

Should The Federal Government Focus More Attention on The Surveillance of Methicillin-Resistant Staphylococcus aureus from Food Sources?

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Currently, the Center for Disease Control and Prevention conducts active population-based surveillance for laboratory confirmed cases of infections caused by ten microorganisms (Campylobacter, Shigella, Shiga-toxin producing *E. coli*, Salmonella, Yersinia, Vibrio, Listeria, Cryptosporidium and Cyclospora and non-STEC) from ten state health departments, USDA FSIS and the Food and Drug Administration using a collaborative program called FoodNet. The Foodborne Diseases Active Surveillance Network (FoodNet) of CDC's emerging infection program allows ten U.S. States to actively monitor all laboratory-confirmed infections with select enteric pathogens transmitted commonly through food. This surveillance method has been successful in helping public health agencies to determine the trends associated with the consumption of select food or microorganisms, however, no active surveillance data is available to determine the trends associated with food-related outbreaks due to contaminated agricultural products with *Staphylococcus aureus* using the existing FoodNet Surveillance system. Furthermore, the surveillance of foodborne diseases is complicated by several other factors, which pose serious challenges to the public health. Therefore, there is a need for base-line data and a system that actively monitor the number of cases of Staphylococcal outbreaks associated with the consumption of agricultural products, including salad crops.

Humans and animals are known to be carriers of *Staphylococcus aureus*, and able to transmit the pathogen to foods unknowingly, however, the accurate prevalence of staphylococcal food poisoning is unknown because it is not reportable through active surveillance systems. In addition, cases of methicillin-resistant *Staphylococcus aureus* (MRSA) in animals used for food production and reports of sporadic cases in dairy cattle, as well as the isolation of a new clone, CC398 from pigs, chicken and other food animals appear to be emerging. Consequently, contamination of meat by pathogens is an important food safety issue because food animals arriving at abattoirs are frequently carriers of *S. aureus* (Mead and Dodd [1] Rodríguez-Calleja et al. [2]). Surveillance data on most food borne diseases (FBD) usually include both sporadic and outbreak cases, except for illness caused by *Staphylococcus aureus*. Furthermore, MRSA is a common pathogen associated with nosocomial infections, widely recognized as the cause of morbidity and mortality throughout the world, and considered a major Public Health problem (Ho et al. [3]; Klevens et al. [4]). With several surveillance systems, data is scattered and sometimes difficult to amalgamate in order to get an understanding of foodborne outbreaks. Epidemiological analysis can lead to the provision of a more accurate estimation of illnesses from the multiple reporting agencies, which is one of the top priorities of the USDA Food Safety Program. However, not all foodborne pathogens are actively surveyed. To date, information on *Staphylococcus aureus* foodborne outbreaks in produce is limited at best.

A recent review of the foodborne outbreaks line-listing report by Ajayi et al. [5] showed that *Staphylococcus* spp. were implicated and confirmed as the causative agent in several outbreaks of FBD from 1997-2007. Several foodborne pathogens are known to infect both animals and humans (Aucoin [6]). In addition, cases of MRSA in animals used for food production appear to be emerging. There is no information in the FoodNet data about outbreaks caused by *Staphylococcus* spp., particularly MRSA, even though, some researchers have documented that MRSA from animal

reservoirs have recently entered the human population in Europe (van Loo et al. [7]). Pigs have recently been shown to be major reservoirs for MRSA 398 (ST398) worldwide in the Netherlands, Korea, Japan, Canada, Singapore, and the USA (Voss et al. [8]; Huijsdens et al. [9]; Khanna et al. [10]; Smith et al. [11]). Other reservoirs include poultry products [7]; Pereira et al. [12], cattle (Lee et al. [13]), dairy herds (Devriese and Hommez et al. [14]), and pets [6]. Furthermore, Klevens et al. [15] reported that percentage of MRSA isolates increased from 35.9% in 1992 to 64.4% in 2003 and further estimated that MRSA attributed to 94,000 infections and more than 18,000 deaths in 2005 in USA in the National Nosocomial Infections Surveillance System (Klevens et al. [4]). While it is not clear how many or if any of these hospital-onset, healthcare-associated community onset and community associated infections were a result of foodborne outbreaks. According to Lee [16], transmission through food products has not been fully investigated.

Our government has been diligent in monitoring several microorganisms over the past decade through their surveillance networks; however, with the reemergence of superbugs, such as methicillin-resistant *Staphylococcus aureus*, our government may need to consider adding this to the list of monitored foodborne pathogens in their FoodNet surveillance network.

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Received February 11, 2012; Accepted February 11, 2012; Published February 16, 2012

Citation: Williams LL (2012) Should The Federal Government Focus More Attention on The Surveillance of Methicillin-Resistant *Staphylococcus aureus* from Food Sources? *Med Aromat Plants* 1:4. doi:10.4172/2167-0412.1000e117

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