



Technical Bulletin

Information from Phibro Technical Services

Trial Demonstrates Non-interference and Possible Synergistic Effect of a Blended Saponin Nutritional Specialty Product and Live *Salmonella* Vaccine

Magni-Phi® nutritional specialty product contains two saponin ingredients which offer a natural solution to promote intestinal integrity and help improve the immune response in poultry. Studies demonstrate that feeding Magni-Phi may lead to better nutrient utilization, improved gut health and condition, and improved performance.

This trial demonstrated

- No effect or interference with the vaccine “take” was observed in broilers vaccinated with a live *Salmonella* vaccine and fed Magni-Phi at two different levels
- After a *Salmonella* Heidelberg challenge, the group vaccinated with a live *Salmonella* vaccine and fed Magni-Phi at 500 ppm had the lowest levels of *Salmonella* in the ceca at day 42 using a most probable number regression model
- Broilers vaccinated with a live *Salmonella* vaccine and fed Magni-Phi at 500 ppm had a statistically significant improvement in adjusted feed conversion at days 35 and 42

Trial Design

Commercial broilers were raised in pens of 50 birds in the trial, including two pens for each of four treatment groups. Treatment groups (Table 1) included an untreated control, a group vaccinated with a commercial *Salmonella* vaccine at day of age, a group vaccinated with a commercial *Salmonella* vaccine at day of age and fed Magni-Phi at 250 ppm, and a group vaccinated with a commercial *Salmonella* vaccine at day of age and fed Magni-Phi at 500 ppm.

Table 1. Treatment Groups

Treatment 1	Unvaccinated Control
Treatment 2	<i>Salmonella</i> vaccine only
Treatment 3	<i>Salmonella</i> vaccine + 250 ppm Magni-Phi
Treatment 4	<i>Salmonella</i> vaccine + 500 ppm Magni-Phi

Two days after vaccination, eight birds each from the three vaccinated groups were cultured for the presence of *Salmonella* to confirm proper vaccination and no interference from Magni-Phi. Also, on day two of the trial, all remaining birds were administered a *Salmonella* Heidelberg challenge strain using oral gavage.

The trial was conducted on new, clean litter and all birds were vaccinated for coccidiosis. Birds were fed standard starter, grower, and finisher rations. After a feed withdrawal at the end of the trial, 30 birds of each treatment group were tested for *Salmonella* by culture of the ceca.

