Horses were born to eat grass and how they evolved has allowed them to be efficient users of a high forage diet. In fact, for many of today’s horses, they will survive and thrive on an all forage diet.

When you compare a horse owner to someone raising other classes of livestock, there are some definite similarities, but also some striking differences. It is in the differences and similarities that you find the opportunities and challenges related to the use of pastures by the horse owner. While both can and do use pasture as part of their feeding programs, the horse owner is often more willing to use supplemental feeds and not rely on pasture as a major nutrient source. In years past, many speakers at the Heart of America Grazing Conference have talked at length how they want to maximize pasture and reduce or remove any reliance on stored forage in their livestock operations. For the horse owner, using pasture does provide an opportunity to reduce their need for stored or purchased forage supplies. However, the challenges they face to do this are reflected in the production goals they have, the availability of pasture land and the other resources required to maximize grazing opportunities.

For a moment, consider the opportunities. The many forage species that will grow in this 5 state area can provide significant amounts of feed. While a Bluegrass pasture may produce approximately 2 tons of dry matter per acre, some of the other cool season forages properly managed, can provide up to 4 tons of dry matter and if a legume is added, these yields can easily be exceeded. The total forage available will provide adequate nutrients to meet the nutrient needs of many classes of horses. The nutrients provided by some of the common forages can be seen in Table 1. In addition to the nutrients listed in Table 1, the nutrient requirements for a mature horse at maintenance are also listed. It should be noted that for the mature horse at maintenance, quality pasture can meet the horse’s nutrient requirements and in some cases, exceed them. Researchers have demonstrated that using a combination of both cool and warm season grasses in pasture, the forage produced was able to provide nutrients needs to sustain adequate growth rates of yearling horses (Rouquette et al 1985). The yearlings grazing Bermuda grass pasture were fed a concentrate mix that did increase the horse’s daily gain, however the pasture only horses had growth rates that were 0.50 kg/day which is considered to be a moderate growth rate by NRC ’89 standards. In a similar study with yearlings fed concentrate to increase energy intake the horses fed the greatest amount of concentrate did out perform the pasture only horses but the differences were related to daily gain as there was no difference in any of the skeletal measurements (Hansen et al 1987). The difference in growth rate was due to a greater energy intake but the pasture only horses did perform at an acceptable level indicating that a good quality pasture with an adequate yield can meet the nutrient needs of a growing horse.
Table 1. Nutrient Composition of Common Pasture Forages versus Nutrient requirements of Mature Horse at Maintenance.

<table>
<thead>
<tr>
<th>Forage Typea</th>
<th>Dry Matter %</th>
<th>DE Mcal/lb.</th>
<th>Crude Protein %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kentucky Bluegrass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetative</td>
<td>31</td>
<td>1.44</td>
<td>17.4</td>
</tr>
<tr>
<td>Mature</td>
<td>42</td>
<td>1.12</td>
<td>9.5</td>
</tr>
<tr>
<td>Orchardgrass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetative</td>
<td>23</td>
<td>1.44</td>
<td>18.4</td>
</tr>
<tr>
<td>Mature</td>
<td>35</td>
<td>1.06</td>
<td>8.4</td>
</tr>
<tr>
<td>Ladino Clover</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetative</td>
<td>19.3</td>
<td>1.14</td>
<td>25.8</td>
</tr>
</tbody>
</table>

Horse Requirementsb

<table>
<thead>
<tr>
<th>Maintenance</th>
<th>DE Mcal/lb</th>
<th>Crude Protein %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.90</td>
<td>8</td>
</tr>
</tbody>
</table>

a Maximizing the Value of Pasture for Horses ID167. K.D. Johnson
M. A. Russell Purdue University Cooperative Extension Service.

In the case of broodmares that are commonly maintained on high forage diets it has been reported that open mares will have reasonable reproductive efficiency on a pasture only system but when the stress of lactation is included native pasture may not be of sufficient quality or quantity to meet the horse’s nutrient needs to have acceptable reproductive efficiency (Gibbs and Davison 1991).

