland Ecology/Grazing Management (Sonora)
Dr. Darrell Ueckert - Brush Control/Range Management
Dr. Dan Waldron - Sheep and Goat Breeding and Genetics

TEXAS AGRICULTURAL EXTENSION SERVICE - FAX:915/655-7791

Mr. Scott Durham - District Director-Agriculture
Mrs. Renee Sanders - District Director-Family & Consumer Sciences
Mr. Steve Byrns - Communications Specialist
Dr. Frank Craddock - Sheep and Goat Specialist
Dr. Tom Fuchs - Entomologist and State IPM Coordinator
Dr. Jason Johnson - Economist-Management
Dr. Allan McGinty - Range Specialist
Dr. Dale Rollins - Wildlife Specialist
Dr. Chris Sansone - Entomology Specialist
Mr. Jeffrey Sorelle - Computer Specialist
Mr. Cody Stone - Program Specialist-4-H
Dr. Billy Warrick - Agronomy Specialist
Mrs. Tamara Trail - Extension Associate-Conservation
Mr. Ken Cearley - Extension Associate-Wildlife
Mr. Andy Laughlin - Extension Assistant-Sheep and Goats
Mr. Wade Polk - Program Specialist-Risk Management

Goldthwaite, Texas, United States



Mills Co. Sooner

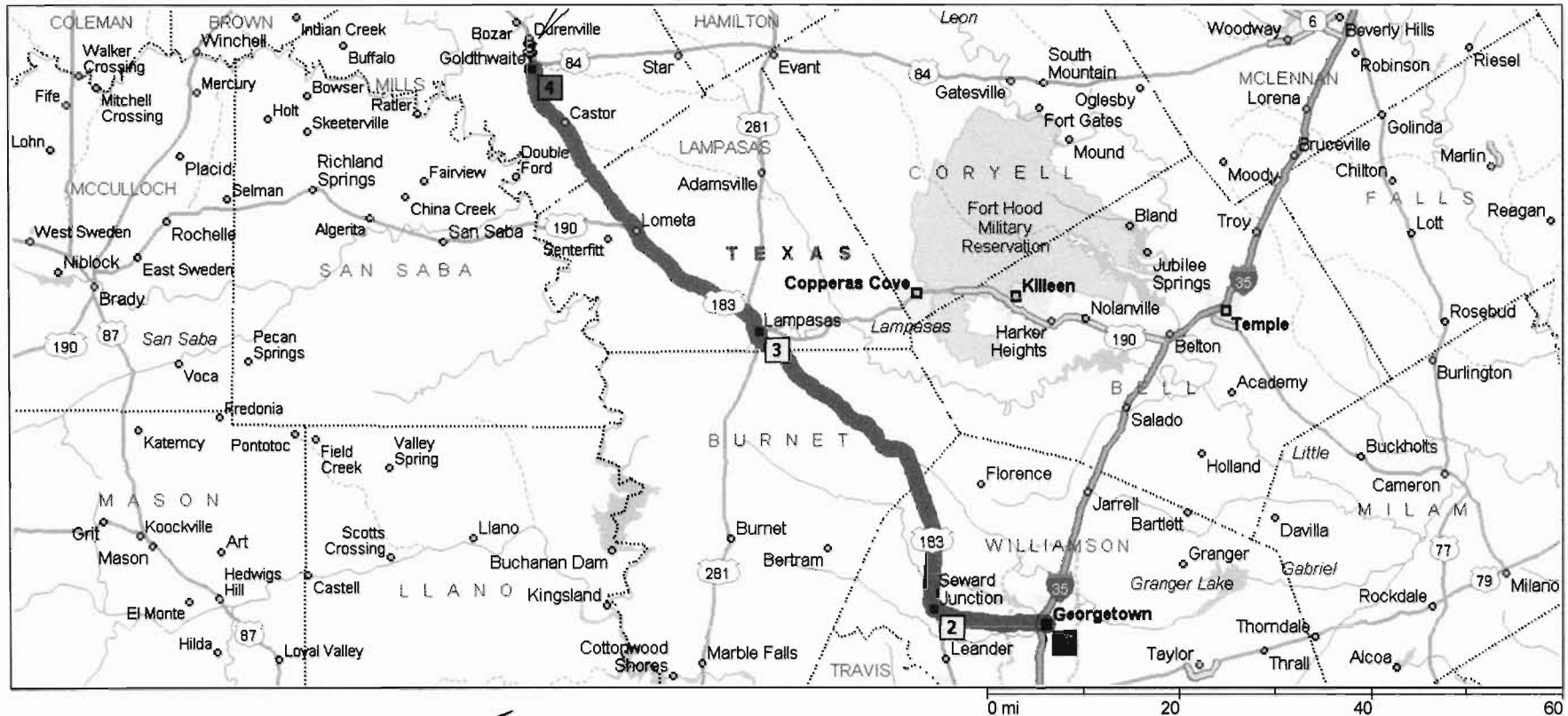
117 Parker St.

NAME — LARKIN-HOOD

Phone - 915-648-3111

- Go to first Red light
- Turn left for one block
- Turn right on Parker ST.
- One block a yellow brick building

Georgetown to Goldthwaite



- From Georgetown Take Hwy 29 to 183
- Turn right on 183
- 183 to Goldthwaite,

ANEXO: MATERIAL RECOPILADO

MATERIAL INFORMATIVO SOBRE EXPORTACIONES DESDE USA



AMERICAN GENETICS INTERNATIONAL

- - - FAX - - -

Date: March 27, 2001
To: Lou *Rachan*
From: Cherie
Subj: Airfreight to Santiago

FAX - 915-658-8741
6 pages total

From Miami, approx \$8,500 including the cost of the freight, cost of the pen, fuel surcharge, loading of the animals into the pens and transferring the pens to the aircraft, C&D of the aircraft, freight forwarders fee and an attendant.

The animals could be shipped on a DC-8, 747, or 767 depending upon the type of aircraft the airline is flying at the time. Special care needs to be taken to ensure that the aircraft does not stop for refueling in an FMD country such as Argentina.

email: Agicdlar@aol.com --- www.american-genetics.com

CORPORATE OFFICE	ADMINISTRATIVE OFFICE
5521 Greenville Ave., Suite 104, PMB440, Dallas, TX 75206	Route 1, Box 747, Highway 2869, Big Sandy, TX 75755
Tel: (214) 821-1429 --- Fax: (214) 821-5145	Tel: (903) 769-2847 --- Fax: (903) 769-2868



AMERICAN GENETICS INTERNATIONAL

- - - FAX - - -

Date: March 28, 2001

To: Luis Rocha
From: Cherie

Fax: 1-915-658-8741
10 pages total

Yes, the GSM-102 program is available for Chile and covers credit from 90 days to 3 years. There is only one bank in Chile approved by CCC, **Banco Bice**. It covers any type of livestock, semen or embryos on a C&F basis (does not cover insurance).

Attached are:

Programas de Garantia de Credito para Exportaciones de Estados Unidos - 6 pages
Program Announcement - 2 pages
Procedures for Importing Livestock through AGI - 1 page

email: Agicdlar@aol.com --- www.american-genetics.com

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5521 Greenville Ave., Suite 104, PMB440, Dallas, TX 75206
Tel: (214) 821-1429 --- Fax: (214) 821-5145

ADMINISTRATIVE OFFICE

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Tel: (903) 769-2847 --- Fax: (903) 769-2868

[Return to the FAS Home Page](#)

Programas de Garantía de Crédito para Exportaciones de Estados Unidos:

Lo que todo Importador debe saber

Marzo 1996

En muchos países es posible utilizar los programas de garantías para los créditos a la exportación del Departamento de Agricultura de los Estados Unidos (USDA) para ayudar a financiar la importación de alimentos y productos agropecuarios de los Estados Unidos con condiciones de pagos diferidos. Estos programas de garantía de créditos garantizan el pago para los bancos de los Estados Unidos que otorgan créditos a los bancos del país importador para financiar la exportación de productos agropecuarios de los Estados Unidos. La reducción del riesgo puede reflejarse en tasas de interés más bajas y en menores costos de financiamiento de los que se obtendría sin la garantía del USDA, o bien podría significar la diferencia entre la disponibilidad de financiamiento por parte de bancos de los Estados Unidos y la imposibilidad de obtenerlo.

En este folleto se ofrecen respuestas a preguntas que comúnmente se hacen los importadores acerca de cómo participar en los programas de garantía para los créditos a las exportaciones de los Estados Unidos. En la parte de atrás encontrará una guía especial para importadores con los pasos básicos para participar en estos programas, así como una explicación sobre a quién contactar para obtener información más detallada.

Qué son estos programas?

El Departamento de Agricultura de los Estados Unidos (USDA) maneja dos programas de garantía de crédito para promover la exportación de productos agropecuarios de los Estados Unidos. El primero proporciona cobertura para el financiamiento con plazos de crédito de 6 meses a tres años, y el segundo, que cubre los créditos a más de tres años pero sin pasar de 10 años. El programa de crédito de corto plazo se denomina GSM-102, y el de mediano plazo GSM-103. Estos dos programas cubren créditos comerciales otorgados para el financiamiento de ventas y no constituyen un subsidio o una forma de ayuda en alimentos.

En ambos programas la CCC (Corporación de Crédito para Productos Agropecuarios del USDA) avala los créditos extendidos por los bancos estadounidenses a los bancos extranjeros, los cuales utilizan cartas de crédito irrevocables, en dólares de los Estados Unidos, como forma de pago para los productos agrícolas importados. (1) Las cartas de crédito deben ser abiertas de acuerdo a las instrucciones del importador, el cual a su vez tiene la opción de negociar sus propios términos de crédito con los bancos locales, a fin de permitirles realizar los pagos diferidos por los productos agropecuarios importados de los Estados Unidos. (2)

Cuáles son los productos agropecuarios cubiertos por las garantías de crédito?

El USDA considerará el proporcionar garantías de crédito para un país determinado, para cualquier producto totalmente producido en los Estados Unidos, con la condición de que dicha acción tienda a preservar o ampliar el mercado para las exportaciones de ese producto de los Estados Unidos hacia ese país. En general los productos agrícolas deben ser alimentos para consumo humano y animal, fibra vegetal, o productos similares. Productos forestales, tales como la madera aserrada y la pulpa.

así como el pescado, han sido definidos por el Congreso de los Estados Unidos como productos agrícolas para los fines de estos programas, y también disfrutaron de la cobertura de los mismos. A la fecha se ha dado cobertura a productos tan variados como algodón, aceite vegetal, pollitos para cría y postes telefónicos. El programa GSM-103 se enfoca en un número de productos mas limitado, tales como trigo y ganado para cría.

Hay algunos productos que estén excluidos de esta cobertura?

Todos los productos deben de cumplir con los requerimientos de las leyes de origen de los Estados Unidos. Los insumos agropecuarios manufacturados, como plaguicidas, fertilizantes, maquinaria o suplementos vitamínicos, no están cubiertos por los programas.

Existen otras restricciones en el programa?

Todos los productos deberán estar sujetos a una revisión de precios para poder tener derecho a financiamiento. Es decir, debe estar disponible la información de comercialización necesaria para que la CCC pueda determinar si el precio de venta está dentro de los límites prevalecientes en el mercado.

Normalmente solo se otorgan garantías a importadores en cuyos países existen bancos aprobados para emitir cartas de crédito. Sin embargo, el USDA puede anunciar asignaciones de garantías para ventas a países en una región específica, donde no todos éstos países tienen bancos aprobados para participar con la CCC. Las exportaciones a éstos países serán cubiertas en tanto los importadores puedan conseguir cartas de crédito a través de bancos aprobados por la CCC en otros países de la región.

Cómo puedo ser candidato para participar en estos programas?

Cualquier comprador, localizado en un país con acceso a los programas GSM, puede hacer un contrato con un exportador estadounidense y trabajar con un banco de su país (el cual ha sido previamente aprobado por la CCC) para obtener la carta de crédito necesaria para la garantía de la CCC. Los importadores de algunos países pueden verse restringidos por las leyes y regulaciones de sus gobiernos con respecto a la importación de ciertos productos, o por su habilidad para obtener la mencionada carta de crédito.

Qué es lo que cubre la garantía?

Por lo general, la garantía del gobierno de los Estados Unidos cubre el 98 por ciento del valor en puerto del producto exportado, determinado en el punto de exportación de los Estados Unidos, además de una porción de los intereses sobre el financiamiento. La cobertura de la garantía por lo general se limita al crédito otorgado únicamente por el valor del producto. Sin embargo, la CCC, en circunstancias muy especiales podrá dar cobertura sobre créditos otorgados para costos de fletes en las que el exportador estadounidense efectúa la venta sobre la base de costo y flete, o de costo, flete y seguro.

Cómo conoce el importador cuáles bancos participan en el financiamiento?

Los anuncios de la CCC sobre nuevas coberturas pueden incluir los nombres de los bancos aprobados en un país o región. Este es un caso típico cuando únicamente uno o dos bancos del país han sido aprobados. Por el contrario, cuando un gran número de bancos son aprobados los anuncios no nombran los bancos específicos, sino que se refieren a éstos como "cualquier banco aprobado por la CCC", la cual notifica a los bancos acerca de su aprobación. Para asistencia con respecto a los nombres de las instituciones bancarias aprobadas se debe contactar al Agregado Agrícola de la Embajada de los Estados Unidos en el país, o al Agregado de Economía o Comercial, en casos en que el USDA no tenga funcionarios permanentes en el país.

Quién tramita el financiamiento?

Por lo general los bancos en el país importador establecen líneas de crédito con bancos estadounidenses de acuerdo con la cobertura anunciada por la CCC para el país importador. El importador debe negociar un acuerdo con el banco de su país para que éste le emita una carta de crédito (que deberá ser garantizada por la CCC) y para financiar la importación. Es entonces cuando el exportador estadounidense deberá aplicar por su garantía.

Los importadores que quieran utilizar estos programas deberán recordar que la CCC únicamente garantiza los arreglos de financiamiento entre los bancos. El otorgamiento de crédito a un banco extranjero de ninguna manera implica que el importador recibirá beneficios del crédito por parte del banco en el país importador. Los créditos en moneda otorgados al importador por el banco de su país es cuestión de negocios entre esas dos partes y tales negociaciones quedan totalmente fuera del control y la responsabilidad de la CCC.

Qué trámites se necesitan?

La mayoría de los detalles técnicos que conciernen las transacciones de crédito cubiertas por la garantía, deberán ser manejados por el exportador estadounidense, el banco extranjero y el banco de los Estados Unidos. Para el comprador y el vendedor la transacción es similar a otras ventas comerciales que necesitan cartas de crédito.

Para que un exportador estadounidense pueda hacer los arreglos que permitan que la compra del importador esté respaldada por una garantía de la CCC, el banco local deberá expedir una carta de crédito a nombre del exportador estadounidense en la que se cubra el pago de los productos en dólares de los Estados Unidos. La carta de crédito y el contrato de compra-venta relativo, deberán especificar los documentos requeridos que hayan acordado el importador, el exportador, el banco extranjero y el banco estadounidense. Los documentos requeridos para los programas GSM-102 y GSM-103 son responsabilidad de los exportadores estadounidenses, quienes solicitarán a los importadores los documentos adicionales previamente acordados.

Para qué necesito una carta de crédito?

Una carta de crédito es una práctica comercial bien establecida para recibir pagos por todo tipo de transacciones. Sigue siendo el mejor medio disponible para garantizar que la CCC pueda contar con la documentación completa de la operación. Una carta de crédito también hace que los bancos en el país importador evalúen su capacidad financiera. Lo que releva a la CCC de esa tarea.

Si los envíos son financiados por medio de una carta de crédito por bancos privados de los Estados Unidos, por qué es necesaria una garantía del gobierno de los Estados Unidos?

Si las exportaciones son financiadas por medio de cartas de crédito por bancos privados de los Estados Unidos entonces no es necesaria la garantía. Sin embargo, una garantía de la CCC puede facilitar la obtención de un crédito en casos en los que un banco privado de los Estados Unidos quizá no esté dispuesto a financiar exportaciones a crédito. Por tanto, quizá la garantía de la CCC sea la única forma en que los bancos en su propio país puedan obtener crédito para ayudar a pagar una importación agropecuaria de los Estados Unidos. A su vez, la garantía le puede permitir al banco extranjero solicitar a los bancos estadounidenses mayores créditos y en condiciones más favorables, los cuales no estarían disponibles de otra manera.

Cuál es el costo de utilizar estos programas?

Los costos del importador pueden variar dependiendo del país en el cual se realiza la importación y

Lo que todo Importador debe saber

de los arreglos particulares negociados entre el exportador estadounidense y el banco extranjero. Normalmente, el importador deberá pagar como mínimo los gastos por apertura de la carta de crédito y otros costos asociados con la transacción, así como intereses y gastos por cualquier crédito concedido por el banco local. La cuota de la garantía es pagada una única vez por el exportador y es equivalente a un determinado porcentaje del valor garantizado. Para el programa GSM-102 las cuotas son menores al uno por ciento, y en el caso de créditos a largo plazo (GSM-103) las cuotas son mayores. Las cuotas exactas son anunciadas por la CCC en sus listas de cuotas.

Cómo se determina la tasa de interés?

El costo del financiamiento es negociado entre los bancos en el país importador y en los Estados Unidos. Por lo general el tipo de interés es flotante (ajustado periódicamente) y se encuentra ligado a la tasa "prime" de los Estados Unidos o la tasa interbancaria de Londres (LIBOR).

Las tasas de interés sobre cualquier crédito local otorgado al importador por el banco en su país son materia de negociación entre esas dos partes.

Cómo se pagan los intereses?

Usualmente el capital y los intereses se pagan por medio de un traspaso bancario de rutina al banco de los Estados Unidos que haya financiado la operación, a las tasas y en los plazos especificados en la carta de crédito o en el convenio de financiamiento correspondiente entre el banco de los Estados Unidos y el banco nacional. La CCC requiere que el total de intereses devengados se pague en cada plazo en que vence el capital, y el capital es pagadero por lo menos anualmente. Es posible que los bancos en los Estados Unidos requieran que se pague el interés a intervalos más frecuentes que el capital.

Se puede pagar el crédito anticipadamente?

Es posible. Cualquier arreglo en cuanto al crédito se hace con el banco en el país importador. Estos convenios de crédito no son gobernados por las reglas de la CCC.

Si se paga por anticipado sería posible eliminar algunos de los cargos?

También aquí la respuesta es que un pago anticipado únicamente afecta el arreglo al que se haya llegado con el banco en el país importador. En cualquier caso, el pago anticipado del crédito no eliminaría una serie de costos como los de las cartas de crédito, documentación y comisión por conversión de divisas. Tampoco afectaría la comisión de la CCC por la cobertura de la garantía, que se calcula sobre la base del plazo original del crédito y que no es reembolsable al exportador.

Es necesario reportar la llegada del producto?

Sí, en algunos casos. El exportador requiere documentación que demuestre que el producto se ha internado en el país destinatario. El exportador es el responsable de obtener esta documentación, y las normas del país importador en cuanto a importaciones determinarán si la información procede del importador, del banco local, del gobierno importador, o de alguna otra parte.

Cómo puedo averiguar si hay disponibilidad de garantías de crédito o solicitar cobertura para algún producto que no esté incluido en estos programas?

Debe comunicarse con el funcionario de agricultura de los Estados Unidos en su país. Esta persona tendrá información sobre la disponibilidad de garantías de crédito para la venta de productos específicos a su país. En los países en donde el USDA no tiene un funcionario de agricultura permanente es posible comunicarse con el Consejero Comercial o para Asuntos Económicos de la

Embajada de los Estados Unidos en el país, o escribir al USDA a la dirección que aparece en la parte de atrás de este folleto.

En su solicitud deberá dar la información específica sobre el país, el producto de interés, la cantidad, el valor estimado, el período de envío, el plazo de crédito deseado, y en caso de contar con el mismo, el nombre del banco extranjero que expide la carta de crédito.

Las solicitudes deberán ser presentadas lo más pronto posible, recordando que el programa opera basado en el año fiscal de los Estados Unidos que es del 1 de octubre al 30 de setiembre. Las ventas contra la cobertura de un año fiscal dado, deberán ser registradas por los exportadores antes del 30 de setiembre, aún cuando el producto pueda enviarse hasta el mes de noviembre, inclusive. La autorización de la garantía por parte de la CCC se basa en la situación económica y financiera del país importador, su potencial como mercado para productos agropecuarios de los Estados Unidos, la existencia de bancos aprobados por la CCC para abrir cartas de crédito y la disponibilidad de cobertura dentro de los niveles globales del programa.

El Departamento de Agricultura de los Estados Unidos prohíbe la discriminación en base a raza, color, nacionalidad, sexo, religión, edad, incapacidad física, creencias políticas y estado civil (no todas las prohibiciones aplican a todos los programas). Personas con incapacidades y que requieran información sobre los programas (por ejemplo Braille, video, cassette de audio, etc) deberán contactar la oficina de comunicaciones del USDA al teléfono (202) 720-2791.

Para interponer una queja por favor escriba al Secretario de Agricultura, Departamento de Agricultura de los Estados Unidos, Washington DC 20250, o llame a los teléfonos (202) 720-7327 (voz) o (202) 720-1127 (TDD). El USDA ofrece igualdad de empleo.

Pasos para Participar en los Programas de Garantía de Créditos para Exportaciones Agropecuarias de los Estados Unidos

A continuación se presenta una lista de pasos que se deben seguir para poder utilizar los programas de garantía de créditos para la exportación de la CCC. Dichos pasos no se presentan en orden cronológico específico y es posible adelantar algunos o llevar otros a cabo en una fase posterior del proceso.

1. Averiguar si la Corporación de Créditos para Productos Agropecuarios (CCC) del USDA ha anunciado la cobertura de garantía de créditos para su país y el producto que le interesa. Adicionalmente a los contactos mencionados en este folleto, los exportadores estadounidenses y/o los bancos extranjeros pueden proveer esta información.
2. Si hay cobertura disponible, se debe identificar a un exportador estadounidense que sea elegible para la garantía de la CCC, y que esté dispuesto a vender su producto en términos satisfactorios.
3. Determinar que bancos han sido aprobados por la CCC y tiene convenios de crédito con instituciones estadounidenses para trabajar con los programas de crédito para exportaciones GSM 102/103. Obtener un acuerdo preliminar con uno de estos bancos en el que el banco se comprometa a manejar la transacción.
4. Celebrar un contrato de compra-venta a crédito con un exportador estadounidense, consistente con las asignaciones de la CCC para países y productos. El exportador estadounidense registrará la venta con la CCC para la garantía de pago.
5. Tramitar que el banco local envíe al banco de los Estados Unidos una carta de crédito irrevocable exclusivamente en dólares a nombre del exportador y/o proveedor de ese país.

6. Cuando el banco de los Estados Unidos notifique al exportador de la carta de crédito o la confirme, el exportador enviará el producto.

7. Para el cobro, el exportador presentará al banco de los Estados Unidos los documentos generados por la operación de exportación, junto con la garantía de la CCC. Cuando el banco de los Estados Unidos pague al exportador por el producto enviado al amparo de su carta de crédito, se activa una línea de crédito y el banco enviará los documentos al banco del importador.

8. El banco del importador liquida la operación y le expide al importador los documentos necesarios.

9. El importador recibe el producto y le paga a su banco según el acuerdo que tenga con éste. El pago podrá incluir capital e intereses, gastos por la carta de crédito, la documentación, divisas, garantía y cualquier otra cuota que cobre el banco local.

10. El importador proporciona al exportador estadounidense copias de la documentación de internamiento, según sea apropiado.

11. El banco del importador pagará el capital y los intereses según lo programado en su arreglo de financiamiento con el banco de los Estados Unidos.

Para mayor información, contactar al Agregado Agrícola en la Embajada de los Estados Unidos de su país, o escriba al Deputy Administrator, Export Credits, Foreign Agricultural Service, U.S. Department of Agriculture, AG Box 1031, Washington DC 20250-1031, fax (202) 720-2949.

NOTAS

1. La garantía de la CCC es extendida al exportador de los Estados Unidos quien normalmente asigna esta garantía a la institución financiera estadounidense, la cual a su vez extiende el crédito al banco extranjero. De esta manera, el exportador estadounidense puede recibir su pago, por parte del banco en los Estados Unidos, una vez que hayan sido presentados todos los documentos solicitados en los términos de la carta de crédito. Sin embargo, el exportador estadounidense no está obligado a asignar la garantía de la CCC. En su lugar, el exportador puede recibir los pagos diferidos directamente del banco extranjero, de acuerdo a los términos de la carta de crédito del banco extranjero. Dado que ésta última situación se presenta en muy limitadas ocasiones, no será discutida más ampliamente en este folleto.

2. La garantía de la CCC, una vez asignada al banco de los Estados Unidos, cubre únicamente el crédito extendido por esta institución al banco extranjero. El banco extranjero no está obligado a aceptar todos los términos del crédito de los Estados Unidos o del importador.

Last modified: Friday, April 10, 1998

News Releases

USDA EXTENDS GSM-102 CREDIT GUARANTEES TO SOUTH AMERICA REGION

WASHINGTON, Nov. 2, 2000—The U.S. Department of Agriculture has authorized \$370 million in credit guarantees for sales of U.S. agricultural commodities to the South America Region under the Commodity Credit Corporation's Export Credit Guarantee Program (GSM-102) for fiscal year 2001. The South America Region includes Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, and Venezuela.

This program announcement is issued in accordance with 7 C.F.R. 1493.10(d).

COMMODITY ALLOCATIONS

According to Richard Fritz, general sales manager for USDA's Foreign Agricultural Service, exporters may apply for credit guarantees on a first-come, first-served basis to cover sales of any of the commodities specified in the GSM list of commodities published in FAS program announcement PR 0240-00 issued June 12, 2000, or as superseded. The latest commodity list can be obtained by accessing the FAS home page as specified below.

The allocation does not assign dollar amounts to any of the commodities specified in the GSM list of commodities, providing buyers and sellers maximum flexibility in arranging the size of their transactions within the scope of the overall allocation.

TERMS OF COVERAGE

In accordance with section 1493.20(v)(1), this announcement offers coverage on an f.a.s. or f.o.b. basis. For commodities sold on a C&F or C.I.F. basis, coverage to point of ocean vessel or international air carrier discharge is also available in accordance with section 1493.20(v)(2). Coverage is not available under this announcement for insurance costs.

Coverage of up to 98 percent of the principal is offered on credit terms from 90 days to 3 years, except for solid wood products, wood pulp, and wood chips, for which coverage is offered on credit terms of up to 720 days. Adjustable interest coverage is also offered in accordance with FAS program announcement PR 1080-94, issued Sept. 26, 1994. X

ELIGIBLE BANKS

Any bank approved by CCC in Argentina, Bolivia, Brazil, Chile, Colombia, and Venezuela is eligible. Also, any CCC-approved offshore branch (e.g., Cayman Islands, Bahamas, Netherlands Antilles) is eligible. Exporters are advised to obtain from their foreign buyer the name of the CCC-approved foreign bank that will be opening the letter of credit.

GUARANTEE FEE RATES

Pursuant to section 1493.70, fees are as stated in FAS program announcement PR 1080-94, issued Sept. 26, 1994.

SPECIAL TERMS AND CONDITIONS

Sales must be registered with CCC by Sept. 30, 2001, and exporters' contractual arrangements must call for exports no later than Nov. 30, 2001.

POINTS OF CONTACT

FAS home page: <http://www.fas.usda.gov> and by fax

polling. Callers should set their fax machines for polling and dial (202) 720-1728. For additional information, contact FAS Information Division at (202) 720-7115.

In the event of any discrepancy between the *FAS Online* home page version of this release and the standard FAS release (available in hard copy and by facsimile from FAS), the standard release shall prevail as establishing terms and conditions of any CCC payment guarantees issued pursuant to this release.

PR 0460-00

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AMERICAN GENETICS INTERNATIONAL

Importando el Ganado que usa el Crédito a Exportación GSM-102 Programe

1. La Genética Americana Internacional (AGI) preparará una "factura proforma preliminar" y un "acuerdo de compra" de ser utilizado en discusiones con un banco brasileño que ha sido aprobada por CCC que abrirá carta.
2. El comprador solicitará un préstamo con un banco aprobada CCC, usando el programa del crédito a exportación GSM-102.
3. Una vez que el comprador haya obtenido la aprobación de préstamo de su banco brasileño, él o su banco necesita proveer de AGI la información siguiente:
 - a. el nombre y el direccionamiento de el banco brasileño que va abrir la Carta de Credito
 - b. término que el crédito está siendo extendido entre el la banco brasileño y el banco de los E.E.U.U. y los intervalos entre los pagos principales (pagos semestrales o anuales).
4. El comprador pagara electronicamente el honorario de registro del G/M a la cuenta de AGI para poder colocarse la venta con el CCC.
5. AGI comenzará a localizar y a identificar los animales que resuelven los requisitos del comprador y establecerá un itinerario de la inspección y selección.
6. Después de la selección de los animales, una factura proforma final será preparada que muestra el valor del total C&F del envío. Esta factura proforma será utilizada por el comprador para obtener su licencia de la importación.
7. En el plazo de 10 días que siguen la selección, el comprador remitirá a AGI un depósito 20% basado en el precio portuario F.O.B. de los animales.
8. Después de la selección, el CCC publicará un número de referencia que sea remitido por AGI al comprador. Este número de referencia necesita ser incluido en de Carta de Credito (L/C) cuando se abre.
9. El comprador abrirá el L/C para el valor completo de la factura comercial y el depósito 20% será enviado al comprador después de que el L/C sea pagado.
10. Una vez que se haya abierto el L/C y una copia se ha enviado a AGI, los animales comenzarán la prueba de la salud. Se espera que los animales sean enviados en el plazo de 45 días que siguen el comienzo de la prueba de la salud.
11. Después del envío, AGI someterá documentos al banco que confirma de los E.E.U.U. para la negociación del L/C. Cuando se financia el L/C, el depósito 20% será transferido de nuevo al comprador y el CCC será notificado que se ha terminado la venta.

email: Agicdlar@aol.com --- www.american-genetics.com

CORPORATE OFFICE
5521 Greenville Ave., Suite 104, PMB440, Dallas, TX 75206
Tel: (214) 821-1429 --- Fax: (214) 821-5145

ADMINISTRATIVE OFFICE
Route 1, Box 747, Highway 2869, Big Sandy, TX 75755
Tel: (903) 769-2847 --- Fax: (903) 769-2868

USDA-APHIS

USDA-APHIS
4700 River Road Unit 59
Riverdale, MD
20737

Phone: 1-801-734-4336; 754-8066
(direct)
FAX: 1-301-734-3222
email: Bob.H.Bokma@usda.gov

Facsimile

To: Cheri Derouin, American Genetics
International
Cc: Lou Rocha, Elia Vanechanos
@Fax: 1-903-769-2868, 56-2 330-3203
From: Bob H. Bokma, DVM, MPVM Dipl
ACVPM
Date: Monday, March 12, 2001 @ 9:59AM
Re: New Chilean goat and sheep semen
requirements
Pages: 4, including this

Dear Cheri;

I spoke with Lou Rocha today, informed him of these new requirements, as summarized by Mr. Lew Stockard, FAS, Santiago Chile.

Regarding Boer goats and goat semen from TX, a serious problem is that of their Bluetongue requirement. By copy of this note, I am informing APHIS in Santiago of our interest in negotiating these requirements, we could offer animals blood tested negative repeatedly by Virus isolation for bluetongue.

I am also requesting that APHIS in Santiago inquire as to the status of any standards for facilities for collection of semen.

Best regards,

Bob Bokma
New phone number 1-301-734-8066



Voluntary Report - public distribution Date: 1/25/2001

GAIN Report #CI1006

Chile

Livestock and Products

New Rule for Imports of Ovine and Caprine Semen

2001

Approved by:

Lewis J. Stockard

U.S. Embassy, Santiago

Prepared by:

Lewis J. Stockard

Report Highlights:

On January 20, Chile published a final rule establishing new sanitary requirements for imports of ovine and caprine semen.

Includes PSD changes: No

Includes Trade Matrix: No

Unscheduled Report

Santiago [CI1006], CI

10

10

GAIN Report #CI1006

4. **Animals Residing in Facility** - Once the animals have entered the facility, they must be under the constant supervision of an authorized veterinarian and show no clinical signs of the infectious contagious diseases (List B of the OIE) during 6 months prior to the first collection of semen destined for Chile, and for 40 days after the last collection.

The animals at the facility must show negative results every two years for four diseases, including blue tongue and brucellosis. These tests must be conducted in officially authorized labs and will not be required if the competent authority certifies that the country of origin is free of the disease.

5. Donor - The animal must reside in the facility for at least 30 days before and after the collection of semen destined for Chile, and not have shown clinical signs of disease nor have been used for natural breeding.

6. Semen - The collection, treatment, conditioning and storage of semen will only be done in facilities designed for this purpose, using materials which are washed, disinfected and sterilized. Only semen collected in that facility may be processed there. The semen can only be diluted with pathogen-free material.

End Summary

UNCLASSIFIED Foreign Agricultural Service/USDA

MATERIAL INFORMATIVO
PROPORCIONADO POR EL SEÑOR FRED
HOMEYER (RANCHO ANTELOPE CREEK)

MEDICAL TIPS FOR GOAT RAISERS

Anyone that has raised goats for any length of time has had a sick goat. When we have a sick goat our primary concern is doing whatever is necessary to get the goat well as soon as possible. Most of us can't take our animals to the vet. every time they get a runny nose, therefore, unless we happen to be extremely wealthy, we must learn to doctor our sick animals when they come down with minor health problems. Of course, major health problems still need the attention of a qualified vet. Determining which problems are major and which ones or minor will depend upon your personal experience and knowledge of goats and their care. I am fortunate to know an outstanding vet that has taken the time to learn about goats and their medical problems. He has shared a lot of valuable information with me that has made it possible for me to take care of my goats when they have minor medical problems. I should mention that I have also read almost everything that I can find regarding goat medicine. This includes the book, "Goat Medicine" by Smith and Sherman as well as several other less technical publications. I also have a Merck Veterinary Manual in my library that comes in handy from time to time.

Very few if any medicines are manufactured explicitly for goats and there are not many medicines that list goats on the label. You should be aware that when a medicine, even one that can be bought over the counter at your local feed store, does not list goats on the label, the use of this medicine on a goat becomes what is know as "extra label". That means that administering this medicine to your goat needs to be under the supervision of a vet. This would include something as simple as an aspirin. Therefore, before you give any medicine to your animal it might be helpful to talk with your vet.

The following goat medicine tips were developed from positive experiences with my goats during the past three years. If you have some effective procedures that you would like to share and add to this list, please let me know. You should also be aware that I am not a vet. and that I am not advocating that you use any of the techniques that I am going to describe below. This article is simply the documentation of my experiences with my goats. Some of these things may not work with your animals. The last thing that I would recommend before relating my experience is that you should always consult your vet. whenever you have a question about doctoring your goat. More and more vets are becoming knowledgeable about goats and goat medicine.

Worming - I use injectable IVOMEC. The directions specify to use 1cc per 100 pounds but I use 1.5 cc for nannies and 2 cc for larger billies. I draw up the IVOMEC in a syringe and then

remove the needle and shoot the liquid on the goat's tongue. You could also inject the liquid intramuscularly if you want. Every other time that I worm my goats, I used a colored drench rather than a clear drench. If I have more than a few goats to worm I use IVOMEC sheep drench instead of the injectable type and I use a standard drench gun to administer the drench in their mouth. I am careful not to injure the goat's mouth when inserting the drench gun. Being from dry West Texas I normally drench my goats twice a year. If I lived in a wetter climate I would have to drench more often. Collecting a fecal sample and taking it to your vet for analysis will determine when you need to worm your goats. The type of parasites present in the fecal sample may also determine which drench to use. I would contact my vet before using IVOMEC since it is not labeled for use on goats. There are parts of the world where goats are becoming resistant to various worming drenches. Some efforts have even been made to try to develop more worm-resistant goats through selective breeding.

Pinkeye - When the goat's eye begins to water, I shoot 1 cc of Tylan 200 onto the eye. I draw up 1 cc in a syringe, remove the needle and shoot the liquid onto the eyeball. Of course, I use rubber gloves as pinkeye is very contagious. If the pinkeye is worse when I first discover it, I will spray some Furox (nitrofurazone) directly onto the eye from a spray can or I will shoot penicillin directly on the eyeball. I doctor the goat everyday until the pinkeye clears up (which it will normally do in 14 to 21 days). In advanced cases of pinkeye where the goat is already blind, I will give 2.5 cc of LA200 intramuscularly and shoot approximately 1 cc of penicillin onto the eyeball. Sometimes an intramuscular shot of evaporated milk (such as Pet Milk or Carnation Milk) will help cure pinkeye. This procedure introduces a foreign enzyme into the goat's system and they will produce antibodies to combat the milk which will also fight the pinkeye. In any event, I contact my vet. before using drugs such as Tylan 200, LA200 or penicillin as giving these medicines to goats is an "extra label" therapy. (None of these three medicines list goats on the label.)

Scours - I initially give the goat 5 cc of probiosis if it is an adult goat and 1 cc of Spectam (Spectinomycin) for young kids. Watch your kids closely as e. coli (a disease of the gut) can kill a kid very quickly. If the color of the scours is green, it may be caused from overeating on new feed or feed that is too high in protein. In the case of kid goats that are still nursing or on a bottle, I would suspect e.coli and give them Spectam immediately!. If this does not clear the situation up in two days I would contact my vet. For adult goats, if the scours does not clear up after giving the probiosis, I will give from 5 to 10 cc of pepto-bismol drawn up in a syringe and shot into the goat's mouth with the needle removed from the syringe. If the condition continues in an adult goat for more than 4 or 5 days, I will contact my vet. There are products such as Baytril which your

vet may prescribe for extreme cases of scours. Baytril has been banned by the FDA for use in animals that are to be used for meat. Baytril leaves a potentially harmful residue in the goat's body. If the scours look bloody, either red or perhaps dark like dried blood, I would suspect coccidiosis and would contact my vet immediately. Products such as Corid may be helpful in dealing with coccidiosis but your vet will advise you on this. I isolate any goat with coccidiosis from the rest of the herd to prevent its spread through the herd. Coccidiosis can normally be prevented by feeding specially formulated rations that contain a coccidiostat such as rumensin or decox. I also make sure that the special ration contains ammonium chloride to prevent urinary calculi (water belly) in the male goats.

Consistent coughing - I use 2.5cc of LA200 for does and 3 cc for large bucks. When I give an LA200 shot I also give the goat 5 cc of probiosis to cut down on possible scours. The antibiotic in LA200 can upset the flora in the goat's stomach. LA200 has a 3 day residual (the shot lasts for 3 days in the goat's system) so you should see marked improvement in a couple of days. After giving 2 shots of LA200 over a 6 day period and the condition has not improved, I would contact a vet. If the goat contracts pneumonia you might have to use a drug such as Naxcil that would be prescribed by your vet. This drug must be kept cool and records must be kept by the vet that administers the drug. Goats will normally cough a little bit during the day as they bring up their cud for chewing or when they breath a little dust in the air. There is a difference between an occasional cough and consistent coughing. You should be able to tell the difference. The probiotic (probiosis) that I use is called Receiving Gel and is manufactured by Dura-Vet. The tube of receiving gel holds 80 cc and costs a little less then probiosis. I get this medicine at my feed store. If you can't get probiosis, cultured butter milk will help to stimulate the flora in the goat's rumen.

Runny Nose - If the drainage is clear, this is usually caused by allergies. If the drainage has some color to it, I give from 3 to 5 cc of penicillin in the muscle. I give shots in the large neck muscle or in the hind leg (not a great idea as you may hit a nerve and permanently cripple the goat.) I normally repeat this procedure for 5 days. The weight of the goat will determine the dosage of penicillin to use. A good rule of thumb is 10,000 units of penicillin for each pound of body weight. I look at the label on the bottle of penicillin to determine how many units are in a cc of medicine. Normally there will be 300,000 units per cc so a 30 pound goat would get 1 cc of penicillin per injection. A 100 pound goat would get about 3.5 ccs (100 pounds times 10,000 equals 10,000,000 units or about 3.5 cc). Sometimes a runny nose is accompanied by yellow drainage from the eyes. The biggest problem with using penicillin is that most people don't use a large enough dose and only the weaker bacteria die, leaving the stronger bacteria and the goat gets sicker instead of well.

Penicillin kills many types of bacteria. Before using penicillin I would consult my vet for instructions and supervision.

Trimming hooves - If the goats are confined in pens and are getting a high protein feed, I trim their hooves about once a month. I use a commercial hoof trimming tool for this. My trimming tool is made by Berdizo. (Very, very sharp so be careful!) There are several good trimmers on the market but I like the Berdizo trimmer the best. If I cut too deeply into the hoof and cause the goat's foot to bleed I use blood stop powder and then spray some wound-kote over the powder. Watch the goat closely for a couple of days as they can easily bleed to death through their feet. I trim the hoof very gradually, cutting off a small amount of material at a time. I try to make the goat's hoof look like a kid goat's hoof, that is, level across the bottom so that the goat will stand upright on it's feet. Badly neglected hooves may take several trimmings over a month or more before I get the hoof formed properly. Some people also use sandpaper or a rasp to help shape the bottom of the foot.

Feed - For goats in pens (intensive management), I use a specially formulated ration that is 17% protein and is made in 1/4" pellets. More and more feed companies are making a special goat ration. The one that I use is made by a local company named Angelo Pellets and the feed is called 17% Goat Grower. Another feed that I use for my show goat prospects is called N-timidator. This feed was developed by a man named, Terry Blair (a nutritionist) and is also sold at Angelo Pellets in San Angelo, Texas. Both of these feeds contain a coccidiostat to prevent coccidiosis and ammonium chloride to prevent urinary calculi (water belly) in male goats. Male goats living in pens and fed a concentrated, high-protein ration can develop solid crystals or calculi (rocks) in the urethra which prevents the goat from urinating. This condition is called water belly, is very painful for the goat and can quickly develop into a very serious life-threatening situation. Water belly requires immediate attention from the vet. I supplement feed goats in pastures with 20% protein 1/2" cubes. I begin creep feeding my kids at 10 days by putting Goat Grower in creep feeders that I have built for this purpose. The creep feeder is made from steel rods and is 4 feet square and 4 feet high. I surround the feeder with 2 x 4 inch mesh wire and leave the front open for the kids to enter the feeder. The front has bars spaced 5 inches apart. This distance between bars will allow the kids to enter and will keep the adult goats out of the creep feeder. I put the feed in special plastic trays inside the creep feeder. I have found that a 3/16" pellet size is even better than a 1/4" pellet if your feed store can make it for you. The kid goats seem to prefer the smaller pellet. I feed my big bucks that are not in the current breeding program in a separate pasture. The feed I use is called AP-40. This feed is medicated and contains a lot of cottonseed hulls for bulk. AP-40 is normally about 9% protein and does not contain ammonium chloride.

Flushing Does and Bucks - I normally flush (or supplement feed) my does with more feed for the 45 days before breeding and continue this higher supplement for 45 days after breeding. The purpose of this is to get the doe in good condition so that she can produce twins or triplets if possible. Flushing will increase your kid crop substantially. I limit the number of does to 25 head per buck. If I am using an intensive management procedure, that is, goats in pens, I will pen the buck away from the does during the day to allow him to rest. I will normally flush my breeding bucks for about 45 days prior to the start of the breeding season to build up their strength. If I pen the buck during the day I will feed him a high protein ration to keep him vigorous. I turn the buck out with the does at night as most breeding is done in the dark. Most goats do not breed between March and August, however, the Boer goat tends to have a longer breeding season. Many of my rancher friends only put the bucks out with their does from September 1 to November 1 and then all the kids are born within a two month span in the Spring. (The gestation period, time the doe carries the kid, is normally 140 to 151 days or about 5 months.) Don't forget to continue feeding your breeding buck(s) after the breeding season so that he can regain his vigor and strength.

