Pregnancy Toxemia and ketosis
By Robin Walters
Oct 28, 2002, 10:07am

Robin Walters

Pregnancy toxemia and ketosis are the result of the high carbohydrate (energy) demand of multiple fetuses in late pregnancy. The kids require an increasing amount of carbohydrates the last trimester. Does bearing twins have a 180% higher energy requirement than those with just a single fetus. Does carrying triplets have a 240% greater energy requirement. When this demand exceeds the supply, fat is metabolized into glucose. The metabolic needs of the kids are met at the expense of the dam; this is what causes the ketotic condition. To complicate matters, multiple fetuses produce more waste products, which leads to the doe becoming toxic if she does not flush them from her system.

Risk Factors for Pregnancy Toxemia
Multiple fetuses
Poor quality of ingested energy
Dietary energy level
Environment
Genetic factors
Obesity
Lack of good body condition or high parasite load
Confinement - lack of exercise

Toxemia and ketosis are typically seen in does that are overweight and get little exercise. Under weight animals that are fed a poor quality feed are also candidates for toxemia. Look for does at the bottom and top of the pecking order. These does may be getting to much or not enough feed. Does should be in good body condition, and not overly fat when bred. They can be maintained on good roughage or forage during the first 100 days of pregnancy. During the last trimester the doe should gain approximately 1/2 lb. per day. The doe must intake enough carbohydrates to supply the demand of the growing fetuses and to keep her alive and functioning also.

I also believe that you see an increase in toxemia during extended drought or rainy conditions. Severe weather conditions cause the quality of the feed change, limits and changes the available browse, and the animals do not receive the vitamins and minerals that they get naturally from high quality feeds and browse. Extremely wet conditions, especially if following a prolonged drought can also cause a dramatic and quick increase in the worm load, and cause the doe to drop enough body condition to become a candidate for toxemia.

When there is a decrease of glucose levels in the doe's brain, they tend to lie down, become sluggish, and show a loss of appetite. They may get stiff, and walk with a staggering gait. Swelling (edema) of the lower limbs is not uncommon. Some does may also grind their teeth. Keto-acidosis is also common during toxemia and needs to be treated daily. As the disease progresses, the neurological systems become compromised due to lack of glucose. Blindness, stargazing, tremors, aimless walking, ataxia (uncoordinated staggering

gait), are seen and eventually the doe becomes comatose. At this stage the fetuses succumb and release toxins that send the doe into endotoxic shock, and death. Does that survive toxemia need to be watched for dystocia, and lactational ketosis.

Diet should include high quality roughage and increased concentrates. At first sign of decreased appetite, or unwillingness to rise, managers need to be wary. Exercise should be offered and forced if necessary. Some type of high-energy supplement needs to be given to keep the doe from coming ketotic. The carbohydrate (energy) level of the diet needs to be increased. This can be accomplished by adding corn, fresh alfalfa hay, or a soybean supplement to the diet. Increasing the protein does not necessarily increase the energy level.

High Energy Supplements
Propylene Glycol
Nutri-drench
Dextrose
TKM Solution
Magic (1 part Molasses, 2 parts Kayro, 1 part Corn Oil)
Glucose IV

If the kids are within 7 days of due date, and the doe does not respond immediately to treatment, giving 20-25mg dexamethasone can induce labor. Labor will begin within 48 hours. Dexamethasone is preferred over hormonal induction of parturition because of its beneficial stimulus to appetite. Also, dexamethasone may also prepare the lungs of marginally immature kids increasing their chances of survival during labor or cesarean. Valuable does that fail to respond within 24 hours should have a cesarean immediately. Even with surgery and fluids, prognosis is poor for the survival of both the doe and kids. If valuable does don't respond to treatment early termination of the pregnancy should be considered.

