

What's the Most Germ-Ridden Object in Your Kitchen? It's Not the Sponge

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STORY AT-A-GLANCE

- › Out of the estimated 48 million cases of foodborne illness that occur every year in the U.S., up to 20% may be linked to food prepared at home
- › In a study commissioned by the U.S. Department of Agriculture's Food Safety and Inspection Service, about 48% of the spice containers were contaminated
- › Cutting boards and trash can lids were the No. 2 and No. 3 most-contaminated objects, while the handles of sink faucets turned out to be least-contaminated
- › In another study conducted in 10 U.S. kitchens, 67% of sponges tested positive for fecal coliforms, while 33% contained E. coli
- › Handwashing, even for five to 8.99 seconds, significantly reduces contamination risk

Out of the estimated 48 million cases of foodborne illness that occur every year in the U.S., up to 20% may be linked to food prepared at home.¹ This means food you cook right in your own kitchen has the potential to make you sick, and it's possible to transfer those disease-causing germs onto other surfaces nearby.

While you may be aware of the risks of a dirty sponge used one too many times – or even how your kitchen sink could serve as a reservoir of bacteria – when's the last time you cleaned your spice jars?

It turns out these inconspicuous kitchen staples may be among the primary culprits for cross-contamination, and pose perhaps the highest contamination risk in your kitchen.

48% of Spice Containers Were Contaminated

In a study commissioned by the U.S. Department of Agriculture's Food Safety and Inspection Service,² researchers with Rutgers School of Environmental and Biological Sciences and colleagues analyzed 371 adults cooking turkey burgers in kitchens ranging from apartment-style to those in teaching locations and food banks.³

Poultry, including chicken and turkey, are among the top sources of *Campylobacter*-related illnesses, with the bacteria causing 0.8 million foodborne infections per year in the U.S.⁴ As noted in the *Journal of Food Protection*:⁵

"According to the Interagency Food Safety Analytics Collaboration, 40.5% of nontyphoidal Salmonella illnesses were attributed to Food Safety and Inspection Service (FSIS)-regulated products, whereas 78.8% of all nondairy Campylobacter illnesses were attributed to FSIS-regulated products that includes, in descending order, chicken, turkey, other meat or poultry, beef, pork, and game (0.6%)."

Clearly, improper handling of raw poultry, such as inadequate cooking, poor hand washing, and cross-contamination of ready-to-eat (RTE) foods in the home, can result in the development of foodborne illness from such pathogens."

To determine just how prevalent cross-contamination is on kitchen surfaces during ordinary meal preparation, the researchers asked participants to prepare a meal of raw ground turkey patties with seasoning and a prepackaged salad. The meat was inoculated with a bacteriophage called MS2 to serve as a tracer throughout the kitchens.

The subjects didn't know their food safety behaviors were being scrutinized until after the meal was already prepared. The researchers then swabbed a variety of common surfaces, including sink faucet handles, kitchen utensils and spice containers.

Surprisingly, the handles of sink faucets turned out to be least contaminated, while spice containers were the most.

About 48% of the spice containers were contaminated with MS2 – significantly higher than most other kitchen surfaces tested, which typically had contamination frequencies of less than 20%.⁶ Cutting boards and trash can lids were the No. 2 and No. 3 most contaminated objects. According to study coauthor Donald Schaffner, a distinguished professor in the Department of Food Science at Rutgers, in a news release:⁷

"In addition to more obvious surfaces like cutting boards, garbage can lids and refrigerator handles, here's something else that you need to pay attention to when you're trying to be clean and sanitary in your kitchen. Our research shows that any spice container you touch when you're preparing raw meat might get cross-contaminated. You'll want to be conscious of that during or after meal preparation.

... We were surprised because we had not seen evidence of spice container contamination before. Most research on the cross-contamination of kitchen surfaces due to handling of raw meat or poultry products has focused on kitchen cutting boards or faucet handles and has neglected surfaces like spice containers, trash bin lids and other kitchen utensils.

This makes this study and similar studies from members of this group more comprehensive than previous studies."

What Other Kitchen Surfaces Have the Most Germs?

Bacteria are virtually everywhere, and they're not always cause for alarm. However, when washing dishes be wary of reusing sponges too many times, as studies repeatedly count them as among the most contaminated kitchen objects.

In a study conducted in 10 U.S. kitchens, 67% of sponges tested positive for fecal coliforms, while 33% contained E. coli.⁸ Other research found Salmonella in 15.4% of sponge samples, while a hygiene study revealed kitchen sponges had the second

highest load of coliforms – only drain traps were higher.⁹ As noted in BMC Public Health:¹⁰

"During cleaning food residues may adhere to the sponge surface and damp sites such as sink areas can act as further microbial reservoirs that can contaminate the sponges during their use. Subsequent poor handling, storage or improper disinfection of kitchen sponges will lead to further microbial growth at room temperature.

