



# World Nutrition Forum's Asian debut focuses on dairy nutrition

Biomin recently held their World Nutrition Forum in Singapore and some 800 delegates from 75 countries attended. This was the first time the event was held outside Austria and, with the right balance of social and scientific sessions, everyone who attended, including International Dairy Topics, hailed the meeting a great success. The theme of the Forum was NutriEconomics – Balancing Global Nutrition and Productivity: People, Performance, Profit and Planet and here we highlight the key messages to come out of the event.

On the dairy front there were several interesting and informative presentations including one on challenges for future dairy nutrition by A. M. van Vuuren and colleagues from Holland.

The important quality of ruminants is their ability to convert fibrous feedstuffs that are inedible by man into human edible proteins such as those found in milk and meat. This is important as globally there is twice as much grazing land as there is cropping land.

Over the last 50 years the productivity of dairy cattle has greatly increased. Today, milk is produced more efficiently because at higher milk production levels maintenance levels are proportionally less as relatively more energy goes into milk production.

As a consequence, the feed required per litre of milk produced is reduced. However, a high culling rate impacts negatively on nutrient use efficiency.

## Management and genetics

Improved management and genetics have contributed to increased productivity, but even so the modern dairy cow can only achieve her genetic potential when properly fed.

This will be affected by what the land is used for, as it might be able to produce more valuable crops, for example, for human food consumption, nutraceuticals or biofuels.

Reducing nutrient losses during the preservation process (for example, silage making) will increase the nutrient yield of the land. The competition between food, feed and fuel will intensify!

Improving the efficiency of utilisation of phosphorus and nitrogen in intensive dairy farming will benefit the environment and reduce feed costs. This is especially the case with phosphorus whose global resources are becoming scarcer.

In dairy cows the nitrogen in urine is much more volatile than that in the faeces and so

reducing urinary nitrogen is therefore important if we are to reduce nitrogen pollution.

The important agricultural greenhouse gases are methane and nitrous oxide and both pathways that produce these in the cow are regarded as substantial inefficiencies

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## The Chinese challenge

The opening session of the World Nutrition Forum centred on Doris and John Naisbitt from the Naisbitt China Institute considering how China is evolving to meet tomorrow's challenges.

China's strategy is to combine strategic planning with seeking bottom-up support and raising productivity by leveraging ecological and environmental friendly technologies to work in a holistic approach of economic, social and political change.

China has moved from economic progress at all costs to investing in sustainable environmental friendly projects as the means to progress to a higher level.

Using a trial and error approach, despite all shortcomings and mistakes, China has become the most dynamic country in the world.

John and Doris reflected on recent times. In 2000 the West appeared to be set for a bright new century and China was fulfilling its role as the workshop of the world.

Some 12 years later things have dramatically changed. America, the flagship of Western values and achievements, is joining the old world in its downwards slide – the average net assets of an American family declined by 40% between 2007 and 2010. However, we should not write the USA off as its economy is still the largest and three times bigger than China's. However, China is building economic alliances with emerging markets both in and outside Asia. Japan has become China's largest trading partner and these two countries now trade directly and not through the US dollar.

Emerging markets such as Brazil, Indonesia, Chile, Malaysia, India, Turkey,

Mexico and others will want to capitalise on these shifts and changes.

China's political system is much more adaptive to economic necessities than the established representatives of the free market and its governing structures are independent of election driven cycles which allows for efficient actions and long term strategic planning. China's urgent problems, with corruption and the environment top of the list, will be addressed by increasing transparency.

Today, some 800,000 local rural leaders are elected in a grass roots democracy and reforms in areas such as property ownership and equalisation of public service will hopefully address China's new social challenge – the widening gap between poor and rich. The driver of social progress is an increasing respect for the rights of the individual, which is a massive change in the Chinese mindset. The more China develops, the more opportunities it will create and the more it will contribute to the world!

Western democracy appears to have lost its way and hunger for power, party politics, self-interests and little engagement to adapt to the changing conditions of a globalised world economy means western politicians are becoming more detached from the people they are meant to represent. Western democracy is deaf to the need to re-invent itself to meet changing needs in the way China has.

With constant improvements in the quality of their living conditions the vast majority of the Chinese see no need for a sudden change to their one party system as long as it delivers what China needs.

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in dairy production systems. In 2011 a Life Cycle Assessment methodology was used to assess the emissions of carbon dioxide, methane and nitrous oxide for 155 countries.

It concluded that increasing productivity reduces the contribution of methane and nitrous oxide to the total amount of greenhouse gases emitted from dairy production systems as the emissions are diluted out over more kg of milk.

Strategies for reducing methane emissions can centre on manipulating the animal, the feed or the rumen. With regard to the first, animal breeding for lower methane production is the main option but this is not neces-

sarily compatible with other breeding goals. However, good nutrition and good breeding can increase cow longevity and this will positively impact on methane emissions.

