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Newsletter Number 7

Dear Red Breed Enthusiasts,

There is often talk of selecting for sustainable cows and the topic gets new energy each time there is an international heads of state meeting on carbon emissions. Certainly Viking Genetics has published such ambitions and Australia has a group of people discussing them also. Probably your country has a similar discussion occurring somewhere.

As the discussion progresses we get to a critical question: Do we consider cow emissions on a per cow basis; or per unit of production -litres or fat or protein or kilograms of solids. In other words, should we measure emissions per cow, or is it more efficient to dilute the emissions with a more productive cow?

This question takes on greater importance when considered in countries with predominantly pasture grazing systems, rather than those where total mixed ration systems are dominant. In grazing systems the cow has a much greater ability to select her preferred diet, usually the most digestible options rather than balanced fibre and nutrient choices. Some scientists are promoting studies which extoll the virtues of dietary supplements like seaweed extracts to reduce emissions, but are they just changing the chemical makeup of the emissions into more acceptable compounds without providing efficiency gains? Or are they proposing measurable financial gains? In total grazing diets, feed additives can only be presented as ad libitum alternatives in the paddock, making their effectiveness unpredictable.

Solutions to this discussion become less clear when we include opinions from consumer pressure groups who promote the notion that it is more natural for cows to be allowed to graze pasture, rather than controlled balanced diets which include useful supplements. The reality is that lower stocking rates and less dietary control decreases pasture quality and energy is wasted by cows which have to process lower quality forage. So while some would like to see fat cows idling their time chewing their cud among the wild flowers, this system is actually very inefficient.

In each of the last two years our farm has submitted data for an independent carbon audit and the results indicate that the greatest gains are to be found in maximising rumen function efficiency, rather than minimising the farm's operating energy consumption, or buying consumables with lower carbon foot prints. Four important management statistics were highlighted: the number of replacements reared; their age at first calving; the length of their productive life and the number of days not milking during their life. All of these focus on the number of days in a cow's life when she is eating and not providing an output, although the audit recognised the need for the regular annual 56 day dry period which is essential for her natural regeneration.

So back to the initial questions:

1. Should the dairy cow become smaller to reduce emissions per cow, or is there an optimum size which can maintain efficient high production and effectively minimise her maintenance inputs?
2. Can a single selection composite successfully encapsulate all the necessary traits to breed such a cow?
3. How do we educate consumers about the fake news which propagates the false notion of cows rolling in wild flowers, as the ideal way to produce healthy milk?

What do you think?

Turning our attention to cow longevity, some are wondering if the data systems are focussing too much on first lactations and in so doing produce biased herd life/longevity breeding values. We have all had young cows fly effortlessly through their first lactation, only to crash out on the second or third one. Such cows are not particularly uneconomic, but they forfeit huge potential which could be gained from a fourth, fifth, or sixth lactations. Mature lactations are the easier for herd managers and they dilute heifer rearing costs more completely. Good herd management also involves first lactations achieving close to 85% of mature herd average.

Most proofs contain a longevity composite which is based on some parent data and type information, which is supplemented with actual performance data as lactations pass. But could more functional conformation data be included to improve the reliability of longevity estimations? In Australia at least, it is difficult to link herd departures to conformation failures because the herd management programmes do not gather that level of detail. They simply ask if the cow died or was sold, with about nine sub headings under each option. There is no ability to assign the departure to bad feet, or broken udder ligament, or bad teat placement. This generates an assumption that cows only get sold for mastitis, infertility, injury, ease of milking, low production, or a general term called type defect. Another aspect is that many farmers do not differentiate between the conformation which can be enhanced for the show ring, and that which is examined by a classifier to predict a cow's in built resilience.

Herd management, nutrition and genetic ability improvements have increased dairy cow output, but the cow must have sufficient structural integrity to enable her to express that output in a trouble free manner, over a long lifetime. Despite improvements in phenotypic data collection, there remains a significant amount of inexplicable longevity variation, with too many daughters of outstanding bulls leaving herds prematurely. We should be recording more detail about cow departures to explain the whole story.

Canadian studies have compared herd life with various type traits and ranked the most important traits in descending order: Fore Udder Attachment, Udder Texture, Udder Depth, Rear Udder Attachment, Median Suspensory Ligament, Bone Quality, Rear Attachment Width, Angularity, Rear Legs Side View, Rear Leg Rear View, Foot Angle and Loin Strength. The last trait is roughly half the importance of the first, while the list continues with less important traits. Of course these findings are a generalisation and herd environment can reorder the list. For example high hoof care costs could elevate the importance of feet and leg traits.

Recording more details about conformation durability could increase the rate of Red Cow improvement. Changing data recording systems is often very slow work, but breeders could improve their herd longevity by considering more functional type traits in their mating decisions. It is critical that we do everything within our imagination to improve the prosperity of the unique Red cattle which have been entrusted to us.

