Mythbusting: Forage and the Equine Diet







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Let's Get Started!

- What "counts" as forage
- Why it's essential to the equine diet
- How much forage do horses need
- How to develop a forage ration
- Types of forage available
- Choosing the right forage for the horses in your care





Forage, in the form of pasture or hay, should be the primary component of the equine diet







SIMPLE, RIGHT?! Of Course Not!

Square or round bales?

Silage vs. Hay

First or second cutting?

Legume vs. Grass

Did it rain TOO much?

Did it rain ENOUGH?

Is Timothy better than Bermuda?



Why Do Horses Need Forage ?

- Forage contains fiber which is converted into "fuel" for the horse
- As non-ruminant herbivores, horses are uniquely suited to break down the fibrous plant matter found in grass and hay
- Free choice access to water and plain white salt are the other essential components of an equine diet

As long as rations are appropriately calculated and the forage provided is of sufficient quality and quantity for each individual horse in your care, forage can and should comprise 50-100% of your horses' diet.





The unique digestive system of the horse requires the horse to have a constant supply of small amounts of forage moving through his system.

Left to their own devices, how much will horses eat?



An adult horse can eat 1.5% to 3% of their total body weight in **dry matter** – all water removed from food and weighed. Foals will consume around 1%.



This percentage is determined by several factors including:



- Volume of different parts of the GI tract
- Rate of passage
- Appetite
- Energy demands of the individual horse
- Energy density of the actual feed



In the care of humans, how much should horses eat?

- As stewards of the equines in our care, it is in their best interest for us to mimic their natural eating preferences as closely as possible.
- Put simply, this means developing a feed ration that considers the individual needs of each horse and provides continuous access to quality forage as the primary source of food.
- For the typical 1,000 lb adult horse in light work with no special needs, this means providing approximately 20 pounds, per day, of dry matter in the form of forage.



Example: Black Beauty

AGE: 22WORK: LightWEIGHT:1,000 lbs.SEX: Gelding

Based on the information provided, Black Beauty would need **15-30 lbs of a dry matter (DM) feed** ration daily to meet his nutritional needs – energy (calories), protein, vitamins, and minerals – not more or less of any nutrient, with 50% - 100% of the ration being forage.

If 100% forage cannot meet these nutritional needs, then forage is reduced and concentrate (grains) are added as a supplement.



Where to Start: Determining Rations

Reference "Bible"

Nutrient Requirements of Horses National Research Council

http://www.nap.edu/openbook.php?record_id=11653

Storey's Guide to Feeding Horses

http://www.amazon.com/Storeys-Guide-Feeding-Horses-Management/dp/1580174922



ANIMAL NUTRITION SERIES

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Consider the Following Factors

First, categorize each horse by:

- Age: young, adult or senior
- Weight: kilograms or pounds
- Activity Level: maintenance, light work, heavy work
- Health modifiers: underweight, overweight, pregnant or lactating mares, dental health
- **Species modifiers:** donkey, miniature horses, equine





Three Different Ways to Determine Weight

- Weight tape (easiest/least accurate)
- Calculation using various measurements
- Livestock Scale









Understanding Calories

Average Woman

- 2,000 Calories per day
- 45 g of crude protein

Average 1,000 lb. Horse

- 16,000 Calories per day
- 630 g of crude protein





Two Key Nutrients to Consider When Balancing Rations: Energy and Protein

Energy (Carbohydrates)

- Fiber translates to energy for the horse
- The horse obtains fiber from forage in the form of cellulose and hemicelluloses

Protein (Amino Acids)

- Provide amino acids to the body for growth and repair
- Amino acids are essential to all vital processes









Choosing the Right Forage

Consider these factors:

- Characteristics of the horses in your care
- What kind of hay is available in your area
- Available pasture (access/quality)





Two Types of Forage







Grasses

- Many varieties
- Categorized as warm and cool season

Legumes

- Alfalfa
- Lespedeza



Two Primary Forms of Forage

Fresh

- Pasture grasses and legumes

Preserved

- Hay
- Silage
- Alfalfa Cubes
- Ground high fiber
 by-products
 (i.e. beet pulp







Pasture (Grass)

- Higher moisture content than hay
- Cool season grasses: grow best where summer temperatures are lower; can survive freezing
- Warm season grasses: grow best where there is little or no winter frost; can tolerate higher summer temps
- General rule of thumb: 1.5 two acres per full-sized horse for grazing/exercise
- Nutrients are only as good as the quality of the grasses





What Qualifies As Hay?

- Preserved pasture plants that have been dried to less than 20 percent moisture content.
- As a general rule, fresh plants in the pasture are 14 to 20 percent dry matter.
- The same grasses, offered as hay, contain 75 to 80% dry matter
- Hay is only as good as the maturity/quality of the grasses present at the time of haymaking
- If the grass is poor quality, full of weeds, or too mature, the nutritional value will be negatively impacted.



Common Types of Hay

Cool Season (Grass)

- Timothy
- Orchard Grass
- Fescue
- Bluegrass
- Red Top

Legumes

- Alfalfa
- Alfalfa/Grass Mix
- Lespedeza



Warm Season (Grass)

- Brome
- Coastal (Bermuda)
- Tift



Choosing Hay: What to Consider

- What's Available in your region
- Nutrient value
- Cost
- Type of Horse
- Most important: Cleanliness



Evaluating Quality

The only way to truly know the nutritive value of hay is to have it analyzed.

However, a visual inspection can give you lots of information about the hay.





Visual Inspection: Plant Maturity

No matter what type of hay you're considering, plant maturity is the single most important factor when determining nutritive value.





