The role of broiler nutrition in environmental management

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As intensive animal industries expand in Australia, so too will the volume of manure that requires disposal in an environmentally responsible way. Broiler nutrition has traditionally been focused on maximising growth and improving feed nutrient utilisation. However consideration is now being given to environmental concerns. The extensive use of organic fertilisers (manures) on Australian soils has contributed to eutrophication of aquatic systems (Nash et al. 2003). Since land application of broiler litter is the primary disposal mechanism, it is in the industries best interest to become more accountable for the nutrients contained in their wastes. Therefore by improving the utilisation of nutrients and reducing their concentrations in the manure, the environmental burden of such wastes will be reduced.

Phytate is a plant derived P rich molecule and represents 60–70% of the P in broiler diets. However monogastric animals cannot effectively hydrolyse phytate into available inorganic–P forms (Kies et al. 2001). This loss in feed nutrient utilisation has led to additions of inorganic P being included in rations, which results in large quantities of P being excreted by broiler chickens, thereby increasing the P concentration in broiler litter (Nahm 2002). Phytase is an enzyme that can be used to improve feed nutrient utilisation in broiler chickens by making the P in phytate more available to birds, hence improving the agronomic value and overall resource status of broiler litter (Bosch et al. 1997). The inclusion of phytase in broiler diets can reduce P concentrations in manure by 30%, while improving the digestibility of crude protein and energy capture (Kies et al. 2001).

From an agronomic perspective, addition of phytase improves the resource status of broiler litter for plant production by balancing the primary plant nutrients. Phosphorus is usually in excess when broiler litter is applied at N rates, and this excess in P can then accumulate in soils or move into the wider environment causing eutrophication of aquatic systems (Sharpley et al. 2000). This suggests that with increased understanding in broiler nutrition, benefits in both broiler production and environmental protection can be achieved. In conclusion, as the intensive animal industry expands animal nutrition will most likely assume an increasing role in environmental management.

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