



Quality Second

As a companion silage article to last month's "Palatability First", quality is best discussed in terms of energy, fibre, protein and digestibility. Essentially, silage's capacity to be converted, or more correctly, value added to milk dollars.

I plan to be involved in two separate silage trials this season. The first is with the client I worked with last season on trying to improve quality, and got distracted with fermentation/moisture data which was the basis of last month's article. The second is another client with whom I'll work on a weekly basis to monitor growth rates and schedule cutting to the goal of maximum dry matter harvested and quality criteria.

The goal of this second trial is to increase dry matter harvested by several fold! To achieve this increase we will be cutting at earliest possible stage to enable cutting the whole farm while grazing a cow to the acre. Quality will be a legacy of this goal – early cut, short pasture. I will keep track of costs also, as fertilizer will be a major contributor to enabling us to meet our goal.

Earlier this year I read an article produced in the USA on silage quality. It was based on 40 years of laboratory data (30,000 samples), and despite dramatic increase in forage management technologies, there has been only small improvement in average silage quality. I suspect the same scenario would exist in Australia too.

Although the authors of this paper did not comment on why, but focused more on describing actual data, silage quality had not improved in proportion to forage preservation knowledge. I believe it to be due to our presuppositions on the task of conserving forage; the worst being, the longer we shut up a paddock the more silage we'll cut. Silage making should only be a tool to maintain pasture quality, to control and prevent pasture from going to head. This will produce both quality and quantity.

All we achieve here is a high number of bales per ha in one cut. Quality in terms of digestible nutrient and capacity for conversion to milk dollars just went out the window. If that same paddock had been cut twice at a higher quality (shorter – more digestible nutrient – more milk dollars) I am certain the total bales per ha would have been greater. Contrary to popular belief, quality and quantity go together. For rapid regrowth we must cut leaf, leaving some left for 'collecting' energy from sunlight for regrowth, and not cut stalk leaving no 'solar panels' to catch energy for regrowth.

The first value to determine silage quality and its capacity for value adding to milk dollars is obviously Relative Feed Value, which is essentially digestibility, and should be reported on your feed tests. However, there is a definite correlation between peak energy, protein and digestibility.

There is a significant difference between pastures, on these values, relevant to species. When I've sampled standing pastures of similar stage of growth/fertilizer history etc, RFV's have varied from 180 down to 130; this can translate to big differences in the vat – as much as 5 litres! Newer grass species are dramatically out performing older pastures, particularly in the final analysis - milk dollars: a very strong case for ongoing pasture renovation. I regularly see differences of \$2/cow/day (30% higher) in Milk Over Feed Cost (profit) between seemingly similar farms. Pasture quality, from both plant species and well balanced fertilizer programs, is the difference.

In silage, plant maturity is the single factor in determining Relative Feed Value, energy and protein. Plant maturity at cutting will also determine how quickly pasture regrowth occurs; another very significant factor in farm profit – how many cuts or grazings we get during those critical eight weeks or so of perfect growing conditions.

I stop short of specifying a pasture height for cutting as this will vary widely dependant on pasture species and fertilizer applications. The best measure is to ensure we are cutting leaf, not stalk. Although it's historical when visible, but pasture should be green after cutting. If it is white, we've cut stalk (too late) and can forget that paddock for probably 6 weeks. If it's green and well fertilized, it will be back in the grazing rotation in as short as two to three weeks time (weather), and this can be double the pasture actually harvested and considerably higher in milk dollar capacity.

Pasture can be as high as 13 MJME (energy) in spring, yet average silage ME is 10 MJME or less. Compound this with maturity which binds up energy and protein in lignin (mature fibre) and the actual energy and protein available for milk production can be considerable less again.

Once we have cut, there is only one priority – getting it into a bale/pit and wrapped/covered as fast as possible. Once grass is cut its like ice in the sun - it evaporates. Extended periods on the ground can reduce dry matter by 30%. Following is a list of potential dry matter losses during ensiling: Respiration 1–2%, fermentation 3–8%*, Effluent 0–7%*, Wilting 2–5%*, Surface Wastage 1–10*, and Aerobic Deterioration 1–10%*. (* Areas where inoculant makes a difference).

Respiration and wilting are closely linked. Grass continues respiration after cutting, converting plant sugars to carbon dioxide and water. Wilting is about trying to reduce moisture inside the cut leaf. Certainly atmospheric conditions play a big part here (humidity and temperature), but moisture is lost through pores on the leaf surface which close up in darkness or reduced sunlight. Hence moisture content of cut pasture increases over night, or when shaded under a windrow. Tedding speeds up drying by exposing these pores to light. Check moisture level with a microwave to ensure 65%.

Having said that, I'm convinced we over-ted, based on the fermentation data presented in last month's article. As a result, we bale too dry, causing excessive wilting losses; both dry matter and nutrients, and end up with low feed value silage of poor palatability from limited lactic acid production during fermentation. We have severely reduced our silage's capacity for value-adding to milk dollars. An average 200 cow dairy can have a silage investment of \$100,000 - worth managing!