



## RELATIVE FEED VALUE (RFV)

The Hay Marketing Task Force of the American Forage and Grassland Council has endorsed the use of **RELATIVE FEED VALUE (RFV)** as a measure of forage quality.

RFV is determined by combining the digestibility and potential intake of a forage into one number. This number (RFV) is based on the amount of Neutral Detergent Fiber (NDF) and Acid Detergent Fiber (ADF), which will tell us the maturity of the forage plant when harvested. Thus, forage with high ADF and NDF levels will score poorly because the ability of the horse to digest this forage and meet their nutrient needs is reduced. Crude protein is not included in the equation because it is not highly correlated with digestibility or intake. However, the more mature the plant, the lower the percent of protein. (See Table 2).

The higher the RFV in all forages, the more digestible and palatable they are. The table below lists the quality standards along with the nutrient percentages of ADF & NDF and their resulting RFV's.

<b>Forage Grade and Description:</b>	<b>If the ADF is:</b>	<b>If the NDF:</b>	<b>Then the RFV is:</b>
Prime (Prime)	Under 30	Under 40	Over 151
1 (Premium)	31-35	41-46	150-125
2 (Good)	36-40	47-53	124-103
3 (Fair)	41-42	54-60	102-87
4 (Poor)	43-45	61-65	86-75
5 (Reject)	Over 46	Over 66	Under 74

This table is from the veterinary textbook, *Equine Internal Medicine*, 2<sup>nd</sup> Edition, Applied Nutrition Chapter, Don Kapper, PAS, guest author and Stephen Reed, DVM, editor.

The forage grade Prime or a RFV above 151 will usually be pasture, haylage, or 2<sup>nd</sup> through 4<sup>th</sup> cuttings, due to the inability to cut and dry hay in the spring of the year. The exception will be the forage grown on irrigated lands where the weather can be controlled. When feeding this quality of forage, horses will consume over 3% of their body weight per day and we recommend our **ProAdvantage Line** of feed call Diet Balancers, because they are the most concentrated sources of nutrients and the lowest calorie. They contain no cereal grains, so they are also ideal for horses with ESSM (EPSM) and Equine Metabolic Syndrome. There are two different formulas to complement either Grasses or Legumes. Grasses include: Orchard grass, Timothy, Brome, Coastal Bermuda, Bluestem, Wheat grass, etc.; while Legumes include: Alfalfa, Clover, Peanut hay, etc.

When feeding forage with a RFV between 103 and 150, horses can eat between 2% to 3% of their body weight per day, and will need very little grain to maintain desired body condition. This is when we recommend our **ProElite Line** of feed which includes Oat, Barley & Corn for added calories and are balanced to complement either Grass or Alfalfa forages.

As the forage matures and the ADF and NDF rise, it is difficult for the performance horses to eat enough hay per day to maintain desired body weight. In these instances horses will need to be fed more pounds of a grain mixture per day. When feeding forage with a RFV between 102 & 75, we recommend our **Premium Line** of horse feed.

The Premium Line of feeds has the lowest starch content, because there is no corn in the formula and more of the calories come from vegetable oil and digestible fiber. This helps prevent hindgut acidosis caused from eating too much starch. Fat does not affect pH levels in the digestive system and the added digestible fiber in these feeds will help maintain the normal fermentation process in the hindgut.

If a forage grade 5, or a RFV below 74 must be fed, or a limited amount is fed of any of the above grades of hay, the following is recommended:

Feed our **Complete Feed**, called Premium Senior Formula Horse Feed, which is available in texturized, or pelleted forms. Regardless of which form of this feed is chosen, make sure the horses consume enough Progressive Nutrition “Units” per day to meet all of their nutrient needs. Premium Senior Formula contains the equivalent of 60% forage, with the inclusion of Beet Pulp, Soybean Hulls and Alfalfa Hay, which are the best, or most digestible, fermentable fiber sources and the lowest NSC values we have available today. We recommend feeding twice as much of the grade 5 hay per day than the horse can possibly eat. Because the horse is a selective, continuous grazer and will consume the tender leaves first and leave the less digestible stems for bedding. If the horse is forced to eat large amounts of this non-digestible fiber found in the course, over mature stems, problems that may arise include: colic and/or impaction.

Table 1: explains how the RFV is used to compare quality of forage to its nutritional worth, based on the maturity of the plant when harvested. Notice how much less the horse can eat per day, as a percent of their body weight, as the forage matures. This is because, as the non-digestible fiber (ADF & NDF) increases, the palatability is lower and the rate of passage through the intestinal tract slows due to its poor fermenting quality.

TABLE 1. Hay Quality Standards For: Grass, Grass/Legume Mixed and Legume Forages:		
Analysis <sup>b</sup> (dry matter basis)		
Quality Standard <sup>a</sup>	DMI <sup>c</sup> % of B. Wt.	RFV <sup>d</sup>
Prime (Prime)	>3.0	>151
1 (Premium)	2.9-2.6	150-125
2 (Good)	2.5-2.1	124-103
3 (Fair)	2.0-1.7	102-87
4 (Poor)	1.6-1.3	86-75
5 (Reject)	<1.2	<74

<sup>a</sup> Quality Grading Standard assigned by Hay Market Task Force of AFGC.

<sup>b</sup> Analysis associated with each standard.

<sup>c</sup> Dry matter intake (DMI), % of body weight. **This is for mature horses only. Young growing horses will consume lesser amounts of this forage.**

<sup>d</sup> Relative Feed Value (RFV)

➤ Greater than

< Less than

Table 2: shows the more mature legume can have similar protein levels as the immature mixed forage and the more mature mixed forage can have similar protein levels to immature grass forage. In all of these cases the calories/lb. and RFV will be far less in the more mature forages. Just because hay contains a legume, i.e. alfalfa or clover, does not mean it is always better. Maturity of the plant when harvested (baled or eaten) will determine its quality (digestibility/RFV) and the true nutritional value of each type of forage, whether it is grass, mixed or legume.

TABLE 2. Protein and Calorie Levels in Forages, based on type and maturity*						
	Grass		Grass/Legume Mixed		Legume	
	% Protein	MCal. DE/lb. <sup>e</sup>	% Protein	MCal. DE/lb.	% Protein	MCal. DE/lb.
Prime (Prime)	>11	>1.05	>16	>1.10	>21	>1.17
1 (Premium)	8-10	.95	13-15	1.03	18-20	1.10
2 (Good)	7-8	.86	11-13	.93	16-18	1.00
3 (Fair)	5-7	.80	9-11	.86	14-16	.94
4 (Poor)	4-5	.77	7-9	.82	12-14	.89
5 (Reject)	<4	<.73	<7	<.78	<12	<.83

\*These percentages are based on forages analyzed by Holmes Laboratory, Inc., from 1980-2002 and are on a dry matter basis.

<sup>e</sup> DE = digestible energy for horses.