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Feed Changes and Their Consequences

We have observed an autumn calving herd this year that has maintained a very stable milk production over six months. In October this year when I reviewed this herd's ration/production I noticed this unusual flat lactation curve – very little fluctuation from around 30 litres. I then compared the monthly rations to discover, they were all very similar: approximately 25% silage, 31% grain and 42% pasture, plus 2% minerals in a total constant intake of 20.5 kgs DM.

We will try to keep this herd as close as possible to this same diet until dry off to see just how well an unchanged, or minimally changed diet, can sustain milk production. I will report on this next year in another article as I think the phenomenon has significant positive ramifications for all Australian herds. This ration could, or rather, a stable ration, easily be duplicated anywhere. To date, the positive milk production outcome is convincing me of the benefits of not challenging rumen microflora populations and the very high feed conversion efficiency we appear to be gaining from this.

The reverse of this scenario is the 'norm'. Many herds, due to very average pasture growth this year, and a fairly abundant silage harvest last spring, have maintained a reasonable silage percentage in their ration right through the year as the above herd has. The problem arises, although minimised this year, as we did not see our usual 'spring flush' of highly digestible pasture, when the ration changes from a slower fermenting/reasonably fibrous, especially long material (effective fibre) supporting good rumination and saliva production, to a low fibre, highly digestible grass/grain ration in spring.

In the later part of October we observed a sudden change from nice score 3+ (1 to 5) manures to score 2 and less (loose and some bubbly - gas - acidosis) from the equally sudden change to a rapidly fermentable grass/grain only diet in many other herds. Apart from all the very negative cow health concerns from acidosis, I'm convinced the damage to rumen bacteria populations and milk production potential, is even worse; at least economically.

Initially, the rumen will drop in pH and prevent fibre digestion, reducing feed conversion efficiency. But I think the greater issue is its capacity to adjust from a high percentage of fibre digesters from the former more fibrous diet, to increase starch/sugar digester numbers to cope with the different diet nutrients. There is little doubt total bacteria population decreases from this assault, especially the fibre digesting group.

Then, a few short weeks later, in December, we are going to change the diet back to a high fibre, even higher than pre-spring, as grass has now become very fibrous and lower in digestibility, as we add silage back into the ration. I believe we can manipulate rumen bacteria population mixes in early lactation, but equally I believe, beyond mid-lactation this is very difficult to do.

The obvious outcome is severely reduced capacity of the rumen to digest our typical summer ration (dry land) of grain, silage, some summer crop and a pick of course pasture. From Christmas to the end of January there are horrendous milk production drops; just as high milk price starts. Certainly energy/protein density is involved in this drop, but digestive efficiency, I think, is of far greater consequence than we would believe, perpetrated by our violent ration changes. Sure, solids test increase, but only due to concentration in dramatically less litres. Overall income per cow plummets.

Research in the USA on very low BF% (2.2%) cows on a high starch diet, which we would associate with clinical acidosis, revealed from transmitting pH sensors placed in the rumen, that these cows did not have rumen pH readings unlike cows on a more fibrous diet. The researchers then removed rumen contents and examined them for various digesting bacteria groups. The result was that these cows had very high numbers of starch digesters, and very low numbers of fibre digesting bacteria; hence little acetic acid was produced, the precursor for butter fat production. I think this supports my thinking that rations can be very different, but must remain constant/stable and cows will produce a rumen bacteria matrix accordingly.

I intend reviewing all my clients Feed Budgets in January when silage reserves are known, and re-scripting these Feed Budgets to the goal of sustaining, as best as possible, stable rations for the next twelve months. This will obviously be very connected to our transition rations as the starting point. I think this subject deserves far more attention, and I will write more on it next year as the above herd dries off.

It would also be timely to consider heifers in this same ration discussion. Historically, heifers suffer growth retardation over summer purely on declining nutrient intake (energy/protein). We could also view the probable rumen population damage they suffer from far greater ration swings than do our milking cows. There is a growing body of research in the USA on heifer nutrition and its life-time milk production/reproduction consequences under TMR feeding regimes. This is without consideration to loss of digestive capacity as a multiplier effect on heifer growth over our summer's nutrient deficient rations.

Although this appears a gloomy picture, I think the solution in stable rations is unbelievably simple, and achievable on any dairy farm in Australia.