Goat & Sheep News

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Contents

- Ketosis in Ewes and Does
- Forage Brassicas: A Cost-Efficient Option
- Calendar of Events

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Ketosis in Ewes and Does

Steven M. Jones, Associate Professor
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Several small ruminant producers and county agents on behalf of producers have contacted us with questions about ewes and does in late gestation suddenly becoming nonambulatory. Symptoms suggest that, in most cases, it is probably ketosis. Ketosis has several common names including pregnancy toxemia, lambing/kidding sickness, pregnancy disease and twin-lamb/kid disease. It occurs in all parts of the world and can be a fatal disease occurring only during the last month of pregnancy. It most often affects ewes/does pregnant with twins or triplets and is characterized by low blood sugar (glucose). Economic losses because of the disease are considerable, and it is the most commonly occurring metabolic disease of sheep and goats.

Clinical signs of the condition include a gradual decrease in food intake, depression or inactivity, being down and unable to rise, tremors, wobbliness, weakness, circling and grinding of the teeth, and if left untreated, it may result in death of the animal. The condition develops due to a reduced ability to consume sufficient energy from their diet to meet the energy demands of the mother and her babies. Ewes/does who are obese or very thin are more at risk of developing this condition. This condition appears to be on the increase, especially in goats.

Maryland Cooperative Extension Service

It is generally accepted that the basic cause of pregnancy toxemia is a disturbance of carbohydrate or sugar metabolism. In earlier phases of the disease, blood glucose concentrations are less than 30 and may be as low as 10 mg/100 ml (normal 45 to 80). Blood ketone bodies, on the other hand, are usually greater than 15 and

occasionally may be as high as 80 mg/100 ml (normal 1 to 4). The free fatty acid content of the blood plasma also is increased, meaning that body fat is being broken down and used for energy. Since glucose is essential for proper functioning of the brain, a deficiency of glucose will result in nervous dysfunction and eventually coma and death. Glucose is also required for the muscles during exercise, but one of its greatest uses is by the fetuses. The growing fetuses continually remove large quantities of glucose and amino acids for their growth and energy requirements. Furthermore, the problem of supplying glucose seems great in that sheep/goats and other ruminants do not absorb much glucose from the diet, and instead glucose has to be manufactured in the liver from other compounds.

Preventing pregnancy toxemia involves three management goals. Adequate nutrition should be provided during the final weeks of pregnancy, there should be ample room for exercise and control of other conditions that might result in reduced feed intake or increased energy demand, such as parasitism, mastitis or foot-rot. As the mother's uterus enlarges towards the end of pregnancy, there is less room for her stomach (rumen) to fill with feed. Prevention of pregnancy toxemia in animals pregnant with two or more lambs requires supplying the protein and energy needs of the dam and the developing fetuses without causing a grain overload/indigestion situation. The secret is good quality forage, with supplementation of perhaps a pound of grain per ewe per day the last three to four weeks of pregnancy. The grain needs to be introduced gradually and with ample feeder space. Yearlings should be fed separately from adults to minimize competition. Older animals that have lost molars may need a pelleted roughage source to supply their nutritional needs. Ewes and does carrying three to four fetuses (if known) should be offered 1 to 2 pounds of grain per animal per day during the last month of gestation. The increase in intake of high energy dense foods to 1 to 2 pounds per day should be accomplished gradually so as not to upset the normal function of the rumen, which may precipitate the onset of pregnancy toxemia.

The most important aspect of successful treatment is early recognition of the clinical signs mentioned above. Initial treatment of sheep or goats with pregnancy toxemia begins with 2 ounces (60 ml) of propylene glycol orally two to three times a day or 45 to 60 ml of a commercial energy product orally twice a day. Additional supportive treatments are 60 ml of calcium borogluconate subcutaneously divided into four sites, mixed B vitamins or thiamine and intravenous dextrose (60 ml of 50 percent solution diluted to slightly less than 500 ml in sterile water). Animals that are acidotic and dehydrated will benefit from large volumes of intravenous fluids with added sodium bicarbonate. Antibiotics are indicated if the fetuses may have died. If the ewe or doe is unresponsive and unable to rise, the prognosis is grave. If the animal is not eating by the next morning, a C section may be attempted to try to save its life. If there is partial response and the last possible breeding date is known, induction of parturition with 20 or 25 mg of dexamethasone may be attempted if the ewe has reached day 142 of pregnancy or the doe has reached day 144 (Carroll, 1974). Induction requires approximately 48 hours and will come too late for severely affected animals. Goats, but not sheep, can be induced with prostaglandin (10 mg of Lutalyse®), and kidding or abortion typically occurs in 30 to 36 hours (Bretzlaff and Ott, 1983). Once animals become recumbent and refuse to get up, medical treatment is usually unrewarding and a cesarean section (C-section) is recommended to immediately remove the negative energy drain of the fetuses on the mother.

Abrupt feed changes must also be avoided, and ewes/does should not be stressed during late pregnancy. There must be adequate feeder space so that all animals can fit around the feeders and get their fair share of hay and grain. Producers should strive to have pregnant females in moderate body flesh (condition score of 3+) prior to parturition. Pregnant females should be prevented from becoming obese during early pregnancy, and thin individuals plus yearlings should be separated and receive extra feed until they achieve the desired condition score.

References

Bretzlaff, K.N. and R.S. Ott. 1983. *J Anim. Sci*. 38:1-9

Carroll, E.J. 1974. *Theriogenology* 19(6):849-853

LeValley, S. 2010. Pregnancy Toxemia (Ketosis) in Ewes and Does. Fact Sheet 1.630; Colorado State University.