Surface wounds on the body - I first spray the wound with Furox and blue wound kote and then surround the area with ear tick and fly spray, particularly if the wound occurs in the hot part of the summer when flies are prevalent. If the wound does not heal pretty quickly I used Novalsan cream, applied daily for several days. You should see marked improvement pretty quickly. I also sometimes use nitrofurazone ointment on the wound instead of Novalsan. If a buck kid gets an infection due to castration, I will put nitrofurazone in the cavities that were left by the removal of the testicles and continue this procedure for several days. I will also give the buck kid 1 to 2 cc of penicillin for 5 days. If the infection is not too bad, I will use Furox in the spray rather than the ointment. In most instances, the kid will get well in a week or so. If the infection continues I would consult my vet. Of course, I would call the vet prior to giving the kid penicillin in the first place.

Drooping Head, Isolated from Herd and General Bad Feeling - If the goat is normally active and shows signs of isolating itself and appears to feel bad, I will put them in a pen and give them electrolytes in their water and drench them with about 1/4 tube of energy gel. Sometimes a 60 cc drench of Propylene glycol or karo syrup mixed in warm water will also perk them up. I also normally give them an LA-200 shot and 5 cc of probiosis. Normally the goat will respond in a couple of days. I would consult my vet. prior to giving the LA200 shot. If the goat does not improve in 5 days or so, I would consider taking it to the vet.

Ketosis or Pregnancy Disease - The mother goat gives a lot of herself to making milk for her kids. A chemical imbalance can result in the doe that can kill her very quickly. The therapy is simple and can save the goat's life. I use a 60 cc drench of propylene glycol (karo syrup and warm water will also work). They need some simple sugar in their system to restore a good balance. You need to watch your does for about a week before and a week after kidding as this is the most prevalent time for pregnancy disease to strike.

Infected Wounds on the Body - If a wound has festered (such as a CL knot or cactus thorn) and needs to be lanced and drained, I carefully lance the wound with a very sharp, sterile instrument and drain the infection onto a newspaper. I destroy the pus that is drained by burning it. Do not bury this infectious material as it could harm other goats. This pus can be very contagious so I wear rubber gloves when doing this operation. Of course, be very careful not to cut yourself. I clean the wound with hydrogen peroxide and then wash it out with betadine or 7% iodine. (Iodine is pretty rough on the goat). After the wound is clean, I infuse the wound with a tube of "Today" which is an antibiotic that is used to infuse goat's udders to cure infections in the bag. A 3 to 5 cc penicillin shot will also help. I would check the wound daily for several days. Sometimes, putting LA200 in the wound will also help. An old timer shared a secret with me recently regarding CL knots. After cleaning out the abscess and infusing with "Today" I inject apple cider vinegar into the sore for several days. Often the sore will dry up and the scarring will almost disappear. I would contact my vet prior to using penicillin or LA200. Since Today is made for use on goats and lists goats on the label, you would not have to contact your vet prior to using it. If I don't see marked improvement in a few days I contact my vet. Before I lanced one of these very contagious abscesses myself, I would call my vet and see how much he charges to do this. If the price is reasonable I would take the goat into the vet to have the abscess lanced so that I would not have to worry about destroying the infectious material myself. Goats that have had abscesses lanced should be separated from the herd for at least 30 days to prevent spreading the problem. Any time that I doctor my goats, I wear rubber surgical gloves to prevent the spread of any disease. Many of the diseases that goats have are also contagious to humans.

Large Udders and Infected Bags - A goat will sometimes produce more milk than their kids can nurse. I will milk out the bag daily to keep it from getting infected. I use a small plastic milking needle that I ordered from a catalog. Your vet may also have some of these. They are called J-12 teat infusion cannula and are made by Jorgensen Laboratories, Inc. in Loveland, Colorado. These milking needles come 100 to a box and cost about 5 cents each. I push this needle gently into the orifice of the teat and the milk will normally drain out freely. I drain the

milk into a bottle or other container and will freeze it for later use if the milk is fresh and good. Using the milking needle keeps from bruising the bag from rough handling if you try to milk the goat. If the bag is hard or perhaps infected, draining the bag can be a challenge. The milk may be chunky and clog the plastic milking needle. In this instance, you may have to repeatedly remove the needle, clean it out and re-insert the needle to get the bag emptied. If the bag is very hard, I infuse the bag with a solution of terramycin powder and water. This terramycin is packaged for putting in the water for chickens. I mix up some of this powder in water and infuse it in the bag with a syringe and milking needle. This solution should break up the material in the bag and allow you to milk the chunks out. If I feel that my goat has serious bag problems I consult with my vet. I would call my vet prior to using the terramycin powder as use on goats is not listed on the label of the package.

Sore Mouth (Orf) - sometimes thick, scabby sores will turn up on a goat's mouth, lips, gums or udder and perhaps other hairless areas. Sore mouth or contagious ecthyma is a viral disease of sheep and goats. It normally lasts about 21 days whether you do anything or not. Kid goats can pick up the disease from their surroundings and spread it to their mother's udder by nursing. The doe's udder can become very sore and she might not let the kid nurse. If I notice that the kid is not able to nurse I will supplement feed with bottled milk. I take special care to sterilize the nipple from the milk bottle after letting an infected kid nurse. Sore mouth is extremely contagious and can rapidly spread through a herd. I always wear rubber gloves when handling goats with sore mouth as I do anytime I am doctoring goats. I isolate the goats with sore mouth from the rest of the herd and make sure that they are eating and drinking. I will try to feed them a softer food during the time they have the condition. I thoroughly clean the feed buckets and water buckets that have been used by infected goats. If a human gets sore mouth it is called orf. I have known a couple of people that have had orf and they told me that you don't know what miserable is until you have a case of orf! Normally goats that have had sore mouth are immune after recovery. Since sore mouth has to run its course about all I can do is try to alleviate the symptoms by softening the sores and scabs. I spray WD-40 on the sores to soften them. I will sometimes pull the scabs off and apply nitrofurazone ointment directly on the sores. I destroy the scabs by burning. Some ranchers will vaccinate their entire herd for sore mouth. The vaccine is a live virus and gives the goat a case of sore mouth.

Getting your buck to breed - I have had older bucks that showed no interest in breeding, particularly in the heat of the summer. I have found that I can rub the buck on his face and back and gradually work down to his testicles. He will normally become excited. I will pull the buck over to the hot doe and gently

give him a squeeze on the testicles. This will normally cause the buck to show some interest and may result in your doe getting bred by an otherwise lazy buck. Not all bucks will respond to this procedure. (I wouldn't let your neighbor watch you doing this procedure!) If it gets results, I am not ashamed to try it. I have kids on the ground to prove that this works. We got 16 does bred last summer that would have otherwise missed a cycle.

You can contact the author: Fred C. Homeyer at Antelope Creek Ranch, HC 60 Box 50, Robert Lee, TX 76945 (1-800-2941052). If you have access to the internet you can contact the author at: fred.homeyer@mailserv.angelo.edu.

WHY WAS THE BOER GOAT BRED FOR A RED HEAD AND WHITE COAT?

I was looking at my boer goats the other afternoon and I began wondering why most of them have white bodies, red heads and short hair. In fact, if you look at the boer goat standards for both the South Africa Boer Goat Association and the American Boer Goat Association, white bodies, red heads, dark pigment under the tail are desirable traits.

As most of you may know by now, the boer goat as we know it probably began in 1918 when a Mr. Jordaan in South Africa obtained some does from one person and a good "big, robust, dappled" buck from another person and started selecting for such characteristics as disposition, rapid growth, early maturity, sound legs and feet, heavy muscling, mothering ability, milk production and the ability to make a living in the veldt (open range.) I began searching the literature and came across an e-mail message on my computer that came through the internet (the information superhighway that we are hearing so much about these days) that was very informative and answered many questions regarding why the properties of the modern boer goat are so desirable, particular to folks that live in Texas and the surrounding areas. While some of the article is a little technical and a mite boring, I thought that you might like to learn what I have discovered.

Mr. Merida Smuts-Ayers, a South African animal scientist, recently posted an e-mail on the internet in which he gives his opinions about the boer goat. Mr. Smuts-Ayers states that areas such as South Africa and Texas are considered to be sub-tropical environments and animals that prosper in these regions tend to possess thick, highly movable, pigmented skins, which have a high capillary density, with a short, shiny, smooth, medullated hair coat. According to Smuts-Ayers, high capillary development in the skin is necessary to remove excess heat in hot environments such as Texas. He further states that wounds of adapted animals (animals that have successfully evolved under these conditions) have high capillary density, bleed freely for a short period of time, with an excess of lymph fluid and the wound heals faster. In addition he states that a thick and highly movable skin, with short, shiny hair prevents the attachment of ticks and other biting insects, prevents penetration of the parasite mouthparts into the animal and does not provide shade from the heat for parasites. An additional advantage is that these characteristics prevent the spread of tick-born, fly-born and mosquito-born diseases according to Mr. Smut-Ayers. He also feels that these adapted animals possessing medullated hairs have more functional sweat and sebum glands per unit area than unadapted animals having both medullated and unmedullated hairs. As is commonly known, sweat glands are necessary for effective heat removal from the both. If you don't sweat in a heated situation you can rapidly develop heat exhausting or heat stroke. Mr. Smut-Ayers also states that the short, shiny hair of adapted animals, such as the boer goat, reflects sunlight more effectively than wooly coated animals. I had not thought of that but he may be right. He states that the long wavelength infra-red rays and the medium length waves are effectively

reflected by white, yellow or red-brown hair, but not by black hair while short wavelength ultra violet rays are effectively reflected by yellow, red-brown and black hair.

On the subject of pigmented skin, Mr. Smut-Ayers states that a pigmented skin is ideal to prevent cancers around udders, reproductive organs and the belly, and it is felt that pigmented skin prevents cancers and cataracts of the eyes. Thus, according to Smut-Ayers, a shiny, short hair-covering with a white, yellow or red color, and a dark skin is the ideal combination for an animal to be resistant to the high temperatures and the intense radiation (from heat or ultra-violet rays) found in the open savanna of South African and the open range of Texas. I visited Southern African a couple of years ago and there are many places that look like areas of Texas. It was almost unbelievable how closely the areas are alike.

After discussing the above properties in generality, Mr. Smut-Ayers turned his attention to the boer goat breed, with its distinctive red head and white body. He feels that the reason for the red head is that pigmented hairs usually grows out of pigmented skin while white hairs do not always grow out of light skin. It is a fact that cataracts and cancer are big livestock problems in sub-tropical areas, thus to insure that boer goats would not be susceptible to eye problems, Mr. Smut-Ayers feels that an easy way to prevent cataracts and cancer was to select animals for a red head. The South Africa Boer Goat Association standards insist that registered boer goats have pigmentation on the eyes, and other hairless areas. The standards also state that the hairless area under the tail must have at least 75% or more pigment. Of course, total dark pigment under the tail is the most desirable trait for this area. Mr. Smut-Ayers feels that the reason for distinctive color has less to do with the requirements of the market than it does with what he calls "functional efficiency".

It is interesting to note that the South Africans who judged the national boer goat show in Tyler, Texas this year were quite surprised when they visited several well known boer goat operations in Texas. They admonished us for penning and pampering our boer goats. They felt that the boer goat was developed to make a good living in harsh range areas where very few other species could live. They encouraged us to let the goats out into the pastures to make a living and reproduce in the environment in which they were bred to thrive. I don't know if I would be too keen on turning an animal I had paid as much as \$100,000 for out into the pasture but now that most boer goats are much less costly (most are less than \$1000) perhaps we can turn these incredible animals out and allow them to continue to thrive as they were intended, out on the veldt in Africa or the open ranch in Texas.

I don't know about you, but for me, raising boer goats has been one of the most enjoyable and rewarding endeavors of my life. They are really something special!

Article Number One

After my article on "Goat Medicine" appeared in the BOER TRADER a couple of months ago, I received many phone calls from people all over the country. They had a lot of interesting questions about their goats. It seemed to me that there was a need for a "question and answer" column about goats. I proposed the idea to Scott Campbell, the editor of Ranch Magazine and the Boer Trader, and received a positive response. I proposed a sort of "Dear Abby" type of column where the readers would send in their questions and we would answer a few of these questions in the Boer Trader each month. If you have any questions, please send them or call:

Boer Trader & Meat Goat News
P.O. Box 2678
San Angelo, TX 76902
915-6554434
fax (915) 658-8250

If you have access to a computer and the internet, you may send your questions to me at: fred.homeyer@angelo.edu

The first decision to make was what to name the column. I thought about "Dear Gabby" as a take off from Dear Abby, however, I settled on "Goat Tips from A

Rabbit Twister". You are probably wondering, where did that name come from. Since my little ranch is in Robert Lee, Coke County, Texas I decided on the name "Rabbit Twister". Folks from Coke County are known as rabbit twisters due to the fact that during the depression, when times were very hard, they would take a piece of barbed wire and run it down in a rabbit hole and proceed to twist the wire around until it got tangled up in the fur of the rabbit. This would allow them to pull the rabbit from the hole and PRESTO! dinner was served. So the name - Rabbit Twister.

The information that I will share with you in this column has been obtained from personal experience and visits with many "old time" goat people. Much of the currently used medicine on goats has been passed down from rancher's practical experience and is not recorded in the any book. All I can tell you is that it works! You should also know at the beginning that I am not a vet. I have a PhD degree in Computer Science which has nothing to do with goats or goat medicine. I first became interested in goats when the boer goat fever began sweeping the country. I attended many seminars on artificial insemination, embryo transplants, and various other topics pertaining to goats. I have read just about every book and article that I could get my hands on trying to learn as much as possible about these fascinating animals. It seems that the more you learn about goats the more there is to know. Most of the published research on goats concerns the diary breeds and the angora. There has been very little published research about Spanish goats. In fact, most ranchers consider their Spanish goats to be "windmill goats". That is, when the windmill needs fixing they round up a few of their "windmill goats" to make the money to pay for the repair.

Well so much for the formalities. How about some questions.

One of the people that called me last week wanted to know where they could order supplies such as hoof trimmers, etc.

There are many catalogs that offer animal supplies and medicine but the ones that I use most often are:

Caprine Supply
P. O. Box Y
33001 West 83rd St.
DeSoto, KS 66018
(1-800-646-7736)

Omaha Vaccine Company
P. O. Box 7228
Omaha, NE 68107
1-800-367-4444)

Jeffers General, Equine and Pet Catalog
P. O. Box 948
West Plains, MO 65775
(1-800-533-3377).

If you call these folks I would imagine that they would be happy to send you a catalog.

Question: How often should I change the water in my goat's water trough?

Goats do not like to drink dirty or tainted water. I give my goats fresh water every day. I try to clean out my water troughs at least once a week and put fresh water in the troughs every day. Sometimes they can get e.coli from the bird droppings that may fall into their drinking water. If you wouldn't want to drink it, neither would your goat.

Question: Do I need to change the worming drench that I use on my goats each time that I worm them?

I alternate between a clear drench such as Ivomec and a colored drench such as Tramisol. Using the same drench time after time will reduce the effectiveness of the drench. Besides, these two there are other good products on the market for this purpose. Which drench you use depends somewhat on what parasites you have in your area of the country. As to when to drench, you should check fecal samples periodically to determine if worms are becoming a problem. You might check with your vet or other informed source in your area. Your local feed store operator can normally give you some good information.

Well, so much for the first column on "Goat Tips". Please feel free to send me any questions that you might have about goats. If I don't know the answer, we will do a little research and try to find out the information that you need. If you are ever up around Robert Lee, Texas be sure and stop by for a visit. Talking about goats is one of my favorite things to do. Who knows, I might even buy you a chicken fried steak at the Cracker Barrel or the Ranchland Restaurant down the road. See you next month.

(Number Two) - 4/12/96

The response to the first "goat tips" column has been very gratifying. I have met many new friends from the phone calls that I have received. It appears that "goat people" are everywhere and we have many of the same problems and questions. Finding the answers to your questions is what this column is all about. If you have a question about goat raising please call or write to:

Boer Trader & Meat Goat News
P.O. Box 2678
San Angelo, TX 76902
915-6554434
fax (915)658-8250

If you have access to a computer and the internet, you may send your questions to me at: fred.homeyer@angelo.edu

If you are wondering about the title, "Goat Tips from a Rabbit Twister" you need to go back and read the first edition of this column where I gave a little history about the "rabbit twisters" in the old days in Coke County, Texas.

The information that I will share with you in this column has been obtained from personal experience and visits with many "old time" goat people. Much of the currently used medicine on goats has been passed down from rancher's practical experience and is not recorded in the any book. All I can tell you is that it works! If you have a remedy or therapy that works on your goats that you would like to share please give me a call or drop me a line.

Question: Do I need special fencing in the pens or pastures to hold my goats?

Before you put goats in a pasture you should check your fences for holes. Believe me, if there is a hole in the fence a goat will find it. If you have goats escaping I would also check for overhanging tree limbs that lay over your fence. A goat is an escape artist and will climb trees or practically anything else if it wants to get out. I have even had a goat in a 10' x 10' x 6' pen escape by vaulting half way up on a corner and then vaulting over the opposite corner in the other direction. In my fences I use 39" high net wire that has 12" verticle spacing and is graduated from 3" horizontal spacing on the bottom to 8" horizontal spacing on the top. I string 3 strands of barbed wire (usually gaucho wire) above the net wire for a total height of about 4 feet. I have found that goats with horns will get their heads stuck in net wire that has only 6" vertical spacing. If you have a goat that continually

gets its head caught in the fence there are several solutions; trim or cut its horns off (be prepared for some bleeding and the use of blood stop powder), put new 12" vertical spacing net wire in your fence or perhaps sell the goat if it continues to be a problem. It seems that the same goat(s) will get their head caught over and over again. Perhaps the goat likes the personal attention you give it when removing it from the fence. Getting the goat's head out of the fence can sometimes be a frustrating experience. There is normally a lot of twisting and tugging. The trick is to twist the goat's head by it's horns and at the same time grasp the goat's chin and use the chin to position the head so that it can be removed from the fence. You should also be careful that the goat's ear tag, if it has one, does not get caught in the fence as it pulls it's head loose. I have better luck standing on the side of the fence where the goat's head is rather than standing over the goat's body on the other side of the fence. The situation will dictate which method will work best for you. Occasionally you may need to cut the wire in the fence and then repair it when the goat has been removed. Once you have decided to put goats in a pasture and you have repaired all the holes in your fences, I would turn the goats out. If they do not escape overnight or in a few days, you will find that the goats will probably stay in the pasture if they have enough food and water to keep them satisfied. I get my goats trained to come to the feed bucket pretty quickly. My feed bucket is the most effective herding device on the ranch.

Question: I have a kid goat that appears to be dead. It is cold and stiff but still has a weak heart beat. Is there anything I can do to revive it? Many young kid goats can be brought back from near death by getting their body temperature elevated and getting some warm milk in their stomach. If the kid feels cold and its mouth is also cold it is in critical condition and near death. I take the kid and hold it in a sink of warm water that is about 100 degrees. You may need to hold the kid in the water for up to 30 minutes or until you feel that its body temperature is warm enough as evidenced by a warm feeling mouth. Obviously you do not stick the kid's head under the water, just the body. (Holding the kid's head under water for any length of time will certainly solve your problem but not in the manner that you wanted.) A heating pad may also be used to warm the kid up. The next step is to get some warm milk in its stomach. The kid may still have a sucking response and if this is the case I would feed it as much milk as it will drink, up to about 2 ounces. The milk can be goat's milk from its mother or another goat or it may be a milk replacer such as Land O Lakes kid milk replacer. If the kid is a newborn, you need the mother's first milk that contains colostrum or you need to feed the kid some commercially bought colostrum. The kid needs this first milk with colostrum in order to get necessary antibodies and immunities to keep it well. After 24 hours of life the kid loses its ability to absorb the good things that colostrum has in it and the kid will probably die in two to three days if it did not get enough immunity. A new born kid needs to nurse very soon after being born if at all possible. One way or the other you need to get colostrum into the newborn kid. If the kid does not have a sucking response after you have warmed it up you need to consider "tubing" the kid. "Tubing" is a technique that involves putting a flexible rubber or plastic tube into the kid's mouth and running the tube down into its stomach. This tube can be as long as 18 inches and needs to be inserted at least 10 to 12 inches into the kid through its mouth. The tube is tapered on the end that goes into the stomach and has two or three holes through which the milk can be delivered. Great care should be taken not to drown the kid. When you insert the tube be especially careful not to run the tube into the kid's lungs rather than the stomach. It takes a little practice to master this procedure but tubing can save a bunch of kids over time if done properly. Once the tube is in place, I connect a 60cc syringe to the end of the tube, fill the syringe with warm milk and gently force the milk into the kid's stomach by depressing the plunger on the syringe. Depending upon the size of the kid, I normally put about 2 ounces or 60 cc of milk into the kid per feeding. You will need to repeat this tubing procedure every four hours for a day or so. If the kid

survives it will normally begin sucking and you can feed it from a bottle in a day or so. I like to use the prichard teat on a 20 ounce plastic Coke bottle for feeding milk to baby goats. The prichard teat can be obtained from your feed store, vet or from one of the equipment catalogs I discussed in a previous column. I bought my tubing kit from Caprine Supply. Well, that's it for another column. Be sure and stop by my place just outside of Robert Lee sometime. I would enjoy getting to know you and share some goat facts. Adios!

You may contact the author, Dr. Fred C. Homeyer, at Antelope Creek Ranch, HC 60 Box 50, Robert Lee, TX 76945: Ph:(915)453-2863.

(Number Six)

The phone calls keep coming and the letters keep arriving at my house and at Ranch Magazine's office. Thanks for such a positive response. I continue to make a lot of new friends in the goat business. In fact, I am corresponding almost daily with a person in Maryland via e-mail about her goats. She just bought her first pure blood boer buck and is she excited. We discussed shipping a goat to her but it proved to be too costly for the goat and time constraints involved. I will be sharing some information about shipping goats across the country or the world in a future column. If you have a question about goat raising please call or write to:

Meat Goat News
P.O. Box 2678
San Angelo, TX 76902
915-6554434
fax (915)658-8250

If you have access to a computer and the internet, you may send your questions to me at:fred.homeyer@mailserv.angelo.edu

Since this is the meat goat edition of Ranch Magazine, this column will be considerably longer than normal. We want to get the word out to every one who will listen about the exciting potential of the meat goat and the very significant impact that the boer goat is playing in developing faster growing animals with more meat on their frame. I hope you enjoy the information in this column. You may have to use a little perseverance to get through it but hopefully it will be worth the effort. Good reading!

Question: I have heard several different versions of the history of the boer goat in South Africa. Do you know anything about this?

As far as I know, the most comprehensive history of the boer goat appeared in the Proceedings of the Second World Congress on Sheep and Cattle Breeding 1984, Volume II. This history was written by Dr. Quentin Campbell, a South African. There are several different opinions regarding the origin of the boer goat but most of the versions begin with "indigenous goats" being obtained from a tribe of people in Africa. One version states that the ancestors of the boer goat may have come from Europe about the time of Christ. An article written by a Mr. Barrow in 1801 mentions some people named "Namaqua Hottentots" who owned a small herd of handsome goats that were spotted like a leopard and these goats may be ancestors of the boer goat. By culling and

selection over the years, various colors, throat tassels (wattles) and other characteristics have been almost entirely eliminated in the modern white-red-headed boer goat. A Mr. Theunis Jordaan is considered by many to be one of the pioneer breeders who actually began the development of the boer goat as we know it in the United States. Mr. Jordaan wrote an article in the first journal of the South Africa Boer Goat Association Journal (published in 1959) in which he reviewed the origin of the boer goat in what he described as the Buffelsfontein Boer Goat Stud. In 1918, Mr. Jordaan's father, Mr. W. G. Jordaan bought some animals from a Mrs. van de Venter. These animals were short-haired with white bodies and light red heads. Mr. Jordaan also bought a "big, robust dapple-coloured goat" from Mr. I. B. van Heerden. A while later the Jordaan family from Buffelsfontein bought some additional goats from Mr. Jeremias Triegaardt. This was the start of the modern boer goat. Such desirable traits as disposition, rapid growth, early maturity, strong legs and feet, heavy muscling, mothering ability, milk production and the ability to make a living in the veldt (open range) were emphasized through selective breeding and culling. According to a Dr. Plug of the Transvaal museum in South Africa, the boer goat came into South Africa at about the time of Christ, or perhaps even earlier, with nomadic Iron Age peoples. In any event, the ancestors of the boer goat have surely been in Africa for centuries. As Jens-Birger Giebelmann from Brits, South Africa has stated, "If establishing a breed means selecting for colour and upgrading - then yes- the Boer Goat breed began in 1918." Ms. Giebelmann has compiled an extensive list of references on the boer goat and can make them available to interested parties. Her e-mail address is: jens@icon.co.za Because of the problems that we had with South Africa in the early 1990's we could not import boer goats directly from South Africa. Instead we got goats from New Zealand in 1993 that were originated from some embryos that were brought from South Africa to New Zealand. There were three groups of New Zealand goats; Landcorp (the New Zealand government farm) had North Island goats (K prefixes on the pedigree), and South Island goats (E prefixes on the pedigree). The third flock of New Zealand goats are called African Goat Flock and are owned by the quarantine station operator where a group of goats brought to New Zealand by an Australian investor were placed. When the Australian investor came upon hard times Mr. Moodie, the station operator, ended up with the goats and called them the African Goat Flock (WW prefixes on the pedigree). There was another group of boer goats that came to the United States from the Australian Breeding Management Group (ABM) and were also originally brought to Australia as embryos from Zimbabwe. What we are calling South African boers are the goats that came from Canada in recipient goats carrying embryos from South Africa and a group of goats that were physically imported from South Africa by Jurgen Schulz of Lampasas, Texas. These goats are the CODI/PCI partnership goats and were recently sold at auction in Lampasas, Texas. A Dr. Thian Hor The from Edmund, Oklahoma also brought some embryos directly from South Africa to start his flock. So there you have it, a quick history (perhaps not so quick) of the boer goat up to the present time in the United States. The boer goat is considered to be the meat goat of the world and is already having a very significant impact on meat goats in the United States. Many have said that the meat goat business is a 21st century industry and it appears that the boer goat and its influence is right in the middle of what may be some of the most exciting developments in livestock production in the history of the United States. We will have to wait and see.

Question: I have been looking at a few boer goat pedigrees lately and notices that there are a lot of different prefixes to the numbers. What does all this mean?

There is a lot that you can learn about a boer goat if you know a little bit about the various prefixes and numbering systems used on the pedigrees. The first thing that might be of interest is the registration number assigned to a particular goat by the American Boer Goat Association. The first two digits of the registration number will be the last two digits of the year in which the goat was registered. The next three digits in the registration number are the number of the day of the year, beginning with 1 for January 1, and the last three digits in the number are the actual order in which the papers were processed for that goat on that given day. For example: #95123005 would be a goat registered on the 123rd day of 1995 and it was the fifth goat processed that day. This numbering system insures a unique identification number for each individual goat. The registration number for the goat whose papers you may be inspecting appears in the middle at the top on the front of the certificate. (The front is the page with the colorful stripes, either purple for pure blood or red, white and blue for percentage goats). Other information on the front of the paper will include the percentage boer in this animal, the breeder of the animal and the current owner as recorded in the American Boer Goat Association (ABGA) offices. The toll-free number for ABGA is 1-800-4140202. These folks are some of the most friendly and helpful people that I believe I have ever dealt with. They can tell you just about everything that you might want to know about a boer goat. The actual pedigree for the goat appears on the back side of the certificate. In the middle of the page at the left side will be the ABGA number for this goat and a name, if any. The father or sire of this goat will appear a little higher to the right and the mother or dam will appear a little lower to the right of this center number. On the next level is listed the father and mother of each father and mother on the line to the left. This process continues for several generations but it is rarely complete for the boer goats currently in the United States. If the goat is not registered in the ABGA it may have an alphabetic letter prefix, a number and possibly a year listed as the identification for the goat. For example, WW20, K536/88, A3048. If an asterisk preceeds the letter it indicates that this goat is not registered in the ABGA. Here is a list of the various possible letter prefixes and their meaning:

K - North Island, New Zealand (Landcorp Farming Limited)

WW - African Goat Flock, New Zealand (Rob Moodie)

E - South Island, New Zealand (Landcorp Farming Limited)

Z - embryos from Zimbabwe

BR - embryos from Zimbabwe in WW

O - Olds College in Canada - work with New Zealand (Landcorp) on embryos in 1993 and afterward (*Occc/93 or later where ccc is New Zealand K- number)

A - Australia (Australian Breeding Management)

*dddnnnnnn - South African: first three digits are a breeder number, the other numbers and letters are tag identification for this particular goat assigned by the breeder.

Studded goats - goats certified by the South Africans and will have no pedigree other than the sire and the dam. The goats that Jurgen Schulz brought from South Africa are studded. All studded goats are the result of natural breeding. Studded boers are registered as a full blood boer by ABGA but the pedigree on the back will be mostly blank.

Goats coming through Canada in recipient does will have South African numbers.

You can register half bloods breed to halfbloods and percentage goats that have half or a greater percentage boer, i.e, 5/8 etc.

Because New Zealand began their program with a rather small number of individuals you will see the same numbers appearing on a lot of pedigrees. Z01, Z02 appear in almost all of these pedigrees if the pedigree goes back four generations.

WW19, WW20, BR840, BR64, BR483, BR69 are numbers that you may see in an African Goat Flock animal.

E13/89, E14/89, E17/89 (Basel), Z7/87, ZR11,ZY7,AL50,AY17 are numbers that you may see in an animal from the south island of New Zealand. (The K524 buck was the only goat that was taken from the north island to the south island so you may see him in a south island goat's pedigree).

K798/91 (Hercules) ,K536/88 (The Old Man) ,K502/88 (The Doe Maker) ,K356/91 (Batla's Hope) ,K295/91 (Kohl's good doe) ,K544/88 (Booger) are numbers that you will see on the pedigrees of a lot of north island New Zealand animals. The most promoted and advertised boers early on were north island New Zealand goats and as a result some of them have become household words in the boer goat business. Because of the wide use of embryo transfer you will see those numbers above and also K704, K115/87, K110/87 a lot.

A3048,A442,A95/88B are numbers that may appear on an Australian boer goat's pedigree. Since the ABM (Australian Breeding Management Group) started with 110 goats the genetic diversity is typically much greater than what you might see in the New Zealand goats. For example, you might see A3048 on a much smaller percentage of Australian goats than if it were one of the originally imported New Zealand goats.

For the record, there were seven goats flown to the United States from Australia and their numbers were 2671, 2672, 2673, 2674, 2675, 2676, and 2677. At the present time, I am proud to say that 2671 and 2677 live at Antelope Creek Ranch in Robert Lee, Texas. 2671 broke his shoulder in the flight over the ocean and as a result has a difficult time getting around. No one has told him that life is tough, however, as he is the lead buck in a pen of 18 bucks.

Studying pedigrees can provide a lot of late evening entertainment if you become interested in such. Caution - this can be habit forming. Why do we study pedigrees? One of the answers may be to do effective line breeding and bring out the good qualities of a blood line either from the buck side or the doe side. What may be considered bad practice for humans (incest) is considered good practice in mating goats and other animals. Of course, very close line breeding can result in outstanding animals or mutts but it's worth the chance. Of course this assumes that you will make fajitas of the mutts and not sell them to unsuspecting newcomers who want to start a good line of goats. The responsibility is up to us as goat raisers to maintain integrity.

Question: What is the smallest percentage boer goat that I can register with the ABGA?

The smallest percentage that you can register is a half blood, that is 50%. You can mate two half bloods and register their offspring as a half blood. You can mate a half blood to a 3/4 blood and register the offspring as a 5/8 blood and so on. The cost to register a percentage boer goat with the ABGA is \$10 and the cost to register a pure blood boer goat is \$25. The cost to transfer ownership of a goat is \$10. The annual membership dues for American Boer Goat Association is \$100.

Question: When I mate two percentage boer goats how can I determine the percentage boer of the offspring?

The simple way that I calculate this is to add the percentage boer of each of the two goats together, find a common denominator (from third grade math which most of us have forgotten already) and divide this number by two. For example, if I were to breed a 1/2 boer buck to a 1/4 boer doe this would give $\frac{1}{2} + \frac{1}{4}$ or $\frac{2}{4} + \frac{1}{4}$ (the common denominator is 4) which gives a total of $\frac{3}{4}$ (which is equivalent to $\frac{6}{8}$). If I divide $\frac{6}{8}$ by 2 I get $\frac{3}{8}$ which is the percentage boer of the offspring. Of course, this offspring would not be registerable in ABGA and neither would the 1/4 doe as all animals must be at least 1/2 boer to be registered. Another example that might be easier to understand: suppose I mated a full blood buck to a Spanish doe. The percentages would be $1 + 0$ for a total of 1. Dividing 1 by 2 gives $\frac{1}{2}$ and this would be the percentage of the offspring, that is one half or 50% boer. It gets more interesting when you mate something like a full blood buck with a 3/4 blood doe. This would be $1 + \frac{3}{4}$ or $\frac{7}{4}$ ($\frac{4}{4} + \frac{3}{4} = \frac{7}{4}$) which is the same thing as $\frac{14}{8}$. We divide $\frac{14}{8}$ by 2 and we get $\frac{7}{8}$ for the offspring. Of interest here is that if we were to cross a full blood animal with a 7/8 blood animal, the kids are $\frac{15}{16}$ and if the kid is a doe kid, it is considered to be a pure blood by the ABGA. That is, a 15/16 boer doe is considered to be an American full blood boer doe. It takes 31/32 boer influence to get what is considered to be an American pure blood boer buck (of course, this would be crossing a pure blood boer with a 15/16 boer in which case the resulting kids would be 31/32. Both buck and does kids from this mating could be registered in ABGA as full blood boer goats. When boers were sky high last year this was the way that people were beginning to develop their pure blood herd, however, with the market settling to more reasonable levels (where the "normal" person can play a little) it may be a easier to purchase a few pure blood animals than to breed into pure blood through the percentage. Now that I have thoroughly confused you and your eyes are watering and your head is aching I better get off this subject. This is a fascinating area but everyone

doesn't like math. If you have a question about what percentage your offspring might be and I did not cover it above, just drop me a line or give me a call and I will be glad to calculate it for you. If you survived this article, I promise that the next one will not be quite so number oriented and technical. If you don't have any boer goats and don't think that you may ever own one you can omit reading this column.

You may contact the author, Dr. Fred C. Homeyer, at Antelope Creek Ranch, HC 60 Box 50, Robert Lee, TX 76945: Ph:(915)453-2863.

Question: I am beginning to build a library of books about goats. Would you recommend some books that might be helpful to me.

I continue to build my "goat book library". It is my experience that has been a lot written about diary goats and angora goats but there is not much information out there about boer goats, Spanish goats, etc. Some of the books in my library are as follows:

Merck Veterinary Guide - this is a very technical book but there is a lot of good information if you can wade through the technical jargon. Your vet may need to help you with this book.

Smith & Sherman: Goat Medicine - this is a relatively new book and is one of the most comprehensive books available on goat medicine. Every aspect of goat medicine is covered and overall it is fairly easy to read. This book is a little pricey but it is well worth the money, in my opinion. This book is published by Lea & Febiger, A Waverly Company, Philadelphia, PA, ISBN 0-8121-1478-7.

Ensminger: Sheep & Goat Science - this is a textbook that is used in many college classes around the country. This book is mostly about sheep, however, there is a lot of good information on goats as well. This book is also a little expensive in my opinion. It would not be one of the first books that I bought for my library, however, it is in my library and I reference it often.

Dunn: The Goatkeeper's Veterinary Book - this book was written in Canada is primarily concerned with diary goats. The book is relatively easy to read and understand. It is much less technical then the Scott & Sherman book or the Merck Vet. Guide. I have read this book and learned a lot of valuable information. It is published by the Farming Press - Ipswich, United Kingdom. There are ads on this book in Ranch Magazine from time to time.

These are just a few of the books that you might consider for your library on goats. Of course, it depends on how serious you are and how much information you want to know. Before I bought one of these books I would go to the city or school library and perhaps look at a copy of the book. Several of these books cost in the range of \$75 each. If you have friends that are also raising goats you might consider each buying one of the books and sharing them with each other.

Winrock International: Goat Health Handbook - this is a spiral bound paperback book that is crammed packed with valuable information about goats. This book was designed for use in third world countries and is written very simply.

Well Goat - Sick Goat - this book is one of the most informative that I have found regarding general information about goats. I have searched and searched

and have been unable to locate the source of this book. A friend of mine loaned me his copy of this book. If you know where I can obtain a copy, please give me a call. It is a super reference.

Goat Keeping - this is a book written in Canada that is primarily about diary goats. This book is published by the same company that printed the "Goatkeeper's Veterinary Book". The book is easy to read and has a lot of good information.

Question: It there any information about goats on the World Wide Web? I have just gotten a computer and obtained access to the internet.

If you have access to the internet there are a number of web pages out there concerning goats. The American Boer Goat Association has an excellent web page as does Rancho Pegaso (this site is called the Boer Goat Information Center). The Rancho Pegaso web site is compiling articles about boer goats from all over the world. Information is frequently added to this site so you may want to reference it from time to time. I referenced this site this morning and found that there were three new articles that I had not seen before. You may want to print copies of the articles from this site and read them at your leisure. There are some excellent research articles from South Africa as well as reports on current research being done on meat goats and boer goats in the United States at the Rancho Pegaso site.

The ABGA web site address is:

<http://www.webstar.net/abga/index.html>

The address for the Rancho Pegaso web site address is:

<http://www.boergoats.com/>

This site is also called the "Boer Goat Information Center"

If you have access to one or more search engines you might search on **goat**. You will be amazed at the amount of information that is available on the World Wide Web about goats. If you are not computer literate or do not know anything about the internet, please excuse the response to the last question.

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MEAT GOATS A TWENTY-FIRST CENTURY INDUSTRY

It seems that everyone is talking about meat goats these days. What is a meat goat and how is it any different from a "regular" goat? Very simply, a meat goat is a goat that is raised to be eaten by someone. Aren't all goats raised to be eaten? No, some goats are raised for milk and others are raised for their fiber such as cashmere or mohair. Believe it or not, over 80 percent of the people in the world eat goat meat on a regular basis. Goat meat is healthy and good for you since it is low in fat and cholesterol.

Many of the people who eat goat meat make up what we call the "ethnic market" which is made up of people from many different places in the world. The primary ethnic consumers in the United States are Hispanic, African-American, Mediterranean immigrants, Asians, Muslims and people from the Caribbean Islands. Some of these people like young, fat goats while some prefer thin goats and some really like the biggest (stinkiest) billy goat they can find. Many of the goats raised in Texas are transported by truck to the major goat consuming markets on the East Coast (New York and New Jersey), Florida and California. The 2000 mile trip is very hard on the goats and they arrive at their destination in worse shape than when they left Texas. It

would be much better if we were able to slaughter the goats in Texas and transport carcasses in refrigerated trucks to various parts of the country.

A recent research report entitled, "Market Potential for Meat Goats" was published by the Department of Agricultural Economics at Texas A & M University and presents much interesting information about meat goats and their market potential. According to this report most of the meat goats currently consumed are young goats which are tender and very tasty. These goats produce a dressed carcass that weighs between 10 and 30 pounds which means that the goat when it was alive probably weighed between 20 and 60 pounds. Ranchers and other meat goat producers are trying to cross several different types of goats in an effort to get a kid goat to weigh as much as possible in a short period of time. The goal of many of these producers is to raise a 70 pound kid in 90 days. Normally a kid goat will be weaned from its mother in about 90 days so what we see happening is that a kid goat is taken to market at the same time that he is weaned. Those ranchers that are growing goats for the market that prefers a heavier carcass (50 to 60 pounds) are trying to grow a goat that will weigh 100 to 120 pounds at around one year of age.

In order to achieve the goal of a heavy, fast growing goat a superior meat producing buck (and possibly doe) must be used. The boer goat from South Africa is considered to be the meat goat of the world. Boer goats were first brought to the United States in 1993 and since that time have been used in goat herds throughout the country to produce a faster growing kid goat. People have crossed many different types of goats with the boer goat trying to find the combination that will give the fastest growing kid with the heaviest carcass that will yield the most meat per pound of carcass. Boer goats have been crossed with Spanish, Nubian, Alpine, Toggenberg, Angora, Saanen, Ibex and several other goat breeds trying to discover what works best. One of the reasons that the boer goat was brought to this country was to try to cross them with angora goats. When the mohair incentive program was phased out many ranchers had thousands of angoras whose mohair had very little value. If the angora could be used to produce a fast growing meat goat kid then the angora goats would have greater value to the rancher. Many people that have produced the boer-angora cross have found that the offspring is surprisingly good. Taking a long backed, thick chested angora doe and crossing her with a big, meaty boer buck produces half blood kids that still have a little mohair but are very stocky, meaty and grow rapidly. The second cross, that is taking this half blood doe and crossing her with a full boer buck produces a three quarter boer goat that is slick haired and is even thicker, grows faster and has more meat. While the other breeds mentioned above also produce fine offspring, particularly the nubian that gives a lot of milk, it seems that the angora-boer has some advantages. A recent carcass study conducted at Texas A & M University looked at several different meat goat carcasses and the angora-boer was ranked highest.

According to the A & M research study, the challenge for the meat goat industry is to identify new meat goat marketing channels and to build more goat consumer demand in a majority of U.S. homes, not just the ethnic population. Texas is the number one producer of both Spanish goats and angora goats. In the study Texas A & M identified the following market channels for goat meat: retail chain food stores, independent food stores, eating establishments (restaurants) that were chains or franchises and finally independent eating establishments. When surveyed these market outlets reported that between 14% and 19% of these stores sold goat meat or products containing goat meat, such as burritos, hamburgers, etc. From a study of this group it can be estimated that the yearly demand for goat meat is about 4,800,000 goats per year. This is 14.7 times more goats that were reported slaughtered in approved government facilities in 1995. In 1995 the average carcass weight was 30 pounds. If the goal is to produce carcass weights of 50 pounds then the growth potential for goat meats consumed in the United States grows from 9.8 million pounds to 240 million pounds.

We are beginning to see feedlots that specialize in raising goats. If a goat enters the feedlot at 50 pounds and gains about .4 pound per day it would take 150 days to get the goat to weigh 110 pounds. A 110 goat should produce a carcass that weighs between 50 and 60 pounds. If a feedlot could hold 20,000 goats at one time and could process about 50,000 goats per year then it would require about 100 feedlots across the country to produce the 4.8 million goats that appear to be in demand in a year.

This is an exciting time in the history of goat raising. Because of the low price of cattle and the relatively high price being paid for goats, many ranchers have begun selling their cattle herds, building better fences and buying big nanny goats and boer bucks to begin raising meat goats. The sheep and goat slaughter facility being built in San Angelo, Texas (Ranchers Lamb of Texas) will provide additional momentum to the meat goat industry as the rancher can get his goats slaughtered for a reasonable price and ship carcasses rather than live goats to the markets throughout the country.

So how do you get started in the meat goat business? The first thing that you need is a good fence. An old timer once told me that to hold goats you need to build the best fence that you can and then take a 5 gallon bucket of water and throw the water at the fence. If the water goes through the fence it won't hold goats.

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CROSSING BOER GOATS WITH ANGORA GOATS

(You May Have Diamonds In Your Pasture!)

I have a ranch near Robert Lee, Texas called Antelope Creek Ranch where I have been building a herd of meat goats for several years. We have crossed the full blood boer goat on many different breeds of goats in an effort to produce a 70 pound kid goat in 90 days. I want to be able to wean my kids at 90 to 100 days and send them directly to market. The principal demand from the ethnic people in the United States that eat goat meat is for a 25 to 40 pound carcass weight which means that the live goat must weigh between 50 and 80 pounds. My 65 to 70 pound weaning buck kids are right in the middle of this interval.

