

Feeding *Baleage* and Handling the Plastic After Removal

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Baleage makes an excellent feed for beef and dairy cattle. However, feeding baleage is different from feeding hay. Because it is much wetter than hay, baleage is much more susceptible to deterioration. Then, one has to deal with all that plastic. So, why would anyone want to deal with baleage? Because it is worth it. This month's article concludes a series covering the management and use of baled silage by providing a few tips and tricks for how to feed baleage efficiently and deal with the plastic.

The Smell Test

Whether it is in a silo or as a wrapped bale, the process of fermentation is very similar. As long as the package is free of oxygen, bacteria will be able to derive energy from the carbohydrates that are in plant cell sap and tissue. This process is called fermentation. The waste of their fermentation processes leads to a buildup of acid. This is why silage has a low pH. In fact, the fermentation is generally considered good when the pH drops below 4.5 and excellent if it is below 4.0.

These organic acids also give off a silage smell that characterizes the fermentation process. Good silage is characterized by being high in lactic and propionic acids. Lactic acid generally has minimal smell, but propionic smells sweet. Silage will sometimes have a slight sour or vinegary smell. Such silage usually has not fermented as well, and this results in more acetic acid, which is the same organic acid found in vinegar. Though silage that has a slight sour smell may be less palatable to the livestock, it generally is safe to feed as long as lower intake rates are acceptable.

Baleage bales that have a foul, rancid or putrid smell to them are indicative of very poor fermentation. Such material may have even undergone a secondary fermentation, where

the lactic acid formed early has been decomposed and butyric acid is formed. In extreme cases where the crop was excessively wet or the silage wrap failed to exclude oxygen, this secondary fermentation can result in botulism poisoning if the forage is fed to livestock. This is rare, but it can occur. So, be sure that the baleage that is fed passes the smell test. If it smells bad, test it for poor fermentation or botulism risk before feeding it.

Mold

It is not unusual to observe some mold growth on baleage bales. Once the plastic has been removed, one may find molds of various colors on the exterior of the bale. One of the most common is white mold (Fig. 2). White mold is usually associated with baleage bales that were baled too dry to ferment well, but it can occur even if they were baled at the proper moisture level. It often grows on the flat sides of the bale or just under small holes in the plastic. White mold is a harmless yeast, usually in the *Mucor* or *Monila* genus. The mold spores for these species are too large to cause respiratory issues, and they produce no known mycotoxins. Livestock often will push this moldy material out of the way or consume it.

Molds that are green, blue, yellow or red are indicative of a problem. A moldy patch that is red or red with a white edge is likely to be *Monascus ruber*, while yellow/green mold is *Aspergillus fumigatus*, and a patch of blue/green is *Penicillium roqueforti*. Baleage bales with any of these three mold colors present should not be fed to livestock, as there is a risk of mycotoxins that may cause performance issues or, in some cases, animal death. The blue/green *P. roqueforti* is especially problematic because it produces several harmful mycotoxins.



Figure 1. Individually-wrapped baleage bales wait to be fed.

Figure 2. White mold is a harmless yeast, but molds that are green, blue, yellow or red are indicative of a problem.



Figure 3. Plastic at the joints between baleage bales usually splits easily when a bale is lifted and hauled away.

Eat It Fast

Once the plastic has been removed, it is important to minimize the time between when the bale is unwrapped and exposed to oxygen and when the silage is consumed. The major issue with feeding silage is that the product is not stable. An analogy using our eating habits would be potato salad. It should not sit out very long before we eat it; otherwise it will spoil. This is especially true at a summer picnic, where temperatures can speed the deterioration. But this can also occur in the wintertime, even though it may take longer. In either case, it is not worth the risk of eating it if it has been out for very long.

As a “rule of thumb,” never leave silage exposed to the air for more than two days during feeding. If the daytime temperature exceeds 60° F, don’t leave it exposed more

than one day. This rule of thumb is especially important for producers who feed baleage. It is extremely critical for those who use an in-line bale wrapper, since this determines the feed-out rate. If one has made baleage using an in-line bale wrapper, they must be feeding enough animals that they can feed at least one bale per day in the winter. This is because as a bale is fed, the next bale is being exposed to air. Individually wrapped bales are usually not subject to exposure before they are fed, and thus the feeding schedule is somewhat more flexible.

The following are some additional “rules of thumb” on how to feed baleage or, in some cases, what not to do:

- Ensure that the storage site does not increase the chances of exposure to air (e.g., falling limbs, risk of damage by wildlife, etc.).

- Ensure that the forage is between 50% and 60% moisture before it is wrapped and ensiled.
- Don't spear into bales after they have been wrapped. Squeeze carriers or handlers are better but may still stretch, tear or puncture bales.
- Patch any holes in the plastic with silage or greenhouse tape. Duct tape has no UV inhibitor and will break down quickly in the sun.
- Obtain forage samples from baleage bales about 30 days before feeding, and immediately patch the hole.
- Plan to match the forage quality of the baleage bales to the class of livestock most appropriate to its Relative Forage Quality (RFQ). Provide supplements, as needed, to offer a balanced and economical ration to the livestock being fed.
- To feed a bale that has been wrapped using an in-line wrapper, simply spear into the bale, lift, and pull away (Fig. 3). The plastic between it and the next bale will tear away. Cut over the top and peel the plastic off in one large section. If frozen, it will be more challenging to peel off both the plastic and net wrap/twine.
- To feed an individually wrapped bale, cut a large X in the end to be speared and pull back the flaps. Spear the bale, lift, and cut across the top and down the other flat side to peel the plastic off in one piece.
- Always remove the net wrap or twine before feeding the bale.
- Do not force animals to eat waste or refused silage, as it may be spoilage and can lead to poor performance or animal health issues.
- The ensiling process usually completes within 3-6 weeks, depending on a large number of factors. At essentially any

point, the forage can be fed, but this should be done only in an emergency situation. The partially-ensiled product will heat excessively and spoil very quickly.

- Feed baleage bales within 9 months of wrapping to ensure that the plastic has not deteriorated or bale deformation has not over-stretched the plastic, causing oxygen intrusion into the bales.

Have a Plan for Handling the Plastic

An often-overlooked issue with baleage production is the volume of waste plastic that can be produced. Many folks become frustrated or disgusted with baleage because they end up with waste plastic all over the farm if they failed to have a plan to deal with it. Therefore, it is recommended that a producer devise a routine for collecting the plastic as soon as it is removed from the bale. Compressing the material into a barrel, crate or box will be helpful in reducing the bulk of the plastic. To my knowledge, no recycling options yet exist for this waste plastic (it is too dirty), so it must be dumped in a landfill. Burning the plastic is illegal, is not safe, may have adverse effects on the environment, and leaves a residue that is difficult to clean up. Thus, burning should be avoided.

To Be Continued...

For more tips on baleage production and other forage management recommendations, visit our website, www.georgiaforages.com. If you have additional forage management questions, visit or contact your local University of Georgia Cooperative Extension office by dialing 1-800-ASK-UGA1. 

