Concurrent Session 9: Animal Nutrition

Effects of fibre source and whole wheat inclusion on the performance, starch digestibility and gut parameters of broiler chickens

AM Amerah, V Ravindran, RG Lentle, DG Thomas
Institute of Food, Nutrition and Human Health, Massey University, Palmerston North, New Zealand

**Background** – The current use of highly processed ingredients in poultry diets has negative effects on the development of the digestive tract of poultry. Broilers housed in a litter floor system consume wood shavings, possibly to compensate for the low levels of coarse fibrous materials in their diet. The coarse fibrous nature of whole wheat may improve the development of the gizzard allowing improved nutrient utilisation.

**Objectives** – To examine the effects of diluting wheat-based diets with insoluble fibre sources and whole wheat inclusion on the performance, starch digestibility and gut parameters of broilers.

**Design** – The following treatment diets were formulated. (i) control diet based on ground wheat, (ii) same as control except that 200 g kg\(^{-1}\) whole wheat replaced ground wheat prior to pelleting, (iii) control diet diluted (6:100 w/w) with cellulose and (iv) control diet diluted (6:100 w/w) with wood shavings. Each diet was fed ad libitum to six replicate groups (8 birds/replicate) from days 1 to 21 post-hatch.

**Outcomes** – Wood shavings increased \((P<0.05)\) the relative gizzard weight and, improved \((P<0.05)\) ileal starch digestibility and feed efficiency, compared to other dietary treatments. All gut components were shorter \((P<0.05)\) in birds given feeds containing cellulose and wood shavings compared to those fed the control and whole wheat diets.

**Conclusion** – Gizzard stimulation using wood shavings improved starch digestion and the performance of broiler chickens.

The role of functional carbohydrate feed ingredients in promoting immunity in monogastric animals

LATucker\(^1\), A Kocher\(^2\), M. Lazarevi\(^3\), P Spring\(^4\)
\(^1\)Waiti Hill Ltd, PO Box 307, Feilding 4740
\(^2\)Alltech Biotechnology Centre, Canip Pike, Nicholasville, KY, USA
\(^3\)University of Belgrade, Belgrade, Serbia
\(^4\)Swiss College of Agriculture, Zollikofen, Switzerland

**Background** – Promoting correct development of the immune system and ensuring adequate protection in young animals is key to their growth and survival. It is now known that certain types of carbohydrates can interact with the immune communication channels in the digestive tract, which modulate immune responses. As farmed monogastric animals often have poorly developed immunity, using such functional ingredients may assist in their health and welfare.

**Objective** – To determine the immune responses of different animal species to diets supplemented with mannan-oligosaccharides (MOS).

**Design** – The first trial was conducted with 48 broiler chickens, from 8-48 d of age and housed in four pens, which were vaccinated against Newcastle’s Disease at 15 and 33 d. The trial compared a control diet against a diet supplemented with 1 kg/t MOS. Antibody titres were measured by commercial ELISA kits at 48 d. Two further randomised and replicated piglet trials (using 48 and 60 piglets respectively), supplemented the animals orally with 0.75 g/d MOS at birth and 1 day old. Growth was monitored, and Ig status by radial immuno-diffusion from blood samples taken at 2 days old was recorded as a measure of immunity status.

**Outcomes** – Broilers receiving MOS had significantly higher antibody titres compared to the negative control group (1568 vs 671; \(P=0.045\)). Piglets supplemented orally with MOS at birth and day old had 32% higher IgG levels \((P<0.001)\) in the first trial and 23% higher IgG \((P<0.01)\) and 9% increased weight gain \((P=0.023)\) in the second trial.

**Conclusions** – Supplementing monogastric animals with MOS may improve their immuno-competence, which is important for their future health and welfare.