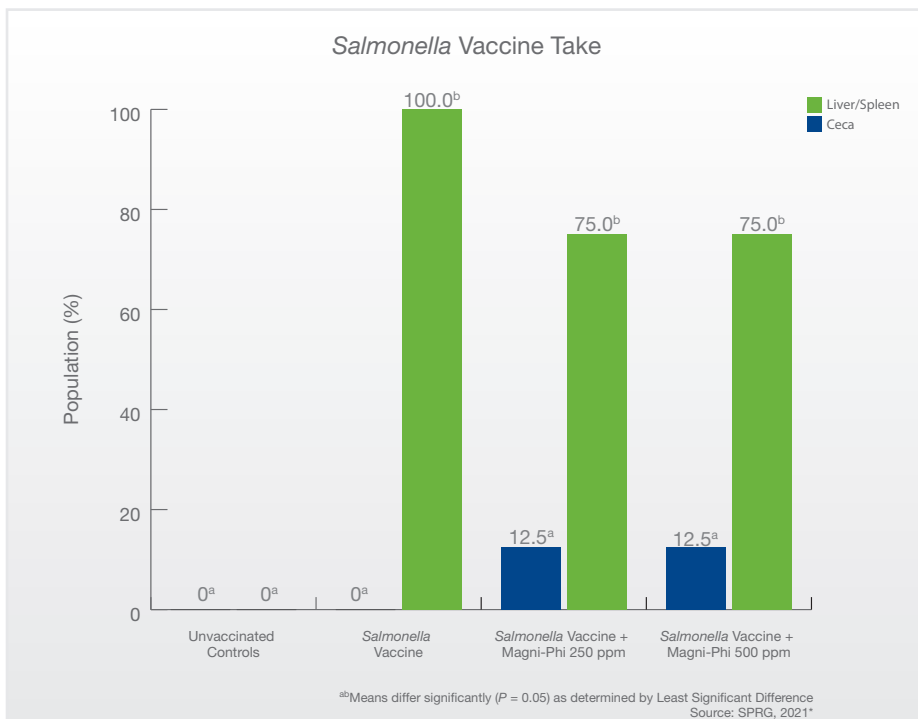


Results

Two days after vaccination, four birds were collected from each pen of the three treatment groups that included the live *Salmonella* vaccine to confirm the vaccine application was successful and to determine any possible interference. Samples were evaluated from the ceca and a combination of tissue from the liver and spleen. All identified *Salmonella* isolates were typed as serogroup B, the vaccine serogroup, and presumed to be the vaccine strain.

There did not appear to be any interference from Magni-Phi in the colonization of the vaccine strain. These results of positive tissue colonization are consistent with other studies using this vaccine and no statistically significant differences were noted (Figure 1).

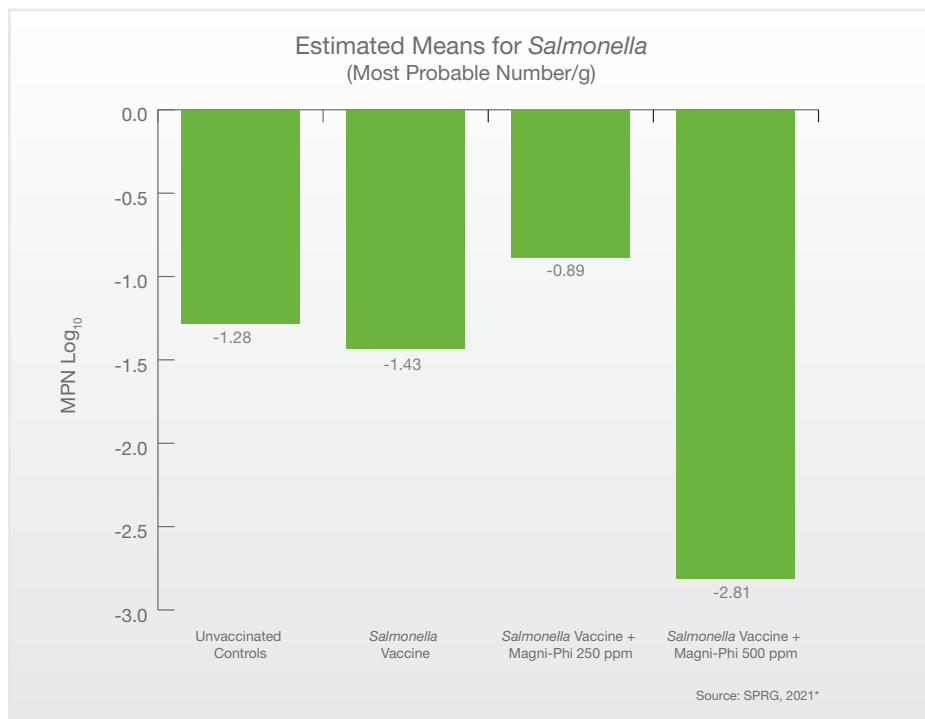
Figure 1. Population of Birds - *Salmonella* Vaccine Take



At the end of the trial, ceca samples were taken and analyzed for presence of *Salmonella*. It is not possible to confirm if samples were free of *Salmonella* or if the *Salmonella* concentration was below limits of detection of the test. All samples with a zero most probable number (MPN) per gram were censored to a -0.5 MPN per gram. A Tobit regression statistical model was applied to the results which estimates a true mean of *Salmonella* numbers based on distribution of MPN in the positive samples, as well as proportions of negative samples in the different treatment groups. Use of this model allows a comparison of effects of the treatment groups on the most probable number of *Salmonella* Heidelberg per gram in collected ceca. There were 91 negative cultures with the remaining 29 samples testing positive for *Salmonella* serogroup B, consistent with the *Salmonella* Heidelberg challenge strain.

