

CASE STUDY:

Reducing Pathogens on Jalapeno Peppers and Other Produce

The BIRKO logo features the brand name in a bold, white, sans-serif font, centered within a circular graphic. The circle is primarily blue with a white swoosh that curves around the top and right sides, and a yellow swoosh on the left side.

Birko's Chemistry and Antimicrobial Spray Conveyor Removes More Than 90% of Bacteria from Produce Surfaces

Challenge

Nearly half of foodborne illnesses in recent years can be attributed to fresh produce¹. Because of these outbreaks, research has focused on best practices for preventing contamination of produce such as leafy greens, sprouts, tomatoes and melons, yet there's little to no research on reducing pathogens during the post-harvest processing of peppers.

About the Study

Birko's technical services team conducted extensive research to validate the use of antimicrobials to clean and sanitize jalapeno peppers. An antimicrobial spray conveyor was used to compare the efficacy of seven commercial antimicrobial solutions to inactivate natural microbial flora, *E. coli* and *Salmonella*.

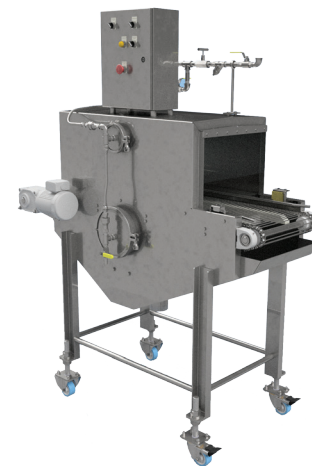
Store-bought peppers (some inoculated in the lab with *E. coli* and *Salmonella*) were passed through our antimicrobial spray conveyor with a single top and bottom spray bar operating at 20psi and 0.5 gallons/minute at a belt speed of 21 inches/minute.

Findings

- Birkoside MP-2 is the most effective at reducing all bacteria tested. It reduces natural microbial flora by 1.6 logs, *E. coli* by 1 log and *Salmonella* by 1.6 logs.
- VeggieXide reduces natural microbial flora by 1.4 logs and *Salmonella* by 1 log.

WHY JALAPENO PEPPERS?

- They're a major commercial crop. About 700,000 tons are produced each year. That's 19 billion jalapeno peppers in the U.S.
- They're most commonly consumed raw (i.e. without further processing to reduce or eliminate natural microorganism flora or pathogens).
- Over the past decade, they've caused 1,714 illnesses in 43 states, 286 hospitalizations and 2 deaths².
- Little is known about the efficacy of antimicrobials to reduce bacterial pathogens on jalapeno peppers. To our knowledge, there's only one study published on the topic and it only tested 2 products: sodium hypochlorite (SH) and Peracetic acid (PAA).



¹Centers for Disease Control and Prevention (CDC), 2008.

²Centers for Disease Control and Prevention (CDC), 2008 and 2010.

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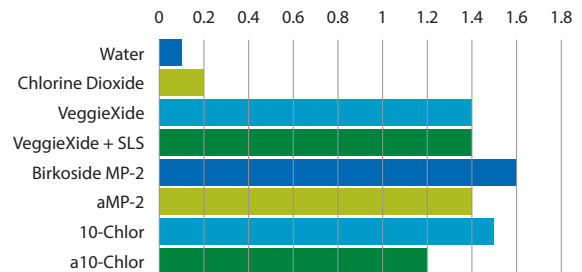
Findings Continued

- Water alone is not sufficient to reduce bacteria on jalapeno pepper surfaces.
- Chlorine Dioxide (CD) is not an effective antimicrobial.
- Birkoside MP-2 and VeggieXide are potential alternatives to chlorine for controlling *Salmonella* during fresh produce processing.

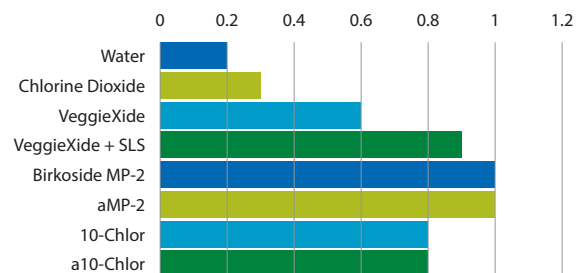
Additional Benefits

- The commercial antimicrobial spray conveyor has several advantages over traditional produce washing systems:
 - Avoids the organic matter buildup found in commercial washing tanks.
 - Shorter contact time (20 seconds versus >1 hour), allows use of higher concentration of antimicrobials without negative impact to product quality.
 - Uses less water than conventional washing tanks (0.5 gallons/minute compared to >800 gallons).
 - Top and bottom spray bars are positioned to provide optimal coverage.
- Findings are applicable to all types of peppers and any produce with skin – apples, cucumbers, tomatoes, melons, cantaloupe – which are traditionally consumed raw.
- An effective alternative to dunk tanks and flumes that reduces the potential for cross contamination.
- Can be coupled with our Automatic Mixing System to eliminate multiple batch mix time.
- Reduces down time and speeds up cleaning process. Sanitizes while keeping the product moving.
- Prevents bruising of the product's flesh.
- Reducing natural microbial flora can increase shelf life.
- Meets sanitary design guidelines.

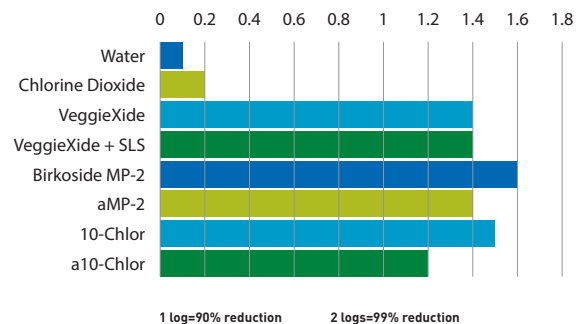
Natural Microbial Flora Log Reduction



E. coli Flora Log Reduction



Salmonella Flora Log Reduction



The full report was published in the *Journal of Food Protection*, Vol. 79, No. 11, 2016, Pages 1854-1859. Read it online at www.birkocorp.com or request a copy from your Technical Sales Representative.

Contact your Technical Sales Representative to find out how Birko's chemistry and equipment can work for you.

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