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AN INVESTIGATION INTO

SILVER STABILIZED HYDROGEN PEROXIDE AS AN ALTERNATIVE TO FORMALDEHYDE FOR HATCHING EGG SANITATION

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(AVIMUNE)

RELEVANT MATERIAL FROM OTHER SOURCES

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- Tomczyk *et al*.
- When stabilized with silver ions, hydrogen peroxide breaks down more slowly, extending its half-life in water and maintaining its biocidal power longer - helping to improve the shelf-life of treated product.
- SSHP at a concentration of 0.3% achieved a 1-2 log CFU/g reduction (95-99%) of *Pseudomonas* type bacteria. Increases in the concentration to 0.9% had little effect on the efficacy.
- Effective against *Enterobacteriaceae*, yeasts and moulds, including spores. No proliferation of bacteria was seen after 4 weeks of storage.
- If SSHP is applied at concentrations >1%, it may have a negative effect in eggshell quality.

INVESTIGATIONAL PRODUCT

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- Peroxsil^{Ag+} - silver stabilized hydrogen peroxide solution.
  - 50% Hydrogen Peroxide stabilized with Silver at 0.5%
  - Used at 1:64 dilution -> 0.78% Hydrogen peroxide in final solution.
- Solution applied to hatching eggs on setter trays, using a battery powered knapsack sprayer.
- Spray applied to top and bottom of each egg. Sufficient solution applied to completely wet each egg. About 350ml/ setter tray of 150 eggs.


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TREATMENT AND SAMPLING PROTOCOL

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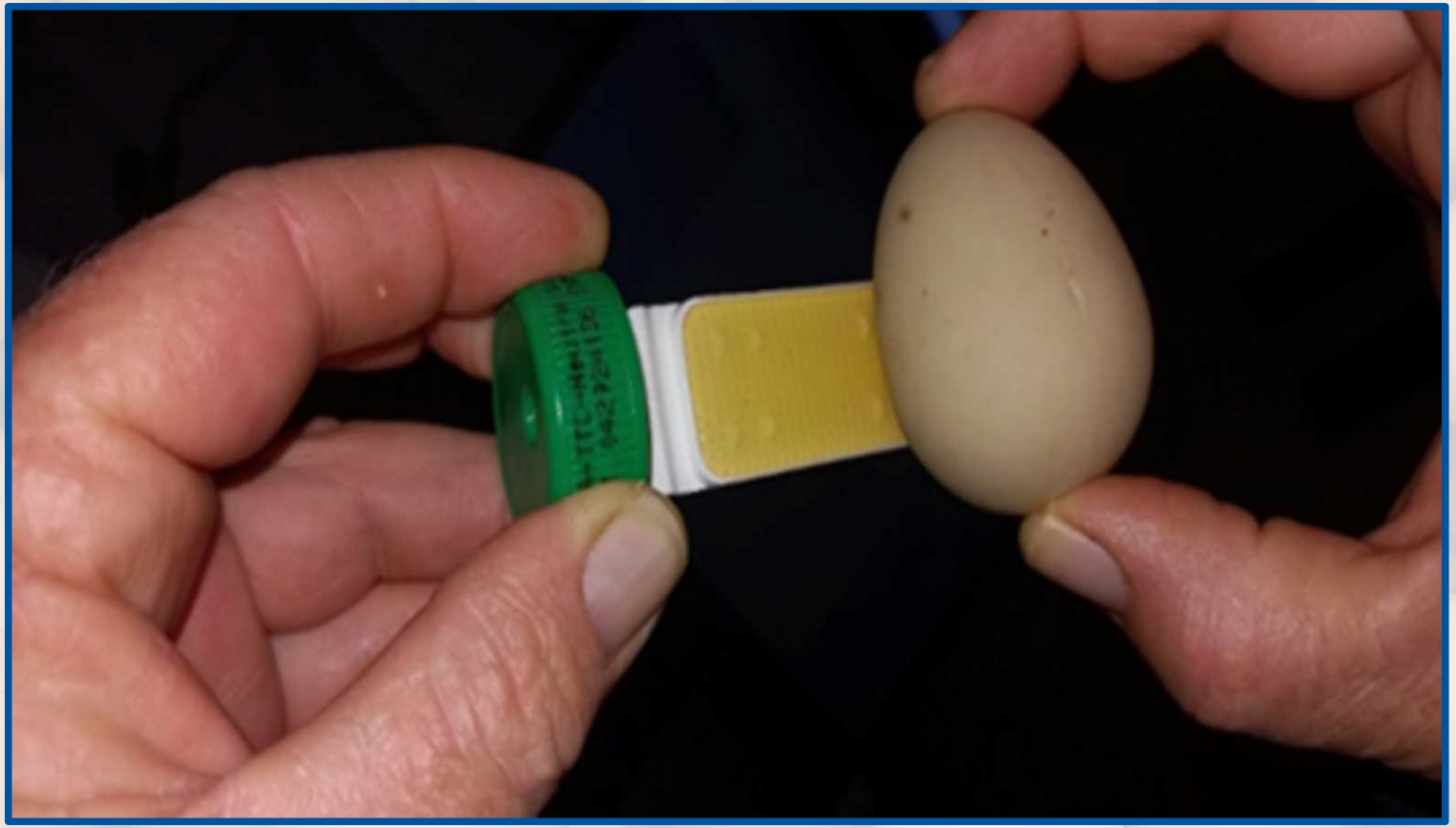

