

## **Can nutritional manipulation enhance immune competence in broiler chickens?**

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**Background** - Antibiotic use for disease control in animal production systems, such as the chicken meat broiler industry, has been implicated in the development of antibiotic resistance in humans. As a result, there is increasing interest in the manipulation of nutrition and the development of new vaccination programs to enhance immune competence.

**Objective** - To determine whether nutrition could be used to enhance immune competence through supplementation of broiler diets with vitamins A, C and E and the minerals zinc, copper and selenium.

**Design** - To vary the extent of challenge to the immune system, two different housing environments (optimal and suboptimal) were used. Two diets were fed in each environment (nutritionally enriched vs control) and half of the birds within each diet group and environment were vaccinated with a live vaccine for coccidiosis (containing various *Eimeria* strains) whilst the other half were not. The trial was conducted over a six-week period during which time body weight, weekly feed intake and indicators of immune competence (white blood cell counts and bursa and thymus weights) were measured.

**Outcomes** - Results showed increased bursa and thymus weights in chickens in the suboptimal environment suggesting the level of infection was greater. Eosinophil counts were significantly greater ( $P < 0.05$ ) in birds fed the enriched diet and in vaccinated birds, suggesting an enhanced response to the coccidiosis parasites.

**Conclusion** - These results are promising for the use of dietary manipulation as an alternative to antibiotic treatment in the future.