

Reference Document: 2005 FDA Food Code

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Provisions: 4-501.114, 4-703.11; 7-204.11

Document Name: Methicillin Resistant *Staphylococcus aureus* (MRSA) and Sanitization

Document Description:

This office fielded an inquiry regarding the existence or development of any standards for MRSA disinfection in food operation, and whether our current methods of sanitization would address this issue as well.

Date: 11/21/08

Questions:

1. Have any standards been developed for MRSA (Methicillin Resistant *Staphylococcus aureus*) disinfection in food operations?
2. Do we know of anything that would suggest that our current methods of sanitization won't address this issue as well?

Discussion and Rationale:

Presently we have no evidence that MRSA would not respond to normal methods of sanitization as prescribed in the FDA Food Code. 2007 and 2008 news articles have given rise to popular speculation about MRSA being a new killer bug or superbug and an emerging infectious bacterium. MRSA has been around for years, and has become increasingly community acquired in college and high school athletic settings. The genes responsible for toxin production and antimicrobial resistance are moveable, however, so the pathogenic bacterium may or may not express these traits in subsequent generations. Also, antimicrobial resistance behavior is not a predictor of a microorganism's toxigenicity. We have no indication that MRSA's resistance to certain antibiotics is linked to toxigenicity or susceptibility to sanitization measures commonly used in food establishments.

Rarely have foodborne outbreaks been reported as associated with MRSA, however an article was published in January 2002 on a community-acquired MRSA food borne illness outbreak¹ where a food handler, food specimen, and three patrons all tested positive for a toxin-producing strain of MRSA. Despite its ubiquity as a healthcare-acquired pathogen, and increased reports of community-acquired infections, MRSA has not previously been reported as a cause of outbreaks of gastroenteritis. Methicillin-resistant strains of *Staphylococcus aureus* are as likely to produce enterotoxins as are methicillin-sensitive strains. Therefore, outbreaks of acute gastroenteritis due to MRSA are not unexpected.

In this particular outbreak, it appears that MRSA-contaminated food was the vehicle that affected low risk persons, and that the food was likely contaminated by an asymptomatic food employee and carrier whose only apparent exposures were intermittent visits to a nursing home. More information regarding this outbreak is available at: <http://www.cdc.gov/ncidod/eid/vol8no1/01-0174.htm#Figure>

Staphylococcus aureus infections including MRSA occur most frequently among persons in hospitals and health care facilities, manifesting as surgical wound infections, urinary tract infections, bloodstream infections, and pneumonia, but can be acquired in the community and cause skin infections and illness.

Of relevance in retail food settings, MRSA skin infections can occur anywhere, but some settings have factors that make it easier for MRSA to be transmitted. These factors, referred to as the 5 C's,² are as follows: Crowding, frequent skin-to-skin Contact, Compromised skin (i.e., cuts or abrasions), Contaminated items and surfaces, and lack of Cleanliness. Locations where the 5 C's are common include schools, dormitories, military barracks, households, correctional facilities, and daycare centers.

The CDC has published MRSA guidance for health care settings, non-health care settings, general workplaces, and community settings including schools where MRSA is known to be harder to control due to its resistance to certain antimicrobials.

More information regarding MRSA and health care settings is available at:

http://www.cdc.gov/ncidod/dhqp/ar_MRSA_spotlight_2006.html

More information regarding MRSA and general workplaces is available at:

<http://www.cdc.gov/niosh/topics/mrsa/>

More information on MRSA and schools is available at:

<http://www.cdc.gov/Features/MRSAinSchools/>

More information on community acquired MRSA is available at:

http://www.cdc.gov/ncidod/dhqp/ar_mrsa_ca.html

Food products can be contaminated by colonized or infected food worker's hands or from nasal discharges. Even seemingly healthy employees may serve as reservoirs for pathogenic microorganisms that are transmissible through food. *Staphylococci*, for example, can typically be found on the skin and in the mouth, throat, and nose of many employees. Statistics from the CDC's National Institute for Occupational Safety and Health (NIOSH) inform us that 25-30% of the population is colonized with *Staphylococcus aureus* bacteria and approximately 1% is colonized with MRSA.³ The hands of employees can be contaminated by touching their nose or other body parts. Untreated individuals in uncomplicated cases can be communicable for 10-21 days, and untreated individuals with purulent discharges (i.e. yellowish liquid produced by infection) may be communicable for weeks or months. *Staphylococcus aureus* toxin is extremely heat stable and is not inactivated by normal cooking and reheating temperatures, so preventing contamination of foods is important.