TEST METHOD

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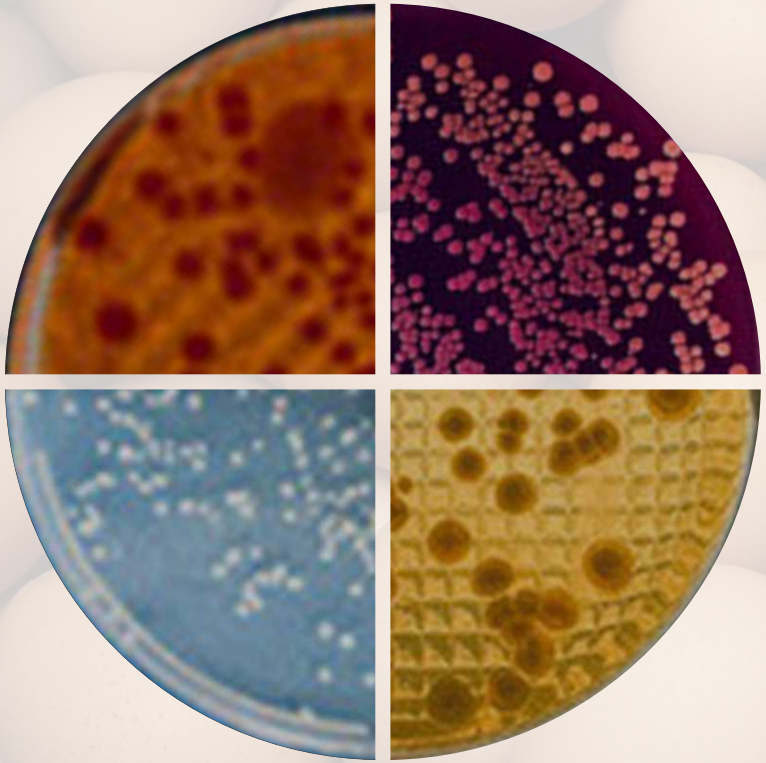

- Eggshell bacterial counts are done by pressing approximately half of the eggshell surface onto an agar plate and then counting the number of bacterial colonies appearing on the surface of the agar after 48 hours of incubation. A maximum of 100 colonies are counted.

- The bacterial load of egg contents is determined by inserting a swab into the interior of the egg and plating onto an agar plate. The total number of bacterial colonies are counted.

