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Silage Quality Matters

Most dairy farms make a considerable investment in silage, in both dollar terms and tonnages of forage conserved. The impact of silage quality has major implications on milk production over a large portion of lactation, in varying degrees, according to pasture availability. Needless to say, silage quality effects farm profit, and the cost to make good quality silage is no different from poor quality. It is very much a management issue – one we can influence significantly.

There was a very large volume of poor quality silage made in southern Victoria last spring. The defining factor was extensive mould growth, far more costly in wastage than actual energy/fibre/protein issues. I was confronted with a number of enquires as to why there was so much mould in last year's silage. After much discussion, some anecdotal evidence tempered with research reading, I've put together some facts on this matter.

The vast majority of mouldy silage was baled late in the season, mostly December. This was after some hot (droughty) weather in November. Mould spores increase dramatically in drought-like conditions, so we already had the potential for trouble before pasture was even cut. Due also to lateness of cutting, grass was very mature, add to this our failure to recognise this material was already dry enough to bale. Mould growth would have accelerated in windrows with established spore count, ample oxygen and humidity.

This scenario would have magnified in the bale. Due to dryness, mature grass with high stalk to leaf ratio, compaction in the bale was seriously compromised leaving high volumes of air in bales. Although grass was dry by ensiling standards (goal 65% moisture), it had ample moisture for humidity in the bale. Wrap this in plastic and we have excellent environmental conditions for a mould explosion. And that's exactly what happened, producing significant failures in fermentation and very high wastage at feed-out.

There is a tool available to many farmers now either by virtue of their own equipment, and certainly through most silage contractors, that can minimise this mouldy silage risk. It is simply chopping silage. Rarely do I see mould in bulk silage stacks, and if I do it normally has another cause – poor compaction through inadequate pack tractor weight or time spent packing.

Modern balers have capacity to reproduce compaction of bulk silage through utilizing the knives for chopping grass as it is baled. Compaction is only one of two very significant benefits of chopping silage. The other is the release of organic acids from leaf which has a major impact on lactic acid bacteria colonies. Research has shown lactic acid bacteria colonies can be increased by 10 fold and greater (Much et al 1989, Henderson et al 1972) while other, less desirable bacteria colonies are not increased.

The increase in silage quality, which is ultimately decided by the cow, through chopping is of major significance. To eliminate mould through compaction and air exclusion is an obvious advantage in reduced wastage. To increase lactic acid bacteria colonies by 10+ fold will have measurable impact on lactic acid production which equals palatability, but also rapid pH decline minimising dry matter losses through extended fermentation time.

The addition of millions of additional lactic acid bacteria colonies by virtue of a quality silage inoculant combined with the above measures will enhance feed conversion efficiency by increasing silage intake and minimising wastage. Quality inoculants have been proven to reduce the growth of moulds and subsequent mycotoxin production in combination with good silage production management. Little can be done to eliminate mycotoxins produced before ensiling.

This is a management issue related mostly in Australia to plant maturity at cutting.

Plant maturity can easily be identified as the single most damaging affect on silage quality, and by quality I mean silage's capacity to be converted to milk dollars. Maturity is one thing we influence most. Reviews of silage quality data from forage testing laboratories over the past forty years reveals a horrid fact: silage quality has not improved much in that time despite massive gains in science and technology available through knowledge, inoculants and machinery. The blame rests heavily on us as managers.

Having made silage for thirty years as a dairy farmer, and had greater involvement as a farm advisor, I'm only too aware of climatic factors beyond the control of managers. However, there is an overriding compulsion by farmers to wait a bit longer to "bulk-up" a silage cut. This costs us dearly in lost milk production. The impacts of maturity have a rapid downward spiralling effect on milk dollar returns on silage investment.

Maturity decreases protein, energy, minerals and plant organic acids. It reduces plant water (moisture), leaf to stem ratio, but does produce a range of 'antiquality' substances and endophytes both of which reduce fermentation capacity. On a final note, avoid spreading effluent on paddocks earmarked for silage. Although it may add valuable nutrients, it also adds undesirable organisms detrimental to both fermentation and post ensiling intakes. If cows won't eat it; we've lost a lot of money.

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