

Supplemental Winter Feeding of Goats

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When deciding what to feed and how much to offer your goats this winter, it would be useful to remember that goats evolved over time and place as forage-consuming animals. For centuries they maintained and reproduced themselves on browse, forbs, “weeds”, and pasturage without added grain, protein, or minerals. Doubtless mortality was high and productivity low but...they did survive.

In recent times, as goat prices have improved, goats are being selected and managed for increased productivity (kidding at younger age, more twinning, larger birth weights, greater milk production and heavier weaning weights per day of age). Gains in productivity are made only through better genetics and/or superior nutrition. Theoretically superior nutrition throughout the entire year can be achieved in the South via year round grazing or by a combination of grazing and preserved forage (hay, silage, or stockpiled grasses). In the real world, however, most goat owners find they must provide, in addition to forages, some supplemental dietary protein and/or energy and/or minerals during the winter period of 90 to 120 days.

Accordingly, owners must be knowledgeable enough to provide the required supplements in the most economical ways. Overfeeding, underfeeding, improper ration composition, and overpriced feeds all increase feed cost per head, thereby decreasing net profit per enterprise. Inherited wealth or a well-employed and understanding spouse are required to sustain cash flow deficits. If you have neither, either heed this information or consider selling out in the interest of domestic tranquillity.

Nutrient Requirements of Goats

All breeds (and crosses), sexes, and ages of goats require the same basic nutrients: protein, energy, minerals, vitamins, and water. The daily diet must contain adequate protein because no other nutrient can substitute for it. On the other hand, energy needs may be met with dietary carbohydrates (starches and/or fiber) or fats or even from excess protein. Nutrients are required by the goat for maintenance, growth, pregnancy, milk production and fattening.

Maintenance requirements are used for basal metabolism (maintain body temperature and support vital functions) and

for physical activity. The daily maintenance requirements may range from 50 to 100% of total daily nutrient requirements, depending on whether the animal is also growing, lactating, gestating, or fattening. Maintenance requires much more energy than protein; contrarily, growth and pregnancy (particularly the last 6-8 wks) require more protein than energy. Lactation requires large quantities of both protein and energy, while fattening requires much energy but little protein. Purposefully fattening a goat is uneconomical in two ways: first, it takes 2.25 times as much feed to put on a pound of body fat as it does to put on a pound of muscle (protein and water) and, secondly, the current market discriminates heavily against overly fat goats. Muscular, well-conditioned goats are desirable; excessive external and internal fat is a no-no.

The daily needs of protein and energy for goats may be expressed in actual quantities of crude protein (pounds C.P.) and energy (pounds of total digestible nutrients— or TDN) by adding up the amounts needed for maintenance, milk production, etc. Alternatively, daily protein and energy needs may be expressed as percentages of the daily feed intake (on a dry matter basis). To illustrate: a two year old, growing, milking doe weighing 90 lb would require about .55 lb of protein and about 3.2 lb of TDN per day. Assuming a typical dry matter intake per day of 4.5 lb, her ration would need to be about 12% protein ($.55 \div 4.5 \times 100$) and about 71% TDN ($3.2 \div 4.5 \times 100$), dry matter basis.

Using research results and long-term producer experiences, including my own, I have calculated the requirements shown on next page (Table 1). Readers should understand that these figures are approximate. Anyone telling you he possesses precise, accurate figures for goat nutritional requirements or for infallible feeding recommendations bears close watching—he has already lied to you once. With this warning in mind, I now illustrate representative age/sex requirements.

As is evident, the size of animal, its rate of growth and whether it is pregnant or milking, singly and collectively influence the nutritional needs of the goat. Goats tend to “eat to appetite”, taking a wide array of feedstuffs of varying dry matter, protein, energy, and mineral contents. Total

Table 1. Dietary Protein, Energy, and Mineral Requirements of Goats¹

Class of goat	Ave. feed intake/day, lb ¹	% Crude Protein	% TDN	% Ca
Growing doeling, 45 lb ^a	2.4	8.8	56	.38
Growing male kid, 66 lb ^b	2.9	9.0	57	.33
Yearling doe, 90 lb ^c	4.6	10.0	56	.33
3 yr old doe, 110 lb ^d	5.0	11.7	69	.48
Mature buck, 220 lb ^e	5.3	9.0	55	.29
Dairy doe, 150 lb ^f	7.5	11.6	71	.48

¹Calculated on basis of the dry matter in the feeds eaten.

^aGrowing at the rate of .25 lb/day

^bGrowing at the rate of .33 lb/day

^cYearling female, last trimester of pregnancy and growing

^dMilking 2 qt/day-enough for twins

^eNot gaining wt, moderate activity

^fNubian, milking/gallon/day of 4.0% bf

intake of feed dry matter/hd/day ranges from 3.5 to 5.5% of body weight with 4.5% being typical. Total dry matter intake/hd/day is influenced by the nutritional needs of the goat and by the qualities (digestibility) of the feeds eaten. Moreover, higher quality feeds are generally more palatable, thus promoting even higher intake. Conversely, goats may try to eat larger quantities of lower quality feeds in order to obtain sufficient nutrient intake. There is a limit to this compensatory action, however, and poor performance will surely result from sustained poor feed quality. Wise owners recognize that, contrary to popular belief, goats cannot create meat and/or milk out of po-ass feeds. The merely ignorant can, with diligence, expect to triumph over this lack of information; for those more mentally challenged, a quick exit from goat ownership is quite likely.

