



Hay Demystified

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WHRS Winter 2012

We all know (I hope!) that it's crucial to feed our rabbits hay to maintain their optimal health. Hay is the single most important food in a rabbit's diet that has a positive impact on health. Gut stasis in our foster rabbits nearly disappeared once we added to their diets unlimited access to hay. But what is hay? Is it straw? Why do we care about grass versus clover hays? Which product is best for my bunny? It can be pretty confusing. Let's see if we can help to demystify this essential part of your rabbit's diet.

What Is Hay?

When we talk about "hay", we refer to the dried leaves and stalks of grass or to the clover-family (leguminous) plants. Farmers call them "forage" and they are a major part of herbivore diets from horses to cattle to goats, meaning that hay itself is an important agriculture product. Hay doesn't include dried tree leaves, flowers, or vegetables. Because hays include grasses, you could make hay from your lawn, if your neighbors let you grow it that tall. For technical and personal reasons that I'll explain below, I definitely don't recommend that you do this. Hays require special growth and preparation, and you don't want to accidentally make your rabbit sick.

The two major hay types are grass-based and clover-based. Clover-based plants are rich in protein and calcium, thus it is a great food for dairy cows. Clover hays include alfalfa and a host of clover varieties (alsike, crimson, pea, and red, to name a few). It's no surprise that lots of alfalfa hay is grown in Wisconsin, and on most area farms this is what you'll find for sale. But rabbits don't make milk, so clover hays are generally too rich for them. The high protein content can give some rabbits messy butt because the cecal microbes overferment the protein. The high calcium content can increase a rabbit's risk for bladder and kidney problems. However, clover-based hays are still healthier than a no-hay diet, and if you can't find grass hay, then it is okay to feed clover-based hay. Clover-based hays are also good choices for nursing and growing bunnies, as well as elder buns having trouble maintaining weight. And, of course, clover hays - fresh or dried - are a yummy treat when fed in moderation.



Many types of grasses are grown and dried to make hay. The choice is driven largely by climate. Different grasses grow better in different climates, so the types available in your region are dictated by seasonal temperatures, rainfall levels, soil conditions, and other factors. Some common grasses that are grown for hay in Wisconsin include rye, orchard, fescue, brome, quack, marsh, and foxtail. If they are not treated with herbicides, grass hays can contain a small percentage of other plants that grow in the pasture. These are often other grasses, but could also include a few native plants such as prairie cornflower. Farmers monitor their hay quality so these extra plants provide taste variety and can be considered treats for your rabbit.

Straw is not hay. Those familiar yellow bales that appear at harvest time are by-products of the seed industry. "Straw" is the thick, hollow stems that are leftover after harvesting seed crops such as wheat or oats. These stems have very little nutrient content and are very poorly digested. Thus we do not recommend feeding straw to rabbits as a major food. Many rabbits also don't like to eat straw, suggesting it is not very tasty.

Make Hay while the Sun Shines!

Why do we call this grass product "hay" instead of "grass"? It's because the grass is dried before storage. This is essential because too much moisture in the hay creates a perfect environment to grow toxic and dangerous molds such as *Aspergillus*. Never, ever feed moldy or wet hay to your rabbit. Throw it away. For this reason we always store hay under a roof (barn, home, closed container) and keep it dry. (Side story: Moldy hay led to the discovery of Vitamin K! Prof. K.P. Link at the UW-Madison was asked to study cattle with uncontrollable bleeding. He discovered that their moldy alfalfa hay contained a new compound that he named Warfarin, which he showed is a vitamin K derivative and is now an important medication to prevent stroke.)

Once the grass finishes its major growth, it is cut and left in the field to air-dry. This "cures" the hay. This exposure in the sunshine also increases the hay's vitamin D content, an important nutrient. Thus farmers need a week or so of fairly dry weather in order to cut and harvest hay; a rainy June can delay the hay harvest. Once the hay reaches the right dryness, it is baled and stored for use until the following year, when the next hay crop is harvested.



In many parts of the country, including Wisconsin, the warm summer permits a second cutting in late summer or early fall. Of course, rain is needed too. This past summer we had very little rain, so the grass grew very little (just like our lawns). Second cuttings of hay were scarce until the rains came in late August, and the grass could grow again. Fortunately enough rain came that many Wisconsin farmers could cut their second crop. Typically Wisconsin farmers get two hay cuttings, and every few years they get a third cut if autumn is warm.

Nutritional Value of Hay

Why is hay so important? It's because hay is low in calories and high in fiber, a perfect combination for the herbivores' digestive system. Herbivores such as rabbits evolved on a diet with a poor nutritional content. Foods such as dried grass, bark and dead leaves are low in nutrients such as protein, calcium and vitamins. Rabbits evolved a neat trick to get more nutrition out of this foodstuff. Microbes in the large cecum ferment these dried grasses (think silage in a silo) and, as a by-product, make essential amino acids and vitamins. The rabbit consumes these as cecotropes.