I have crossed a full blood boer buck on Spanish, Nubian, Alpine, Saanen, Spanish-Milk cross does, Angora, Cashmere, Kiko, Stiff-leg, and even some Persian Ibex cross does. Just as there are some people that are 5 feet tall and some that are 6 feet tall, there are some good kids from each of these crosses and there are some mediocre kids from each of these crosses.

I can truthfully say that the very best cross that I have found to date is a full blood boer buck crossed on an angora doe and then the subsequent crossing of these boer x angora (boergora) offspring back to a full blood boer through the F3 (seven eighths cross). The results in the F2 (three quarter boer - one quarter angora) and the F3 (seven-eighths boer) are startling! The F3 is a totally smooth haired goat that you can't tell from a full blood boer. The F3 kids look like little gorillas when they are born, extremely thick from the neck, chest and throughout the body.

To prove that this cross is viable I have crossed several different full blood boer bucks on several different angora does. The progeny in every case has been exceptional. I have not had a bad kid from this cross. Of course, not all angora does will yield exceptional kids. My angora does are long, straight-backed with heavy bones and a wide, thick chest. My sample size is rather small, five angora does on four different full blood boer bucks but all the kids from these crosses are thick and meaty. It seems that the more boer in the cross, the thicker the kids. My 7/8 boer - 1/8 angora kids look like full blood boer goats. There is not a hint of mohair and the thickness borders the unbelievable!

I had planned on writing an article about this cross for some time as I think that this information could be of worldwide interest. Angoras have the reputation for being poor mothers, however, my experience has been quite the contrary. I have found that angora does are some of my best mothers. They give adequate milk and seem to take great pride in their kids.

Since Texas ranchers have literally thousands and thousands of angoras that they don't know what to do with since the mohair incentive has gone, perhaps they might consider crossing good boer bucks on their angora does. They may discover that they have "diamonds in their own backyard." Of course, if the price of mohair increases, they could always put angora bucks back on their angora does and be back in the mohair business again.

There has already been some research done on the boer-angora cross. A recent meat goat carcass study at Texas A & M University rated the angora x boer as the top carcass in the study.

It should be reiterated that the angora does that I am using are well above average in length, conformation and thickness. I choose a long-backed, thick chested angora doe to begin the program. The F1 (half blood) cross still has quite a bit of hair, however, the mature weight of these does has been as high as 150 pounds. I have some F2 (3/4 boer x 1/4 angora) does that will weigh over 180 pounds at two years of age. My F3 (7/8) goats are still kids that are one to two months old at this point. I plan on continuing the cross through F4 (15/16) to see what will happen.

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Number 23

Question #1: I have bought a show goat and plan to show him in my county show. Where can I get some information on what to feed him, etc.?

Showing meat goats is becoming more and more popular with each passing year. The goat show at the San Angelo Livestock Show last year may have been the largest goat show in history with over 800 animals registered. Goats are smart and most of them are fairly easy to train and work with. In addition, they are relative inexpensive to purchase compared with a cow, for example. I recently saw an information brochure called the Texas Club Goat Guide. This information was compiled by Frank Craddock, Russ Stultz, Mike Harbour and Joe Raff. If you would write to Ranch Magazine at the address given above or to me personally at the ranch, I will be happy to send you a copy of this guide. It is 15 pages long and contains information on everything from building pens, sheds, etc., to selection of a show animal, nutrition, feeding, fitting and showing. You might also contact the Texas Agricultural Extension Service in San Angelo, Texas or your County Extension Agent for some additional information and assistance.

Question #2: What are some of the qualities that I should look for when selecting a show goat for a meat goat show?

The old saying, "beauty is in the eyes of the beholder" is certainly true when it comes to show goats. There seems to be two major types of show goats at this point in time; the tall, leggy goats with a long neck and feminine front end and the short, somewhat squatty goats with a lot of thickness throughout. Normally, a particular judge will prefer one type or the other so it is difficult to select a show goat that will place well in a given show without knowing who the judge is going to be and what type of animal he prefers. I have friends that are serious enough about jackpot meat goat shows that they have as many as 50 to 60 head of show goats on feed. They keep "books" on the judges and know what type of goat to take to which show. These are folks that are competing for trailers, boats, etc. - people serious about winning.

Knowing the date of the show for which you are selecting a goat is important. Most meat goat shows require that the goat still have his baby teeth at the time of the show. A goat normally cuts his yearling teeth at 12 to 13 months so most people will try to purchase a goat that is as close to 1 year old as possible at the time of the show. If a goat loses his teeth prior to the show he will be disqualified. Of course, there are also several classes of goats in a show and the determination of which class a goat falls

into is determined by his weight at show time. It seems that many people try to raise the heaviest goat possible and everyone ends up with goats in the heavy weight class. It is important to remember that there is also a class for lightweight goats and that sometimes these lightweight goats also win the grand championship. Sometimes people will select a goat born in March with the intention of showing him in a January county show and in a major livestock show in March. The goat's birthdate is a major consideration in timing for a show. Some shows are "terminal" shows in that the goats will be loaded in a truck and sold for slaughter at the conclusion of the show. If you plan on showing your goat at several shows, don't put him in a terminal show until you are ready to get rid of him.

Because of the different types of goats and different judges, most folks will purchase several show goats, some of each of the two types mentioned above. I have sold as many as 8 show goat prospects to a single individual. It is difficult to evaluate a goat when you are standing directly over them and the goats are in a small pen, 6' x 6' or 8' x 8'. I prefer to get back about 15 to 20 feet from the goat and watch the it from a distance. You may need to turn the goat out into a larger area so that you can get far enough away from him to actually observe him effectively. I like to watch the goat walk from side to side to get an idea of how well he is put together. I let my eyes follow the goat from nose to tail as he walks from left to right or right to left. If my eyes make it all the way to his tail, the goat fits together pretty well. If my eyes stop at any point, that is where the goat does not fit together. I like to observe the goat walking toward me and directly away from me to determine how his feet track when he walks. I like for a goat to walk straight on both front and back legs without being "hocked" or "bandy legged". Sometimes a goat will throw his legs out to the side when he walks rather than tracking straight ahead. I notice whether the goat appears to be "loose" in the shoulders as he walks. At this point I also pay attention to the thickness of the chest and front end as well as the thickness of the bone in the legs. Sound feet and legs are very important, in my opinion.

Once I am satisfied with how the goat is put together and how he walks, I look at the overall length of the goat, the straightness of his back, and how much he drops at the tail. Some goats will drop off drastically at the tail. This is not desirable, in my opinion. The overall length of the goat is important and longer goats are better, in my opinion. The length of the loin area as well as the width of the loin can be determined by holding the goat and measuring these areas with your hand. While holding the goat, you can also get an idea of the meat in his back legs by feeling this area. Most goats that have been in the pasture will not have hard muscling in the back leg but this can be improved upon with regular exercise once the goat is put on a training and feeding regimen.

While holding the goat you can also note the relationship between the hook bone and the pin bone which are located behind the loin area and on the hip of the goat. It is desirable to have a goat with a broad rear end. How the hook and pin are located with have some bearing on the width of the rear end.

After a while you will develop an "eye" for recognizing good show goat prospects. The more goats that you look at, the better you will become. The American Meat Goat Association has set out criteria for selecting and judging meat goats. With time, this criteria will gain more widespread acceptance. As with any new and exciting endeavor, it takes time to create standards and time to realize some uniformity and consistency.

It is my feeling that the most important issue in preparing a goat for a county show is the responsibility that the young person assumes in caring for and feeding their goat during the months prior to the show. If done in the proper spirit, the real benefit to the young person is not the color of the ribbon that is ultimately won at the show, it is the reward for knowing that they have done a good job in preparing their animal for the show. When the

young person goes into the ring with a well-fed, healthy goat, they are a WINNER!

Learning To Read A Boer Goat Pedigree

This article could have also been titled, "What Do All Those Different Letters and Numbers Mean In A Boer Goat Pedigree?" There is a lot that you can learn about a boer goat that is registered in the United States if you know a little bit about the various prefixes and numbering systems used on the registration certificate issued by the registration system of the American Boer Goat Association (ABGA).

Prior to January 1, 1997, the actual pedigree for the goat appeared on the back side of the registration certificate. In the middle of the back page at the left side would be the ABGA number for this goat and the name of the goat, if any. The father or sire of this goat would appear a little higher to the right and the mother or dam would appear a little lower to the right of this center number. On the next level was listed the father and mother of each father and mother on the line to the left. This process continued for several generations but it is rarely complete for the boer goats currently in the United States.

If the goat is not registered in the ABGA it may have an alphabetic letter prefix, a number and possibly a year listed as the identification for the goat. For example, WW20, K536/88, A3048. If an asterisk preceeds the letter it indicates that this goat is not registered in the ABGA.

Here is a list of the various possible letter and number combinations that might appear in the pedigree.

K - Keri Downs, North Island, New Zealand (Landcorp Farming Limited) - normally this number appears as "Kxxx/yy" where the number after the letter K is the unique number of the goat and the number after the slash was the year the goat was born.

E - Erewell, South Island, New Zealand (Landcorp Farming Limited) Normally this number appears as "Exxx/yy" where the number after the letter E is the unique number of the goat and the number after the slash is the year the goat was born.

WW - African Goat Flock, New Zealand (Full Blood Boer) - normally this number appears as "WWxxx" where the xxx is the unique number of the goat.

WG - African Goat Flock, New Zealand (Percentage Boer) - normally this number appears as "WGxxx" where the xxx is the unique number of the goat.

Z - embryos from Zimbabwe and ancestors of the New Zealand (Landcorp) goats - normally this number appears as "Zxx/yy" where the xx after the Z is the number of the goat and the yy after the slash is the year the goat was born.

BR - ancestors of the WW goats in African Goat Flock - normally this number appears as "BRxx" where the xx is the unique number of the goat.

O - Olds College in Canada (partnership with New Zealand (Landcorp)) - normally this number is "Occc/yy" where the ccc is the same number as the corresponding K number and yy is the year the goat was born.

A - Australia Breeding Management (Australia) - normally this number is Anxxxx where the xxxx is the unique number of the goat and the n is the last digit of the number of the year the goat was born, i.e. 2 is 1992, 3 is 1993, 4 is 1994 and 5 is 1995 - ancestors in an ABM pedigree may have a number of the form "Axxx/yyB" where the xxx is the unique number of the goat and the yy is the year the goat was born.

TR### - goats registered with the Canadian Boer Goat Association - normally the ### is the unique number of the goat. (Some of the other letters and prefixes listed above may also appear in a Canadian Boer Goat Association Registration Certificate.

ddd/nnnn - South African - normally the first three digits are the breeder number assigned by the South African Boer Breeders Society and the numbers after the slash are the unique number of that goat from that given boer stud farm in South Africa.

Studded goats - goats certified by the South Africans and will have no ancestors listed in the pedigree other than perhaps the sire and the dam. For example: the goats that Jurgen Schulz brought from South Africa are studded. All studded goats are the result of natural breeding. Studded boers are registered as a full blood boer by ABGA but the pedigree will be mostly blank.

ddd/nnnn - Frozen embryos from South African goats were implanted in recipient does in Canada and these recipient does were imported into the United States over several years. The kids born from these recipient does will have South African numbers as this was the primary way to bring South African goats into the United States for quite some time. Also these kids will have the South African numbers of their ancestors in their pedigrees.

YY-DDD-NNN - IBGA registration number where the YY is the year the goat was registered, DDD is the day of the year the goat was

registered starting with 001 as January 1 and NNN is the sequence the goat was registered on a given day starting with 001.

YYDDNNNN - ABGA registration number prior to January 1, 1997 where the YY is the year the goat was registered, DDD is the day of the year the goat was registered starting with 001 as January 1 and NNN is the sequence the goat was registered on a given day starting with 001.

100XXXXXX - ABGA registration number after January 1, 1997 where the xxxxxx is the sequence number of the goat when it was submitted for registration.

Since January 1, 1997 the ABGA has been issuing papers that are maroon and white for full blood boer goats and blue and white for percentage boer goats. The different colored pedigrees reflect the use of a different computer program to maintain the database of registration records.

The pedigree that was previously listed on the back of the paper is, currently (after January 1, 1997) listed on the front of the page with three generations of parentage being given. The older style pedigrees listed four generations. You can contact the ABGA office to get an extended pedigree for your goat that will go back as far as the database has information. Some of the goats in the registration system at the moment may have as many as seven generations of heritage available.

If there is an entry in the "Miscellaneous" section of the ABGA registration certificate it may include registration numbers from IBGA and/or possibly the Canadian Boer Goat Association if the goat is also registered in one or more of these associations.

To transfer an animal to another person, the owner needs to sign the back of the pedigree under the "transfer" section. The new owner can send this copy of the pedigree into the ABGA office and receive a new pedigree with his name listed as owner. The normal charge for transferring a goat to a new owner is \$5 for ABGA members and \$10 for nonmembers.

Studying pedigrees can provide a lot of late evening entertainment if you become interested in such. Caution - this can be habit forming. Why do we study pedigrees? One of the answers may be to do effective line breeding and bring out the good qualities of a blood line either from the buck side or the doe side of a pedigree. Registration of pedigrees and tracking our goat's genetic heritage is the primary reason that most people join the American Boer Goat Association. The pedigrees give our goats some of their value. A good rule of thumb, however, is that pedigree for a given goat is only as good as the man giving you the paper.

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South Africa Boer Goat Breeders Association

<u>NAME</u>	<u>STUD NO.</u>
Jordaan, B J & Sn	101
Van Aardt, A S & Sn.	102
Botha, P B	103
Schoeman, C J & Sn	104
Jordaan, Gideon	105
Nell, L A	106
Kruger, T P & Sn	107
Jordaan, J A & Sn	108
Jordaan, J R & Sn	113
Birch, E S	114
Malan, S W	116
Biggs, T A	120
Berrington, W S	127
Nel, P J	129
Vorster, A E	133
Van Niekerk, J A	143
Marais, S J (Fanie)	155
Vorster, I S	157
Greeff, P J	162
Maree, H P	163
Bredenkamp, J M	167
Fourie, T	170
Henderson, P W	175
Du Preez Boerdery	176
Botha, Theuns en Willem	184
Van Zyl, W J	185
Berrington & Nel	189
Hobson, Pastoral (Co)	189
Jordaan, Japie	192
Botha, E	195
Greeff, L M	196
Wentzel, D	201
Marais, J J O	202
Steynberg, J P	216
Moorcroft, H L	217
Namibie Administrasie	224
Buys, B J	225
Bohm, E	226
Van der Ahee, F M	227
Bosman Landgoed Bpk.	232
Gous, I S & J H	239
Du Plessis, A	241
Kinghorn, R D	251
Maritz, A W A	256
Jordaan, W J Jnr	263
Middendorff, I U	282
Jordaan, Jackie	285
Jordaan, W G & Sn	286
Groenewald, H B	295
Versveld, W v R	299

Botha & Kötze	310
Nell, F J	313
Steyl, L R	316
Van der Merwe, P J (Ron)	324
Steyn, J A	333
Erasmus, M S (Mev)	338
Botha D S	348
Von Wieligh, H D	355
Maritz, F	356
Gous, J G L	367
Gous, J G Y	367
Van Wyk, P J	390/720
Booyesen, H J	430
Venter, J C Jnr.	444/474
Schoeman, C A	452
Mulder, J J	472
Burger, A W A	479
Van der Walt, D J	484
Bothasdal Boerdery	486
Esterhuyse, H P	486
Kuhn, C C	489
Van Gend, C G & Sn	497
Botha, H	505
Nel, P F	506
Van Zyl, A J	512
Trollip, S W M	514
Van Zyl, J J	515
Van Rooyen, P B	518
Tsumis Landboukollege	521
Swiegers, J A	522
Potgieter, J H	523
Coetzee, T	524
Stander, J G	534
Knipe, A L	548
Jordaan, Andrew (AS)	549
Coffee, J A	554
Van Zyl, F J	555
Wannenberg, P J	556
Du Raan, A B L	566
Olivier B J	570
Van der Merwe, J B	571
Agenbach, C J	572
Van der Merwe, J A	575
Du Raan, G	582
Vlok, A C	585
Jacobs, P D	586
Bloem, M G & JP	595
Collen, H R	602
Van Schalkwyk, C L	611
Hayward, S A	614
Botha, J W	615
Van Rensburg, L E J	617
Bothma, G	622
Maritz, H E	626
Swiegers, G	627
Du Toit, S P	632
Myburgh, P D	633
Maritz, S G	634
Ehlers, S S	636
Smit, N A	637
Marais, P G & Sn	646

Maritz, A W A	648
Van Zyl, D H	649
Blaauw, P J L	659
Henning, C R	661
Oosthuizen, D	662
Groenewald, H B & Sn	665
Schoeman, Jurie J J	667
Burger, W S	671
Hoon, G J	672
Van Niekerk, J J	676
Carsten, J J	677
Conradie, J J	680
Sondags, Besproeiingsraad	681
Koortzen, P W H	686
Grobler, R J	688
Meyer, C C	693
Cilliers, D S U & Sns	694
Comley, C M	695
Urry, K T	712
Bester, J J	723
Burger, J A P	724
Van Bergen, J F J	737
Walters, A M	739
Meyer, J J	745
Cumberland B/Bokstoet	747
Van Zyl, J G	748
Kyryseb, P M	751
Coetzee, S F	753
Burger, L M	762
Louw, D J	763
Venter, A P	767
Administrasie van Hereros	769
Lotter, G J L-Kobus	770
Risser, H G A	771
Botha, P N	776
Jacobs, D R	777
L & A B/B Stoet	782
Kotze, J L K	788
Nel, J	789
Vorster, B J M	792
Van Zyl, A J	794
Van Zijl, A P J	797
Van Zijl, I J M (Alfie)	797
O'Callaghan, H	799
Lopper, H P	802
Van Niekerk, H J	806
Kruger, J C	807
Gnetum Landboukollege	812
Camwood, C C & Sns	819
Hatting, JHJA (Jnr)	823
Lotter, G J L	826
Zwiegers, J A S	827
Lambrecht, J C M	828
Du Plessis, H L	831
Lubbe, D B & A D	832
Moolman, J J	834
Munke, H K M	835
Jordaan, J U	837
Strydom, L G	838
Pietersen, C J	841
Wiid, P J	844

Van Wyk, Kobus	845
Pienaar, A J	850
Van Rensburg, R	852
Maritz, J H	854
Janse van Rensburg, O	859
Roets, P G W	861
Markram, J C (Edms.Bpk)	862
Dippenaar, A J	865
Petzer & Henning	869
Goosen, H W	871
Nel, D	872
Heiser, H W	873
Blignaut, J F	874
Bloem, W F	876
Lombard, W & E	878
Slabbert, Z de B	882
Rust, P J	885
Maree, J B	888
Wiese, J (Mev)	889
Van der Westhuizen, N S	890
Nel & Lourens	891
Joubert, F J	892
SteenKamp, C J H & Sn	895
Malan, S P	897
De Waal, S W P	900
Du Toit, C F	903
Nolte, J J	907
Van der Westhuizen, K W	910
Botha, J J	911
Nel, E J	912
Vorster, W H	914
Van Wijk, J G	915
Erasmus, W de S	916
Poortjie Boerbokke	917
Horn, A H	920
De Witt, P J	921
Myburgh, A M (Mev)	924
Enkeldoring B/B Stoet	925
Roodekranz Boerdery	926
Van Wyk, F H	927
Meades, D J	930
Kanon-B/B Stoet	931
Gers, J	934
Friederich, M G (Mev)	936
Venter, J J	937
Hugo, O D	938
Tripple J B/B Stoet	939
Van Wyk, J C	940
De Bruyn, P J	941
Grobler, L J & Sn	942
Du Plessis, W A	943
De Klerk, C J	944
Rabie, J K	945
Du Toit, C J	946
Alberts, H G	947
Lottering, J G	948
Vlok, D	949
Van Staden, B P	951
Sachse, D C	952
De Waal, J J	954
Van Niekerk, G P	955

matched what I had imagined the original boer buck to look like as many accounts of the history of the boer goat include documentation about a "big, robust dapple-coloured goat".

The Proceedings of the Second World Congress on Sheep and Cattle Breeding 1984, Volume II contains a history of the boer goat written by Dr. Quentin Campbell, a South African. In this article, Dr. Campbell relates that Mr. Theunis Jordaan is considered by many to be one of the pioneer breeders who actually began the development of the boer goat as we know it in the United States. Mr. Jordaan wrote an article in the first journal of the South Africa Boer Goat Association Journal (published in 1959) in which he reviewed the origin of the boer goat in what he described as the Buffelsfontein Boer Goat Stud.

According to Mr. Jordaan, in 1918, Mr. Jordaan's father, Mr. W. G. Jordaan bought some goats from a Mrs. van de Venter. These goats were short-haired with white bodies and light red heads. Mr. Jordaan also bought a "big, robust dapple-coloured goat" from Mr. I. B. van Heerden. A while later the Jordaan family from Buffelsfontein bought some additional goats from Mr. Jeremias Triegaardt. Many people consider this to be the start of the modern boer goat.

Sometimes things in your life happen in a sequence because soon after purchasing this book on angoras that contained the photo of what may be the dappled or spotted goat mentioned in the South African journal, a friend of mine phoned me at the ranch. My friend told me about a full blood boer kid that had just been born at his ranch. It seems that this little doe kid was orange-brown and covered with white spots. I was aware of the parents of this spotted doe kid as I had helped my friend buy the two full blood boer parents of this kid. The parents are both perfectly marked with white bodies and dark red heads. Since this was the first spotted boer that I had ever seen I convinced my friend to sell me this kid. I bought her when she was 5 days old and my friend delivered her to my ranch when she was 3 months old. I know that there may be some folks who will doubt that such a spotted kid could come from the mating of two correctly colored boer goats. Someone will probably think that the sire of this kid was a big spotted Nubian buck but let me assure you that I am aware of the area where my friend raises goats and there are no other goats in the area. This spotted kid had to have come from these two correctly colored full blood boers.

This spotted doe kid was significant to me because it brought out a very important fact about selective breeding. Even though the boer goat has been selectively bred for close to 100 years to have a white body and a red head, a spotted goat that is a "throw back" to the original dappled boer buck can be born at any time. After acquiring this little spotted doe I named her, "Antelope Creek Patches".

I began looking around the country for more spotted full blood boers and was fortunate enough to find one at George Ahlschwede's September Sale last year. This second little doe is not totally spotted but has the shoulder and right front leg colored dark maroon with white spots on top of the dark brown cape. She is a beautiful little goat and I named her "Miss Liberty" because she looks sort of like a flag when she walks by.

Since discovering these spotted goats I have questioned almost everyone that has visited the ranch to see if they have ever seen a spotted full blood boer kid and several of them affirmed that they had also seen a few such goats. I would imagine that spotted boers that are born in South Africa are sold quickly or disposed of in some fashion as they don't meet the South African Boer Breed Standards.

While I was thinking about boer goats that are colored differently than what is specified in the boer breed standard I discovered a website on the internet that was produced by DNAfrica (Pty.) Ltd. whose url address is: (<http://dnafrica.co.za/SAVANNA.HTML>). This website includes a description of goats in South African that are solid white and other goats that are solid red. These white goats and red goats closely resemble the boer goat in both structure, confirmation and other properties that make the boer goat the meat

goat of the world. The white goats were called Savanna Goats and the red goats were called Kalahari Reds. I discovered that there is a Savanna Goat Society which registers both the Savanna Goat and the Kalahari Red. The South African Registrar of Livestock Improvement has recognized the Kalahari Red to be a separate breed from the Savanna Goat.

Upon further reading I learned that the solid white Savanna Goat was started in about 1957 at the goat farm of DSU Cilliers and Sons in South Africa. Mr. Cilliers started with a mixture of colored indigenous does and a white buck. Selective breeding with this herd emphasized breeding a "white, heat and parasite resistant, functionally efficient, meat-producing animal." A solid white goat will have a potential for developing skin cancer if there is little or no dark pigment under the white hair. One of the boer breed standards requires dark pigment on the hairless parts of the goat's body, that is, under the tail and around the nose and eyes. I thought that it was interesting to note in the presentation made on the DNAfrica webpage that Savanna Goats are selected for totally black pigmented skins. The breed standard for Savanna goats specifies that not only the skin, but all the horns, hooves and bare skin areas must have black pigmentation. It is desirable for the Savanna Goat to have coat of short hair just as it is with the boer goat.

A couple of years ago, Jurgen Schulz from Lampasas, Texas imported a large number of boer goats and a few Savanna Goats directly from South Africa. He recently sold his herd of Savanna Goats at auction and now they are dispersed all over the country. I happened to see Jurgen's flock of Savanna Goats when they were at his ranch and there were very nice goats. If they had had red heads I would have sworn they were boer goats.

Some meat goat breeders in South Africa prefer a red colored goat that will not shine in the moonlight and will not be as easily spotted by predators as a white goat might be seen. This reminded me of the first boer goats that were imported into the United States and a red goat named "Booger" that became famous and sired a lot of red offspring. In the beginnings of the boer goat in the United States many U.S. ranchers wanted red boer goats as they felt that predators could not see them as easily in the dark. For quite some time, red boers commanded a premium price in the auction rings in the U.S.

It is interesting to note that other color phases of boers have turned up from time to time. I recently had a black full blood boer kid born out of two white bodied and red headed parents. This black doe kid has a white stripe across her side but is predominately black. There is at least one boer goat producer in the U.S. that is specializing in solid black boer goats.

I have personally not seen many solid red boer goats that have not had white stripes or white hair. A lot of the red boers will have a white belly strip or belly band or perhaps white socks on their feet or a white blaze on their face. For the record, we had a solid red boer doe kid born at Antelope Creek this past Spring that is solid red without a single white hair. Her mother did not know what to do with such a strange colored kid and I had to "reason" with her mother to get the mother to nurse this kid. After a few days of working with the mother, this little red doe's mother would back up into the opposite corner of the bonding pen when I walked up and would glare at me as if to say, "I'll let this kid nurse but I really HATE this job!" This red doe kid is now about 6 months old and is developing into quite a beauty. I am anxious to see what happens when I breed her to a "correctly" colored boer buck.

Speaking of breeding, I am also anxiously awaiting the first offspring from my totally spotted girl, "Patches". I have bred her to a correctly colored boer buck and she should be kidding in a couple of months. The little partially spotted doe named "Miss Liberty" was bred to my Texas Twister buck and had a correctly colored buck kid with the exception of his tail area. This buck kid had a solid red tail and it looked like he had been dipped in a bottle of red ink as his tail and a circular area on his rump around the tail were bright red. Miss Liberty loved that little buck kid but he died of pneumonia during one of our extremely cold spells last winter. We have bred

Miss Liberty again to a son of Texas Twister named "Twister's Tornado a.k.a. The Boss". I can't wait to see the results.

Finally, it seems that everyone is looking for a market niche these days where they are producing something different from everyone else. While the boer goat is being produced primarily for meat, due to the docile and friendly nature of most boer goats there may someday be a market for "pet boers". If I can reproduce a number of these spotted boer goats, perhaps we can start a variety of boer goats called "PARTY BOERS."

If you know of or have seen any spotted full blood boer goats I would appreciate your giving me a call on my toll-free line at the ranch. Who knows spotted boers may become the "rage" some day.

You can contact the author, or, Dr. Fred C. Homeyer, at Antelope Creek Ranch, HC 60 Box 50, Robert Lee, TX 76945: Ph: (800)294-10524, or visit his website at www.antelopecreek.com.

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Linebreeding vs. Inbreeding

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Written for The Goat Magazine

Linebreeding and inbreeding are subjects that most folks talk about in quiet whispers as if they were "dirty words." In truth, however, what may be considered incestuous for humans is accepted practice in the production of high quality breed stock in many animals species. Since this subject has captured my attention lately, I decided to do some research and reading about linebreeding and how one uses this concept to improve the genetic base for a group of animals. Quite a lot has been written about line breeding and some of the information that was written over 50 years ago is just as valid today as it was when it was first written.

One of the books that I read in this area was entitled, "Aids to Goatkeeping" by Carl A. Leach. This book was first copyrighted in 1926 and the edition that I read was copyrighted in 1971. It is important to note that the ideas expressed in this book have been around for some time and have gained considerable acceptance, especially in the dairy goat world. Mr. Leach was the editor of Dairy Goat Journal for many years and has a way of explaining a complicated idea in simple terms.

Animals can be bred for purposes other than for producing offspring. For example, dairy cows are bred primarily to produce milk rather than calves. Sometimes a person uses great care in studying and considering particular animals in order to improve the genetic base of a specific herd of animals and sometimes a person has the goal of improving an entire breed of animals.

"Grading" is a term given to the breeding program when the goal is to improve the offspring by taking common or indigenous animals and breeding them with a higher bred animal in order to produce an offspring that is an improvement on the common or indigenous parent. In most cases one of the mates in this type of breeding program is a purebred or pure blood animal. Sometimes one can experience what is known as hybrid vigor where the offspring is considerably better than expected and in some cases this hybrid vigor will be expressed in some quality that is even better than the purebred mate used in the breeding.

The normal mating in a "grading" system involves the use of a purebred sire or male and a common doe or female. It would seem obvious that

improvement from the male side could be spread over a herd of females more quickly than the effect on improvement that could be realized from a single female. Normally a female, for example a goat, will only produce 1 to possibly 3 or 4 offspring where a buck or male goat can perhaps breed as many as 30 to 40 does or females. I personally do not try to breed a mature male to more than 25 to 30 females in a given breeding season unless I am using special care to rest the buck during the day and let him out to breed at night. During the day I will give the buck extra food, special care and perhaps some vitamin supplements if I plan to breed him to a large number of females in a breeding season.

Using a buck on a number of females will spread his good traits and characteristics throughout a herd fairly quickly. Of course, one can realize the good traits of a given female in a single breeding season through the use of embryo transplant technology where the female is given special shots and hormones in an effort to cause her to produce a large number of fertilized eggs from a given mating. These embryos are then transplanted into recipient females who carry the embryo to term, birth the kid and in a lot of cases raise the kid to weaning. In some cases, a single doe can produce 30 to 40 embryos from a single mating. Embryo transfer technology allows the introduction of the good qualities from a given buck and a given doe into perhaps a large number of offspring from a given mating.

The first mating of a purebred buck and a common doe produces offspring that are considered half bloods. This first generation of offspring is sometimes called the F1 cross. Mating these half blood does to a purebred buck produces the F2 cross kids that would be considered to be three quarter or $3/4$ blood kids. The process of mating increasingly higher percentage offspring to a purebred buck will result in the F3 ($7/8$), F4 ($15/16$), F5 ($31/32$) cross and so on. Different breed associations for various animals will consider a $15/16$ or a $31/32$ animal to be a purebred or pure blood animal. Breeding up through the percentages can never result in a truly 100% animal. In the case of the boer goat, the American Boer Goat Association considers a $15/16$ doe to be pure blood and a $31/32$ buck to be pure blood. The International Boer Goat Association or IBGA considers both $15/16$ does and $15/16$ bucks to be pure blood animals. The boer goat associations distinguish between a full blood or 100% animals and a pure blood or very high percentage animal of at least $15/16$. The process described above, that is, breeding up through the percentages is sometimes called "grading." If an animal has unknown parentage it is sometimes called a mongrel even though the animal could possess some highly desirable traits.

The goal of grading should always be to produce a higher percentage offspring. For this reason, one normally does not breed a half blood to a half blood or a three-quarter blood with a three-quarter blood because the percentage of the offspring is not higher than the percentage of the sire and the dam. A half blood bred to a half blood produces a half blood offspring. One normally tries to produce an offspring that has a higher percentage blood than the least percentage of either mate.

One of the potential problems with grading is that it is very tempting to stop increasing the percentage offspring when a particularly good individual is produced that is not entirely a purebred animal. Improvement using less than a purebred animal is very, very slow in most cases. It should be mentioned that some producers don't want to produce higher percentage offspring in the long run. Many meat goat ranchers in Texas prefer a $3/4$ blood or $7/8$ blood boer buck sire rather than a pure blood or full blood sire. Part of the reason for not using a purebred sire may be that the hybrid vigor of some percentage animals can be very noticeable and desirable.

Linebreeding and inbreeding are the terms that often crop up in a discussion of breeding practices. The two terms mean the same thing. Linebreeding has a positive connotation while inbreeding is negative. What is normally considered incestuous or forbidden in humans can actually be a good practice for animals. Many great herd sires from various breeds are in fact very highly line bred, that is, they are the product of carefully planned

matings of animals that are closely related such as a father bred to a daughter or a mother bred to a son. The mating mentioned above is the "closest" or "tightest" form of linebreeding. Breeding grandparents back to grandchildren is still considered to be linebreeding although not as close as the "closest" form.

Linebreeding is practiced in an effort to intensify the blood or desirable traits and characteristics of a particular ancestor in an animal's pedigree. The more this close breeding of relatives occurs, the more consistently good traits can be realized in the offspring. Desirable traits in goats might include strong feet and legs, good reproduction, great mass and muscle, good milk production and other desirable characteristics. Of course, with the good comes the bad and linebreeding can also cause very bad traits, weaknesses and defects to show up in the offspring including traits termed "lethal genes". One example of a lethal gene might be a situation where the large intestine does not meet with the rectum and the animal dies within 24 hours of birth. Other examples of bad traits might be overshot ("parrot mouth") or undershot jaw, crooked legs, etc.

Linebreeding is also inbreeding in the strictest sense but the main idea that perhaps differentiates the two terms is that linebreeding is inbreeding with very well defined goals in mind. The goal of linebreeding is to get as much blood from a given line of animals into the offspring.

Normally inbreeding refers to the indiscriminate breeding of related animals without paying attention to particular blood in the parentage, such as breeding brothers to sisters without specific goals in mind. Brother bred to sister is a close form of inbreeding and what one normally thinks of when you mention inbreeding. This practice is not considered to be linebreeding as no increase in blood from a particular ancestry is realized when mating brother to sister. Even though this is considered to be the worst case of inbreeding, it is possible that even brothers and sisters can be quite different biologically. This is according to laws of nature as stated in something called Mendel's law.

Carl Leach in his "Aids to Goatkeeping" book states that "Linebreeding is the most powerful method known of making the most of the excellence of superior individuals. It is the method by which the highest possible percentage of the blood of an exceptional individual can be preserved to characterize an entire line of descent, with the same speed as shown by the law that governs grading. It is not a method of originating excellence, but of preserving and utilizing it. It is probably safe to say that all really great animals in every breed have been strongly inbred themselves, since closely bred animals are enormously prepotent over everything else.

Linebreeding emphasizes bad characters as well as the good. If weaknesses and defects occur in linebred strains, it merely amplifies those already existent - it does not make them. This very amplification of defects makes linebreeding important to the breeder in demonstrating the hereditary characters with which he must deal in his breeding program." (Leach: Aids to Goat Keeping, p. 23.)

The idea of always needing "new blood" or changing sires in a herd quite often can be harmful rather than helpful for many breeders. A sire with "new blood" can bring unknown undesirable traits to a herd. The chance of introducing the bad qualities from "new blood" is far greater than the dangers that may result from close or tight linebreeding where you are aware of the desirable characteristics and heritage of the sire you are using. The breeder should try to introduce the qualities of his very best animal throughout his herd by introducing the blood of a good sire in the offspring. This process should continue as long as improvement in the offspring is realized.

Page 21 of Leach's "Aids to Goatkeeping" gave me a new view of the amount of contribution that a particular animal makes in the pedigree of an offspring. Pedigrees and registration papers have their greatest value when used to plan a breeding system to improve a given herd of animals. "Pedigree or ancestor worship" occurs when one gives some distant ancestor credit for

the good qualities of the offspring under consideration. A distant relative may constitute only a very small part of the inheritance in an offspring.

When mating two animals, the sire and his full pedigree of ancestors contribute one half or 50% of the inheritance in the offspring while the dam and her entire pedigree of ancestors contributes the other one-half. The actual sire and dam each contribute 1/4 of the offspring's pedigree while the grandparents of the sire and dam each contribute 1/8. The great-grand parents each contribute 1/16 and the great-great-grand parents each contribute 1/32. The fractional contribution of each ancestor that goes further and further back in a pedigree gets less and less. In other words, the great-great-great grandparents each give 1/64 each and so on.

It is sometimes very helpful to know the characteristics and qualities of a given animal's brothers and sisters as one can see the qualities of an entire family exhibited by examining as many siblings as possible. Knowing the good qualities of an entire family can be very beneficial in a study of pedigrees where the breeder is establishing a breeding system to improve his herd.

Knowing the percentage contribution of a particular ancestor makes one realize that you can get more than the one-fourth contribution from the sire of an individual by having the sire appear in other places in other generations in the pedigree. This goes the same for the dam. There is a term called genetic representation which gives an indication of the total contribution from a specific animal appearing in several places in the pedigree. It might be possible to get a high enough genetic representation from a particular sire or dam such that it is as if this specific sire or dam produced the offspring under consideration even though it wasn't actually the physical parent."

The area of linebreeding and inbreeding really opened my eyes to some ideas I had never thought of before. You may have seen some pedigrees where the same sire or dam appears several times in the background of a particular animal. Each time the ancestor appears adds a small percentage to the effect of that ancestor on the offspring whose pedigree we are examining. If a particular ancestor appears a lot of times in both the sire's side and/or the dam's side we can get what is termed a high "genetic representation" for that ancestor. If the genetic representation for a given animal approaches 40% to 50% it would be as if that ancestor almost were able to clone himself in the offspring whose pedigree we are examining.

I think I understand what I just said. At any rate it seems sort of clear to me and I hope that I have made it sort of clear to you. I would be more than happy to discuss this topic (or any goat related topic for that matter) with you personally if you would like to give me a call on my toll-free line: 800-2941052. I normally get into the house at the ranch about 9:30 p.m. in the evening (central standard time). I usually get from 3 to 5 calls every evening from all over the country. It starts on the East coast and migrates over to the West coast where they are two hours earlier than I am in Texas.

If you enjoy raising your goats even half as much as I do raising my goats you are truly blessed. I hate to go to bed at night and I can't wait to get up in the morning. After all, what is a good life about anyway, if it's not looking forward to another great day? My wife gave me an interesting perspective the other day. She said, "If you wake up in the morning and stretch out your arms and don't feel the sides of your coffin, it's going to be a great day!"

You may contact the author, Dr. Fred C. Homeyer, at Antelope Creek Ranch, HC 60 Box 50, Robert Lee, TX 76945; Ph:(915)453-2863.

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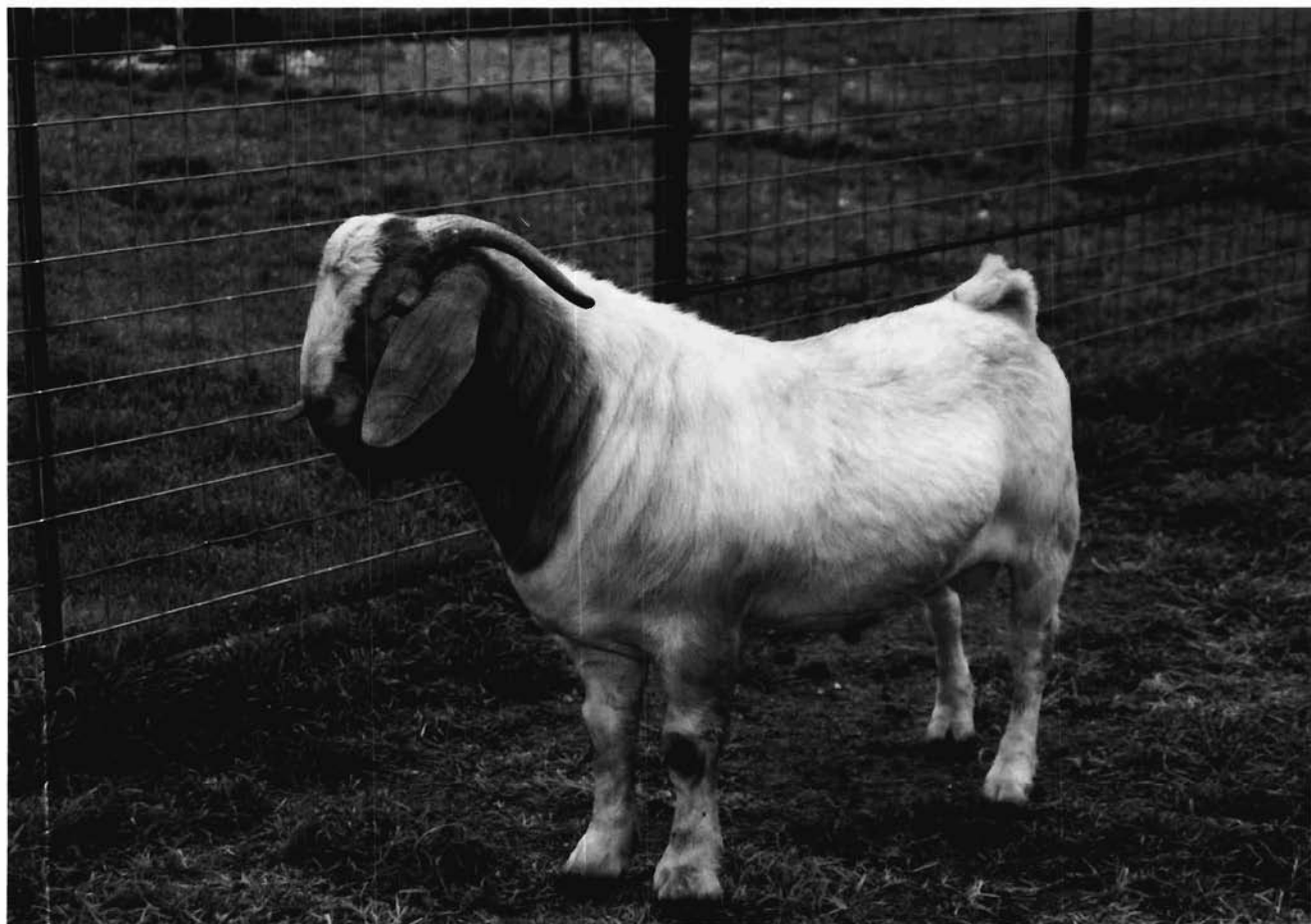
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ANEXO: FOTOGRAFIAS



REBAÑO BOER ROJO

La herencia de los colores y su patrones aún no está muy bien entendida por los criadores de Boer. Observan el rebaño el Sr. Bruce Lott de la ABGA y el Sr. Brad Roeder, del Departamento de Agricultura de Texas.



