Prevenio
A CMS Technology Company

Validation of Produceshield Plus and OxypHresh 15 on Diced Tomatoes

Objective. Validate the efficacy of OxypHresh 15 alone and in combination with Produceshield Plus (PS+) to reduce *Salmonella* in the wash water and on the surface of diced tomatoes. These studies were completed with and without an organic load added to the flume water.

Summary of Results. OxypHresh 15 and OxypHresh 15/PS+ were significantly (P≤0.05) more effective than chlorine in reducing *Salmonella* on the surface of tomatoes and eliminated all *Salmonella* in the wash water. At short treatment times, OxypHresh 15/PS+, showed a significantly (P≤0.05) rapid reduction versus chlorine. When organic load was added only the OxypHresh /PS+ blend was significantly (P≤0.05) more effective than chlorine.

Materials and Methods. All testing was completed at Michigan State University under the direction of Dr. Elliot Ryser. Tomatoes were provided by Lipman Family Farms.

Treatment Types :

Treatments were made in the hold tank and pumped over to the flume. To mimic high organic load ~140 L of extract collected during commercial processing was added to the hold tank to target turbidity 0f 300 NTU.

	Concentration(ppm)	pH
OxypHresh 15	80	3-3.5
OxypHresh 15 / Produceshield Plus	80	1.8
Chlorine - 5	5	6.5
Chlorine -10	10	6.5

1000 L hold tank
Turbidity = 300 NTU

Pathogens:

- Roma Tomatoes
- Dip-inoculation
- *Salmonella* Typhimurium LT2 and MHM112
- Target 5 - 6 log CFU/tomato

Processing :

Tomatoes were diced into ¼" sections and then treated in the flume. Samples were collected at 20s, 40s, and 60 s.

130 L Flume

Salmonella Reduction (no organic load added to wash water). OxypHresh 15 and OxypHresh 15/PS+ showed significantly (P≤0.05) higher reductions vs chlorine (figure 1). Salmonella was eliminated in the wash water while populations increased in the water and chlorine treatments. (figure 2). OxypHresh 15 showed a significantly (P≤0.05) higher reduction at short treatment times (figure 3). OxypHresh 15/PS+ blend also showed a significant (P≤0.05) reduction in lactic acid bacteria (spoilage bacteria) vs all treatments.

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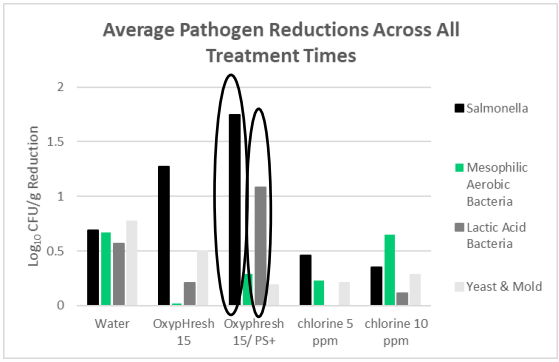

Figure 1. Pathogen Reduction on diced tomatoes. Oxyphresh 15/PS+ showed significantly higher reductions in *Salmonella* and lactic acid bacteria.

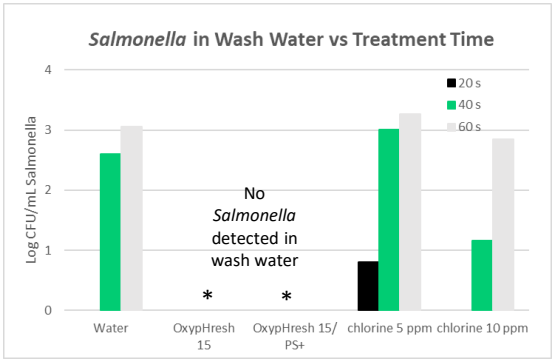

Figure 2. *Salmonella* detected in wash water over treatment time. No *Salmonella* was detected in OxypHresh 15 and OxypHresh15/PS+

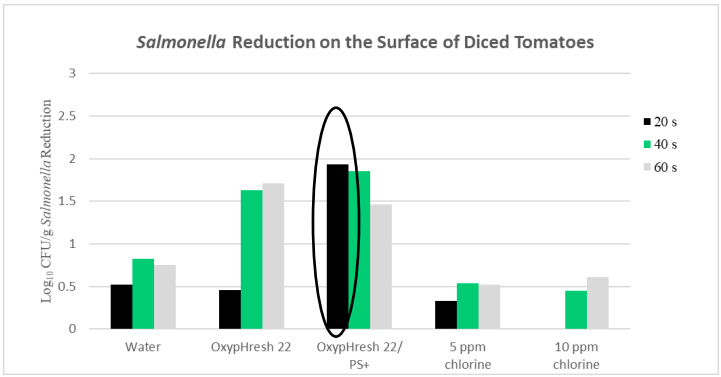

Figure 3. Reduction of *Salmonella* on the surface of diced tomatoes vs treatment time. OxypHresh 15/PS+ at 20s showed a significantly higher reduction vs all other treatments.

Salmonella Reduction (organic load added to wash water). When an organic load was added to simulate commercial conditions, OxypHresh 15/ PS+ provided significantly ($P \leq 0.05$) higher reductions of both *Salmonella* and lactic acid bacteria (figure 4). The OxypHresh 15/PS+ showed significantly higher reductions in *Salmonella* at 20 s treatment time (figure 5).

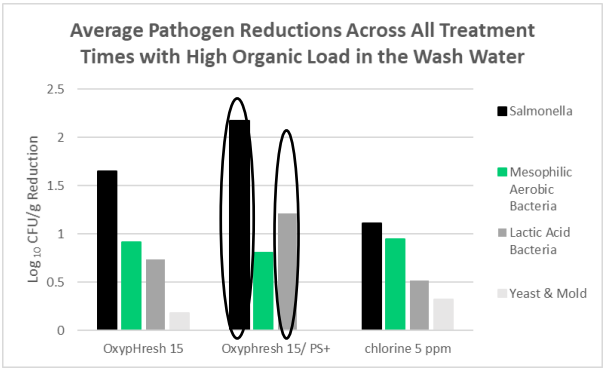

Figure 4. Pathogen Reduction on diced tomatoes. OxypHresh 15/PS+ showed significantly higher reductions in *Salmonella* and lactic acid bacteria under high organic load conditions.

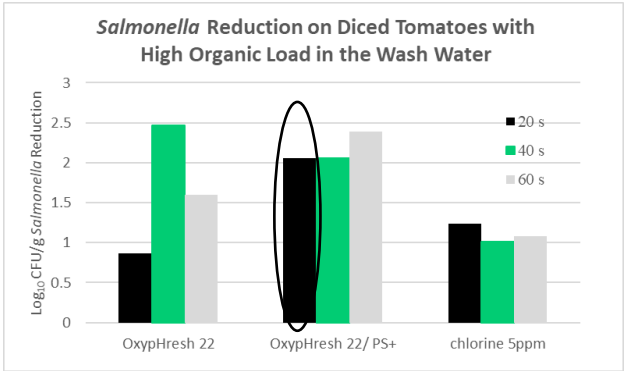

Figure 5. Reduction of *Salmonella* on the surface of diced tomatoes vs treatment time. OxypHresh 15/PS+ at 20s showed a significantly higher reduction vs all other treatments.