Farm Vet News

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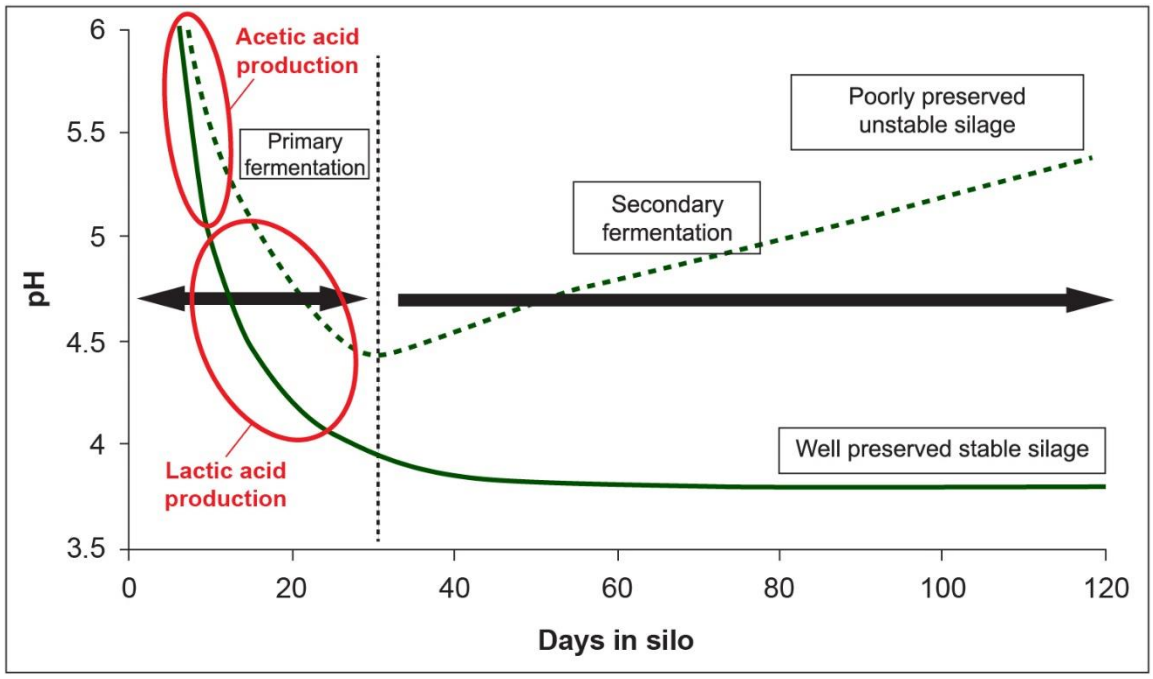
Making good grass silage

What are we aiming to achieve?

Ultimately in making silage we're aiming to pickle grass and preserve it for producing milk through the winter when grass growth and grazing are unavailable.

This process starts as soon as the grass enters the clamp, as the grass continues to respire using up the remaining oxygen, the resulting anaerobic conditions foster the replication of lactic acid producing bacteria resulting in the desired rapid pH drop.

If we get it right, the pH drop is sufficient to inhibit the growth of Clostridial bacteria which, if given the chance, will metabolise the lactic acid to butyric and ammonia reducing the D-value, ME and palatability of the silage.



Patterns of Fermentation

Key criteria for ensuring a rapid pH drop

1. DM of the grass and wilt time

We can influence the DM of the grass entering the clamp by manipulating the DM of the grass at the time of cutting and the period of wilting.

- ***DM of the grass at cutting***
  - High DM grass is difficult to ensile and compact, increasing the amount of air trapped within the silage but also increasing the opportunity for air to enter the clamp - both of which prevent the shift to anaerobic conditions increasing the risk of secondary fermentation.
    - If you have higher DM fields to cut, consider reducing the chop length to encourage better consolidation in the pit.

- Low DM grass is easier to ensile, but often fails to start rapidly fermenting resulting in a slimy, butyric silage.
    - Avoid mowing when there is water on your wellies when you walk through (regardless of whether it is dew or rain).
    - If you have to cut lower DM fields, consider insisting on a wider swath to increase the surface area available for water evaporation.

- ***Wilt time***
    - The wilt time influences both the DM of the crop entering the clamp and the concentration of Water Soluble Carbohydrates (WSC) so getting it right is critical.
    - We should be aiming for a DM of 300g/kg for pit silage (400g/kg for big bales) with grass being cut at around 150-200g/kg DM.
    - We should be aiming to wilt in hot, dry conditions as increased humidity (as appears to often be the case in the UK) will encourage the grass to continue to respire quicker than the DM can increase, resulting in a lower WSC concentration. Often it can be better to not wilt in poor conditions.
    - Heavily wilted crops (>48hrs) will be prone to going mouldy in the clamp (same principle as sourdough bread).

2. Water Soluble Carbohydrate (WSC) concentrations

- During vegetative growth WSC produced by photosynthesis are used for structural carbohydrates, as the plant enters the reproductive phase increasing amounts of WSC are stored. When making silage, we're aiming to cut as the majority of the plants have moved into the reproductive phase.
    - The higher the concentration of WSC at harvest, the higher the chance of a well-preserved forage as these are the sugars which are converted into lactic acid.
    - Minimum of 3% is required to achieve good fermentation to ensure that the lactic acid producing bacteria have sufficient energy to rapidly multiply and quickly drop the pH and kill secondary micro-organisms.
        - The grass should feel "sticky" due to the high sugar levels as it goes into the clamp.

3. Nitrates

- High levels increase the buffering capacity of the crop, making it harder to achieve the desired pH drop.
    - Nitrate levels can be expressed as nitrate levels (should be <1,000mg/kg and it drops at a rate of 500mg/kg/d) alternatively as nitrate/nitrogen levels (which quantify whether the nitrates absorbed by the plant have been metabolised into proteins, they should be <0.1%).

In order to maximise the odds of making perfect grass silage, approximately 50% of farmers are moving to pre-cut testing a few days prior to taking a silage cut - perhaps this is the year you should consider using it?!

General advice

- Speak to your contractor (if you use one) ahead to time to make sure they understand how important this is to you, keep you fresh in their minds and help them to understand what you're expecting of them.
- Remember it costs the same to make rubbish silage as it does good! The money is already spent and revenue for the winter is dependent on the quality of this product, so make it right!

Written by Jim Willshire BVSc DCHP PGDipBA PGCertVetEd FHEA MRCVS, on behalf of Endell Vets Dairy Team