SSHP EFFECTIVELY REDUCES BACTERIAL CONTAMINATION OF EGGSHELLS

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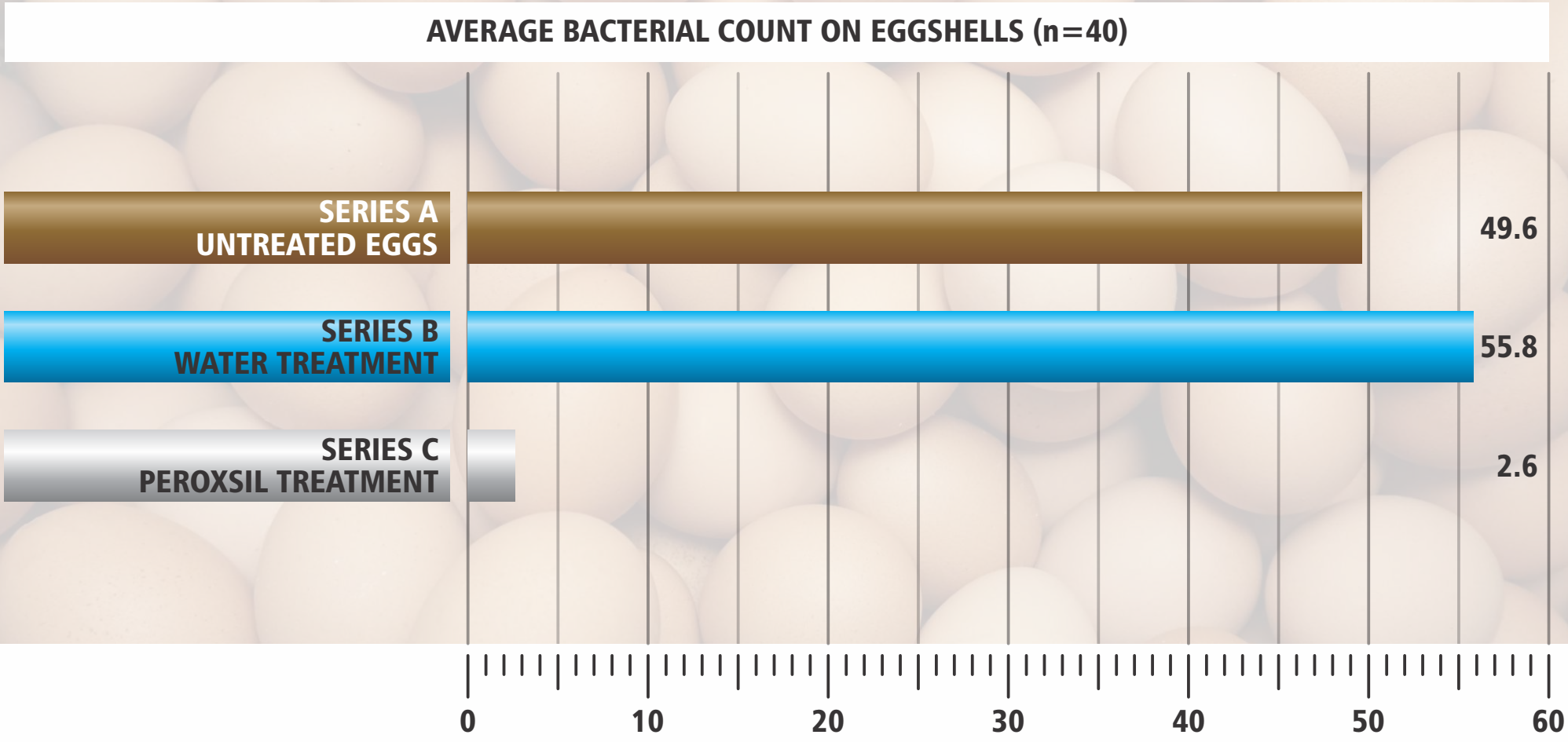