The key to treating toxemia is catching the subtle symptoms promptly. Fist concern is to hydrate the doe and get enough sugars to the brain to get if functioning properly. We have been successful treating does with the following mixture:

TKM Solution
3- 500ml bottles Dextrose
3- 500ml bottles of Amino Acid Solution (not concentrate)
1 - 500ml bottle Calcium Glutenate 23%
(This can be mixed up ahead of time & stored in a cool dry place)

The goat also needs to receive the following - they need to be added when you get ready to administer the dose:
Fortified B Complex - 5ml daily
Thiamine - daily
Vitamin C & E Supplements - daily
Probiotics - I give a double calf dose every time I treat. If this doesn't stimulate their appetite, add 1 teaspoon of baking soda daily (add after you have mixed everything together!)

I prefer the Loveland Industries Calf Pak for probiotics. When choosing probiotics make sure you purchase one that contains viable (live) probiotics. Be careful in handling probiotics; don't leave out in extreme heat or cold. The refrigerator is a good place to store them. For the Vitamins I have had a lot of success using Capra Products Capra-Tech 100 to provide the C & E, and the Capra Cool for the thiamin & additional probiotics. This seems like a remarkable amount of probiotics, but you are fighting a metabolic disorder that is on going. You will not cure it, but you can add support to enable the doe to live through pregnancy and hopefully deliver live kids. We give 20-60cc magic twice daily at first signs of toxemia. If the doe is completely off feed or becoming lethargic we give a loading dose of 4-8oz. of the TK Solution. It is then repeated every hour (2-4oz.) until the doe is standing, drinking, and urinating. We have also found it helpful to give an equal amount of water (drench if necessary) at every treatment. Once these does quit moving, they don't get up and drink, as they should.

Be cautious given electrolytes or products that are high in sodium or potassium. Although in a pinch they will work to hydrate the animal, you don't want to give long term anything that has a lot of potassium in it. That is why we use the dextrose instead of oral electrolytes. You need to make sure that the doe urinates, giving a mild diuretic such as cranberry juice may also be helpful. The does need to flush the toxins from their system.

When the doe starts to respond we start decreasing the treatment intervals. Treatment is dropped to 3-4 times a day, and if the doe is back on her feed and eating well, we just give the magic mixture two to three times daily. We have treated does successfully with 100-500ml of the TKM solution given daily. Amount needed varies with each individual doe. The doe may scour the first couple of days & Pepto-Bismol or Kaopectate can be given to relieve the dietary scours. Don't be terribly concerned if the doe scours it is caused by the drastic dietary changes and will clear up as the doe continues to eat.

Propylene glycol can be given orally at the rate of 4 ounces, 4 times daily. Nutri-drench can be substituted for propylene glycol, and is easier to dose orally - it doesn't taste quite as offensive to the doe. Intravenous glucose (25-50 grams - in a 5 or 10% solution), and B Vitamins, can also be given. If probiotics are not available give baking soda orally to prevent acidosis these need to be given at least once a day. Dextrose (50%) can be given IV in a single 60-100ml dose, followed by a 5% dextrose solution in an electrolyte drip.

Keto-acidocis is precipitated by metabolism of fat. When the doe is not consuming an adequate amount of carbohydrate, that she metabolizes fat to make glucose. The byproduct of this is ketones, which must be secreted by the kidneys. The doe must have a fluid intake to allow this to happen. That is why plain water is given, drenched, or tubed, along with the 50% glucose, and other support therapy. When enough glucose is present, fat is not metabolized, and the body has time to get rid of it. As this happens, the doe will become more alert, and start to eat and drink on her own. This is a vicious cycle, and difficult to break. If caught early, and treated conscientiously, the cycle can be broken. The doe must be monitored carefully until the kids are born, condition can change quickly and needs to

be responded in a timely fashion.

Does that have prolonged battles with toxemia and/or ketosis sometimes have difficulty kidding. Dystocia is common due to the lack of exercise. The uterus tends to loose muscle tone and often the kids must be pulled. The does lack condition or energy to birth them unassisted. After kidding I feel it is very important to leave the kids with the doe, even if you have to supplement them. The kids will stimulate the doe's will to live. Continue treatment three to four days after kidding to prevent a relapse.

Sources:
8th Edition Merck Veterinary Manual
Goat Medicine (Dr. Smith & Sherman)