

Station #5 Nutrition, Pastures and Feeds (Seniors Only)

Nutrient Requirements of Goats by: Jean-Marie Luginbahl

The goat is not able to digest the cell walls of plants as well as the cow because feed stays in their gastrointestinal tract for a shorter time period. A distinction as to what is meant by “poor quality roughage” is necessary in order to make decisions concerning which animal can best utilize a particular forage. Trees and shrubs, which represent poor quality roughage sources for cattle, because of their highly lignified stems and bitter taste, may be adequate in quality for goats. Goats will avoid eating the stems, but don't mind the taste and will benefit from the relatively high levels of protein and cell soluble in the leaves of these plants. On the other hand, straw, which is of poor quality due to high cell wall and low protein, can be used by cattle but will not provide maintenance needs for goats because goats utilize the cell wall even less than cattle. Goats must consume a more concentrated diet than cattle because their digestive tract size is smaller relative to their maintenance energy needs. When the density of high quality forage is low and the stocking rate is low, goats will still perform well because of their grazing behavior, even though their nutrient requirements exceed those of most domesticated ruminant species. Total digestible nutrients (TDN) and protein requirements to the chemical composition of feeds shown in Table 1 should give producers an idea of how to match needs and appropriate forages. For comparison, low quality forages have 40 to 55% TDN, good quality forages have from 55 to 70% TDN, and concentrates have from 70 to 90% TDN.

High quality forage and/or browse should be available to does during the last month of gestation and to lactating does, to developing/breeding bucks, and to weanlings and yearlings. Female kids needed for reproduction should be grazed with their mothers during as much of the milk-feeding period as possible and not weaned early. When the quality of available forage and browse is limited or is of low quality, a concentrate supplement may be considered to maintain desired body condition, depending on cost: benefit. Whole cottonseed makes an excellent supplement for goats when fed at no more than 0.5/lb/head/day. Dry does and non-breeding mature bucks will meet their nutritional requirements on low to medium quality forage (10-12% protein and 50-60% TDN). Providing free choice of complete goat mineral or a 50:50 mix of trace mineralized salt and dicalcium phosphate is advisable under most situations. Selenium is marginal to deficient in many areas. Therefore, trace-mineralized salt or a complete mineral mix containing selenium should always be provided to the goat herd year around. It is sometimes advisable to provide a mineral mix that contains 20-25% magnesium oxide to reduce the risk of grass tetany when heavy milking goats are grazing lush small grain or grass/legume pastures in early lactation. Copper requirements of goats have not been definitively established. Growing and adult goats are less susceptible to copper toxicity than sheep, however, their tolerance level is not well known. Young, nursing kids are generally more sensitive to copper toxicity than mature goats, and cattle milk replacers should not be fed to nursing kids. Mineral mixes and sweet feed should contain copper carbonate or copper sulfate because these forms of copper are better utilized by the goat than copper oxide.

Suggested Supplemental Feeding Program for Goats

When goats are raised on browse, abundant forage should be made available to allow goats to be very selective and to ingest a high quality diet that will meet their nutritional requirements. When forage or browse is limited or low in protein (<10%), lactating does (and does in the last 30 days of gestation) and developing/breeding bucks should be fed 1.0 lb/day of a 16% protein mixture (77:20:2.5:0.5 ground corn: soybean meal:goat mineral:limestone). Alternatively, ground corn and soybean meal can be substituted by whole cottonseed for lactating does. Low to medium concentration of protein (>10%) will meet requirements of dry does and non-breeding bucks. When forage of browse is limited or low in protein (<10%), weanlings and yearlings should be fed ½ to 1/0 lb/day of the 16% protein mixture. Goats can be forced to eat very low quality feed including twigs, tree bark, etc., but producers should be aware that this practice will hurt the productivity of superior meat and fiber goats.

Grazing Management for Goats

Grazing of forage generally provides the least expensive way of supplying nutrients to animals. Therefore, it is advantageous to develop a year round forage program which allows for as much grazing as possible every month of the year. However, good pasture management involves much more than simply turning the animals to pasture. The principles of controlled grazing of goats or sheep are similar to those used for cattle. The primary goal is to have control of the animals' grazing pattern so that one can dictate the degree of defoliation and the frequency of defoliation. To obtain efficient animal production over a number of years, the needs of the plants as well as the needs of the animals must be taken into consideration. The development of a successful forage systems/grazing management entails:

1. Adjusting the number of animals grazing a certain area (stocking density) of pasture because some forage must be left at the end of the grazing period to maintain adequate plant production. Otherwise, overuse will weaken the plants and regrowth will be slower. Adjusting the stocking rate requires experience because forage growth is not uniform throughout the year or from year to year.
2. Harvesting ungrazed forages as hay or silage at an immature stage of growth when forage growth is more rapid than it can be grazed. This will provide high quality feed when grazing is not available. Cross fencing will keep animals concentrated on small areas while excess growth accumulates on other paddocks. Under those circumstances, short duration rotational grazing through a series of paddocks, or strip grazing a rapidly growing pasture by allowing animals access to only enough forage to carry them for one day using movable fence, are alternatives to consider.
3. Overseeding grass pastures with legumes, ryegrass, small grains, or brassicas to extend the growing season and to provide some high quality feed during the winter and spring.

4. Restricting the use of high quality forage, when in short supply, for the supplementation of other low quality pastures, hay or silage. This can be achieved by letting goats graze high quality forage a few hours at the end of each day, or by grazing the limited high quality supply every other day.

When the aim is to kill or reduce the amount of unwanted vegetation, then greater severity and frequency of grazing is necessary. Goats will actively select major weeds at particular stages of growth. As a rule, effective control of unwanted vegetation can be achieved in two years. Therefore, the advantages of the goat in feeding strategy must be weighed against its disadvantages. Being a browsing animal, the goat stunts tree growth and prevents the regeneration of forests and thus should be managed carefully in areas desired for forests. Goats could be very useful, however, in areas where regrowth of brush and trees is not desirable.