TECHNICAL BULLETIN

PWT® – INHIBIT *SALMONELLA* COLONIZATION IN YOUR FLOCK

For over 20 years, PWT, pH Water Treatment, has been used to reduce poultry water pH and microbial biofilms in drinker equipment without hindering water consumption. Reducing water pH is especially important during feed withdrawal prior to slaughter when *Salmonella* prevalence increases in the crop. Using PWT as your water acidifier promotes a crop environment that is unsuitable for *Salmonella* growth.

FEED WITHDRAWAL INCREASES *SALMONELLA* COLONIZATION

Poultry are taken off feed 8-12 hours prior to slaughter in an effort to reduce gut fill and the risk of bacterial contamination from ruptured GI tracts during processing[1]. However, during feed withdrawal, a crop devoid of feed (i.e., no starch) will increase in pH[2]. This increase in pH creates a favorable environment for *Salmonella* to colonize and proliferate in the crop, thus increasing the risk of *Salmonella* contamination at slaughter[2,3].

FEED WITHDRAWAL TREATMENT	POSITIVE *SALMONELLA* SAMPLING IN CROP
None (0 hours)	**33%**
Partial (6 hours)	**83%**
Full (12 hours)	**79%**

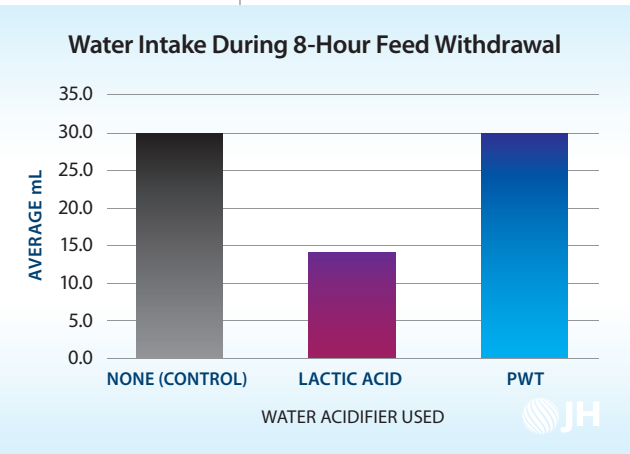
Table 1. *A series of experiments[3] conducted at the University of Georgia reported that Salmonella presence (without intervention) increased as broilers transitioned from being full-fed to a feed withdrawal of 12 hours.*

LOW pH INHIBITS *SALMONELLA*

Most types of *Salmonella* do not thrive in acidic environments and have a minimum growth pH of 4.0-4.5, meaning they cannot grow when exposed to a pH below this threshold[4]. By reducing drinking water to a targeted pH of 3.0-4.0 with PWT, *Salmonella* can be inhibited from colonizing and proliferating in the crop.

WATER ACIDIFICATION WITH PWT DECREASES *SALMONELLA* PREVALENCE

An experiment conducted by the USDA-ARS[5] compared PWT against lactic acid as an acidifier in broiler drinking water during a period of feed withdrawal. Market age broilers challenged with a combination of *Salmonella* Typhimurium and *Campylobacter jejuni* were provided acidified drinking water during an 8-hour feed withdrawal period. The concentration of each acidifier used (PWT or lactic acid) was the amount needed to drop the water pH to 3.5. Water consumption was measured during the withdrawal period and crops were assessed at the end of 8 hours to measure *Salmonella* colonization and pH.



Water acidification with PWT not only inhibits *Salmonella* activity in the crop but does so without a negative impact on water consumption that is commonly associated with organic acids. The acid strength (i.e., pKa) of PWT also allows for lower product usage with the same or even better results—saving you money and allowing you to reduce the impact of *Salmonella* on your investment.

Table 2. *Acidifying water with PWT did not alter water consumption compared to the control (tap water with no acidifier added), whereas lactic acid treatment significantly reduced water consumption.*

PWT®: ACIDIFY WATER AND REDUCE FLOCK MICROBIAL EXPOSURE

PWT® *– pH Water Treatment is a mineral acid that delivers targeted pH levels without the bitter taste common to organic acids. Unlike organic acids, PWT doesn't contain carbon compounds that can contribute to biofilm development, ensuring clean water delivery while maintaining palatability for optimal consumption.*

PRODUCT DETAILS

- Available in bulk and from distributors
- GRAS (Generally Recognized as Safe) status under FDA
- Highly water soluble and easy to administer
- Produced in compliance with Food Safety and Modernization Act

1. https://www.extension.purdue.edu/extmedia/AS/AS_576_W.pdf

2. Corrier, D.E., J. A. Byrd, B. M. Hargis, M. E. Hume, R. H. Bailey, L. H. Stanker. 1999. Survival of Salmonella in the crop contents of market-age broilers during feed withdrawal. Avian Dis. 43:453-60.

3. Harris, C. E., L. N. Bartenfeld Josselson, D. V. Bourassa, B. D. Fairchild, B. H. Kiepper, and R. J. Buhr. 2019. Evaluation of Drinking Water Antimicrobial Interventions on Water Usage, Feed Consumption, and Salmonella Retention in Broilers Following Feed and Water Withdrawal. J. Appl. Poult. Res. 28:699-711.

4. Petrin S., M. Mancin, C. Losasso, S. Deotto, J. E. Olsen, L. Barco. 2022. Effect of pH and Salinity on the Ability of Salmonella Serotypes to Form Biofilm. Front Microbiol. 13:821679. doi: 10.3389/fmicb.2022.821679.

5. Byrd, J.A. and T.M. Johnson. 2001. Efficacy of water administration of sodium acid sulfate (SAS) in reducing crop contamination during feed withdrawal. Proceedings of the ANMA/AAAP Annual Meeting, Boston, MA.

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