

# How Good is our Kentucky Haylage? A Summary of 2017-18 Farm Results

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The ability to harvest moist forage as hay gives Kentucky producers many advantages, including timely harvest, higher forage quality, and less weathering loss over hay systems. The baleage system allows producers to utilize commonly available forage equipment (mowers, rakes, balers) rather than requiring choppers and silo structures or bags. Making high quality baleage requires timely access to bale wrappers.

To make high quality baleage, producers should:

- Cut at the proper stage of maturity.
- Bale when the wilted forage is between 40 and 65% moisture content (MC).
- Bales should be as tight as possible to help exclude oxygen and accelerate the ensiling process.
- Wrap bales within 24 hours, and ideally the same day.
- Move bales to the wrapping/storage site.
- Wrap bales with a minimum of four and ideally six to eight layers of UV-stabilized, stretch wrap plastic.
- Periodically check the wrapped bales and plug any holes present in the bales.

Inline bale wrappers speed up the baleage operation and saves plastic over implements that wrap bales individually. The popularity and expanding availability of inline bale wrappers has resulted in greater application of the technology among Kentucky producers. Most producers have had excellent results in making and feeding and even selling baleage. However, some producers have had animal performance problems and even deaths from feeding baleage. In nearly all cases, feeding problems with baleage are caused by poor quality arising from excessive moisture, inadequate or punctured plastic wrap. These problem instances are few but are often cited as a barrier for adoption of the technology.

To better understand the haylage system, and to possibly predict when problems will occur with baleage, a project was initiated to sample a wide variety of farmer-produced baleage. Samples were collected in Anderson, Estill, Fleming, Henry and Shelby counties from haylage made in 2017-18. In all, a total of 44 samples were analyzed. These samples included soybeans, small grains, grasses, grass-legume and alfalfa. Cutting dates ranged from late spring to late November.

## Results

In general, all but one lot of haylage had good visual and odor characteristics. Producers have reported no feeding issues to date. The one problematic sample contained high levels of butyric acid and the producer was advised that it could be a problem. Forage nutritive value was high, with crude protein, total digestible nutrients (TDN) and relative feed value (RFV) averaging 15%, 56% and 100, respectively.

The stability of baled silage can be measured by the total amount of volatile fatty acids (VFA) produced as well as the VFA profiles. Total VFA across all samples averaged 6.0% which is on the low end of the

recommended range of 5.0 to 10.0 (Dairy One Forage Laboratory). The average lactic acid value for these samples was 2.4%, slightly below the recommended value of 3%.

