

Quality of Hay for Grass-fed Sheep

—Ulf Kintzel

Photos by Author

In an article not too long ago, I laid out what is necessary to be successful in finishing lambs as grass-fed. In today's article, I would like to talk about my experience in feeding hay to sheep, with dry hay being the only source of feed for ewes during the winter. While I have ewes that need to just be maintained, as well as lactating ewes at the end of winter, I never try finishing lambs on stored feed. Some have conveyed to me that they are able to finish lambs on haylage. I prefer not to and stick to seasonal production simply because I am deeply convinced that the sweet flavor of my grass-fed lambs is due to the rich pasture with a high percentage of legumes. I have personally found lambs raised on stored forage blunt and perhaps even a little steely in flavor. When it comes to flavor, you usually don't get a second chance with customers. Besides, finishing lambs on stored feed is very expensive. That is another reason why I don't do it. Customers often expect products to be available all year long and the concept of a seasonal product is not easy for some of them to grasp. Yet, you can "train" some of these customers by explaining why the lamb must remain a seasonal product. While not all accept it, a good number of them do.

In this article, I will only talk about adult sheep to be maintained and lactating ewes with lambs that primarily nurse and whose intake on forage is very low and at the beginning stages. If you are now expecting tables with numbers that list

the feed value of hay cut and cured at certain times at different stages, I will disappoint you. Those tables are plentiful already and easily accessible when you search the topic on the Internet. I will provide almost exclusively anecdotal evidence, based on my years of experience. In my description of the hay I seek, I will be at times at odds with what seems to be the prevailing opinion about hay.

Let's start with the protein content. When discussing hay, that is the first but often only ingredient that will be mentioned. However, sheep get about one third of their protein need from the rumen bacteria. (The rumen bacteria are able to digest nutrients that animals that are non-ruminants can't, such as cellulose. More about that ability when I discuss energy.) These bacteria are in a constant process of multiplying and dying off. The ones that died off are digested by the sheep. That means hay with a protein content of around ten percent is high enough in protein. In fact, I once had hay tested that was almost pure grass hay, cut early enough, and brought in without any rain. It tested for eight percent of protein and it was good enough to bring a flock of ewes that lambed at the onset of spring through the winter.

The part that is far more important for sheep to bring them well through the winter is energy or carbohydrates. Energy keeps you warm. Energy keeps you fat (not desirable for most of us, but definitely desirable for a fat ewe trying to get through the cold winter). Energy comes in two forms



Early cut first-cutting hay is the ideal winter feed for grass-fed sheep.



My sheep always have free-choice hay available throughout the winter.

in hay: sugar and fiber. Sugars are molecules of various but always small sizes. Fiber is in essence cellulose, a long chain of sugars, and lignin—the kind of fiber you don’t want much of in hay. To make the list complete, I need to mention a third form of sugars, which is starch. Starch is a longer chain of sugars, but not as long as cellulose. Starch is very nutrient dense and is found in the seeds of plants such as grains and is the very ingredient that grass-fed producers are avoiding by not feeding any grain. To be on the same page with my readers, I will use the words energy, carbohydrates, and sugars interchangeably in this article. When I say grass, I mean common grass varieties like orchard grass and timothy mixed with legumes like red and white clover as well as birdsfoot trefoil, and various other plants found in a typical hay field or pasture, with the exclusion of alfalfa, since that particular legume behaves a bit differently. A second reason for excluding alfalfa is my lack of experience with it.

Given the fact that aside from protein, energy is very important, the logic would dictate to cut hay at a time when sugar contents are high. And here at this point I find myself often in disagreement with other farmers. Early-cut first-cutting hay is high in sugars (as well as protein). In my area, early-cut would be cut in mid to late May and perhaps at the very beginning of June. Around mid-June, the grass, particularly orchard grass, gets more and more fibrous, due to the fact that the grass is trying to grow seed stems. Timothy always has a longer open window of good quality than orchard grass, which matures earlier and quicker. I don’t have much timothy myself in my pasture, since it isn’t an ideal grass species for grazing, but when I buy hay, I am delighted when I see timothy hay, since it is far more likely to be cut early enough, while orchard grass is most often cut too late when cut at the same time. The exception is an improved orchard grass which matures up to two weeks later and tends to be less clumpy and fibrous when it develops seed heads. However, few people hay such improved orchard grass. I have about twenty acres of it, which gives me a larger open window during haying time in the spring. But I digress...

Back to grass developing seed heads: That kind of developing fiber contains more and more lignin. While a certain amount of lignin is important for rumen function, it cannot be digested by the rumen bacteria, and the nutrients in it are not available to the sheep. In addition, the more lignin there is in hay, the less hay is being consumed. Intake, which is very important for sheep that get their only nutrition from

hay, goes down. (Leafiness, on the other hand, suggests little lignin content and increases intake.) Such hay that is cut in late June and early July I always call “4th of July” hay. It is one of the most useless kinds of hay there is. Yet, I am personally aware of a good number of people who specifically cut it that late because of the higher yield. Some also cut that late because the weather during that time is far more stable, while in late May and early June the chance of showers and rain is much higher. Well before there was any hay testing, German farmers had this to say about the scenario of cutting hay when they created one of their many rhyming sayings: “Man mäht das Grass nach seiner Güte, am besten vor der Blüte.” (One cuts the hay according to its quality, desirably before it blooms.) Never being shy of a saying, they have one for the late-cut hay as well: “Langes Grass ist des Bauern Stolz, doch glaube mir, du mähtst nur Holz.” (Long grass is the farmer’s pride, but believe me, wood is all you cut.) I could have left it at these two sayings instead of writing the two previous three paragraphs. They truly say it all.