For many livestock producers the use of alternative forages to extend or provide addition grazing is a common management practice. However for the horse owner the use of annual cereal crops such as wheat or oats is generally not an option due to limited access. If however that access is available grazing crops such as wheat can be effective. Webb and co workers (1993) reported daily gains ranging from 0.5 – 1.0 kg/day for horses grazing winter wheat. The young horses gained the least amount of weight while the older horses gained 1.00 lb/day. A concern with this is the horses may be gaining too much weight and owners would need to control access to forage such as wheat pasture to prevent problems associated with over weight horses.

Can horses be raised to today’s standards with pasture being a significant source of nutrients? Based on the research just discussed the answer clearly is yes. Why do horse owners still rely on purchased feed supplies to supply nutrients to their horses? In many cases it is because many of today’s horse owners have horses for other reasons such as sport and recreation rather than considering their horse operation a production unit. While there are many farms with the acreage and horse numbers to be a production unit and that is what they are, there are those that have small acreages and a small number of horses. It is with the small operation that the opportunities and challenges related to pasture are the greatest.

What are the opportunities? The biggest opportunity is the ability to grow high quality forage in abundant amounts even on a small farm. By taking advantage of advice related to species selection, seeding rates, fertilization and other agronomic practices
Horse owners can have productive pastures that will meet their needs. There are challenges associated with this, as many owners lack the necessary resources to implement all that is suggested to them. Larger producers may have the equipment available and expertise to manage their pastures taking advantage of the many pasture options. For many keeping their horses on small acreages equipment may not be available and there may be a need to have many activities done by a custom operator. While this can be effective there are times that getting the operator to come to the farm at the correct time is a big challenge.

The opportunities exist but what other challenges does the horse owner face? In general it is the horse. It is commonly recommended that horse owners have a minimum of 2 acres of pasture for each adult horse. Under normal growing conditions, this amount of pasture should produce sufficient forage to meet the horse’s nutrient needs. Horse owners can, however, reduce this acreage requirement slightly by using good grazing management. The challenge is to encourage horses to use more of the available forage and reduce spot grazing. The most effective practice to accomplish this is to use a rotational grazing program.

The rotational grazing system needs to be based on the concept of moving the horses based on forage availability. Grazing is started when there is at least 6-8 inches of available forage and then horses would be moved to the next pasture when they have grazed the area to an average of 3-4 inches. This allows the forage to have reserves for re-growth and while it does not eliminate selective grazing it can help to reduce it. The rotational system provides opportunities to better use the available forage and can in most situations extend the grazing period. This extension the grazing time can significantly reduce the amount of hay that is needed. For many horse owners that may not be the most critical reason for practicing a rotation system but the improved stand vigor or the fact that grass is left at the end of the season can be very important. In a demonstration at the University of Kentucky over a summer grazing period, two mature horses were maintained on a 2.3 acre pasture divided into 3 separate paddocks. The horses were rotated every 14 days which resulted in 14 days of grazing followed by 28 days of rest for each paddock. The horses grazed from mid-May to mid-November, and during this time, maintained body weight and body condition with no supplemental feed. When the horses were moved from pasture, there was 5-6 inches of forage still on the pasture. There was evidence of lawns and roughs in the paddocks but it was limited. It is important for horse owners to leave at least 3-4 inches for forage when they rotate the horses out of the pasture. By leaving this amount of forage there should be reasonable recovery to the grazing height of 6-8 inches in time if growing conditions are reasonable. The moving of horses when forage is low to a new area is easily done but there is a need to ensure that there is a suitable land base to allow for the recovery time the pasture needs based on the growing conditions in the area. Moving horses based on the calendar only can quickly result in over grazed pastures because there has not been sufficient time for the plants to recover. For the horse owners this means walking the pastures as part of the decision making process. In a second demonstration at the University of Kentucky 2 groups of 4 horses were rotated between 2 acre paddocks on a 14 day cycle. This allowed the pastures only 14 days to recover from grazing before the horses were returned. The result was that the horses were able to maintain body weight over the early summer but when growing conditions were not favorable they lost weight and created significant areas of bare ground in the pastures. This was similar to the scenario seen on many small horse farms where there are too many horses and a limited amount of pasture.
If growing conditions are such that pasture does not recover soon enough, horse owners will need to make the decision that the horses are fed hay for a period of time till the pasture has time to recover. If horses are being fed on pasture there may need to be some restrictions as to where the horses can go just because they are being fed hay does not mean they won’t continue to graze and over graze parts of the pasture. Having a smaller area designated as a sacrifice area can be helpful as it can reduce the total area that needs to be renovated when growing conditions improve. This sacrifice area can be a valuable asset during both dry and wet conditions when horses can significantly damage the pasture.

