GENERAL CARE OF GOATS

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Introduction

Interest in goats has mushroomed over the past fifteen years. Increased interest in goats and the value of these animals has made us to do a better job in managing them. Kid management from birth to breeding is an essential component of the dairy goat enterprise. The kid management along with the nutritional management of the doe herd has the greatest effect on the long-term productivity of the goat herd. The dairy goat kid at birth represents a genetic resource necessary to replenish the herd gene pool, which has a changing composition due to death, culling, and sales for breeding stock. While the genetic characters of the kid are determined at the hour of conception, survival to lactation and an adequate body size are necessary to realize inherent genetic potential for lactation. Kid mortality has a direct effect on genetic progress, and thus we need to maintain low mortality from birth to weaning.

Pre-Parturition

The kid management program should actually begin prior to parturition with attention to the nutritional needs of the gestating doe in late lactation and during the dry period. The tendency is to regard the late-lactation and dry doe as a non-productive part of the milk-producing system. On the contrary, however, an adequate diet for the dry doe is essential to reproduce healthy kids. Pregnant does should receive plenty of exercise. An obese doe should be avoided but the high-producing doe needs to recover body weight lost during the previous lactation. Clean, cool water and free choice trace-mineralized salt should be available.

Vaccination booster for Clostridium perfringens C and D and tetanus toxoid should be given not less than 3 weeks prior to kidding. Vitamin E/selenium injections are given during the dry period to prevent white muscle disease in the kids, especially in areas where soils are selenium deficient. Does should be wormed at dry off and also before kidding.

Parturition

The doe should kid in a clean environment, either a well-rotated pasture or stall bedded with straw or other absorbent material. The kid prior to birth has been existing in a germ-free environment and parturition represents exposure to common disease organisms to which the mature animal has developed resistance. The location of the kidding stall or pasture should be near a well-traveled area
so that the doe can be frequently observed for kidding difficulties. Few adult does require assistance at the time of kidding though problems are always a possibility. First-freshening does should be closely watched, especially if bred to bucks known to sire large kids.

Kid Management

At birth, two management practices are critical to the future health and survival of the newborn kid. The navel cord should be dipped in a solution of tincture of iodine to prevent entry of disease-causing organisms through the navel cord and directly into the body of the kid. If necessary, a long navel cord can be cut to 3 or 4 inches in length. A bleeding cord should be tied with surgical suture material. Dipping of the cord in iodine not only prevents entry of organisms but promotes rapid drying and the eventual breaking away of the cord from the navel.

The second critical practice is the feeding of colostrum milk as soon after birth as possible. The colostrum, or first milk, contains antibodies, which the doe did not pass to the fetal kid in utero. Consumption of colostrum must occur as early as possible and prior to 18 hours after birth as there is a rapid reduction in the permeability of the intestinal wall of the newborn to the antibodies. The colostrum milk should be bottle-fed to the newborn to insure adequate consumption. Excess colostrum can be frozen for use in orphan or bonus kids. Recent research indicates that disease organisms, especially caprine arthritis encephalities (CAE), may pass from doe to kid through the milk and transmission might be avoided through the use of extra colostrum frozen from does tested and shown to be CAE-free or pasteurized colostrum. An additional practice at birth which enhances the health of the newborn kid is to give 3 injections of iron dextran and vitamins A and D after birth. A vitamin E/selenium injection may be beneficial in areas of selenium-deficient soils.

Kids should be checked carefully at birth for any deformities or abnormalities. Pneumonia is a major killer of young kids. A dry, draft-free environment is an excellent preventative measure. Kids should receive colostrum 10% of their body weight within 24 hours. For example a six pound kid will receive 300 ml of colostrum within 24 hours. Kids could be left on does to nurse or started on a good quality milk replacer after they get their colostrum. A lamb milk replacer may be the best substitute for goat milk. Typical lamb milk replacers contain 22 to 24 % protein and 28 to 30% fat. Casein, a protein in lamb milk replacer, can be completely replaced with whey protein concentrate, which allows acidification. Acidification helps maintain the quality of the unused milk and reduces the incidence of diarrhea. Maintaining milk replacer quality after mixing is particularly important when kids are fed ad libitum.

