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Using Hand Sanitizers

Authored by Katheryn Parraga, Muscle Food Safety Extension Specialist, Virginia Seafood Agricultural Research and Extension Center, Virginia Tech; Minh Duong, Postdoctoral Associate, Department of Food Science and Technology, Virginia Tech; H. Lester Schonberger, Research Associate, Department of Food Science and Technology, Virginia Tech; Laura K. Strawn, Associate Professor and Extension Specialist, Department of Food Science and Technology, Virginia Tech; and Reza Ovissipour, Assistant Professor and Extension Specialist, Department of Food Science and Technology, Virginia Tech

Introduction

Since the COVID-19 pandemic started, one of the recommendations by the U.S. Centers for Disease Control and Prevention (CDC) has been to regularly wash your hands with soap and clean water after touching common surfaces (e.g., door handles, market carts, etc.), coughing, sneezing, and eating.

Even though the CDC recommends alcohol-based hand sanitizers, other types of hand sanitizers are available for the public. Therefore, picking the right hand sanitizer can be difficult. This guide aims to provide information about the different types of hand sanitizer and ingredients used to prepare them.

When to use a hand sanitizer? Use with or without handwashing?

The CDC recommends washing your hands with clean water and soap as the best option to stop the spread of germs and protect others. Proper hand washing (see video: Proper handwashing-the first line of defense) will reduce the number of germs and dirt from your hands. Using hand sanitizer after washing your hands will further reduce the number of germs. Alcohol-based hand sanitizers are not a replacement for washing your hands.

If your hands are not properly washed, hand sanitizers will not be as effective. This is because the chemicals in hand sanitizers – also known as the active ingredients - will bind to the dirt and not kill germs (this is why it is so important to clean first, then sanitize). Handwashing will help remove or reduce other types of substances like chemicals, metals, and some germs that the hand sanitizer will not kill. If you cannot wash your hands, then a hand sanitizer is a better option than nothing, followed by handwashing as soon as possible.

Types of hand sanitizers

Pay attention to the ingredients list and instructions on hand sanitizers. Several varieties of hand sanitizers are available for the public—for example, gel, foam, cream, spray, wipes, etc. (Figure 1). When buying a hand sanitizer, first read the label and identify its active ingredient (e.g., ethyl alcohol/ethanol, isopropyl alcohol) and its percentage. The CDC recommends using alcohol-based hand sanitizers that have at least 60% or up to 95% alcohol.

Read and follow the instructions to properly sanitize your hands. For instance, some sanitizers indicate to **put** enough sanitizer to entirely cover your hands, and others indicate to **rub** until hands feel dry. It is important to let the hand sanitizer dry; if you rinse or wipe the sanitizer off before it dries, it may reduce its effectiveness (as most sanitizers use the time to kill germs, called “contact time”). When using wipes, it is important to use hand sanitizer wipes; other wipes may contain chemicals that

are used intended explicitly for hard, non-porous surfaces and not hands. For example, Clorox wipes are designed for use on specific surfaces and not to clean or sanitize hands. This information will be included in any directions on the package.

Figure 1. Type of hand sanitizers (Source: Jing et al., 2020).

Other types of hand sanitizers (non-alcohol-based)

The CDC does not recommend using hand sanitizers that do not contain alcohol. However, a common active chemical compound in non-alcohol-based sanitizers is benzalkonium chloride. This ingredient is legally marketed as a hand sanitizer since it meets requirements set by the Food and Drug Administration (FDA). **As mentioned before, it is not recommended by the CDC.**

Recalls of hand sanitizers and potential dangers: Not all are created equal

Since June 2020, the FDA has recalled several hand sanitizers for different reasons. Some are recalled due to the sanitizer containing methanol (methyl alcohol) and/or n-propanol (1-propanol). These two active ingredients are toxic to humans when in contact with the skin. Another reason for potential recalls is hand sanitizer packages could lead consumers to accidentally ingest the product. For example, when hand sanitizer packages look like a beverage can, water bottle, babies' food pouch, etc. (Figure 2). In addition, microbial contamination has been found in some hand sanitizers that were not made properly. For example, one hand sanitizer was found contaminated with *Burkholderia.* Which is a bacterium that can cause infections (skin, soft tissues, lungs, or bloodstream). This was a non-alcohol-based hand sanitizer.

Due to elevated hand sanitizer recalls, the FDA has provided a list of products you should NOT use. This list will help consumers to check if the hand sanitizer they want to purchase and use has been recalled. If you have a hand sanitizer at home that has been recalled, you should contact your local Department of Health or trash collection service to properly dispose of that product (as it is hazardous waste). The FDA recommends not pouring, mixing with another hand sanitizer, or using regular trash for disposing of a recalled product as it may be collected and used by another individual(s).

Figure 2. Hand sanitizer packages have been recalled because they can lead consumers to accidentally ingest the product (Source FDA.gov).

Making your own hand sanitizer

The FDA does not recommend consumers make their own hand sanitizers. The World Health Organization (WHO) does have guidelines for making your own hand sanitizer. The WHO recommends using ethanol or isopropyl alcohol, hydrogen peroxide, and glycerol (Table 1). If using these guidelines, the final products will have CDC's recommended alcohol concentration (above 60%). It is essential to use alcohol that is safe for humans to use (e.g., alcohol that you would purchase from a pharmacy, liquor store, etc.). Based on these formulations, the final mixture will remain a liquid. The WHO does not recommend using it as a gel, foam, or aerosol spray. A gel or foam hand sanitizer may require other ingredients or tools, therefore, reducing the quality and effectiveness of the product. Adding colorants, dyes, and/or perfumes are not generally recommended because it could end in accidental ingestions, reduced effectiveness of the sanitizer to kill germs, and/or skin irritation. When making your own hand sanitizer, label the bottle with the contents and the date you prepared the mixture. Keep the bottle secure and out of reach as one way to avoid any accidental ingestion (e.g., by a child, an animal, etc.).

References

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Additional Resources

Proper handwashing – the first line of defense. Virginia Tech. Available at: https://www.youtube.com/watch?v=G7M0vo5NkzE

Cleaning, Sanitizing, Disinfecting, and Sterilizing. What is the difference? FST 386NP. Available at: https://resources.ext.vt.edu/contentdetail?contentid=3198&contentname=Cleaning,%20Sanitizing,%20Disinfecting,%20and%20Sterilizing.%20What%27s%20the%20difference%3F

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