



> Global News

Categories: Animal Health | Corporate News | Dairy News

E-mail Print

Experts Unite to Discuss Ways to Improve Dairy Cow Health, Fertility and the Environment

Source: Feedinfo News Service
(dated 18/06/2009)

18 June 2009 - Leading dairy cattle and management scientists from Denmark, the UK, the US, Italy and Japan shared their knowledge of recent developments in dairy nutrition to a group of over 100 delegates at DSM's specialist ruminant Symposium held in Copenhagen on 29 April 2009.

Some of the dairy feed sector's main issues were discussed, such as the impact of nutrition on cow health and fertility, feed efficiency and the environment.

Essential Oils

Dr. Randy Shaver of the University of Wisconsin-Madison explained that essential oils have a vital role to play in maximising feed conversion efficiency in dairy herds.

Commenting on various trials he conducted, he said: "There's no doubt that supplementing dairy rations with essential oils, by using products such as CRINA® Ruminants, optimises feed conversion efficiency – more energy is diverted into milk production, rather than laying down body condition".



Randy Shaver, Ph.D.

Dairy Science Department
University of Wisconsin-Madison

"Today, dairy producers adhere to the philosophy that, throughout a cow's lactation, it's all about maximising feed intake – or rather dry matter intakes – in order to maximise milk production ...But the results of adding essential oils to the ration are similar to those seen in the US when growth promoting antibiotics are added to dairy rations – we see greater feed efficiency. More energy is diverted into production. UK and European dairy producers can use essential oils to achieve the same efficiency that we see in the US," added Dr. Shaver.

Dr. Shaver urges a change of mindset, similar to that of pig, poultry and beef producers, for dairy cattle producers. He believes that producers should be focussing on the feed conversion efficiency of their herds rather than chasing high dry matter intakes at all costs.

"Producers would do well to remember that they're not paid for body condition score – they're paid for milk. And so their remit should be to produce as much milk as they can as efficiently as they can. And I believe that essential oils can help them to do that," stated Dr. Shaver.

Enhancing Starch Digestibility

Randy Shaver also presented his work on the use of amylase enzymes as a means to help improve fibre digestibility in the cow's ration and enhance starch digestibility so as to provide the cow with more digestible energy.

He explained that high corn prices have fuelled a desire in the US to feed lower starch diets to dairy cows and to partially replace starch from corn with digestible or soluble neutral detergent fibre from by-product feeds. However, the consequence of that was a reduction in lactation performance (when feeding 18% and 20% starch diets on a dry matter basis formulated using beet pulp and citrus pulp to partially replace corn grain).

"But lactation performance was not reduced for diets as low as 16% and 17% starch formulated using soya hulls," he said. "And we found that diets containing 21% starch were acceptable when high fibre, moderate protein by-product feeds were used to partially substitute corn and protein supplement."

However, adding exogenous enzymes, with amylolytic activity, to low-starch dairy rations increased the digestibility of the forage fraction of the diet.

For instance, cows fed a low starch diet with a DSM exogenous enzyme amylase product (RONOZYME® RumiStar™) results in an increase in milk yield and an increase in feed conversion efficiency. Meanwhile, dry matter intake does not increase.

"There's certainly some potential here for further study. And such a product could help to alleviate some of the concerns that producers have about the method and timing of harvesting forage maize, which can also impact on its digestibility. A product that helps to 'break down' the forage portion of the silage, and fibre more digestible, could mean that producer could afford to spend less time worrying about, for example, the maturity, particle size and processing method of their maize forage," said Dr. Shaver.

Beta-Carotene Improves Fertility

Looking into dairy cow fertility, Dr. Katsuya Kida of Obihiro University presented his work carried out so far on the use of beta-carotene and its role in safeguarding fertility.

Cows on high maize diets are particularly susceptible to β -carotene deficiency. However, thanks to beta-carotene supplementation with products such as DSM's ROVIMIX®, cows are much more likely to hold to first service.

"Cows that ovulate within three weeks of calving show a normal ovarian cycle and calving to first AI intervals are also shorter than for cows that are not cycling within this time. So earlier ovulation after calving guarantees a better reproductive performance ... Research has revealed that cows that ovulate 'early' also have high β -carotene concentrations in their blood plasma during the previous dry period, compared to cows that don't begin cycling again so quickly," he added, revealing the rationale behind his work", said Dr. Kida.