CLEANER EGGSHELLS RESULT IN REDUCED CONTAMINATION OF EGG CONTENT

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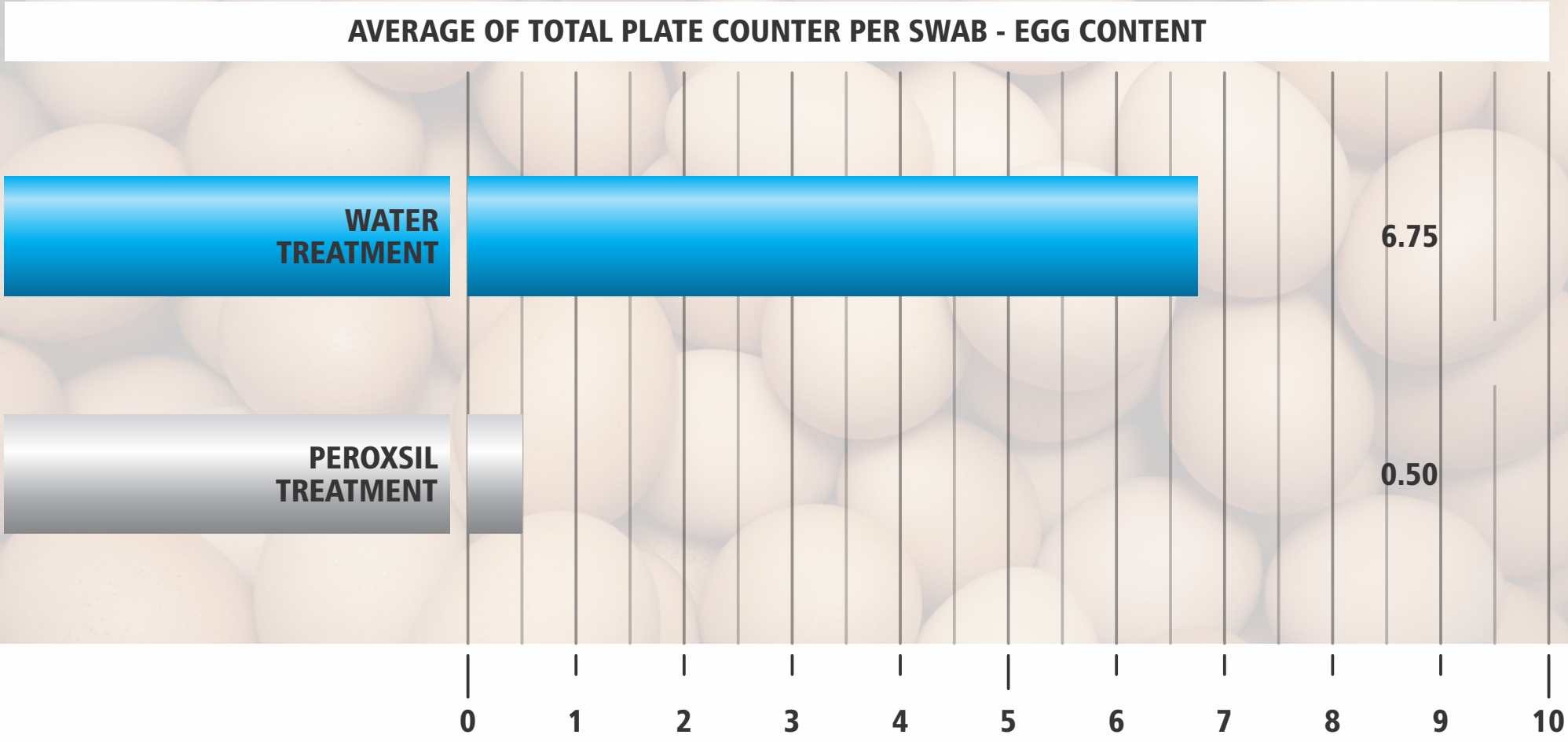