A couple of readers have drawn my attention to the Casein content of milk with a question: Do Red Cows possess superior casein qualities in their milk and could this be a marketing point? Let us review milk's four biggest solid components:

1. Casein

Casein makes up about 80% of the proteins in milk and the word itself is derived from the Latin "caseus", meaning cheese. Casein carries amino acids, carbohydrates, calcium and phosphorous and when separated from milk it is used as an industrial binder.

Cow's milk contains four types of casein, beta-casein and kappa-casein are two of those. Cows with the BB genotype Kappa-casein usually produce a higher protein content. Cheese made from BB Kappa Casein milk clots 25% faster, is twice as firm and yields about 10% more cheese, than AA milk.

The lesser known E casein variant is anecdotally associated with lower coagulation properties. An E carrier cow will be genotyped AE or BE or EE.

In recent years the marketing of A2 milk has asserted the benefit of Beta-casein in human diets.

2. Whey

The two types of whey protein are: beta lacto globulin and alpha lactalbumin. Beta lacto globulin has considerable effect on the percent of casein in protein through its effect on whey. Confusingly, the genetic marker for identifying the lacto globulin trait is also expressed as AA, AB or BB.

About 18 percent of Holstein cows are AA, 49 percent AB and 32 percent BB for beta lacto globulin.

Alpha lactalbumin regulates the production of lactose in the milk of almost all mammalian species.

3. Lactose

Lactose is the main sugar present in milk and is important for the production of infant formula and pharmaceutical products.

Milk contains roughly 4.6 percent lactose, with Holstein cows showing genetic variation between 4 and 5.5 percent and the trait has a 55 percent heritability. The European Union introduced a breeding value for lactose percent in 2015. It is difficult to alter Lactose content through nutrition management.

4. Milk urea nitrogen

Milk urea nitrogen (MUN) indicates the amount of urea in the milk and is primarily used to indicate how efficiently a cow synthesizes crude protein. It has a greater heritability than fat or protein percent. There is some thought that lower MUN values may provide advantages when carbon audits are calculated and a positive farm profitability indicator.

Dairy cattle breeders are quickly adopting more genomic testing, which is providing information about recessive traits that we have not had in the past. The high heritability of some of these traits could provide an opportunity to build some economic advantages for red cows. First step is to quantify the genetic make-up of your herd and review if the bulls you are selecting will improve the value of your milk. But there can be trade-offs and we need to be careful that negative traits are not unwittingly allowed into in our cattle.

Presently, many farmers are pursuing traits like BB kappa casein, because they are seen as desirable rather than breeding toward a more immediate premium. At some point we must convert this work into financial gain, which is something dairy farmers and processors have not been able to achieve with any scale. There is a growing trend to extract market premiums through on farm processing and sell the produce through farm shops, but for a variety of factors this does not suit every dairy farming situation. More industry wide and more Red Breed premiums are required.

If you have already been including these factors in your breeding decisions, I am sure other readers would like to learn any lessons or insights you have gained.

In this issue, we have some thoughts and observations from Caitlyn Hentschke, who with her husband Ben Hentschke has a deep commitment to the Ayrshire Breed in South Australia. The 2019 IRDBF tour visited Boldview Farms Cher- Bar Ayrshires, which is conducted by brother and sister duo Scott Braendler and Cheryl Liebich, together with their spouses and children. Caitlyn is one of Cheryl and Barry's children.

If a passion for breeding Ayrshires was not enough to fill Caitlyn's mind, she also conducts a business called Biz Boost from an office in Millicent. The description from the BizBoost website describes her work as: "helping rural and regional businesses to grow and achieve their goals by providing quality web development, graphic design and print solutions".



Caitlyn and Ben Hentschke

Here is Caitlyn's response to the question: **Does there still exist a useful youth education and encouragement aspect to showing?**

The benefit of showing cattle is often a hotly debated topic amongst commercial and stud breeders. Some would argue that it is a waste of time and money and that cosmetic falsification makes animals appear better than what they actually are, thus promoting misleading information and comes down to the skills of the fitter, rather than the merit of the animal herself.

Others argue that showing is one of the best forms of marketing to help promote and improve your breeding program and marketability of genetic family lines. It also promotes Australian genetics to the rest of the world.

However, the role of showing extends well beyond the aspect of 'winning'. For many years now, showing cattle has proven to be a gateway into the dairy industry for a lot of younger people who have not grown up on a family farm. I've seen firsthand, keen young kids be invited to help out a neighbour or family friend at a show as they've expressed a bit of interest and want to try a new experience... and just like that, they're hooked.

From there, the interest grows and can quite often lead to more involvement in the dairy industry through the purchasing of animals to start up a small hobbyist operation, employment on farm or within the industry and even the pursuit of higher education in fields related to agriculture.

