MicroLife PRIME

Technical Bulletin

Information from Phibro Technical Services

Direct-Fed Microbial Trial Demonstrates Improved Control Against Common Disease Challenges in Turkeys

MicroLife® Prime direct-fed microbial is a patent-pending proprietary combination of four probiotic strains of *Bacillus amyloliquefaciens*, *Bacillus subtillis*, *Bacillus licheniformis* and *Bacillus coagulans*. These strains were selected to create a synergistic effect that encourages a higher intestinal population of beneficial bacteria to support turkey health, performance and processing yields. MicroLife Prime has been shown to reduce populations of *Clostridium perfringens*, *Escherichia coli* and *Salmonella*, as well as reduce lesion scores associated with coccidiosis. This study was designed to evaluate four inclusion levels of MicroLife Prime to turkeys in a typical production environment, with this technical bulletin reporting coccidiosis lesion scores and bacterial counts.

Compared to challenged and unmedicated controls, all groups fed MicroLife Prime had statistically significant:

- Improved coccidiosis lesion scores at days 28 and 84
- Reductions of *E. coli*, *Salmonella* and *Clostridium perfringens* intestinal isolations on day 84

Trial Design

A floor pen trial was conducted with all challenged groups housed on built-up litter from a commercial turkey farm that reported high mortalities from the three previous flocks. The litter was known to contain *Clostridium perfringens* and other common bacteria such as *E. coli* and species of *Salmonella*. In a previous trial at the research facility, these pens had also been supplemented with additional *E. acervulina* and *E. maxima* coccidia oocysts and an additional *Clostridium perfringens* challenge. The unchallenged, untreated control group was grown on new, clean litter.

Male turkeys were vaccinated in the hatchery with a commercial coccidiosis vaccine. Each treatment had 12 replicates of 24 birds per pen arranged in a randomized block design. Birds were fed standard corn and soy diets with no consumption restrictions. MicroLife Prime was fed at four inclusion levels as follows: 500,000, 1 million, 1.5 million or 2 million colony forming units (CFU) per gram of feed throughout the trial. No other feed additives or antibiotics were used.

Coccidia lesion scoring was conducted on days 28 and 84 using the Johnson and Reid method. Bacterial data results presented were completed on day 84. Statistical analysis of all parameters used a multi-factorial procedure to compare the means of the treatment groups using ANOVA (Analysis of Variance). A Least Significant Difference of means was reported at the $P < 0.05$ level as determined by Duncan's New Multiple Range Test.

Results

The litter challenge model was successful in creating a disease challenge similar to field stressors found in commercial turkey growing conditions. This was demonstrated in the challenged control group with 9.17% mortality.

Coccidiosis lesion scoring was done on days 28 and 84. Groups fed all inclusion levels of MicroLife Prime had statistically significant reductions in coccidiosis lesion scores at both time points compared to the challenged control group (Figure 1).

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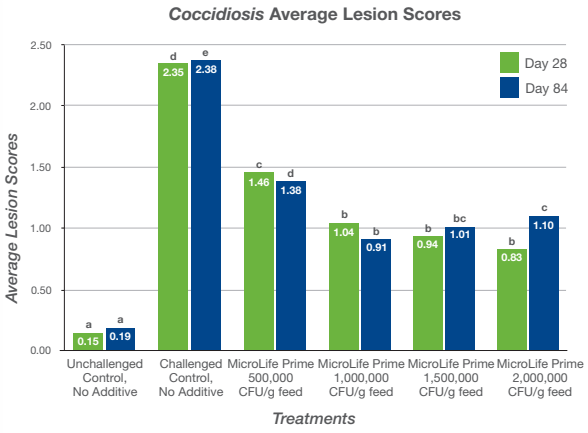
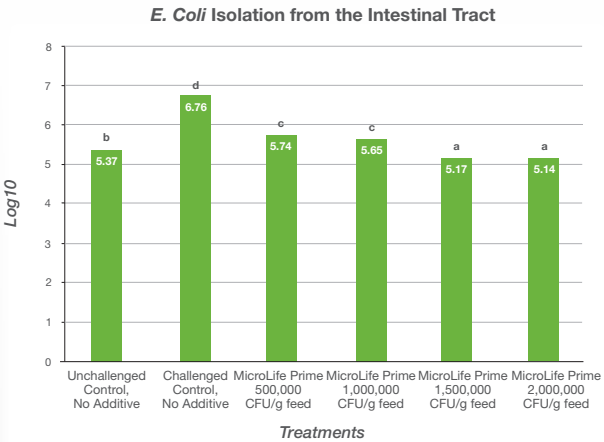
Figure 1. *Coccidiosis* Average Lesion Scores on day 28 and 84



