

Evaluation of Microgen's D-125 for Food and Beverage Processing Applications

Written by Benjamin Tanner, Ph.D, 2/2/08

Author Background:

Benjamin Tanner is the president of Antimicrobial Test Laboratories, a commercial microbiology laboratory. He holds a Ph.D. in Microbiology and Immunology and has worked in the disinfectant industry for several years. He is the author of the book, "Legal Aspects of Infectious Diseases." Before launching Antimicrobial Test Laboratories, he worked as a microbiologist for the Clorox Company (Oakland, CA), developing disinfectants and other antimicrobial consumer products.

Purpose:

The purpose of this evaluation is to describe the applicability of Microgen's D-125 product for use in sanitization of surfaces in the food and beverage processing environment.

Introduction:

When considering a disinfectant or sanitizer for food processing applications, many criteria are important to consider. First and foremost, it is important that the product be efficacious against a broad range of microorganisms, especially food-borne bacteria. Secondly, it is important that the product work quickly and have proven effectiveness and stability in the presence of organic matter. Lastly, it is important that use of the product not be prohibitive to workers (excessive volumes of product must not be required, and it must be reasonably safe to work with).

Microgen, Inc's DISNFX D-125™ is a dilutable, quaternary ammonium disinfectant that is approved for sanitization of food-contact surfaces in the United States by the United States Environmental Protection Agency (USEPA).

Product label instructions specify the following general procedure for sanitization of food contact surfaces:

- 1) Scrape and pre-wash utensils, glassware, and cookware.
- 2) Wash with detergent.
- 3) Rinse with potable water.
- 4) Sanitize in a solution of 4 oz. product per 7 gallons of water (200 ppm solution).
- 5) Wet surfaces thoroughly for 1 minute.
- 6) Let surfaces drain and air dry. Do not rinse or wipe
- 7) Fresh sanitizing solution should be prepared daily or more often if solution becomes diluted or soiled.

The World Health Organization (WHO) specifies the Hazard Analysis and Critical Control Point (HACCP) system for control of pathogens in the food and beverage processing industry¹. An important feature of HACCP is the use of effective food contact surface sanitizers throughout food production in a proactive, preventative fashion to reduce the overall burden of pathogens in the food processing/production environment¹. Microgen's D-125™ disinfectant is well suited for the HACCP system, because of qualities that are discussed in further detail below.

AntimicrobialTestLaboratories LLC

●●●●● Disinfectant Development Specialists

Relevant Kill-Claims and Other Product Efficacy Data:

D-125™ sanitizes food contact surfaces quickly and effectively. In a remarkable study performed in 2003, the D-125™ product was shown to sanitize a population of greater than 1×10^{10} (10 billion) *Escherichia coli* cells per milliliter of suspension within just 30 seconds². This test is noteworthy, because the standard test method used for the study (the AOAC Official Method 960.09^{3,4,5}) specifies a concentration of just 7.5×10^7 to 1.25×10^8 bacteria per milliliter.

D-125™ kills a broad range of microorganisms. It has been proven to be effective against various strains of *Salmonella* (including the important pathogen *Salmonella typhi*), *Campylobacter jejuni*, *Listeria monocytogenes*, *Bacillus cereus*, *Shigella dysenteriae*, *Staphylococcus aureus*, and various strains of pathogenic *E. coli* including hemorrhagic strains such as *E. coli* O157:H7. All of these pathogens are major concerns in the food processing environment. It has also been shown to be effective against more than 100 additional microorganisms⁶.

Generally, quaternary ammonium technologies are thought to be less susceptible to the deleterious effects of organic matter than common bleach (sodium hypochlorite). Because of this, D-125™ is more likely to work after prolonged periods of use or contact with heavily soiled items or surfaces.

Conclusions:

Microgen's D-125™ disinfectant is an effective sanitizer of food contact surfaces at 200 ppm. The product has also been proven to kill a broad range of pathogens. Since only 4 ounces of product are required per each 7 gallons of water to make the 200 ppm sanitizing solution, use in the food and beverage processing environment is not cost-prohibitive.

References:

1. Introduction to HACCP. World Health Organization. Downloaded 2/2/2008. (http://www.who.int/foodsafety/fs_management/en/intro_haccp.pdf).
2. ATS-Labs Study #A01684. October, 2003. ATS-Labs, Eagan, MN.
3. Official Methods of Analysis of the AOAC, Sixteenth Edition. 1995. Chapter 6, Disinfectants. 960.09. Germicidal and Detergent Activity of Disinfectants.
4. USEPA, Registration Division. Office of Pesticide Programs. 1979. Efficacy Data Requirements, Sanitizing Rinses (For previously cleaned food contact surfaces). DSS/TSS 4.
5. USEPA, Registration Division. Office of Pesticide Programs. 1979. Efficacy Data Requirements. Supplemental Recommendations. DSS/TSS 2.
6. Microgen D-125™ USEPA Master Label. May 17, 2007. Downloaded 1/30/08. (<http://www.microgeninc.com/milestones/PDF/D-125%20Master%20Label.pdf>)
7. World Food Programme - United Nations Global Marketplace Registration No.138780