The social aspect and competitiveness of showing seems to draw people in. Then paired with the extensive global marketing and social media engagement surrounding the 'show scene', allows younger people to establish a huge network of relationships branching out worldwide – you become part of a community with a common interest. For some, it provides them with a place of belonging which they may have not experienced before.

When it comes to targeting the younger generation, there is appeal in terms of activities and educational programs that are held based around showing.

Judging schools, camps, youth events, youth shows and many more are all on offer to young people and delve into the fun aspects of leading, fitting and judging. They also have the ability to teach important life skills and values including responsibility, leadership, respect, care and patience.

From there, we seem to have found the right recipe for establishing the next generation of fitters, judges, semen sales reps, marketing whizz's and more.

Yet, if we're trying to build the next generation of 'dairy farmers', then there is still a substantial gap in the range of education provided at such events which shapes the day-to-day operations of an actual dairy farming career.

Whilst some of these activities touch on more in-depth topics such as cow anatomy, conformation and animal nutrition, there is a lack in the educational focus on more commercial based topics such as animal health, production, fertility and general management.

After personal experience in a number of judging competitions, camps and information days, there is a lot of emphasis put on features such as topline, udder, rear rib and rump which are crucial to the productivity of a cow. However, they are also traits that can be cosmetically enhanced and 'hidden' in a show setting so can potentially be misinterpreted in terms of functionality and can distract from other body features that are also essential when looking at cow productivity.

There is an evident neglect for the parts of a cow that factor into her productivity at home in her working clothes such as heart room, muzzle width, leg set, heel depth, udder attachments and bone quality. Some of these can be hard for younger people to identify and are crucial information when it comes to the commercial viability and longevity of a cow.

Whilst those in the dairy industry all have the same overall objective to 'breed a better cow' – there are varied interpretations as to what makes a 'better cow'. It is here that we are potentially losing out on providing a well-rounded educational system for the younger generation that are keen to get involved in the industry due to differing opinions.

From a commercial point of view, there is a push to improve the productivity of a cow, improve health traits, balance higher output with lower input and improve the overall profitability of the individual. Whereas the stud breeder; whilst also looking at productivity, is also heavily looking at type and marketability of progeny to make a profitable breeding individual, therefore there is added emphasis on classification and type assessed competitions, such as showing. Both methods also come with sacrifices which can be seen as detrimental depending on your stand point ie fertility and longevity.

Whilst many could argue until they are blue in the face about which approach is 'right', in order to progress the industry and inspire the younger generation to stay involved, there needs to be some sort of balance found that incorporates the best of both worlds.

In order to achieve this, there doesn't necessarily need to be a dramatic reinvention of the wheel, but rather an adjustment to the curriculum and delivery of some of these programs already in existence. Whilst the range of information that could be taught is probably too extensive to be piled into one camp or day, there can simply be an incorporation of topics specifically relevant to one another that cover the benefits of both the stud and commercial approach. For example, while learning how to read a bull proof and select a mating for a cow, why can we not also cover how to read a herd test report and analyse the information provided to make a breeding decision that is not only based on type assessment?

One of the best ways for younger people to learn is by listening and observing older generation farmers who have seen the genetic development over many decades – back before we could punch everything into a computer and get the answers handed to us. Whilst the 'fitter' will have their place when it comes to education on the presentation aspect of showing, the 'farmer' is where the core knowledge originates. The ability to visually assess and study production figures to gain an understanding of bull reliability and productivity of an individual is a skill that needs to be held onto.

Most of the knowledge I have picked up across the years came from observing and asking questions to both those in my family and around me that had been doing this for years. Their philosophies and reasoning behind decision making have helped to shape my own breeding decisions along with the adaption of newer age technology and information. At the end of the day, it is how we progress.

Unfortunately, the youth of today are facing the ever growing pressure in the show ring that money talks. If you've got the budget, you can buy your way to the top – whether it be through purchasing an elite heifer from one of the top studs, or being able to pay a professional to prepare her for the show. Whilst more common in the larger breeds, it is starting to filter through to the minority breeds as well. It is here that we are losing sight of what showing is about and the benefits it provides the greater dairy industry, mainly through the encouragement and education of the younger generation.

We are in a tough industry which can be seen in the diminishing number of small to medium sized farms still in operation and the growing corporate model that is taking over the Australian Dairy Industry.

Therefore, we need to find the individuals that are willing and keen to keep the Australian Dairy Industry going and educate them in a way that combines the best of both commercial and stud breeding to find the balance to make it a sustainable industry. The show scene is essentially a gateway to the industry for youth and provides an educational pathway for these individuals that are likely to nurture and progress Australian Dairy for years to come.

Thankyou to Caitlyn.

If any of the topics raised in this newsletter resonate with your opinions, or maybe you disagree, please feel free to contact me and the issue can be discussed some more.

Happy Red Breeding,

Graeme Hamilton