SSHP IS AS EFFECTIVE AS FORMALIN FOR EGGSHELL DISINFECTION

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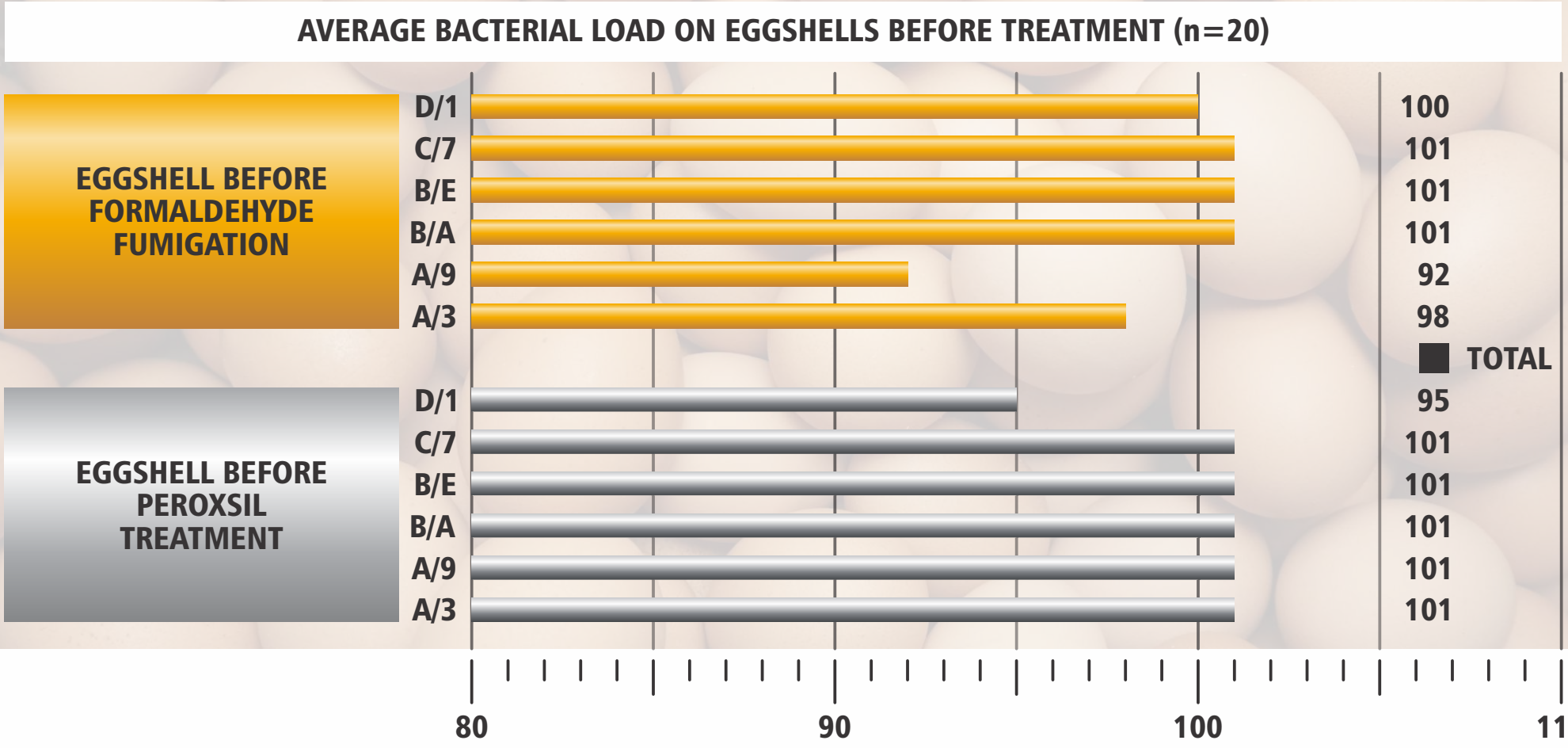