With the goal of preventing the transmission of pathogenic microorganisms through food in food establishments, the FDA Food Code provides general food safety guidance with regard to sanitizers and sanitization, hand washing, employee hygienic practices, employee health reporting, restriction and exclusion of ill employees, and recommendations designed to prevent the spread of pathogens from employees with open or infected wounds or lesions. Section 2-201.11 specifically addresses infected lesions that may introduce *Staphylococcus aureus* into food through food employees. Sections 4-501.114, 4-703.11, and 7-204.11 of the FDA Food Code address the effective use of sanitizers in the retail food establishment.

Receiving authority from the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and/or state pesticide laws, the United States (US) Environmental Protection Agency (EPA) (and the states) registers or licenses pesticides for use in the United States. Pesticides are often referred to according to the type of pest they control, and include various types such as chemical pesticides, biopesticides,

pest control devices, and antimicrobial pesticides. As defined by EPA, “antimicrobial pesticides are substances or mixtures of substances used to destroy or suppress the growth of harmful microorganisms whether bacteria, viruses, or fungi on inanimate objects and surfaces. More than 5000 antimicrobial products are currently registered with the U.S. Environmental Protection Agency (EPA) and sold in the marketplace. Nearly 60% of antimicrobial products are registered to control infectious microorganisms in hospitals and other health care environments.”⁴

A critical aspect of registering a pesticide product is the approval of the product label. Pesticide product labels provide critical information about how to safely handle and use pesticide products. For more information about pesticide product labels, go to:

<http://www.epa.gov/pesticides/regulating/labels/product-labels.htm#regulation>

The information on this page is intended to help pesticide registrants and the public better access, understand, and use information about pesticide labels. EPA’s Office of Pesticide Program, Pesticide Product Label System (PPLS) also maintains a collection of pesticide labels approved under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

Antimicrobial pesticides have two major uses: 1.) disinfect, sanitize, reduce, or mitigate growth or development of microbiological organisms; 2.) protect inanimate objects (for example floors and walls), industrial processes or systems, surfaces, water, or other chemical substances from contamination, fouling, or deterioration caused by bacteria, viruses, fungi, protozoa, algae, or slime.”⁵ According to CDC’s National Institute for Occupational Safety and Health, “cleaning contaminated equipment and surfaces with detergent-based cleaners or Environmental Protection Agency (EPA)-registered disinfectants is effective at removing MRSA from the environment. It is important to read the instruction labels on all cleaners to make sure they are used safely and appropriately.”⁶

EPA defines antimicrobial pesticides primarily for hard surface sanitization, establishes tolerances for food pesticides, and publishes a listing of Registered Products Effective Against Methicillin Resistant *Staphylococcus aureus* (MRSA) and Vancomycin Resistant *Enterococcus faecalis* or *faecium* (VRE).

Pesticide registration information is available at:

<http://www.epa.gov/pesticides/regulating/registering/index.htm>

Pesticide tolerance reassessment and reregistration information is available at:

<http://www.epa.gov/oppsrrd1/reregistration/index.htm>

You may also be interested in the list of personnel contacts listed on the Contacting EPA about Regulating Pesticides page, <http://www.epa.gov/pesticides/regulating/contacts.htm>

For more information, you may wish to contact the Office of Pesticide Programs directly at:

U.S. Environmental Protection Agency
Office of Pesticide Programs, Registration Division
Ariel Rios Building
1200 Pennsylvania Avenue, N.W. (7505P)
Washington, DC 20460
Phone: (703) 305-5447

