



# VAC-PAC PLUS®

## Vac-Pac Plus: Field-Proven Stabilization of Poultry Mycoplasma Vaccine for Efficient Drinking Water Application

### INTRODUCTION

Controlling chronic mycoplasma infections via effective vaccination is a tool for ensuring animal health and the safety of animal-derived foods. As the poultry industry moves away from routine antibiotic use in food animals, effective vaccination becomes increasingly essential—not only for disease prevention but for reducing the need for antibiotics, which supports broader goals of animal welfare and human food safety. However, live mycoplasma vaccines in particular are highly sensitive during dilution and delivery, a characteristic that has historically favored eye drop application. Mass delivery of mycoplasma vaccines, improperly executed, resulted in loss of vaccine viability, threatened flock coverage and undermined efforts to minimize antibiotic reliance. Addressing this challenge has driven the need for robust, independently validated vaccine stabilizer technologies.

### IDEAL SOLUTIONS FOR STABILIZING MYCOPLASMA IN MASS APPLICATIONS

Animal Science Products, Inc. (ASP) is a longstanding leader in avian vaccine stabilization science. Our second-generation Spray-Vac stabilizer was rigorously tested by the USDA Agricultural Research Service (ARS) Poultry Research Unit for use with live *Mycoplasma gallisepticum* (MG) vaccines—representing one of the most demanding tests of stabilizer performance in real-world production. In landmark laboratory and field studies (Leigh et al., JAPR 2008), Spray-Vac was proven to:

- Protect MG vaccines (FVAX-MG and Mycovac-L) against oxidation and osmotic lysis (major causes of mycoplasma viability loss during mass administration).
- Match the efficacy of phosphate-buffered saline (PBS) in preserving live MG titers throughout the administration period, regardless of tap water variability.
- Achieve 100% flock seroconversion using routine pullet house protocols and vaccinating with tap water spray.
- Remove cost, labor, and logistic barriers associated with distilled water use in large-scale vaccine application.

Such independently validated results set a new industry standard in spray vaccine stabilization and provided the platform for further mycoplasma vaccine administration research.

## NEW ADVANCEMENTS: MS-H ACHIEVEMENTS WITH VAC-PAC PLUS

Building on the prior research with Spray-Vac, subsequent studies using drinking water stabilized with Vac-Pac Plus confirm the stabilizer’s engineering is well fitted to the task of preserving *Mycoplasma synoviae* (MS-H) during mass vaccination.

### FIELD RESULTS: HUNGARIAN MS-H STUDY

A recent Hungarian field trial in a commercial multi-age layer system (n = 47,600 MS-free brown layers, vaccinated with MS-H at 6 weeks via drinking water with Vac-Pac Plus) delivered compelling quantitative evidence:

- **Vaccine Viability (CCU/ml):** Measured by broth micro-dilution, vaccine titers ranged 1.0–2.9 × 10<sup>5</sup> CCU/ml over 0–5 hours, demonstrating robust viability protection well past standard administration windows.
- **Vaccine Genomic Stability (qPCR):**
- **Colonization Rates - Differentiating Vaccinated Animals (DIVA PCR):** Percentage of flock PCR-positive for vaccine strain rose from 0% at 6 weeks to 95% at 20 weeks, with sustained levels through production.

**Vac-Pac Plus qPCR at Key Times**

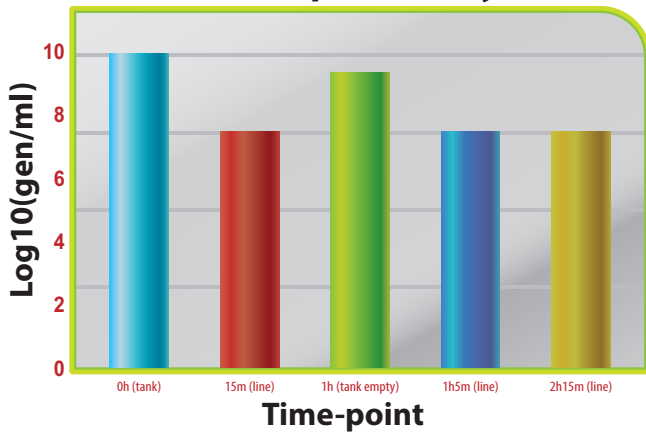


Figure 1: MS-H Vaccine Stability in Water: Genomic Copy Number at Field Timepoints (Log per ml by qPCR).

