HAY QUALITY 101

What a hay grower can control

- Soil fertility: pH, fertilizer, inputs, manure
- Weed management
- Variety selection/seeding rate
- Equipment
- Storage conditions
- Grazing pressure

What a hay grower can't control

- Soil type
- WEATHER

Fields aren't factories; hay from the same farmer from the same field may not be the same year to year

WHAT IS "GOOD" HAY?

1. **You can find bad hay by looking at it; you can ONLY find high nutrient value hay by testing**
    a. Why test?
        i. To feed a balanced diet
        ii. To calculate how much you will need for a year
    b. Other important factors
        i. COST
        ii. Ease of access
        iii. Your storage capacity

2. **Quality can be subjective, what do your animals actually need?**
    a. Know your goals
        i. Life stage
        ii. Activity level
        iii. What % of your animals' diet is hay vs. pasture or other
        iv. Avoiding toxic plants/nitrate levels

3. **There is no such thing as perfect hay**
    a. Good quality hay is hay that meets the goals for your animals

4. **What is a hay test?**
    a. Wet Chemistry or NIR
    b. Use 100% Dry Matter column to interpret results
        i. ADF: digestibility
        ii. NDF: how much the animal can eat before they're full
        iii. Crude Protein: energy available
        iv. Nitrate: toxicity issues, especially for ruminants

Hay Quality 101: Equine

Always consult with your veterinarian/ nutritionist for specific advice and know your animals; "typical values" are general parameters collated from Extension publications.

Element	Typical Value	Description
Moisture	**11-16%**	Under 10% too brittle Over 17% mold risk Over 25% fire hazard Storage issue rather than nutritional, but important for quality
ADF *Acid detergent fiber*	**30-45%*** *Lower=more digestible*	**Digestibility** The higher the number, the less it will be broken down in the GI tract *45%+ ADF can be acceptable for horses at maintenance, lower energy needs
NDF *Neutral detergent fiber*	**40-60%*** *Lower=more palatable*	**Palatability/Preference** The higher the number, the less hay your horse will eat *65%+ ADF can be acceptable "busy hay"
CP *Crude Protein*	**10-12% for an average adult horse at maintenance**	**Reproduction, lactation, growth & maintenance** Target ranges vary based on age, activity level, and life stage. Young, high-intensity, or lactating animals need a higher CP%. Impacted by maturity of plant at harvest, forage type
NSC *Non Structural Carbohydrates*	**<10% for metabolic syndrome**	**Starches and Sugars** High concentrations can cause health problems for animals at risk of pasture-associated laminitis, colic, or equine metabolic syndrome

Hay Quality 101: Ruminant (Cattle)

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Element	Typical Value	Description
Moisture	**11-16%**	Under 10% too brittle Over 17% mold risk Over 25% fire hazard Storage issue rather than nutritional, but important for quality
ADF *Acid detergent fiber*	**30-45%*** *Lower=more digestible*	**Digestibility** This measures the highly indigestible parts of the plant—the higher the number, the less digestible it is
NDF	**40-60%*** *Lower=more palatable*	**Palatability/Preference** Animal intake decreases as NDF increases
CP	**7-13%+**	**Reproduction, lactation, growth & maintenance** Dry cows, lowest level for rumen function=7% First 60 days of lactation: 11% Balance of lactation cycle: 9% Growing ration for calves: 14-16%
Nitrate	**<.44% or 1012 ppm safe for all stages**	**Reproductive issues** Test if high N fertilizer is used, following drought, and in susceptible forages
TDN *Total digestible nutrients*	**45-58+%**	**Old feed value not used by all, approximation of "energy density"** Sum of digestible carbohydrates, protein, and fat

Table 3. Guidelines for Nitrate in Feedstuffs (Express on 100 percent Dry Matter Basis in the Total Diet).

Nitrate content (%)	Comment
0.0 to 0.44	This level is considered safe to feed under all conditions.
0.44 to 0.66	This level should be safe to feed to nonpregnant animals under all conditions. It may be best to limit its use for pregnant animals to 50 percent of the total ration on a dry basis.
0.66 to 0.88	Feeds safely fed if limited to 50 percent of the total dry matter in the ration.
0.88 to 1.54	Feeds should be limited to about 35 - 40 percent of the total dry matter in the ration. Feeds containing over 0.88 percent nitrate should not be used for pregnant animals.
1.54 to 1.76	Feeds should be limited to 25 percent of total dry matter in ration. Do not use for pregnant animals.
over 1.76	These feeds are potentially toxic. Do not feed.

Source: Iowa Beef Center