

Animal health and nutrition symposium

The 24th Alltech International Animal Health and Nutrition Symposium was recently held in Lexington, Kentucky in the USA and some 2,000 delegates from over 85 countries attended.

International Poultry Production was present and in this review we will focus on the papers that are of interest to poultry producers. These papers tended to look at green issues and effective, efficient production.

In the opening paper Ken Laughlin from Aviagen championed the view that modern industrial poultry production can be green and started by rebutting most of the world's media for criticising modern industrial agriculture in relation to environmental impact, welfare, biodiversity and sustainability.

Between 1970 and 2005 world poultry meat production increased 4.4 times. In 1970 the developed world had some 75% of this production, but by 2005 this had fallen to 45%.

Improvements in FCR result in less feed being required and a reduction in outputs (waste) per kg of meat produced. Over the last 30 years FCR has improved by 1.6 points per year. The 30% reduction in feed requirement has had a direct impact on environmental burdens. The impact of agriculture on global warming is from nitrous oxide and not from carbon dioxide, thus improvements in the efficient use of nitrogen (protein) are critical.

If we look at the life cycle of production most organic animal production reduces primary energy use by 15-40%, but organic poultry meat production increases energy use by 30%. On the welfare front Ken felt that much had been achieved, for example, in relation to tibial dyschondroplasia, hock burn, pododermatitis and ascites.

Fernando Rutz from Brazil addressed the



As part of its continued expansion and commitment to excellence in research Alltech recently opened its new Centre for Animal Nutrigenomics and Applied Animal Nutrition. Pictured above is the Governor of Kentucky, centre, and to his left Pearse Lyons of Alltech.

subject of improving fibre utilisation by poultry. The great demand for maize for ethanol production means that substitution of maize by products such as corn byproducts and other feedstuffs will increase.

By using solid state fermentation technology (Allzyme SSF) in poultry diets it is possible to increase the bioavailability of energy, protein, phosphorus and calcium of various dietary vegetable substrates. This has now been shown in numerous trials.

In Australia its inclusion reduced the ME in the diet by 150kcal per kg and gave a 60g improvement in body weight at 42 days, while maintaining FCR at 1.84.

In India this technology gave a 79g improvement in weight when ME was reduced by 75kcal per kg and both calcium and phosphorus were reduced by 0.1%. FCR was improved by seven points. Similar results have now been obtained in Brazil.

When it comes to layers, the use of Allzyme SSF in low density diets improves bird performance. In a recent layer trial in

China Allzyme SSF maintained performance even though ME was reduced by 100kcal per kg. Egg quality parameters were also maintained.

Trials in Brazil have yielded similar results and in older flocks significant improvements in internal egg quality were seen.

Jon Ratcliff from the UK looked at the challenges associated with ingredient supply, variability and the optimisation of constraints. In essence he felt the solutions would come from novel ingredients such as enzymes, novel proteins and organic minerals and by using mycotoxin binders and products that help to maintain gut integrity. In addition, it was critical to invest in the early feeding phase and give the chick the best possible start.

Weapon against resistance

Karina Horgan from Alltech's European Biosciences Centre then considered the role of Bio-Mos as a new weapon against antibiotic resistance. Even though the cessation of the use of antibiotic growth promoters has been associated with marked reductions in the occurrence of antibiotic resistant bacteria in food animals, these reductions have not led to the complete disappearance of the resistant strains. A recent trial was undertaken to assess whether dietary supplementation with Bio-Mos had an effect on antibiotic resistance gene levels in the microbial flora in chicken caecal contents.

After 20 days supplementation with this product a significant reduction in the levels of various tetracycline and erythromycin resistance genes was seen. Similar results have been seen in pigs. How these reductions are occurring is unclear.