I am often asked if I feed second-cutting hay to my sheep in the winter or while they are lactating. (The implied premise often is that first-cutting hay is not as nutritious as second-cutting hay.) I do at times, but not all second-cutting hay is created equal. Many times, any hay that is not first-cutting hay is referred to as second-cutting. Few people make a distinction between a second, third, or fourth cut. Yet, it matters. Grass and legumes that grow in the summer after the first cut is still high in energy, assuming a reasonably fertile field as opposed to one that is milked out where not much grows after a first cutting of hay. Lambs for instance, that are raised on such pasture throughout the summer, have phenomenal gains. Hay cut during that time is very palatable and nutritious with a high content of energy. That changes when the fall rains start in September, which creates more rapid growth. While this grass is relatively high in protein, it lacks energy. The high protein content still works well for young lambs that grow fast, since muscle growth requires protein, but is almost useless when it comes to finishing and fattening lambs, which requires energy. Hay cut at that time during the fall lacks the energy that sheep would need in the winter. Ready for another German saying about this topic? “Eine Hand voll Grass im Frühjahr ist mehr wert als ein Arm voll im Herbst.” (A hand full of grass in the spring is worth more than an arm full in the fall.) Hay cut in September and into October is often very green and looks appealing. However, I prefer a good first-cutting hay any day

over this fine-looking (and expensive!) hay.

Aside from the time when I think hay should be cut to be suitable for grass-fed sheep as winter feed, it is also important what happens while it is being cured. The biggest problem is rain. During the curing process, hay is already losing sugars. Rain washes sugars out at a much faster rate. The dryer the hay, the faster sugars get washed out by rain. Protein is affected very little by a few showers or

some light rain, but the very valuable energy content declines rapidly. When you make your own hay, it will happen from time to time that it gets rained on. That cannot be avoided. However, when you purchase your hay, you can stay clear of it. Leafy, good-smelling hay that is green looking (what I call looking like tea) most likely did not get rained on.

I should mention that it also matters when during the course of a day the hay is cut. Sugars are used by the plant at night to grow, which diminishes the sugar content until dawn. During the day, more sugars are produced than are used, which increases the sugar content in the grass throughout the day. This is why it makes sense to cut hay later in the day. It does take some nerve, though, to wait that long in the day to cut the grass, with the weather forecast possibly breathing on your neck.

You may have wondered why I went to great length to write about dry hay and said nothing thus far about haylage in round bales. Such silage has both the advantage of needing a lot less drying time and is higher in nutrients, since it loses fewer nutrients during the curing time. However, such haylage is far more likely to develop some mold. That is no problem for some species, but can be a problem to sheep because of a disease called Listeriosis, commonly called circling disease. The bacteria of that disease thrive in the mold of haylage. Sheep affected by the disease will most certainly die, since the bacteria affects the brain and antibiotics are not let into the brain easily by a barrier that prevents it from entering. This is why I have shied away from it. I have seen too many sheep die that way. Yet, I am keeping that option open for those days when the weather forecast predicts rain before the hay is dried and ready to be baled. The man who custom-hays my fields is now offering baleage. I am reasonably certain that I know what I will choose when I look at rain clouds and have to weigh the risk of some cases of Listeriosis against the risk of my hay getting rained on.

Now I want to make a few comments about hay storage. It always strikes me as odd when I see fancy tractors pulling



Storing the hay inside and on pallets helps preserve nutrients and avoids spoilage.

expensive balers making round bales, only to see that these bales are left outside for months to come. I once heard a comment of someone making hay that all the hay loses during that time is color. Actually, it is well established that hay loses an enormous amount of nutrients during such time outdoors due to spoilage and nutrients washing out. I always store my hay in the barn and on pallets to have air circulation underneath and keep moisture from

entering the bales. The situation changes a bit in the winter when bacteria are absent and cannot spoil the hay. Due to space limitations, I put some of my hay outside in December or January or store hay I purchased during the winter at the local hay auction on pallets, but uncovered, outside. I feed that hay within a month or two, and since there is no spoilage due to bacteria and rains are rare (since most precipitation is coming down as snow that time of year), the risk of nutrients being lost or washed out is minimal.

Last, but not least, I want to address the feeding method of hay for my grass-fed flock of White Dorper sheep. Throughout the winter, when grazing ends around the beginning of the new year and I feed hay, there is always free-choice hay for the flock available, day and night. Because of that, there is a certain amount of waste. I estimate between five and ten percent, depending on the quality of the hay. In the barn, this wasted or rejected hay is used for bedding and I have no need to purchase additional bedding. However, most of my hay is fed outside in large round bale feeders, which I place strategically throughout the pasture during the course of the winter to have the areas fertilized that I want to have fertilized. The wasted and rejected hay is additional fertilizer, so I take the “waste” in stride and don’t actually view it as waste. I certainly will not limit intake by rationing the hay fed each day. That might lead to less waste, but bears the risk of not providing the sheep—growing yearlings, pregnant ewes, and lactating mothers alike—with too little nutrition. 🐑

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