

Effectiveness of proper hand washing on sanitation in seafood processing microenterprise units

Global Hand Washing Day is an annual global advocacy day dedicated to increasing awareness and understanding of hand washing with soap. The first Global Hand Washing Day was celebrated on October 15, 2008, as per recommendation of UN General Assembly in 2008, as International Year of Sanitation.

Sanitation is the first line of defense in any effective food safety programme. Food handlers' correct knowledge of problems, conditions of

handling and good manufacturing practices are some of the most important conditions contributing to good hygienic quality in food preparation and/or quality deterioration. There are more than 250 different food-borne diseases and millions of people fall ill every year and many die as a result of eating unsafe food. Often hands act as vectors that carry disease-causing pathogens from person to person through direct contact or indirectly through contact surfaces and foods. Hand washing

with soap is among the most effective and inexpensive way to interrupt the transmission of microorganisms in a food processing environment. Although people around the world wash their hands with water, many often forget washing their hands with soap at critical moments, particularly after going to the toilet and before handling or eating food. The challenge, therefore, is to transform simple hand washing to hand washing understanding scientific principles. Food handlers have specific responsibilities in food safety related to their health and hygiene. Proper and adequate training on personal hygiene practices are absolutely essential for food handlers for safe handling of food and thus to prevent food-borne diseases.

Effective hand washing is an important strategy to prevent the risk of infection and it will take nearly one minute which involves the application of a soap or any antimicrobial agent onto wet hands; then rubbing of both hands to form a lather and effective rubbing on back of the palm, between the fingers, back of the fingers, finger tips, under finger nails, thumbs, wrists etc., rinsing with clean water; and drying hands with clean towel or dryer (Fig. 1).

In connection with the ‘Global Hand Washing Day’ an awareness campaign on “Importance of effective hand washing in seafood processing and food-borne illnesses” was conducted at Moothakunnam, Ernakulam on 15th October, 2014. The campaign was organized as part of the DST project entitled “Food safety interventions for women in fishery based micro enterprises in

Fig. 1. Demonstration of hand washing procedure as per WHO guidelines



1st Step
(Wet your hands with clean water & Apply enough soap)



2nd Step
(Rub hands palm to palm)



3rd Step
(Rub the back of both hands with interlaced fingers)



4th Step
(Palm to palm with fingers interlaced)



5th Step
(Back of fingers to opposing arms)



6th Step
(Rotational rubbing of thumbs)



7th Step
(Rotational rubbing of fingertips on palms)



8th Step
(Rinse hands thoroughly with clean water)



9th Step
(Dry hands thoroughly with a clean towel)



10th Step
(Use towel to turn off faucet)



11th Step
◀ (Clean hands = Safe hands)

coastal Kerala". To assess the impact of training, stakeholders from micro enterprise units were divided into two groups. The group to which training was imparted was designated as Group A and the other group as Group B. Eleven steps of proper hand washing as per WHO guidelines on hand hygiene was demonstrated during the training session (Fig. 1). The level of hand hygiene before and after the training was assessed by conventional microbiological swabs. Swabs were collected from the critical areas of hands or the parts often missed during hand washing and brought to the laboratory in aseptic condition. Swabs were taken before and after hand wash to compare the variations. Analysis was performed as per standard protocol. The efficiency of training was evaluated by comparing the two groups with respect to time taken for hand washing, persons wearing jewelry, uncut nails, open wounds and other hand hygiene practices etc.

All food handlers washed their hands with tap water. In Group B about half of them (43.75%) used soap, rubbing of the hand areas (between fingers, finger tips, around wrist, thumbs etc.) was either not practiced at all (78.12%) or partially done (37.50%). Initial mesophilic bacterial count was 1910 ± 154 cfu/cm² in Group A and 1829 ± 153 cfu/cm² in Group B which reduced by 90.55% in Group A and 63.74% in Group B after hand washing (Fig. 2). In Group B, 84.38% of stakeholders took less than 20 sec. for hand washing whereas food handlers in Group A, who acquired training took 40-55 seconds. Prior to washing, a variation in mesophilic count of about 154 cfu/cm² was noticed

between both hands of the food handlers in Group A while the second group showed a variation of 153 cfu/cm² which indicates that initially there was no significant difference ($P < 0.05$) between the two groups. The variation in mesophilic counts between two hands of first group of people after hand washing was 11.7 cfu/cm² but the second group exhibited a significant variation of about 131 cfu/cm² between two hands even after washing. This probably indicates that most of them may have omitted the critical steps of friction and rubbing during hand washing. *Escherichia coli* and *Staphylococcus aureus* count in Group A people was significantly reduced after hand washing being less than 10 cfu/cm² in all cases. Even though the hand washing method followed by the food handlers in Group B significantly decreased both *E. coli* and *S. aureus* counts, they were reduced only to 66.67% and 76.48% respectively, indicating the necessity of an intervention.

The skin underneath rings had more microorganisms than control sites. Training was found to be useful that 91% and 92% of food handlers in Group A followed the system of removing rings and bangles prior to hand wash but only 14.29% and 18% of Group B removed rings and bangles prior to washing indicating the need of an intervention. Almost all of them were aware about the unhygienic aspects of long nails before the training itself but many forgot to cut their nails, may be due to laziness or time pressure. Open wounds are also a source for cross contamination and it was found that 6.25% of food handlers had open wounds.

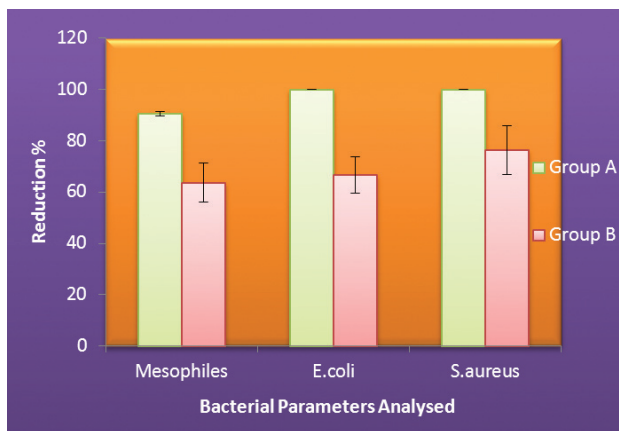


Fig. 2. Impact of training on hand hygiene

Microorganisms thrive well in a damp environment. So hand drying is an important step to prevent cross contamination. Most of the food handlers (87.5%) in the present study followed wiping their hands on towels after hand wash but they rarely noticed the cleanliness of the wiping material. It was found that the entire food handlers from Group A wiped their hands on clean towels after training. Taps should not be touched again with freshly washed hands. Group which acquired training turned off the faucets using the towels whereas Group B used washed hands to turn off the faucets. Foot operating taps are more

recommended in food processing units. Petri plates with microbial growth were exhibited to make them aware about the bacteria in dirty hands and to emphasize the importance of proper hand washing. Posters were also displayed on food-borne diseases, treatment, preventive measures and personal hygiene practices.

Most of the food-borne disease outbreaks are attributable to poor personal hygiene practices and improper handling of food. The spectrum of food diseases are widening with emerging patho-

gens. Judicial washing of hands is a simple step in personal hygiene which can significantly reduce the risk of food-borne illness. Present study revealed that besides inadequate hygiene facilities, lack of proper training plays a vital role in unhygienic practices. Significant reduction ($P < 0.05$) in bacterial counts indicated the impact of intervention. Training was found to be effective in this study but long-lasting improvement in hand hygiene practice needs a multifaceted approach involving both behavioural change and continuous monitoring facility.

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