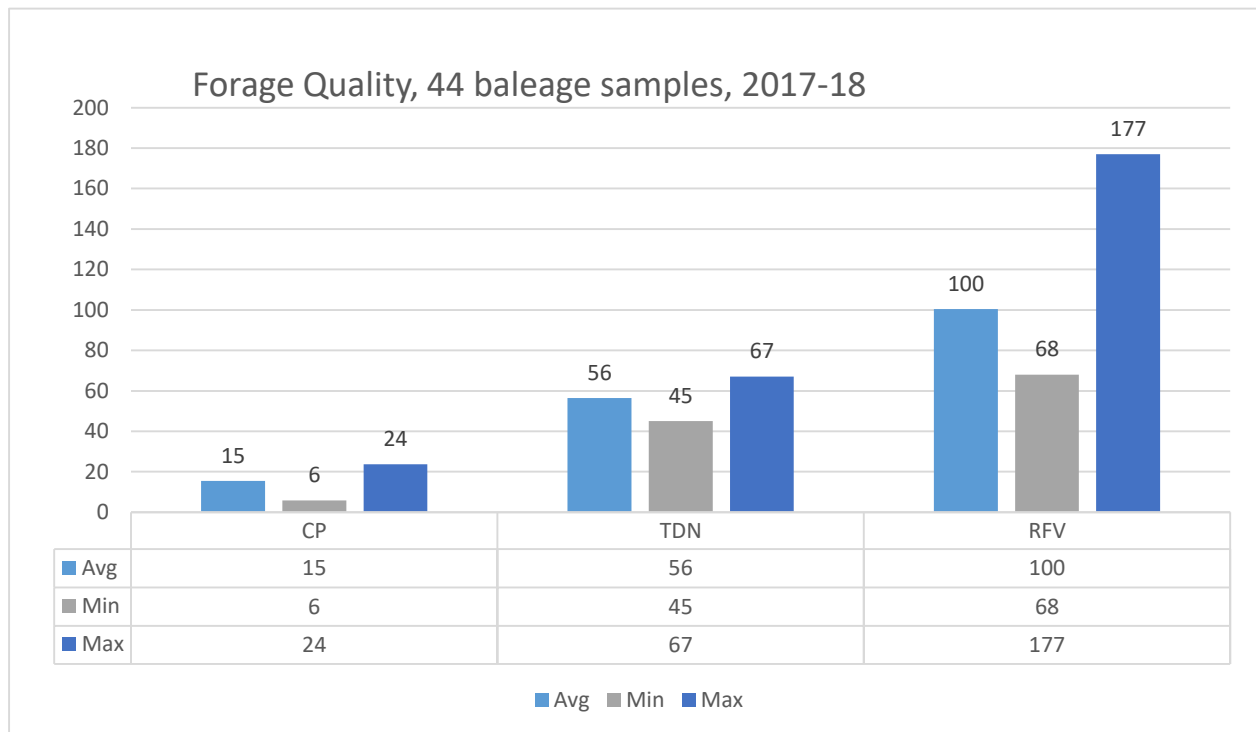
**Discussion**

Moisture content had the greatest impact on total acidity, explaining 76% of the variation (the high butyric acid sample was omitted from this analysis). Interestingly, for baleage with MC between 40 and 60% (a commonly recommended accepted range), lactic acid concentrations failed to exceed the desired level of 3% in 14 of 16 samples. In this sample set, recommended lactic acid concentrations were met more frequently when MC were between 60 and 75%.

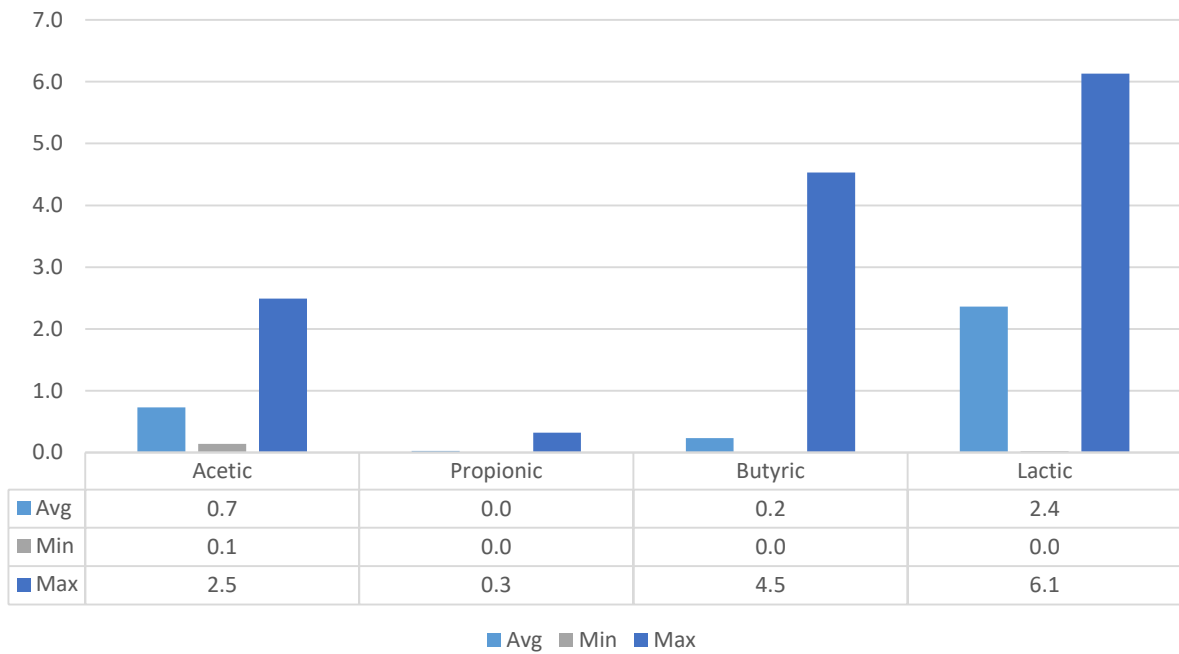
As mentioned before, only one sample had an ‘off’ VFA profile, having a butyric acid content of 4.5%. In good baleage, butyric acid should be less than 0.1%. The average across all samples was just above that value at 0.2%. Fifteen out of 44 samples had butyric acid values above 0.1%, but all but one of those were 0.4% or less. The excessive amounts of butyric acid are most likely due to the very high MC when baled (80% measured as baleage).

**Conclusion**

Baleage is a system which can readily produce high quality forage in Kentucky. VFA profiles were variable, and very highly correlated to MC. Baling at MC on the wetter end of the recommended range (60% or above) produced higher levels of ‘good’ VFAs in these samples. Very wet baleage (80%) leads to high levels of ‘off-type’ VFAs.



Percent Volative Fatty Acids, 2017-18, n=44



Total\_acid

