OPTIMUM UTILIZATION OF ALFALFA IN HORSES

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When considering forage utilization in horses one must consider principally two factors; 1) forage quality and 2) the relationship between voluntary intake of a forage and a particular class of horses nutrient needs.

Forage Quality

Factors to consider in terms of forage quality for horses are little different than those to consider for any specie of livestock. Of critical importance is stage of maturity of the crop when cut or grazed. More than any other one factor maturity affects how useful alfalfa hay is as a source of nutrients for the horse. Table 1 shows the dramatic effect that maturity has on digestible energy and protein. Ideally, alfalfa should be cut at the very early bloom stage, less than 10% of the plants in bloom. This will serve to produce the optimum balance between forage quality for the horse and forage harvested per acre.

Table 1. Effect of maturity on energy and protein value of alfalfa hay.

<table>
<thead>
<tr>
<th>Stage of Maturity</th>
<th>Digestible Energy (Mcal/kg)</th>
<th>Crude Protein %</th>
<th>Digestible Protein %</th>
<th>TDN %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Bloom</td>
<td>2.42</td>
<td>17.2</td>
<td>13.4</td>
<td>55</td>
</tr>
<tr>
<td>Mid-Bloom</td>
<td>2.29</td>
<td>16.0</td>
<td>11.6</td>
<td>52</td>
</tr>
<tr>
<td>Full Bloom</td>
<td>2.16</td>
<td>15.0</td>
<td>10.1</td>
<td>49</td>
</tr>
</tbody>
</table>

In addition to maturity, several other factors which are components of the definition of "horse hay" should be considered. They are: 1) Freedom from mold. Because of stem size, legumes are characteristically more difficult to cure properly than are grasses. For hay to be marketable for horse feed it must not contain mold. This may in more humid areas necessitate the use of preservatives. 2) Leafiness. Obviously as leaf content increases nutritive value of the forage increases, however, skill is needed to bale hay that will not result in either shattering of leaves or molding of the hay. 3) Freedom from weeds and debris. Simply a matter of attention to detail in the production of any forage crop; and, 4) Color and aroma. A function of not getting a rain post cutting, adequate curing time and not allowing severe sun bleaching.

Voluntary Intake vs Nutrient Needs

Horses may be expected to consume from 2 1/2 to 3 percent of their body weight per day in dry matter. (For example, a 1200 lb mare could be expected to consume 30-36 lbs of dry matter/day).
The greater the nutrient density of the feedstuff consumed, the smaller the amount which must be consumed in order for the horse to meet their nutrient needs. This fact further emphasizes the importance of maturity with respect to suitability of hay for horses.

There are several factors which may affect either voluntary intake or ability of the horse to consume adequate forage to meet their nutrient needs. As stage of pregnancy increases, voluntary intake of forages decreases and nutrient needs increase. Because of high nutrient needs, the horse at high work intensity, the lactating mare and the young rapidly growing horse probably are not able to consume adequate amounts of forage to meet their nutrient needs.

Based on the above points, one may assume that the mature horse at maintenance, and light work, the stallion, and the pregnant mare may meet their nutrient needs with good quality hay alone.

Utilization of Alfalfa Hay in Feeding Programs

To facilitate more understanding of the information presented, horses will be discussed by age and productivity status. Also, we will assume that the alfalfa hay is 14% protein and contains 1 Mcal of DE per lb.

1) Mature Horses - Mature horses, at maintenance, may generally be expected to meet their nutrient needs by feeding of good quality pasture or hay alone. For example, the 1,100 lb. mature horse requires \( 17 \text{ Mcal of DE/day} \). Alfalfa is 1 Mcal DE/lb therefore \( 17:1 = 17 \text{ lbs of hay/day} \) needed to meet the horses requirement. 17 lbs is only 1.5% of 1,100, so obviously the horse would be able to consume adequate quantities of hay to meet his needs. From a practical standpoint, allowing the horse 2% of his body wt/day should serve to meet his nutrient needs while allowing for possible wastage.

2) Pregnant Mares - 1,100 lb. pregnant mares (a pretty good average mare of light horse, i.e. Q.H. TB etc., breeds) requires \( 19 \text{ Mcal of DE/day} \) during the final 90 days of gestation. Based on the assumption that a mature horse may consume 3% of their body wt. per day in hay, one would think that hay alone could be used to meet the pregnant mares nutrient needs. However, from a practical standpoint, most producers would elect to feed 5-8 lbs. of a good quality grain mix plus liberal quantities of hay. This is wise from several respects, first as the growth of the fetus progresses the mare is able to consume a smaller quantity of hay due to her body capacity and second, if, in late gestation a mare is allowed to gain some weight rather than simply meeting her nutrient needs then she will probably maintain better condition during lactation and rebreeding efficiency will be improved. Therefore,
allowance of 20 lbs of good quality alfalfa hay plus 5 lbs of grain mix containing 12% protein should meet the pregnant mares nutrients needs for maintenance, pregnancy, and some weight gain.

3) **Lactating Mares** - Energy & protein needs of the lactating mare are substantially greater than those of the mature horse at maintenance and the pregnant mare. The recommendations of the National Research Council relative to the feeding of the lactating mare are to feed a ration that is 60% hay or forage and 40% concentrate. In most instances, nutrient needs of the lactating mare can be met by feeding 10 lbs. of a good quality 13% protein grain mix plus liberal quantities of good quality alfalfa hay. Again it may be possible to meet the lactating mares requirement by feeding good quality hay alone, however, to avoid weight loss during this period of nutrient need it is probably advisable to feed the indicated amount of grain plus hay.

4) **Young Growing Horses** (weanlings) - Because of the high protein content of alfalfa hay, when compared to grass hays as well as some of the other legume hays commonly fed to horses, it is of particular value in feeding programs for young horses. The protein requirement of the weanling as a percent of the total ration is 14.5%. If a concentrate mix containing 16% protein plus alfalfa hay is fed then the young horse's protein requirements are met nicely. Weanling rations should be fed such that 65% of nutrient intake is provided by the grain mix and 35% from forage although more utilization of forage is possible when a particularly high quality forage is being fed. From a practical standpoint, one may feed alfalfa hay free choice plus 1.5% of the weanlings body wt/day in concentrate and meet their nutrient requirements. **Yearlings** can be fed in much the same manner as weanlings with more reliance on the forage fraction of the diet. This is due to greater G.I. tract capacity of the yearling allowing consumption of more forage as a percent of their body wt.

5) **Performance Horses** - One of the major areas in which alfalfa may effectively be used is in feeding programs for horses in training. Due to palatability, greater energy value and soluble carbohydrate content of alfalfa when compared to other forages, alfalfa is a good forage, hay, for performance horses. Alfalfa may be fed in liberal quantities either mixed with grass hay or alone in addition to the performance horses grain allowance.

**Some Points of Interest**

1) Many horsemen still object to alfalfa hay because of the traditional view that it is "hard on a horses kidney's". There is no scientific evidence of renal impairment from feeding alfalfa hay. Certainly now the more progressive
2) Consider a 70-30 alfalfa-grass mixture. I consider this to be a particularly ideal horse hay in free choice feeding systems. Grasses which lend themselves to mixing with alfalfa for the production of horse hay are Timothy, Orchardgrass and Bromegrass. Many horsemen prefer this type of mixture to straight alfalfa and from a management standpoint it is easier to feed. When put up properly, alfalfa-grass hay makes very good horse feed and should be quite marketable.

3) Don't price yourself out of the market. It is foolish to expect a man to pay more for a lb. of TDN from alfalfa than he pays for the same from oats or a complete feed.