

## *Trials Demonstrate Effect of a Saponin Nutritional Specialty Product on Performance as well as Necrotic Enteritis and Salmonella Infections*

Magni-Phi® contains two saponin ingredients derived from yucca plants and quillaja trees which offer a natural solution to promote intestinal integrity and help improve the immune response in poultry. Previous controlled studies have confirmed field observations where use of Magni-Phi in feed improved intestinal integrity. A healthy gut led to improved broiler performance and reduced mortality in the face of strong disease challenges such as *Clostridium perfringens* (necrotic enteritis) and *Salmonella* incidence. A series of four trials were conducted to measure the effect of Magni-Phi fed at two levels in the presence of a severe disease challenge with multiple pathogenic organisms.

### This Trial Demonstrated:

- Birds fed Magni-Phi at either the 250 ppm or 500 ppm inclusion level had statistically significant improvements in body weight gain, feed conversion and mortality, compared to birds not fed Magni-Phi
- Likewise, both levels of Magni-Phi were shown to significantly reduce the fecal *Clostridium* counts and the number of birds testing positive for *Salmonella* at two sampling ages
- Magni-Phi provided a significant linear improvement in all measured parameters

### Study Design

This report summarizes four individual trials conducted at the same test facility. Commercial broilers were raised in pens of 55 birds in a randomized complete block design. Treatment groups included an untreated control, a group fed Magni-Phi at 250 ppm, and another group fed Magni-Phi at 500 ppm (one trial included only the control and a 250 ppm Magni-Phi group). Pooled data in this analysis includes 50 replicates of each treatment group.

The trials were conducted on used litter from previous trials supplemented with litter from commercial farms that had experienced coccidiosis, necrotic enteritis and *Salmonella* challenges. Oocysts of *Eimeria acervulina* and *E. maxima* were added to each pen before birds were placed. *Salmonella* serotypes isolated from litter samples included *Enteritidis*, *Typhimurium*, *Kentucky*, *Indiana* and *Heidelberg*.

All birds were given a hatchery vaccination with a commercial coccidiosis vaccine. Standard starter, grower, and finisher rations were used in the trials.

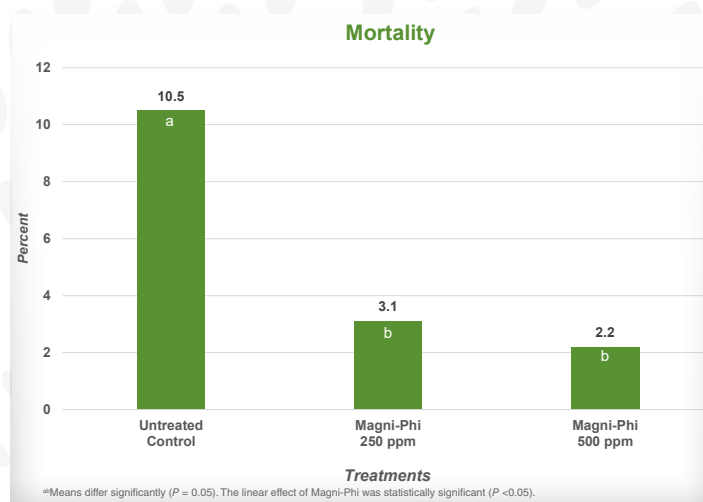
On days 21 and 42 (end of the trials) several evaluations were conducted. Besides measuring performance parameters on all treatment groups, *C. perfringens* and *Salmonella* assays were completed on four birds from each pen at day 21 and 10 birds per pen on day 42. Using culture techniques described in Bafundo, et. al. (2021), *Clostridium perfringens* counts (measured as Log10 CFU per g feces) and percent *Salmonella* incidence were determined.

All data from the four trials were pooled and analyzed. Linear regression analysis was used to test the linear effects of the increased Magni-Phi levels. Statistical differences between treatments were tested using the Holm-Bonferroni procedure to the Least Significant Difference methodology. Statistical differences were established at  $P < 0.05$ .

### Performance Results

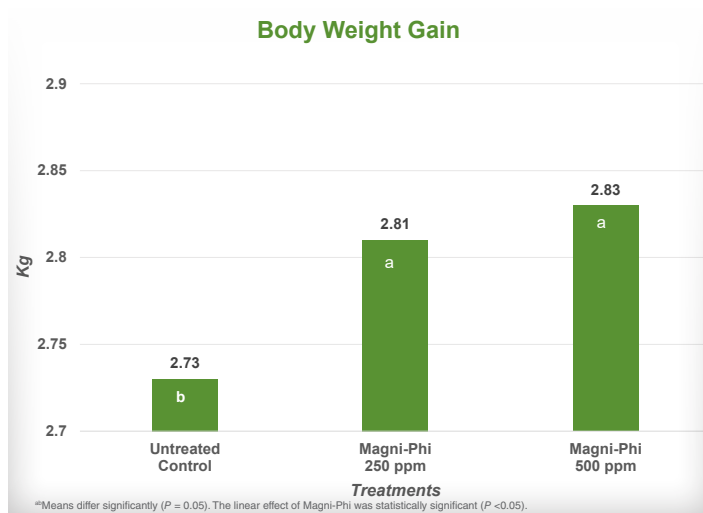
An extremely high mortality of over 10% in the untreated control clearly demonstrated the severe disease challenge in the trials. Both levels of Magni-Phi reduced mortality significantly with the 500 ppm level resulting in a difference of over eight percent ( Figure 1).