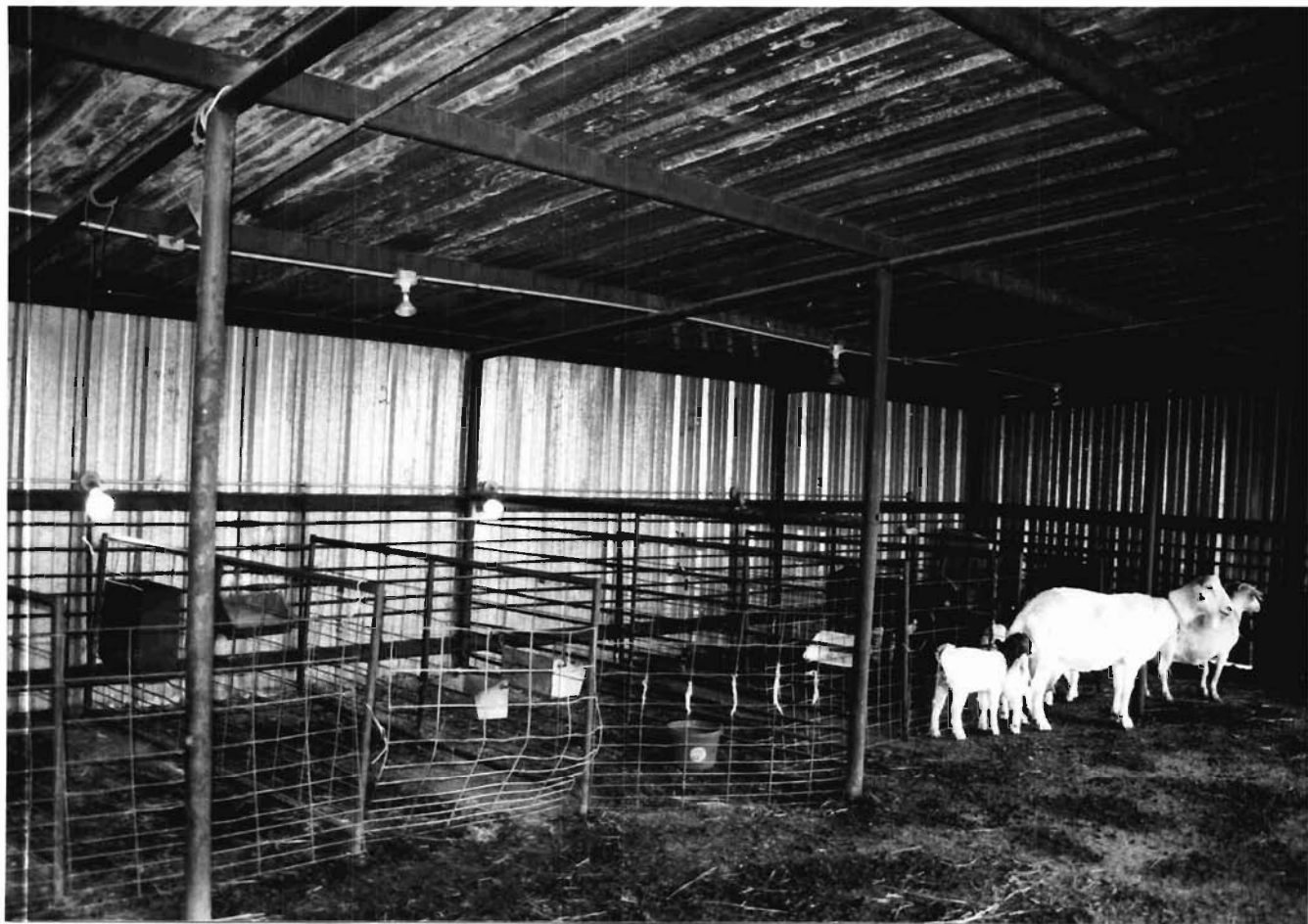
REPRODUCTOR BOER

Macho Boer de 1 año y medio seleccionado para maduración tardía (alto peso y bajo contenido de grasa), perteneciente al Sr. Norman Kohl de El Dorado, Texas.



REBAÑO BOER ROJO

Este rebaño, perteneciente a un hijo del Sr. Norman Kohl de El Dorado, Texas, ha iniciado un programa para producir animales de color rojo tapado. Este color tiene un gran atractivo con algunos productores comerciales que prefieren mantener un rebaño en que el color de los animales es uniforme.



INSTALACIONES PARA PROTECCION DE PARICIONES Y CRIA TEMPRANA

En este tipo de construcciones se ubican los cabritos y sus madres en los primeros días de vida, normalmente son abiertas y expuestas hacia el lado opuesto al viento. Cuentan con iluminación infrarroja en muchos casos.

En el piso se utiliza un sistema de cama caliente.



PLATAFORMAS DE ALTURA REGULABLE PARA TRABAJO CON CABRAS

Estas plataformas permiten realizar fácilmente y a una altura cómoda para el operario, trabajos como el despalme.



PISTA DE ENTRENAMIENTO PARA MACHOS BOER

En este tipo de instalaciones se hace correr, generalmente con ayuda de un perro, a los machos en el periodo previo a la exhibición para lograr un mayor desarrollo muscular.



PESA PORTATIL Y PESAJE DE UNA OVEJA DE LA RAZA DORPER

La raza ovina Dorper es originaria, al igual que el Boer, de Sudáfrica. Tiene un gran atractivo en Texas debido a que no es necesario esquilarla ya que produce un poco cantidad de lana que muda. Tiene un alto potencial de crecimiento y es de un temperamento mucho más tranquilo y más baja que la raza Suffolk. En este momento en Texas se está comenzando a aumentar el número de animales de la raza pura.



**REBAÑO TÍPICO DE CABRAS CON PORCENTAJE DE ABSORCIÓN DE LA
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Rebaño comercial en el Oeste de Texas.



INSTALACION PARA CREEPFEEEDING DE CABRITO

(Permite el acceso al comedero sólo de los cabritos, excluyendo las madres. El suplemento que se asministra *ad libitum* contiene normalmente un 16% de proteína).



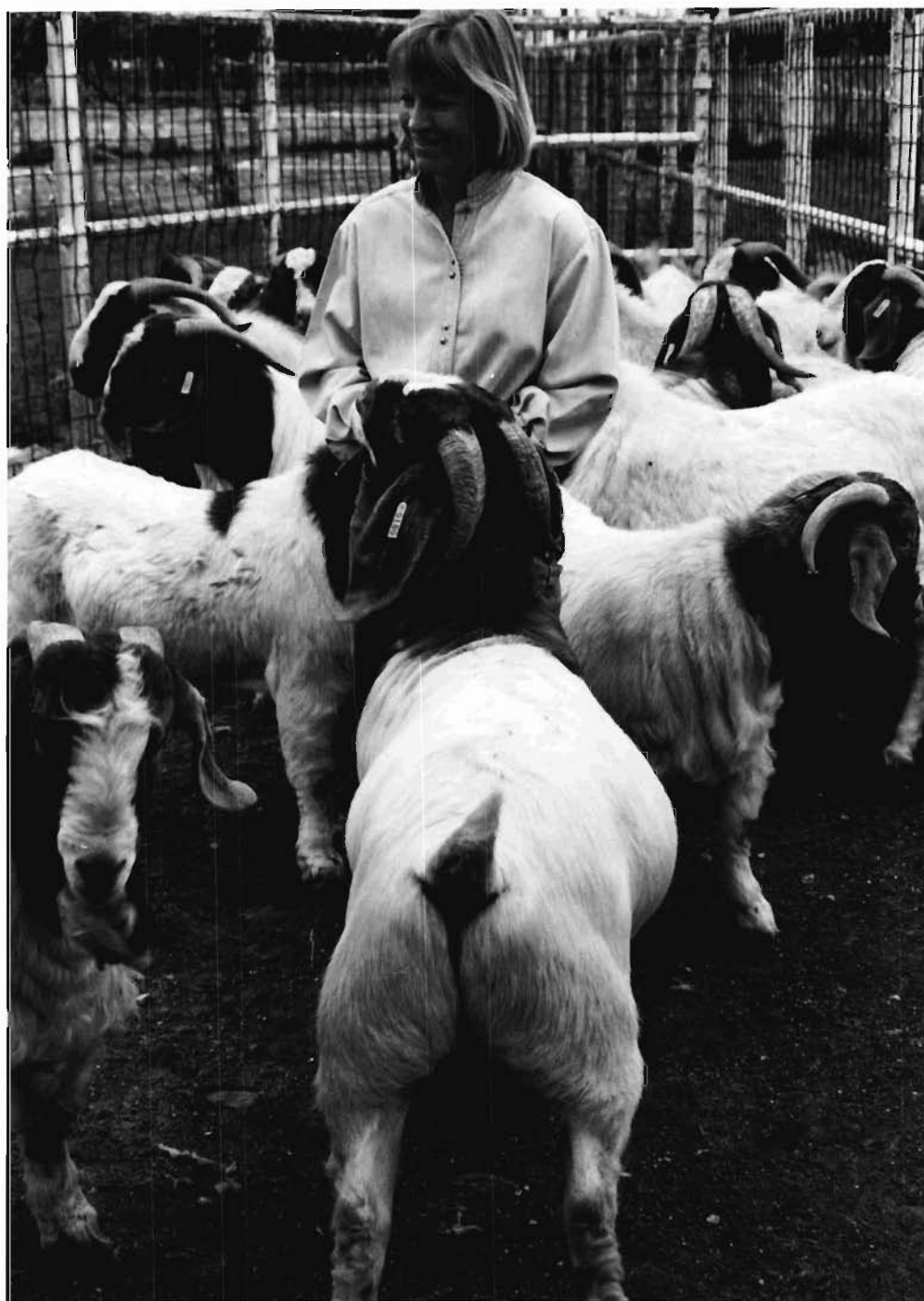
ESQUILA

La mano de obra en la esquila en Texas se obtiene contratando grupos de trabajadores, normalmente mexicanos, que durante la temporada se movilizan de uno a otro predio



LLENADO DE FARDOS DE LANA

La mano de obra en la esquila en Texas se obtiene contratando grupos de trabajadores, normalmente mexicanos, que durante la temporada se movilizan de uno a otro predio



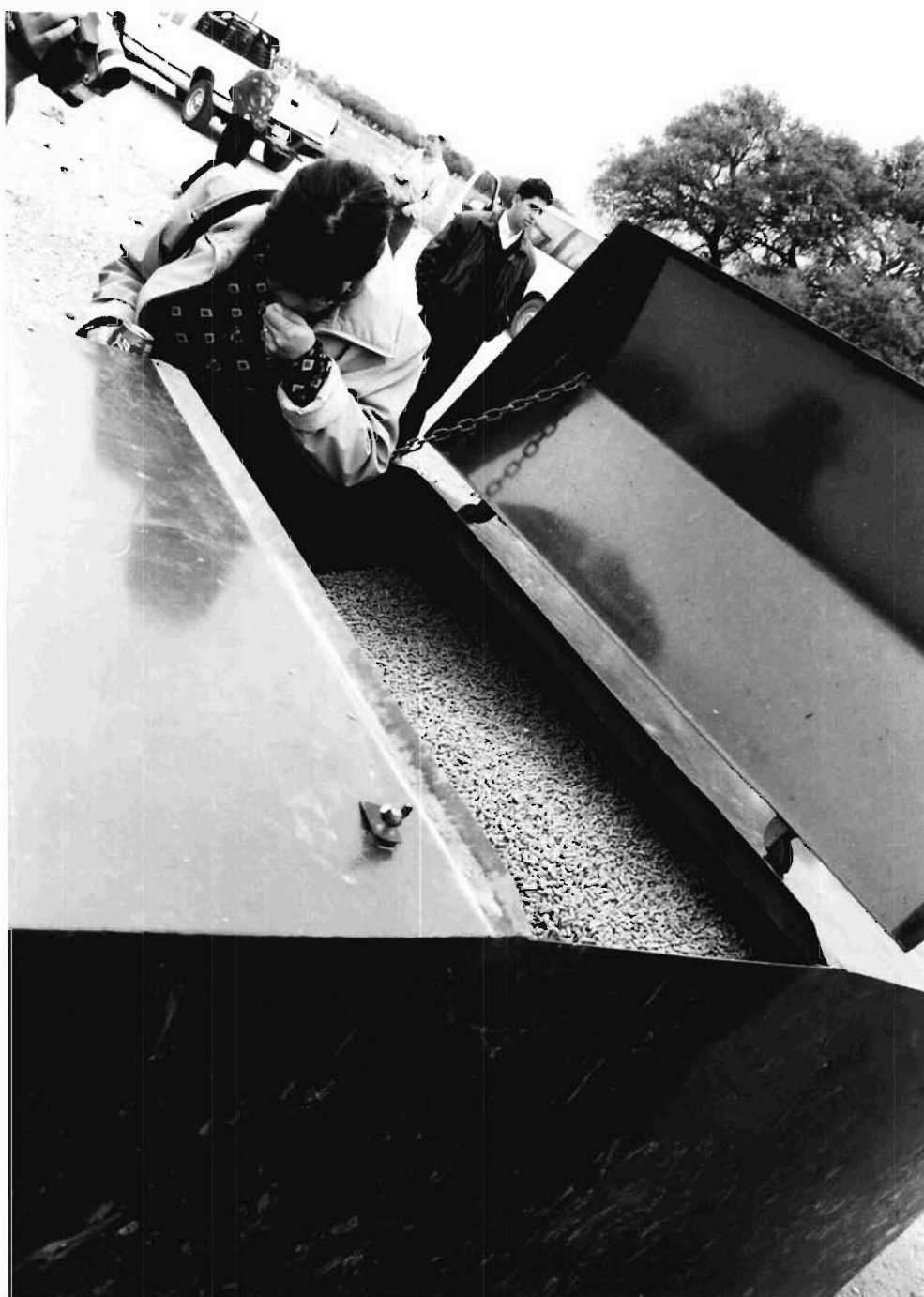
VISTA POSTERIOR DE UN MACHO BOER JOVEN

En el grupo de machos jóvenes que se observa, este reproductor destaca especialmente por la profundidad y cantidad de masa muscular en su pierna, así como por el ancho del dorso que indica la cantidad de musculatura en el lomo del animal.



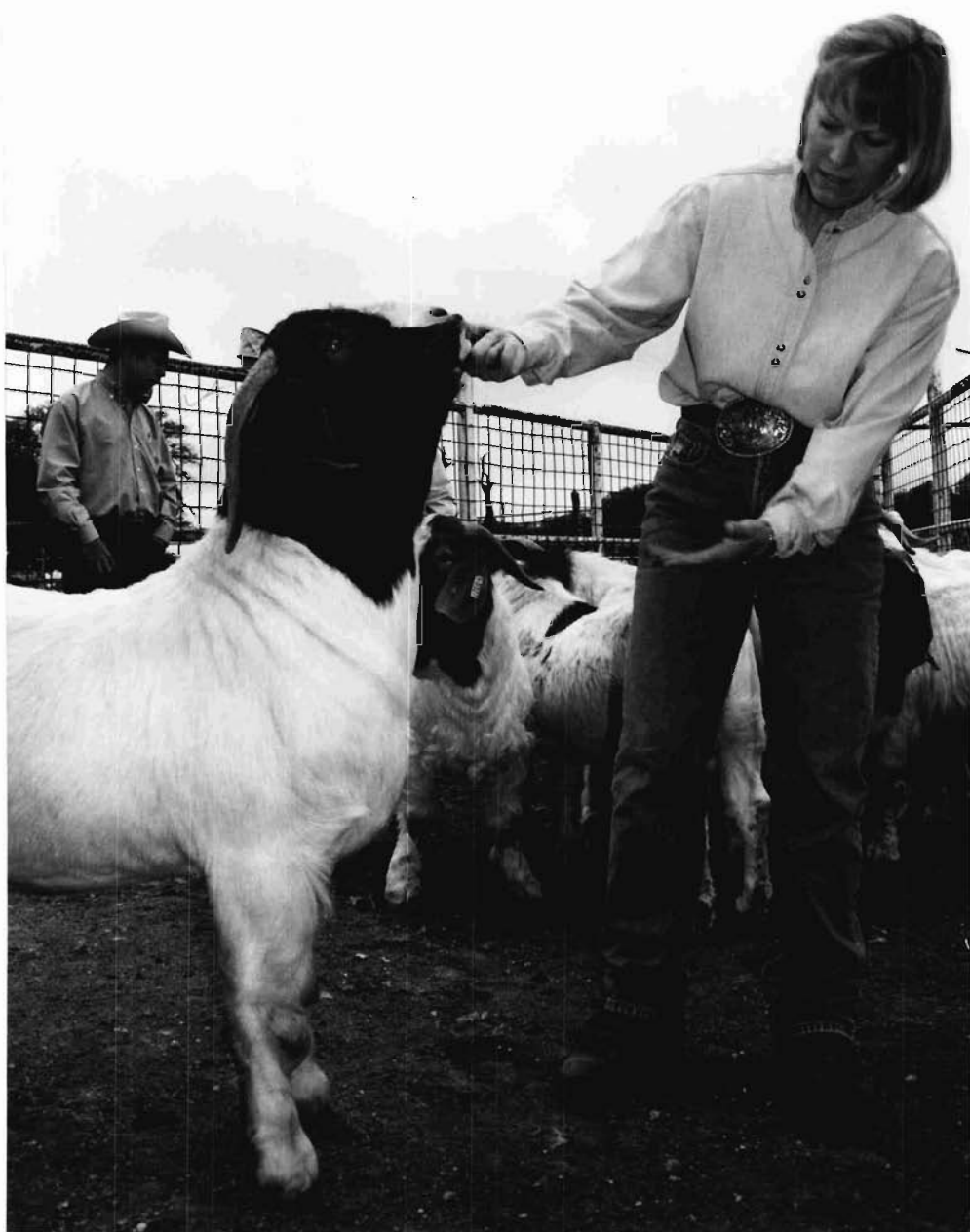
RAMPA DE CARGA PARA CAPRINOS

Construcción móvil y de bajo peso que permite cargar fácilmente cabras a un vehículo



VISTA SUPERIOR DE LA TOLVA CONTENEDORA DEL CORRAL DE CREEP FEEDING

Esta estrategia de alimentación de cabritos es común entre criadores de ganado fino, debido al mejor aprovechamiento del gran potencial de crecimiento temprano que tiene la raza Boer



ASPECTO DEL PECHO Y CUELLO DE UN MACHO DE LA RAZA BOER

En este macho joven se observa el gran desarrollo de la masa muscular en el antebrazo, la curvatura costal tras la paleta y una baja cantidad de pliegues de piel en el pecho.



CORRECTA UBICACIÓN DE LOS DIENTES EN LA RAZA BOER.

En algunos animales, a la edad de un año y medio, es posible observar una separación excesiva de la encía superior y la arcada dentaria. En esos casos, en animales adultos, se produce una separación aún mayor que impide la alimentación normal del animal en la pradera



CABRA HIBRIDAS ANGORA X BOER

La base para la absorción de la raza Boer en Texas ha sido la raza Angora, debido a su difusión como productora de mohair en el pasado. Según los productores, la craza produce excelentes madres.

ANEXO: ANTECEDENTES PREVIOS

[[Return to Publications Table of Contents](#)]

Trends in red meat slaughter in the US.

T.A. Gipson¹ and S. R. Rein²

¹Virginia State University and ²Virginia Commonwealth University

Weekly slaughter data on cattle, hogs, sheep, goats and horses were obtained from the USDA National Agricultural Statistical Service and analyzed for time trends. The data set covered the 15-year period of 1980 through 1994 and only for the aforementioned species slaughtered at federally inspected plants. Trends for the number of cattle, hogs, sheep and horses slaughtered at federally inspected slaughter facilities tend to be cyclical. In recent years, cattle and hog numbers seem to be increasing; however, sheep and horse numbers seem to be decreasing. The trend for the number of goats slaughtered at federally inspected slaughter facilities tends to be linear and increasing over this time period.

citation: Gipson, T.A. and S.R. Rein. 1995. Trends in red meat slaughter in the US. Virginia Journal of Science 46:277.

[[Return to Publications Table of Contents](#)]

[[Return to Publications Table of Contents](#)]

Marketing: Kids

Terry A. Gipson

Virginia State University

Demand

The demand for goat meat has continued to increase over the last decade and a half. In 1977, the first year that USDA began keeping statistics on goat slaughter at federally inspected plants, approximately 35,000 goats were slaughtered nationwide (NASS, 1994). By 1994, that number had risen to nearly 350,000, essentially a 1000% increase over that period. It should be noted that goats also pass through other slaughter channels, e.g., state-inspected slaughter facilities and on-farm slaughter. Data on these other slaughter channels are unavailable or nonexistent. Therefore, knowing exactly how many goats are slaughtered in the United States annually is not possible. However, NASS data does indicate the trend in the number of goats slaughtered and in the demand for goat meat in the United States which is increasing significantly.

Even with this significant increase in domestic slaughter, the United States continues to be a net importer of goat meat. In 1989, the United States imported 1,200 metric tons of frozen or chilled goat meat valued at \$1.7 million (FAS, 1994). In 1994, imports rose to 2,000 metric tons valued at \$4.2 million. Where does this large quantity of imported goat meat originate? Basically, only two countries are net exporters of goat meat worldwide and they are Australia and New Zealand. Both countries have large populations of feral goats and periodically these goats are round-up and harvested for export. In 1994, Australia accounted for 75% of the goat meat imported by the United States and New Zealand accounted for 25%.

The demand for goat meat is also seasonal. Many goat producers have cited Easter, Muslim holidays, 4th of July and Christmas as periods of peak demand for goat meat. However, only Easter is substantiated as a peak demand using the NASS weekly data. The number of goats slaughtered doubled the two weeks before Easter. The increased demand for goat meat at Easter is predominately attributed to the "Easter kid" market. This market is driven by the Greek and Italian ethnic populations residing in the urban Northeast. There does not seem to be a year-round market for kids except the cabrito market of Mexico. The 4th of July, Christmas, Eid Al-Fidir and Eid Al-Udha do not significantly affect the baseline number of goats slaughtered. A possible explanation as to the nonsignificant effect of the Muslim holidays on goat slaughter is that the goat meat market is largely an ethnic market. The author has visited several slaughter facilities that cater to the Muslim (halal) slaughter trade. These wholesalers/retailers see only a slight increase in goat slaughter volume preceding the two Muslim holidays. They feel that the Muslim clientele is the group that bought goat meat last week and will be the ones buying goat meat next week. Another possible explanation for the nonsignificant effect of the two Muslim holidays is that culturally Muslim prefer to slaughter the small ruminants themselves for these holidays. It is possible that for these holidays, Muslims are purchasing animals and slaughtering them on-farm. Unfortunately as was stated earlier, statistics for on-farm slaughter are nonexistent, therefore this hypothesis is untestable.

Recently, the repeal of the Wool and Mohair Incentive program has greatly affected the number of goats slaughtered (Pinkerton and Harwell, 1994). With the loss of the incentive program, mohair producers are sending marginally productive Angoras to market. After the August/September 1994 shearing season in Texas, the number of goats slaughtered in federally inspected facilities surpassed 10,000/week for the first time ever.

Marketing Channels

Many channels exist for the marketing of goats/kids; however, livestock auctions **and** on-farm sales predominate. In a recent survey conducted by Cooperative Extension at Virginia State University, livestock auctions and on-farm sales were identified as the two major channels that goat producers used to market their animals. Seventy-four percent (74%) of goat producers responded that they used livestock auctions as one means of marketing their goats. Fifty-four percent (54%) of the producers said that they had also used on-farm sales. Other marketing channels include contract sales, cooperative marketing and value-added processing. Livestock auctions are convenient because they offer a year-round and local outlet for marketing goats; however, they generally allow the lowest profit margin for producers. It is important to note that not all livestock auctions are created equal when it comes to marketing goats. A producer will be able to increase revenues by choosing a livestock auction that routinely handles goats over one that occasionally handles them. On-farm or direct sales to the consumer offer the greatest profit margin on live animals for the producer because all middlemen and their fees have been eliminated. It offers a year-round marketing outlet; however, it has its disadvantages. Because the meat goat trade is ethnically driven and bargaining is a cultural norm for many of these ethnic groups, the goat producer will need to become adept at bargaining. For many Americans this is a distasteful practice. To successfully direct market goats, a producer needs to be located near a large urban area with a substantial ethnic population. Many producers feel that the potential of livestock theft is also increased because of direct marketing. Cooperative marketing probably yields the greatest power for the producer but currently it is only used to meet seasonal demands, i.e., Easter kids. Contract sales offer security in terms of pricing and markets but are a rarity. Value-added processing probably offers the greatest overall profit margin and allows for year-round marketing. However, the cost of equipment and the complexity of market development may discourage some producers.

Establishing Grading Standards

The marketing of goats is largely an unorganized process (Pinkerton and Harwell, 1994). At a recent meat goat meeting, producers, scientists and marketing specialists identified the development and establishment of formalized grading standards for live goats as a top priority for the advancement of the meat goat industry (AMGA, 1994). The Virginia Department of Agriculture and Consumer Services in conjunction with Virginia State University has a research project studying the feasibility of establishing grade standards for slaughter goats. Scientists from the University of Florida and Virginia Polytechnic Institute and State University (VPI&SU) are also involved in this project. This marketing tool would allow producers and buyers to sell/buy goats in uniform lots according to their quality. The tentative grade standards for kids are:

Prime (Blue Head) - Prime slaughter kids exhibit superior meat type conformation and possess a high degree of finish in the brisket and over the backbone. The backbone is well covered and smooth when the hand is pressed down on. The hair coat of prime kids is smooth and lustrous indicating a high level of nutrition and freedom from disease and parasites.

Choice (Red Head) - Choice slaughter kids exhibit average meat type conformation and possess a moderate degree of finish in the brisket and over the backbone. The backbone is moderately prominent to the touch when pressed down on. The hair coat of choice kids is smooth and clean in appearance.

Good (Green Head) - Good slaughter kids exhibit at least average meat type conformation, but possess only a moderately thin to thin degree of finish in the brisket and over the backbone. The backbone is very prominent when pressed down on and feels "knobby" to the touch. Good grade kids are healthy in

appearance and have the potential to reach the choice grade.

Utility (Yellow Head) - Utility slaughter kids exhibit symptoms of poor management including nutrition, parasite control or genetic deficiencies. Utility grade kids are very thinly fleshed with a hair coat that is rough and dull in appearance.

This project will grade and take live-animal measurements and correlate them with carcass measurements. Twenty-three mature goats were slaughtered at the VPI&SU abattoir in early March. Twenty kids are scheduled for slaughter in early April and yearling goats are scheduled later.

Conclusions

The demand for goat meat is rising rapidly. Domestic slaughter and imports continue to rise annually. However demand can be seasonal with Easter influencing significantly the number of goats slaughtered. The two most popular channels for marketing goats are livestock auctions and on-farm sales. The establishment and implementation of grading standards would benefit the industry.

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Pinkerton, F. and Harwell, L., 1994. Marketing channels for meat goats. Meat Goat Production & Marketing Handbook, pp.75-83.

citation: Gipson, T.A. 1995. Marketing: kids. Proceedings of the Virginia State Dairy Goat Association, April 1, 1995, Blacksburg, VA, pp 13-15.

[[Return to Publications Table of Contents](#)]

[[Return to Publications Table of Contents](#)]

Meat goats: Management considerations for the production of meat.>

S. Wildeus and T. A. Gipson

Virginia State University

Goat production for meat differs from that for milk or for fiber in its reduced production intensity and increased emphasis on reproductive efficiency, kid growth rates and meat confirmation. Most of the goat breeds in the U.S. have been selected for either dairy production (Nubian, La Mancha, Swiss breeds) or mohair production (Angora), while neglecting maternal ability, and growth rate/muscling, respectively. Currently, the only true meat breed is the South African Boer goat that has recently been imported in the U.S. The Spanish goat, developed under extensive range conditions, the Tennessee Wooden-legged goat and the Pygmy goat are all smaller breeds, but have meat-type conformations and potential as components in a meat-producing crossbreeding scheme. For meat goat production to be efficient and profitable, animals must perform well under a forage-based system with limited inputs of harvested feeds. Females should be capable of giving birth to multiple litters with minimal assistance and successfully raise kids to weaning. Although goats generally are seasonal breeders, meat-type goats should ideally have extended breeding seasons or breed throughout the year. This would allow a decrease in kidding interval and allow breeding to produce kids for specific markets opportunities (i.e. Easter). No grading standards are currently adopted for goats and carcasses are marketed whole, but kids with good meat confirmation generally command higher prices. Hence selection and management for meat-type conformation and high growth rates should be pursued. To this end research is needed to characterize the meat production capacity of selected breeds and their crosses under Virginia production conditions and to refine meat goat management systems.

citation: Wildeus, S. and Gipson T. A. 1994. Meat goats: Management considerations for the production of meat. Virginia Journal of Science 45(2):44.

[[Return to Publications Table of Contents](#)]

[[Return to Publications Table of Contents](#)]

Use of linear skeletal measurements in evaluating meat-type goat breeds.

S. Wildeus and T. Watkins

Virginia State University

In an effort to objectively screen goat germplasm for their meat production potential, measures evaluating conformation traits in live animals are needed. In a preliminary study, linear skeletal measurements were employed to (1) compare differences between three goat breed types and (2) determine the correlations between and within individual measurements. Twenty-nine female goats, representing three breed types (Nubian - N, Spanish - S, Virginia Brush - V) were used. Linear measurements were taken using either scissor-type calipers or a yard stick with a horizontal crossbeam level. Measurements included width of skull (WE), jaw (WJ), shoulders (WS), hip (WH) and pin bone (WP), length of skull (LS), metatarsus (LM) and back (LB), and height at wither (HW) and hip (HH). Additional measurements included bodyweight (WT) and heart girth (HG). Measurements were collected at two occasions 7 days apart. Breeds differed significantly ($P < 0.05$) in WT, HW, HH and LM, with values for N being higher than those for S and V. Body weight was highly correlated with HG ($r = 0.85$, $P < 0.001$), whereas LM was highly correlated with HH ($r = 0.93$, $P < 0.001$) and HW ($r = 0.84$, $P < 0.001$). The correlation within measurements was highest for WT ($r = 0.99$), HW ($r = 0.91$), HH ($r = 0.91$), and LM ($r = 0.89$). The coefficient of variation for these measurements ranged from 6.1 to 8.8%. The findings indicate that differences in WT between these breeds were more closely related to height rather than width measurements of the animal. Data also suggest that simple and precise skeletal measurements, such as LM, can be incorporated into evaluating the conformation of meat-type goats for breed development.

citation: Wildeus, S. and T. Watson. 1994. Use of linear skeletal measurements in evaluating meat-type goat breeds. 10th Biennial Research Symposium, Assoc. of Res. Directors, Oct. 2-5, New Orleans, LA.

[[Return to Publications Table of Contents](#)]

[[Return to Publications Table of Contents](#)]

Breed Capabilities and Selection for Meat Production

Terry A. Gipson, Ph.D.

Virginia State University
Petersburg, VA 23806

Introduction

Traditionally in the United States, goats (*Capra hircus*) have been kept for milk or fiber production or for eliminating undesirable plant species from pastures (Glimp, 1995). However in recent years, increased attention has focused on the goat as a producer of meat. This interest in meat production is fueled by the increasing demand for goat meat (Escobar et al., 1993). This demand is largely driven by an expanding ethnic population with a traditional preference for goat meat.

The advent of the Boer goat, a fast-growing, large-framed meat breed, has stimulated additional interest. Many have heralded the Boer as the champion of the fledgling meat goat industry. However, several other goat "breeds" could contribute to efficient meat goat production. The objective of this paper is to describe meat goat breeds and their production traits.

"Breed" History and Development

Table 1 contains the country of origin and the estimated U.S. population for several goat breeds that are currently being raised for meat production or could contribute to the meat goat industry.

Boer

The Boer goat owes its name to the Dutch word "boer" meaning farm and was probably employed to distinguish the farm goat from the Angora goat imported into South Africa in the 19th century (Teh and Gipson, 1993). The Boer goat was probably derived from indigenous goats of the Namaqua Hottentot and of the southward migrating Bantu tribes with a possible infusion of Indian and European bloodlines. The present-day, improved Boer goat emerged in the early 20th century when ranchers in the Eastern Cape province started breeding for a meat type goat with good conformation, high growth rate and fertility, short white hair, and red markings on the head and neck. Since 1970 the Boer goat has been incorporated into the National Mutton Sheep and Goat Performance Testing Scheme, which makes it the only known goat breed routinely involved in a performance test for meat production.

In the late 1980's, parastatal organizations in New Zealand and Australia imported Boer goats into their respective countries from South Africa. After a five-year quarantine period, Boer goats were released for exportation to the United States. The New Zealand Boers were released in 1993 and the Australian Boers were released in 1994. Prices for the first Boers to be released in North America were around \$6,000 per animal. Within one year, price rose to around \$45,000 per animal due to limited supply and speculation by "exotic" breeders. Since then, prices have plummeted as "exotic" breeders have left the market and as more Boers enter into the supply.

Brush

This is a catch-all designation for goats that do not fit into any breed description. In some places they are called “briar” goats, “hill” goats, “wood” goats or just plain goats. Brush goat production is characterized by very few inputs and usually involves a high degree of experimental crossbreeding. The Brush goat is usually well adapted to its environment because only the strong survive to reproduce.

Myotonic

The Myotonic goat is known by many different names depending on the region where it is raised. Other names include "Tennessee Wooden-leg", "Tennessee Stiff-leg", "Nervous Goat", "Fall-Down Goat", "Scare Goat" and "Fainting Goat". Little is known about the history of Myotonic goat except that in the early 1880's a man appeared in Marshall County, Tennessee with a sacred cow, three does and a buck. These four goats suffered from “fainting fits” and would “faint” when startled or frightened. The four goats were purchased by a local physician who was intrigued by their oddity and propagated the breed. The original owner of the goats disappeared and their origin remains a mystery.

These “fainting fits”, otherwise known as hereditary myotonia, have endeared this breed to medical researchers, hobbyists and curiosity seekers but not to producers. “Fainting” is considered a management nuisance by producers because it exposes the goats to predator risk. When these goats are startled, they experience transitory muscle stiffness causing extension of hind limbs and neck. If unbalanced in this startled state, the animal will topple over or will stand immobile until the attack passes. These “fainting” attacks usually last only 10-20 seconds. The degree to which myotonia and muscularity are related is not known. Therefore, it is not known if selecting against myotonia will affect muscularity.

Nubian

The Nubian, also known as the Anglo-Nubian, was developed in England from Indian, African and European breeds of milk goats. Selection criteria were for a large-framed dual-purpose goat to be used for milk and meat production. In 1909, six Nubian bucks and eight does were imported into the United States (Hall, 1987). The Nubian quickly became popular because of its docile temperament and high milk fat content. Nubian numbers surpass all other dairy breeds in the United States. It is also easily distinguished from other dairy breeds, largely Swiss type, by its long drooping ears and roman nose.

Pygmy

The Pygmy goat, an achondroplastic dwarf, has its origins in the Fouta Djallon Plateau of West Africa, where it is known as the West African Dwarf Goat. In its native West Africa, the Pygmy is the dominant goat breed and is used almost exclusively for meat production (Devendra and Burns, 1983). This is partly due to the fact that the Pygmy is able to survive a higher level of trypanosome infection than other African goat breeds. The Pygmy goat was imported into the United States in the early 1960's for biomedical research and for petting zoo stock. Due to its small size, it has become very popular among hobbyists and pet owners.

Spanish

Until the arrival of the Boer, the Spanish goat of Texas was considered the meat goat standard to which other breeds were compared. It is postulated that the Spanish goat descended from goats brought to Texas by early settlers from New England and by Spanish explorers (Willingham, 1990). Today, the Spanish goat is found primarily on or around the Edwards Plateau of central Texas. Until recently, these goats were

kept mainly for clearing brush and other undesirable plant species from pasture lands. Meat production was a secondary production trait until the heightened interest in meat production increased goat prices, prompting many Spanish producers to rethink selection objectives and management practices. Spanish is a term used primarily to distinguish these goats from Angora or dairy goats. There have been obvious infusions of dairy and Angora blood in many Spanish herds but no organized attempt has ever been made to use them for milk or mohair production.

Other breeds

In the broadest sense, every goat breed is a meat producer. Every goat that goes to the sale barn, regardless of breed, is slaughtered for human consumption. There are several breeds that are less suited for meat production than those already listed. These include the Angora, high-producing cashmere goats and dairy breeds other than the Nubian. The Angora is a small-framed breed known for its fiber production. This fiber is called mohair and is used in many textiles. Another fiber produced by goats is cashmere. Generally, the smaller individuals of these breeds produce the finest fiber, which brings a higher price than the coarser fiber. Also, high-producing fiber goats generally have smaller litters than other goats. A large-framed animal that produces twins or triplets routinely is a desired trait for a meat producing goat. Thus, selection for meat production is antagonistic to selection for fiber production.

Other dairy breeds include Alpine, Saanen, Toggenburg, Oberhasli and LaMancha. The first four breeds are European in origin and are collectively known as "Swiss" breeds in the United States. The Swiss breeds have been intensely selected for milk production. The LaMancha is a descendant of goats brought to the New World, specifically California, by early Spanish explorers and Roman Catholic missionaries. It also has been selected for milk production; however, it has lower milk production than the Swiss breeds. Two major complaints from producers about using dairy breeds or about the infusion of dairy blood into goats used for meat production are the problems of pendulous udders that become bruised and damaged by rocks and brush under extensive management and the problem of too large of teats for successfully raising kids on pasture.

Production Traits

Four key production traits should be considered for improving productivity in meat goats. These are adaptability to environmental and production conditions, reproductive rate, growth rate and carcass value. This paper will deal with the first three because they are readily measurable on the farm. With good record keeping and a set of scales, the meat goat producer can collect all the information needed to increase the productivity of his or her meat goat enterprise.

Adaptability

If an animal's ability to survive and reproduce is impaired by the production environment, then the profitability of that enterprise may be greatly diminished. The goat is perhaps the most adaptable of all the domesticated livestock and survives in a wide range of environments worldwide. However, when it is taken out of one environment and placed in another it does not always realize its production potential. Angora goats imported into the Sahel of West Africa performed very poorly due to the harsh environment (Wilson, 1992). Alpine and Saanen dairy goats imported into India performed only slightly better than local breeds under a stall management system (Devendra and Burns, 1983). Therefore, one might expect Spanish goats to perform differently in the humid southeast than they do in the arid southwest; or Boer goats to perform differently under extensive management in North America than they do under extensive management in South Africa.

For the most part, the management practices for meat goat production in the United States are based on minimal inputs. Enterprise analysis studies have shown that the two major financial inputs into a meat goat enterprise are feed and veterinary costs (Harwell, 1994). Controlling internal parasites accounts for the majority of the veterinary costs and has been identified as the number one health problem in goats (de la ConchaBermejillo, 1993). To reduce feed expenditures, it has been proposed that goats raised for meat production should be maintained on an extensive forage-based system, either on improved pastures or on browse. One strategy to reduce veterinary expenditures and to delay the onset of anthelmintic resistance is to select animals that are genetically resistant to internal parasites (Baker, 1991).

The prevailing production systems of the different breeds are shown in Table 2. Brush, Myotonic and Spanish goat production systems are generally extensive with few, if any, inputs and on marginal land. Brush goats have traditionally been kept for clearing brush from farm land in the East. Apart from the smallish “fainting” variety fancied by the hobbyist, the Myotonic goat is generally considered a “brush” goat and is raised for the primary purpose of reclaiming pastures from brush encroachment or the utilization marginal lands. The Spanish goat, like the Myotonic, is kept for pasture reclamation on the beef cattle ranches of Texas. Until recently, traditional goat management in central and west Texas had few inputs and the Spanish goat has survived and reproduced under these harsh management and climatic conditions. With the current popularity of goat production and the need for recipients for embryo transfer for the Boer trade, the price of goats has increased and Texas ranchers are improving their goat husbandry.

For the most part, the production system for Boers, Nubian and Pygmy range from semi-intensive to intensive, meaning that supplementation plays a major role in the management system. To realize the growth potential of the Boer goat, a high plane of nutrition is needed. Grasses and browse do not supply enough protein to support this growth, so the vast majority of Boer producers heavily supplement their animals with grain or with complete feed. Although, the Nubian was originally developed as a dual-purpose goat, breeders have decided to emphasize milk production and its 305-d milk production has increased significantly over the last decade. To realize its milk-producing potential the environment must not be limiting and thus an intensive management system has become the norm for this breed. The Pygmy goat is favored by hobbyists and petting zoo staff. Even though it has fairly low maintenance requirements, it is usually raised under semi-intensive conditions due to its pet status.

Few studies exist that provide evidence for resistance to internal parasites (Table 2). In a breed comparison study, Myotonic and Pygmy bucks were more “resistant” to internal parasites than were Nubian and Spanish bucks (Gipson, 1995). Under natural challenge, Myotonic and Pygmy bucks had lower fecal egg counts for trichostrongyle-type nematodes, lower oocysts counts for coccidia and higher packed-cell volume than did Nubian and Spanish bucks. Another study monitored composite fecal egg counts in Brush, Nubian and Spanish does for a twelve-month period (Lovin and Gipson, 1996). Brush does had significantly lower fecal egg counts (390 trichostrongyle eggs per gram of feces (epg)) than did Spanish (785 epg) or Nubian (900 epg). Deworming of the individual breeds was conducted when the fecal egg count surpassed 1,000 epg for that breed. Thus, this monitoring resulted in six dewormings with an average interval between dewormings of 68 days for the Brush, nine dewormings with an average interval between dewormings of 46 days for the Spanish, and 12 dewormings with an average interval between dewormings of 34 days for the Nubians. An estimated annual cost was calculated for each breed based upon average doe weight, number of dewormings and the current cost of popular goat dewormers. Estimated annual deworming cost for Brush was \$5.16/doe, for Spanish was \$7.29/doe and for Nubian was \$13.08/doe. Anecdotal producer evidence suggests that the Boer is as “susceptible” to internal parasites as is the Angora (Culliford, 1995), which is itself notoriously “susceptible” to internal parasites (Thedford, 1993).

Reproduction

Reproduction is considered to be the single most important factor contributing to the efficiency of a meat production enterprise. Goats are fecund, prolific and have a gestation length of five months. This combination of reproductive parameters suggests a highly efficient meat-producing animal. However, under temperate environmental conditions, goats tend to be seasonal breeders. Females come into estrus in the Fall with anestrus occurring in late Spring. Generally, this seasonal breeding pattern translates into one kid crop per year. Seasonality of breeding is considered to be the foremost hindrance in the efficient production of meat from goats.

Brush, Pygmy and Myotonic does appear to have the ability to breed year-round. Based upon scientific study, the Pygmy appears to be truly aseasonal. Researchers have shown that when a tropical breed was relocated to a temperate environment, females became seasonal breeders (Wildeus et al., 1991); however, this was not the case with the Pygmy. In the Netherlands over a 7-year period, Pygmy does kidded throughout the year and had a kidding interval of 193 days. This ability to rebreed approximately 45 days postparturition, or approximately at weaning, translates into almost two kid crops per year. A proposed kidding frequency of three kid crops every two years should be achievable for the Pygmy. Myotonic producers report that their does kid at all times of the year but no scientific evidence exists to support this. The Myotonic doe may indeed be aseasonal or it just might have an extended breeding season. In a study conducted at Virginia State University to examine out-of-season breeding, Brush, Nubian and Spanish does were exposed to bucks during the month of May (Ezekwe and Lovin, 1996). In the first year of the study, Brush doe had a conception rate of 83%, Nubian 58% and Spanish 0%. In the second year, the conception rate declined to 58% for Brush and to 0% for Nubian. In the second year, Spanish does again failed to conceive (0%) during the month of May.

Boer does also appear to be seasonal breeders, which would limit efficient reproductive performance. Research in South Africa indicated that the Boer doe has an extended breeding season, without complete anestrus occurring, with peak sexual activity occurring in autumn and low activity in late spring to midsummer. This activity was measured using vasectomized bucks and is not necessarily a measure of ovulation. Nubian goats maintained under tropical conditions in Mexico conceived throughout the year, but fertility levels were higher in May to December than the remainder of the year (Mellado et al., 1991).

More information on seasonality is available for the Spanish goat than for other breeds. Research under Texas range conditions and with continuous exposure to the male indicated that the breeding season for Spanish does extended from August to January. The months of February to early March and May to July are transitional periods with deep anestrus occurring March through April. The majority of the parturitions occurred between November and February and a second peak was observed in May. The average kidding interval was 326 days but followed a bimodal distribution. A small group of does that kidded in October to December rebred before the anestrus period and had a kidding interval of approximately 200 days. The vast majority of the does had a kidding interval of 355 days. Recently in Texas, Spanish and Spanish-Boer crosses were examined for estrus activity. No individual in either group was cycling in September (Waldron et al., 1995). Estrus activity increased in both groups with over 90% of the does cycling in November. Afterwards, activity decreased with 0% cycling in March for Spanish and 3% for Spanish-Boer crosses.

Kidding rate or prolificacy, defined as the number of kids born per doe kidding, is an important contributing factor to reproductive efficiency. Several studies have shown that even though twins and triplets have lower birth and weaning weights and have slower growth rates, they produce more total weight of kid weaned (McGowan and Nurse, 1992) and thus mean higher profit for the producer.

The Boer goat is prolific with a kidding rate of 200%. However, other breeds are not far behind the Boer.

