SurpHace™

Performance Starts with pH

TECHNICAL BULLETIN

COMBAT DIGITAL DERMATITIS WITH A SMARTER FOOTBATH SOLUTION

Digital dermatitis, caused primarily by *Treponema* bacteria, represents one of the most costly lameness issues facing dairy operations today. Research shows the economic impact ranges from $64 to $133 per disease episode.

The challenge has been finding an effective, economical solution that addresses digital dermatitis without creating additional operational burdens. Copper sulfate ($CuSO_4$) footbaths work, but bring several concerns:

- Heavy metal discharge and environmental impact
- Worker safety risks during handling and mixing
- High costs associated with the amount needed for effectiveness
- Soil contamination from repeated applications

Meanwhile, the search for alternatives has often led to compromise – products that are either less effective or less safe.

COMPLEMENTARY CHEMISTRY AT WORK

Recent research conducted by RTI Labs reveals an effective, more affordable approach to digital dermatitis management. The study examined how **SurpHace**™ (sodium bisulfate - $NaHSO_4$) performs against *Treponema denticola*, a bacteria strain genetically and phenotypically similar to the *Treponema* species that cause digital dermatitis in cattle.

Researchers tested multiple formulations over 40-minute exposure periods, mimicking real-world footbath conditions. What emerged was evidence that **SurpHace** delivers powerful antimicrobial activity on its own, but creates even stronger effects when combined with copper sulfate.

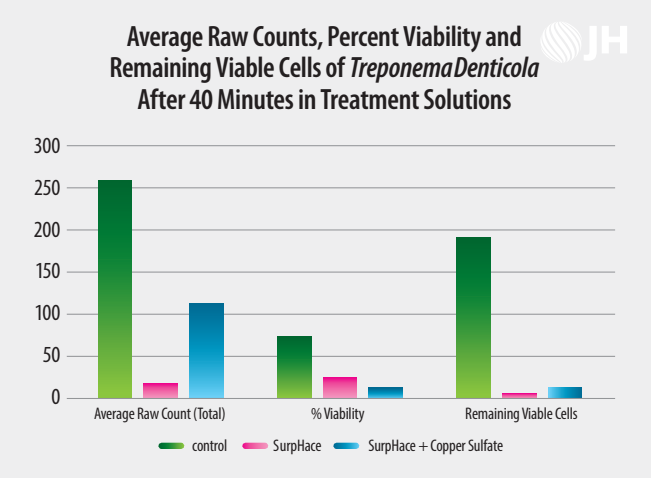

Chart 1. *How Different Footbath Treatments Affect Treponema Bacteria: Cell Counts and Viability*

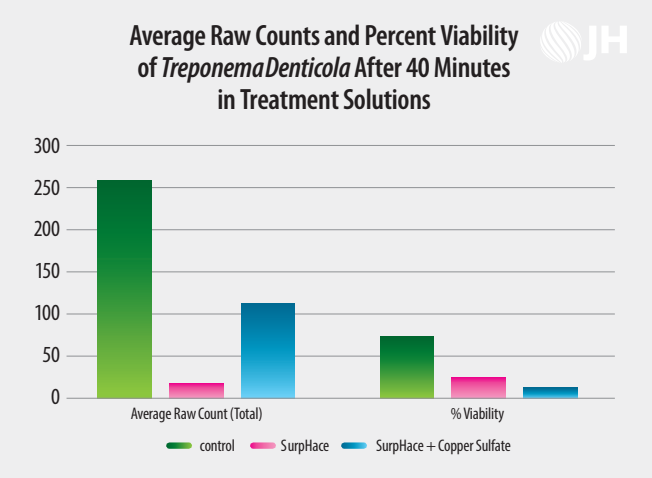

Chart 2. *The Power of Combination: How SurpHace + Copper Sulfate Delivers Better Results*

Results revealed **SurpHace**'s effectiveness through powerful pH regulation. When used alone, **SurpHace** dramatically reduced total bacterial counts to just 17 cells, with 25% viability remaining. When **SurpHace** was combined with copper sulfate, results showed 113 bacterial cells remaining, but with only 10% viability—the vast majority were rendered non-infectious **(Chart 1)**. The data demonstrates substantial protection from both approaches, with even greater potential in real-world footbath applications where contact times are typically longer.

THE POWER OF COMBINATION

The side-by-side comparison reveals two distinct but effective mechanisms. While **SurpHace** alone excels at reducing overall bacterial counts through acidification, the 50/50 combination leaves more intact bacterial cells but neutralizes them completely–rendering them unable to cause digital dermatitis infections **(Chart 2)**. This difference matters operationally.

Copper sulfate alone requires large volumes to achieve bactericidal action, driving up costs and heavy metal concerns. Because **SurpHace** is such an effective pH regulator, the 50/50 mixture harnesses its acidification power while maintaining optimal pH levels for extended hoof contact periods, delivering the best of both products while mitigating operational challenges.

THE BOTTOM LINE

SurpHace alone achieved a 97.74% (1.65 log) reduction while the 50/50 combination delivered a 94.15% reduction (1.24 log) in viable bacteria—all in just 40 minutes **(Chart 3)**. With longer contact times typical in real-world footbath applications, these reductions would likely be even greater.

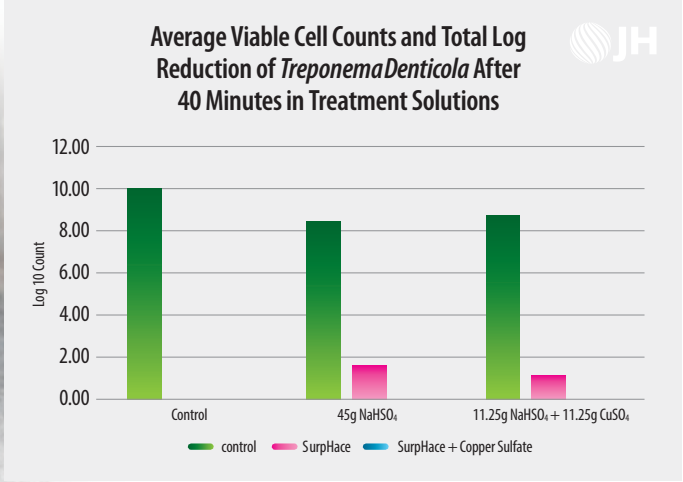

Chart 3. *Measuring Success through Bacteria Reduction*

A PARTNERSHIP THAT WORKS FOR YOU

SurpHace offers an effective, economical alternative that eliminates the compromises of traditional footbath programs. Plus, it's on the EPA Safer Choice List of Chemicals making it a safe addition to the dairy. By taking advantage of the unique synergy between **SurpHace** and copper sulfate, dairy operations get superior bactericidal action with reduced chemical costs and environmental impact.

Contact a **Jones-Hamilton** representative to put **SurpHace** to the test on your dairy operation.

Formerly known as BEEFUP *and* PARLORPAL

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