Biofilm of Antibiotics Resistant Salmonella Typhimurium and Salmonella Enteritidis Against Detergents

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ABSTRACT
Salmonella is able to produce biofilm which is more resistant toward disinfectants and antibiotics than its planktonic form. Salmonella typhimurium from beef and Salmonella Enteritidis from raw vegetables isolates were tested for their susceptibility using 18 different antibiotics. Salmonella typhimurium isolate was resistant toward Streptomycin, Sulfamethoxazole, Penicillin, Erythromycin, Tetracyclin, Ampicillin, Rifampicin and Clarithromycin while Salmonella enteritidis was resistant toward Amikacin, Streptomycin, Penicillin, Cipfoflaxin, Erythromycin, Ampicilin, Tetracyclin, Rifampicin, Cephalothin, Amikacin, Chloramphenicol and Clarithromycin. Both of Salmonella isolates showed MAR index > 0.2, indicating that these isolates might be originated from high risk sources. Out of the five detergents, Detergent 3 (D3) (Linear alkyl Sulfonic acid) was found to be the most effective. The Minimum Inhibition Concentrations (MICs) and Minimal Bactericidal Concentration (MBCs) was ranged from 6250 – 25,000 µg/ml and 25,000 to > 50000 µg/ml, respectively. Biofilm-producing ability of antibiotics -resistant Salmonella typhimurium and Salmonella enteritidis were inhibited at 12,500 – 25,000 µg/ml and eradicated at >50000 µg/ml. Therefore, Detergents showed potential antimicrobial activity against Salmonella.

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Introduction
Foodborne illness is a major international public health concern (Carl et al., 2003) and this is proven by the microbial contamination affecting most foodstuffs consumed in the world (Concina et al., 2008). Salmonella are among one of the most important causes of foodborne gastroenteritis worldwide. The infection of Salmonella is known as Salmonellosis. They are gram-negative, facultative anaerobes and inhabit the intestinal tract of animal (Chia et al., 2009).

Antibiotics are the only effective therapy for the food-borne infections (Mao et al., 2007). One of the most important food safety concerns is the increasing antibiotic resistance of food-borne pathogens. Recently, many aerobic and anaerobic bacteria were reported to show antibiotic resistance...