



Genetics and management must go hand in hand

Feeding for fertility and efficiency

We round up some of the keynote dairy papers from a global animal nutrition conference held in the Netherlands. Read on and see if you can pick up some practical pointers to improve your herd's performance.

text **Karen Wright**

Producers should consider both genetics and management if they're looking to improve feed efficiency. So says Wageningen University's Roel Veerkamp.

Speaking to an audience of ruminant specialists from around the world at this year's Provimi animal nutrition seminar in the Netherlands, the professor of genetics and genomics dismissed the common misconceptions among producers that the genetic potential of their herd is high enough or that they need to learn how to manage cows first before they worry about genetics. "Some also believe that the heritability of certain traits is so low that any improvement will be down to management.

"But 94% of the improvement in milk yield has been from genetic improvement in the past two decades with a similar value for fat and protein improvement," he says. "And we now have broader breeding goals and we can select for more traits."

That said, he stresses that genetics and management must work together if an

animal is to achieve its potential. "You can't get good performance from a genetically 'unhealthy' cow or from a genetically healthy cow on a poor diet."

Professor Veerkamp, who spent six years at the Scottish Agricultural College in Edinburgh developing selection tools for UK breeding programmes, says that genomics will play a major role in future breeding programmes.

Fewer inputs

"We need to work towards getting more milk from fewer inputs, which means greater feed efficiency. This has advantages for the producer, the cow and the environment," he says.

He cited approximate breeding goals in today's dairy herds as: 40% increased productivity; 30% improved robustness, which includes a cow that is healthier and more 'self-sufficient' and with improved fertility; 15% as feed efficiency; and 15% farm specific.

The latter may include type classification, meat, and breeding animals for export. "Looking ahead, breeding decisions

will be focussed on strengthening a combination of traits rather than adding to a single trait."

He stressed that one 'missing link' in genetic selection tools is feed efficiency, but he hopes that genomics will play a part here.

"We can't measure feed efficiency through progeny testing, but we already have work going on in this area using genomics. Genomic selection might be the tool that we have been waiting for.

"We are using world-wide data from research institutes, including the UK, and combine phenotypic information, such as the size of the cow and dry matter intakes, with her genetic blueprint to come up with a prediction



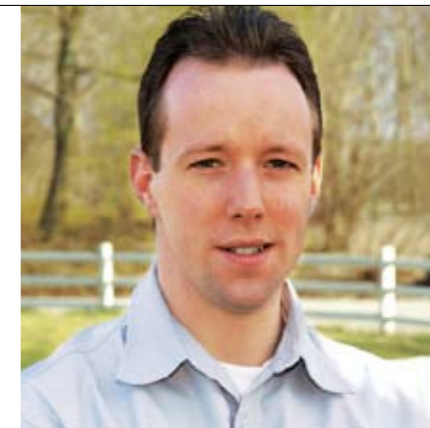
Roel Veerkamp

formulae. It is a huge project and the methodology is vital, but if we can make a breakthrough in this area we could see huge advances in efficient milk production and real progress in the drive to produce more for less.

"Genetics still offer huge potential for progress. Like a car, a cow can always be more efficient and we need to keep developing her."

Feed costs equate to 80% of operational costs on a typical dairy farm and they're still rising. "So if the feed can be used more efficiently, then herd profitability can increase," Cargill Animal Nutrition's Sander van Zijderveld told delegates.

Dr van Zijderveld also stressed the contribution of better feed efficiency to



Sander van Zijderveld

improve animal productivity and help feed a rising global population.

"Ruminants are often considered inefficient converters of protein into milk and meat.

"But we can look at this in a different way and remember that they can convert non-human-edible protein into a valuable protein source for humans. This is a key feature in the future human food supply."

Dr van Zijderveld pointed out that the world population is forecast to increase by two billion to nine billion by 2050. "Improving feed efficiency will play a big part in meeting the need for more food.

"We haven't bred cows for high feed efficiency, although it has been an

important breeding target in pigs and poultry."

He added that while there may be scope to improve feed efficiency through breeding, dietary improvements were his main focus.

"Gross feed efficiency can be measured from the ratio of fat corrected milk production to dry matter intake.

"But we mustn't ignore stage of lactation. Feed efficiency will look good in early lactation but this is mainly due to body fat mobilisation. It then drops later in the lactation, caused by increased body fat storage and the recovery of body condition. So feed efficiency must be measured within a group of cows, or a herd, at similar stages of lactation."

Feed efficiency

He offered some practical guidelines on stimulating feed intake – and feed efficiency. "Avoid deterioration of silage by adding an inoculant – a lot of feed value in silage can evaporate before it is used and energy can be lost through poor silage management.

"And heat stress can affect feed intake and if feed isn't pushed up to the barrier it can't be consumed."

He also looked at the digestibility of the ration.

"Improving digestibility by 5% increases yields by almost 4kg of milk and feed efficiency increases from 1.6 to 1.8kg of milk per kilogramme of dry matter. Better forage digestibility is the best route to improving feed efficiency through nutrition.

"Using enzymes and yeasts will stimulate fermentation of cell walls that will, in turn, in turn promote feed efficiency.

"For example, one feed additive that's designed to improve fibre digestion has consistently shown improvements in feed efficiency in dairy cattle of 4%."

Practical approach

On a practical note, producers were advised to review cows' physical activity, such as excessive walking distances or overcrowding that would divert energy away from milk production.

He encouraged producers and nutritionists to work out the feed efficiency of groups of cows at each lactation stage and compare this with an industry benchmark and use it to evaluate new nutritional measures.

"Knowing your herd's feed efficiency will become important in the future, both with regard to dairy business profitability of dairying and the industry's role in feeding a growing world population." |



Vital research: improving feed efficiency is key to feeding a growing global population