But, I digress...I have found it practical to lump certain animals into broad categories in order to simplify nutritional

decision-making and reduce numbers of feed mixtures; see Table 2 on next page.

The differences in protein and energy between these categories may seem rather small to you, but they can have measurable adverse consequences on your goat's performance. The uninformed may blame such sub-par performances on poor genetics or poor health for what is, in point of fact, poor feeding practices by the owner.

During the warm season grazing period, goats will very likely meet all their nutritional requirements from whatever combination of forages is available; only a trace mineralized salt and possibly some phosphorus would be needed in addition. However, during late fall and through the winter, forages decline precipitously in quality and quantity. Thus, supplemental protein and energy will very likely be necessary to maintain satisfactory performance. (This is not

Table 2. Practical Dietary Recommendations for Feeding Goats

	% Protein	% TDN
Growing kids, dry does and bucks	9-10	54-58
Pregnant goats	10-11	56-60
Lactating goats	12-13	62-68

true, of course, if you provide a few hours of grazing daily on ryegrass or small grain pastures.)

In practical terms, successful goat owners have found that adequate winter rations may consist of dry grasses, hay and a commercial protein source. In my own operation, I find that offering Bahiagrass and/or Coastal Bermudagrass hay ad lib plus 1 lb of 20% protein pellets daily will be adequate for pregnant and early lactation goats, Dec/Jan/Feb. My grass hays are usually low (6-8%) in protein; if they were in the 10-11% range, I would either change to a 16% protein pellet or perhaps cut the 20% pellet amount down to 3/4 lb/day. Overfeeding protein is economically unsound. It is also physiologically impossible because the goat's liver will turn all excess protein into energy and urine ammonia—ergo, the phrase, *peeing away your money*, is particularly appropriate here.

Ad lib feeding hays with protein levels in the 12-13% range would furnish adequate protein, but lactating does would probably respond favorably—and economically so—to some additional energy, say, 1/2 to 1 lb of corn/hd/day, while pregnant does could likely do well on 1/4 to 1/2 lb/hd/day.

Feeding hays (ad lib) with protein levels of 15-18% such as alfalfa or peanut or grass/legume mixtures is unnecessary. It will not hurt the goat, particularly if she has an adequate, relatively high phosphorus mineral mix available; however, it is usually cost prohibitive. I have successfully fed peanut hay (14-15% CP) and grass hay on alternate days plus a 1/2 lb of corn for pregnant does and 1 lb for lactating does. Do not feed these hays simultaneously because erratic protein intake will result.

For kids 3-6 months of age, I use a lb or so of 16% protein feed plus grass hay; for older kids, including those in early

pregnancy, I prefer a lb or so of 14% protein feed. I admit to probably overfeeding doe kids, but I get them bred to kid (without problems) at 12-14 months, and I seem to regularly get +50% twins, so...it works for me.

It is easy enough to talk about optimum feeding of goats, but the reality of finding the needed supplements in the proper form in your area maybe something else again. For kids, I prefer a small pellet (3/16 inch) or coarse ground mixes; for older goats, a 3/8 inch pellet is about right. The 5/8 or 3/4 inch cattle pellet is too difficult for goats. If you need a commercial 20% protein feed but can get only a 15 or 16% feed, you can either feed a fourth more feed (in order to get adequate protein intake) or top dress the 16% feed with 1/4 lb or so of CSM (41% protein). Or, you could possibly find a feed miller willing to make a custom 20% protein feed, most probably in an unpelleted form (perhaps at higher cost due to small batch size).

To summarize, let us assume you have segregated your herd into practical groups according to their nutritional needs; further assume you have the correct protein supplements (content and form). The remaining difficulty then is: how do you manage the groups to “insure” that each individual gets its fair share? It is not easy.

Putting out hay daily in racks or bunks (or, less satisfactorily, on more or less clean ground) is readily done, though sometimes sinfully wasteful, depending on physical design of the feeders. I have found one linear foot/goat to be sufficient space (if feeding hay ad lib). Having two or more separate racks is helpful—makes it more difficult for the boss goats to boss.

Feeding restricted amounts of protein/energy supplements is not easily done even when adequate total trough space (12

linear inches/hd) is available. Gracious, equitable sharing is simply not a caprine characteristic; greed, aggression, and sheer size conspire to “cheat” the more civil and/or smaller goats. What to do? You cannot build enough troughs or scatter them far enough—forget that.

Pouring pellets or corn on the ground at a high lope offers some hope but encourages parasitism and waste and occasionally endangers the pourer. I have put pellets in (hanging) vee troughs with goats locked out. I open the gate, avoid the rush, and then wait until the timid ones congregate near or outside the gate. Then I offer them pellets in other nearby vee troughs on the ground. A few still will simply not get their share, but if they survive and do reasonably well, I brag on them as easy-keepers as I look for buyers.

I have also tried a self-fed supplement, e.g., 80-85% CSM, 5% calcium carbonate and salt—use 10% salt initially and later up it to 15% to limit their intake to an average of 3/4 lb/hd/day. This amount will supply about 1/2 lb of protein which is close to half of the daily protein need (the other half comes from hay and/or standing forage). This works fairly well and may be economical unless CSM is unusually expensive.

Of course, self-fed, “complete” feeds solve the problem of equitable intake. One can offer ad lib a blend of hay or hulls, corn, CSM, and minerals (and possibly molasses for palatability and dust control). Your goats will do wonderfully well while your spouse will find it ever so convenient to feed. It will be less easy to pay for.