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What Makes Good Silage

Why make good silage would seem pretty obvious, but just to convince you lets look at costs. Silage costs around $110+/tonne of dry matter (DM) to make, either baled or bulk. There is only about $10/tonne DM difference in cost. Add to this pasture at $150+/tonne DM, and we have feed that has cost us at least $260/tonne DM to produce.

This cost is the same whether we make good or bad silage. The crunch comes when we realize a loss of just 7% in digestibility, over 5 tonne DM silage, represents a loss of one tonne of milk! Understanding the science of silage-making becomes the guide to profitable management of this critical operation. The dollars involved demand we get it right.

NDF (neutral detergent fibre) is the first measure of quality. This is determined at cutting, ideally within a couple of days of perfect grazing maturity – NDF 40%. Only cut in daylight so simple fermentable sugars are ample. Adequate sugar is essential for production of lactic acid and rapid pH drop.

Moisture content becomes the next consideration. For good fermentation our goal is 60 – 65% moisture. Higher moisture dilutes sugars for lactic acid producing bacteria hence hindering pH drop, and butyric acid fermentation which renders silage unpalatable. Clostridia spoilage is also likely. Lower moisture inhibits fermentation due to higher oxygen presence, inability to expel oxygen due to difficulty getting adequate pack.

There are new developments in getting cut pasture to 65% moisture through wide swathing. Most mowers nowadays tend to windrow as they cut. Removal of deflector plates creating wide swaths can rapidly increase drying time. The goal is maximum leaf exposure; stalks can be covered by leaf.

The stomata, or pours of the leaf, can reduce moisture down to 60 – 65% very rapidly when open. Stomata are generally open during the day, and closed at night or in the shade of the swath. Laundry does not dry in a plie, neither does silage. Under good drying conditions, wide swath, low humidity, sun light and breeze, 60 – 65% moisture can be achieved in an hour of cutting.

Wide swathing, and selecting days can facilitate cutting and baling in a day. Several US machinery makers are altering mower design to accommodate this rapid drying potential with obvious major impacts on silage quality.

Pack is next consideration. Tight dense bales or well packed pits not only have less oxygen in them at ensiling, but also allow less oxygen to penetrate later. Correct moisture content, chopped or sliced pasture obviously increases pack capacity. At moisture 60 – 65%, over 180 days, silage density of 167kgsDM/cubic meter will lose 20% of its dry matter. At 367DMkgs/cubic meter dry matter loses are reduced to 10%. A goal of 250kgsDM/cubic meter is achievable. This would put a 1.2m x 1.2m round bale at about 340 kgsDM or at 60% moisture 850 kgs. Few bales or pits would meet these criteria. Lucky we usually feed out most of our silage in less than 180 days.

Wrap within 2 hours of baling; at higher temperatures and less dense bales, less than 2 hours, and cooler weather, up to 4 hours. Thicker plastic and less layers are more effective in keeping out oxygen.

Limit exposure to sunlight of wrapped bales. Stack bales when practical to reduce surface area exposure. Stack bales on end to prevent squatting which loosens plastic layers allowing oxygen entry. Align rows of bales in a north south direction to reduce surface area exposed to sunlight.

Failure in any of the above reduces digestibility of silage. Commit just a few silage- making sins and digestibility can drop 7% or more. As mentioned above, on 5 tonne of DM silage a 7% drop in digestibility equates to a loss of one tonne of milk.

Inoculating silage with a quality product can reduce many of the above risks due to its ability to enhance a rapid pH drop. Lowering silage to 4.5 to 5 pH quickly is your best insurance against substantial losses in milk production due to induced digestibility declines.

An inoculant containing a minimum of 200,000 CFU (bacteria), and enzymes to improve sugar availability for bacteria to convert to lactic acid will not just assist in digestibility, but also improve silage palatability and intake by cows. Both these are critical to milk production over silage feeding times. US trial work has revealed inoculated silage produces higher rumen pH (less acidosis) and contains higher amounts of digestible fibre – more milk per tonne of silage.

Many farms are investing near $100,000 in silage each year (grass cost + silage making cost for 300 cow dairy). This figure is probably in excess of total farm fertilizer cost, a little less than the grain bill, (300 cows @ 1.5 tonne/cow). These three figures constitute the majority of farm expenditure; therefore demand our utmost consideration to ensure they are money well invested.

In the case of silage, the minimal added cost of inoculating is money well invested. No farmer would not consider grain quality an important criterion in regard to that expense, nor whether his fertilizer investment was going to pay a dividend. All feeds must be valued in accordance with their capacity to be converted to milk.
Inoculating is hedging a very substantial feed investment.

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