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Washing Away Misconceptions About Gloves and Handwashing

Rebecca Montville, Research Scientist & Donald Schaffner, Ph.D., Extension Specialist in Food Science

Everyone agrees that handwashing is very important in preventing foodborne disease. However, there are many misconceptions regarding proper handwashing practices. Through better understanding of the factors influencing handwashing and cross contamination from hands to food, kitchen safety can be improved.

Myth: Handwashing is only really important if you are sick.

Fact: It is important that good handwashing practices always be followed. With many gastrointestinal illnesses (any illness that includes stomachache, diarrhea or vomiting), the infected person may be contagious before showing any symptoms. It is also important to realize that anyone caring for a child with diarrhea can transmit disease as well. Individuals affected with hepatitis A, for example, can spread the virus for 4 weeks before showing symptoms of illness. It is especially important that hands be washed after going to the bathroom and whenever coming into contact with body fluids.

People suffering from any illness should not come into contact with food for others. In the commercial kitchen, food handlers should not be working with food when ill. If worker s cannot take a day off, they should be reassigned to a job that involves no contact with food. Under no circumstances should an ill person handle food for others. This includes preparing food in the kitchen at home. If one member of a household is sick, others in the house can be infected. Ill food handlers have been the source of many foodborne disease outbreaks.

Myth: You only need to wash your hands after going to the bathroom or after handling raw meat.

Fact: When handling food, there are many times when it is important for people to wash their hands. Every one handling foods should wash hands when entering the kitchen, even if only returning from a break. In addition to washing hands after using the bathroom, any time someone touches the mouth, nose or scalp, hands should be considered dirty. Also, anyone cleaning equipment or food contact surfaces, should wash hands before returning to food preparation.

Myth: All bacteria on the hands are bad bacteria.

Fact: There are bacteria on everyone's hands that are actually helpful. There are two different types: resident bacteria and transient bacteria. Resident bacteria are bacteria that normally live on your skin. These bacteria generally do not make people sick. They help keep the numbers of transient bacteria (bacteria that are not naturally occurring on hands and are the result of some sort of contamination) in check, by competing with them. When fewer resident bacteria are present on people's hands, the number of transient bacteria can soar and they may end up with warts or other skin problems

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(*2,25*). Almost all bacteria that cause foodborne disease outbreaks are transient. The only exception is an organism called *Staphylococcus aureus*. *Staphylococcus aureus* occurs naturally on the skin. If large numbers of this organism get into food, it can cause illness. The risk of infecting a food with *Staphylococcus aureus* increases if the food handler has an infection like a cut, pimple or boil. Therefore, foodhandlers with skin infections should not contact food.

Myth: Hand soap without an antimicrobial agent is not effective.

Fact: Studies have shown that antimicrobial soaps are only slightly more effective than regular soaps (*4,13,19,21,22*). The most important aspect of handwashing is the action of breaking up the layers of fats on the hands (done with soap). This fat can entrap bacteria, so by removing some of it, bacteria are also removed. Both antimicrobial and regular soaps will work to remove this layer. Antimicrobial soaps can reduce bacteria further, but for the most part, the soap is not in contact with bacteria long enough to kill them.

Myth: People can get germs from using the same bar soap as other people.

Fact: Research has shown that bacteria do not readily transfer from one person to another by soap (*3,11*). It is likely that any bacteria picked up from bar soap are washed away when you rinse your hands.

Myth: The hotter the water you use for handwashing, the better.

Fact: In the past the Food and Drug Administration has recommended that water temperature be 120°F for handwashing. Recently they have changed their recommendation 105°F (*http://vm.cfsan.fda.gov*). There is no research to prove that higher temperatures improve handwashing (*18*). Handwashing water is not hot enough to kill bacteria. However, hotter water is more likely to cause excessive drying of the skin. It is harder to remove bacteria from dry skin because of extra cracks and grooves, and dry skin can make handwashing painful (*14*). As a rule, the best temperature to wash hands is the warmest temperature that you find comfortable.

Myth: Hot air hand dryers are the most sanitary way to dry your hands.

Fact: Hot air hand dryers can actually increase the amount of bacteria on your hands after handwashing (*5,6,23*). Bacteria can grow inside of hand dryers because they provide a warm moist environment. When the dryer is turned on, the air that comes out can be filled with bacteria (*5,6,17,23*). Paper towels are a better way to dry your hands because they can physically remove bacteria while not adding additional bacteria to the hands.

Myth: Alcohol hand sanitizers are an acceptable substitute for handwashing.

Fact: Alcohol sanitizers have been shown to work on clean hands; when clean hands were contaminated with bacteria, alcohol hand sanitizers eliminated bacteria fairly well (*1,15*). It is likely, however, that sanitizers don't work as well on hands that are dirty and greasy. For this reason sanitizers should be used only in addition to proper handwashing. It is also important to keep in mind that alcohol can dry out the skin, which can cause an increase in bacteria over time (*12,16,21*). There are even some studies that show that bacteria increase after the first use (*8,24*). Because of so much conflict between different studies on alcohol sanitizers, it is generally recommended that they only be used after handwashing or when water is not available.

Myth: There is no point in washing your hands after going to the bathroom because you need to touch the dirty doorknob on the way out.

Fact: The amount of bacteria that transfers from hands to surfaces is actually quite small (*7*). If someone with dirty hands touches the doorknob, only a small amount of the bacteria from dirty hands will end up on the doorknob. Of the bacteria on the doorknob, only a small amount will then transfer to your hands. Therefore, if you wash another person's hands and touch a doorknob with bacteria on it, your hands will still be much more clean than if you didn't wash them at all.

Myth: As long as foodhandlers wear gloves, there is no chance of hands contaminating food.