Visual Inspection: Texture

Texture = Stem size and Pliability (flexibility)

- Texture plays a role in how palatable hay is to a horse.
- Second cutting hay is typically softer than first cutting, which is why horses (and their owners) often will opt for second cutting, when given the choice.



Visual Inspection: Leafiness

Leaves are an excellent indicator of quality. Leaves are high in protein and energy.





Visual Inspection: Foreign Objects

- Weeds
- Stubble
- Rubbish
- Insects
- Bottles
- Cans
- Snakes









Visual Inspection: Color

- Bright Green: high vitamin and protein content
- Dark Brown: indicates heat damage
- Lighter Yellow: may be sun bleached inspect the middle to get a true picture
- White to Gray: indicates mold; do not feed to horses



Visual Inspection: Aroma

Good hay will smell good.

 Hay that smells musty or moldy
 ELIMINATES that hay as an acceptable feed for horses





Pasture/Hay Resources

New types of grasses are continually being introduced into those available as horse hay sources.

Your agriculture extension office can help determine what's available in your area and answer questions. USDA Agriculture Extension http://nifa.usda.gov/extension

Hay and Forage Growers http://hayandforage.com/

Kentucky Equine Research http://ker.com/

The Horse.com <u>www.thehorse.com</u> + nutrition newsletter



Three Ways to Determine If You're Meeting your Horse's Nutritional Needs with Forage

- 1. Trial and Error: feeding what's available and decide if horse is losing weight or gaining
- 2. Informed Guess use charts that provide estimates of calories, protein, Ca and phosphorus and observe horse's response
- 3. Hay Analysis: Gives you a true picture of the nutrient content of your hay



Hay Analysis Using Available Tables

Feed	Calories Per Pound	Crude Protein in grams per pound
Green Pasture**	245- fresh grass (20% DM)	23.6 g
	1,086 (DM)	
Orchard Grass Hay	780	35.4 g
Timothy Hay	810	36.7 g
Bermuda	850	47.2 g
Brome	850	57.2 g
Fescue	860	53.6 g
Alfalfa Hay	940	79.4 g
Alfalfa meal	1,104	86.3 g
Beet Pulp	1,272	45.4 g



The only way to truly know the nutritional content of your hay is to have it analyzed.



How To Sample Hay for Analysis







How to Sample Hay for Analysis

- Can obtain a coring tool from feed store that takes a core sample from a bale of hay. Sample 10-20 and cut along a diagonal of the bale.
- Or, take handfuls of hay from different areas of several bales, mix samples and place in clean paper or plastic bag. Get a mixture of leaves and stems.
- Usually the cost is \$20 \$40 dollars and often it is free from county Department of Agriculture extension agent
- <u>http://equi-analytical.com/taking-a-sample/</u>



Hay Analysis

Crude Protein (CP) Dry Matter (DM) Acid Detergent Fiber (ADF) < 31%Neutral Detergent Fiber (NDF) < 55% Relative Feed Value (RFV) > 150 Non-Structural Carbohydrates (NSC) < 18% Calcium to Phosphorus Ratio 2:1 Total Digestible Nutrients (TDN) – similar to RFV



A Forage Only Diet Will Likely Need

All horses need salt- plain white salt – sodium is the main electrolyte found in blood and the fluid surrounding cells



Pasture provides nutrients that are lost in the haymaking process. If a horse grazes on good quality pasture at least 8 hours each day, additional supplementation (except salt) should not be required unless specific health or stress levels warrants more nutrient intake

If horses don't have access to pasture, and their primary forage source is hay only, the following supplements will need to be considered:

- Vitamin E: 1 IU per pound f body weight. So my 1100 lb horse would need 1100 IU
- Essential Fatty Acids: Feed ½ cup flaxseed per 400 lbs. body weight
- **Minerals:** Multiple vitamin/mineral supplement
- Beta Carotene: Which is converted to Vitamin A



Hay Alternatives: Cubes and Pellets

Pros

- Easy to use (especially for horses that need soaked forage)
- Comes with nutritional analysis attached to the bag – no analysis needed
- Easy to store and to carry

Cons

- Usually more expensive that traditional bales
- Typically used for specialty cases or short term situations







Hay Storage and Bale Types

- Hay comes in many shapes and sizes. It's important to understand what kind of hay you're buying and the weight of the individual metrics of the hay (entire bale, and flake).
- Square bales especially will vary in terms of weight, density and consistency
- No matter what type of hay you use, it's important to weigh individual bales and flakes
- Proper storage is also essential to protecting your hay
- Take home message: always weigh your hay and store it off the ground, with shelter from the elements



Round Bales: Pros/Cons

- If stored appropriately, can be used for large numbers of horses
- Usually less expensive by weight than smaller bales
- Need appropriate equipment to move
- More susceptible to weather damage
- Susceptible to weather damage if left unprotected
- Hay racks save losses/reduce waste







Square Bales: Pros/Cons



How Much Does A Square Bale Weigh?

How about One Flake?

It varies bale by bale. Each bale should be weighed before its broken apart and then flakes should be weighed so you can ensure you are feeding enough hay

Pros

- Easier to store large quantities
- Easier to carry/transport
- Can have several different types on hand

Cons

- Consistency
- Size
- Availability



Benefits of Steaming Hay

- Retains minerals, vitamins and nutrients lost by soaking hay
- Most bacterial and fungal spores killed off
- No lifting of heavy hay nets
- Less expensive than haylage
- Prevent respiratory disease
- Palatable to horses





Specialty Diets

Donkeys Mules Miniature horses and ponies Pregnant/lactating mares Emaciated Horses







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