Another challenge for the horse owner is to use all the forage available when it is rapidly growing. One way to look after all the extra forage is to purchase more horses to eat the grass, but that generally results in a horse population greater than what the land base can handle. A better alternative is to use a managed intensive grazing system. This practice means more horse density on the pasture area for a shorter period of time. To be effective, horse owners need to divide the pasture into a larger number of paddocks and allow grazing for only 3-5 days. The horses need to be moved once the available forage has been grazed to 3-4 inches. With a greater number of paddocks, there will be ample time for re growth of the forage. In addition as the forage growth rate slows during the later part of the season the size of paddock can be increased as the horses are better able to keep up with the pasture growth. This management practice does require more resources of facilities and time as there will be more paddocks and more time spent assessing forage supplies and moving horses.

How can horse owners deal with those pastures that have grown faster that they were able to use them, resulting in more forage than the horses are able to eat. In these situations, it would be wise to bale hay if the equipment is available. However if the baling of the pasture is not a practical solution horse owners will need to consider that horses grazing taller forage tend to waste significant amounts of the feed, but they also graze more selectively creating areas that are essentially overgrazed. When these pastures are rested, the over grazed or preferred grazing areas will be less mature than other parts of the pasture and horses may spend more time in these areas effectively over grazing them and causing areas of bare soil. If the pasture is mowed to eliminate the maturity difference that can help but may not eliminate the problem of grazing selection.

An added concern when there is more forage than the horses being fed require, is how to limit feed intake. As horses will graze for 12 -16 hours per day limiting intake may mean limiting access to the pasture. Horses may need to be stabled or confined to a dry lot for some period of each day to reduce forage intake and the possible problems associated with obese horses. If stabling is not an option horses may need to fitted with a grazing muzzle for a portion of the day or all day to restrict intake. If the horse is limited to only a few hours of grazing per day the horse owner will need to watch changes in body condition to ensure that they are receiving adequate daily intake to meet maintenance requirements. In many cases those feeding other classes of livestock maximum intake is needed and sought after while for the mature horse at maintenance controlling weight gain becomes a serious challenge.

It has been previously mentioned the need for a sacrifice area to allow horse owners the option to remove horses from pasture when environmental conditions are such that pastures may be damaged by hoof action. For most horse owners they might consider using a sacrifice area during wet conditions in the spring or fall when hoof damage can be significant on soft wet pastures. However, the consideration for hoof damage on dry pasture should also be
included in the management scheme. Regardless of why a sacrifice area is developed, it will mean providing an alternative source of nutrients to the horses as they won't be grazing. The use of a sacrifice area may be more important to those owners that have limited land resources and need to protect what they have.

Pasture design may have some effect on where horses grazing. In cases related to exercise areas, it is often suggested that rectangular runs promoted more exercise. What design will foster even forage for consumption is unknown at this time. Certainly, areas within pastures that are social areas, shade, water, or the gate can result in reduced forage stands, more weeds, and mud during wet conditions.

Areas where manure is deposited, are not generally grazed by the horse and are significant contributors to the development of lawns and roughs. Owners need to spread manure to aid in its breakdown and prevent those areas of rank growth. Concern over parasite problems due to the spreading of manure becomes a challenge and needs to be dealt with. Horse pastures should be harrowed during hot dry conditions as an effective means to reduce the potential parasite load on the pasture. This may mean pastures are harrowed only once or twice during the summer grazing period, causing a build up of manure. If horses could be maintained for a period of time in the sacrifice area, there may be more opportunities to drag pastures and reduce manure build up.

The opportunity is to grow forage that can and will provide feed to meet the nutrient needs of your horses. Can pastures provide forage for horses on a year round basis as is being tried by other grazers. This seems like an insurmountable task and it may well be. However the challenge is there to maximize the use of pasture on horse operations regardless of the operation size. Good pastures make for healthy horses and a healthy environment. It is a great challenge.

**Literature Cited**


Johnson K. D. and M.A. Russell ID 167 Maximizing the Value of Pasture for Horses Purdue University Cooperative Extension Service