The biggest problem with using lamb milk replacers occurs with the feeding schedule. Frequently kids become “pets”. There is a tendency to feed them as much milk as they will consume each feeding. Unfortunately, this may result in bloat and sudden death of diarrhea. A restricted feeding is necessary.
<table>
<thead>
<tr>
<th>Age</th>
<th>Amount of Fluid</th>
<th>Feeding Schedule</th>
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</thead>
<tbody>
<tr>
<td>1 to 3 days</td>
<td>4 ounces</td>
<td>5 times a day</td>
</tr>
<tr>
<td>3 days to 2 weeks</td>
<td>8 to 12 ounces</td>
<td>4 times a day</td>
</tr>
<tr>
<td>2 weeks to 3 months</td>
<td>16 ounces</td>
<td>3 times a day</td>
</tr>
<tr>
<td>3 months to 4 months</td>
<td>16 ounces</td>
<td>2 times a day</td>
</tr>
</tbody>
</table>

Kids will nibble at fine-stemmed leafy hay at one or two weeks of age. At three to four weeks a calf starter should be offered. As the hay and grain consumption increases, gradually reduce the milk being fed. When the kid is eating 1/4 pound of grain per day plus some hay and is drinking water from a bucket, it is time for weaning.

**Birth to Weaning**

Milk is the principal component of the diet of the pre-weaning kid. There are numerous ways to feed milk including the use of bottles or pails, suckling the dam or nurse does, and self-feeder units. The method chosen will depend upon such factors as the size of the herd and available labor, as well as personnel preference. With any system, the health of the kid, sanitation, and available labor are the major factors to consider. Under natural suckling, kids consume small amounts of milk at very frequent intervals. Ideally, artificial rearing should mimic natural suckling but the constraint of available labor precludes frequent feeding. Nevertheless, kids should be fed 2 to 4 times daily for the first week or two and twice daily thereafter. Bottle feeding is more labor intensive but kids receive more individual attention and are easier to handle post-weaning than kids that are allowed to suckle does. Pail or pan feeding may reduce labor somewhat but body weight loss and need for extra “training sessions” at the beginning must be expected.

For larger herds, self-feeder units such as a “lamb bar” may successfully reduce labor. The key to use of the system is the maintenance of a low temperature of the milk (40°F) that will limit intake by the kid at any one time. Small, frequent feedings increase digestibility and decrease digestive disturbances. Consumption of large quantities of milk may lead to bloat due to entry of milk into the reticulo-rumen or rapid passage of milk through the abomasum and small intestines resulting in diarrhea or nutritional scour.

In raising dairy goat kids, increase in size and weight is not the only measurement of success. A well-formed skeleton and proper development of internal organs are often neglected when the emphasis is on rapid gains. An average daily gain of 250 g during the first weeks of life should be the goal. By limiting daily milk consumption to about 2 quarts, daily consumption of dry feed will be encouraged. Dry feed consumption is important in developing body capacity. By increasing body capacity, feed intake and digestion increase. Research has shown that at two months of age a weaned kid has a reticulo-ruminal capacity 5 times as large as suckling kids of the same age.
Kids should be consuming forages such as pasture grass or hay by two weeks of age and grain within four. Careful attention need be given to formulation of a concentrate supplement for the pre-weaning kid. Palatability is of primary concern. Molasses at the rate of 10% of the total dry matter, corn (preferably chopped or rolled), and whole or rolled oats make up the energy “core” of a good pre-weaning diet. Balance the crude protein needs by adding cottonseed or soybean meal or another high protein source. Through few studies with kids have been done, crude protein contents of the pre-weaning ration should be within the range of 14 to 18%. Ground alfalfa may be added at 5% or less to provide additional stimulation for reticulo-ruminal development.

Several factors need to be considered when making the decision as to when to wean dairy goat kids. The most important consideration is whether or not the average daily consumption of concentrate and forage is adequate for growth and development to continue in the absence of milk. Fixed weaning ages are less desirable than weight goals such as 2.0 to 2.5 times birth weight. Many producers who have an erratic or marginal market for their milk delay weaning for longer periods than necessary. While milk feeding may promote more rapid growth than a concentrate-forage diet, maintaining kids on milk may delay the attainment of the dry feed intake level necessary to weaning and also leaves the kid disposed to diarrhea.