Brush does appear to be very prolific also and have averaged a kidding rate of nearly 200% in the Virginia State University research herd. Brush does conceiving out-of-season had only a slight decrease in kidding rate to 180%. Myotonic does had a kidding rate near 197% on a Texas ranch raised under intensive management. Over a 7-year period in the Netherlands, Pygmy does had a kidding rate ranging from 183% to 190%. In studies conducted for milk production, Nubian does had a kidding rate of 160% and 162%. In northern Mexico, Nubian had the highest litter size of five dairy breeds evaluated, 192% vs. 165% for the other four (Montaldo et al., 1978). However, in a later study in Mexico, Nubian does had a kidding rate of 169% which was not significantly different from other dairy breeds evaluated at the same time (Montaldo et al., 1995). When Nubian does did conceive out-of-season, there was no apparent decrease in kidding rate (170%). In a nutrition study conducted during the Fall breeding season, two different levels of supplementation (.5 lbs. of cracked corn vs .75 per head per day) had no effect upon birth weight or litter size, which was 171% (Ezekwe and Lovin, 1995). Under Texas range conditions, Spanish goats have a kidding rate of 130% (Lawson and Shelton, 1982). This low kidding rate was attributed to the extensive management system. The authors felt that it underestimated actual levels because kids might be lost before they were recorded.

Growth Rates

Growth, expressed as average daily gain (ADG), can be effectively divided into two periods: growth before weaning and growth after weaning. A high pre-weaning ADG reflects both the genetic potential of the kid and the mothering ability of the doe. In some production systems, kids are sold at weaning and therefore post-weaning ADG is of little importance, while in others, kids are sold as yearlings or older and post-weaning ADG becomes an important production factor.

Wide variations exist in pre-weaning ADG among the breeds, ranging from fast-growing Boer to the slow-growing Pygmy. Characteristic of the large-framed, muscular breed that it is, the Boer has high pre-weaning growth, ranging from 130-200 grams/day. Brush, Myotonic, Nubian and Spanish kids appear to have similar pre-weaning ADGs. Myotonic kids gained 117 grams/day when nursing dams raised under intensive management, (Gipson, unpub. data). The Spanish goat has a preweaning ADG of 115 grams/day under Texas range conditions (Gathuka et al., 1982). In a study in Louisiana, Nubian kids raised on their dams on pasture had a pre-weaning growth of 114 grams/day (Gebrelul et al., 1994). The Pygmy is a small goat and has a corresponding slow growth rate. In the Netherlands, pre-weaning growth rate on the Pygmy goat ranged from 85 to 95 grams/day.

Generally, post-weaning growth follows the same pattern as pre-weaning growth with Boer having the highest and Pygmy the lowest and with the other breeds being intermediate. The Boer has been reported to exceed 200 grams/day post-weaning (Casey and van Niekerk, 1988). Myotonic weanlings grew at a rate of 121 grams/day (Gipson, unpub. data). In Texas, the Spanish goat had a post-weaning ADG of 40 grams/day on pasture and 150 grams/day in the feedlot (Blakeman et al., 1992). In Virginia, Spanish males grew at a rate of 115 grams/day under full feed (Wildevus and Gipson, 1994). In a comparison study of Spanish and Spanish-Boer cross males, Spanish kids gained 132 grams/day in the feedlot and 2 grams/day on pasture vs. 168 grams/day feedlot and 2 grams/day pasture for the Spanish-Boer cross males (Waldron, 1995). The poor growth rate on pasture was attributed to the near drought conditions that prevailed during the pasture study period. Possibly reflecting the milk-producing ability of the Nubian doe, Nubian kids actually have a decline in growth during the post-weaning period compared to pre-weaning and had a post-weaning ADG ranging from 60 to 90 grams/day (Casey and van Niekerk, 1988; Wildevus and Gipson, 1994). In the Netherlands, the Pygmy had a post-weaning ADG of 50 grams/day. In another study, Pygmy males had a post-weaning gain of 63 grams/day and females 44 grams/day (Hatfield et al., 1984).

Conclusions

The meat goat industry is hampered by the lack of an efficient goat breed for meat production on a low-input system. Several “breeds” are available to the producer; however, no single breed possesses all the desirable production characteristics. Brush, Spanish and Myotonic have evolved under extensive management; Brush, Myotonic and Pygmy have the advantage in parasite resistance; Pygmy has the advantage for year-round breeding; Boer, Brush, Myotonic and Pygmy have the advantage for litter size; Boer has the advantage for pre- and post-weaning growth; and Nubian has the advantage for milk production. However, further scientific research is needed to thoroughly assess the productivity of the different breeds under the same management conditions and to assess their potential contribution to efficient meat goat production. The meat goat industry must be careful in developing its production objectives which should emphasize productivity, not frame size. Generally larger does produce larger kids, but they also have a higher dietary requirement for maintenance and reproduction than do smaller does. This higher dietary requirement may translate into lower stocking rates or a need for supplementation. The former lowers herd productivity and the latter decreases profitability. The beef and sheep industries have realized that large females are not necessarily the most productive (Rahnefeld et al., 1993; Head et al., 1995). Learning from these other two livestock industries, the meat goat industry must concentrate on productivity rather than size.

Table 1. Goat breeds used or proposed for meat production, their county of origin and estimated U.S. population.

“Breed”	Origin	Estimated U.S. Population
Brush	U.S.	?
Boer	South Africa (1)	10,000* (6)
Myotonic	U.S. (2)	> 3,000 (7)
Nubian	England (3)	100,000* (8)
Pygmy	West Africa (4)	32,000* (9)
Spanish	U.S. (5)	300,000 (10)

*Total number of registered animals
(1) (Casey and van Niekerk, 1988); (2) (Lush, 1930); (3) (Hall, 1987); (4) (Lincicome and Hall, 1984); (5) (Willingham, 1990); (6) (Campbell, 1995); (7) (Anonymous, 1992); (8) ADGA, per. comm.; (9) (Anonymous, 1993); (10) (Paschal, 1990).

Table 2. Goat breeds used or proposed for meat production and their production characteristics.

"Breeds"	Adaptability		Reproductive Performance		Growth (grams/day)	
	production environment	internal parasites	seasonal breeder	kidding rate	pre-weaning ADG	post-weaning
Brush	extensive (*)	"resistant" (*)	no (*)	200% (*)	117 (*)	?
Boer	intensive (1)	possibly "susceptible" (7)	yes (9)	200% (13)	130-200 (1)	200+
Myotonic	extensive (2)	"resistant" (8)	"no"	197% (14)	117 (17)	121
Nubian	intensive (3)	"susceptible" (8)	yes (10)	160% (15)	114 (18)	90 (21)
Pygmy	semi-intensive (4)	"resistant" (8)	no (11)	183% (11)	85 (11)	50 (
Spanish	extensive (5,6)	"susceptible" (8)	yes (12)	171% (16)	115 (19)	40 (past) 108-150 (21)

(*) (Gipson, unpub. data); (1) (Casey and van Niekerk, 1988); (2) (Gasparotto and Goll, 1995); (3) (Hall, 1987); (4) (Lincicome and Hall, 1984); (5) (Shelton, 1990); (6) (Smith, 1992); (7) (Culliford, 1995); (8) (Gipson, 1995); (9) (Greyling and van Niekerk, 1987); (10) (Ezekwe and Lovin, 1996); (11) (Montsma, 1986); (12) (Lawson and Shelton, 1982); (13) (Erasmus et al., 1985); (14) (Gipson et al., 1994); (15) (Teh et al., 1985); (16) (Ezekwe and Lovin, 1995); (17) (Gipson, 1994); (18) (Gebrelul et al., 1994); (19) (Gathuka et al., 1982); (20) (Casey and van Niekerk, 1988); (21) (Wildeus and Gipson, 1994); (22) (Blakeman et al., 1992).

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[[Return to Publications Table of Contents](#)]

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Genetic Resources for Meat Goat Production

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ABSTRACT

Several U.S. goat breeds exist that could contribute to efficient meat goat production. The Boer goat, a recent arrival, is a large-framed breed renowned for its prolificacy and fast growth rate. However, the performance of Boers under extensive management has been questioned. The Spanish goat of Texas is considered to be well adapted to an extensive management system and has moderate reproductive and growth rates, although it may be a seasonal breeder, which would limit accelerated kidding. The Myotonic or "fainting" goat is considered a good candidate for meat production because of its muscular meaty conformation, prolificacy and extended breeding season. Fainting is a management nuisance but it is not known to what degree, if any, fainting and muscularity are related. The Nubian goat is a dual-purpose goat used for milk and meat production with moderate reproductive and growth rates, but its adaptability and mothering ability are questionable under an extensive system. The Pygmy goat is a small-framed breed that is hardy, prolific and an aseasonal breeder. However, the Pygmy has low rates of gain and occasional dystocia problems. No single goat breed has all of the desirable traits needed for efficient meat goat production.

Key Words: Goats, Meat Production, Genetic Resources

Introduction

Traditionally in the United States, goats (*Capra hircus*) have been kept for milk or fiber production or for eliminating undesirable plant species from pastures (Glimp, 1995). However in recent years, increased attention has focused on the goat as a producer of meat. This interest in meat production is fueled by the increasing demand for goat meat (Escobar et al., 1993). This demand is largely driven by an expanding ethnic population with a traditional preference for goat meat.

The advent of the Boer goat, a fast-growing, large-framed meat breed, has stimulated additional interest. Many have heralded the Boer as the champion of the fledgling meat goat industry. However, several other goat "breeds" could contribute to efficient meat goat production. The objective of this paper is to describe meat goat breeds and their production traits.

"Breed" History and Development

Table 1 contains the country of origin and the estimated U.S. population for several goat breeds that are currently being raised for meat production or could contribute to the meat goat industry.

Boer

The Boer goat owes its name to the Dutch word "boer" meaning farm and was probably employed to distinguish the farm goat from the Angora goat imported into South Africa in the 19th century (Teh and Gipson, 1993). The Boer goat was probably derived from indigenous goats of the Namaqua Hottentot and of the southward migrating Bantu tribes with a possible infusion of Indian and European bloodlines. The

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[[Return to Publications](#) [Table of Contents](#)]

present-day, improved Boer goat emerged in the early 20th century when ranchers in the Eastern Cape province started breeding for a meat type goat with good conformation, high growth rate and fertility, short white hair, and red markings on the head and neck. Since 1970 the Boer goat has been incorporated into the National Mutton Sheep and Goat Performance Testing Scheme, which makes it the only known goat breed routinely involved in a performance test for meat production.

Myotonic

The Myotonic goat is known by many different names depending on the region where it is raised. Other names include "Tennessee Wooden-leg", "Tennessee Stiff-leg", "Nervous Goat", "Fall-Down Goat", "Scare Goat" and "Fainting Goat". Little is known about the history of Myotonic goats except that in the early 1880's a man appeared in Marshall County, Tennessee with a sacred cow, three does and a buck. These four goats suffered from "fainting fits" and would "faint" when startled or frightened. The four goats were purchased by a local physician who was intrigued by their oddity and propagated the breed. The original owner of the goats disappeared and their origin remains a mystery.

These "fainting fits", otherwise known as hereditary myotonia, have endeared this breed to medical researchers, hobbyists and curiosity seekers but not to producers. "Fainting" is considered a management nuisance by producers because it exposes the goats to predator risk. When these goats are startled, they experience transitory muscle stiffness causing extension of hind limbs and neck. If unbalanced in this startled state, the animal will topple over or will stand immobile until the attack passes. These "fainting" attacks usually last only 10-20 seconds. The degree to which myotonia and muscularity are related is not known. Therefore, it is not known if selecting against myotonia will affect muscularity.

Nubian

The Nubian, also known as the Anglo-Nubian, was developed in England from Indian, African and European breeds of milk goats. Selection criteria were for a large-framed dual-purpose goat to be used for milk and meat production. In 1909, six Nubian bucks and eight does were imported into the United States (Hall, 1987). The Nubian quickly became popular because of its docile temperament and high milk fat content. Nubian numbers surpass all other dairy breeds in the United States. It is also easily distinguished from other dairy breeds, largely Swiss type, by its long drooping ears and roman nose.

Pygmy

The Pygmy goat, an achondroplastic dwarf, has its origins in the Fouta Djallon Plateau of West Africa, where it is known as the West African Dwarf Goat. In its native West Africa, the Pygmy is the dominant goat breed and is used almost exclusively for meat production (Devendra and Burns, 1983). This is partly due to the fact that the Pygmy is able to survive a higher level of trypanosome infection than other African goat breeds. The Pygmy goat was imported into the United States in the early 1960's for biomedical research and for petting zoo stock. Due to its small size, it has become very popular among hobbyists and pet owners.

Spanish

Until the arrival of the Boer, the Spanish goat of Texas was considered the meat goat standard to which other breeds were compared. It is postulated that the Spanish goat descended from goats brought to Texas by early settlers from New England and by Spanish explorers (Willingham, 1990). Today, the Spanish goat is found primarily on or around the Edwards Plateau of central Texas. Until recently, these goats were kept mainly for clearing brush and other undesirable plant species from pasture lands. Meat production was a secondary production trait until the heightened interest in meat production increased goat prices,

prompting many Spanish producers to rethink selection objectives and management practices. Spanish is a term used primarily to distinguish these goats from Angora or dairy goats. There have been obvious infusions of dairy and Angora blood in many Spanish herds but no organized attempt has ever been made to use them for milk or mohair production.

Other breeds

In the broadest sense, every goat breed is a meat producer. Every goat that goes to the sale barn, regardless of breed, is slaughtered for human consumption. There are several breeds that are less suited for meat production than those already listed. These include the Angora, high-producing cashmere goats and dairy breeds other than the Nubian. The Angora is a small-framed breed known for its fiber production. This fiber is called mohair and is used in many textiles. Another fiber produced by goats is cashmere. Generally, the smaller individuals of these breeds produce the finest fiber, which brings a higher price than the coarser fiber. Also, high-producing fiber goats generally have smaller litters than other goats. A large-framed animal that produces twins or triplets routinely is a desired trait for a meat producing goat. Thus, selection for meat production is antagonistic to selection for fiber production.

Other dairy breeds include Alpine, Saanen, Toggenburg, Oberhasli and LaMancha. The former four breeds are European in origin and are collectively known as "Swiss" breeds in the United States. The Swiss breeds have been intensely selected for milk production. The LaMancha is a descendant of goat brought to the New World, specifically California, by early Spanish explorers and catholic missionaries. It also has been selected for milk production; however, it has lower milk production than the Swiss breeds. Two major complaints from producers about using dairy breeds or about the infusion of dairy blood into goats used for meat production are the problems of pendulous udders that become bruised and damaged by rocks and brush under extensive management and the problem of too large of teats for successfully raising kids on pasture.

Production Traits

Four key production traits should be considered for improving productivity in meat goats. These are adaptability to environmental and production conditions, reproductive rate, growth rate and carcass value. This paper will deal with the first three because they are readily measurable on the farm. With good record keeping and a set of scales, the meat goat producer can collect all the information needed to increase the productivity of his/her meat goat enterprise.

Adaptability

If an animal's ability to survive and reproduce is impaired by the production environment, then the profitability of that enterprise may be greatly diminished. The goat is perhaps the most adaptable of all the domesticated livestock and survives in a wide range of environments worldwide. However, when it is taken out of one environment and placed in another it does not always realize its production potential. Angora goats imported into the Sahel of West Africa performed very poorly due to the harsh environment (Wilson, 1992). Alpine and Saanen dairy goats imported into India performed only slightly better than local breeds under a stall management system (Devendra and Burns, 1983). Therefore, one might expect Spanish goats to perform differently in the humid southeast than they do in the arid southwest; or Boer goats to perform differently under extensive management in North America than they do under extensive management in South Africa.

For the most part, the management practices for meat goat production in the United States are based on minimal inputs. Enterprise analysis studies have shown that the two major financial inputs into a meat

goat enterprise are feed and veterinary costs (Harwell, 1994). Controlling internal parasites accounts for the majority of the veterinary costs and has been identified as the number one health problem in goats (de la Concha-Bermejillo, 1993). To reduce feed expenditures, it has been proposed that goats raised for meat production should be maintained on an extensive forage-based system, either on improved pastures or on browse. One strategy to reduce veterinary expenditures and to delay the onset of anthelmintic resistance is to select animals that are genetically resistant to internal parasites (Baker, 1991).

The prevailing production systems of the different breeds are shown in Table 2. Myotonic and Spanish goat production systems are generally extensive with few, if any, inputs and on marginal land. Apart from the smallish "fainting" variety fancied by the hobbyist, the Myotonic goat is generally considered a "brush" goat and is raised for the primary purpose of reclaiming pastures from brush encroachment or the utilization marginal lands. The Spanish goat, like the Myotonic, is kept for pasture reclamation on the beef cattle ranches of Texas. Until recently, traditional goat management in central and west Texas had few inputs and the Spanish goat has survived and reproduced under these harsh management and climatic conditions. With the current popularity of goat production and the need for recipients for embryo transfer for the Boer trade, the price of goats has increased and Texas ranchers are improving their goat husbandry.

For the most part, the production system for Boers, Nubian and Pygmy range from semi-intensive to intensive, meaning that supplementation plays a major role in the management system. To realize the growth potential of the Boer goat, a high plane of nutrition is needed. Grasses and browse do not supply enough protein to support this growth, so the vast majority of Boer producers heavily supplement their animals with grain or with complete feed. Although, the Nubian was originally developed as a dual-purpose goat, breeders have decided to emphasize milk production and its 305-d milk production has increased significantly over the last decade. To realize its milk-producing potential the environment must not be limiting and thus an intensive management system has become the norm for this breed. The Pygmy goat is favored by hobbyist and petting zoo staff. Even though it has fairly low maintenance requirements, it is usually raised under semi-intensive conditions due to its pet status.

Few studies exist that provide evidence for resistance to internal parasites (Table 2). In a breed comparison study, Myotonic and Pygmy bucks were more "resistant" to internal parasites than were Nubian and Spanish bucks. Under natural challenge, Myotonic and Pygmy bucks had lower fecal egg counts for trichostrongyle-type nematodes, lower oocysts counts for coccidia and higher packed-cell volume than did Nubian and Spanish bucks. Anecdotal producer evidence suggests that the Boer is as "susceptible" to internal parasites as is the Angora, which is itself notoriously "susceptible" to internal parasites (Thedford, 1993).

Reproduction

Reproduction is considered to be the single most important factor contributing to the efficiency of a meat production enterprise. Goats are fecund, prolific and have a gestation length of five months. This combination of reproductive parameters suggests a highly efficient meat-producing animal. However, under temperate environmental conditions, goats tend to be seasonal breeders. Females come into estrus in the Fall with anestrus occurring in late Spring. Generally, this seasonal breeding pattern translates into one kid crop per year. Seasonality of breeding is considered to be the foremost hindrance in the efficient production of meat from goats.

Pygmy and Myotonic does appear to have the ability to breed year-round. Based upon scientific study, the Pygmy appears to be truly aseasonal. Researchers has shown that when a tropical breed was relocated to a temperate environment, females became seasonal breeders (Wildevus et al., 1991); however, this was not the case with the Pygmy. In the Netherlands over a 7-year period, Pygmy does kidded throughout the year

and had a kidding interval of 193 days. This ability to rebreed approximately 45 post-parturition, or approximately at weaning, translates into almost two kid crops per year. A proposed kidding frequency of three kid crops every two years should be achievable for the Pygmy. Myotonic producers report that their does kid at all times of the year but no scientific evidence exists to support this. The Myotonic doe may indeed be aseasonal or it just might have an extended breeding season.

Boer, Nubian and Spanish does appear to be seasonal breeders, which would limit efficient reproductive performance. Research in South Africa indicated that the Boer doe has an extended breeding season, without complete anestrus occurring, with peak sexual activity occurring in autumn and low activity in late spring to mid-summer. This activity was measured using vasectomized bucks and is not necessarily a measure of ovulation. In a Spring breeding study conducted in Virginia to examine out-of-season breeding, 65% of the Nubian does exposed to bucks conceived while none of the Spanish does exposed conceived. Nubian goats maintained under tropical conditions in Mexico conceived throughout the year, but fertility levels were higher in May to December than the remainder of the year (Mellado et al., 1991).

More information on seasonality is available for the Spanish goat than for other breeds. Research under Texas range conditions and with continuous exposure to the male indicated that the breeding season for Spanish does extended from August to January. The months of February to early March and May to July are transitional periods with deep anestrus occurring March through April. The majority of the parturitions occurred between November and February and a second peak was observed in May. The average kidding interval was 326 days but followed a bimodal distribution. A small group of does that kidded in October to December rebred before the anestrus period and had a kidding interval of approximately 200 days. The vast majority of the does had a kidding interval of 355 days. Recently in Texas, Spanish and Spanish-Boer crosses were examined for estrus activity. No individual in either groups was cycling in September (Waldron et al., 1995). Estrus activity increased in both groups with over 90% of the does cycling in November. Afterwards, activity decreased with 0% cycling in March for Spanish and 3% for Spanish-Boer crosses.

Kidding rate or prolificacy, defined as the number of kids born per doe kidding, is an important contributing factor to reproductive efficiency. Several studies have shown that even though twins and triplets have lower birth and weaning weights and have slower growth rates, they produce more total weight of kid weaned (McGowan and Nurse, 1992) and thus mean higher profit for the producer.

The Boer goat is prolific with a kidding rate of 200%. However other breeds are not far behind the Boer. Myotonic does had a kidding rate near 197% on a Texas ranch raised under intensive management. Over a 7-year period in the Netherlands, Pygmy does had a kidding rate ranging from 183% to 190%. In a Virginia study, Nubians had a kidding rate of 170% when bred out-of-season. In studies conducted for milk production, Nubian does had a kidding rate of 160% and 162%. In northern Mexico, Nubian had the highest litter size of five dairy breeds evaluated, 192% vs 165% for the other four (Montaldo et al., 1978). However, in a later study in Mexico, Nubian does had a kidding rate of 169% which was not significantly different from other dairy breeds evaluated at the same time (Montaldo et al., 1995). In a nutrition study conducted during the Fall breeding season, two different levels of supplementation (.5 vs .75 per head per day) had no effect upon birth weight or litter size, which was 171% (Ezekwe and Lovin, 1995a). Under Texas range conditions, Spanish goats have a kidding rate of 130% (Lawson and Shelton, 1982). This low kidding rate was attributed to the extensive management system. The authors felt that it underestimated actual levels because kids might be lost before they were recorded.

Growth Rates

Growth, expressed as average daily gain (ADG), can be effectively divided into two periods: growth before

weaning and growth after weaning. A high pre-weaning ADG reflects both the genetic potential of the kid and the mothering ability of the doe. In some production systems, kids are sold at weaning and therefore post-weaning ADG is of little importance, while in others, kids are sold as yearlings or older and post-weaning ADG becomes an important production factor.

Wide variations exist in pre-weaning ADG among the breeds, ranging from fast-growing Boer to the slow-growing Pygmy. Characteristic of the large-framed, muscular breed that it is, the Boer has high pre-weaning growth, ranging from 130-200 grams/day. Myotonic, Nubian and Spanish kids appear to have similar pre-weaning ADGs. Myotonic kids gained 117 grams/day when nursing dams raised under intensive management, (Gipson, unpub. data). The Spanish goat has a preweaning ADG of 115 grams/day under Texas range conditions (Gathuka et al., 1982). In a study in Louisiana, Nubian kids raised on their dams on pasture had a pre-weaning growth of 114 grams/day (Gebrelul et al., 1994). The Pygmy is a small goat and has a corresponding slow growth rate. In the Netherlands, pre-weaning growth rate on the Pygmy goat ranged from 85 to 95 grams/day.

Generally, post-weaning growth follows the same pattern as pre-weaning growth with Boer having the highest and Pygmy the lowest and with the other breeds being intermediate. The Boer adds its faster pre-weaning growth rate and has been reported to exceed 200 grams/day post-weaning (Casey and van Niekerk, 1988). Myotonic weanlings grew at a rate of 121 grams/day (Gipson, unpub. data). In Texas, the Spanish goat had a post-weaning ADG of 40 g/d on pasture and 150 g/d in the feedlot (Blakeman et al., 1992). In Virginia, Spanish males grew at a rate of 115 g/d under full feed (Wildeus and Gipson, 1994). In a comparison study of Spanish and Spanish-Boer cross males, Spanish kids gained 132 g/d in the feedlot and 2 g/d on pasture vs 168 g/d feedlot and 2 g/d pasture for the Spanish-Boer cross males (Waldron, 1995). The poor growth rate on pasture was attributed to the near drought conditions that prevailed during the pasture study period. Possibly reflecting the milk-producing ability of the Nubian doe, Nubian kids actually have a decline in growth during the post-weaning period compared to pre-weaning and had a post-weaning ADG ranging from 60 to 90 g/day (Casey and van Niekerk, 1988; Wildeus and Gipson, 1994). In the Netherlands, the Pygmy had a post-weaning ADG of 50 g/day. In another study, Pygmy males had a post-weaning gain of 63 g/d and females 44 g/d (Hatfield et al., 1984).

Conclusions

The meat goat industry is hampered by the lack of an efficient goat breed for meat production on a low-input system. Several "breeds" are available to the producer; however, no single breed possesses all the desirable production characteristics. Spanish and Myotonic have evolved under extensive management; Myotonic and Pygmy have the advantage in parasite resistance; Pygmy has the advantage for year-round breeding; Boer, Myotonic and Pygmy have the advantage for litter size; Boer has the advantage for pre- and post-weaning growth; and Nubian has the advantage for milk production. However, further scientific research is needed to thoroughly assess the productivity of the different breeds under the same management conditions and to assess their potential contribution to efficient meat goat production. The meat goat industry must be careful in developing its production objectives which should emphasize productivity, not frame size. Generally larger does produce larger kids, but they also have a higher dietary requirement for maintenance and reproduction than do smaller does. This higher dietary requirement may translate into lower stocking rates or a need for supplementation. The former lowers herd productivity and the latter decreases profitability. The beef and sheep industries have realized that large females are not necessarily the most productive (Rahnefeld et al., 1993; Head et al., 1995). Learning from these other two livestock industries, the meat goat industry must concentrate on productivity rather than size.

Table 1. Goat breeds used or proposed for meat production, their county of origin and estimated U.S.

population.

"Breed"	Origin	Estimated U.S. Population
Boer	South Africa (1)	10,000* (6)
Myotonic	U.S. (2)	> 3,000 (7)
Nubian	England (3)	100,000* (8)
Pygmy	West Africa (4)	32,000* (9)
Spanish	U.S. (5)	300,000 (10)

*Total number of registered animals

(1) Casey and van Niekerk, 1988; (2) Lush, 1930; (3) Hall, 1987; (4) Lincicome and Hall, 1984; (5) Willingham, 1990; (6) Campbell, 1995; (7) Anonymous, 1992; (8) ADGA, per.comm.; (9) Anonymous, 1993; (10) Paschal, 1990.

Table 2. Goat breeds used or proposed for meat production and their production characteristics.

108-150 (feedlot) (21,22)

"Breed"	Adaptability		Reproductive Performance		Growth (g/d)	
	production environment	internal parasites	seasonal breeder	kidding rate	pre-weaning ADG	post-weaning ADG
Boer	intensive (1)	"susceptible" (7)	yes (9)	200% (13)	130-200 (1)	200+ (1)
Myotonic	extensive (2)	"resistant" (8)	"no"	197% (14)	117 (17)	121 (17)
Nubian	intensive (3)	"susceptible" (8)	yes (10)	160% (15)	114 (18)	90 (20,22)
Pygmy	semi-intensive (4)	"resistant" (8)	no (11)	183% (11)	85 (11)	50 (11)
Spanish	extensive (5,6)	"susceptible" (8)	yes (12)	171% (16)	115 (19)	40 (past 22)

(1) (Casey and van Niekerk, 1988); (2) (Gasparotto and Goll, 1995); (3) (Hall, 1987); (4) (Lincicome and Hall, 1984); (5) (Shelton, 1990); (6) (Smith, 1992); (7) (Culliford, 1995); (8) (Gipson, 1995); (9) (Greyling and van Niekerk, 1987); (10) (Ezekwe and Lovin, 1995b); (11) (Montsma, 1986); (12) (Lawson and Shelton, 1982); (13) (Erasmus et al., 1985); (14) (Gipson et al., 1994); (15) (Teh et al., 1985); (16) (Ezekwe and Lovin, 1995a); (17) (Gipson, 1994); (18) (Gebrelul et al., 1994); (19) (Gathuka et al., 1982); (20) (Casey and van Niekerk, 1988); (21) (Wildeus and Gipson, 1994); (22) (Blakeman et al., 1992).

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on nutrition, consumer demand & acceptance

Meat Cut Specifications

Directory of slaughter goats for sale

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Recipes



General information

Goat meat, or Chevon, is one of the most widely consumed meats in the world. However, its consumption in the US has generally been limited to specific ethnic groups. It has an excellent flavor somewhat similar to beef and venison. It has less fat than chicken or any of the red meats commonly consumed in the US. This is because goats tend to deposit their fat internally before they deposit it externally. When a goat is slaughtered, this internal fat is removed along with the rest of the "innards". A well conditioned goat does have a tiny coating of fat over its muscles that helps keep the meat from drying out rapidly. Goats do not marble (intersperse fat within their muscles), thus, goat fat along a cut of meat is usually easily trimmed. Although goat meat is low in fat, studies have indicated that this fat contains a higher percentage of cholesterol than chicken or beef fat. However, these same studies have concluded that goat meat is much lower in saturated fats than the rest of the commonly consumed meats including chicken with the skin off. It has an excellent ratio of polyunsaturated to saturated fats making it a very healthy choice of meat. We will probably see consumption of goat meat increase as more and more people are introduced to its excellent qualities. Because of its low fat content, goat meat can lose moisture and toughen quickly if cooked at high temperatures and under dry conditions. Goat meat is usually cooked slowly to moderately and is often marinated first or cooked in a sauce. One easy marinade is to soak the meat in beer and a 1/4 cup of lemon juice. If you eat meat and have never tried goat meat, we urge you to try it!! ENJOY!!

Web articles on goat meat consumption -

- Dr. Addrizzo's article on health benefits of goat meat
- Florida A&M article on acceptance of goat meat
- Article on consumer demand for goat meat
- Lamb and goat meat market research in Brooklyn, NYC

[general info][meat specifications][slaughter goat directory][meat for sale][recipes]

Goat Meat Specifications

There are numerous ways to process goats. Some ethnic groups prefer the whole carcass to be cut into two inch chunks of meat and bone for currying and stewing while others prefer to have the carcass cut into specific roasts, chops, etc. More information on these conventional cuts is available on the web at [Chevon Meat Cuts](#) . If you are selling goat meat through a federal prison contract, it is important to be familiar with the [proposed institutional meat purchase specifications for fresh goat](#). These specifications are available in PDF format on the web ([click here](#)). As well as providing specifications on allowable trim etc. for specific cuts, this document also provides brief style and cutting instructions, and charts of the main muscle systems and bones in the goat. Many Muslims consume only meat that has been slaughtered following Halal criteria. For more information on Halal meat, you can access the following CU student papers -

- [Halal Meat Trade in the USA](#)
- [Interpretation of Halal and Haran Foods](#)
- [Requirements for Kosher Meats](#)

[\[general info\]](#)[\[meat specifications\]](#)[\[slaughter goat directory\]](#)[\[meat for sale\]](#)[\[recipes\]](#)

Directory of farms with slaughter goats for sale in the NE US

ESMGPA members with USDA meat for sale

-please contact tatiana Stanton at tls7@cornell.edu if you currently have meat for sale that you would like to advertise here.

- **Brookside Farm** - meat available by individual cuts or by the complete carcass. Billy goat carcasses available by order only. All cuts of frozen goat meat shipped UPS. Contact Elizabeth & Mary Krug, 2302 East Schodack Rd., East Schodack, NY 12063. Phone - (518)477-9548, email at E_Krug@msn.com .
- **Stone & Thistle Farm** - retail cuts available year round. Contact Tom & Denise Warren, Kelso Rd., East Meridith, NY 13757. Phone - (607)278-5773, email at warren@catskill.net.



Our goat meat recipes



1. Goat Kebobs

Marinate de-boned goat meat chunks (you can use an entire kid or just the legs and shoulder of a

Marinade

1 can coconut milk
1 can Red Thai curry
2 oz turmeric
2 oz Caribbean curry powder
1 oz ground cloves
2 oz kosher salt
scotch bonnet or habanero peppers
(can use jalapenos)

Salsa

1 cored, peeled pineapple
2 pitted, peeled mangos
2 peeled papayas without seeds 1/2 cup
fresh cilantro
1 lb firm, red tomatoes
juice of 4 oranges and limes

Cut meat into desired sizes (small cubes if cooking in oven, larger pieces if grilling on barbecue). Combine marinade ingredients in a bowl and baste well over all meat pieces. Marinate in refrigerator a minimum of 3-4 hours (preferably overnight). Dice pineapple, mangos, papayas, and tomatoes. Mince cilantro and peppers (be sure to wear gloves when chopping peppers to avoid burning your hands). Mix everything together gently. Add in orange and lime juice and refrigerate. Grill pieces of meat on a barbecue until tender, or simmer on stovetop in an oiled Dutch oven with a couple of cups of water for about 1 1/2 hours. Serve with chilled salsa.



4. Thai Curry- courtesy of Robert E. White

Goat chuck
salt
pepper
potatoes
tomatoes
cilantro
ginger
garlic
red pepper
Jalapeno pepper
flour
peanut oil
red Thai curry paste
coconut milk
soy sauce
sugar
Thai fish sauce

Glacé de Viand

Bake 10# bones in olive oil until brown.
Chop 1/2 lb. celery, 1 lb. onions and 4 tomatoes.
Cook bones and vegetables in water.
Simmer overnight.
Strain.
Cook down to gel.
Freeze until needed.

Cube goat chuck, add salt and pepper. Cube potatoes and tomatoes. Chop cilantro, ginger, garlic, red pepper. Remove seeds from Jalapeno peppers and chop. Dust meat cubes with flour and sear in peanut oil. Cook Jalapeno pepper, ginger and garlic in peanut oil (don't brown). Add seared meat and red Thai curry paste. Add 1 package of Glacé de Viand and coconut milk. Add tomatoes, potatoes, some cilantro and soy sauce. Simmer. Before serving, add red pepper, the rest of the cilantro, sugar and Thai fish sauce.

yearling animal leaving the rack and loin to make into chops) for at least 24 hours. Put on skewers with mushrooms, onions (either Spanish onions or little white boiling onions), tomatoes, zucchini, bell peppers, eggplant, you name it. Broil over coals 15 to 20 minutes until tender, turning and basting in the marinade occasionally.

Marinade suggestions -

Marty's Lazy Soul Method - take a good quality commercial garlic marinade and add to it some extra water, olive oil, and a nice vinegar.

The Cornell University Barbecue Sauce Method - mix together 1/2 pt. good quality cooking oil, 1 pt. cider vinegar, 3 tbsp. salt, 1/2 tsp. black pepper, 3 tsp. poultry seasoning, 1 beaten egg. This will do about 8 to 12 lbs. of meat. Recipe can be halved but leave in the one egg.

The "Oo La La" Method - mix together 6 oz. of tomato paste, 1/2 cup dry white wine, 1/2 cup wine vinegar, 3 tablespoons of olive oil, 2 tablespoons of mustard, 1 1/2 tablespoons of Worchester sauce, 3/4 teaspoons each of sage, oregano, and salt, 3/4 cups of minced onions, and 6 crushed cloves of garlic. This will do about 8 pounds of meat.

2. Jamaican Curried Goat

2 pounds stew meat with bones <i>(the entire goat can be processed into 2 inch chunks of meat and bone for curry dishes)</i>	1 tsp white pepper
1 tbsp of lemon juice or 1 lemon	1/2 tsp salt
1 large onion chopped	1 hot pepper, chopped and seeds removed (preferably a scotch bonnet or habanero)
1 bunch scallions (optional)	2 tbsp cooking oil
2 fresh garlic cloves, crushed	1 cup Irish potatoes, cubed (optional)
1 tbsp fresh thyme or 2 tablespoons dried	1 cup cho-cho (chayote squash), cubed (optional)
2 tbsp curry powder	2 cups of water

Choose a Caribbean curry mix if possible for this dish. Trim any fat off the meat and then cut the meat into small pieces. Traditionally the bones are left in the curry to contribute flavor and nutrition. Rub the meat in lemon juice and then combine with the onion, garlic and spices. Leave covered in the refrigerator overnight (or at least a couple of hours).

Heat oil in a skillet or Dutch oven over medium heat and brown the meat mixture. Add the water and simmer for 1 hour. Correct seasonings as needed and continue cooking for about another half hour until tender. Add more water as needed. Potatoes and/or cho-cho can be added in the last hour if you wish. Serve over white rice preferably cooked in coconut milk!

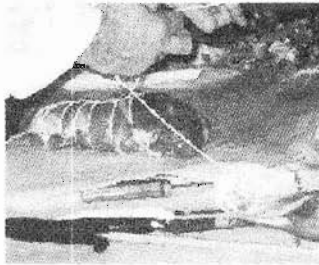
3. Spiced Islands Grilled Goat with Tropical Salsa - courtesy of Robert E. White, Cornell Hotel School

@10 lbs of goat meat cuts such as the chuck and brisket (also called front or yoke). You can also use de-boned legs or chops.

5. **Seco de Chivo** - *courtesy of tatiana Luisa Stanton*

2 1/2 pounds de-boned stew meat	1 1/2 pounds of tomatoes, fresh or canned
2 tbsp cooking oil	12 ounces of beer
Achiote (annatto seeds), optional for color	1 1/2 teaspoons oregano
3/4 cups red onion, chopped	1 tbsp brown sugar or honey
3 cloves garlic, chopped	1 stalk of celery with leaves, chopped
1/2 cup green peppers, chopped	1/4 tsp cloves, ground
1/2 tsp cumin, ground	1/4 tsp allspice, ground
1/2 tsp black pepper, ground	salt to taste
1 hot pepper, chopped and seeds removed (preferably an aji or serrano)	2 sprigs of cilantro, minced

In a large skillet or Dutch oven fry two or three annatto seeds in the oil until the oil turns red. Remove the seeds and add the meat and sear at high heat until lightly browned. Reduce the heat and add the onion, garlic, green peppers, cumin, and pepper. Cook slowly until the onions are transparent but not browned. Liquefy the hot pepper with the tomatoes and beer to form a salsa. Add this salsa to the meat along with the sugar or honey, oregano, clove, allspice and celery. If the meat is not covered with liquid add water to cover. Gently bring to a boil and then reduce heat. Continue cooking 1 or 2 more hours until meat is tender. Stir occasionally and add water as necessary to keep meat from sticking to pot. Taste and adjust spices as desired. Add the cilantro. Serve with Spanish rice.



6. **Roast Leg of Goat Florentine**

- *courtesy of Robert E. White, Cornell Hotel School*

1 hind leg of goat	10 oz fresh spinach
2 heads garlic	1/2 cup fresh basil
4 oz shallots	2 lemons
1 lb celery	1 bunch fresh rosemary
1 lb shitake mushrooms	2 tablespoons Dijon mustard
1 lb carrots	1/4 cup olive oil
1 lb Spanish onions	salt and pepper

To prepare leg, de-bone and cut open (i.e. butterfly). To de-bone, cut leg horizontally at each of the main joints to form two rings of exposed bone. Twist the meat off of the bones by grasping the top joint with one hand and the meat with the other and twisting. Cut the resulting cylinder of meat vertically. Lay it flat and then partially cut it horizontally and fold back to make a large rectangle. Pound meat flat.

Sauté shallots in small amount of oil until fragrant. Add mushrooms and cook a few minutes until tender. Add spinach and basil and sauté until wilted. Cool. Lay meat out flat. Sprinkle exposed surface with a mixture of lemon juice, olive oil, rosemary leaves, Dijon mustard, salt and pepper

(reserve half of this mixture). Lay a row of stuffing across the meat in a line. Roll the rectangle of meat up to form a cylinder and tie with butcher twine. Coat outside of the stuffed roll with the remaining lemon juice mixture. Place in Dutch oven or roasting pan and surround with chopped celery, carrots, onions, and minced garlic. Roast at 325 - 350 F for about 1 1/2 hours until done, i.e. when an internal temperature of 130 F is reached.

An alternate stuffing is to delete mustard from the lemon juice mixture. Then combine 8 oz. of soft goat cheese (chevre), 2 tbsp rosemary, 2 oz. breadcrumbs, salt and ground pepper. Roast 3 sweet peppers (a red, a green, and a yellow). Remove skins and seeds and cut into thin strips. Place peppers along lower portion of roast keeping 1 inch from the edge. Place cheese mixture atop peppers and roll roast encasing peppers and cheese. Tie roast and coat with remaining lemon juice mixture.



7. **Marinated Goat Leg**

- courtesy of Robert E. White, Cornell Hotel School

1 leg of goat - butterflied
juice of 2 lemons
lemon rinds
olive oil
oregano or rosemary

salt
ground black pepper
garlic
2 tbsp Grey Poupon Mustard

Remove bones, sinew and fat. Prepare marinade sauce: juice of 2 lemons, lemon rinds, olive oil, salt, black pepper, garlic, 2 T Grey Poupon mustard and oregano or rosemary. Marinate leg for a minimum of 8 hours in the refrigerator. Grill to taste.

8. **Barbacoa** - *courtesy of tatiana Luisa Stanton*

6 pounds de-boned goat leg cut in chunks
2 teaspoons salt
3 tablespoons cider or wine vinegar
5 small hot chili peppers
10 cloves garlic
1 tablespoon Mexican oregano
2 teaspoons whole cloves
2 teaspoons cumin seeds
1 teaspoon black pepper
1/2 teaspoon cinnamon, ground
8 cooked tomatillos
1/2 cup toasted almonds, walnuts, or pine nuts
2 tablespoons cooking oil

1 pound of ripe tomatoes, chopped
1 green bell pepper, chopped
1 cup green onions, minced
1/2 cup cilantro, minced
1/2 cup fresh tomatillos, chopped
1/4 cup fresh basil, minced (optional)
1 clove garlic minced
1 teaspoon coriander seed, ground
salt to taste

Sprinkle the meat with salt and vinegar. Cover and chill overnight or for at least a couple of hours. Make a paste in a blender or food processor of the chili peppers, garlic, oregano, cloves, cumin, black pepper, cinnamon, tomatillos, nuts, and oil. To be on the safe side, put your cloves in first to make sure they do get broken up some. The cumin seeds do not have to get completely ground, but you want them at least partially broken up as well. Smear the paste all over the boned meat and bake in a well oiled Dutch oven or roasting pan covered at 350 F for 2 1/2 to 3 hours until tender. Put the ripe tomatoes, green pepper, green onions, cilantro, coriander, and fresh tomatillos in a lightly oiled sauce pan and cook over low heat until starting to simmer. Remove from heat. When the meat is done, shred the meat and serve in warm flour tortillas topped with the salsa.



9. Jerked Leg of Goat

- courtesy of tatiana Luisa Stanton

- | | |
|---|---------------------------------|
| 1 leg of goat - bone in | 2 teaspoons ground black pepper |
| 1 1/2 cup onion, finely chopped | 1 tablespoon ground pimiento |
| 4 to 6 cloves of garlic, finely chopped | (allspice) |
| 1 tablespoon fresh thyme leaves (or 2 | 1/2 teaspoon ground nutmeg |
| tablespoons dried leaves) | 1/4 cup of soy sauce |
| 2 teaspoons salt | 1 very hot pepper, chopped, |
| 1 teaspoon ground cinnamon | or teaspoon hot pepper oil |

Mix or puree together the onions, garlic, soy sauce, and spices to form a paste. Pierce the leg of goat all over and rub the paste all over the meat. Any unused paste (also known as "jerk rub" can be stored in a glass jar in the refrigerator for up to a month for later use). Cover or wrap in foil and refrigerate overnight to allow spices to penetrate meat. Preheat the oven to 400 F. Sear the meat loosely covered with foil in a roasting pan at 400 F for 15 minutes and then reduce heat to 350 F. Roast meat for another hour or two depending on weight() until the internal temperature reaches 150 to 160 F. Remove the foil for the last 15 minutes of cooking. If you use a tougher cut such as a neck roast for cooking, plan on a longer cooking time and on marinating the meat in a mixture of beer and lemon juice overnight. Put the jerk rub on it in the morning and then cook in the afternoon.

