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# DAIRYTECH NUTRITION

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## Begin with the End in Mind

I guess to do this we need to decide what the end should look like. Obviously here I'm referring to calving. A cow in very good health and no calving problems, milking exceptionally well, and perhaps most importantly, she's back in calf. As fertility has become a significant issue, and rightly sighted as a key issue in farm profitability, this is the end I have in mind.

Over the next couple of months I want to focus on all issues involved in achieving this end. Not surprisingly, they are all interconnected and in synergetic unison create a very profitable lactation. My plan this year in these articles is basically, to work backwards; from a pregnant lactating cow at 120 days in milk. If we achieve this, the remaining 180 days is simply about keeping the feed before her.

No other area of dairy management has as many influencing factors as reproduction. Hence, if we achieve high in-calf rates, then we will have gotten most other issues right too. The ingredients for high conception per service will also project good milk production as a bonus. The list of influencing criteria includes incidence and severity of metabolic disease, infectious disease, lameness, heat stress, milk production and energy status, heat detection efficiency and a variety of other management and nutritional considerations. My goal here is to focus on nutritional effects, but not foregoing the influence of the above list, commonly greater than nutrition.

Body condition and energy status: negative energy balance is sighted as the biggest nutritional factor influencing reproduction. Body condition has its determining foundation in dry-off BCS; followed closely by dry cow nutrition to maintain constant BCS. Variation either up or down is a precursor for excessive mobilisation of body fat in early lactation and reduced intake, a driver of ketosis, clinical or sub-clinical (issues we'll discuss over the next few months). Even sub-clinical ketosis, and I'm convinced from some trial work we did last year, it is far more prevalent than many would believe, can impair reproduction. A New York study revealed 14 to 18 percent reduction in pregnancy rates in affected cows.

Strategies to promote high dry matter intake both in pre-calving and post-calving cows includes sound ration balancing of energy, protein and fibre, and the management input to ensure it happens. Again, matters we'll discuss in future articles.

Fats and fatty acids can play a significant role in this too, however, this science in grazing based diets is not well researched at this time. Pasture itself can vary significantly in fats, and differing fatty acids that can exert differing biological effects in butterfat, immune function and reproductive efficiency. Likewise, sugars in pasture not just fluctuate throughout the day; they also come in a variety of forms with varying ruminal effects.

I have written much on MUN (Milk Urea Nitrogen) testing of our milk which we still await release of this invaluable information in regard to dietary protein management. We face a very significant problem throughout winter grazing of very high soluble protein in our pastures. Elevated levels of MUN are most likely to be problematic in very early stages of pregnancy, although I hasten to add, an NZ study claimed high soluble protein from pasture did not cause fertility issues in itself. But I think there is more to this. The loss of early embryos may also be greater than many of us believe, revealing itself in empty cows we thought were pregnant, or at best returning to heat sometime after insemination.

Minerals and vitamins: adequate supplementation of trace minerals particularly in the previous lactation enabling reserves to have been deposited in body fat during late lactation, have major implications in fertility. The ones of most importance are, zinc, manganese, copper and cobalt. There have been some reports of benefits of B12 injections at calving and post-calving. Beyond the immune function benefits of vitamins A and E and their impact on uterine health, there is little vitamin-related data in support of improved reproductive performance, however vitamin D has a growing research base in relation to its impact on immune function, which in turn, certainly does impact fertility.

In summary, good reproduction requires very consistent integration of many management-related, cow-related and nutrition-related factors. Nutrition is rarely the sole cause of reproductive failure, nor will it be the entire solution. Having said that, it certainly has wide ranging implications to the whole success of dairy profit; both milk production and reproduction.