Disbudding

Kids should be disbudded in the first two weeks of life. Buck kid horns grow faster than doe horns. Some large single buck kids should be disbudded within the first week. Disbudding a buck kid is the true test of proficiency and many fail it, judging by the number of scurs seen on adult bucks. If you try to de-horn a buck kid whose horn base is wider than a regular de-horning iron, you will get re-growth of the horn in a crown outside the burned area. If you try to de-horn a small kid with a wide calf de-horner, you may get re-growth of the horn from the center of the ring. If one person is doing the job, a de-horning box offers the best and safest restraining.

Although local anesthetic is commonly advocated, the actual technique is not easy and the baby goat will scream while being held in preparation for a ring block or a cornual nerve block.

Goats are more sensitive than other ruminants to local anesthesia, and causes adverse reactions as a result of overdosing. If kids are brought to the clinic, the easiest and fastest technique is masking them down with halothane and oxygen. However, remove the mask and gas flow during cautery; otherwise a flash fire in the goat hair may result. Xylazine at 0.3 to 0.4 mg/kg is commonly used for injection anesthesia, and kids should be kept warm during the prolonged recovery period.

The equipment most commonly used is an electric-heated metal rod with a hollowed-out end. None of the irons can be relied upon to maintain a constant temperature, and it is extremely important to match temperature and time. Underburning will result in scurs and overburning will lead to brain damage or death. The horn bud is located over the sinus close to the cranium in kids. After the de-horning iron is hot, apply the de-horner firmly over the horn area and rock it around slowly for 3.5 to 4 seconds. Remove the iron and repeat if necessary and do the other side. Descending could be
done at the same time if necessary. Inject the kids with 150 IU tetanus antigen. Although the risk of tetanus after disbudding is not great, it is a good practice to do it.

Dewattling

Many goat breeders believe that wattle detracts from the appearance of a show goat, and it is difficult to show clip the hair evenly and smoothly, so wattles are removed at birth.

Castration

Dairy and pygmy goats should be castrated if they are intended to be companion animals. This will reduce the smell and aggressive behavior. Angora goats are castrated so they can be run in either flocks for mohair production. Angora goats are usually castrated at 6 to 12 months of age so that they can develop bigger horns.

Reproduction

Doelings are usually bred when they reach a weight of 80 to 95 pounds. Breeding season is usually September to February but some does particularly Nubians, will breed at any time of the year. They are seasonably polyestrous and cycle every 20 to 21 days. Estrus lasts about two days and is detected by frequent urination, tail erect and swishing, drop in milk production, riding and being ridden by other goats and hanging around the buck pen. Ovulation is usually towards the end of estrus and gestation is 144 to 157 days.

Pregnancy Diagnosis

1. Non-return to estrus
2. Ballottement
3. Vaginal biopsy: > 40 days
4. Cervical palpation: 30-50 days, soften, blunt
5. Radiographs: 75 days
6. Rectoabdominal palpation: Hulet rod > 70 days
7. a) Real-time: B-mode > 25 days
   b) Amplitude depth: A-mode 60 to 90 days
   c) Doppler: > 30 to 40 days
8. Progesterone assay: Post breeding at 21 days
9. Estrone Sulfate: > 50 days - milk or urine
Parturition

Stage I  Uterine contractions 6 cervical
dilation. Lasts 3 to 6 hours

Stage II  Abdominal contractions
1 to 3 hours
< 1 hour before the first fetus born

Stage III  Placental expulsion usually within two hours after the last fetus

Signs of parturition

Udder engorgement
Vulva edema
Pelvic ligament relaxation
Udder secretion becomes colostrum
Anorexia, restlessness
Cervical mucus

Induction of parturition

Lutylase - drug of choice
20 mg given intra-muscular
Kid in 27 to 40 hours

Common Diseases of Goats

Caseous lymphadenitis

Caseous lymphadenitis is otherwise called pseudotuberculosis. Lymph nodes get abscessed commonly under the jaw and ear, in front of the shoulder, flank, above the udder or scrotum and in the hock. The lymph nodes may feel warm, and may swell to 3 to 5 cm or larger. The disease is seldom fatal, unless involving a major artery or nerve around the head or internal lymph nodes. The abscesses contain a characteristic cheesy, greenish color pus. Diagnosis is based on the location of the abscess, character of the pus and culture. Transmission is through ingestion of contaminated feeds and break in the skin.

