

27th Alltech Health and Nutrition Symposium – the ‘game changers’

The recent 27th International Alltech Health and Nutrition Symposium took as its theme ‘Game Changers’ and was attended by some 2,600 delegates from 72 countries.

Following the opening of the Symposium by Lexington’s Mayor Jim Gray and Kentucky US Congressman Ben Chandler and the awarding of the Alltech Medal of Excellence to Prof. Inge Russell of Heriot-Watt University in Scotland, Damien McLoughlin from The National University of Ireland reflected on ‘A time of Change in Agribusiness’

He highlighted that there are currently some 1.5 billion consumers in the world and that this figure will soon double. Nowadays businesses need to be more than lucky and, to survive, a firm needs to reinvent its business over and over again.

He gave delegates the following five take-home points:

● **No fads or fashions.**

Just change and success can come from long term change based on continually renovating and innovating products in a response to consumer health and wellness issues. This is the basis of Nestlé’s success.

● **Don’t be first, just be different.**

A good example of this in practice is Zespri Kiwifruit of New Zealand. They used new technologies to

develop new strains of kiwi fruit, including Zespri Gold. The company now sells 30% of the world’s kiwi fruit but collects 70% of the value from this market.

● **Know where growth comes from and go where growth is.**

In 2005, JBS was largely unknown outside Brazil but today is the largest protein firm in the world. JBS saw the growth potential of being a global protein supplier and they also realised the importance of having a significant presence in Australia and the USA and so they made significant acquisitions in these and other countries. Today JBS uses scale, market position and brand recognition to drive their global success.

● **Don’t act now!**

Liuhe, which was founded in 2005, is now the number one animal feed company in China. Liuhe invests in management skills realising that this is where the greatest return is – not in technology. The company’s philosophy is be positive and simplify issues, work hard and well, learn and reflect and harmonisation with self, users and competitors,

● **It’s about you and everything you do.**

KFC China is now larger than KFC USA and opens a new outlet every 18 hours. Founder Sam Su believes that incremental change is not

enough if you want to be great and emphasises the importance of high quality decision making and for this he relentlessly pursues good people. He believes in making bold and innovative decisions.

In closing off the first session Alltech’s founder and President Pearse Lyons focused on the wealth of great opportunities now being presented by the technological revolution.

Several speakers on the swine programme focused on key issues for modern swine production.

W. H. Close from the UK looked at prolific sows and trace mineral nutrition. He started by asking the question ‘What do we mean by 40 piglets?’ He considered the most meaningful interpretation to be 40 weaned piglets per sow lifetime for all sows in the herd. This obviously depends upon litter size, parity distribution in the herd and sow longevity.

Meeting the sow’s needs

Organic minerals better meet the needs of the modern hyperprolific sow by ensuring that the metabolic, endocrinal and physiological needs of growth, reproduction and immunity are met.

In this respect, the total replacement of inorganic minerals with organic minerals has been shown to increase litter size by at least 0.5-1.0 piglets per litter and, in addition, boost the productive life of the sow, resulting in both an increase in annual and lifetime performance.

As litter size increases, piglet birth weight decreases. In fact for each extra piglet born birth weight decreases by 40g and piglet weight variability increases.

In addition, the percentage of water in the developing piglet increases, whereas protein and fat percentages decrease and muscle development is also affected.

In effect, this means that such piglets are more vulnerable and have reduced immune status and this means reduced performance and increased mortality. Providing organic minerals in the sow gesta-

tion and lactation diets benefits piglets at birth, weaning and later. Thus, replacing inorganic with organic minerals benefits the sow, but also the piglet, by ensuring better quality piglets at weaning and beyond with enhanced survivability and better performance.

Productivity or quality?

Bruce Mullan from Australia considered the imponderable question – productivity or quality? – as invariably selection for high productivity has unfavourable consequences for a variety of metabolic, nutritional and health traits.

He highlighted how improving litter size reduces average birth weights which impacts on grower performance and meat tenderness. So, we need to balance high number of piglets with quality and long term performance.

He then considered foetal programming in which acute or chronic stimulation in utero establishes a permanent response in the foetus that affects physiological function later in life.

Bruce cited as an example the significant delay in the average age at first oestrus in gilts farrowed to sows that had been stressed during the last four weeks of gestation. Progeny born to sows housed in stalls for the duration of gestation had a better feed to gain during the grower-finisher period than progeny from sows housed in groups for all or part of gestation.

The implications of this latter observation should be considered in the light of the move away from individual crating of sows during gestation.

There is a considerable body of evidence to indicate that nutrition and stress during gestation can programme gene expression of the immune system and the hypothalamic-pituitary-adrenal axis in the developing foetus and that these effects may persist for the lifetime of an animal. Unlike the effect on carcass composition, which is relatively easy to measure, any underlining

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Asian visitors at this year’s symposium.