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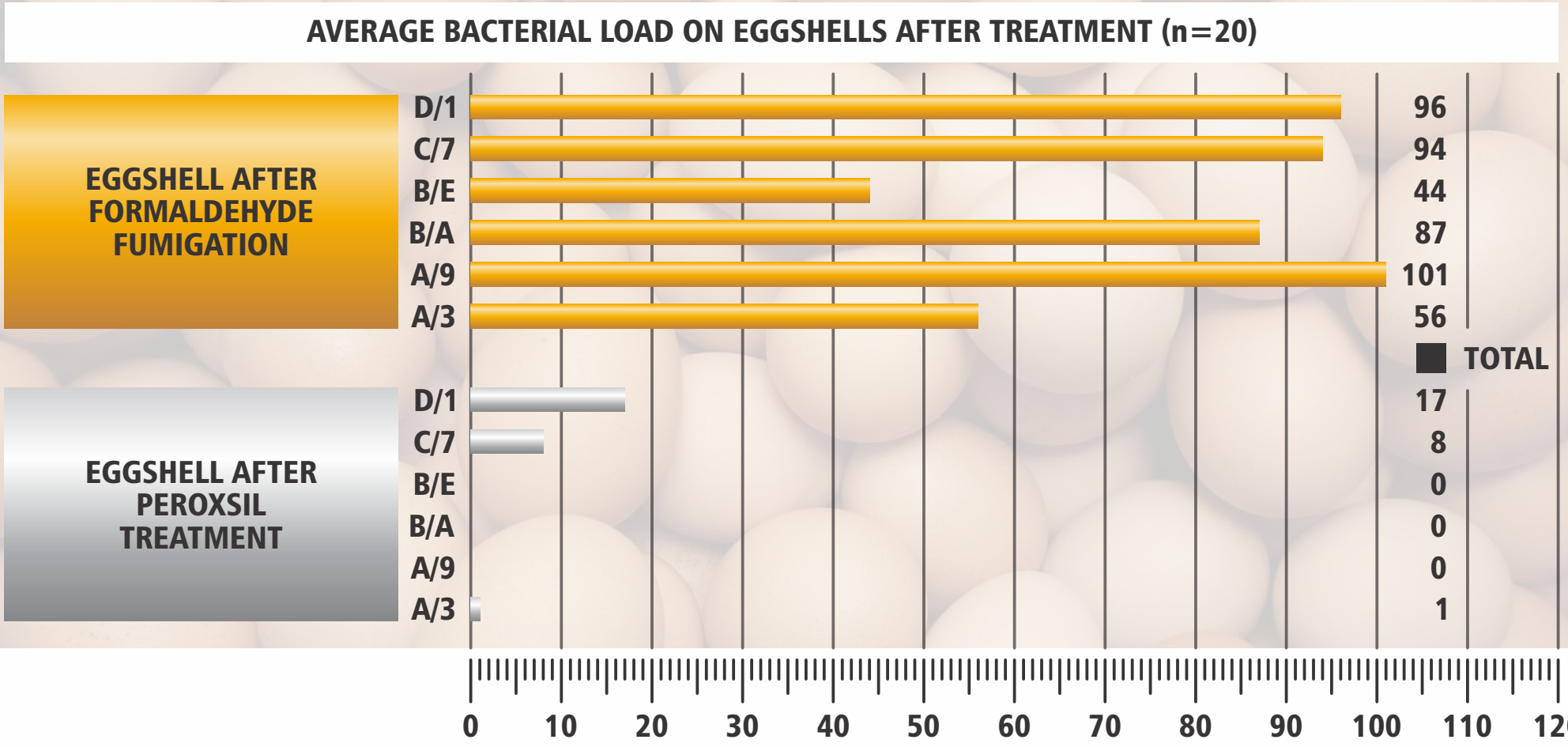

EGGSHELLS TREATED WITH SSHP REMAIN CLEAN AFTER TRANSPORT TO THE HATCHERY

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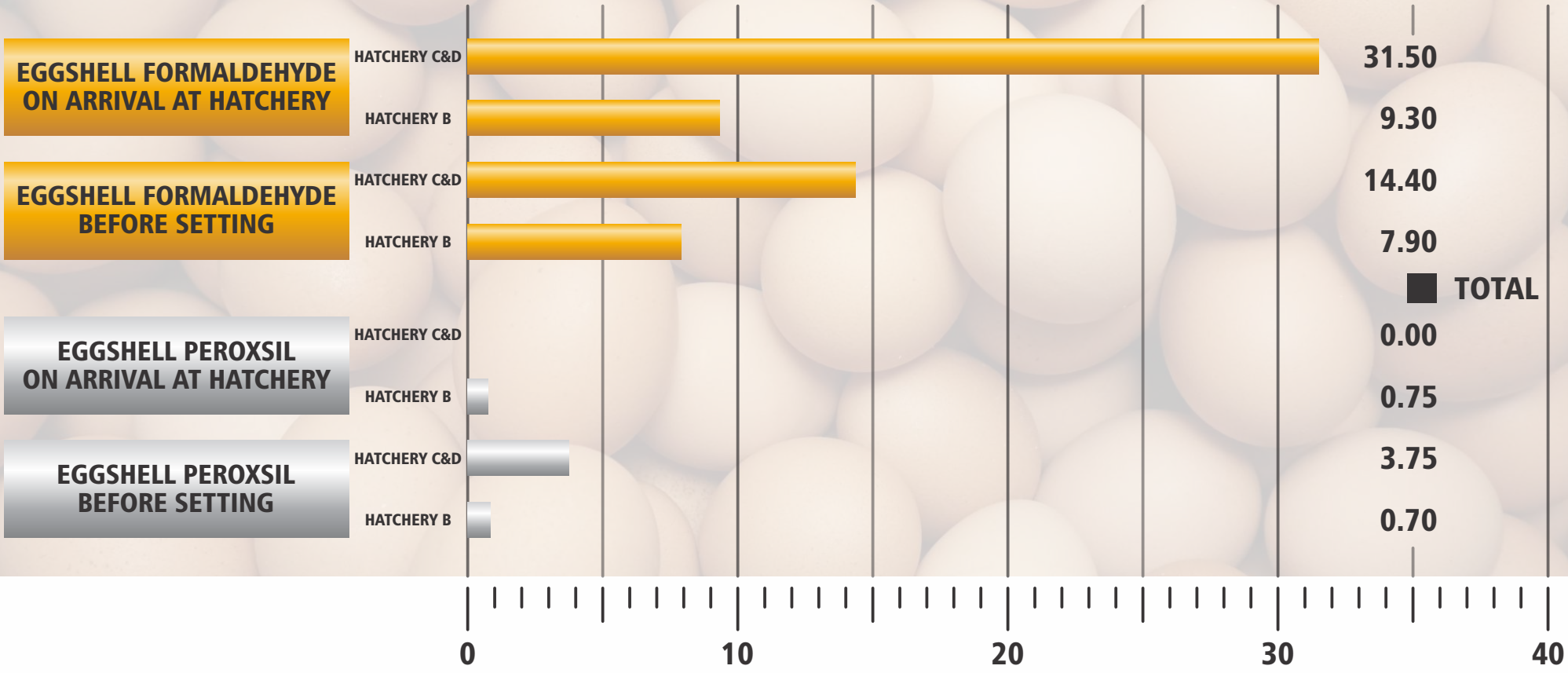
AVERAGE BACTERIAL LOAD ON EGGSHELLS AT THE HATCHERY (n=40)



SSHP HAS NO NEGATIVE EFFECT ON HATCHABILITY

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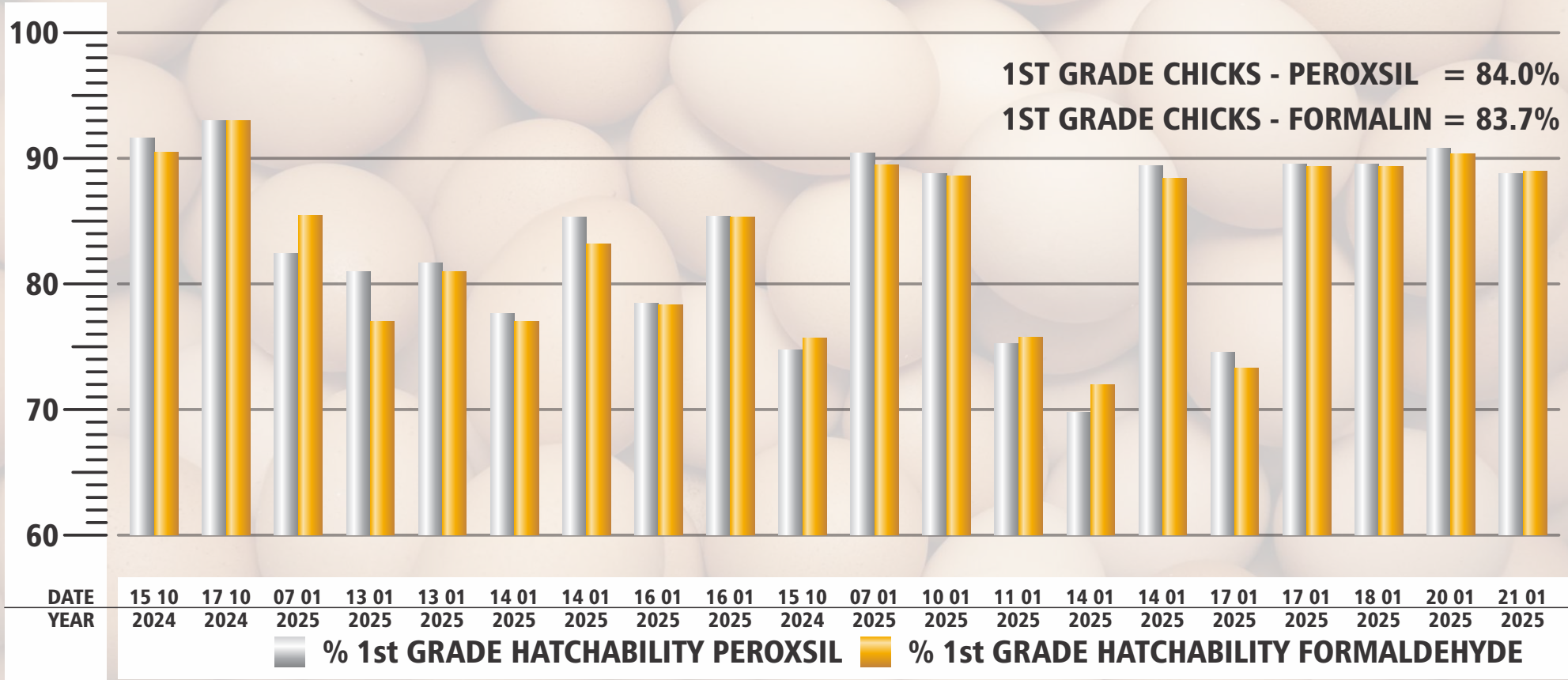
% 1st GRADE HATCHABILITY FORMALDEHYDE vs PEROXSIL DISINFECTION - FARM A, B, C & D



FORMALIN vs SILVER STABILIZED HYDROGEN PEROXIDE

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ASPECT	SILVER-STABILIZED HYDROGEN PEROXIDE (SSHP)	FORMALIN (FORMALDEHYDE)
MODE OF ACTION	OXIDATION (H_2O_2) + ANTIMICROBIAL SILVER IONS	PROTEIN/NUCLEIC ACID CROSS-LINKING
ANTIMICROBIAL SPECTRUM	BROAD: BACTERIA, VIRUSES, FUNGI, SPORES	BROAD: STRONG ON BACTERIA AND FUNGI
TYPICAL CONCENTRATION	0.5 – 1.0%	~ 6 - 8 ml OF 40% FORMALIN PER m^3 AIR
APPLICATION METHOD	FOGGING, SPRAYING OR DIPPING	FUMIGATION IN SEALED CHAMBERS
RESIDUE	NONE (WATER + OXYGEN); TRACE SILVER	LEAVES TOXIC RESIDUES; REQUIRES AIRING
IMPACT ON HATCHABILITY	SAFE WHEN PROPERLY USED	CAN REDUCE HATCHABILITY IF OVERDOSED
OPERATOR SAFETY	LOW RISK; PPE RECOMMENDED	HIGH RISK; IRRITANT, CARCINOGEN
VENTILATION NEEDS	MINIMAL	ESSENTIAL (TOXIC VAPORS)
REGULATORY STATUS	GENERALLY ACCEPTED, MODERN METHOD	BANNED/RESTRICTED IN MANY COUNTRIES
ENVIRONMENTAL IMPACT	BIODEGRADABLE, ECO FRIENDLY	TOXIC; HAZARDOUS WASTE CLASSIFICATION
SHELF LIFE / STABILITY	STABLE WITH SILVER IONS; LONG SHELF LIFE	STABLE, BUT FUMES ESCAPE EASILY
COST (SHORT TERM)	MODERATE	LOW
COST (LONG TERM/SAFETY)	LOWER (LESS PPE, FEWER HEALTH RISKS)	HIGHER (PPE, MONITORING, LIABILITY)
EASE OF USE	SIMPLE; EASY AUTOMATION	LABOR INTENSIVE; NEEDS CONTROLLED SETUP

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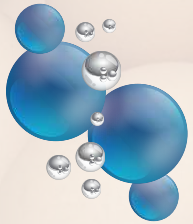
THANK YOU

This project was sponsored by Peroxsil and Diag Poultry



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