**Figure 1. Mean Mortality in Combined Trials**



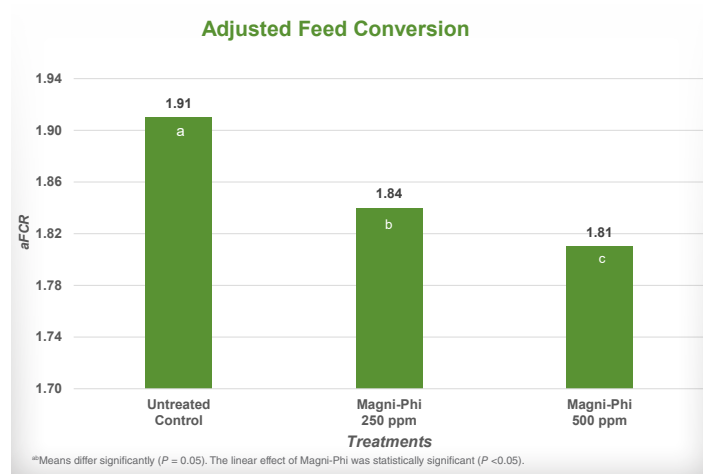
Treatment groups fed both levels of Magni-Phi showed a significant improvement in body weight gain of at least of at least 80 grams (0.8 kg) during the trials (Figure 2).

**Figure 2. Mean Body Weight Gain in Combined Trials**



A significant linear improvement in feed conversion was observed with both levels of Magni-Phi. Birds fed the lower level of Magni-Phi had a seven-point improvement and those fed 500 ppm had a ten-point advantage (Figure 3).

**Figure 3. Mean Adjusted Feed Conversion in Combined Trials**



## Challenge Results

The results of the *Clostridium perfringens* enumeration were consistent with the mortality results shown in Figure 1. Both levels of Magni-Phi reduced the CFU counts; these responses produced a significant linear effect.

**To learn more about Magni-Phi, talk with a Phibro expert at 800.677.4623.**

This information has been prepared for industry professionals.

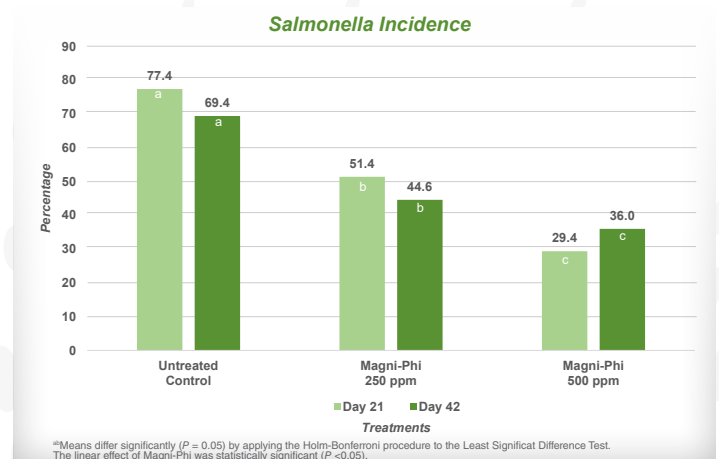
**Table 1. Mean *Clostridium perfringens* Counts in Combined Trials**

	<i>Clostridium perfringens</i> Enumeration (log <sub>10</sub> CFU/g of feces)	
	Day 21	Day 42
Magni-Phi (ppm)*		
0	4.09 <sup>a</sup>	4.06 <sup>a</sup>
250	3.56 <sup>b</sup>	3.57 <sup>b</sup>
500	3.13 <sup>b</sup>	3.42 <sup>b</sup>

\*Magni-Phi linear effect was significant (P < 0.001) for all variables presented.  
\*\*Different superscripts in each column denote statistical differences (P < 0.05).

Samples were also cultured for the presence of *Salmonella* at both time points. Again, the linear effect of an increased feeding level of Magni-Phi was noted with both levels significantly reducing the percentage of *Salmonella* positive birds (Figure 4).

**Figure 4. Mean *Salmonella* Positive Isolation Percentages in Combine**



## Conclusion

This analysis of the combined results of four robust, carefully controlled trials clearly confirms the benefits of Magni-Phi and the added value of a higher inclusion level of the product. Broiler producers have repeatedly observed similar trends in their own operations. Magni-Phi continues to be a natural solution that promotes intestinal integrity and improves the immune response in poultry. The effects of reduced mortality, better weight gain and lower feed conversion are important contributions to improved production efficiency. In addition, the possible effects of a reduction in the incidence of necrotic enteritis and *Salmonella* infections are noteworthy.

## References

Bafundo, K.W. et al. "The Effects of a Quillaja/Yucca Saponin Combination on Performance, *Clostridium perfringens* Counts and Percentage of *Salmonella* Positive Broiler Chickens". *EC Veterinary Science* 6.3 (2021): 40-45.