

KENTUCKY GOAT FRIENDLY PASTURE CONCEPTS

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Goats are accomplished grazers of grass and browse plants. In addition, they can be managed within a grazing system both intensively or extensively as long as quality forage is made available. Goats are facultative browsers, they prefer to feed at eye level and upward and then feed on forage from the top of the plant down. Goats prefer to move freely from plant to plant-removing foliage from select portions of plants. Foliage meals are dictated by quality factors that insure adequate protein and energy levels. Each stem or leaf is clipped with precision leaving the forage residue standing equal in height and lined up in military fashion. Unlike larger ruminants, there is little fouling or treading of forage.

This process of picking and moving to the next plant is a process of nutrient regulation by consuming diverse plant materials. This is reflective of the fact that goats cannot sustain body weight or function on low quality feeds. When the overall quality of the grazing material is average to low, through selection, goats can increase both protein and energy intake by picking from diverse plants and plant parts from within the grazing plane. The reason for the development of this type of feeding behavior is to compensate for a small rumen volume, a high rate of passage of ingested materials and a small fermentation vat.

Goats are easy grazers because of their approach to grazing homogenous pastures. Pastures are grazed from the fence-lines and forward on both the left and right side of the center of the field. Gradually, the goats will graze forward and toward the center of the back portion of the pasture and usually leaving a small area of un-grazed material in the center positioned forward to the point of the initial entry into the field.

Defining Grazing Systems

When defining grazing systems for goats, three important issues must be addressed. First, the grazer must provide the animals with sufficient quantity and quality of forage material. The objective of good forage management in a grazing system should also positively affect internal parasite management. Finally, the dominant forage species must be utilized to the greatest potential and then effectively integrating with annual and/ or perennial forage species.

Quality forages can meet almost all of the goat's nutritional needs regardless of the reproductive state of the female. The most efficient and least expensive means of harvesting and feeding forage crops is by grazing. Permanent and

annual pasture costs will run from \$0.01-\$0.04 / lb of Total Digestible Nutrients (TDN). Energy, TDN is the most limiting nutrient component in Kentucky and if not provided for by forages, must be met by feeding grains, cereals or concentrates. Concentrate feed costs will range from \$0 .05 - \$0.15+ / lb of TDN. (NCSU, Extension Service Publication, 2003)

Why feed goats forages over concentrates? Because they are not cows or sheep and do not respond well to concentrate feeding. Goats are very effective ruminants and can consume as much as 5% of their body weight in forages. At the same time, they are poor assimilators of concentrate feeds. In general, they have a poor rate of gain (.12 - .92 lbs / day, averaging 0.52 lbs / day for bucks on test) together with a poor feed efficiency (5.1 – 12.5 lbs of feed / lb of gain, averaging 7.1 lbs of feed to 1 lb of gain) for a 16% protein and a 60% TDN concentrate buck test ration (Langston Univ. 2003). Furthermore, feeding concentrates may cause metabolic disorders resulting in disease. Diseases that are particularly problematic and many times result from concentrate feeding are acididosis, ketosis, thiamine deficiency, urinary calculi and obesity.

Profit or lose in the meat goat business is hinged on the cost of maintaining the breeding herd and the average number of kids weaned per breeding female. Beyond these two factors, little else has a great impact on profit or loss. Selecting for greater rate of gain and improved feed efficiency will affect profitability over time but these traits are not fundamental to profitability. Therefore, goats that consume high levels of forages are more profitable for meat farmers than goats fed concentrates (UK Goat Budgets).

Goats grazing homogenous or mixed forages should have a daily allowance of 5-8% of body weight. If allowance is set at 5% of body weight, allowance must be increased as animals increase in weight. Where as allowances of 8% allows a greater degree of flexibility but with less efficiency. Rotation residence time should be set at a maximum of 18 days. Seven to 14 day residence time is reasonable. Residence time and rotation sequence should be determined by forage growth rate and quality factors. Secondly, forage residues should be a minimum of 5 – 6 inches in height in order to reduce internal parasite larvae intake.

Internal parasites are the number one disease problem in goat production in Kentucky. Stomach worms in the family Trichostrongylidae are the leading cause of death in the Kentucky goat population (Animal Disease Diagnostic Laboratory, Newtown Pike, Lexington, Kentucky, 2003). Anthelmintics, or deworming agents, once thought to be the answer to all internal parasite problems are now part of the problem. Due to dependency and over use of these drugs, internal parasite resistant has developed in all small ruminant-producing regions of the world. This statement was recently made by Dr. Ray Kaplan, Veterinary Parasitology, University of Georgia, 2003, "It is quite likely that any new technologies or developments in internal parasite control will be less effective

than chemical control has been prior to emergence of drug resistant internal parasites...Unless we dramatically change the ways we use anthelmintics, there may be no effective anthelmintics remaining.”

One of the most important tools in the arsenal against internal parasites is pasture management through rotation and residual height management. One effective, yet simple method is to divide pasture fields in to smaller grazing paddocks and move goats away from manure on a 7 – 18 day bases. Rotations should be less than 21 days from the day of entry.