Note: Statistical superscripts are relative to each evaluation
[a,b,c,d,e]Means differ significantly (P < 0.05) as measured by Least Significant Difference
Source: Phibro Data, 2020

Groups fed all inclusion levels of MicroLife Prime had a statistically significant reduction in the isolation of *E. coli* from the intestinal tract (Figure 2).

Figure 2. *E. coli* Isolation from the Intestinal Tract



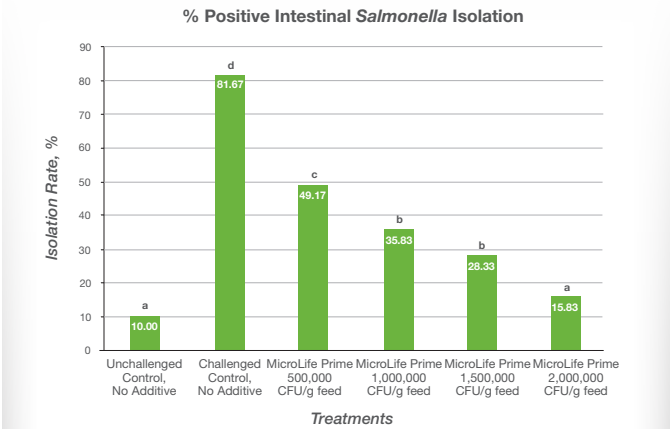
[a,b,c,d]Means differ significantly (P < 0.05) as measured by Least Significant Difference
Source: Phibro Data, 2020

At the end of the trial, all groups fed MicroLife Prime had a statistically significant reduction, compared to the challenged control group, in the percentage of *Salmonella*-positive birds, ranging from 32 to 65 percentage points. A linear reduction was observed as the MicroLife Prime levels increased with the highest-level fed, ending with a statistically similar result as the unchallenged control group (Figure 3).

To learn more about MicroLife Prime, talk with a Phibro expert at +1.800.677.4623.

This information has been prepared for industry professionals.

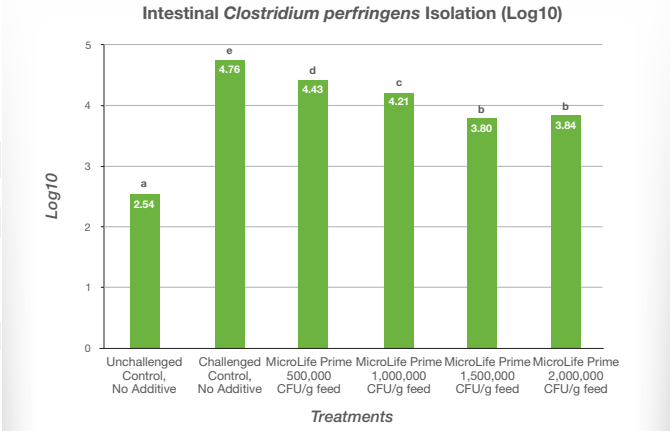
Figure 3. Percent Positive Intestinal *Salmonella* Isolation at the End of Trial



[a,b,c,d]Means differ significantly (P < 0.05) as measured by Least Significant Difference
Source: Phibro Data, 2020

Compared to the challenged control group, all groups fed MicroLife Prime had a statistically significant reduction in the isolation of *Clostridium perfringens* from the intestinal tract at Day 84 (Figure 4).

Figure 4. Day 84 Intestinal *Clostridium perfringens* Isolation



[a,b,c,d,e]Means differ significantly (P < 0.05) as measured by Least Significant Difference
Source: Phibro Data, 2020

Conclusion

In this study, birds fed all inclusion levels of MicroLife Prime had notable reductions of coccidial lesions and bacterial counts of *E. coli*, *Salmonella* and *Clostridium perfringens*. A linear improvement was often observed in the results as the inclusion level of MicroLife Prime was increased. Turkey producers may use this information in deciding how to incorporate MicroLife Prime into their feeding programs.