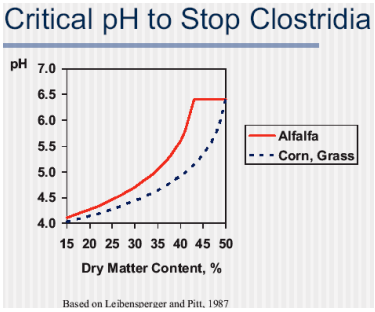
KEYS TO PREVENTING CLOSTRIDIAL FERMENTATION (Butyric acid)

There are few things that es) ferment poorly. The ma he production of butyric aci cts associated with clostridia D DIGESTIBILITY, the third is DRY MATTER LOSS and the fourth concern is HEALTH RISKS.

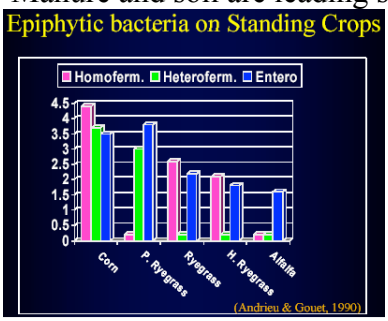
The level of reduced intake and reduced digestibility is related to both the level of butyric acid and other by products such as cadaverine and putrescine; plus the level being fed. The dry matter loss alone of the silages which suffer a clostridial fermentation can be as high as 50% or more. There is an additional energy loss of 18%.

So why do silages go clostridial and how can we prevent these problems? The key management issues to preventing clostridial fermentations are: ensiling at the correct percent dry matter; preventing contamination from soil or manure; inoculating with an effective homolactic inoculant and preventing exposure to air.

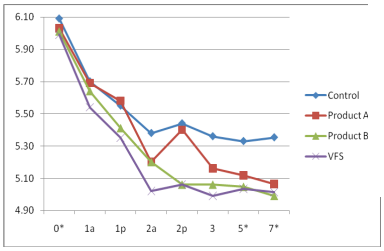
As seen in the graph below, the critical pH to prevent the growth of clostridia is both pH and crop dependent. In general, there is never any significant growth of clostridia in haylage crops when harvested and ensiled at dry matters of 35% and greater. The graph shows when haylages are 35% dry matter or greater than the critical pH to prevent clostridial growth is pH 5. This pH is reached fast when good management practices are followed; fast fill, adequate packing, minimum contamination from soil and or manure; use of a homolactic silage inoculant etc. Significant problems occur in haylages when they are between 30% and 35% dry matter. In these wetter haylages, the pH to prevent clostridia is significantly lower, pH 4.7. Many haylages do not reach this low of a pH before they have clostridia grow. The problem is worsened since clostridia break down protein producing ammonia which raises the pH allowing continued clostridial growth. continued clostridial growth and fermentation.



Manure and soil are leading sources of epiphytic or naturally occurring bacteria on haylage crops. As seen in this graph, in general all crops which are mown and then laid in contact with stubble and soil are at a much greater risk for contamination. A leading cause is manure application rates are heavier on these crops, especially crops such as triticale when manure application rates are heaviest. Manure should not be applied within 2-3 weeks of harvest. Where irrigation is being used, a minimum of 1-2 applications of clean water is recommended before harvest. It is interesting that the real problem with the bacteria levels on the plants naturally is not the pure number of clostridial bacteria but rather the ratio to the lactic acid producing bacteria.



Using a silage inoculant does not insure against the possibility of a clostridial fermentation but certainly helps.



The graph to the left shows the benefit from using various inoculants on triticale silage. Two of the inoculants resulted in a significantly lower pH within 48 hours. This rapid drop in pH is the best protection from clostridial fermentations occurring in addition to ensiling at the proper dry matter and preventing soil and manure contamination.

5540 Spur Lane Emmett, Idaho 83617 ph. 208-369-0549 e mail crosby.nss@g.com