Mingan Choct of CRC, Australia, reported on three trials that were undertaken to examine the effects of Bio-Mos on growth, nutrition utilisation and gut development in broilers. In the first trial two levels (1 and 2g per kg feed) were used. Bio-Mos tended to improve FCR in the starter phase and a decrease in the populations of lactobacilli and coliforms in the ileal and caecal contents was seen.

Correspondingly, pH and microbial fermentation in the gut were changed.

In the second trial FCR birds were chal-

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Table 1. Paul Aho's key observations.

- Good cost reductions over several decades which should continue.
- Good improvements in grain genetics and crop farming brought down grain prices until very recently when grain prices rose sharply because of the demands of biofuels.
- 15 years' progress in reducing price of chicken meat wiped out over last three years.
- Consumers' ability to purchase chicken is reducing.
- Poultry and eggs are consumer favourites.
- Better FCR. Therefore, the cost of poultry meat rises slower than that of other meats.
- Impact of bird flu has decreased as consumers appreciate the very small risk to them.

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lenged with a pathogenic *E. coli*. Bio-Mos had positive effects on FCR in the *E. coli* challenged birds and reduced the number of mucosa associated coliforms and crypt depth in the jejunum of the challenged birds on day seven.

In the third trial interactions between Bio-Mos, growth, nutrient digestibility and gut development were evaluated in broilers. Similar gut microflora changes were seen.

American economist Paul Aho then looked at the economic future of the poultry sector. His observations are in Table 1.

S. F. Bigili from Auburn University in the States then addressed the challenge of meeting quality and welfare expectations in

| Treatment | Weight gain (g/bird) | Feed intake (g/bird) | FCR | Breast meat (%) |
|---------------------------------------|----------------------|----------------------|-------|-----------------|
| Control | 3,115 | 5,348 | 1.743 | 19.5 |
| +0.3mg per kg Se from sodium selenite | 3,084 | 5,046 | 1.638 | 20.7 |
| +0.2mg per kg Se from Sel-Plex | 3,019 | 4,938 | 1.638 | 20.2 |
| +0.3mg per kg Se from Sel-Plex | 3,159 | 4,770 | 1.555 | 21.0 |
| +0.4mg per kg Se from Sel-Plex | 3,138 | 4,679 | 1.499 | 20.9 |

Table 2. The influence of selenium (Se) type on broiler performance.

broilers with foot pad dermatitis. Information on the aetiology of this condition is limited, but tends to point to a complex interaction of many risk factors such as weight, bedding type, litter quality, flock health, nutrition, feeding and management programmes.

Research has shown that sticky, caustic indigestible carbohydrates from plant protein sources, primarily soybean meal, can contribute to foot pad dermatitis even when litter moisture is within acceptable levels. Feed enzymes may help to reduce this. Other factors were discussed.

Early broiler nutrition

Steve Leeson from the University of Guelph in Canada then reflected on early broiler nutrition. The young chick does not produce an adult complex of digestive enzymes and so digestibility is limited. This situation is further complicated with the change in nutrient substrate from yolk and albumen to complex carbohydrates, proteins and lipids in conventional diets when a highly digestible pre-starter was offered for just the first four days and at 42 days the birds were still significantly heavier.

Trevor Smith, also from the University of Guelph, Canada, talked about the adverse effects of fusarium mycotoxins in turkeys and the efficacy of MTB-100 in preventing these. Trials have shown that feedborne fusarium mycotoxins adversely affected performance, metabolism, immunity and intestinal morphology and that the feeding of MTB-100 is a cost effective way to prevent many of these losses.

The final paper was by V. Ravindran from Massey University in New Zealand who reported on a study to compare the effects of inorganic and organic (Sel-Plex) on the performance and meat quality of broilers.

His findings are summarised in Table 2 – particular attention should be given to source and dosage effects. ■

At the Symposium Dr Ronan Power (centre) received the 2008 Scientific Medal of Excellence for his work in advancing the use of nutrigenomics and gene profiling as tools for improving animal and human nutritional strategies.

