WATER QUALITY & HEALTH COUNCIL
PERSPECTIVES

Preventing Foodborne Illness: Destroying Raw Food Pathogens on Surfaces and by Cooking

By the Water Quality & Health Council
August 24, 2018

One of the most challenging aspects of cooking is safely handling raw foods. Uncooked and undercooked foods can transfer pathogens to every surface they contact, including cooks' hands. With no way of knowing whether a given raw food harbors pathogens, cooks must *assume all raw foods do*. That is the reason, for example, we never return cooked meats to the platter upon which they were delivered, raw, to the backyard grill.

To avoid spreading raw food pathogens from one surface to another—a process known as cross-contamination—it is essential to disinfect all kitchen surfaces that come in contact with raw foods. You can choose from a variety of available disinfecting products, or you can mix up your own. One handy and inexpensive option is to prepare a dilute solution of common chlorine bleach (see the text box below).

Cooking to Destroy Foodborne Pathogens

Disinfecting Food Contact Surfaces

Wash the surface with soapy water, rinse with clear water, and apply a dilute solution of chlorine bleach made by adding 1 tablespoon to 1 gallon of water.

Make bleach solution daily, as it loses strength over time; never mix bleach with ammonia or ammonia-based cleaners!

Properly cooked foods are safe to eat because heat destroys pathogens present. Raising food to a predetermined temperature by boiling, roasting, frying, baking, broiling or grilling gets the job done. The US Department of Agriculture reports minimum cooking temperatures for a variety of foods. The specific minimum internal temperature of each food depends on the "kill" temperature of the most heat-resistant pathogen of concern in that food. In the case of poultry, for example, a single minimum internal cooking temperature of 165 °F is recommended to ensure microbiological safety. *Salmonella*, the most heat-resistant foodborne pathogen of public health concern in raw poultry, is destroyed at that temperature. Nevertheless, higher temperatures may be needed to eliminate a pink, rubbery texture.[1]

Steaks, roasts, and chops of beef, lamb, or veal are done when they reach an internal temperature of 145 °F and have "rested" for 3 minutes. Meat recipes often include a rest time because once removed from the grill, oven or range-top burner, the internal temperature of the meat may continue to rise, accomplishing further pathogen destruction. There is also a taste-related reason to let meat rest before eating: meat juices tend to become trapped in muscle fibers as the meat cools. In other words, the rest time for meat is worth the wait from both a food safety and palate perspective!

Remember, minimum cooking temperature recommendations are helpful only if cooks actually monitor food temperatures using a good, probe-type kitchen thermometer.

The Food Temperature "Danger Zone"

Equally important as reaching the correct cooking temperature is preventing foods from remaining at temperatures in the "Danger Zone" for prolonged periods. The range between 40 °F and 140 °F earns this scary title because bacteria that cause food poisoning multiply most quickly in that range. As a rule of thumb, cooked foods should not be held at room temperature for more than 2 hours before being refrigerated. When the air temperature is 90 °F or above, that time shrinks to 1 hour.

[1] National Advisory Committee on Microbiological Criteria for Foods (2006). Response to the Questions Posed by the Food Safety and Inspection Service Regarding Consumer Guidelines for the Safe Cooking of Poultry Products, *Journal of Food Protection*, vol. 70, No. 1, pp. 251-260. On line, available: http://jfoodprotection.org/doi/pdf/10.4315/0362-028X-70.1.251?code=FOPR-site

Typhoid Mary

Proper hand washing by food handlers is critical to food safety, not only after touching raw foods but also after using the bathroom or changing diapers. The infamous 19th century cook, "Typhoid Mary" Mallon carried and spread Salmonella typhi bacteria to 7 of 8 families who employed her over the course of 4 years. During one of those years it is speculated that she was the main cause of an outbreak of typhoid fever that sickened 3,000 New Yorkers. According to The College of Physicians of Philadelphia, she was officially blamed for 10 outbreaks totaling 51 cases of typhoid fever, and three deaths from the disease. She may have spread the bacteria, which was shed by her body in feces and urine, by hand contact during food preparation.

As a healthy carrier of Salmonella typhi, with neither typhoid fever symptoms nor an understanding of the risk Mary posed to the public, she continued to cook for a living despite orders to the contrary. Once identified by health officials as a carrier in 1907, she was pursued and quarantined twice against her will. Sadly, after spending a total of 26 years in quarantine on North Brother Island in the East River, she died alone there in 1938 at age 69.

For a related topic, please see "A Consumer's Guide to Monitoring and Preventing Foodborne Illness Outbreaks"