The Merck Veterinary Manual; http://www.merckvetmanual.com

Forage Brassicas: A Cost-Efficient Option

Steven M. Jones, Associate Professor
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Brassicas are annual crops that continue to grow during the fall and into the winter. They are highly productive, digestible and contain relatively high levels of crude protein and energy. They can be grazed 80 to 100 days after seeding, depending on the species and weather. Turnips, radishes and rape are all fall crops that can produce good forage before cold weather.

Proper grazing management is important to optimize the true potential of these crops. Rotational or controlled grazing can potentially increase forage availability over continuous grazing by more than 50 percent. An increase in forage availability creates additional management options, such as increasing the number of animal units, extending grazing during drought, reduced input costs and time savings. Strip grazing small areas provides the most efficient utilization.

Demonstrations were established on three farms in 2011 to show the benefit of using forage brassicas for small ruminants. These demonstrations were proposed to show practices for extending fall and winter grazing for sheep and goats in Faulkner, Ouachita and Cleburne counties.

Three years of data reveal several recommendations for forage brassicas. Brassicas can be planted with wheat or ryegrass to add more forage. We have com-pared different planting methods over the past couple of years and have found that some methods that work well for planting small grains and ryegrass do not work for turnips. In our experience, broadcasting seed in short grass sod and covering with a tire drag does not work well and planting in October is too late. Turnips and other forage brassicas are best planted by early September on a tilled seedbed or lightly disked. Do not plant the seed too deep. Roll or cultipack the seedbed, broadcast the seed and lightly roll or cultipack to cover the seed. A harrow or field cultivator will likely cover the seed too deep. Fertility management is very similar to that for wheat or ryegrass – about 50 to 60 pounds per acre of N and apply P and K according to soil test for winter annual pasture. Forage turnip leaves do not contain a lot of fiber. It is best to plant them in combination with small grains or ryegrass or limit-graze them to reduce digestive problems in animals that consume too much. Another option is to make hay and/or grain supplement available while transitioning animals to the brassicas. This is particularly important for young, growing animals.

The two forage brassica varieties used in our demonstrations were Appin and Pasja. These varieties are products of Ampac Seed Company. The third brassica variety used was a seven-top, commonly used as a vegetable crop but with a history of being used as a forage crop for small ruminants and in deer food plots in Arkansas. Brassica seeding rate was 5 pounds per acre. In addition to the brassicas, ryegrass was over seeded (22 pounds per acre) on each demonstration farm. Forage analysis averages for each variety is shown in Table 1.

At the time of sampling and the start of grazing (approximately November 1), the ryegrass had not reached adequate forage height to sample or graze. The crude protein and TDN exceed the nutritional requirements for all classes of livestock. Please note that the seven-top was fertilized, while some plots of Appin

Table 1

Forage	CP %	TDN %	DM (acre)	Canopy Height (in.)
Ryegrass	N/A	N/A	N/A	N/A
Appin	27.94	77.45	2,482	12.18
Pasja	31.44	75.30	1,615	11.66
Seven-Top	31.02	78.50	2,049	11.90

Table 2	Farm Location	Actual Cost	Comparison Cost	Total Savings	AU Grazing Days/Acre
	Faulkner	$636.76	$3,742.01	$3,105.25	158
	Cleburne	$10.80	$77.70	$66.90	132
	Ouachita	$49.70	$238.98	$189.28	67

and Pasja were not. Under the same management, the Appin produced 2,992 pounds of dry matter/acre. Remember that these results were achieved in a historical drought year.

To compare the amount of dry matter/acre, we can compare the averages of other forages that would have been available in the same time period based on previous demonstration results. An average bale of hay (4 × 5) will weigh 700 to 800 pounds. Stockpiled bermudagrass produces 2,500 pounds of dry matter, while stockpiled fescue will average 2,000 pounds.

The question is always, "is the practice practical and cost efficient." The cost savings of each farm is presented in Table 2.

Actual cost is the total cost of seed and fertilizer on each farm. Comparison cost is the total cost of hay and grain supplement that would have been fed, if the brassicas had not been utilized. The animal units (AU) grazing days per acre were calculated based on the number, weight and nutrient requirements of animals on each farm.

$$\text{AU grazing days} = \frac{\#\text{AU} \times \text{grazing days}}{\text{acres}}$$

The preliminary results from these demonstrations show that the use of brassicas is a cost-efficient way to produce high-quality forage at a time of year that can be devoid of acceptable grazing. Due to the mild winter and the use of rotational grazing, the forage brassicas have continued to put on vegetative leaf and are still being grazed. The ryegrass is beginning to grow as a result of good moisture and longer day length. Even without the brassicas, the ryegrass will provide high-quality spring forage just in time for the lactating does.

Calendar of Events

March 10, April 14, and May 12-September 10, 2012: **Goat and Sheep Producers Buying Station**, Duckett Farms, 146 Hwy. 174N, Hope, Arkansas. 9:30 a.m. – 2:30 p.m. Contact: Jesse Duckett, 870-703-7321.

April 14, 2012: North Arkansas Meat Goat Association meeting and pasture walk at Critter Ridge near Yellville, Arkansas. Starts at 9:30 AM.

April 28, 2012: Goat Field Day, Langston University; **tgipson@langston.edu**

August 7, 2012: Forage Management Workshop, Quitman High School. Hosted by Arkansas Cooperative Extension Service.

September 8, 2012: Artificial Insemination Demonstration, Langston University; **http://www.luresext.edu/goats/extension/AIregLU09082012.pdf**

October 20, 2012: North Arkansas Meat Goat Association meeting and pasture walk at a member's farm. Starts at 9:30 AM.

November 8, 2012: Goat Field Day

Steven M. Jones

Steven M. Jones, Associate Professor - Animal Science