



# Understanding livestock nutritional requirements

Owning any kind of livestock—cattle, horses, goats, sheep, you name it— is a huge responsibility. No matter what species you own, understanding nutritional requirements is key to maximizing both animal health and cost efficiency.

When determining your livestock’s nutritional requirements, consider the following factors.

## Life cycle considerations

**Maintenance** is when animals are not actively growing or reproducing. The goal is to feed them to *maintain* their current body condition score.

When livestock are going through the **reproduction cycle** (gestation or lactation stages) their

nutritional requirements are higher, peaking at lactation.

**Age** also influences nutritional requirements. Growing animals have higher nutritional requirements. It is also important to consider **level of exercise**. For example, horses that are worked lightly have fewer requirements than horses that are worked heavily. Those worked heavily are burning more calories and require diet adjustments to maintain their weight and energy.

Keep in mind that the **species of animal**, its **breed**, and its **sex** can also affect nutritional requirements. Larger breeds and/or breeds that produce higher milk yields have higher nutritional requirements. Bulls also generally have higher nutritional requirements during the breeding season than the off season.

## Cold weather care

With winter and cooler temperatures approaching, it is important to understand how freezing temperatures affect your livestock. Cold temperatures, wind chill, and precipitation can make it difficult to meet an animal’s nutritional requirements because their energy requirements increase. If these increased energy needs are not met, animals will start losing weight, which can impact health, reproduction, and your bottom dollar.

One of the most common ways to satisfy the nutritional requirements of animals during the fall and winter months is to supplement a diet of hay with grain, cake, protein tubs, and liquid feed.

## Quality control

Understanding hay quality is critical for winter feeding. Although hay testing requires time and money, it also provides valuable information, enabling producers to create accurate and cost-effective feed rations.

Quality varies depending on the type of forage, soil type, fertilizer



Round bale probing location

New Africa, Shutterstock

Fig. 1 – Hay probe sampling locations.

rate, and the maturity of the forage when it was harvested.

The most important factor that impacts forage quality is maturity at harvest. As the plant matures, fiber concentration increases, which decreases digestibility and palatability. Crude protein content also decreases as maturity increases.

High-quality hay should be fed to animals with higher nutritional requirements, such as growing animals, cows in late gestation, and lactating cows. Low-quality hay should be fed to animals with lower nutritional requirements, such as open cows, cows in the early gestation stage, and mature bulls.

## Testing hay quality

When analyzing quality, make sure to test the hay in different groups, or lots. Hay in the same lot must be harvested from the same field and consist of similar types of plants, cutting dates, maturity, variety, weed contamination, type of harvest equipment, curing methods, and storage conditions. If these conditions differ, feed should be designated and sampled as a separate lot.

For best results, use a hay probe or core sampler when collecting samples to send to the lab. The hay probe should penetrate at least 12–18 inches into the bale. To obtain a representative sample of the lot, obtain an aggregate sample of 15–20 random bales per lot. See Figure 1 for the locations where round and square bales should be probed.

Most UW Extension offices have hay probes available for checkout, as well as additional information on sampling and testing labs. Costs per sample range from approximately \$15 to \$50.

A mid-range analysis that provides information such as crude protein percentage, relative feed value, estimated percentage of total digestible nutrients, percentage of key minerals (calcium, phosphorus, potassium, and magnesium), and fat percentage, should meet most producers' needs.

## Annual forages

During drought years, grass and alfalfa hay can be expensive and hard to find. Other feed options to consider include annual forages and alternative feeds.

Annual forages harvested for hay, such as foxtail millet, oats, sudan grass, and sorghum-sudan hybrids, can provide good alternatives.

However, testing for nitrates is recommended on annual forage hay because it can accumulate high levels of nitrates under various growing conditions that can potentially reach toxic levels. For more information on nitrate toxicity, check out the spring 2022 *Barnyards & Backyards* article "Keep an Eye Out for Nitrate Toxicity."

## Alternative feed options

Alternative feeds include corn residue, field peas, beet pulp, wheat straw, cottonseed hulls, soybean hulls, wheat middlings,

### Additional resources: testing hay quality

- Hay You: How to Take a Hay Sample & the Importance of Nitrate Testing: [bit.ly/hay-you-nitrate-testing-video](https://bit.ly/hay-you-nitrate-testing-video)
- Barnyards & Backyards Live! Buying Hay – Let's Get to the Good Stuff: [bit.ly/buying-hay-BB-video](https://bit.ly/buying-hay-BB-video)
- The Importance of Testing Hay Quality: [bit.ly/hay-quality](https://bit.ly/hay-quality)
- Managing Forages to Minimize Nitrate Poisoning: [bit.ly/minimize-nitrate-poisoning](https://bit.ly/minimize-nitrate-poisoning)

wet distillers grain, and cull potatoes.

Alternative feeds are often cheaper than hays in providing energy, protein, and bulk filler to a diet. However, many alternative feeds vary widely in nutrient content. An analysis should be completed to obtain their nutrient value prior to feeding.

Additional factors, such as product storage, shelf life, availability, and costs (e.g. transportation, per pound of nutrient, per head per day) should also be considered.

For more information on grazing, forages, and how to keep your livestock healthy and happy, visit [bit.ly/BB-forage-pastures](https://bit.ly/BB-forage-pastures).

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