The researcher argued that blood plasma beta-carotene levels in freshly calved cows are an important indicator of nutritional and health status and subsequent reproductive performance.

In one of his trials Dr. Kida found out that cows that became pregnant before they had been in milk for 85 days showed higher beta-carotene concentrations two to four weeks after calving compared to cows that were not pregnant.

Precision Management



[Klaus Lønne Ingvartsen](#) of the Danish Institute of Agricultural Science spoke about an automated 'precision management' tool that should help producers to keep on top of herd health, fertility and productivity by identifying sub-clinical diseases, like mastitis, ketosis and oestrus.



Klaus Lønne Ingvartsen, Ph.D.
 Danish Institute of Agricultural Science
 Dept. of Animal Health, Welfare and Nutrition
 Research Centre Foulum

"Pre-empting problems is key to protecting dairy productivity and profitability," said Dr. Ingvartsen.

He argued that producers are in the need of tools such as Herd Navigator if they are to meet the nutritional requirements of their high genetic merit cows today and optimise production. He argued that the need for such systems will be much greater in the future, as genetics continue to progress.

Herd Navigator is a computerised tool that offers 'real-time' on-farm monitoring. It's linked to the milking parlour and samples and analyses milk for early signs of sub-clinical diseases.

"Cow health, fertility and welfare are also important and must be optimised for economic as well as legislative reasons. And traceability and product information are still important issues," added Dr. Ingvartsen.

More Antioxidants

Dr. Antonella Baldi of the University of Milan, meanwhile, encouraged the extra use of antioxidant supplements for dairy cows during the transition period to respond to the limited dry matter intake often noticed.

She reminded her audience that antioxidants play a key role in protecting ruminant health, working hard to 'mop up' reactive oxidative species (ROS) that can cause oxidative stress. ROS can cause damage that impairs dairy cow health and performance. She used the examples of vitamin E and selenium as proven antioxidants.

"Vitamin E supplementation in freshly calved cows is associated with enhanced functionality of blood macrophages and neutrophils, low somatic cell counts, good mammary health, and decreased incidence of placental retention and other reproductive disorders ... Selenium is often thought of in connection with vitamin E, because the response to supplementation with one depends on the status of the other. But vitamin E deficiency can not be made good with selenium – and vice versa," said Dr. Baldi.

Dr. Baldi also highlighted recent trial work that investigated dairy cow immunity when supplemented with different sources of vitamin E and selenium. Quoting William Weiss of the Ohio State University, she said that cows supplemented in the dry period with 2,500mg/day of synthetic vitamin E had better immune status compared with cows supplemented with natural vitamin E.

In another study by Dr. Weiss, dry cows supplemented with inorganic sodium selenate or organic selenium



Antonella Baldi, Ph.D.
 University of Milan
 Department of Veterinary Science
 & Technology for Food Safety

yeast showed no difference in neutrophil function or immune response following an intramammary challenge.

Dr. Baldi also pointed out to the fact that there is work being undertaken on other dietary antioxidants such as vitamin C, which mainly depends on ascorbic acid synthesis from glucose, since dietary vitamin C is largely degraded in the rumen. However, glucose is limited during the transition period in lactating cows, which could limit vitamin C synthesis.

She added that extra work is needed if vitamin C is to be recommended as a routine dietary supplement.

Efficient Reproduction to Reduce Emissions

Nottingham University's Prof. Phil Garnsworthy explained that one of the main strategies for reducing the environmental footprint of dairy systems must be to reduce the wastage of cows by avoiding premature culling for fertility.

Professor Garnsworthy told the delegates that dairy systems contribute between 20% and 30% of emissions and excretions, both in the UK and Europe.

"The trend during the past 30 years for increased milk yield per cow is a major obstacle when looking to reduce emissions because, as genetic merit for milk yield has increased, there has been an accompanying decline in fertility," explained Prof. Garnsworthy.

"Methane emissions are expected to decline by just 19%, unless the issue of poor fertility can be addressed. "If fertility could be restored to levels seen 20 years ago then reductions in methane emissions could be 36%," he added.

To tackle declining fertility, Prof. Garnsworthy believes that it is important to minimise the negative energy balance in early lactation and to maintain adequate plasma insulin concentrations at strategic phases of the reproductive cycle.

More information about the ruminant symposium and DSM's range of dairy nutritional products can be obtained from Adrian Packington at: Adrian.packington@dsm.com