Treatment is by isolating the infected animals, surgically lancing the abscess and flushing it with 7% iodine away from the rest of the animals. Injectables like penicillin and tetracycline may be used parenterally for 3 to 5 days.

Prevention is by keeping a closed herd. Any new addition needs to be quarantined 30 to 90
days. There is a vaccine available with some success.

**Enzootic Abortion**

Enzootic late term abortion in does is caused by Chlamydia psittaci. It causes late term abortions, stillbirth, mummified fetus or weak kids. Retained placenta with uterine disease is usually associated with this disease. Chlamydia abortion can be positively diagnosed by culturing the aborted fetus or membranes and also serology may be useful.

Transmission is by ingestion, with the organism delaying growth in the doe until late in the following pregnancy. Treatment is by using tetracycline given intramuscularly for 5 to 7 days will reduce the number of abortions by reducing the spread of the organism to uninfected goats. Feeding tetracyclines at 110 to 165 g/ton or 10 to 165 mg/kg is helpful to control the disease. Isolating the aborting does, burning the aborted kids and after firth is necessary to control the disease. Prevention is by vaccination.

**Colibacillosis**

Clinical signs include watery diarrhea, rapid dehydration, severe depression, and weakness. Diagnosis is based on clinical signs and by culture. This syndrome is seen in newborns up to two weeks of age with high mortality. The organism is taken in by mouth, usually very soon after birth. Outbreaks readily worsen unless strict sanitation procedures are begun. Lack of adequate colostrum usually contributes to colibacillosis.

Treatment is by replacing the fluid loss and parenteral antibiotics. Prevention is by good sanitation and colostral mangement. Vaccinating the does during gestation may be helpful.

**Enterotoxemia**

Clostridium perfringens type C: struck, kid dysentery
Clostridium perfringens type D: overeating disease, pulpy kidney disease

**Clinical signs:** star gazing, convulsions, tooth grinding, twitching and death within few hours. May or may not have bloood tinged diarrhea.

**Necropsy:** fluid around the heart with clots (chicken fat) and blood in the lumen of the intestine. Urine will have high levels of glucose.

**Predisposing factors:** change in feed, increased amount of grain fed or increased consumption of milk.

**Treatment:** Not successful
Antitoxin
Penicillin
Charcoal

Prevention: vaccination of does or kids

**Johne’s Disease**

*Mycobacterium paratuberculosis*

**Clinical signs:** loss of weight, rough haircoat, milk production decreased, depressed, off feed and diarrhea. Seen in animals 3 to 5 years old.

**Diagnosis:**
- fecal culture
- serology
- I/V Johnin test
- lymph node biopsy

**Treatment:** not successful

**Prevention:** remove infected animals; buy health animals; avoid stress.

**Pinkeye**

*Infectious kerato conjunctivitis*

**Clinical signs:** watery eyes, rendess of the eye, swelling of the eyelids, photophobia, cloudy cornea with vascularization and ulcers.

**Etiology:** various bacteria, viruses, rickettsia, chlamydia

**Treatment:** eye ointment; long acting tetracycline

**Tetanus**

*Clostridium tetani*

**Clinical signs:** usually appear 7 to 14 days after the organisms enters the body. Initially, stiffness or hardness to localized muscle groups and later generated stiffness. Violent spasms to any squick movements or noise, flared nostrils, dilated pupils and protrusion of the third eyelid.
**Treatment:** unsuccessful
- antitoxins
- penicillin
- tranquilizers

**Prevention:** vaccination

**Caprine Arthritis Encephalitis Syndrome**

Caused by a virus and is spread from older infected goats to kids, perhaps by contact or through the milk from an infected doe to her kid. Even though a high percentage of goats may be serologically positive, only a small percentage of goats ever show signs of the disease.

