

Competitive Exclusion of Antibiotic Resistant Pathogenic *E. coli* in the Intestinal Tract of Chickens

C.A. Day, MDL, UK

The Study

- The effect of treatment with the commercial avian flora product Aviguard on caecal colonization of chicks by a pathogenic, antibiotic resistant strain of *E. coli* was studied.

Method

- An invasive strain of *E. coli* (078:K80) with a known respiratory tract tropism was used to challenge chicks previously treated with Aviguard.
- The *E. coli* strain has shown resistance to several antibiotics; enrofloxacin, gentamycin, specinomycin, oxytetracycline, spiramycin, trimethoprim, sulphonamide, flumequine and oxolinic acid.
- A set of naive birds was given direct challenge of 4 log₁₀ cfu *E. coli* by oral gavage. These were immediately put amongst experimental groups of chicks to mimic natural spread of disease.
- The *E. coli* challenge was carried out 24 hours after Aviguard administration to day old chicks.
- Half of each group of chicks was killed at 7 days and half at 14 days.
- E. coli* counts were carried out on caecal contents isolated from each bird.

- Contents were plated onto McConkey no. 3 broth plus enrofloxacin to select for the antibiotic resistant bacteria.

Results

- All control birds became highly colonized with *E. coli* 078:K80 by 7 days post challenge and this persisted to day 14.
- In the Aviguard treated groups, fewer birds became colonized and all birds that were colonized showed reduced levels of colonization compared to controls.
- The chicks that were given Aviguard experienced significant reductions of 5 to 6 log₁₀ in the numbers of *E. coli* present in the gut compared with the controls.

Conclusions

- Aviguard, given prophylactically before birds are exposed to the challenge, reduces the caecal colonization of antibiotic resistant *E. coli* 078:K80
- It is possible that Aviguard could play a role in the control of endemic antibiotic resistant *E. coli* in poultry production.
- This could allow a better control of environmental contamination with resistant *E. coli* by the replacement of these bacteria by non-pathogenic, sensitive strains.