Secondly, use annual and perennial crops to break-up dominate permanent pastures. In general, permanent pastures promote internal parasite build-up. Therefore, in order to escape infested pastures, clean pastures should be established near or within the dominant pasture base. These breaks in permanent pasture use gives rise to internal parasite load reduction through time, exposure to sunlight and drying conditions. Furthermore, alternative management techniques such as graze pasture behind goat with non-infective species such as horses or cattle are another means of reducing parasite populations. Likewise making hay behind goats helps in removing infective larvae. Finally, off site, or off farm grazing or browsing of brush, forbs and weeds is always beneficial to the farm by allowing time for egg numbers to decline before returning to the farm.

The dominant forage species for Kentucky is KY 31 Tall Fescue. Tall fescue can be found on 6 million acres in Kentucky. In order to utilize the fescue to the fullest extent possible, both quality and quantity levels need to stay high. Tall Fescue in the early part of the year, April 15 – July 1 is capable of supplying nutrition to goats at any state of reproduction. Similarly, the second period of growth comes in late fall November 1 – December. Integrating alternative species into the fescue pastures can provide high quality forages during dormant fescue periods.

Farm forage resources should reflect soil capabilities, topography of the farm as well as desired management intensity of the farm manager. Use soil map information to identify blocks within the farm offering various potentials for forage production. The following lists of forage blocks may assist in identifying potential resources.

1. *Block 1 – winter annuals* – Winter annuals are crops planted in the fall and harvested by grazing in the spring. Winter annuals can support does that have kidded and lactating. If body condition drops more than 1-point (on a 1 – 5 scale) additional grain, .5 to 1 lb/head/day can be fed. Ideal body condition for lactating does should be 2.5 – 3.0. Energy supplementation becomes more important with multiple births. Some examples of winter annuals for Kentucky are small grain pastures and annual ryegrasses.

2. Block 2 – browse plants - Goats by nature are browsing animals. Goats would prefer browsing to grazing. Many Kentucky farms have become overgrown with small trees, brambles, brush and assorted woody plants. Such conditions are often found where mowing is difficult due to slope and rock outcrops. Goats can be moved from small grain pastures into browse areas as soon as full foliage has accumulated on the woody plants. If only 1/3 to 1/2 of the foliage is removed during a single grazing season, the plant will respond with abundant re-growth the following year. On the other hand, continuous defoliation and barking will eliminate the plant. As the goats establish grazing boundaries and allies between woody plants, grasses will return to these areas and cattle and sheep can effectively utilize these areas together with the goats.
3. Block 3 – perennial pasture grasses – Internal parasite egg and larva loads are generally high on perennial pasture grasses during the spring of the year. While goats are grazing winter annual pastures and/or browse plants, cattle can graze the spring pastures thus cleaning the parasites from the second growth. Secondly, hay can be harvested from perennial pasture thus eliminating the majority of internal parasites prior to grazing by susceptible goats. Summer pastures are adequate for dry does, but growing animals should be supplemented with an energy and protein.
4. Block 4 – summer annuals – Summer annual crops are planted in the spring and harvested by grazing or by making hay or silage. Soybean, corn, sunflower, pearl millet and Sorghum Sudan hybrids are all potential choices. Taller crops like corn or Sorghum Sudan hybrids should be allowed to get twelve inches above the heads of withers or doelings before grazing. Once grazed to desirable height, grazers should be rotated forward allowing 10-20 days for regrowth. First grazers may be lightweight market animals followed by dry does or cows. Leaving a 6 to 8 inch stubble height will reduce internal parasite uptake due to grazing height separation.
5. Block 5 – perennial legumes – Perennial legume crops can be harvested two, three sometimes four times per season. Legumes like alfalfa, red clover and Sericea Lespedeza can be used effectively within a goat-grazing plan. Alfalfa and red clovers, cool season legumes are earlier than Lespedeza, therefore, spring born nursing juveniles can graze ahead of their mothers by passing through creep gates into fresh legume pasture. Lactating does having limited access to pasture, subdivided by electric fencing and are forced to clean up the legumes. Alfalfa stands can be thinned if the crop is not harvested to crown level. The next growth can be harvested for hay followed by a second grazing period for weanling market animals and replacement doelings. It is important to note that dry does or bucks should be used only as clean up grazers otherwise they will become fat resulting in reproductive health problems.

Sericea Lespedeza is a warm season legume with a high potential for goat production. Sericea can be grazed and/or harvested for hay. Harvest should begin once the crop has reached 15 to 20 inches in height. A 4-inch stubble should be left to insure proper re-growth. Sericea can be harvest 2-3 times within a season. Winter annual cereals, clovers and vetch can be over-seed into the crop in the fall for early spring grazing. Sericea can also be used for interseeding standing perennial grass pastures. Sericea Lespedeza can be established on soils and slopes known to be undesirable for clovers and alfalfa.