



Dairy Nutrition & Management Solutions Ltd

Optimizing grass-based systems

NZ data show supplements increase total profit

There have been a plethora of articles recently that have been bagging the use of supplements. In a recent article Woodward (1936) was quoted saying that if a cow eats enough pasture to provide the required digestible nutrients, she will not be deficient, implying cows need pasture only. The key words are IF and REQUIRED. At that time, the average cow in the USA produced about 225kg MS/cow. Based on energy requirements, such a cow would only require about 3700 kg DM or 12-13 kg DM of good quality pasture. Woodward was correct that such a low daily requirement could easily be met by pasture only.

NZ's average production/cow has improved from 308 to 377 kg MS/cow in the past 10 years, currently requiring about 16 kg DMI per day. This is a long way from a modern cow's genetic potential, but the average NZ cow could satisfy this low requirement from pasture only. But is this the most profitable approach?

Good quality well managed pasture is an excellent feed for dairy cows. *IF* only cows could graze more of it. It is not a qualitative problem but a quantitative problem. Cows simply cannot graze enough of it to support modern-day potential production levels, the reason why NZ cows are only producing about 380 kg MS/cow. This is the reason many NZ farmers are using energy dense supplements to increase DMI, production and profitability.

Previous researchers at Ruakura, like Kolver, did a number of trials on supplements in the 1990's and reported that cows producing 29.6 kg milk /day could only eat 19 kg DM from pasture. However, similar cows on TMR diets consumed 23.4 kg DM and produced 44.1 kg of milk, not that anyone is suggesting TMR diets in NZ. Kolver concluded that research, both locally and internationally, suggested that the maximum pasture intake is about 19-20 kg DM for a 500 kg cow at peak intakes. *IF* only cows could graze more pasture!

Substitution is a favourite bogeyman in NZ. I have heard it stated a number of times that the energy added through supplements, will simply be left behind as wasted pasture, comparing supplements to feeding a child chocolate cake before dinner. This is a favourite half-truth. If there is no net gain in energy intakes when supplements are fed, how is it possible that some herds in NZ on pasture plus supplements are producing 500-600+kg MS/cow? While there is no doubting that substitution does exist, the information is often selectively presented to fit the narrative of pasture only.

Results from a feed trial that showed that cows eating the SAME amount of energy/day, whether from pasture or pasture plus supplement, produced the same amount of milk. This should be no surprise. This research is often presented when discussing substitution, leaving farmers with the perception that pasture will produce the same amount of milk as pasture plus supplements. Farmers need to understand that this trial was conducted in pens and cows were not free grazing. What the cows ate was carefully controlled. The more grain the cows were fed, the less cut grass was offered. There was no opportunity for cows to increase energy intakes, as the trial simply compared different energy sources that provided the same amount of energy.

Kolver also reported that cows on pasture produced 269 kg MS, while similar cows on pasture plus maize silage produced 363 kg MS/cow, cows on pasture plus maize grain produced 400 kg MS/cow, while cows on pasture plus a balanced ration produced 407 kg MS/cow. If the net gain in energy intake was zero due to substitution, how is this increase in production possible? The reported response to maize silage supplement was 78 grams MS/kg DM of maize silage; 99 grams MS per kg DM of grain and 99 grams per kg of balanced pellets, which just happens to be very similar to what numerous others have reported in NZ and what we typically see on farm.

Kolver found the response to extra supplemented energy was 7.5 grams MS per MJ ME for maize silage, maize grain or balanced pellets.

Monitoring milk responses over the short term rather than over the whole lactation can be very misleading but is often quoted in preference to the previous full lactation studies. The key to profitable supplementation is to ensure the cow eats the maximum amount of pasture she can physically graze, and is then supplemented to optimise DMI and milk production. The first 4000-4500 kg a cow eats must be home grown pasture. Offering more pasture than the cow can physically graze, is a sure way to waste grass. Increasing stocking rate and buying in feed to carry more cows, for which there is not enough available pasture, is a sure way to get low response rates and lose money. Choose the right system with the correct stocking rate and efficient supplementation will always be profitable, as long as the marginal cost is kept below the milk price.

In most parts of the world the protein fraction of the diet is the most expensive component, while energy from grains is relatively cheap. In NZ we are in the fortunate position to have surplus cheap, protein in pasture. Supplementing cheap grain (additional energy) to improve the utilisation of the protein in grass, which would otherwise be wasted, is a massive competitive advantage for NZ, but is not being fully utilised.

With typical response rates of 100 grams MS/kg of grain measured over a lactation, simple maths would reveal that \$3 grain (10 kg) would give 1 kg milk solids worth \$6. Even if the total costs of producing the extra milk solids increased by 1.5 times the cost of the supplement, the cost of producing the additional milk solid (the marginal cost) would be \$4.50 per MS. The economic rule states, that if the cost to produce the additional milk solid is less than the milk price, then it is beneficial to increase production. Not using supplements to increase profits this season was a wasted opportunity. In fact, data published at DairyNZ Farmers Forums showed that on average, over nearly a decade, the marginal cost (the added cost for the additional milk produced from the use of supplements etc.) was lower than the milk price, which shows that using supplements has been profitable over the past decade. This is confirmed by the graphs showing an increasing profit as production increased per ha in DairyNZ annual economic surveys. Farmers are urged to check this for themselves on DairyNZ website.

Farmers are advised to make sure their consultant (and scientists) understands the concepts of marginal analysis and proper use of supplements to design a system where total farm profit is maximised, rather than pursuing a system that maximises profit per milk solid. Farming for the lowest FWE/kg MS is seldom the most profitable system.

Using supplements to maximise NZ's competitive advantage of cheap surplus protein in pasture makes perfect economic sense. What a pity there are so many conflicting messages when the data is so clear. This is costing the NZ dairy industry millions.