**MS-H Colonization % by Week**

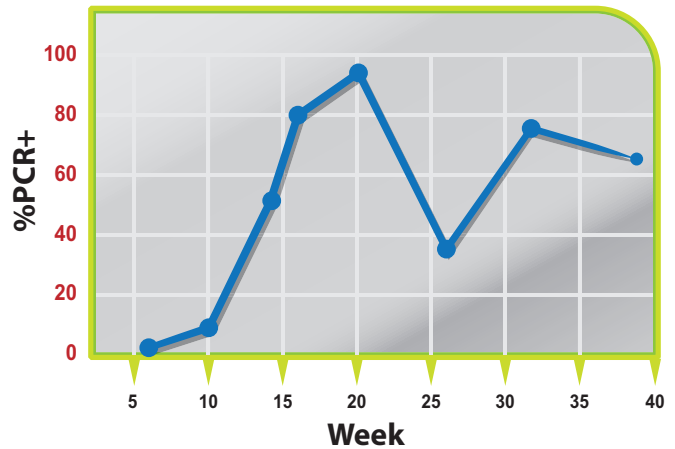


Figure 2: MS-H Vaccine Colonization by Week of Age.

### Vac-Pac Plus Improved Egg Quality

Group	Mortality (%)	Broken/Good Egg Ratio
Control Flock (A)	4.43	5.19
Vac-Pac Plus Vaccinated (B)	4.66	2.74

Table: Weeks 18-76 mortality and broken/good ratio with and without MS-H vaccine stabilized by Vac-Pac Plus.

- **Summary:** The study demonstrated that Vac-Pac Plus preserved vaccine potency in drinking water, enabled successful flock colonization, and improved egg quality while maintaining strong overall flock health without any significant mortality increase—advancing reduced-antibiotic poultry management goals.

## FIELD RESULTS: AUSTRALIAN MS-H STUDY

Independent Australian field studies (Achari et al., 2023) confirmed the performance of Vac-Pac Plus stabilization for mycoplasma vaccination by demonstrating:

- **Consistent vaccine strain colonization rates >70%** across all tested flocks within 5 weeks post vaccination in drinking water stabilized with Vac-Pac Plus.
- **No cases of clinical MS, egg abnormalities, or lameness** in any vaccinated group.
- **Considerable labor savings and management efficiency**, making water vaccination highly practical for commercial producers.
- **Chlorine tolerance:** The stabilizer protected vaccine viability in water containing up to 7 ppm chlorine for at least 240 minutes.
- **Vaccination results:** Confirmed the results were as safe and efficacious as when vaccine is delivered via eye drop.

## SCIENTIFIC CONTINUUM AND WIDE-SPECTRUM SUPPORT

- The **USDA/ARS-validated results for Spray-Vac** put to rest any question about how best to protect live mycoplasma vaccines during large-scale aerosol spray administration. By neutralizing waterborne oxidizers like chlorine and preventing osmotic stress, Spray-Vac and Vac-Pac Plus provide a uniquely effective and convenient improvement over conventional alternatives.
- **European and Australian studies confirm Vac-Pac Plus confers similar vaccine preservation in drinking water**, offering validated preservation of sensitive MS-H live vaccine in prolonged waterline delivery systems.
- Together, these ASP technologies enable producers to meet both flock health and food safety imperatives in an industry rapidly moving away from antibiotics.



### CONCLUSION

ASP's field - and laboratory-proven stabilizers—Spray-Vac and Vac-Pac Plus—make it possible to consistently preserve the potency of mycoplasma vaccines throughout real-world mass application, delivering measurable improvements in flock health, efficient production, and robust disease prevention. These advances are critically important as the poultry industry embraces reduced antibiotic use, ensuring ongoing animal and public health.

### REFERENCES

Leigh, S.A., Branton, S.L., Collier, S.D. (2008). "Stabilization of Live *Mycoplasma gallisepticum* Vaccines During Vaccination with Second-Generation Spray-Vac Vaccine Stabilizer." *Journal of Applied Poultry Research*, 17(2):278–282. USDA/ARS Mid-South Area Poultry Research Unit.

Korosi, L., Kreizinger, Z., Buni, D., Gyuranecz, M., Nagy, T. (2025). "Water vaccination with *Mycoplasma synoviae* MS-H live vaccine under field conditions."

Achari, R.R., Achari, E.M., Walsh, A. (2023). "Drinking water (off-label) administration of a live *Mycoplasma synoviae* vaccine is as safe and efficacious as prescribed eyedrop application." *Australasian Poultry Association Proceedings*.

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