E-mail: opp-web-comments@epa.gov

Web access for inquiries:

http://publicaccess.custhelp.com/cgi-bin/publicaccess.cfg/php/enduser/ask.php?p_sid=iix3mIjj&p_accessibility=0&p_redirect=&p_sp=cF9zcmNoPSZwX3NvcnRfYnk9JnBfZ3JpZHNvcnQ9JnBfcm93X2NudD0xOTIsMTkyJnBfcHJvZH M9JnBfY2F0cz0mcf9wdj0mcf9jdj0mcf9zZWFyY2hfdHlwZT1hbnN3ZXJzLnNlYXJjaF9ubCZwX3 BhZ2U9MQ**

The EPA provides a list of EPA-registered products effective against MRSA at:

http://epa.gov/oppad001/list_h_mrsa_vre.pdf

Additional listings of selected EPA- registered disinfectants, and more information on EPA's registered sterilizers, tuberculocides, and antimicrobial products against certain human public health bacteria and viruses are available at:

<http://www.epa.gov/oppad001/chemregindex.htm>

Response:

1. We have no indication that MRSA's resistance to certain antimicrobials is linked to toxigenicity or susceptibility to sanitization measures commonly used in food establishments. There is no specific FDA Food Code guidance information regarding MRSA in food operations. The Food Code publishes general guidance in the areas of sanitization and sanitizers, proper hand washing, appropriate sanitization of hard surfaces, employee health reporting, and hygienic practices designed to protect food establishments from pathogenic transmission by asymptomatic food employees or food employees with open or infected wounds.

The main message of the Food Code in dealing with the risk of infectious disease transmission in food establishments is a routine multi-disciplinary intervention approach using the strategies of demonstration of food safety knowledge, employee health reporting, appropriate exclusion and restriction where required, and good personal hygienic practices such as proper handwashing and no bare hand contact with ready-to-eat foods. Appropriate cleaning and sanitization of food and non-food contact surfaces are also considered to be prerequisites for a food safety management system.

The use and efficacy of EPA-registered antimicrobial pesticides against MRSA in food operations must be reviewed in concert with provisions listed in the Food Code for food additives and chemical sanitizers including relevant provisions in Parts 3-3, 4-5, 4-6, 4-7, and 4-9. More information on types of antimicrobial products is available at;

http://www.epa.gov/oppad001/ad_info.htm

2. CDC and FDA's Center for Food Safety and Applied Nutrition (CFSAN) experts believe that current CDC and 2005 FDA Food Code recommendations for *Staphylococcus aureus* appear to be adequate for MRSA. In light of recent interest in MRSA, further study of its toxigenicity and transmissibility in retail food operations seems warranted. There are efforts underway at CFSAN to obtain MRSA strains to conduct such testing.

More information on what CDC is doing about MRSA is available at:

http://www.cdc.gov/ncidod/dhqp/ar_mrsa_CDCActions.html

References:

1. "An Outbreak of Community-Acquired Food borne Illness Caused by Methicillin-Resistant *Staphylococcus aureus*," Timothy F. Jones et al., Emerging Infectious Diseases, Vol. 8, No. 1, January 2002, pp. 82-84, available at <http://www.cdc.gov/ncidod/eid/vol8no1/01-0174.htm#Figure>
2. CDC, NIOSH website link at www.cdc.gov/niosh/topics/mrsa
3. CDC, NIOSH website link at www.cdc.gov/niosh/topics/mrsa
4. EPA website link at www.epa.gov/oppad001/ad_info.htm
5. EPA website link at www.epa.gov/oppad001/ad_info.htm
6. EPA website link at www.epa.gov/oppad001/ad_info.htm
7. FDA Federal Food Code, Section 4-501.114 Manual and Mechanical Warewashing Equipment, Chemical Sanitization-Temperature, pH, Concentration, and Hardness
8. FDA Federal Food Code, Section 4-703.11 Hot Water and Chemical.

9. FDA Federal Food Code, Section 7-204.11 Sanitizers, Criteria.
10. FDA Federal Food Code, Annex 3 for the aforementioned sections.
11. FDA, The Bad Bug Book, Staphylococcus aureus at <http://www.cfsan.fda.gov/~mow/chap3.html>

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