Consequently, kitchen sponges are a major source of cross-contamination as they can transmit foodborne pathogens, infectious agents and spoilage causing microorganisms to food contact surfaces."

In another study, researchers analyzed 14 used sponges and found 45 billion microbes per square centimeter.^{11,12} Dish sponges harbor the largest number of E. coli and other fecal bacteria in the average home, likely because they aren't replaced as they should. A number of studies have confirmed kitchen sponges contain the highest number of bacteria on household products.¹³

Can Kitchen Sponges Be Cleaned?

Both sponges and brushes used for dish washing tend to be contaminated with nonpathogenic bacteria, although the brushes contained lower levels in one study.¹⁴ Further, when brushes were contaminated with Salmonella and allowed to dry overnight, the bacteria died more rapidly than in sponges.

"The results in the present study indicated that cleaning utensils that dried between use would have lower numbers of bacteria including pathogens," the researchers explained, and suggested using brushes, which dry more easily between uses, in lieu of sponges. They also stated you can help prevent Salmonella growth in sponges by:¹⁵

- Changing the sponge when it is worn
- Not storing the sponge in the sink

According to the USDA, microwaving sponges properly may also kill up to 99.99999% of bacteria, while running them through the dishwasher kills 99.9998%.¹⁶ If you do put your sponge in your microwave, be sure it doesn't contain any metallic materials.

Michigan State University also advises the sponge be completely wet when you do it, as it could catch fire or explode in the process if it isn't.¹⁷ The wet sponge should be placed on high for one minute and left to cool for up to 15 minutes so you don't get burned.

What Other Kitchen Surfaces Have the Most Germs?

Cutting boards are another major offender when it comes to harboring dangerous bacteria. Experts recommend having at least two cutting boards, one for foods safely eaten raw, such as fruits and vegetables, and the second specifically for cutting raw meat, poultry and fish.

Surfaces you use to chop your food may harbor bacteria including E. coli and Salmonella. Since plastic cutting boards have been easier to sanitize, they were often thought to be safer. That was until the 1980s when a University of California Davis researcher investigated and found although they are easier to sanitize, cutting often nicks the plastic, giving bacteria a place to hide.¹⁸

Wood may be tougher to sanitize, but it does not nick as easily. Further, when wood, plastic and stainless steel surfaces were compared, Campylobacter survived the longest on plastic.¹⁹

The U.S. Department of Agriculture recommends washing your cutting board in hot soapy water after each use and allowing it to completely air dry before putting it away. Bamboo cutting boards are harder and less porous than wood, absorb little moisture and resist scarring from knives. Importantly, replace your worn boards as they develop hard-to-clean grooves.²⁰

Your kitchen sink is also likely to be a source of contamination. In one study, participants prepared breakfast using raw sausage, eggs and a fruit salad made with cantaloupe. After preparation, the kitchen sink was the surface most often

contaminated, with 34% found as such. Perhaps as a result, 26% of the cut-up cantaloupe tested was also contaminated, as it may have been placed in the dirty sink for washing.²¹

Chicken Is Particularly Prone to Contamination

The types of food you bring into your home also play a role in contamination risk. Chicken from concentrated feeding operations (CAFO) continues to be among the most problematic foods, with about 1 in 25 packages of chicken at the grocery store contaminated with salmonella.²²

In New Zealand, Michael Baker, a public health researcher and professor at University of Otago, is urging the implementation of a "tobacco-style" warning label on all raw chicken items, informing shoppers about the health risks involved. "It's the most hazardous thing you can take into your kitchen," he says.²³

Recent studies have also conclusively demonstrated that a majority of urinary tract infections (UTIs) are actually caused by exposure to contaminated chicken.²⁴ In short, it's likely that UTI-causing E. coli may be introduced to your body from the food you eat, namely CAFO chicken, as well as pork and beef.

One study involved 2,460 chicken, pork and turkey samples purchased from large retail stores in Flagstaff, Arizona, nearly 80% of which were found to contain E. coli.²⁵ The researchers also tested blood and urine samples from people who visited a major medical center in the area, finding E. coli in 72.4% of those diagnosed with a UTI.

Washing Your Hands May Help

To reduce your risk of cross-contamination in the kitchen, simple handwashing can be very effective. Research shows that people who attempted handwashing or completed more handwashing steps significantly reduced their risk of cross-contamination.²⁶ Even washing hands for five to 8.99 seconds was associated with significantly reduced risk.

Given the findings of the featured study, you'll also want to thoroughly wash your spice containers as well – and avoid handling them if you've just touched raw chicken. However, resist the urge to grab an antibacterial cleaner to do so, as such products contribute to the development of antibiotic resistance. Instead, clean your kitchen using natural cleansers.

Oregano oil is one such product that has natural antibacterial effects on human tissue and your kitchen counters. In one study,²⁷ researchers found oregano oil is effective against three gram negative and two gram positive bacteria. Including oregano essential oil in your homemade cleaning products is simple, easy and an effective means of killing pathogens without putting your health at risk.

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