This is all fine for the wild rabbit, but our domestic friends already get a nutritionally adequate diet from their veggies and pellets. Thus hay serves as a buffer, not really empty calories, but high in fiber so that the rabbit snacks and feels full. Grass hays are generally low in protein and carbohydrates, and this reduces the risk for obesity, gut stasis, and messy butt. We don't recommend a hay-only diet because it is not a nutritionally-complete food. Think of it as a way to keep the gut microbes balanced and your rabbit's snacking desire satisfied.

This is not to say that hay has no nutritional value - far from it, thanks to microbes in the cecum that can unlock those nutrients. A good farmer always has his hay crop analyzed for its nutrient content (the UW Soils and Mineral Lab located just west of Madison on Mineral Point Road provides this service). This lets the farmer balance his animal's diet with the right mix of hay, lentil or seed meals, and other foodstuffs that make up the diet.

Which Hay is the Best Choice?

You may be surprised. The answer is usually, "the hay that your rabbit prefers." Our goal is to encourage robust hay eating. This means it needs to be tasty. Some Web sites and vendors, and even a few veterinarians, may recommend



Hay Type _____ (fill-in-the-blank, usually with timothy). This advice is often well-intended but pointless. The reality is that, for our purposes, the hays do not appreciably differ in their nutrient content, and all confer quite similar health qualities.

How can this be? It's because the pellets and fresh vegetables are the main source of your rabbit's nutrition. Grass hay contributes little nutrition, despite the quantity eaten. Thus people are often surprised when I tell them that it is not very important what type of grass hay we feed our bunnies. Whether it is orchard, timothy, or brome grass, for our purposes all these grasses have a similar nutrient content for rabbits.

Grass hay is fairly low in calories because most of its energy is locked up in the form of fiber, which cecal microbes digest poorly. It is also lower in protein, vitamins and minerals. This is why we do not recommend a hay-only diet, because such a diet is not complete and cannot meet the rabbit's nutritional needs.

Within a pasture, however, grass hays can vary in their nutrient content depending on when the grass is harvested during its growing cycle. The greatest nutrient density (calories, protein, and micronutrients) is in the young, rapidly growing plant. As the grass slows its growth and switches to seed-making, its fiber content increases while digestible nutrients decrease. This growth cycle is commonly referred to as "first-cut" and "second cut." The growth stage when hay is cut is important when the animal gets nearly all its food in the form of hay, such as horses and cattle. Our rabbits get most of their nutrition from vegetables and pellets. Thus whether hay is first or second cut, its influence on your rabbit's nutritional status is pretty small compared to the rest of his meal. The taste of hay may also vary with the cut, but this is really a matter of your rabbit's preference and there's no clear rule of thumb here.

Loose versus Cubes?

Hay can be purchased in several forms. The most common is loose strands. We find that rabbits really enjoy the long strands because they can root through the pile to find the tastiest piece (which always seems to be at the bottom!) Hay can also be sold in compressed cubes. These are commonly sold for horses. They are perfectly fine for rabbits and confer the same nutritional benefits. Some rabbits prefer one over the other. We sometimes feed both to offer chewing variety. Finally, there are also compressed hay pellets, about the size of the



compressed sawdust pellets that we use for litter. This can be very helpful for rabbits who are missing their incisors, as it provides a hay form they can chew with their molars. However, given a choice, we prefer to feed long strands when possible to encourage even tooth wear, and to keep ingested fur moving through the digestive tract. All three hay forms otherwise confer the same nutrient benefits.

Hay Sources

There are many sources of hay in Wisconsin. You can find a farmer who sells hay through the newspaper (check the agriculture want ad section) or via your County Extension agent. The farmer will tell you what kind of hay he grows and may (or not) have sent it to the UW for nutrient analysis. Always inspect the hay carefully for mold and dust. I break open the hay to look for mold and reject it - while still paying for the open bale - if it is evidence of mold. It should also not be very dusty because this can cause lung damage.

You can also purchase hay in stores. Vendors such as Oxbow, American Pet Diner, and others sell a variety of grass and alfalfa hay types. Your rabbit may have a clear preference for one flavor over another. However, these "boutique" hays are usually very expensive, and this means that the owner will ration the hay rather than giving the rabbit all she can eat. These hays don't confer special nutritional advantages over local-grown hay, despite advertising that suggests otherwise.

Finally, if you can travel to Madison, WHRS sells local-sourced grass hay out of our west-side foster home. Our hay is not sprayed or treated and is grown in Dane County. It is a mix of grasses, and many owners find that their rabbit prefers our local hay over commercial sources. This is great because we want our rabbits to eat a lot of it. We deliberately keep the price low to encourage hay feeding. Store the hay in a dry, closed container and your hay will last for months. The nutrient content does not change much if the hay is kept clean, dry and covered.