

THE FORAGER

Agronomics with livestock in mind!

Keeping Track of Silage/Haylage Temperatures...

The production of heat is a normal occurrence during silage/haylage fermentation. If the ensiled forage is well packed and sealed immediately, the average temperature of the mass should not rise more than 10 to 20 degrees F above the ambient temperature at filling. However, it is common to measure temperatures as high as 110 to 130 degrees F in the uppermost layers of silages during silo filling. These high temperatures are a result of excessive amounts of air trapped in the top layers of forage. The key is that these temperatures should decrease quickly as further packing removes air from the mass. Prolonged high temperatures above 115 to 120 degrees F can lead to heat-damaged protein. Temperatures in this range can also be detrimental to many lactic acid bacteria that are needed to achieve a successful fermentation. Thus, chop forage at appropriate length and with adequately moisture content, pack quickly and tightly, and seal as soon as possible to keep the air out of the forage mass.

When the active phase of fermentation is complete, temperatures in the core of the silo often fall to 70 to 85 degrees F. However, a second wave of heat can be produced in silos because of aerobic deterioration. Penetration of air into the ensiled mass allows spoilage yeasts to metabolize lactic acid. As a result of this, the mass reheats and silage/haylage pH increases. Molds and opportunistic bacteria that thrive on oxygen cause more heating and spoilage. In some cases, we have measured temperatures in silage faces in excess of 145 degrees F. Signs that ensiled forage is aerobically spoiling include measuring temperatures in excess of 100 degrees F 4 to 8 inches in back of the silo face at feed-out, reheating in the bunk, visible mold, lack of a sharp or sweet smell to the silage, and/or a flat or moldy/musty smell. If a pH meter is available, a moldy smell coupled with a high pH may also be a good indicator that a feed has undergone aerobic deterioration. Aerobic deterioration of ensiled forages is, of course, more common during warmer weather.

During cool weather, steam is often released during feedout from the face of large silos because of the difference between retained heat and the ambient temperature. The presence of steam does not always mean that the ensiled forage is spoiling. In fact, large silos can retain significant amounts of heat for prolonged periods of time.

Relatively inexpensive probes can be used to monitor temperatures in silage/haylage piles. Purchase one that is at least 2 to 3 feet long.

Retained heat should seldom register above 95 degrees F, especially after two to three months of storage.

(continued in next column)

Average normal temperatures of silage	
Stage	Normal temperature range
Early ensiling, core temperatures	85 to 105° F
Early ensiling, shallow surfaces, loosely packed	85 to 130° F
During storage - large silos, deep core temperatures	70 to 95° F
Active, aerobically spoiling silages	>110-120° F

(Edited from an article by Limin Kung, Jr., University of Delaware)

TIME TO CUT ALFALFA...

In many areas the spring season is in full swing! Some producers are reaping the bounty of the spring flush of grasses, as they graze their cows. The weather is always the fly in the ointment, but cattle and other livestock never seem to mind that their forage doesn't need to dry-down for harvest. Haylage and hay harvest are another matter.

With the high commodity feed costs the production of the highest quality first cutting becomes more of an economical incentive for timely harvest than ever before. It has been said many times, but will be especially critical this year: high quality forage production means timely harvest, often during narrow windows of opportunity. Avoid any delay in harvesting first cutting!

Producers know that the first cutting of alfalfa/grasses is [usually] the largest yielding cutting each year. Some estimates show first cutting can be 40% of total yields. Because of this, first cutting has the potential to provide either some outstanding forage quality or unfortunately, large amounts of poor quality forage for the entire feeding season. A delay in first cutting will significantly reduce quality and reduce maximum forage yields for the season.

Here are a few production pointers for making quality haylage/baleage: Optimum moisture levels for grass are 45-63%; alfalfa is high in calcium, which buffers haylage fermentation, so moisture levels for alfalfa should be slightly less (40-55% moisture); if making baleage, be sure to wrap bales with at least 6, preferably 8 mils. plastic, to ensure an airtight seal; wrap within 24 hours (or less); limit bale diameter (4') to minimize handling extremely heavy bales and ensure safety; store bales on ends with more layers of plastic wrap for protection; mark/store by cuttings; baleage made with optimum moisture (earlier stages of maturity and wrapped properly) has the potential for 12+ months of storage; bales made under less optimum conditions do not have storability and may need to be fed out in 3-6 months.

(Edited from an article by Paul Craig, PA Educator)