



SELECTING HAY FOR HORSES

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One of the most important aspects of feeding horses is to provide them with good quality forage. It is the basic component of all diets for mature horses. Adult horses that are at maintenance levels of activity do not have a high energy requirement and thus can be maintained quite adequately when fed good quality hay. Young horses, lactating mares and working horses all have requirements for increased levels of energy above that which is available from hay alone and must be supplemented with grain sources.

Recent statistics from the United States Department of Agriculture and the Arizona Agricultural Statistics organizations indicate that approximately 26 million tons of alfalfa hay were produced in the western regions of the U.S., with Arizona hay producers contributing about 1.3 million tons of this alfalfa. Other hays grown in our state contributed in excess of 100,000 tons of annual production. The average Arizona horse consumes about 3.5 tons of hay annually, thus our horses use between 35-38% of the total hay produced in our state.

The nutritional content of hay varies significantly depending upon plant species. Typically there are three types of hays normally found here in Arizona and are classified as legume (Alfalfa), grass (Bermuda grass) and cereal (Oat hay). The nutrient composition of these hays will generally be quite similar in energy content, but protein, mineral and vitamin contents can vary depending on species of plant and the manner which the hay has been harvested.

So is one type of hay better for a horse? It generally comes down to personal preference, hay availability and cost of nutrients provided. Since so much alfalfa hay is produced in our state, it has become one of the most preferred hays due to its high quality and generous availability. Likewise, alfalfa hay usually contains higher levels of protein, carotene (precursor for Vitamin A) and higher levels of calcium than grass hays. Horses like

lactating mares and growing foals that have a need for higher levels of protein in their diets will benefit from diets containing some alfalfa in them. However, owners should be sure the hay is clean, free of dust, mold and foreign materials since poorly managed and harvested alfalfa hay tends to have higher levels of these items than grass hays.

The most important factor that determines the nutritional value of any hay is the stage of maturity when the hay is harvested. More mature plants will generally relate to a lower nutritional value due to greater amounts of fiber. The availability of protein is lower in more mature plants and the digestibility is reduced as compared to plants that are less mature. To determine maturity: look for seed heads or blossoms typical of more mature plants and examine the plant stems. The more woody or thick a stem is the more mature the plant will be. The amount of leaf in the hay also will give you a clue as to the stage of maturity (less leaf relative to stems indicate greater maturity). About two-thirds of the protein in a plant is contained in the leaves, so hays that have greater amounts of leaves will ultimately be higher in protein value. When hay is harvested with excessive dryness, leaves may shatter and the loss of leaves during the baling process produces a hay of lower nutritional quality. Touch the hay since it should feel soft and have flexibility rather than having a dry, coarse or brittle feel. Again, more leaves relative to stems will give you an indication of quality.

Hays that are green in color generally contain more carotene, the precursor of Vitamin A, than hays that are bleached by the sun. Be sure to look inside a bale and not just the exterior to make the color determination. Hay that is stored in the sun will generally look bleached out, but inside the color many times is maintained and is of higher quality. Avoid yellow hay which may be mature or hay that is brown or black indicating that it has gotten wet during baling or storage. This hay should not be fed to the horse!

Smell the hay and look for any foreign materials. The presence of

weeds, insects or trash should be an indication of hay to avoid. The hay should smell sweet and fresh. Hay that has molds in it can be detected by smelling and should not be fed to the horse. Likewise shake a flake of hay to evaluate dustiness. Feeding hay that is excessively dusty may cause respiratory problems and reduce performance of the horses.

The average horse should consume at least one pound of forage per one hundred pounds of body weight daily. It is important to keep at least a minimum amount of roughage in the horse's diet to maintain digestive tract normal fill. This will ultimately reduce digestive upsets and boredom. It is not at all uncommon for the average horse to consume up to 2.5 percent of their body weight daily of an all roughage diet. This level of intake will depend on if the owner feeds any grain or supplements and what the management practices are. Non-working horses will meet most of their

nutrient needs consuming hay alone and should have plenty of clean fresh water and salt available.

Ultimately high quality hay is green, feels soft and flexible and has a fresh smell to it. High-quality hay is usually made from more immature plants that have a higher leave to stem ratio. The use of good quality hay regardless of specie will meet the nutrient needs of most of our pleasure horses. The table below shows that there are indeed differences in nutrient composition of the three hays. Therefore, if all are available at a similar price and quality, the alfalfa hay is a better buy on a cost/nutrient basis. If your horse seems to prefer a source of hay over another, listen to your horse. Your horse may be trying to tell you something about the quality of the hay and what he prefers.

Nutrient Composition of Typical Hays Grown in Arizona

Hay Type	Crude Protein (%)	Digestible Energy (Mcal/lb)	Calcium (%)	Phosphorus (%)
Early-bloom Alfalfa	17 - 20	1.1	1.0 - 1.8	0.1 - 0.3
Full-bloom Alfalfa	15 - 18	.95	1.0 - 1.8	0.1 - 0.3
Bermuda grass	7 - 12	.90	0.4	0.19 - 0.3
Oat Hay	6 - 10	.87	0.5 - 0.35	0.1 - 0.3



Photo 1

PHOTOGRAPHY BASICS

Plants & Landscapes

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Plants provide good material for the photographer, whether they are growing in your backyard or out in the wild. One reason is that they are stationary and can be photographed at various angles or different times of day. In Arizona, there are some incredible plants and landscapes offering countless photographic opportunities. All that is needed to get the best out of photography are a few of the basics and some creativity. Some of the non-technical basics of photography, as known to the author, are composition, lighting and subject matter.

COMPOSITION

In landscape photography it is important to take care with composition and pay attention to several concepts; a common one is the rule of thirds. As you look through your camera's viewfinder, imagine lines dividing your image into nine equal-shaped blocks. Consider framing the main subjects around one of the intersection points rather than the center of the image. With landscapes, this rule can be applied to the placement of the horizon line. If your main subject is land, the horizon line will be two-thirds up from the bottom. A second rule is the use of diagonals—strong lines (e.g., a trail or fence) that fade away into a corner of the picture may improve composition.

Additional considerations with composition include framing the subject, visual cropping, and choosing a viewpoint. While most photographs have a foreground and a background, the foreground can be used to frame and add interest to the scene (Photo 1). In many cases, plants in the foreground add to the composition and can be used to hide unsightly or man-made objects. Visual cropping, on the other hand, comes from observing the four corners of the viewfinder and making adjustments. The idea is to produce a full image of the subject by either moving or zooming closer before pressing the shutter