**Clinical signs:** young kids develop a weakness in the rear legs, stumble, and finally cannot rise. The unused legs lose muscle strength and eventually die. They appear bright and alert, eat well, and are not febrile. In older goats, have one or more swollen joints, eventually leading to an arthritic condition. After a few years, they cannot keep up with the rest of the flock while grazing, lose weight and eventually die. Some of the animals may have contracted joints and eventually walk on their knees.

**Treatment:** none

**Prevention:** serologically monitoring the herd, isolating kids at birth, feed them heat treated colostrum or colostrium from a CAE free flock.

**Contagious Ecthyma or Sore Mouth**

Contagious ecthyma is caused by a virus. Kids can pick up the disease from surroundings and may spread it to their mother’s udder by nursing. Recovery from the disease gives an immunity for at least one year. There is little transfer of immunity from the doe to the kid by the colostrum.

**Clinical signs:** Thick scabby sores that occur on the lips and gums, udders or other areas that have little hair. Lesions on udder may lead to mastitis.

**Treatment:** best done by making the goat feel comfortable, ointments or antiseptics on the lesions are helpful. Adults need not be vaccinated again after the disease is in the herd and all young have been vaccinated. Continual exposure to the disease will keep the adults immune or resistant to sore mouth.

This disease is contagious to man. People who work with these infected animals should wear gloves while handling these animals.
Acidosis

When goats overeat easily digestible feed. The pH of rumen usually drops below 5.

Clinical signs: Bloat, dehydrated, diarrhea, depressed, anorexic and grinding of teeth.

Treatment: stomach tube, remove part of the watery rumen contents, mineral oil with bicarbonate. Severe dehydration need to give fluid intravenously. Rumenotomy indicated if the animal is severely depressed and down.

Impaction

Feeding poor quality roughage may cause ruminal impaction. Animals will not have ruminal motility and the rumen will feel hard and doughy.

Treatment: mineral oil with laxative like carmilax in it; Rumenotomy.

Bloat or Ruminal Tympany

This condition is always an emergency.

Clinical signs: Full left flank, pain, discomfort and rapid respiration.

Frothy bloat is usually caused by feeding on rapidly growing legumes and small grain pastures (wheat, barley, oats, rye).

Gas bloat is usually caused by high grain diet, blockage of the esophagus by a mass or foreign object.

Treatment: Relieve the gas bloat using a stomach tube or a trocar.

Frothy bloat may be relieved by pumping in mineral oil or vegetable oil, mild detergent or poloxalene.

Milk fever

(Parturient paresis, Hypocalcemia)

Seen in does fed high levels of calcium fed late in pregnancy.

Clinical Signs: seen within 24 hours of kidding. Animals will show a wobbly gait or with foot dragging. Later she may be down, have curved neck, hypothermic, pupils dilated and may show muscle twitching.
Treatment: I/V 25% calcium barogluconate 50 to 100 ml. Monitor the heart.

Some clinicians like to give 50 h 100 ml S/C after the I/V treatment.

Prevention: feed low calcium diet during the last month of gestation. Does having triplets or quadruplets may be prone to milk fever.

Polioencephalomalacia

Thiamine deficiency seen in animals on high grain ration or sudden change in management practice.

Clinical Signs: sudden loss of appetite, depression, no fever, rumen motility decreased, head pressing, aimless wandering, blindness, grinding of teeth, muscle tremors and hyperexcitable.

Treatment: Thiamine 5 to 10 mg/kg 1/M every 4-6 hours.

Pregnancy Toxemia (Ketosis)

Pregnancy toxemia occurs during the last few weeks of gestation. Usually seen in does carrying more than two or when the does are fat. This syndrome is caused by sudden extra demand for energy by the fast growing kids. The space available in the rumen is limited in the does carrying more than two or the ones which are fat, resulting in less intake. The does in turn breakdown the fat reserves in her body to support the increased energy demand. This rapid breakdown of body stores produces ketones.

