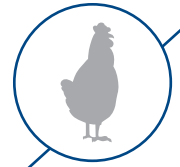


Research Notes P-91

Arm & Hammer Animal Nutrition



CEL-MAX supplementation reduced degree of infection in commercial layer pullets artificially infected with *Salmonella enteritidis*.

OBJECTIVE

Determine if feeding CEL-MAX™ to commercial layer pullets either from 1 day to 17 weeks or from 10 weeks to 17 weeks would affect *Salmonella enteritidis* colonization of both the digestive tract (cecum) and ovaries.

MATERIALS AND METHODS

Two hundred and fifty (250) one-day old Hyline W-36 pullets were purchased from Hyline, Mansfield, Georgia. Each bird was in an individual cage, with forty-eight (48) pullets per treatment group. The following treatments were tested:

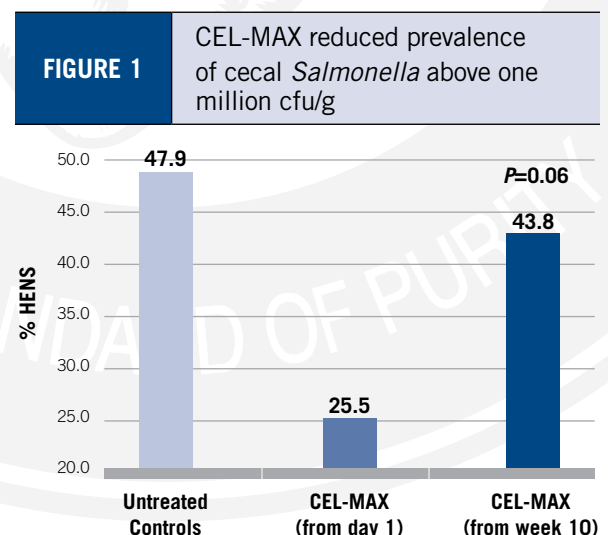
- T1: No additive, challenge
- T2: CEL-MAX SCP, 100g/MT supplemented from day 1 to study termination, challenge
- T3: CEL-MAX SCP, 100g/MT supplemented from week 10 to study termination, challenge
- T4: No additive, no challenge

All birds were fed a non-medicated commercial layer diet in mash form. At 16 weeks-of-age each bird was orally challenged with a nalidixic acid resistant strain of *Salmonella enteritidis* (1.8×10^9 cfu/ml). One week (seven days) post-challenge all birds were necropsied and ceca and ovary samples taken. *Salmonella* was isolated using selective media culturing, and identified and serogrouped using poly-O *Salmonella* specific antiserum. *Salmonella* were enumerated using the most probable number (MPN) method. Data were analyzed statistically, and $P < 0.05$ was considered significant.

RESULTS

Ceca *Salmonella* Prevalence and MPN.

Salmonella was identified in all of the ceca samples from all three of the challenged treatment groups. The prevalence of ceca samples with *Salmonella* loads that exceeded one million cfu/g (the upper quantitative limits of the MPN assay) are summarized in Figure 1. CEL-MAX supplementation from day one of age trended to reduce the number of hens with high (over one million cfu/g) cecal *Salmonella enteritidis* compared to untreated or CEL-MAX supplementation from 10 weeks of age ($P=0.06$).



Quantitative results for the ceca *Salmonella* MPNs are summarized in Figure 2, and the distribution of MPNs is illustrated in Figure 3. Observations which exceeded the MPN threshold were censored in the quantitative *Salmonella* analysis. Both CEL-MAX™ supplementation treatments reduced *Salmonella enteritidis* by over one log compared to untreated control ($P=0.056$).

Ovary *Salmonella* Prevalence. There was no significant difference between challenged treatment groups with respect to ovary *Salmonella* prevalence ($P=0.32$). All except two of the layers had *Salmonella* MPNs that were below the quantitative detection limit of the MPN assay. Decreased *Salmonella* counts in the ovaries is not surprising because ovaries naturally tend to clear *Salmonella* infection rapidly.

CONCLUSIONS

- CEL-MAX supplementation from day 1 of age trended to reduce the number of hens with high (over one million cfu/g) cecal *Salmonella enteritidis* in challenged layers compared to untreated or CEL-MAX supplementation from 10 weeks of age ($P=0.06$).
- Both CEL-MAX supplementation treatments reduced *Salmonella enteritidis* by over one log in challenge trials compared to untreated control ($P=0.056$).
- A higher proportion of hens receiving CEL-MAX from day 1 were noted to have lower *S. enteritidis* counts in the ceca compared to hens fed control or CEL-MAX from week 10.
- No difference between treatments on ovarian *Salmonella* colonization was noted.

FIGURE 2 CEL-MAX reduced *Salmonella* log₁₀ MPN per gram in ceca samples by 1.2 log

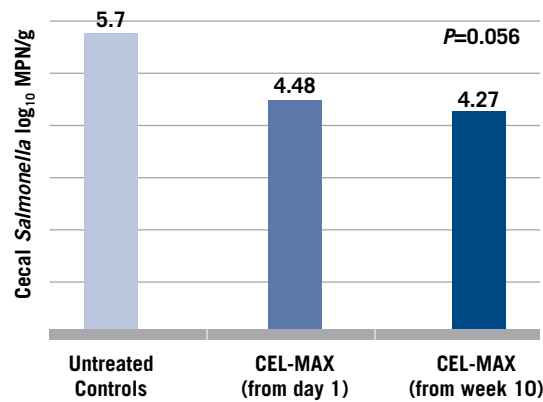
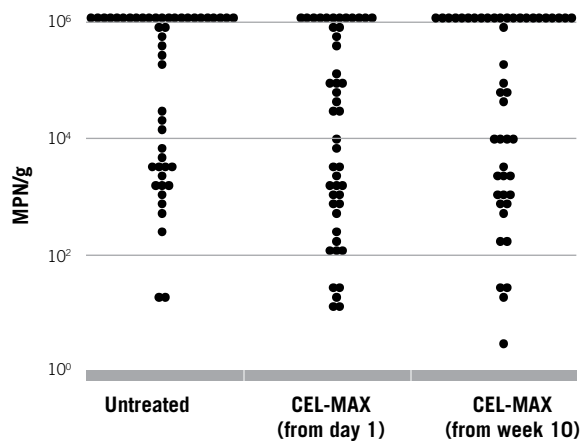


FIGURE 3 More pullets receiving CEL-MAX had lower *Salmonella* MPN per gram in ceca samples



Samples that exceeded the upper limits of the MPN assay were arbitrarily assigned an MPN value of approximately 1×10^6 MPN/g for graphical illustration.



Animal Nutrition



Based on study conducted by Dr. Hofacre at Southern Poultry Research Inc., Athens, GA

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