Fact: Many food service establishments use cheap gloves which bacteria can pass through (*20*). Gloves may also give food handlers a false sense of security (*10,12*); they think that as long as they are wearing gloves, their hands are clean. Anecdotal information shows that when people wear gloves, they are much less likely to wash their hands. After gloves are put on, bacteria on the hands increase quickly (*9*). If a glove is punctured, bacteria on the hands can pass to food even more easily. It is also important to remember that gloves can pick up bacteria from dirty surfaces and transfer them to food. For all of these reasons, handwashing is still the best way to fight the contamination of foods. If gloves are being worn in the kitchen, it is important to remember to change them frequently, with proper handwashing between changes.

References

1. Aly, R. and H.I. Maibach**.** 1979. Comparitive study on the antimicrobial effect of 0.5% Chlorohexidine gluconate and 70% isopropyl alcohol on the normal flora of hands. AEM. 37**:**610-613.

2. Aly, R.**,** H.I. Maibach**,** H.R. Shinefield, and H.G. Strauss**.** 1972. Survival of pathogenic microorganisms on human skin. Journal of Investigative Dermatology. 58**:**205-210.

3. Bannan, E.A. and L.F. Judge**.** 1965. Bacteriological studies relating to hand washing. I. The inability of soap bars to transmit bacteria. Am J Public Health. 55**:**915-921.

4. Bartzokas, C.A.**,** J.E. Corkill, and T. Makin**.** 1987. Evaluation of skin disinfecting activity and cumulative effect of chlorhexidine and triclosan handwash preparations on hands artificially contaminated with *Serratia marcescens*. Inf. Cont. 8**:**163-167.

5. Blackmore, M.A. 1989. A comparison of hand drying methods. Cater. Health. 1**:**189-198.

6. Blackmore, M.A. and E.M. Prisk**.** 1984. Is hot air hygienic? The Home Economist. 4**:**14-15.

7. Chen, Y.**,** K.M. Jackson**,** F.P. Chea, and D.W. Schaffner**.** 2001. Quantification and variability analysis of bacterial cross contamination rates in common foodservice tasks. J. Food Prot. 64**:**72-80.

8. Dyer, D.L.**,** K.B. Gerenraich, and P.S. Wadhamas**.** 1998. Testing a new alcohol-free hand sanitizer to combat infection. Assoc. Oper. Room Nur. J. 68**:**239-251.

9. Fendler, E.J.**,** M.J. Dolan, and R.A. Williams**.** 1998. Handwashing and gloving for food protection. Part I: Examination of the evidence. Dairy Food Envir. Sanit. 18**:**814-823.

10. Garcia-Graells, C.**,** K.J.A. Hauben, and C.W. Michiels**.** 1998. High pressure inactivation and sublethal injury of pressure-resistant *Escherichia coli* mutants in fruit juices. AEM. 64**:**1566

11. Heinze, J.E. and F.Y. Yackovich**.** 1988. Washing with contaminated bar soap is unlikely to transfer bacteria. Epidemiol. Infect. 101**:**135-142.

12. Larson, E. 1989. Hand washing: It's essential — even when you use gloves. Am J Nurs. 89**:**934-939.

13. Larson, E.**,** K. Mayur, and B.A. Laughon**.** 1988. Influence of two hand washing frequencies on the reduction in colonizing flora with three hand washing products used by health care personnel. Am J Infect Control. 17**:**83-88.

14. Larson, E.L. 1985. Handwashing and skin physiologic and bacteriologic aspects. Inf. Cont. 6**:**14-23.

15. Larson, E.L.**,** P.I. Eke, and B.E. Laughon**.** 1986. Efficacy of alcohol-based hand rinses under frequent-use conditions. Antimicrob. Agents & Chemother. 30**:**542-544.

16. Larson, E.L.**,** C.A. Norton-Hughes**,** J.D. Pyrek**,** S.M. Sparks**,** E.U. Cagatay, and J.M. Bartkus**.** 1998. Changes in bacterial flora associated with skin damage on hands of health care personnel. Am J Infect Control. 26**:**513-521.

17. Meers, P.D. and K.Y. Leong**.** 1989. Hot-air hand dryers. J. Hospit. Inf. 14**:**169-171.

18. Michaels, B., V. Gangar, A. Schultz, M. Arenas, T. Ayers, and D. Paulson. 2000. Hand washing water temperature effects on the reduction of resident and

transient (Serratia marcescens) flora when using bland soap, [In Press] Unknown.

19. Miller, M.L., L.E. Milanesi, and L.A. James-Davis. 1994. A field study evaluating the effectiveness of different hand soaps and sanitizers. Dairy Food Envir. Sanit. 14:155-160.

20. Montville, R., Y. Chen, and D.W. Schaffner, 2001. Glove barriers to bacterial cross-contamination. Journal of Food Protection. 64(6):845–849.

21. Paulson, D.S. 1994. A comparative evaluation of different hand cleansers. Dairy Food Envir. Sanit. 14:524-528.

22. Phillips, C.A. 1999. The epidemiology, detection and control of *Escherichia coli* O157. J. Sci. Food Agric. 79:1367-1381.

23. Redway, K., B. Knights, Z. Bozocky, A. Theobald, and S. Hardcastle. 1994. Hand drying: A study of bacterial types associated with different hand drying methods and with hot air dryers, Unpublished Report. The Applied Ecology Research Group—The University of Westminster, London, UK.

24. Sheena, A.Z. and M.E. Stiles. 1983. Immediate and residual (substative) efficacy of germicidal hand wash agents. J. Food Prot. 46:629-632.

25. Snyder, O.P. 2000. A "safe hands" hand wash program for retail food operations.

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