10. Neck Roast Fajitas - courtesy of tatiana Luisa Stanton

Marinate a neck roast (does not need to be de-boned) with lemon juice and beer in a strong resealable plastic freezer bag in the refrigerator overnight. Follow the recipe for the "jerked leg of goat" and cook until very tender without removing foil. Prepare a guacamole sauce using two avocados. Cut the avocados in half and then cut the pulp in small pieces lengthwise and then crosswise without cutting the outer skin. Scoop out from skin and mash together with the juice

from 2 limes. Mix with a teaspoon each of coriander seeds and cumin seeds mashed in a pestle and mortar. Mix with 1 clove of garlic, minced and 1/4 cup of minced green onions or chives. Add about a 1/4 cup of chopped fresh cilantro. Put the avocado pits in the center of the guacamole in a resealable container. Cover tightly and refrigerate. Slice sweet green or red bell peppers into long thin slices, and slice Spanish onions into thin rounds. Sear the onions and peppers at high heat in a small amount of corn oil. Add slices of the neck roast for the last minute of searing. Warm up some flour tortillas. Put the meat, peppers, and onions in the tortillas and cover with guacamole and your favorite salsa. Sour cream, plain yogurt, shredded lettuce, and/or cooked black turtle beans can also be added.

11. **Cumin Roast** - *courtesy of tatiana Luisa Stanton*

Shoulder roast or leg with bone in	3 tablespoons of cumin,
1 cup onions, minced	mashed with mortar and pestle
4 to 6 cloves of garlic, minced	1 tablespoon coriander, ground
	1 teaspoon salt

Mix or puree together the onions, garlic, cumin, coriander, and salt to form a paste. Pierce the goat roast all over and rub the paste into the meat. Preheat the oven to 400 F. Sear the meat loosely covered with foil in a roasting pan at 400 F for 15 minutes and then reduce heat to 350 F. Roast meat for another hour or two depending on weight() until the internal temperature reaches 150 to 160 F. Remove the foil for the last 15 minutes of cooking. If you use a tougher cut, for example, a neck roast for cooking, plan on a longer cooking time and on marinating the meat in a mixture of beer and lemon juice overnight.

12. **Barbecued Goat Steaks**

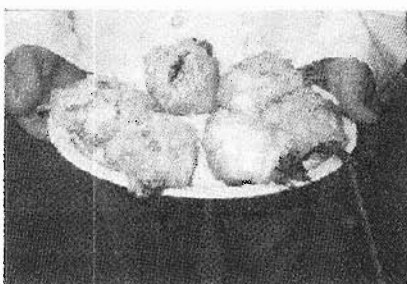
Either hind leg steaks or goat chops
 Jerk rub from the "jerk leg" recipe (about a teaspoon per steak)
 1 cup passion fruit nectar or juice

Rub meat in jerk rub and marinate in refrigerator at least 1 hour. Baste liberally with the nectar and then either barbecue, fry, or broil steaks. Flip and continue basting until cooked to desired extent.

13. **Grilled Goat Chops** - *courtesy of Robert E. White, Cornell Hotel School*

Goat chops (loin or rib)
 balsamic vinegar
 olive oil
 Dijon mustard

Marinate loin or rib chops in a mixture of equal amounts of balsamic vinegar, olive oil, and dijon mustard for several hours in the refrigerator and then barbecue.



14. **Goat Chops in Pastry**

- courtesy of Robert E. White, Cornell Hotel School

Goat chops - from one goat	marjoram
5 lb mushrooms	1/4 lb butter
2 Spanish onions	1/2 bottle of dry, white wine
salt	fillo dough
ground black pepper	16 oz chevre (soft goat cheese)

Make Duxelle: chop 5# mushrooms and 2 onions, mix with salt, pepper, marjoram, stick of butter and 1/2 bottle of wine (dry, white); cook 20-30 minutes on high heat or until dry. Quick chill in freezer.

Rub chops with salt and pepper - sear on both sides. Take 2 sheets of fillo dough - brush with melted butter - 2 more sheets, brush again. Cut fillo dough (all 4 sheets stacked up) into 3" squares, wrap chops in fillo dough squares with Duxelle and chevre cheese. Bake at 400° for 20 minutes. This dish can be served with the red wine sauce listed farther down.

15. **Curried Goat Chops**

Goat chops
1 teaspoon curry powder per chop
1 cup apricot nectar

Rub the curry powder on each chop. Baste liberally with the nectar and then either barbecue, fry or broil steaks. Flip and continue basting until cooked to desired extent. Another good basting sauce to use is homemade apple sauce mixed with tomato sauce.

16. **Barbecued Goat Chops**

Either hindleg steaks or goat chops	1/2 cup lemon juice
1 tablespoon dry mustard	1/2 cup chili sauce, or a tomato and hot
1 tablespoon grated onion	pepper salsa seasoned with chili
2 tablespoons minced parsley	powder
1/4 pound of butter or margarine, softened	

Mix together the mustard, onion, parsley and either butter or margarine. Shape into a small cylinder and refrigerate. Blend together the lemon juice and chili sauce to form a baste. Barbecue chops or steaks on a grill about 1 foot above coals, basting liberally. Cook about 15 minutes on

each side or until done. Serve each chop or steak topped with a slice of the spiced butter roll.

17. Goat Ribs

soy sauce	2 tbsp honey
balsamic vinegar	chopped garlic
sesame oil	chopped ginger
peanut oil	

Prepare marinade sauce: soy sauce, balsamic vinegar, sesame oil, peanut oil, 2 T honey, chopped garlic and chopped ginger. Marinate ribs for a minimum of 8 hours in the refrigerator. Grill to taste.

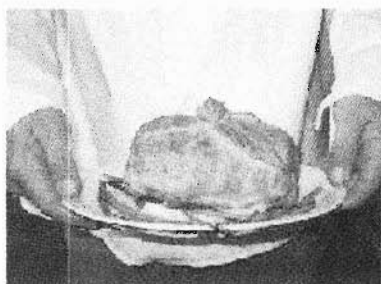


18. Roast Rack of Goat Persillade

-courtesy of Robert E. White, Cornell Hotel School

2 racks of goat ribs prepared as a French roast (<i>remove the meat between the rib bone ends to a depth of at least 1 inch</i>)	2 tbsp fresh parsley
4-5 slices of white bread (can really use any soft bread)	2 tbsp Dijon mustard
	1 cup of chilled cream or whole goat milk
	salt and pepper to taste

Blend together the bread, parsley, mustard, cream, salt and pepper in a food processor to form a paste. Lay racks meat side up in a roasting pan and cover thickly with the paste. Roast at 325 F for about 45 minutes to 1 hour until done. Serve surrounded by extra sauce. this sauce can also be served on grilled chops!



19. Goat Loin In Puff Pastry

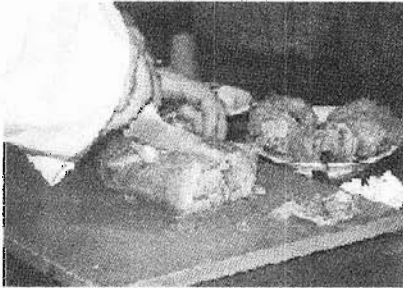
- courtesy of Robert E. White, Cornell Hotel School

1 de-boned goat loin	carrots
olive oil	parsnips
salt	baby asparagus
ground black pepper	puff pastry
2 beaten eggs	bread crumbs

Rub with olive oil, salt and pepper. Sear on both sides. Cut carrots, parsnips into thin strips the size of baby asparagus. Blanch carrots, parsnips and baby asparagus in water.

Open puff pastry (grocery freezer section), roll out, and brush with beaten egg. Place loin on pastry and brush with beaten egg. Place the blanched carrots, parsnips and baby asparagus on the meat and sprinkle with bread crumbs.

Roll meat with filling and brush with egg. Roll and fold pastry and brush with egg. Bake at 400° for 20 minutes. Serve with red wine sauce.



Red Wine Sauce

Chop garlic, tomato, onion, and rosemary.

Cook in olive oil.

Add 1/2 bottle of red wine, some balsamic vinegar and one cake of Glace de Viand.

Cook to sauce thickness.

20. **Goat Cheese Tart with Carmelized Onions** - courtesy of Robert E. White, Cornell Hotel School

2 tart pans with removable sides (or quiche pans)
2 single pastry pie crusts pressed into pans
8 oz roll of chevre, sliced (spiced okay)
1/2 large red sweet pepper, diced
1/2 large red onion, diced
2 tbsp fresh basil, chopped
5 eggs, beaten with whisk
2 cups of fresh goat milk (or 1 cup cow milk and 1 cup cream)

carmelized onion mixture

2 to 3 medium sized red onions, sliced in rings
olive oil
1/4 cup sugar
1/4 cup white vinegar
1/2 cup water.

Sauté red pepper and onions in a dash of olive oil. Lay cheese slices in pastry shells and top with the sautéed peppers and onions and fresh basil. Whisk together the eggs and milk and pour into pastry shells. Bake at 350 F for @45 minutes or until set. Meanwhile, sauté onions in olive oil until transparent. Add in sugar, vinegar and water and cook down until caramelized and almost dry. Remove from heat. Serve slices of tart topped with caramelized onions and a sprig of parsley or basil.

[\[general info\]](#)[\[meat specifications\]](#)[\[slaughter goat directory\]](#)[\[meat for sale\]](#)[\[recipes\]](#)

For questions related to the content of this web page, contact [tatiana Stanton](#)

Return to: [Empire State meat Goat Producers' Association Home Page](#)

Home page: [Animal Science at Cornell University](#)

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EMPIRE STATE MEAT GOAT PRODUCERS ASSOCIATION

Marketing Slaughter Goats

General information - marketing fact sheets, buyer directories, etc.
Current market prices
Producer directory
Ethnic calendar
How to plan breedings to target demand
Factors affecting dressing percentage
Grading Meat Goats - evaluating Easter kids, proposed USDA standards, assessing body condition



General information

Geographically, markets for goat meat exist near large metropolitan centers, such as New York City, Montreal, Philadelphia and Toronto. In New York we have ready access to some of the best markets for goat meat in the country. Our proximity allows us to supply a fresh product and our bountiful rainfall insure lush pasturing for three seasons of the year. There is a niche market for virtually any type of goat, from prime kids to old bucks. An important aspect of meat goat production is understanding the variety of markets channels available for marketing goats in the Northeast US. We have a series of marketing fact sheets available to help producers familiarize themselves with these different channels.

1. Starting a meat goat operation
2. On-farm marketing of slaughter goats
3. Marketing slaughter goats through livestock auction markets
4. Marketing slaughter goats to dealers, packers, wholesalers and retailers

More information on marketing goats in New York can be obtained from the following web sites

- **Meat Goat Marketing in Greater New York City** - provides a general introduction to marketing goats in NYC that has application to several other large Eastern cities. Note, this document takes a while to load.
- **The Cornell University Small Ruminant Marketing Program Home Page** - This series of web pages provides in depth information about marketing projects and references in the Northeast US. It includes an updated version of the **Sheep Lamb Goat Marketing Directory** - "an excellent guide to truckers, USDA slaughterhouses, auctions, dealers/brokers, packers, wholesalers, and retailers in NY State."

Another excellent source of marketing information for Northeast US goat producers is **Bob Melchior**, the marketing coordinator for the CU Small Ruminant Marketing Grant. He can be reached by phone at (607)255-2850 or by email at rjm55@cornell.edu.

Current Auction Prices

- Prices for New Holland Livestock Auction - *Monday & Thursday auctions*
- Prices for Georgia, North Carolina, Virginia, Texas, etc.
- Prices across the US

[|return to main page|](#)[|general info|](#)[|current auction prices|](#)[|calendar|](#)[|planning breeding dates|](#)[|dressing percentages|](#)[|grading slaughter goats|](#)

Ethnic Calendar

for holidays where goat meat is part of the traditional holiday feast

Western or Roman Easter

- April 15, 2001
- March 30, 2002
- April 20, 2003
- April 11, 2004

Type of goat wanted - Fleshy, milk fed kids with relatively light colored meat, 3 months old or younger. Kids weighing less than 20 lbs are generally disappointing to buyers due to low meat to bone ratios and high carcass drying losses. Kids gaining less than 10 lbs per month or 1/3rd pound per day after accounting for birth weight are generally not fleshy enough to be considered prime. There generally is a slight price (per lb of live weight) penalty for kids weighing over 40 lbs. Acceptable weights generally range from 20 to 50 lbs with 30 lbs considered optimum by most buyers.

Eastern or Greek Easter

- April 15, 2001
- May 5, 2002
- April 27, 2003
- April 11, 2004

Type of goat wanted - Similar to Western Easter kids. A slightly larger milk fed kid (i.e. around 35 lbs) is considered optimum.

Navadurgara or Navratra Dashara or Dassai

- October 17 - 26, 2001
- October 7 - 15, 2002

This is a Hindu holiday honoring the goddess Durga. Goats are generally slaughtered from the 7th to the 10th day of the holiday after which families meet together and celebrate with curried goat while receiving family blessings. Female goats are not acceptable for this holiday. Relatively tender male goats are

The Hispanic market for goat is for 20 to 35 lb live weight milk-fed kids for cabrito, and larger animals for seco de chivo.

More information on popular holidays is available on the web at www.interfaithcalendar.org/2001.htm

Cull does and bucks are also in demand for the curried goat market and for prison contracts.

[return to main page](#)||[general info](#)||[current auction prices](#)|| [calendar](#)||[planning breeding dates](#)|| [dressing percentages](#)||[grading slaughter goats](#)||

How to plan your breedings to target specific holidays

Some facts to consider:

- **The gestation period (time from mating to kidding) for US goats is about 150 days.**
- **Birth weights range from around 4 to 8 lbs for Spanish kids and 5 to 11 lbs for dairy and Boer kids.** However, wide ranges can be experienced across the US population. Birth weights depend on the breed and genetic potential for size in the parents, age of the mother doe (yearling does and very old does tend to have smaller kids even though they often have singles), sex of the kid (male kids tend to be bigger than females), size of the litter (kids from multiple births generally average smaller birth weights than kids from single births in the same herd), and nutritional and health status of the doe during pregnancy (does that are severely overweight or underweight during pregnancy tend to have smaller kids).
- **Daily growth rates for baby goats from kidding to weaning at about 3 months of age range from 1/3 and 1/2 lbs in most New York herds.** However, herds with severe environmental restrictions (health problems, low feed inputs) or raising breeds with smaller mature weights may have growth rates as low as 1/4 lb per day. Some exceptional kids under optimal environmental management (but not necessarily optimal economic management) may grow 2/3 lbs per day. Single kids and male kids tend to grow faster than kids raised as multiples on a doe and female kids. Milking ability of the mother and general health and internal parasite condition of the breeding herd affect kid growth rate substantially. Sick and/or starved kids do not grow well. However, in most New York herds count on kids growing from 10 to 15 lbs per month for the first three months of age. Kids that are growing 1/2 lb daily at this age will generally grade PRIME while kids growing 1/3 lb daily will generally grade lower.
- **Goats are generally purchased and shipped about 7 to 10 days prior to the targeted holiday.**

Calculations -

Let's say you want to market 30 to 40 lb kids at Easter in 2002. Western or Roman Easter will be pretty late in 2002. It will be on April 31st. This means kids will probably be picked up about 10 days earlier or on April 21st. If your herd is well managed and you are working with Boer/dairy crosses, your twin kids from does that are 2 years of age or older will probably grow about 1/2 lb daily. Your singles from yearling does will also average about 1/2 lb daily. However, some of your triplets from older does and your twins from yearling does may grow only 1/3 lb daily. Let's assume your kids average about 7 lbs at birth. **When should you breed your does to target the Easter market?**

Growthy kids -

generally used. Size of carcass depends on number of people expected to be fed.

Start of Ramadan - can vary by a day depending on the actual sighting of the moon over the United States that year

- **November 16, 2001**
- **November 6, 2002**
- **October 26, 2003**
- **October 15, 2004**

Type of goat wanted - male and female kids with all their milk teeth (i.e. not older than @ 12 months). Males can be whole or castrated. Overly fat kids are discriminated against. Optimum live weight is about 60 lbs but weaned kids from 45 - 120 lbs. are accepted by different buyers.

Id al Fitr - The Festival of the Breaking of the Ramadan Fast

- **December 17, 2001**
- **December 5, 2002**
- **November 26, 2003**
- **November 15, 2004**

Type of goat wanted - same as for Ramadan.

Id al Adha - The Festival of Sacrifice

- **March 6, 2001**
- **February 23, 2002**
- **February 12, 2003**
- **February 1, 2004**

Type of goat wanted - Prefer yearlings (i.e. animals with one set of adult teeth) that are blemish free. Animals with broken horns, open wounds, torn ears or physical unsoundnesses generally do not meet the criteria. In some cases, castrated animals or lambs with docked tails are frowned upon.

Other holidays when goat meat is commonly consumed include Christmas, the July 4th weekend, and the numerous Caribbean holidays in August - Carnival, Carifest, Jamaican Independence Day, etc.

The Christmas market is for milk fed kids. These type of kids are rare, because these kids must be produced by out -of-season breeding in May for October kiddings. Kids as light as 18 lbs are readily accepted and quality control is generally not as exacting as on Easter kids.

Goats for July 4th weekend are animals suitable for barbecue, generally cabrito kids or young bucks, does, and wethers with 1 or no sets of adult teeth.

Optimal goats for the Caribbean holidays are young, smelly 60 lb bucks. However, older animals of all sexes are often in demand and customers may prefer to buy them rather than pay the extra price for prime young bucks.

The Chinese market for goat according to Frank Pinkerton, PhD, is "limited to the six colder months. The preferred weight range is 60 to 80 pounds live, and goats in good health are required."

40 lb - 7 lb = 33 lb. At 1/2 lb of gain per day, you need about 66 days to get a 7 lb. baby kid to 40 lbs by April 21st. You have 21 days in April, 31 days in March, and still need 2 weeks in February --> So you want their dams kidding by February 14th, i.e., bred about September 14th .

Slower growing kids-

30 lb - 7 lb = 23 lb. At 1/3 lb of gain per day, you need 69 days to get a 7 lb. baby kid to 30 lbs by April 21st --> So you want their dams kidding by February 11th, i.e., bred about September 11th.

This means you definitely want your bucks in the herd by September 1st. Most does are stimulated by the smell of a buck to come into heat within a week of a buck's sudden introduction into the herd. However, the heat cycle of a doe is 18 to 21 days so if you want to make sure all your does have a chance to be exposed before February 11th you need to have the buck in there by August 20th. Your leeway here depends on how many does you are challenging your bucks with, how young and inexperienced your bucks are and whether your buyer will actually accept larger kids or you also have a market for kids for Greek Easter which occurs on May 5th, 2002.

[general info][current auction prices][calendar][planning breeding dates][dressing percentages][grading slaughter goats]

Factors affecting dressing percentage

Dressing percentages (calculated as (hot carcass weight / liveweight) * 100) can vary widely for goat kids from about 35% to 55% with 45% being average. Kids with higher fat scores generally have higher dressing percentages than kids of the same liveweight with lower fat scores.

Dressing percentage is affected by:

- **liveweight,**
- **fatness** -an increase in one fat score will increase dressing percentage by about 2.5%, fatter kids also suffer less live weight and carcass weight loss from fasting prior to slaughter than do leaner kids,
- **time off feed and water** - this affects gut fill and therefore live weight. Live weight percentage losses average 2, 2.5, 3, 4, 5, 7, 10, and 12% for goats off feed 2, 4, 6, 8, 12, 24, 48, and 72 hours respectively. Goats coming off lush pastures will generally have a higher dressing percentage than goats on drier feeds if live weight is calculated only a short time after animals are off feed because lush feed passes through the gut faster),
- **pre-slaughter fasting and stress** - affects dressing percentage because of its influence on gut fill and carcass weight loss. If animals are deprived of feed for 6 or more hours, carcass weight will start to decrease and dressing percentage will actually drop even though the goat's live weight is also decreasing. Carcass weight loss is 2-2.5%, 3-4%, and 6-7% after a 12, 24, 48 hour fast, respectively. Deprivation of water results in another 2% loss in carcass weight ,
- **skin weight** - determined by type of goat and shearing. Skin weight generally averages about 9% of the live weight for a short-haired or shorn goat kid, but can be as high as 15% for an unshorn angora kid,
- **sex** - doe kids tend to be slightly fatter than buck kids of the same weight in the same herd. However, this difference is so slight it rarely affects dressing percentage noticeably,
- **breed**
- **weaning** - weaned kids tend to have a lower dressing percentage than suckling kids of similar

fatness and liveweight.

[\[general info\]](#)[\[current auction prices\]](#)[\[calendar\]](#)[\[planning breeding dates\]](#)[\[dressing percentages\]](#)[\[grading slaughter goats\]](#)



Grading Meat Goats

[Click here](#) for photo show on evaluating "hot house" or Easter kids

Any meat industry benefits from a clear cut understanding between buyer and producer of the quality of the animal being sold. It is not only important that your goats meet the market requirements for weight and age but also that their carcass quality be on target with buyer expectations. One way to do this is to have live animal standards that correlate well with carcass merit.

The following USDA grade standards have been proposed for slaughter goats in the United States:

PRIME

Slaughter kids having minimum requirements for the Prime grade will exhibit superior meat type conformation and possess a high degree of finish. Prime slaughter kids are smooth over the top and the backbone is well covered and smooth when the hand is press down on the back. Prime grade kids will have the appearance of being thickly muscled throughout the body and particularly well muscled in the rear legs and loin. Prime kids shall be at least moderately wide over the back, loin and rump. Shoulders and hips should be smooth in appearance. The overall appearance of Prime slaughter kids shall be one of very good overall health and give indication of a very high level of nutrition.

CHOICE

Slaughter kids meeting the minimum requirements for the choice grade will exhibit at least average meat type conformation. Choice kids will possess a moderate amount of finish over the ribs, back and loin. Choice kids when handled will express at least average muscling in the leg and loin. They should also express at least some development of the brisket. When handled the backbone of choice kids will be only moderately prominent to the touch. the overall appearance of Choice slaughter kids shall be one of good overall health and give indication of an adequate level of nutrition. Choice slaughter kids will have a muscling score of at least slightly thick throughout their body. They will express average or better width throughout the loin, back and rump. The shoulder and hip will be moderately smooth.

GOOD

Slaughter kids meeting the standards for the Good grade will have meat type conformation that will be less

than average. The muscling present in Good grade kids will be typical of slightly thin muscling patterns. Good grade kids are relatively narrow in relation to body length and height and somewhat narrow over the back, loin and rump.

Good grade kids will be healthy in appearance and have the potential to reach the choice grade before breaking yearling teeth. **Good grade kids will be healthy in appearance and have the potential to reach the choice grade before breaking yearling teeth.**

UTILITY

Slaughter kids failing to meet the minimum requirements for the Good grade will be graded Utility. Utility kids will exhibit symptoms of poor management including lack of adequate nutrition, lack of parasite control or poor genetics. Utility kids are very thin fleshed with a hair coat that is rough and dull in appearance.

In summary, these slaughter grades are commendable. They may be somewhat difficult to implement in that different opinions on what "meat type conformation" is may result in grading scores that are subject to personal bias and may not be as uniform across different graders as we would hope. **A Virginia study using these standards to grade "brush" goats of various ages found that the overall edible product to bone ratio for each grade was significantly different and ranged from 3.6 for Prime goats down to 2.3 for Utility goats.** However, Utility goats were on average 3 years older than Prime goats. I haven't seen any work on how well these standards correlate with dressing percentage and meat to bone ratio for kids of similar live weights or ages.

HOW TO ASSESS A LIVE GOAT'S BODY CONDITION

Both New South Wales, Australia and Alberta, Canada have published fat scoring techniques for meat goats. The live animal scores for Australia correlate very well with fat scores measured on a specific site on the animal's carcass after slaughter. This carcass fat score in turn correlates very well with dressing percent and yield of saleable meat. The site they use for both live animals and carcasses is the fat and tissue covering over the second to the last long rib (the 12th rib) as measured 110 mm or 4 inches down from the topline (spine) of the animal.

The live condition scores assigned in Australia are as follows:

- **Score 1** - Individual ribs felt very easily. Cannot feel any tissue over ribs. Corresponds to a covering over carcass site of <4mm (.16 inch).
- **Score 2** - Individual ribs felt very easily but a slight amount of tissue present (covering over carcass site <.24mm or 1/4 inch).
- **Score 3** - Individual ribs felt easily but some tissue present (covering is <10mm or .4 inches thick).
- **Score 4** - Individual ribs can still be felt but tissue prominent (covering over carcass site is about a half inch or slightly less thick).
- **Score 5** - Individual ribs felt or just felt. Tissue is very prominent and may be fluid (covering is more than 1/2 inch thick).

The fat scores for Alberta, Canada rely more on feeling the spine and short ribs of the goat. They are as follows:

- **Very Lean** - Body angular. Backbone raised and sharp. Ends of short ribs sharp and easily felt.
- **Lean** - Backbone raised and barely covered. Pin and hip bones obvious and barely covered. Ends of short ribs smooth but easily felt.
- **Medium** - Backbone slightly raised, smooth and rounded over top. Pin and hip bones lightly

covered. Ends of short ribs smooth but can still be felt. Moderately rounded appearance.

- **Fat** - Smooth, rounded appearance. Backbone can only just be felt. Pin and hip bones smooth and rounded. Ends of short ribs cannot be felt.

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GOAT MEAT IN OUR FUTURE? THE STATUS OF MEAT GOATS IN THE UNITED STATES

By: Clair E. Terrill, Ph.D. - USDA ARS (Retired)
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I am very optimistic about the future of production of meat goats as the demand for goat meat, both domestic and foreign, is certain to increase. Meat goats in the United States are quite a minor food crop now, because goat meat is generally unavailable at retail stores over the country. Furthermore, goat meat, although low in cost because of high efficiency of production and low feed costs, has generally been concentrated in the Southwest where they are a byproduct of mohair production and where Spanish goats are often needed for brush control. Now with a decline in feed grain production in the U.S., total meat production is also starting to decline and if feed grain increases in price or is reduced by drought, the decline in meat production may be rapid. Production of meat from forage is the most reasonable alternative but current low market prices for farm animals discourages meat production on family farms.

Meat from Forage, Not Grain

The bulk of meat from forage is produced by beef cattle but they have not increased in reproductive efficiency in recent years and generally go through a feedlot before slaughter. Current low net returns from cow-calf production generally result in no pay to the producer for risk and management and it is now generally unprofitable to produce finished beef cattle on forage alone.

Goats in Texas are increasing at the rate of 9% per year. These increases may reflect an increase in demand for goat meat but whether these rates of increase can be maintained is quite uncertain. Certainly there is a tremendous opportunity for increased meat production from sheep and goats if their high reproductive efficiency can be increased at a more rapid rate. We know this can be accomplished by selection research.

Prices and supply of feed grains have decreased in the U.S. since 1980. During this same period prices received by family farmers have declined and prices paid by family farmers have increased so that family farms are now declining and feed and food surpluses are generally disappearing. Family farmers are generally not quitting until they die but often then their offspring have left the farm long ago. This means that the loss of family farms may signal a permanent loss of food production. Meat, milk and eggs, possibly the only perfect foods, may be affected most. Similar declines in family farm production and income seem to be occurring in Australia, Canada, and New Zealand, indicating that future food shortages may be world-wide.

One answer to the future food shortage problem will be to find ways of making meat production from forage more profitable by reducing the cost of production. This can best be done by increasing reproductive efficiency, especially with small ruminants, particularly sheep and goats. Research has been very helpful in the past, especially at Dubois, Idaho, where the U.S. Sheep Experiment Station has been so successful in increasing the rate of progress from selection (Ercanbrack 1989, Terrill

1989). This has been accomplished by applying genetic principles such as selecting directly for increasing lamb production of the mother, by breeding ewe lambs, and by turning ram generations every year, thus shortening the generation length and by increasing the selection differential for litter weight of lambs weaned per ewe. The same principles can be applied to selection for feed efficiency (Ercanbrack 1989) by taking the male offspring from the highest producing mothers and adequately testing them for feed efficiency to identify those which are not only highly superior for reproductive efficiency but also superior for feed efficiency. Thus rapid improvement can be obtained in rate of gain with a minimum of fat deposition. Care must be taken to avoid selection for individual body weight rather than litter weight as individual body weight may be in conflict with prolificacy. Selection research of this kind should be done through research facilities, as at Dubois, with the genetic gains being passed on to farmers through sale of males and to a limited extent by sale of females. This research has been done with sheep rather than goats but the same principles would apply.

Every experiment station which maintains herds of goats in excess of 50 head should carry on a selection program as just outlined as very little extra effort is required beyond maintaining individual identification and there would be no interference with any other research for which the animals might be used as the essential data are obtained at weaning time. Genetic gains could be passed on to breeders and farmers (Terrill 1989) as animals with merit above the breed average are sold for breeding. Gains from such selection research at the U.S. Sheep Experiment Station, Dubois, Idaho, gave net returns to sheep producers in the 10 Northwest states over and above returns from the other 40 states, in excess of the cost of all research at Dubois since the Station was established. This selection research was not the traditional kind, but rather had the objective, not in proving that selection works, but rather to increase the rate of progress. Now Ercanbrack (1992) has found that the rate of progress from such research also actually increases with time.

Predator Losses

Now that predators will be taking food, and money also, from people, it seems the time has come to legalize the use of single lethal dose baits to quickly reduce coyote predation and thus loss of human food to predators. In addition, no predator species which might reduce the future human food supply should be protected as an endangered species. Family farmers should organize to reduce the loss of human food to predators by supplementing control efforts of APHIS with winter hunting and denning, especially denning. Support of predator control by APHIS should be greatly increased to provide more effective control in all of the 50 states. Guard dogs and other nonlethal methods may help some individual producers but may have little impact on total losses as losses are shifted from one farm or ranch to another. Now is the time to give the people precedence over nonessential or useless wildlife. This is necessary not only to increase farm income to permit farmers to survive, but also to permit more rapid increase in production of both sheep and meat goats.

Forage Improvement

A great deal of research is needed to improve pastures and forage for sheep and goats. More attention has been paid to increase yields of coarse forages for cattle which are often less palatable for sheep and goats. High yielding legume shrubs and fine legumes are needed for the temperate zone which are plentiful and nutritious earlier in the spring and later in the fall, as well as through the summer. A greater variety of fine growing plants that are highly palatable to sheep and goats are needed, especially those which provide a dense groundcover to prevent erosion on hilly land where erosion is often more prevalent than on cultivated land. More effective pasture improvement through more productive species and more effective methods should be developed. Pasture improvement on poor and marginal land that has been abandoned for crop production or where crop production on marginal lands is becoming unprofitable should be emphasized. Small trees and other shrubs which could grow

quickly in gullies and on other highly erodible land only to be largely consumed by small ruminants and then to quickly regrow when it rains should be developed. Management methods for goats in humid areas could probably be improved as meat goats have generally not been kept in humid areas of the U.S.

Exotic Breeds

Improved meat goats such as the Boer goat of South Africa, possibly some breeds of Cashmere goats, and possibly others should be imported and tested for adaptability over the U.S. as well as for efficiency of meat production, namely, reproductive efficiency. This might need to be done through research both for importation, testing, and introduction as well as for selection for improvement of reproductive efficiency. All existing goat breeds could be improved for reproductive efficiency for meat production which could often be done without much decreased efficiency of milk or fiber production. Specialized production of single products such as milk, mohair, cashmere, or meat may no longer be most profitable. The selection of mohair goats for reproductive efficiency might permit more slaughter, for meat, at younger ages before the yield of fine mohair has shifted to coarser adult mohair. Research to determine the optimum age of slaughter for production of both kid mohair and meat should be increased. Some reduction in total mohair yield might be acceptable if highly valuable meat production was increased. Research at Dubois, Idaho (Ercanbrack 1992) indicates that only slight declines in fleece weight accompany increases in litter weight per ewe.

Goat Meat

Emphasis on goat meat quality is essential for increasing consumption of goat meat whether for domestic use or for export. Selection for improvement of flavor, tenderness, and optimum fat content should accompany selection for reproductive efficiency on research stations. Use of embryo transfer, embryo splitting and/or nuclear transfer should provide identicals for early slaughter and testing of the meat, leaving other identicals for use in breeding, thus to provide an ample selection differential for meat quality even though secondary to reproductive efficiency.

The development of family farm cooperatives to not only provide a market outlet for goat meat and lamb but also to develop rural small or moderate-sized processing plants that would not only be sanitary, safe, and efficient but would provide the family farmer control of meat and meat products through wholesale and possibly retail and export. Research should be involved not only in improvement in production and reproductive efficiency but also in improvement of marketing, processing, and in production of value added products from goat and sheep meat.

Development of lean, boneless cuts, even though high priced, should be emphasized for consumption by affluent people through supermarkets, both domestic and foreign. Then the remainder of meat both from kids and adult animals should be deboned and used for the development of highly nutritious and palatable meat bars which would keep at ordinary temperatures to be consumed by pre-school and school children in all countries, but especially in developing countries, to be made available at or below cost and which would largely be paid for with public funds.

Summary

The possible future of goat meat production in the U.S. is tremendous on forage alone, providing production and efficiency of production can be rapidly expanded. Returns to farmers or ranchers should steadily increase and the cost of the meat to consumers might even decrease. Meat, the perfect food, from goats and sheep may maintain an acceptable level of meat consumption in North and Central America. Selection of buck kids on their mothers' production in litter weight, turning buck generations every year, and keeping emphasis on quality of products are all essential keys to rapid progress which will even increase with time. Such a program should be carried on experiment stations

as well as on farms and ranches as the records required are obtained on experiment stations anyway. Predator losses should be quickly reduced by greatly increasing lethal control. All wildlife species preying on goats or sheep should be removed from endangered species lists and there should be no attempts to increase their numbers or to encourage their production in new areas. The time has come to give people precedence over wildlife, as has been done in most of the rest of the world. Research to improve pastures, ranges and winter forage should be expanded although the principles of range management are already well known. Importation of meat goat breeds such as the Boer goat should be accomplished. Cooperative processing and marketing should emphasize meat quality and should develop value added products to be sold almost directly to consumers, both domestic and foreign. Americans need to eat more meat, and we can produce far more goat meat than we do now. How?

1. Emphasize reproductive efficiency
 1. Select for young weaned per breeding female
 1. Emphasize increase of progress from selection research
 1. Select on litter weight rather than individual weight
 1. Predator losses should be quickly reduced by increasing lethal control
 1. All wildlife species preying on food producing animals, sheep, and goats, should be removed from endangered species lists.
 1. Research to improve productivity of pastures and ranges for sheep and goats should be expanded.
 1. Import the Boer goat and possibly other developed meat goat breeds
 1. Develop cooperatives to process goat and lamb meat for added value
 1. Emphasize direct marketing of high-quality goat and sheep meat

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About the Author

Clair E. Terrill, after having been raised on an Iowa livestock farm, received his B. S. degree from Iowa State University, and thereafter a Ph.D. from the University of Missouri in 1936. He served briefly as an Animal Scientist at the Georgia Experiment Station and then in sheep breeding research at the USDA, U. S. Sheep Experiment Station in Dubois, Idaho, and as Director of the Station from 1953-1955. He then served as Chief of the Sheep and Fur Animal Research Branch of the Agricultural Research Service from 1955-1972, and at the time of his retirement from the USDA-ARS in 1980, Dr. Terrill was National Program Leader for sheep and other animals.

Subsequent to his retirement, Dr. Terrill has continued with professional work, and during his career has produced over 200 publications on sheep breeding and production. He has traveled extensively in all of the sheep and goat countries of the world, and about 40 other countries.

On many occasions during his distinguished career Dr. Terrill has been recognized and honored for his service and contribution to the Sheep and Goat Industry, such awards include: the Service Award in 1972, the American Sheep Producers Council Silver Ram Award in 1979, the Distinguished Service Award of the NE Section of the American Society of Animal Science in 1979, and Agriservices Foundation's All Time Great in the World of Animals Award in 1980. His portrait also hangs at the Houston Livestock Show in the International Stockmen's Hall of Fame, at the Saddle and Sirloin Club of the North American Livestock Exposition in Louisville, Kentucky, and in the Science Hall of Fame of the Agricultural Research Service in Beltsville, Maryland.

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Why Raise Meat Goats?

by
Gail Bowman

The demand for 'chevon', or 'cabrito', or 'goat meat' in the United States is so high that producers can't keep up. Because of this vacuum, much of the goat meat sold in the United States is imported from New Zealand or Australia. About 1.5 million pounds of goat meat is imported every week. And demand just keeps growing.

Much of the demand is generated by the changing ethnic demographics of the continent. About 63% of the red meat consumed worldwide is goat! Much of the goat meat demand in the United States comes from ethnic groups that include Middle Eastern, Asian, African, Latin American and Caribbean heritage. Most of these groups buy goat meat whenever they can find it, and they are willing to pay better prices for higher quality meat.

What is so special about chevon (goat meat)? Many people have digestive problems that require a careful diet. The molecular structure of chevon is different than that of other meats. Therefore, chevon digests more easily. It is also a low fat, good tasting alternative to chicken or fish. I am one of those people who have to watch what they eat. I can eat chicken, some kinds of fish, turkey and chevon. I prefer chevon from an animal that is at least 75% Boer. The Boer influence changes the taste of the meat to a milder, more veal-like flavor. When you have as few choices in your diet as I do, you learn what you like. I have not had the opportunity to try Kiko or Fainting goat meat. My comparisons are with dairy goat meat.

The Direct Market Niche and the Commercial Meat Herd In our area, if you put out the word that you have meat goats for sale, you usually have enough calls to sell your animals right off your ranch. I get about \$1.00 per pound on the hoof. I have had other breeders tell me that they can get more for goats with Boer blood. This is a good example of one way to market your goats - find a profitable direct market niche.

One of the most popular market niches in the meat goat industry today is the direct market. A 'direct market' is a group or type of buyer that will come directly to your ranch to buy from you, for a specific reason. There are many direct market niches for meat goats. I have already suggested one type of direct market niche: the ethnic meat market. Another direct market niche involves the growing trend in the 4-H and FFA clubs to raise meat goats. One of the most profitable direct market niches supplies Chevon to the local restaurants that are serving an ethnic clientele. Another direct market niche is the market for meat breeding stock. Commercial meat breeders will usually pay about double, for breeding stock, what you might have expected to receive for the same animal by the pound.

Many breeders are now working together, in cooperatives or associations, to meet large commercial sales contracts. These contracts supply the meat markets on the east and west coasts of the United States, and require a supply of high numbers of animals, of a consistent quality, on a regular basis. At this time, much of the meat for these contracts is being imported because there just are not enough meat goats in the United States to supply the contracts.

In many areas of the country, slaughter houses are being constructed specifically for goat meat. However, almost none of the goats being processed at these facilities are actually meat type goats. There are just not enough meat goats being raised, which are not pre-sold to direct markets, to supply a production facility.

Fullblood Meat Goats

There are several types of 'meat' goats: Boer goats, Tennessee Fainting Goats, Kiko goats, and 'Spanish' goats. However, only three of these are true breeds with breed associations and standardized meat breed characteristics. These are the Boers, Kikos and Tennessee Fainting goats. The 'Spanish' goats are an indigenous goat of the southern United States. There are a couple of breeders who have done a terrific job of breeding these animals up into a very good meat animal. However no registry or breed standards have been developed at the time of this printing.

Boer goats are large framed animals resembling, in many ways, the Nubian goat. The most striking difference between a Boer goat and any other type of goat you may have seen, is the size. A Boer is a large, double muscled animal developed in Southern Africa specifically for meat and hardiness. They can consistently produce more muscling in less time than any other breed of goat, and will pass this capability to their kids. Boers are vibrantly colored and relatively uniform throughout. They are easy to raise, have mild temperaments, are affectionate, require no milking, no special care, no shearing, and no fancy fences. Boers and Boer crosses also have huge rumen capacity. The Boer goats were developed to clear land that was too difficult to be cleared by humans. They spend a lot more time grazing than other types of goats do. One reason for this, is that they are out grazing in the heat of the day when dairy goats are wilting in the shade. They are also out grazing when the snow is blowing across the pasture. They will graze and thrive on ground that will not support dairy goats without supplementation.

The Kiko goat is a recent development of a New Zealand company called "Goatex Group LLC". These hardy goats were developed as a result of a government funded project to get the native goat population in New Zealand under control. As part of this project, in the 1970's, many goats were hunted and killed, and thousands more were captured to cross with angoras. Some of the native goats confined during this project exhibited enhanced characteristics for growth and meat production. The members of Goatex isolated these animals and began to cross them with hair and milk goats to find a combination that would yield the best results in both hardiness and meat carcass production. The resulting breed was called "Kiko" meaning "meat for consumption" in Maori.

Fainting goats are not huge animals. They average between 17 and 25 inches tall,

and weigh between 50 and 165 pounds. They come in a wide variety of coats and colors, with long ears that stand out to the sides of their heads. Fainting goats have very distinctive 'bulgy' eyes. Several breeders have spent a lot of time and energy breeding this basic breed up into an 'improved' meat goat that is larger and heavier and crosses well with Boers.

Fullblood breeding animals are a whole different industry from the meat production industry. However, the two are very closely tied. When you take a look at what you want to raise, you might consider adding at least a few quality fullbloods to your operation. If the meat industry in your area blooms and expands, there will be more demand for good fullblood meat goats. We are heading into an era of serious meat production.

In all livestock industries, there is a place for the good registered herd sire. These animals must be proven to be fertile and prolific, adaptable, disease free, and have the meat and muscle characteristics that will add productivity to a commercial meat herd. It may be a good idea to consider whether or not you want to make the initial investment to start a good breeding stock herd. Or, alternatively, add a few breeding stock to your meat herd, or some meat production stock to your fullblood herd. The two types are not mutually exclusive. As a matter of fact, one usually leads to the other. If you start with a meat herd, but have to add a fullblood herd sire, sometimes you will also be tempted to buy a fullblood doe to go with him. Then you are suddenly producing herd sires for your neighbors. This is a good idea, because one good fullblood sale a year can pay nearly 1/5th of your feed costs for a year (if you are raising 50 goats).

What are the prices on fullblood meat goats expected to be in the long run? Many things will affect the answer to that question. I know a couple who breed fullblood registered angus cattle. How many rural communities have plenty of cattle? How can these people make their money? They market. They have big production sales where breeders come from all over the world, or tie into a satellite link, to buy their stock. I believe that there will always be top breeding stock. People that advertise, raise quality disease free animals, and let the meat producers know they are out there, will always have a market.

As in all industries, the price you will be able to get for good fullblood stock will depend on the quality of your animals and the effectiveness of your advertising. If you do not want to market, you will probably be able to sell your fullbloods to your neighbors at about \$250 each, indefinitely. If you are well known, and advertise, and you have animals that make the buyer's head turn, you will probably always be able to get at least \$800 for your fullblood meat goats. At the time of this printing the prices for good fullblood stock are about double that amount, and are actually going up. These prices have been stable for three years now, and the market seem to indicate that they will remain firm in the future.

Whether you are interested in raising goats for meat or for breeding, or some combination of the two, meat goats, and goat meat, are here to stay. The market is increasing and expanding, and shows no signs of slowing down. You don't need a lot of specialized equipment to raise meat goats, and you can reasonably plan to raise about 6 does with their kids per acre of good edible vegetation. As an industry, meat

goats are replacing beef, hogs and dairy herds nation wide. Meat goats are the newest and fastest growing small acreage industry in the United States.

Gail Bowman raises South African Boer goats in Idaho and can be reached at 208-543-2217, or FAX 208-734-0832. Her address is PO Box 1626, Twin Falls, ID 83303. Or you can send e-mail to gailbowman@boergoats.com. Gail has a bachelors degree in education and is the author of the book Raising Meat Goats For Profit from which this article is excerpted.