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impact on immunity will be more difficult to notice but yet may have a big impact on the response.

Stability of trace minerals

Richard Murphy from Alltech looked at the structure and stability of Bioplex trace minerals. There are many forms of metal complexes available in the marketplace for use in animal nutrition. These have been generically entitled 'organic trace minerals' by virtue of the fact that the trace elements in question are complexed or otherwise associated with organic molecules.

Terms pertaining to the chemistry of complexation, or chelation as it is commonly known, have created a great deal of confusion. Terms such as metal amino acid complexes, metal amino acid chelates, metal polysaccharide complexes and metal proteinates abound, yet official definitions remain vague and unhelpful.

As an added complexity, the mechanics of organic mineral chelation is a multifaceted and much-debated subject.

Many different laboratory techniques, including infrared spectroscopy, nuclear magnetic resonance, x-ray diffractometry and polarography have been proposed as suitable to assess the degree of chelation in mineral products.

Tests of varying scientific nature and credibility are widely claimed as having the ability to differentiate between 'good and bad' chelates.

Despite the confusion and often contradictory information that exists, mineral chelation is a relatively straightforward process governed by some fundamental chemistry basics.

By carefully considering factors

important in mineral chelation, one can begin to distinguish between the products on the basis of biological stability and thus biological bioavailability.

Dr Robert van Barneveld of Barneveld Nutrition Pty Ltd and the BECAN Consulting Group Pty Ltd of Australia looked at improving feed efficiency in an era of high feed costs.

For the most part, pork producers have viewed 'feed costs' as the absolute cost of the feed and the subsequent efficiency of conversion into saleable product.

With increasing 'credence values' being placed on food production, our future view of 'feed costs' needs to extend to include environmental costs, welfare costs, and what could be termed 'opportunity costs,' particularly the apportionment of resources such as energy to livestock production versus human food.

He then went on to discuss the future challenges facing food producers, to highlight the significance of FCR improvements in pork production in terms of energy conservation, and to examine key strategies that can be employed to improve feed efficiency.

Global awareness

Fundamental to appreciating the impact of improvements in feed conversion efficiency in pork production is a shift from a local consciousness to a global awareness – if we waste feed and subsequently energy and protein in pork production, what are we depriving?

Increasing population size, increasing demand and competition for grains, depleted global grain reserves, increasing urbanisation and

decreasing investment in agriculture all represent a real threat to the amount of food we have at our disposal and the need to conserve at every level.

He questioned whether we have already reached our limits of sustainability, but if we accept that both human food systems and livestock production systems could take significant steps to reduce waste and improve the efficiency of food and energy use, combined with the likelihood that at some point in the coming century population growth will plateau, it is likely that we need to focus on doubling our food production with twice the current efficiency.

Potential energy saving

Tackling future food supply needs, we can demonstrate that pork production can not only play a major role in meeting future food demands, while meeting the increased credence values of consumers, but also that pork production has huge potential to conserve global food energy reserves through improvements in production efficiency.

As an example, a saving of 32g feed/pig/day worldwide or reducing FCR from 2.30 to 2.25 is equivalent to the food energy requirements of 42 million people for 12 months.

The pork industry has been a traditional early adopter of new technologies and there are many new technologies at our disposal that can contribute to improved FCR.

These include improved genotypes, vaccination against GnRF, on-line feed ingredient evaluation and enhanced understanding of nutrient requirements, judicious application of feed enzymes, metabolic modi-

fiers such as ractopamine, functional ingredients such as plasma and feed ingredients that promote improved herd health.

Impact of DON

In an interesting presentation V. Vandenbroucke from Ghent University in Belgium looked at the interaction between the mycotoxin deoxynivalenol (DON) and salmonellosis in the pig.

DON is a trichothecene mycotoxin and it and salmonellosis are emerging issues for both animal and human health. His work has examined the effects of DON on the pathogenesis of a salmonella infection and more specifically on the intestinal and systemic phase of the infection in pigs.

By using porcine alveolar macrophages as an in vitro model for the systemic phase of infection, it has been shown that low concentrations of DON could modulate the cytoskeleton of macrophages through ERK1/2 F-actin reorganisation resulting in an enhanced uptake of *Salmonella typhimurium* by porcine macrophages.

These results suggest that low but relevant concentrations of DON modulate the innate immune system and could also increase the susceptibility of pigs to infections with *S. typhimurium*.

Thus, in pigs, intake of DON-contaminated feed might result in higher infection levels in the herd and consequently a higher public health risk for salmonellosis from the consumption of contaminated pork meat.

Moreover, the increased risk for infection in pigs is of added concern in view of the frequent occurrence of DON in cereal based foods and feeds worldwide. ■