Clinical Signs: Does with pregnancy toxemia are depressed, weak, poor muscle tone and down.

Treatment: 2 to 3 ounces of propylene glycol twice a day. I/V glucose drip. Not successful in getting them up if they are down until they deliver the kids. Caesarian section if they are close to term will sometimes save the doe and kids.

Prevention: Do not let the doe get too fat early in gestation. Feeding them good quality grains or grain by-products and a good quality hay. If she has a history of having more than two kids, increase her energy intake.
## Vaccination Schedule for Goats

<table>
<thead>
<tr>
<th>Period</th>
<th>Time to Vaccinate</th>
<th>Disease</th>
<th>Booster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kids</td>
<td>2, 4, and 8 weeks</td>
<td>CL perfringens C&amp;D</td>
<td>Annual</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CL tetani - toxoid</td>
<td></td>
</tr>
<tr>
<td>Kids</td>
<td>4 to 6 weeks</td>
<td>Contagious ecythma</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(if a herd problem)</td>
<td></td>
</tr>
<tr>
<td>Kids</td>
<td>16 weeks</td>
<td>Rabies</td>
<td>Annual</td>
</tr>
</tbody>
</table>

**Prebreeding**

| Doe             | 30 days prior to breeding | Chlamydia (abtions)     |                    |

**Gestation**

| Doe             | 30 days prior to lambing | CL. perfringens C&DE    |                    |
|                 |                       | CL. tetani - toxoid     |                    |

**Basic supplies:**

- Iodine (7% tincture) for diping navels after they are trimmed. Empty film canisters (2/3 full) are handy to prevent spilling or contaminating the main bottle.
- Betadine® or Nolvasan®. Use to disinfect vulva of goat and hands. Squeeze bottles are handy for dispensing.
- Nolvasan® solution. Use diluted to disinfect scissors and other equipment.
- Obstetrical sleeves and lubricant.
- Paper towels for washing off doe, and for hands.
- Cloth towels to clean off newborn kids.
- Clean bottle and nipple to feed colostrum.
- Red rubber feeding tube (18 French), with 60 ml catheter tip syringe or funnel to feed colostrum to weak kids.
Body socks or warming box for chilled or weak kids.

**CAE prevention:**

1. Tape dam’s teats securely 1 week before due date with 2-3 layers of 1 inch cloth adhesive tape. Hold the teat for 10-20 seconds after taping. This allows the heat from your hand to seal the tape.

2. Remove kids from dam immediately after they are born.

3. As soon as possible, certainly within 6 hour, begin to feed colostrum from a safe source. Give at least 10% of kid’s body weight within 12 to18 hours, for example, an 8 lb kid needs 13 ounces of colostrum. To heat-treat colostrum, first preheat a regular thermos bottle with warm water. Using a double boiler, SLOWLY heat colostrum to 135°F and pour into prewarmed thermos. Check temperature after 1 hour - it should remain at 135°F.

4. Dip navel in iodine at birth; repeat in 12 hours.

5. Feed milk from a safe source after colostrum is consumed. To pasteurize milk, heat to 165°F for 15 seconds.

6. House kids separately from positive does.

**Other disease preventive measures:**

Dam - 1 month prior to kidding

CDT vaccine to help increase colostral antibodies against enterotoxemia and tetanus. BoSe® to raise selenium levels and prevent white muscle disease in kids and retained afterbirth in dam. Get local veterinary advice because the need and dosage level depend on how much selenium is in the soil in the region, as well as on the dietary supplementation.

Kid - birth to first week

Tetanus antitoxin (250 IU) if the colostrum intake was inadequate or if the source of the colostrum had not been vaccinated against tetanus within four weeks of kidding. BoSe® + vitamins A&D - use depends on soil in the region and the diet of the dam.

Kid - 3 weeks - begin coccidiosis prevention

4-8 weeks - Begin CDT series. Revaccinate every 3-4 weeks for 3 doses.

4-8 weeks - BoSe® - repeat if in selenium deficient area.

6-8 weeks - begin deworming, especially if kid has access to outdoors.
The proper citation for this article is: