





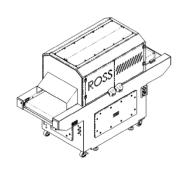
OSU Intervention Study Topline Results



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Oklahoma State University Validation Study

- In February we selected OSU as the lab to use for this comparative study of the included intervention products applied using our Integral Intervention application system OSU's team is headed by Dr. Brad Morgan
- 9 intervention product companies elected to participate & fund this research which compares 12 antimicrobial concentrate formulations head to head under real processing world conditions & rates
- The test protocol was reviewed & accepted by the USDA Food Safety Inspection Services (FSIS) team
- Topline results get shared at June's RMC; OSU's final findings/paper will be given at an AMI conference

The anti-microbial actives get grouped into 3 categories

- ♦ Outstanding Performance exceeds FSIS standard [≥ 1.26 log reduction]
 - Δ HB2 (Bromine), Cytoguard Plus (LAE blended with PAA), Aftec (Sulfuric acid) & Citrilow (Dilute HCI)
- ♦ Standard Performance meets FSIS expectations [achieves a .92 to 1.25 log reduction]
 - Δ Perasan MP (PAA), XG-940 (ASC) & Cecure (Cetylpyridium chloride)
- ♦ Marginal Performance below FSIS standard [< 0.92 log reduction after 7 days]
 - Δ Preserv (Copper Sulfate), Beefxide (Lactic Acid) & Syntrx (Dilute HCl)
 - Shots from the OSU Test Laboratory for this study -



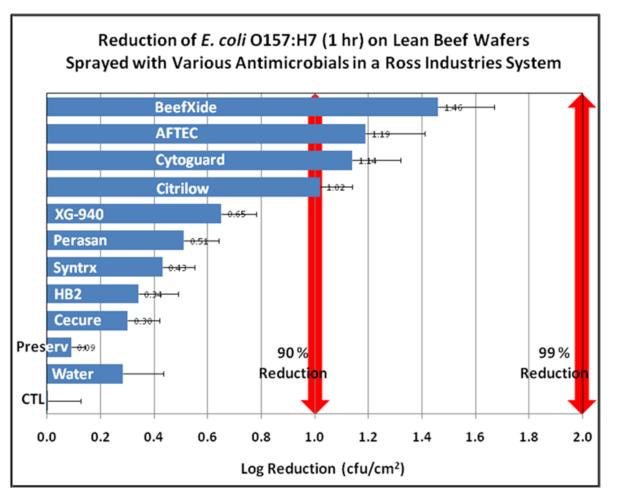






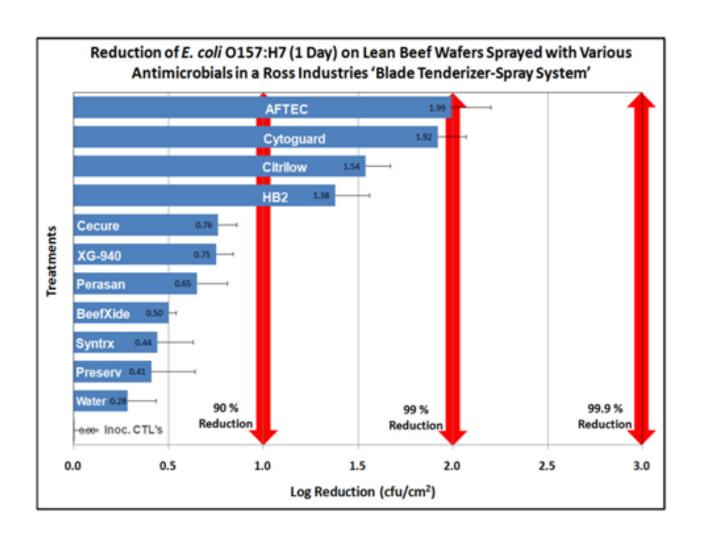
Study Topline – Immediate Impact Results (1 hour after treatment) Showing the Relative Effectiveness of the tested Products

 Lab conditions duplicated typical meat processing room environment including actual tenderizer, production rate & cool 40F application temperature



TopLine OSU Microbiological Sample Results after 1 Day

- These are 24 hour results the performance change for various solutions is obvious
- Cytoguard Plus is a blend of Perasan & LAE the Lauric Arginate synergistic benefit is significant



Topline Results – Impact on Colony Size after 7 Days

 Note the product effectiveness order has changed slightly from the 1 Day (24 hour) results