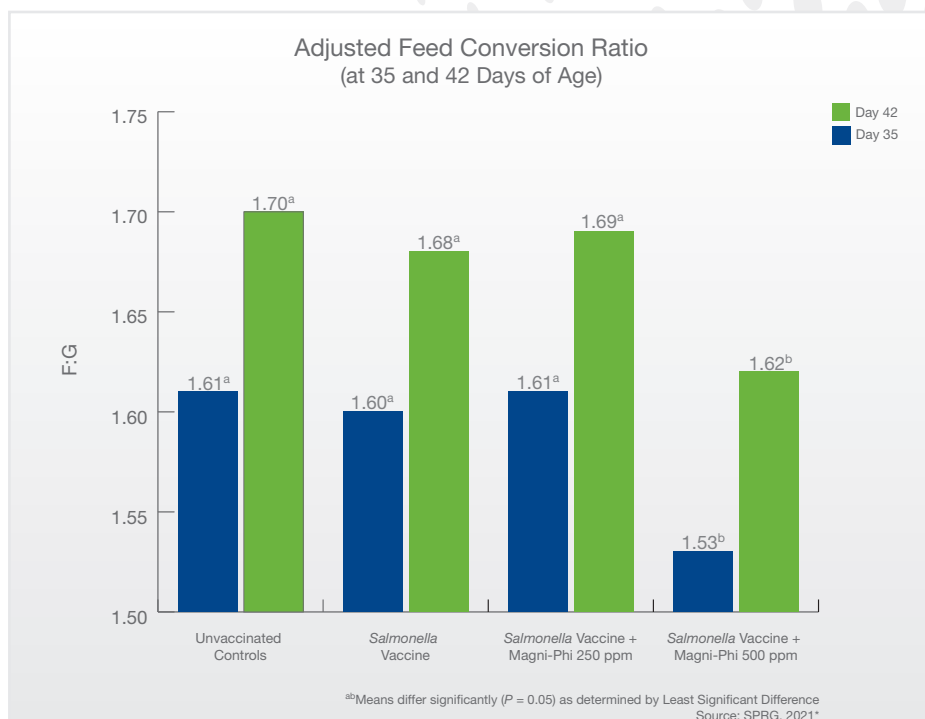
The Tobit regression analysis confirmed that feeding Magni-Phi in combination with the application of the *Salmonella* vaccine did not impact the ability of the *Salmonella* vaccine to reduce colonization of the *Salmonella* Heidelberg challenge. The vaccine and 500-ppm level of Magni-Phi group had the numerically lowest *Salmonella* Heidelberg colonization count using the MPN analysis (Figure 2). These results suggest a possibility of Magni-Phi working synergistically with the vaccine in reducing *Salmonella* Heidelberg counts.

Figure 2. *Salmonella* Presence in Ceca



The group vaccinated with the *Salmonella* vaccine and fed Magni-Phi at a 500-ppm level had a statistically significant improvement in adjusted feed conversion at both 35 and 42 days, with at least a six-point lower feed conversion ratio compared to the other groups (Figure 3).

Figure 3. Feed Conversion



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Conclusion

Broiler producers are looking for solutions to optimize performance, control *Salmonella* on the farm and to reduce the load of *Salmonella* entering the processing plant. In this controlled challenge trial, the use of Magni-Phi did not interfere with protection offered by a live *Salmonella* vaccine. The data related to feeding the higher level of Magni-Phi suggests the possibility of Magni-Phi working synergistically with the vaccine to reduce the amount of *Salmonella* Heidelberg in the ceca at the end of the trial. Also, the higher level of Magni-Phi significantly improved feed conversion.

Producers may also consider a combination program of Magni-Phi and Provia Prime™, (Phibro technical bulletin PV270920GLB) a four strain *Bacillus* product, that has been shown in a separate Phibro technical bulletin to also work well with a *Salmonella* vaccine and improve feed conversion.

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

*Trial was conducted at SPRG in Watkinsville, GA.

This information has been prepared for industry technical professionals only and may be presented and discussed with them upon request.