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GREAT Potential in a New Industry

Richard V. (Rick) Machen, Ph.D. - Asst. Prof. and Extension Livestock Specialist,
Texas Agricultural Extension Service - Uvalde, Texas

While browsing through a livestock industry publication recently, I came across an unusual add. Occupying a single column and tucked inconspicuously amidst the help wanted pages inside the back cover, it read:

WANTED

Person or persons to provide leadership for a lean red meat producing industry. Must have a vision for the future and ability to focus an industry with tremendous enthusiasm, yet lacking a sense of direction. Person(s) must be an energetic, goal-oriented team player and a futuristic thinker not bound by tradition. Untiring positive attitude preferred; excellent people skills a must. For further information, contact your nearest meat goat producer.

Never before has there been such interest and enthusiasm within the U.S. meat goat industry. Never before has the need for production goals and a common sense of direction been greater. Interest and excitement in the industry has primarily been spurred by one event - the introduction of the Boer goat. Introduction of new breeds (almost regardless of species) is always exciting. In the short term, the lucrative market values resulting from high demands on a limited supply stimulate interest. However, the true worth (long-term) of any breed is not established until significant contributions to commodity (i.e. lean meat) production have been made.

What then, are some of the possible contributions the Boer goat will make toward the long-term viability of the meat goat industry? Following is a brief discussion of some of the Boer goat's unique attributes.

Muscle Mass:

Although little carcass data is available to support this claim, observation of the goats and comparison to typical domestic meat goats leads one to conclude that the Boer goat is a more muscular breed of goat. More muscle mass translates into greater body weight at a given age. If the marketing structure ever changes from a "by the head" to a "per pound of body weight" basis, heavier muscled slaughter goats will have a higher market value.

Heavier muscling may also provide opportunities for implementation of different carcass fabrications and diversification of the size and type of goat meat products offered to the retail consumer and HRI patron.

Body Capacity and Mass:

Beef cattle, sheep and swine breeders have proven that substance of bone, structural correctness of feet and legs, spring of rib, depth of side and chest floor width are essential components in the development of a functional, productive, meat-producing animal. Of

the breeds available to U.S. breeders, the Boer is most likely to contribute body capacity and mass.

In addition, the Boer appears to have a larger rumen volume (gut fill) than most domestic goats. In terms of lean meat produced per unit of input, goats cannot compete with the other red meat producing species on grasslands, improved pastures or on concentrate feeds. However, on native ranges with substantial quantities of palatable browse, goats have a competitive advantage and are most efficient in the conversion of browse to muscle protein. The Boer's possible contribution of additional gut fill could result in enhanced forage (browse) intake and improved performance.

Appetite:

Producer observations will substantiate the claim that Boer goats have a greater appetite than other breeds. One opportunity in the meat goat industry is the development of a more continuous supply of goat meat. By nature, goats are somewhat seasonal breeders; breed Sept-Nov and kid Feb-May. Unlike beef, pork and lamb, the goat industry has never developed a "feedlot" phase. One reason for the absence of an intensive feeding phase is the goat's poor appetite and relatively inefficient conversion of feed to body weight. While fattening goats in a feedlot is certainly not advocated here, some "time on feed" may eventually be required to support a continuous supply of goat meat. If so, the Boer goat's apparent ability to influence feeding behavior may prove beneficial.

Maternal Ability:

In South Africa, Boer does exhibit strong maternal instincts and admirable flocking behavior, are prolific and have a relatively long breeding season - traits that warrant consideration and inclusion in the development of an American meat goat.

Boer does also have excellent udder confirmation. Dairy breeds are making a significant contribution to the mature size of the meat goat population, but at the same time may shorten the longevity of many crossbred does due to udder unsoundness. The magnitude of effect the Boer can have on maternal characteristics remains unquantified.

>A word of caution deserves inclusion here. Currently, meat goats are at the same stage of development as the beef cattle industry of 1960. In the fifteen plus years following 1960, new breeds of cattle were imported into the U.S. - breeds with heavier muscle, larger mature size and greater milk production potential. Bigger was better so cattlemen spent twenty years building better cattle, often times with little consideration of consumer concerns or environmental constraints. In the late 1980's, the beef industry realized the need for consumer input and the identification of production targets. The "box" became a major production target and many cattle didn't achieve the objective. Moderation, predictability and consistency are now focal points. So how is this related to Boer goats and the meat goat industry?

Considering the breeds available, the potential exists to develop a meat goat that is too big and too productive for the environment in which it has a competitive advantage. Therefore, it is imperative that breeders identify a production system appropriate for their environment, then develop a goat that efficiently performs therein.

Positive impacts on growth and phenotypic characteristics are substantiated by breeder observations and limited applied research data. Data collected on spring 1994 born 1/2 bloods indicate individual

90 day weaning weights in excess of 36 kg are possible and marketable product produced per doe can exceed 68 kg by 90 days postpartum. Preliminary results from a Texas A&M study comparing Spanish to 1/2 Boer, 1/2 Spanish kids indicates inclusion of the Boer positively affected growth rate, especially in the postweaning phase.

The industry desperately needs a production target or target(s) on which to focus, a goal at which to aim, a clear direction towards success. For the bulk of the industry, long term viability may hinge on the breeder's ability to develop a prolific, fast growing animal with desirable carcass characteristics that can be sustained and productive on a browse diet. The Boer goat can play a significant role in that process.

The meat goat industry is searching for leadership and direction. Someone once said, "The best way to predict the future is to create it." Boer goats have captured the industry spotlight and currently hold everyone's attention. Perhaps the time is right for them and their breeders to step forward in answer to the WANTED add.

About The Author

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>Dr. Machen is the Extension Livestock Specialist for 21 counties in central and southwest Texas. He holds an appointment in the Department of Animal Science at Texas A&M University, and his livestock production responsibilities include beef cattle, sheep, goats, wool and mohair. He directs and coordinates Extension educational programs related to livestock production, conducts applied research, and provides technical assistance to livestock producers.

Since the introduction of the Boer goat in 1993, Dr. Machen has spent an appreciable amount of time evaluating its impact on meat goat production. Research efforts have focused on preweaning growth and performance of Boer sired kids. In addition, feeding studies have been conducted to evaluate post-weaning performance and carcass characteristics of percentage Boer wethers.

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Judging Meat Goats

Criteria As Taken From Texas Agricultural Extension Service Publication No. B-5018

Selection, Management and Judging of Meat-Type Spanish Goats

By: Edmundo E. Martinez, Joe C. Paschal, Frank Craddock, and C. Wayne Hanselka

(Note: The criteria listed below for market goats differ somewhat from those by which Boer goats are judged in purebred competition, because certain characteristics unique to that breed are then considered, as specified in the Boer Goat Breed Standards which are listed elsewhere at this site.)

Several criteria should be considered when selecting and judging meat goats. These include conformation (structural correctness), general appearance (size and scale, capacity, and depth and width of body), muscling (growth and weight per day of age) and condition or finish (fatness).

CONFORMATION

Meat goats should be evaluated on "type" and "market desirability." These terms refer to frame size, skeletal correctness and how these blend in the market animal. "Market desirability" relates how much finish the goat has in relation to its weight, size and age and is sometimes referred to in terms of USDA quality and yield grades used for lambs.

A good market goat should be rectangular in appearance from the side with straight, level top and bottom lines. Length of rump, length of body and length of leg are important to market desirability. The rump should be level and the overall body should be trim. The legs should be straight and placed square under the body, not post-legged or cow-hocked. The fore and hind legs should show evidence of muscling.

From the front, a market goat should show width between the forelegs, muscling in the forearm and shoulders, trimness in the brisket or breast area and soundness and correctness in the front feet and legs. The head should be in proportion to the neck and body.

From the rear, the hindquarter should be muscular and long and the back, loin and rump should be uniform in width. The feet and legs should be straight and spaced square and wide under the goat.

GENERAL APPEARANCE

STATURE. The term stature refers to the overall skeletal size and length of the goat. Goats must have an adequate length of cannon bone from knee to pastern and should be above average in overall length of body and general size. Cannon bone length is a good indication of skeletal size. The goat's height measured at the withers should be slightly more than at the hips, and bones must be of good size.

HEAD. The head should combine the beauty of eyes, nose, ears, and overall form with strength and refinement. It should have a balance of length, width and substance that insures an ability to consume

large amounts of forage with ease.

FRONT END. The front end is a combination of chest and shoulder features. The goat should have a wide chest floor and prominent brisket with a smooth blending of shoulder blades and sharp withers. This insures room for the heart and lungs to do their work with ease and also is evidence of proper muscle and ligament strength.

FRONT LEGS. The goat's front legs should be straight, perpendicular to the ground, sound in the knees and full at the point of the elbow. The legs should move with the front feet pointing straight ahead.

BACK. A back that is straight, strong, wide, long and level is desired in goats. This denotes a strong body build with good muscling and is indicative of strength to carry large quantities of feed.

RUMP. The goat's rump should be long, wide and level from thurl to thurl, cleanly fleshed and have a slight slope from hips to pins. The shape of the rump is important as it affects leg set.

HIND LEGS. The goat's rear legs should be wide apart and straight when viewed from the rear, with clean hocks and a good combination of bone refinement and strength. Observed from the side, a plumb line originating at the pin bone would fall parallel to the leg bone from hock to pastern and touch the ground behind the heel of the foot. The resulting angles produced at the hock and stifle joint will be most ideal for easy walking and a minimum of joint problems.

FEET. Meat goats need strong pasterns and strong, well-formed feet with tight toes, deep heel and level sole. Such feet are highly resistant to injury or infection and easy to keep trimmed. Goats with uneven toes and extremely weak pasterns should be culled.

MUSCLE

Meat characteristics can be visually determined by examining the animal hindquarters loin, shoulders and neck.

HINDQUARTERS. A long, deeply attached muscle, relatively thick at the thigh and stifle is desirable in meat goats. Heavier muscling on the outside of the leg is acceptable. Muscle over the thurl and rump should be obvious.

LOIN. The loin eye or ribeye is typically the best indicator of meatiness in market goats. It should be wide with a symmetrically oval shape on each side of the backbone. This muscle should carry forward over the ribs or rack.

SHOULDERS. The goat's muscling should increase from the withers to the point of the shoulder with the thickest muscle occurring immediately above the chest floor. The circumference of the forearm is the second most important indicator of meatiness, so the forearm muscle should exhibit a prominent bulge and should tie in deep into the knee.

NECK. The juncture of the neck and shoulder should be free of excess tissue. It should gently slope to indicate muscling. Smoothness and quality are important in this area. A long clean neck with muscling in balance to the remainder of the animal is desired.

CONDITION

The term condition refers to the amount of finish or fat the animal is carrying. Goats deposit fat internally before they do externally. The ideal condition is a thin, but uniform, covering over the loin, r b and shoulder. The external fat thickness over the loin at the 13th rib should be between .08 to .12 inches or an average .1 inch.

ACKNOWLEDGMENTS

Information used for this criteria was taken from Texas Agricultural Extension Service Publication B-5018. Other Extension Service Meat Goat Publications Include:

B-5021

Spanish Goat Management

By: Joe C. Paschal, B. Frank Craddock, C. Wayne Hanselka, and Dale Rollins

L-5028

Feeding, Fitting and Showing Suggestions For Spanish Goat Projects

By: Edmundo E. Martinez, Joe C. Paschal, Frank Craddock and C. Wayne Hanselka

B-5034

South Texas Cabrito Recipes

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Evaluation of Slaughter Meat Goats

by

Frank Cradock

Extension Sheep and Goat Specialist

San Angelo, Texas

The following is the evaluation criteria and applicable "points" for each attribute of the animal.

Structural Correctness, Style and Balance

30 Points

- up-headed with neck extending out of top of shoulders
- strong level top
- long rump with slight slope from hips to pins
- front and rear legs should be straight and placed square under the body
- strong pasterns; strong, well formed feet; quality of bone
- proper blending of all body parts.

Volume and Capacity

25 Points

- length of body
- depth of body
- width of body (spring of ribs, width through chest floor)

Muscling

35 Points

- deep, thickly muscled leg and rump, stifle thickness
- broad, thick back and loin
- bold shoulders, wide chest floor, prominent forearm
- width between the front and rear legs

Condition

10 Points

- *thin*, uniform covering of fat over the loin, rib and shoulder

100 - Total Points

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THE BOER GOAT BECOMES INTERNATIONAL

Dr. Stuart Southwell, B.V.Sc - M.R.C.V.S.
Premier Genetics NZ. Ltd. - Drury, New Zealand

In 1985, Landcorp Farming N.Z. decided to improve its Angora goats by importing genetics from Southern Africa, and it was decided to use Zimbabwe as the country of importation. Alan Aiken, the Landcorp representative, was sent across to Zimbabwe to assess the situation and to select the donor animals. Whilst there, he was introduced to this funny looking goat with long brown ears. The locals called this goat "the Boer". These goats had been imported from South Africa many years ago and now formed a significant population in Zimbabwe. Like they have done to many people in latter years, these "Boers" attracted Alan Aiken's interest.

In January 1987, Landcorp went to Zimbabwe to flush embryos from Angora and Boer females. This took place at a quarantine station called Iridor, which was just outside Harare. Approximately two hundred embryos were frozen from this collection, and exported to New Zealand. These embryos were implanted on Soames Island (New Zealand's maximum quarantine facility) in May of 1987.

Concurrently in May 1987, Landcorp went back to Zimbabwe to collect more Angora and Boer embryos. The donors in this second flush were completely different to those at Iridor, and were in quarantine at Keymer Farms which was owned by D. Banks. Because of quarantine regulations and the seasonal nature of the goats reproductive cycle, these embryos from the second flush were not implanted into recipients in New Zealand until April 1988.

Landcorp's final collection of Boer goat embryos from Zimbabwe took place in May 1988. These were implanted in April 1989 and the pregnant recipients went to a second quarantine station in the South Island called Eyrewell.

These three collections from Zimbabwe in 1987 and 1988 formed the basis of Landcorp's Boer goat industry. And by yearend 1988, New Zealand then had two groups of Boer goats, one owned by a consortium with B. Moodie as its spokesperson, and the other by Landcorp Farming.

Also in 1988, an Australian group flushed Boer goat embryos from new genetics, also at Keymer Farms. Those animals were released from quarantine in Australia in November 1995, and by that time had propagated to the extent that there were approximately 2,000 Boer goats at the Terraweena quarantine facility.

Prior to the release of Landcorp's animals from quarantine, Landcorp implanted Boer embryos into recipients at Olds College in Canada. These were the first Boer embryos and later live kids to be born in North America. These goats stayed in quarantine (at Olds College) until the New Zealand release in April 1993, at which time they were able to be released into Canada and the U.S.A.

From that point onwards, the Boer goat has truly become an international entity. Since 1987 the Boer has moved from Africa to New Zealand, Canada, Mexico, Australia, U.S.A., Indonesia, England, India,

France, Malaysia, Denmark, British West Indies, Netherland Antilles, and numerous other countries.

About The Author

Dr. Stuart Southwell, B.V.Sc. - M.R.C.V.S.
Premier Genetics N.Z. Ltd.

No one individual has contributed more to the development of the international Boer goat industry than Dr. Stuart Southwell of Premier Genetics N. Z. Ltd in Drury, New Zealand. He is widely known and respected for pioneering many of the embryo transfer techniques and programme protocols that are being employed by veterinarians and goat producers in many different countries of the world, and has willingly shared his knowledge and experience with those who have sought his advice and counsel. In addition to sharing his surgical techniques with other of his fellow veterinarians, Dr. Southwell has, himself, performed embryo recovery, splitting, and transfer on many thousands of Boer goats.

Other articles by Dr. Southwell at this site are "[Embryo Transfer In The Boer Goat](#)" and "[Artificial Insemination In The Boer Goat](#)".

To confer with Dr. Southwell regarding Boer goat embryo transfer or AI technology, or to engage his services, he may be contacted as follows:

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Michael & Angela Brazil
Loraine, TX

Outlaw Boers
Krista Darnell
Childress, Texas



Krista's Kabrito

by
Krista Darnell

editor's note: This is the first in a series of recipes contributed by Krista Darnell. We'll be featuring her recipes on a weekly or biweekly unscheduled schedule.

The most common question people ask me when they find out I raise goats, is "Why". When I tell them I eat them, the next question is always, "HOW?". They invariably tell me about such and such time when they ate goat and it was horrible. Dry and stringy are usually the words they use to describe it. This is like driving a wrecked Viper and then deciding all Vipers drive like crap. Goat will easily dry out if overcooked, but that's not to be blamed on the goat. Sticking it in the oven and then running off to play in chat rooms will not contribute to a juicy dinner.

Goat in Honey Yield 4 servings

1/2 lb (250 g) lean boneless goat
1 tablespoon hoisin sauce (available from Chinese stores)
1/2 teaspoon sesame oil
2 tablespoons cornstarch (cornflour)
3 tablespoons groundnut peanut oil

For the seasonings:

1 tablespoon light soy sauce
1 teaspoon brown vinegar
1 teaspoon Shaoxing rice wine (available at Chinese stores) or dry sherry
1 teaspoon ginger juice (use a garlic press)
1 teaspoon honey
2 teaspoons sugar
1/2 teaspoon cornstarch (cornflour)

Slice the goat across the grain into thin slices. Place in a dish and mix well with the hoisin sauce and sesame oil. Dust with the cornstarch to coat the meat pieces evenly. Heat the groundnut oil in a preheated wok until moderately hot. Stir-fry the goat for 1-2 minutes, stirring constantly to separate the slices. Remove and drain well.

Pour off the oil, leaving 1 tablespoon behind, and stir in the seasonings ingredients. Bring to a boil. Return the goat to the wok and stir quickly over maximum heat until the seasoning ingredients coat the goat slices. Serve immediately.

Enjoy!

Krista

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Roman Roast Goat with Rosemary and Garlic

Yield 4 servings

2 racks of goat, 8 chops per rack
[about 4 lb (2 kg) total weight]
1/4 cup (2 fl oz/60 ml) sunflower or canola oil
3 small fresh rosemary sprigs
Garlic cloves, cut into quarters lengthwise
2 cups (16 fl oz/500 ml) full-bodied Italian white wine
[as needed to taste]
Freshly ground pepper
Salt
Lemon wedges

Using a sharp knife, score the fat on the top surface of the goat to prevent curling and shrinking. In a large frying pan over high heat, warm the oil. When hot, add a goat rack and brown on all sides, about 5 minutes. Place the rack, bone side down, in a large roasting pan. Repeat with the other rack.

Preheat an oven to 450°F (230°C). Place rosemary and garlic between the chops, pushing them to the bottom where the bones are cracked and using whatever amount suits your taste. Stud the scored surface with rosemary and garlic as well. Pour white wine over the chops into the pan to a depth of 1/4 inch (6 mm) and grind pepper over the racks.

Place in the center of the oven, immediately reduce the heat to 400°F (200°C) and roast, basting once with the wine, until golden brown, about 1 hour.

Remove the pan from the oven, baste the goat again with the wine and cover with aluminum foil. Return to the oven and continue to roast for 20 minutes. Remove the foil, baste again, and continue to roast the goat, uncovered, until the surface is deep brown and crisp, about 10 minutes longer.

Transfer the goat to a cutting board and let stand for 15 minutes before carving. If the goat becomes cool, warm in a 225°F (105°C) oven for 2-3 minutes just before carving. Carve into chops and distribute among warmed individual plates. Season to taste with salt and pepper and garnish with lemon wedges.

Enjoy!

Krista

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DEMAND FOR GOAT MEAT GROWS

By: Merle Ellis
"The Nation's Best Known Butcher"

In some parts of the world goat is the preferred meat.

It is a tradition in Greece at Easter; that's where I first tasted goat. In parts of Mexico, cabrito is standard barbecue fare. Goat meat is served and enjoyed in northern China as well as northern Italy. The French call goat "chevon" and regard it as a delicacy. In America, however, goat meat is far from familiar fare.

"Goats are the most underrated farm resource around today," says Shelly Andrew, an extension agent in Jackson County, N. C. "If properly marketed, this animal is about twice as profitable as cattle. Goats thrive in pasture land too poor to support cattle. They're perfect for mountain areas, and they are very hardy."

The meat-goat business seems to hold new potential. There is a growing, solid market for goat meat in the United States. Indeed, in Florida, one supermarket chain is beginning to carry goat meat next to poultry, pork and beef in the meat case. Their customers with family roots in South America and the Caribbean are demanding it. With the growing interest in all ethnic foods in this country, the interest in goat meat is certain to expand to other states. Goats are naturally low in body fat, with only 51 calories per ounce. A four-ounce serving of roasted goat contains only 85 mg of cholesterol. Goats can live and thrive and produce goat meat on almost anything. Goats eat hay, grass, leaves of trees, branches, even kudzu.

It may be a while before goat meat is available in every market in America, but it is on its way. Until then, try the following recipes using lamb (the closest in flavor to goat) or "get your goat" by mail from Broken Arrow Ranch. Call Kathy or Dawn at (800) 962-4263 to place an order or for more information.

Southwest Leg of Goat

- 1 cup white wine or vinegar
- 1 cup vegetable oil
- 2 cloves garlic, minced
- 1 bay leaf, crumbled
- 2 teaspoons salt
- 1 teaspoon rosemary
- 1 teaspoon sage
- 1/2 teaspoon red pepper flakes
- 1 (5- to 7-pound) leg of goat, boned
- 3 large potatoes, quartered

- 3 onions, quartered
- 3 large chiles or peppers, seeded and sliced
- 2 garlic cloves, skin removed

Preheat oven to 325 degrees.

Combine vinegar, oil and seasonings and pour over goat meat in a glass baking dish. Cover and marinate in refrigerator 12 to 24 hours, turning often.

Remove goat, strain marinade and reserve. Place potatoes, onion, chiles and garlic in shallow roasting pan and pour 1/4 cup marinade over vegetables. Place goat on roasting rack over vegetables. Pour 1/4 cup marinade over goat. Roast for approximately 25 minutes per pound.

Serve with vegetables. Use drippings for gravy, if desired.

Makes 8 to 10 servings.

Cabrito Chops Jalapeno

- 4 goat round bone or blade shoulder chops, 1 inch thick
- 1 teaspoon salt
- 1/2 teaspoon ground pepper
- 1/2 teaspoon ground cinnamon
- 1 (8-ounce) can crushed pineapple in its own juice
- 1/2 cup jalapeno jelly
- 1/4 cup fresh lemon juice
- 1 tablespoon prepared mustard

Sprinkle chops with a mixture of salt, pepper and cinnamon. Combine remaining ingredients in small saucepan. Bring to boil, stirring until jelly is melted.

Broil or grill chops 4 inches from source of heat, 8 to 10 minutes on each side. Spoon sauce on meat the last 5 minutes of cooking time.

Makes 4 servings.

About The Author

Merle Ellis is considered one of the country's top authorities on meat selection and preparation. He is nationally known to the public through his own television series, as well as through his syndicated newspaper column, "COOKING AROUND THE COUNTRY".

Merle began his career as a butcher at the age of 13, working in his father's meat market in Sioux City, Iowa. And after serving in the army, he worked as a butcher while majoring in radio and television at San Francisco State College. A thirteen year career as a producer/director in San

San Francisco television followed, including the formation of his own independent production company and the winning of several broadcasting awards, including two Emmys.

In 1973 he combined his two careers, and became a regular guest on the DINAH SHORE SHOW, where he advised consumers how to get the best meat values. Thereafter he has been a frequent guest on GOOD MORNING AMERICA, and has made hundreds of guest appearances on other national and local television shows. Currently he can be seen as the host of his own television series "COOKIN' USA", a daily cooking show on The Nashville Network.

Merle's book "CUTTING UP IN THE KITCHEN", published in 1975 by Chronicle Books, has sold over 500,000 copies. He is presently writing a cookbook for Knopf Publishing, which will be published in 1996.

Merle Ellis

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Krista Darnell

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The most common question people ask me when they find out I raise goats, is "Why". When I tell them I eat them, the next question is always, "HOW?". They invariably tell me about such and such time when they ate goat and it was horrible. Dry and stringy are usually the words they use to describe it. This is like driving a wrecked Viper and then deciding all Vipers drive like crap. Goat will easily dry out if overcooked, but that's not to be blamed on the goat. Sticking it in the oven and then running off to play in chat rooms will not contribute to a juicy dinner.

Apricot Mustard Glazed Leg Of Goat

Yield 6 servings

The crisp coating keeps the goat succulent and juicy. Bake 10 minutes longer for medium-done. If you use frozen goat, defrost in the refrigerator overnight.

1/4 c Apricot jam
2 tb Honey mustard
2 Garlic cloves; chopped
2 tb Soy sauce
2 tb Olive oil
1 ts Dried rosemary
3 lb Goat leg; butterflied
1/2 c Red wine
1 c Beef stock; canned/homemade
Salt/Ground pepper; to taste

Combine jam, mustard, garlic, soy sauce, olive oil and rosemary. Reserve 2 tb of marinade for sauce. Brush remainder all over goat. Season well with salt and pepper.

Marinate for 30 minutes.

Broil goat for 3 minutes per side. Then bake goat at 425F(220C) fat side up for 20 minutes or until just pink. Remove from oven and let rest on a serving dish for 10 minutes. Pour off any fat in pan.

Add red wine to pan and reduce to 1 tb. Add beef broth, reserved marinade and any extra goat

juices from the serving dish. Bring to boil and boil for 2 minutes.

Slice goat in thin slices against the grain. Serve with some sauce poured over. Serve with a Merlot wine from Ontario Canada, California USA, or St Emilion. A chianti is another fine match.

Enjoy!

Krista

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XS Ranch
M D Shurley
Sonora, TX

Outlaw Boers
Krista Darnell
Childress, Texas



Krista's Kabrito

by
Krista Darnell

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Aromatic Goat

Yield: 8 servings

1 Leg of goat (about 4 lbs)
3 lb Potatoes (about 5 oz each)
1 Lemon (may be doubled)
Honey
Olive oil
Butter
Rosemary, thyme & oregano

Put the leg of goat into a large roasting pan. Bruise the leaves of 2 or 3 sprigs of rosemary and sprinkle them over the meat. Add plenty of pepper and 1 tablespoon honey. Rub the mixture into the meat with your hands. Then rub half a lemon over the joint, squeezing the juice on to the meat as you do so. Do not add any salt. Leave to marinate for 4 to 24 hours.

Peel and quarter the potatoes, then arrange them in a single layer round the goat. Squeeze lemon juice over the potatoes -- use at least half a lemon, or up to one and a half lemons for a strong citrus flavour. Carefully pour 1/4 pint water into a corner of the roasting pan, then sprinkle over the potatoes and goat about 2 tablespoons chopped fresh rosemary, at least 1 teaspoon each fresh chopped thyme and oregano, and some salt and pepper. Drizzle on 1-1/2 teaspoons honey and 1 tablespoon olive oil, then dot with 1 oz butter.

Bake at 425 F (220 C) gas mark 6 for a further 1 to 1-1/4 hours. The ingredients will become gilded and will burnish to a rich brown in places. Lift the meat and turn the potatoes occasionally, and if necessary, add a little boiling water to the pan to prevent drying out.

Enjoy!

Krista

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[KLS Boer Goats](#)
[Keith & Lucinda Smith](#)
[Fort Worth, Texas](#)

Editor's note: Boergoats.com will gladly publish rebuttals to this article which are based on documented evidence.

South African vs South African

All full blood Boers are South African
This is not opinion. This is documented fact.
Editorial by
Keith Smith

I own Boer goats that are direct descendants of some of the only Boers directly imported into the United States from South Africa. They are some outstanding animals but, then, so are our Boers that came to us from New Zealand, Australia, and Canada.

What prompted this editorial was a "buyer" (looker) who stopped by the other day. As we walked through the pens he was stroking me about what nice goats I had and how there were very few breeders with such good stock. Toward the end of his visit he expressed a real interest in "Huggy". I puffed up like a proud papa and proceeded to explain that she was one of our prime brood does, that she was not for sale, and that she was a Grand Champion full blood. "Now that is one fine goat!", he opined. "What's her bloodline? Is she South African"?

"Well, sir... her sire, African Andy, was a direct South African import. One of her great granddams on her dam's side was born in New Zealand, and one was born in Canada."

He looked shocked. "You could have had something really fine, there", he said, spitting out a wad of 'backy. "Too bad she's a percentage".

I didn't come unglued. I stayed on my feet. I patiently explained to him that she is a full blood and that all full blood Boers were South African in origin. I started to explain the different countries from which these great animals were imported into the United State but he cut me off in mid sentence. "Listen, mister!... (Whatshername - name withheld 'cause I'm not stupid) told me that some of you breeders would try to pass off these percentages as full bloods. You gave yourself away when you said New Zealand."

Back in the house, after he had left and I had a chance to cool down, I got to mulling over what he had said. I had heard this same kind of thing from several folks new to the Boer industry - just never referencing the name of a "big breeder". I do know that there are a few breeders out there advertising "full South African genetics". I think it's time to set the record straight !!!

OK... let me take you back a few years and interject some history, here. The Boer goats in the United States are imported - all from South Africa.

- Some are South African embryos imported into the United States from
 - Canada
 - New Zealand
 - Australia
- Some are South African live animals imported into the United States from
 - Canada
 - New Zealand
 - Australia
- Some are descendants of South African animals or embryos born in
 - Canada
 - New Zealand
 - Australia
 - the United States
- Only two groups of South African embryos and live animals were legally imported into the United States.
 - A shipment of goats was imported directly from South Africa by J. Ross, H. Haby, Dr. Speck, and J. Lockhart for the original Lone Star Boer Goats that was owned by Rodney Robinson. These goats were usually named "African Axxx" where the "Axxx" was the individual goats name; such as "African Andy", "African Amy", "African Arvil", etc. Many of the descendants of these goats were purchased by KLS Boer Goats (me) along with Mr. Robinson's company known as RMR Boer Goat Stud.
 - Jurgen Schulz was also able to bring a single plane load of goats directly from South Africa.
 - There are rumors of embryos secretly brought to the United States in spite of the US government restrictions against such activity. I don't think I'd want to admit to owning one of their offspring, would you?

Except for Mr. Robinson's and Mr. Schultz's groups, note that all of the "South African Boer" stock legally in the United States entered here from somewhere other than South Africa.

Just so you don't think I'm against "SA" genetics you need to know that I own offspring of some of the very few Boers that were directly imported into the US from SA. And I'm very proud of them - but no prouder than of my Boers who's ancestors came through some other country.

All full blood Boers are South African! This is not opinion. This is documented fact.

Boergoats.com will gladly publish rebuttals to this article which are based on documented evidence.

ANEXO: CONCLUSIONES INDIVIDUALES

GIRA DE CAPTURA TECNOLÓGICA : PRODUCCIÓN E INDUSTRIA CAPRINA EN LOS ESTADOS UNIDOS.

La primera inquietud respecto a la producción caprina de carne parte luego de una gira de captura tecnológica a INIA Quilamapu Chillán ("Proyecto innovación comportamiento y evaluación del ganado caprino de carne, leche y criollo", Diciembre de 1998) en esta visita adquiero los primeros conocimientos de la raza caprina Boer, especializada en la producción de carne.

Vale destacar que la participación en esta actividad es en calidad de Técnico de Prodesal, dependiente de la Municipalidad de Lonquimay. Como resultado del conocimiento de las características y especialmente del potencial genético y las perspectivas de desarrollo de esta raza, además de conocer las características agroclimáticas de la zona de Lonquimay y conociendo el elevado número de vientres existentes en la comuna y gracias a contactos personales con el Dr. José Cox U. A raíz del Curso de Capacitación en Inseminación Artificial en Caprinos, dictado por la Universidad de Concepción, Marzo de 1999, se estable un primer pre-proyecto de introducción de la raza Boer usando Inseminación Artificial con semen fresco en tres predios de la comuna y donde participé como ejecutante y agricultor. Como resultado de esta experiencia obtuve algunos datos preliminares de las diferencias productivas principalmente en peso al nacimiento y velocidad de crecimiento de los cabritos híbridos Boer, Criollo e híbridos Alpino-Francés.

En Noviembre de 2000, establecí contacto con don Mario Briones y Oriana Burgos, directores del proyecto Boer que se realiza en la comuna de San Fabián en la VIII Región, quienes me ofrecieron la posibilidad de participar en la presente gira de Captura Tecnológica Producción e Industria Caprina en los Estados Unidos.

Con respecto a la organización de esta gira antes de partir, vale decir trámites necesarios para ser participe de este evento como los que se requieren para salir del país, los organizadores me brindaron toda la información de manera clara y con el tiempo necesario de tal forma de no ser una dificultad para mi y que finalmente me permitieron integrar el grupo.

Durante la realización de esta gira me gustaría destacar los siguientes puntos, en lo que se refiere a visitas prediales.

- Calidad genética y el trabajo genético en la selección de caracteres como fertilidad, conformación y rendimientos que se han logrado en peso de los animales, destacando al criador Downen con su macho campeón nacional de la ABGA "Pipeline".
- La selección de las hembras con cuatro pezones, justificados por la prolificidad de la raza y además por la eficiencia de manejo en la crianza de los cabritos.
- La selección de animales con características de pigmentación en cola, corvejón, nudillo, ubre, testículos y pezuñas.
- La capacidad de asociatividad (por el gran número de integrantes, alrededor de 1800 en una agrupación), lo que significa una gran capacidad de organización y gestión basado, principalmente en la confianza de las personas, esto les significó la obtención de beneficios estatales.
- El compromiso de los agricultores por la actividad agropecuaria y especialmente en los logros obtenidos en la raza Boer ya que pudieron formar parte de ferias especializadas y la organización de Shows en el rubro caprino.
- La tecnología involucrada en los procesos productivos y la infraestructura es de alto nivel.
- La comercialización está enfocada a dos áreas, la primera orientada a la producción y venta de animales de exposición (reproductores y mascotas por el efecto show). La segunda y masiva, que de acuerdo a

antecedentes entregados por el departamento de extensión de agricultura de la Universidad de Texas, son 7 millones de cabras existentes en el estado cuya comercialización principal es vía venta de animales en vara procesados en mataderos.

De acuerdo a todos los antecedentes expuestos, personalmente creo que es posible replicar esta experiencia en nuestro medio, tanto a nivel comunal, regional y nacional.

A nivel local, se debe considerar que los vientres criollos existentes, poseen características muy importantes de rusticidad, como adaptación al clima adverso, conformación de patas y pezuñas, pelaje, prolificidad de acuerdo a alimentación y manejo sanitario, deficiencias en alimentación e infraestructura. Las características de rusticidad podrían facilitar el mejoramiento genético para producir carne, aunque es necesario instaurar algunas medidas de manejo básicas para hacer más eficiente la producción, para lograr esto es necesario trabajar en la asociatividad de los productores locales, regionales y nacionales.

1.1 Conclusiones Finales.

1.2 Conclusiones Individuales.

La gira técnica realizada a “U.S.A.”, financiada por el FIA” y ejecutada por la Facultad de Medicina Veterinaria de Concepción, se realiza desde mi punto de vista en forma muy programada y eficiente de tal modo, que nos permitió cumplir no solo con los itinerarios programados sino que además, visitar, conocer iniciativas y lugares que no estaban en la programación.

Las experiencias obtenidas por esta iniciativa, lograron en mi persona conocer y aprender, sistemas de producción y manejo, que me permitieron mejorar mi función como profesional y además me permitió mejorar mi accionar como extensionista.

Conocer los sistemas de alimentación así como la formulación de raciones, es un ejemplo claro de algo que sucede en Chile ya lo veníamos practicando, permitirá perfeccionar nuestros sistemas y mejorar los niveles productivos. Además el conocimiento de otras razas como es el caso de Ovejas Reproductoras específicamente de carne y no de lana, permiten abrir otros horizontes dentro de los sistemas tradicionales de producción. Ejemplos como estos podrían seguir siendo realizados, pero me extendería demasiado, esto demuestra la importancia de este viaje en particular de estas iniciativas en general.

En cuanto a la alternativa de replicar o aprovechar, los conocimientos adquiridos, es totalmente viable desde el punto de vista que la producción y comercialización bovina en Chile cada vez se especializa más y con una mayor presión por parte de otros países, la producción ovina y caprina cada vez esta significando una alternativa de producción y de desarrollo económico.

Alternativas como la creación de una asociación de productores “Boer”, la organización en cuanto a la comercialización y producción de carne caprina son

elementos fundamentales en iniciativas del campo productivo. Así como la incorporación de nuevas razas. Estas como otras son ejes surgidos en este viaje y de responsabilidad de los participantes de llevarlos acabo.

Sin otro particular, se despide agradeciendo y felicitando a todos los gestores de esta iniciativa.

LUIS PINOCHET ROMERO
MEDICO VETERINARIO

INFORME GIRA CAPTURA TECNOLÓGICA PRODUCCIÓN E INDUSTRIA CAPRINA DE CARNE EN LOS EEUU

LONQUIMAY es una de las comunas con mayor cantidad de cabras del país, con alrededor de 45 mil cabezas de las razas criollas, alpina y angora (estas dos últimas en un bajo porcentaje) cuya producción esta destinada al autoconsumo y venta (mercado local) manejado en condiciones muy precarias.

En los últimos cuatro años se han buscado alternativas de poder obtener una mayor rentabilidad de este rubro. Es así como se implemento en proyecto de “Producción e Industrialización de Leche de Cabra”, con lo que se desarrollaron una serie de actividades como establecimiento de praderas de alfalfa, construcción de galpones, programa de riego por aspersión y programa de mejoramiento genético caprino, a través de la inseminación artificial, introduciendo la raza alpino francés, para lo cual se han realizado una serie de capacitaciones, gira de captura tecnológica, visitando distintos planteles lecheros del país, etc

Fue en una de estas últimas actividades donde se conoció la raza caprina de carne “Boer” en el INIA QUILAMAPU, Chillán y en la cooperativa TULAHUEN IV Región (año 1998- 1999) Posteriormente se trabajo la introducción de la raza Boer en la comuna de Lonquimay en coordinación con el Dr. José Cox de la Universidad de Concepción (Junio del 2000), cuyos resultados fueron muy exitosos especialmente en lo que se refiere a peso al nacimiento de los cabritos, velocidad de crecimiento, docilidad y adaptabilidad a la zona.

En marzo del presente año se recibió una invitación para participar de la Gira de Captura Tecnológica PRODUCCIÓN E INDUSTRIA CAPRINA DE CARNE EN LOS EEUU para conocer distintas experiencias y comportamientos de la raza Boer, organización de los productores, comercialización e industrialización.

Entre los puntos que más me gustaría resaltar son :

1. ORGANIZACIÓN : Se observó que es la base de los grandes logros que han obtenido entre las que destaca AMERICAN BOER GOAT ASSN, con alrededor de 2.800 asociados.
2. CALIDAD GENETICA: Resaltando caracteres como fertilidad, conformación y rendimiento de peso, selección de hembras de cuatro pezones (esto por la alta prolificidad de esta raza), formación de ubre, formación testicular, pesuñas, pigmentación de la cola, etc.
3. TECNOLOGÍA E INFRAESTRUCTURA: Todos los productores disponen de tecnología e infraestructura de alto nivel entre los que destacan maquinarias, cercos, galpones, información computarizada, etc...
4. ESPECIALIZACIÓN DE LOS PRODUCTORES: Existe una alta especialización de los productores relacionadas con las distintas actividades del proceso productivo, en lo que destaca el trabajo de la familia y especialmente el trabajo de la mujer.
5. COMERCIALIZACION : Sobresaliendo la venta de ganado de exposición (Show), venta de genética a nivel nacional e internacional y la venta de ganado directamente a mataderos o a través de ferias.
6. INDUSTRIALIZACIÓN : Este es tal vez el tema más incipiente, debido a que recién se están realizando estudios de cortes y presentaciones para el consumidor.

Personalmente, la gira fue muy provechosa se adquirieron muchos conocimientos del Tema Producción de Carne Caprina que podemos utilizar y adaptar en nuestra comuna, que reúne una serie de condiciones favorables para desarrollar de manera decidida este tema. Por estas razones inmediatamente después del regreso de la Gira se ha estado trabajando en varias actividades para impulsar este proyecto, entre las que destacamos:

- a) Adquisición de dos reproductores Boer Puros en el predio de Don Etienne Delaveau, (Rengo, VI Región), hoy se esta asesorando el manejo y la utilización de dichos reproductores.
- b) Coordinación en la introducción de trece reproductores Boer de propiedad de la Universidad de Concepción (Dr. José Cox), que se destinaron a distintos productores de la comuna.
- c) Actualmente se está trabajando en la formación de una organización de productores caprinos de carne de Lonquimay con el fin de buscar alternativas de financiamiento para implementar actividades propias del proyecto, buscar vías de comercialización, etc.
- d) Finalmente deseamos poner a vuestra disposición todo nuestro entusiasmo e interés en desarrollar algún trabajo a nivel nacional con los otros participantes de la Gira con el fin de obtener resultados de mayor relevancia.

Quiero expresar sus sinceros agradecimientos a Dr. Mario Briones y a la Dra. Oriana Burgos, por haberme dado la posibilidad de participar de esta importante actividad y al mismo tiempo instarnos a seguir trabajando para ser de esto un gran proyecto.

Atentamente,

NIBALDO ALEGRIA ALEGRIA

(12.027.577-1)

De:

Iván Antonio Zapata Jarpa
Agricultor de Pinto.

Para:

Informe de gira de captura de
tecnología a los E.E. 2.2.

En primer lugar quiciere darles las gracias al Dr. Mario Briones y la Dra. Oriana Burgos, de la Universidad de Concepción Campus Chillán, por haber tenido la gran deferencia de invitarme a participar de la gira de Captura de tecnología a los E.E. 2.2.

Para mí fue una muy bonita experiencia de crecimiento personal y cultural en la cual pude conocer otra realidad del mundo laboral, y poder compartir varios días con un grupo de personas de distintas profesiones.

Lo que vimos en E.E. 2.2. en relación a los chivos de Raza Boer, fue muy útil y provechoso para mí, porque he llegado decidido a llevar a la práctica la crianza de esta Raza de Chivos.

Lo que me llamó más la atención fue que en la mayoría de los Ranchos que visitamos Trabajaban en la Crianza.

Pequeño resumen del viaje a Dallas
Texas en conocimiento de caprinos
raza BOER.

Salida del Aeropuerto Arturo Merino Benítez, el día
Sábado 24 de Marzo del 2001 y regreso el día Sábado 6 de Abril
del mismo año.

Si nosotros analizamos este viaje por el lado de conocimiento y comparación con lo que nosotros tenemos como crianza en Chile, fue de un éxito total e inolvidable.

La verdad de las cosas, que el apoyo que prestaron los doctores veterinarios en esta gira es impagable, especialmente la función que cumplió el Jefe de la Delegación Sr. MARIO BRIONES.

De partida cuando llegamos a la Granja Murphee Boer nos dimos cuenta que esto es lo que está faltando en nuestro País, la forma como crían y logran el desarrollo de estos chivitos es muy especial.

Reuniendo todo el grupo de crianceros que existen por lo menos en el Estado de Texas, hay un esmero y cuidados por sacar las mejores crías y así poder exportar ganado de primer nivel.

Me llamó mucho la atención, la manera de alimentar los chivitos mas nuevitos, hasta calefacción les tenían en algunos ranchos. Aprovechan muy bien la alimentación, no pierde pasto ni granulados que los colocaban en comederos especiales. Eso ya es una ganancia.

El potencial genético es grande, una hembra puede pesar de 150 a 200 libras y el macho de 200 250 libras. Para lograr esos pesos la alimentación debe ser muy buena. Por eso entre mas rápido su crecimiento mas rápido va a tener crías.

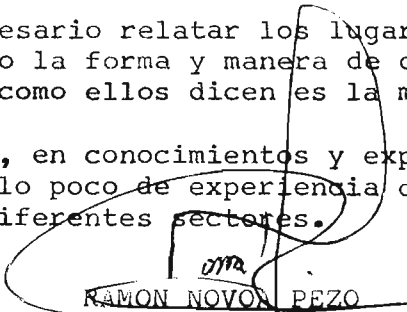
Se tuvo la oportunidad de conocer un matadero moderno donde faenaban hasta 2.000 cabezas diarias de ovinos.