Nutritional strategies to reduce methane production exist but these are sometimes in conflict with other sustainability goals, for example, to use the lowest possible amount of human edible feed resources. In this context, improving the quality of roughage through plant breeding and management is looking very promising when it comes to reducing the greenhouse gases produced per kg of milk.

Trade-offs between methane emissions and nitrogen losses may also occur and, in particular, the reduction of nitrogen excre-

tion via the urine as a result of lower nitrogen fertiliser usage and more mature grass results in more emission of methane from enteric fermentation.

## Rumen endotoxin load

Qendrim Zebeli and colleagues from Austria reflected on the subject of rumen metabolic output and endotoxin load: two sides of the same physiological coin. They focused on the double role of the rumen ecosystem on health and disease.

Feeding cattle unbalanced diets in structural and easily fermentable carbohydrates leads to rumen dysbiosis and the release of bacterial compounds with immunogenic properties which might also be toxic to the cow. One of these compounds is endotoxin or lipopolysaccharide, which is derived from Gram negative bacteria.

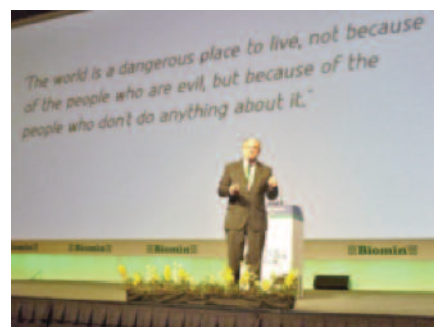
When endotoxin is favoured by the disruption of mucosal barriers, such as during severe rumen dysbiosis, a general and non-specific immune response known as acute phase response is elicited.

In the future we need to develop more efficient feeding strategies that will alleviate the conflict between the high biochemical output of the rumen and the release of large amounts of endotoxin and the disruption of the barrier functions of the rumen's epithelia as this will enhance cow health and productivity.

## Improving rumen efficiency

Dwain Bunting from the USA then looked at improving rumen efficiency, which is more than managing methane production. When it comes to additives for improving rumen function, monensin tends to be viewed as the 'gold standard' but among nutritionists there are the true believers in ionophores who want real proof that new additives are as good as or better than monensin and there are the non-believers who are convinced that downsides such as their negative effects on feed intake or milk consumption, can outweigh claims for increased efficiency. The danger is that this second group will

***Erich Erber, Biomin's founder and director of the executive board, welcomed delegates to the Forum with an interesting and thought provoking presentation.***





**Speakers at Biomin's World Nutrition Forum in Singapore.**

tend to write off all new products. Short term evaluations are rarely long enough to determine whether a product will have sustained effects on volatile fatty acid patterns and methane production.

For example, ruminal protozoal populations can be reduced by 80% and methane production by 30% in the first few weeks after feeding monensin, but both protozoal populations and methane production can be fully recovered by the fourth week of monensin feeding.

Attention also needs to be given to the potential effects of rumen modifiers on rumen protein efficiency. For example, studies with monensin have shown an improvement in the efficiency of feed usage of only 1.9% in urea based diets but an improvement of 7.8% in diets that only contained true protein.

North American dairy cow diets for confined herds are particularly complex. In the field a rumen efficiency additive would never be evaluated in isolation and there is likely to be an overlap with the mode of action of the additive and other feedstuffs, additives or management practices.

In summary, Dwain highlighted that when evaluating rumen efficiency enhancers in the field, expectations should be modest.

## Efficiency of production

Corwin Holtz, also from the USA, considered the subject of consulting for progressive milk producers in the future.

He stated that 'efficiency of production' was the current catchphrase in the USA as American producers try to achieve 45kg of milk or 2.5kg or more of combined butterfat and true protein per cow per day. In the USA the three leading costs of production are:

- Feed costs,
- The cost of rearing herd replacements.
- Labour.

All these need to be managed efficiently and effectively. Corwin sees two primary aspects of cow biology continuing to grow in their importance and these are fer-

mentable fibre and cow comfort.

If cows are presented with highly digestible fibre sources high productivity can be achieved on diets containing 60% dry matter.

In the USA the by-product industry can be a good source of fermentable fibres and projected figures for 2012 for distillers grains is 42.5 million tons. In the future

other fermentable fibre sources should increase in importance.

When herds experience on farm forage challenges (poor NDFD, low inventories, mycotoxins etc) these non-forage by-products can be utilised effectively in diets to promote rumen function and to achieve high levels of productivity. However, this means off-farm sourcing, which needs cash!

There is no question that by-product feeding will continue to play a definitive role in dairy cow diet formulation, but it will need to be viewed in terms of proper economic calculations and the benefits that it may or may not bring to overall rumen and cow health and ultimately efficient and economically sound milk production. ■