Tuvimos la gran oportunidad de ver una esquila, todo con maquinarias eléctricas, que en realidad por acá no las tenemos y es de una gran ventaja porque no se maltrata el ganado.

Un rancharo nos contaba que es preferible que el ganado nazca a todo potrero, es mas saludable para las crías, y se evitan muchas enfermedades.

Pienso que no es necesario relatar los lugares por los que visitamos, porque en el fondo la forma y manera de criar y preparar los animalitos para Show, como ellos dicen es la misma.

Resumiendo esta gira, en conocimientos y experiencias fue maravillosa y esperamos con lo poco de experiencia que adquirimos en algo va a servir a nuestros diferentes sectores.


RAMON NOVOA PEZO
Los Rastrojos
PINTO.



Servag Ltda
El Roble 1190 fono 42-237422 Chillán

Conclusiones Viaje de Captura Tecnológica Cabras Boers, Texas

Quisiera, en primer lugar, agradecer esta oportunidad a las distintas instituciones que hicieron posible esta actividad: Fia y Universidad de Concepción. Como también la valorable gestión del Dr. Mario Briones cuyo aporte fue primordial en el desarrollo de la gira.

Me llamó profundamente la atención la forma de organización y el funcionamiento de las Asociaciones de los agricultores de estado de Texas de EEUU. Conocimos la Boer Goats Association, la cual fue iniciada por los mismos agricultores y es hoy la base de la industria caprina en Texas. Cómo se organizaron? Cómo se logra el interés de un grupo de agricultores y el grado de compromiso para llegar a constituir la base de una industria? Son preguntas que en nuestro país no hemos podido resolver aún.

También cómo existe una coordinación tan fluida y eficiente entre el estado, a través del ministerio de Agricultura y los agricultores, en el desarrollo de la industria caprina.

Finalmente, en este aspecto, el desarrollo y la dedicación por parte de los agricultores en la crianza de las cabras. En algunos casos pudimos apreciar una dedicación total de ellos para esta actividad, ello se grafica en trabajos realizados por sus mismos dueños. También impresiona gratamente la dedicación de la mujer en el negocio, en algunas oportunidades eran ellas las más enteradas del manejo de los animales siendo ellas una pieza fundamental del desarrollo del predio.

La gira dio una visión clara de las oportunidades que ofrece la ganadería caprina y en especial la crianza de los Boers. Para la producción de carne caprina no existe otra alternativa mejor que esta raza. Ello quedó demostrado en todas las visitas realizadas.

Los agricultores que acá asesoramos y que participaron en la gira van a introducir la raza en sus campos y estamos en una etapa de difusión e inscripción de agricultores de interés para formar un grupo.

Quisiera resaltar el impacto que ha tenido este viaje en los agricultores de Pinto. Su visión ha cambiado, se abren nuevas expectativas y tienen una predisposición muy distinta para un mismo trabajo en las mismas condiciones que antes. Cambia una visión radicalmente y se valora lo que hay en el campo y el trabajo realizado como también se evidencian errores de construcciones, manejo y sobretodo de planificación.

Como consultor creo firmemente que un viaje para los agricultores como el realizado tiene un impacto y un bagaje que no se logra por otra vía como la de capacitación o de asesoría por muy buena que sea, es si complementaria y necesaria.

Por último quisiera destacar la cultura de venta que tienen los agricultores y al parecer todos los norteamericanos, están preparados para este aspecto, manejan bien la información, tienen una cultura de marketing muy clara, sus ideas son muy directas y tienen toda la tecnología como acceso y uso de internet, comunicaciones fluidas (teléfonos, buenas carreteras, etc)



Víctor Canumir Veas
Médico Veterinario
Servag Ltda.

Chillán, 28 de Mayo de 2001



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At.

Dra. Oriane Burgos

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RESUMEN GENERAL

Cabe destacar que la gira tecnológica fue muy provechosa vista desde el sin número de productores (grandes, medianos y chicos) que visitamos presentaban un padron común. Alto grado de conocimiento del rubro, a pesar de los pocos años que llevaba la mayor a de ellos.

Es interesante mencionar algunas cosas que me parecen relevantes de poder replicar o adaptar en Chile (nuestro país e industria).

1° Es necesario que la Universidad de Concepción tome el rol de ser la q. proyectos u otra via de financiamiento inicie un programa fuerte de transferencia de embriones en Hembras Criollas propios o de terceros, ello da lugar a tener hembras finas y reproductores machos finos en corto tiempo y desarrollar la masa criadora de finos e híbridos (1/2 de raza 1/2) en Chile.

2° Deberia ser la Universidad que incentive la formación después de que se inicie dicho programa, una Asociación de Productores de Raza Boer en Chile, que pueda llevar exposiciones, registros de tecnología, revistas, etc.

3° Deberia la Universidad promover la asociatividad Ministerio de Agricultura INIA con productores de chivos a modo de generar algunas políticas y directrices claras de futuro desarrollo de la masa caprina del país.



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1º Debería la Universidad a futuro; una vez formandose la asociación y la difusión del Boer en Chile, establecer con organismos gubernamentales (Ministerio de Agricultura) ensayos que terminan en exposiciones de chivos Boer y midan características de: Ganancias de peso/día, que es la característica que buscan todos los agricultores (mayor producción de carne).

JOSE JIMENEZ SANHUEZA
MEDICO VETERINARIO
CARNES NUBLE S.A.
CHILLAN

Use Of Donkeys To Guard Sheep And Goats

1. Guard donkeys should be selected from medium to large size stock. Do not use extremely small or miniature donkeys.
2. Do not acquire a donkey which can not be culled or sold if it fails to perform properly.
3. Use jennies and geldings. Do not use jacks as guard animals.
4. Test a new donkey's guarding response by challenging the donkey with a dog in a corral or small pasture.
5. Use only one donkey or jenny and foal per pasture.
6. Isolate guard donkeys from horses, mules, and other donkeys.
7. To increase probability of bonding, donkeys should be raised from birth or placed at weaning with sheep or goats.
8. Raise guard donkeys away from dogs. Avoid or limit the use of herding dogs around donkeys.
9. Monitor the use of guard donkeys at lambing or kidding as some donkeys may be aggressive to newborns or overly possessive. Remove donkeys temporarily if necessary.
10. Use donkeys in small (< 600 acres) open pastures with not more than 200 head of sheep or goats for best results. Large pastures, rough terrain, dense brush, too large a herd, and sheep or goats that are scattered all lessen effectiveness of guard donkeys.
11. Do not allow donkeys access to feed containing Rumensin, urea, or other products intended only for ruminants.

Source: Paper entitled "Use of Donkeys to Guard Sheep and Goats In Texas" by Murray T. Walton and C. Andy Field and presented at the Fourth Eastern Wildlife Damage Control Conference, September 25-28, 1989, Madison, WI.

ANEXOS DE LA GIRA DE
CAPTURA
TECNOLOGICA
"PRODUCCIÓN E
INDUSTRIA CAPRINA EN
LOS ESTADOS UNIDOS"

A - 00 - 17

ANEXO: MATERIAL RECOPIADO

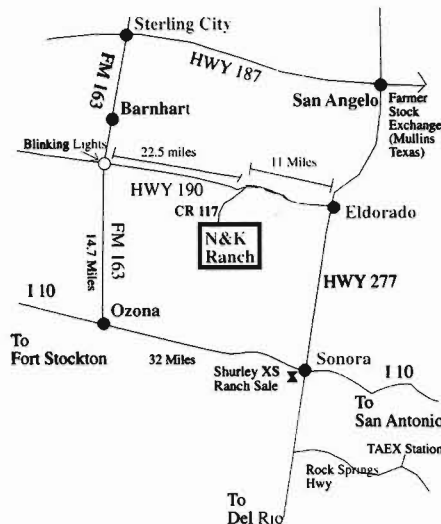
FOLLETOS Y CATALOGOS

**KOHL'S/MORRIS
SCALE-H102**



M 74-O'YELLAR

Everyone knows how I like to talk structure and skeleton. That is what excites me about this guy. His sire **L231 (Bodacious x 123)** and his dam is **J239 (Oscar x Scale's dam)**. This kind of bone and mass with the quality of his front end will be more important with each generation.



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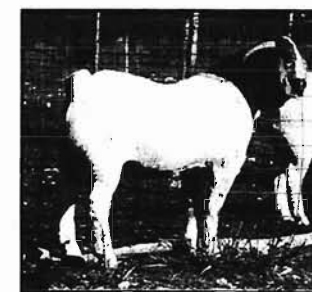


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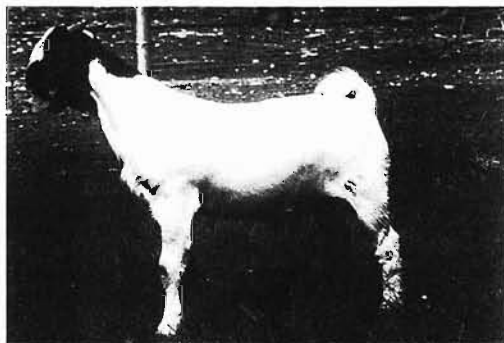


Kallie Tel: 915-224-4707
Fax:: 915-944-1037
Erik (Herdsman) Tel: 915-853-4150

NEW KIDS ON THE RANCH...

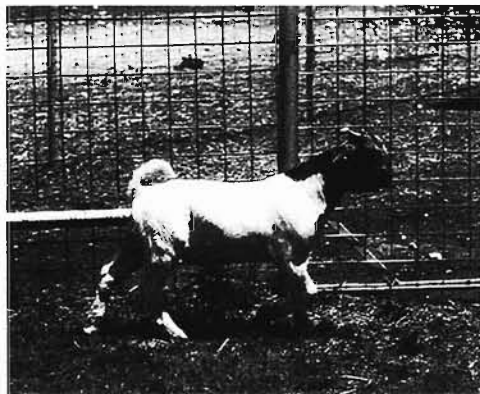
Everyone's pick this year. He is **J22** on the **1998 National Champion Doe**. He has that look we want, muscle mass & late maturity is what he is all about.

M 155-CEO



M 200-ERIK—We call him complete. His balance, structural correctness, muscle, and mass make him a favorite among those whom have looked through the young bucks.

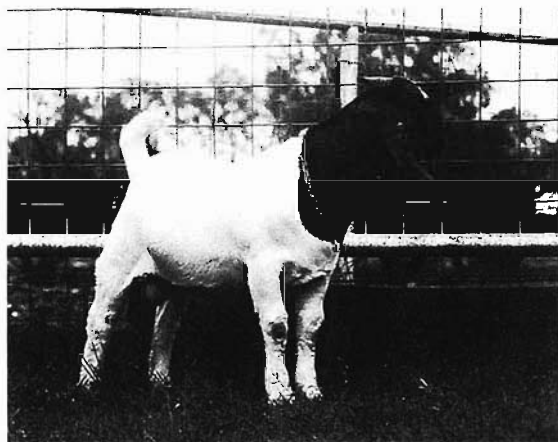
Eye appeal and that great show look is why retained this full brother to 151 & 200. He is fancy.



M 211-ROGUE

M 151-MAVERICK

This buck has the look. What a head and neck attached to a body of extreme length. When you handle his top and look at his butt, you will appreciate his muscle on an extreme skeleton.



M 152-BREAKOUT



Kallie needed this guy. He is **Dream Maker (Farmer's Stock Exchange)** on **235 (Big "O"x E11)**. His extra length the extreme muscle shape should Make a great cross on red does.

M 186-O'RADAR

Owned by: Kallie-Harie Reds



He best combines structure, muscle, and extension of skeleton.

His genetic make-up includes **RADAR LOVE (EXTRA on Banduke/1105)** on the doe I call "Stegall" which is an **OSCAR** daughter



AMERICAN GENETICS INTERNATIONAL

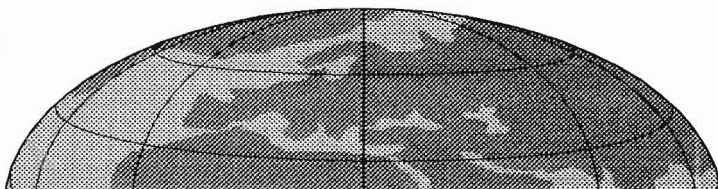
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- ✓ Assists **U.S. breeders** in identifying marketable genetics within their herd and in locating international buyers.
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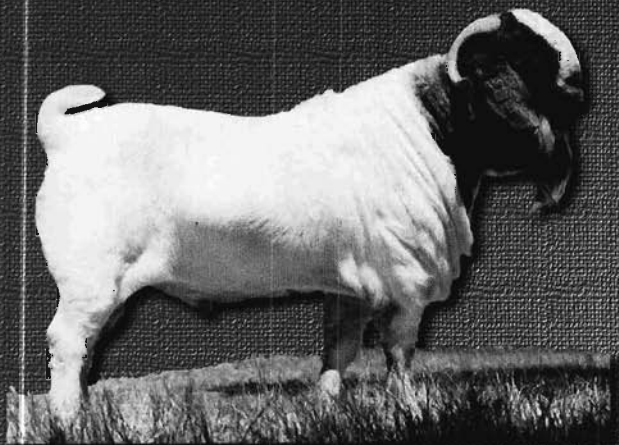
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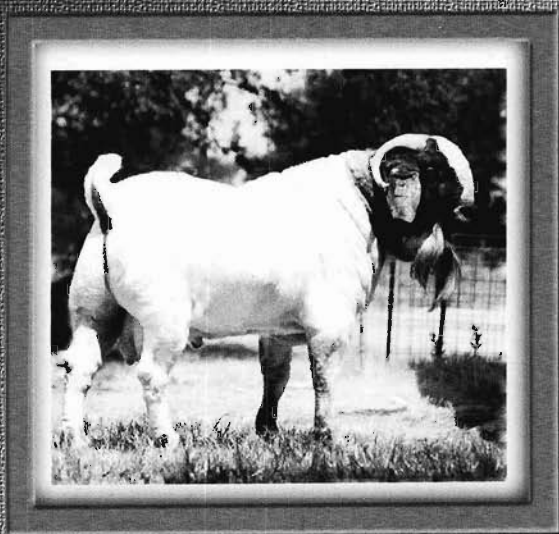
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Project Management and Coordination
Consulting and Technical Assistance

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#802 HMR Sumo

MoJo X Dirk Van Der Walt doe



Straws from these
and 6 other FSE
stud bucks are
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MoJo X #1407 Frances



#888 JLF Rambo
MoJo X #1407 Frances

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Sumo X #845 Amelo



#9050 FSE Nasdaq
#95 Highlander X #844 Pillio

#9199 Surprise
#498 Glipsie X #124 Superman
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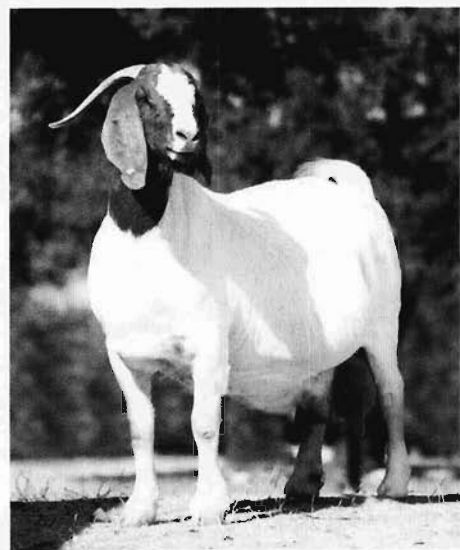


#1407 Frances

Kaptein X Tolle Jordan Doe

2000 Grand and Reserve Champion Plains

Rena Lynch, Handler



#1523 DJ

Kaptein X DJ. DeKlerk Doe

MoJo's Progeny

Nat'l Grand Champ Doe - JLF Dello, 2000 ABGA Nat'l

Grand Champ Get of Sire, 2000 ABGA Nat'l

Best Pair of Does, 2000 ABGA Nat'l

Res Grand Champ Sr. Doe - 845 Amelo, IBGA Nat'l

Res Grand Champ Doe - 845 Amelo, West TX Fair

Grand Champ Doe - 845 Amelo, Black & Gold Show

Grand Champ Doe - 845 Amelo, State Fair of TX

802 Sumo Progeny

Grand Champ Jr. Buck, Starkey's Toro, North TX Show

Res Champ Buck - Starkey's Toro, Spring Fling, Austin

Grand Champ Doe - West TX Fair

Grand Champ Jr. Buck - Silvergate's Taebo, IBGA Nat'l

Grand Champ Jr. Buck - Silvergate's Taebo, West TX Fair

Grand Champ Jr. Buck - Silvergate's Taebo, Black & Gold

Emmitt's Progeny

Grand Champ Doe - 882 Monit, Indiana State Fair

Superman's Progeny

Grand Champ Doe - 700 Matata, West Plains MO

Grand Champ Sr. Doe - 700 Matata, Ill State Fair

Deion's Progeny

Res Champ Doe- 9033, Ill State Fair

888 Rambo's Progeny

Nat'l Res Sr. Grand Champ Doe, 2000 ABGA Nat'l

126 SEBG Superman Progeny

Grand Champ Yrlg Buck - 9222, Ill State Fair

Grand Champ Yrlg Buck - 9222, New Castle IN

107 Twiddle

Grand Champ Sr. Doe- KDMGPA Boer Show

9049 Sassy - #95 Highlander X #844 Pillio

Grand Champ Yrlg Doe, KDMGPA Boer Show

Res Grand Champ Doe, Black & Gold

9050 Nasdaq - #95 Highlander X #844 Pillio

Grand Champion Buck

Ga. Nat'l Livestock Show - Perry, GA

Sooner Boer Goat Show - Duncan, OK

KDMGPA Boer Show, Moorehead KY

East TX Boer Goat Show - Lufkin, TX

Mills County Boer Goat Show - Goldthwaite, TX

Magnolia Boer Goat Show - Laurel, MS

Res Grand Champion Buck

West TX Fair, Abilene, TX

Black & Gold Boer Goat Show, Eastland, TX

Brochure and photos by Bob Dressler DVM,

www.boergoats.cc



#845 Amelo

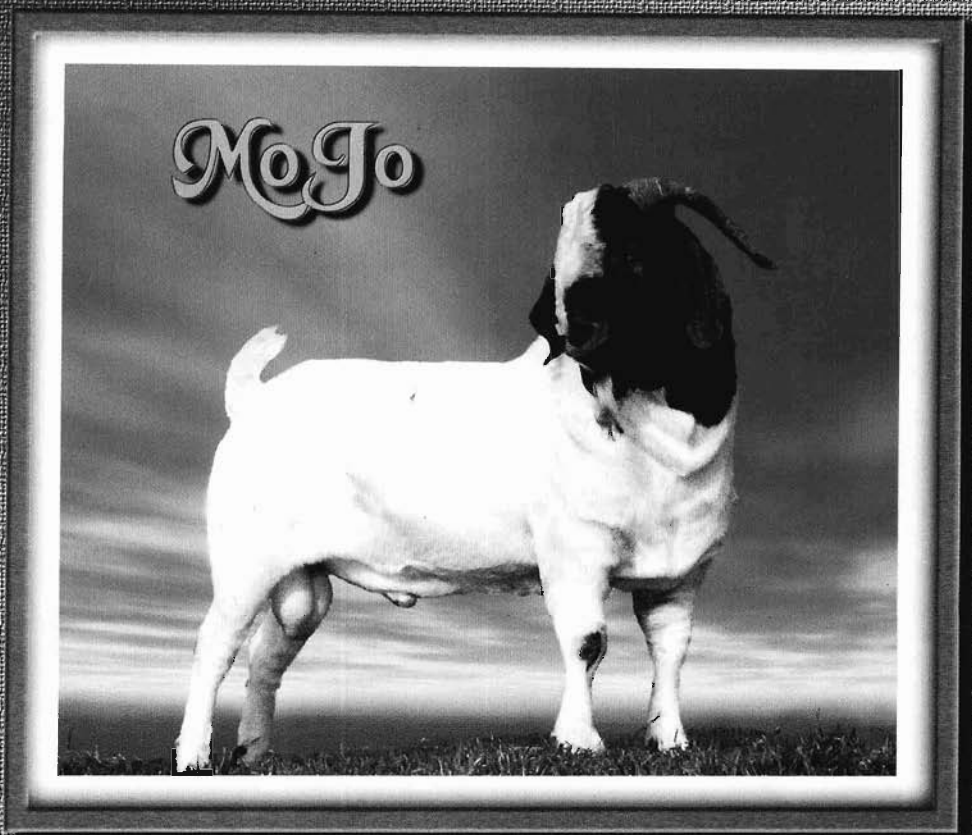
MoJo X 1407 Frances



#844 JLF Pillio

MoJo X 1407 Frances

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ARTICULOS DE EXTENSION SOBRE ASPECTOS SANITARIOS EN CABRAS



Management Tips for Internal Parasite Control in Sheep and Goats

Frank Craddock, Rick Machen, and Tom Craig

The primary control strategy for internal parasites in sheep and goats has been the use of anthelmintics. One result of the apparent overuse of anthelmintics has been the development of resistant strains of gastrointestinal nematodes. The following management tips can be used by producers to help control internal parasites and prevent resistance from occurring.

1. Treat during mid-winter (December, January, February) before parturition to destroy hypobiotic (dormant stage) larvae in the host. Use anthelmintics (ivermectin, fenbendazole, albendazole, and oxfendazole) that are effective against hypobiotic larvae. This will greatly reduce pasture contamination in the spring.
2. Use fecal egg counts to determine if treatment is needed. After treatment, 7 to 10 days, use fecal egg counts to determine if drug was effective. There should be a 95 percent reduction in fecal egg count in order to consider the drug effective. Treat



animals when warranted. Treat every animal.

3. Always rotate to uncontaminated or clean pastures if possible. The use of cultivated land is recommended to break life cycle of parasite. The longer native pasture can be rested the better.
4. Do not underdose. Sort animals according to size and determine dose according to weight of heaviest animal in the

group, not an average body weight. Regularly check that dosing equipment is functioning properly to insure proper dosage. A slight overdose on smaller animals is generally not harmful due to the large margin of safety of most wormers.

5. Wait a minimum of 48 hours after treatment before turning animals onto an uncontaminated pasture.
6. Rotate dewormers on an annual basis or when a resistance develops.
7. Regardless of time of year, routinely treat new animals that are introduced into the flock.
8. When using dewormers, always follow labeled directions. Regardless of product choice, oral dosing is the recommended route of administration. Anthelmintics approved for use in sheep and/or goats are limited to ivermectin, levamisole and thiabendazole. Extra-label use of other dewormers can be utilized if prescribed by a veterinarian.
9. If possible, select livestock that show resistance to parasitism.

Table 1. Anthelmintics available to U.S. sheep and goat producers. Many are not approved for use in small ruminants.

Class of Compound Active Ingredient	Trade Name	Efficacy against			
		<i>Haemonchus contortus</i>	Other gastrointestinal nematodes	Tapeworms	Flukes
Avermectin					
ivermectin*	Ivomec®	+++	+++	—	—
Benzimidazoles					
albendazole	Valbazen®	+++	++++	++++	++++
fenbendazole	Safe-Guard®, Panacur®	++	++++	++++	+
mebendazole	Telmin®	++	++++	++	—
oxfendazole	Synanthic®, Benzelmin®	++	++++	++++	+
oxibendazole	Anthelcide®	++	++++	—	—
thiabendazole*	TBZ®	+	++++	—	—
Imidothiazole					
levamisole*	Tramisol®, Levasol®	+++	++++	—	—

*These products are approved for use in sheep and/or goats.

Authors

Frank Craddock, Professor and Extension Sheep and Goat Specialist, San Angelo;
Rick Machen, Assistant Professor and Extension Livestock Specialist, Uvalde;
Tom Craig, Professor, Department of Veterinary Pathobiology, College Station;
The Texas A&M University System.

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Texas Agricultural Extension Service

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Monitoring Internal Parasite Infection in Small Ruminants

Rick Machen, Frank Craddock, and Tom Craig

Frequently during the spring, summer, and early fall, based on subjective observation internal parasites are cited as the cause for poor livestock performance. While parasites are frequently the culprit, other performance inhibitors do exist. Fecal egg counts are a practical, cost-effective diagnostic tool for determining parasite burden.

Materials and Equipment:

1. Microscope - must have 100X magnification capability. Binocular preferred, monocular acceptable. Mechanical stage preferred but not required.
2. McMaster's slide - two or three chambered counting slide with grid.
3. Fecal sample - 2 grams minimum. Samples should be warm, moist and soft at collection. Eight to 10 pellets per sample is generally a sufficient quantity.
4. Vial - straight sides, glass or plastic, with cap. Fill with 28 ml (cc) of water



and mark meniscus. Add 2 ml (30 ml total) and mark meniscus again.

5. Tongue depressor
6. Medicine dropper
7. Saturated salt solution - prepared by adding salt to boiling water until salt will no longer go into solution. Iodized salt often leaves a white precipitate and is therefore the least preferred.

Procedure

(see diagram)

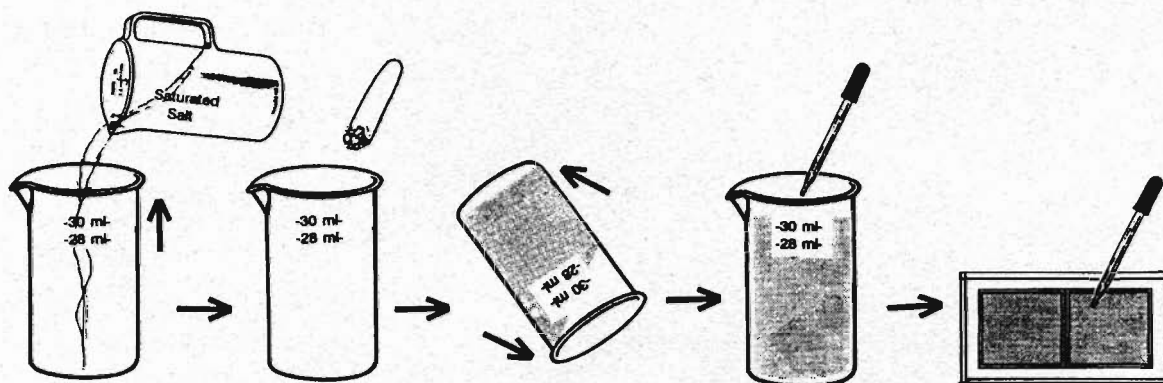
1. Fill vial to 28 ml mark with saturated salt solution.
2. Add fecal material until solution reaches the 30 ml mark. Theoretically, 2 grams of material will displace 2 ml of solution. Mashing pellets between thumb and forefinger before adding to solution will facilitate mixing.
3. Use tongue depressor (larger depressors can be split longitudinally) to break up and mix pellets in solution.
4. Cap vial and mix thoroughly by gently inverting several times (do not shake).
5. With eggs evenly dispersed in the solution, remove cap and immediately remove a dropperful of material.
6. Holding the slide almost flat with ends of slide between thumb and forefinger, completely fill one chamber. Slightly tilting

- slide will facilitate filling. Immediately fill dropper again and fill remaining chamber.
7. Allow 1 to 2 minutes for eggs to float to upper surface of the counting chamber.
 8. Examine at 100X magnification (10X ocular, 10X objective). Two focal planes exist. Eggs and air bubbles will be in the upper plane. Focus on air bubbles, then locate grid.
 9. Count eggs in each grid. Do not count eggs outside the grid.
 10. Calculate number of eggs per gram of feces as below:

Reference

Dunn, A. 1978. *Veterinary Helminthology* (2nd Ed.). William Heinemann Medical Books Ltd., London.

$$\text{EPG} = \frac{\text{Number eggs counted}}{\text{number of grids}} \times 100$$



Authors

Rick Machen, Assistant Professor and Extension Livestock Specialist, Uvalde;
 Frank Craddock, Professor and Extension Sheep and Goat Specialist, San Angelo;
 Tom Craig, Professor, Department of Veterinary Pathobiology, College Station;
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COCCIDIOSIS

Frank Craddock
Extension Sheep and Goat Specialist
San Angelo, Texas

Coccidia are protozoal parasites that are resistant and non-responsive to anthelmintics (de-wormers) used for other internal parasites. They are present in the small intestines of all animals and are expressed mainly in confinement due to contamination of feed and water. Low humidity and high temperatures kill oocysts.

Coccidia destroy the epithelial cells of the mucous membrane of the small intestines which causes hemorrhage and leads to anemia and an abnormal decrease of protein in the blood. Bacteria then penetrate the mucosa, clot the small blood vessels, and cause tissue death. The dead tissue sloughs into the small intestines which changes peristalsis and causes bloody diarrhea. Diarrhea leads to dehydration and eventually death.

Body temperature rises to 105-106 F in early stages and then returns to normal or subnormal from diarrhea. Animals can lose 5-15% of their body weight and secondary infection may also set in. Coccidiosis can affect 10-50% of the flock with mortality reaching 10% or greater. If animals live, they may have permanent damage, cannot use feed efficiently, and gain slowly.

The best preventative measure is to protect feed and water from any kind of fecal contamination. The following coccidiostats can be used to prevent coccidiosis:

Rumensin - 10 to 15 grams/ton of feed

Bovatec (Lasalocid) - 30 grams/ton of feed

Deccox (Decoquinate) - 1 milligram/pound body weight/day

Coccidiosis can be treated by using sulfa drugs and amprolium. Consult your veterinarian as to which products to use and how to use them.

Caprine Arthritis Encephalitis

Andrés de la Concha
Texas A&M University Agricultural Experiment Station
San Angelo, Texas

Introduction

With the recent growing interest in the importation of Boer goats, and Boer goat frozen semen and embryos from New Zealand, there have been some concerns about the potential risk of introducing diseases into the US goat population. New Zealand is considered free of foot-and-mouth disease, rinderpest, scrapie, contagious caprine pleuropneumonia, Akabane, bluetongue, epizootic hemorrhagic disease, and *Brucella melitensis*. New Zealand is not free of caprine arthritis encephalitis (CAE), but this disease is limited to some areas. However, the real threat of CAE for the Boer goat industry is that some producers are considering using dairy goats as recipients for the Boer goat embryos. The prevalence of CAE in US dairy goats is high (between 40 and 80%). Therefore, the use of dairy goats as recipients in an embryo transfer program represents a risk of spreading CAE.

Limited serological surveys indicate that for the most part Spanish and Angora goats in West Texas are free of CAE. It is very important to maintain the new Boer goat population free of CAE. **As a general rule, all recipient goats (whether dairy or meat/hair goats) in an embryo transfer program should test negative for CAE.** The purpose of the present report is to describe some of the characteristics of CAE as well as the ways to prevent this disease.

Etiology and Transmission

Caprine arthritis encephalitis is an infectious disease of goats caused by a virus called caprine arthritis encephalitis virus (CAEV). This virus belongs to the family lentivirus (lenti means slow), and they are so called because they produce slow progressive diseases. Caprine arthritis encephalitis virus is very similar to the virus that causes ovine progressive pneumonia (OPP) in sheep, and some of the disease conditions that these two viruses cause are alike. In fact, sheep are susceptible to infection by CAEV and goats are susceptible to OPP virus.

Transmission of CAEV occurs mostly through the milk and colostrum of infected mothers to nursing kid goats. Contact between infected and non-infected animals is also an important way of CAE transmission. Intrauterine transmission to the fetus can also occur but is less common. These are the reasons why it is very important that does that are going to be used as recipients are free of CAE. If frozen embryos free of CAE are implanted in infected recipient goats, the offspring resulting from these embryos can acquire the infection. Caprine arthritis encephalitis has a major impact on lifetime productivity of goats and on the eligibility of the United States to export goats.

Signs of the Disease

There are two main forms in which CAE can be manifested. In young kids 2 to 6 months of age the disease is characterized by rear leg paralysis that progresses and eventually involves also

the front legs. Most kids affected by this form of CAE eat normally, have normal rectal temperatures and are alert. The paralytic form of the disease is uncommon but needs to be differentiated from other causes of paralysis such as copper deficiency, white muscle disease, bacterial arthritis, or spinal cord injury.

The most common form of the disease is arthritis in adult goats. The onset of this form of the disease is insidious, with affected animals having bouts of joint swelling followed by apparent recovery. The joint enlargement is due in part to increased joint fluid, but generally results from formation of a chronic fibrous inflammatory tissue inside the joints and around the tendons associated with the affected joints. The carpal joints are usually the first to be affected, followed by the stifle, hock, tarsus and hip. The affected joints are painful and have restricted movement. Goats with arthritis are reluctant to walk, remain prostrated or walk on their knees. Other causes of arthritis in goats, such as chlamydial polyarthritis and mycoplasmosis, need to be included in the differential diagnosis. Most does affected by the arthritic form also develop chronic inflammation of the mammary gland (hard bag), with decreased or total suppression of milk production. In addition, some goats develop chronic interstitial pneumonia in conjunction with or independently of the joint and mammary gland involvement. Goats affected by the respiratory form have difficulty breathing and weight loss. This form of the disease needs to be differentiated from other types of chronic pneumonia, including lung abscesses, chronic pasteurellosis and parasitic pneumonia.

Diagnosis and Identification of Infected Animals

Infected animals remain infected for life. The great majority of infected animals do not manifest signs of disease, but they may be the source of virus for non-infected goats. The agar gel immunodiffusion (AGID) test is the most common way to identify infected animals. This test is easy to perform, relatively cheap and fast. However, the sensitivity of this test is low and a large proportion of infected animals (up to 40%), mostly those in the initial phases of the infection, will not be detected. A more expensive test to detect infected animals is the ELISA test. In general, this test is more sensitive than AGID, and as many as 90% of the affected animals can be detected by ELISA although the range of detection may vary between laboratories. Additional studies are needed to determine the efficiency of the ELISA test to detect CAE-infected animals. Because there is a chance of missing infected animals, retesting every 3 to 6 months is recommended.

Prevention and Control

There is no treatment for CAE. All animals that result positive to CAE need to be isolated from the rest of the flock. Alternatively, offspring from infected goats need to be removed from the does immediately after birth and before ingesting colostrum. These kids need to be given colostrum from non-infected does, pasteurized colostrum or bovine colostrum within the first hour after birth and then bottle-fed with non-infected milk or milk replacer until weaning.

Because CAE is difficult to eliminate once infection occurs in a flock, it is important to prevent the disease by repeated testing of new goats and goats that have been in contact with infected animals. For further information contact Dr. Andrés de la Concha at 915/653-4576.

Urinary Calculi in Wether Lambs/Kids

Richard V. Machen, Associate Professor and Extension Livestock Specialist
Uvalde, Texas

Formation of calculi (stones or crystals) within the urinary tract of sheep and goats is common and primarily a metabolic disease. The most common calculi found in lambs and kids on high-concentrate diets is the struvite type, which contains calcium, magnesium and ammonium phosphates. The mineral composition of drinking water, in conjunction with mineral imbalances in the diet, probably contributes more to the initiation of calculi formation than does the lack of water itself.

Castration of young kids and lambs removes the hormonal influence necessary for full development of the urinary tract. Consequently, the problem most frequently occurs in lambs/kids being managed for livestock shows. The sigmoid flexure and urethral process of lambs and kids are the most common sites for calculi to lodge. Irritation of delicate urethral lining at the calculi lodging site causes inflammation and restriction, thus blocking urine flow through the urethra. Retention of urine, abdominal pain and distention and rupture of the urethra or bladder are associated with this condition. A significant number of cases result in death of the animal.

What to look for if you suspect Urinary Calculi:

1. Abdominal discomfort. Wethers are restless, kick at their belly and make frequent attempts to urinate. If hand fed, animals may not charge the trough with the group at feeding time.
2. Attempts to urinate are often accompanied by rapid twitching of the tail. Animals may also groan or bleat

while attempting to urinate. Grinding or gritting the teeth while resting is also an indication of pain.

3. Before complete occlusion of the urinary tract, urine may dribble from the urethra, dry on the preputial hair, and leave mineral deposits.

4. Palpation of the penis and urethral process may reveal significant hypersensitivity, distension and/or swelling.

Prevention

As is the case with many health problems, prevention of this condition is much easier and more effective than attempts at treatment. The following are offered for consideration in the development of a urinary calculi prevention program:

1. Delay castration of young lambs/kids as long as possible.
2. Clean, cool water is a must. Clean enough that you would drink from the trough.
3. A ration with at least a 2:1 calcium to phosphorus ratio greatly reduces the incidence in feeder animals.
4. Addition of 3-4% salt in the ration stimulates water intake and has thereby proved beneficial.

5. Ammonium chloride should be added to the feed at the rate of 0.5-1.5% see Table 1). Ammonium sulfate can be substituted for ammonium chloride. However, results may be less satisfactory.

Table 1. Ammonium Chloride as a Feed Additive (Preventative)		
Ammonium Chloride	To mix, add lb/ton	For topdress, add g/lb feed
0.50%	10	2.27
1.00%	20	4.54
1.50%	30	6.81

6. The diet should provide ample amounts of Vitamin A.
7. Haphazard addition of "supplements" to balanced rations can result in a mineral imbalance in the total diet.

Treatment

1. *If urine flow is completely blocked*, consult a veterinarian. Surgical removal of the urethral process may provide beneficial if the blockage is at or near the end of the penis. However, in lambs and kids, the occlusion is frequently associated with the sigmoid flexure of the penis located inside the abdominal cavity.
2. *If obstruction of urine flow is not complete* (animal still passing small amounts of urine):
- a. Smooth muscle relaxants in combination with anti-inflammatory agents may be helpful. Such treatment must be done under the supervision of a veterinarian, could prove to be expensive and is not practical on a large scale.

b. Withholding feed for 24 hours in

conjunction with oral dosing of ammonium chloride (0.20-0.33 g/kg body weight) can acidify the urine and thereby dissolve struvite crystals associated with high-grain rations (Table 2). Acidification of the urine should be maintained for ≥ 1 week due to the probable presence of multiple calculi in the bladder.

Table 2. Mixing Instructions for Ammonium Chloride Solutions (Oral Drench)				
Ammonium Chloride Dose, g/kg BW	Animal Weight lb	Volume of Dose, cc		
		20	40	60
		mix lb NH ₄ Cl/gal. H ₂ O		
0.20	30	1.20	0.60	0.40
	45		0.90	0.60
	60		1.20	0.80
0.26	30	1.56	0.78	0.52
	45		1.17	0.78
	60		1.56	1.04
0.33	30		0.99	0.66
	45		1.49	0.99
	60			1.32
<p>Might experience difficulty in dissolving this amount of ammonium chloride per gal. of water. Will depend on salinity of water being used (shaded cells).</p> <p>Doses were selected assuming a 20 cc drench gun would be used to administer the ammonium chloride solution.</p> <p>Caution: Ammonia toxicity could be a potential problem if the higher doses of NH₄Cl are chosen. However, treatment of urinary calculi is a desperation effort. Therefore, the risk of ammonia complications may be tolerable in light of impending death if urine flow is not re-established.</p>				

CASEOUS LYMPHADENITIS

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Caseous lymphadenitis is a chronic contagious disease of sheep, goats and occasionally cattle, deer, horses and humans. It is characterized by the formation of abscesses (lumps) in superficial lymph nodes and/or internal organs. The disease is widespread in all countries where sheep and goats are raised.

ETIOLOGY AND TRANSMISSION

Caseous lymphadenitis (CL) is caused by a bacterium called *Corynebacterium pseudotuberculosis*. The organisms may survive for several months in soil, manure, contaminated equipment, skin and tissues of infected animals. Infection may occur after penetration of the organisms through the skin or mucous membranes. Most commonly this occurs through superficial skin wounds from shearing clippers, prickly pear spines, grass awns, wood splinters, dog bites or from docking and castration.

SIGNS OF THE DISEASE

After entering the subcutaneous tissue, the bacteria are carried to regional lymph nodes (glands) where they continue to grow and multiply. In these organs, the bacteria cause necrosis (death) and a chronic inflammatory response that is manifested by enlargement of affected lymph nodes. With time the tissue reaction becomes encapsulated forming an abscess. These abscesses have a thick wall of fibrous connective tissue and contain a greenish to yellow caseous (cottage cheese-to toothpaste-like) material. In sheep, the exudate may be extremely dry and formed in layers that have been referred to as “concentric lamination” or “onion rings”.

The clinical signs depend on the nodes or tissues affected. Animals that pick up the infection orally or from shearing tend to develop abscesses in the lymph nodes of the neck, and legs. The abscesses eventually “ripen” and rupture to the exterior. Infected animals tend to develop abscesses throughout the rest of their lives. The size of the abscesses varies from 1 to 6 inches.

Mastitis due to CL is occasionally observed in sheep and frequently observed in goats. Lesions may also occur in the lungs and result in extensive pneumonia. Animals affected by this form of the disease lose weight and condition over a long period of time (thin ewe syndrome) and develop difficulty in respiration. Other viscera, chiefly the liver and spleen, may contain solitary lesions.

ECONOMIC LOSSES

Economic losses due to CL result from unthriftiness and death of some sheep and from condemnation of infected carcasses and devaluation of hides. In 1981, 5,671,620 sheep carcasses were inspected in abattoirs throughout the United States. Condemnations of whole carcasses due to CL amounted to 5,528 (0.097%). The condition is considered one of the most prevalent and economically significant diseases of mature sheep in the U.S. In a study in Australia, infection

with *C. pseudotuberculosis* caused a 3.8 to 4.8% decrease in greasy wool production and a 4.1 to 6.6% decrease in clean wool production. This study estimated that CL caused an annual loss of \$17 million in wool production in Australia.

DIAGNOSIS

The diagnosis of CL is most commonly established by the observation of clinical signs and lesions. Isolation of *C. pseudotuberculosis* from the lesions confirms the diagnosis.

Two serological tests, enzyme linked immunodiffusion (ELISA) and synergistic hemolysis inhibition (SHI), have been used to detect infected animals. The accuracy and interpretation of results of these techniques are still under investigation.

Caseous lymphadenitis needs to be differentiated from other causes of abscess formation such as *C. pyogenes*. Animals with chronic weight loss should also be tested for paratuberculosis (Johne's disease) and ovine progressive pneumonia or caprine arthritis encephalitis.

PREVENTION AND CONTROL

Prevention is based on reducing transmission of the organism from infected to susceptible animals. This can be accomplished by a combination of sanitary measures, culling and vaccination. Disinfection of shearing equipment and pens can be achieved with common disinfectants or chlorine bleach. Equipment should be disinfected whenever it is contaminated with draining exudate. Careful shearing practices are important. Younger animals should be sheared first and moved to pasture or range as soon as possible. Animals with evidence of the infection should be removed from the flock.

A vaccine for CL is available in the U.S. (Colorado Serum Company) and has been approved for use in sheep. Autogenous bacterins have been used with some success; however, they tend to produce local abscesses, pain and fever in the inoculated animals.

Some owners opt for treating affected animals but this approach will not eliminate the organisms from infected flocks or individuals. The primary treatment is incision and drainage of the abscess. The abscess should be mature, as determined by the soft doughy consistency. The area dorsal and ventral of the abscess should be clipped, and the incision site should be cleaned and disinfected. When possible the incision is made about 1 inch long at the most ventral portion of the superficial enlargement. An elliptical strip of skin 0.5 inches wide should be excised in order to create an opening to allow continuous drainage. The exudate (content of the abscess) is removed and collected carefully for complete disposal. Equal portions of 0.2% nitrofurazone solution and 3% hydrogen peroxide are mixed and about 100 ml are used to flush the abscess. Rolled gauze (2-3 inches wide), which had been presoaked in either 0.5% povidone-iodine solution or 0.2% nitrofurazone solution, is used to pack the abscess cavity. One third of the gauze should be removed every day. Abscesses frequently recur after draining or surgical excision.

Although the organism is susceptible to penicillin, antibiotic treatment is usually not attempted. The formation of the abscesses limits the penetration and effectiveness of antibiotics.