

Food Safety

Introduction:

Although viruses have now emerged as the leading cause of foodborne diseases in the United States, bacteria remain the leading cause of death from foodborne diseases (www.cdc.gov). To understand food safety as it relates to bacterial and viral pathogens, it is necessary to first discuss the behavior of these pathogens in food.

Bacteria:

Bacteria are microscopic organisms that can be found virtually everywhere. Many of the foods coming into a food service establishment or into our homes are already contaminated with not only spoilage bacteria but also pathogenic bacteria. As such some of the major goals of a food safety program are to: slow bacterial growth; destroy the bacteria already present on a food item; to prevent bacteria from being transferred from one food to another; and to keep the bacteria present on a food handler from being transferred onto the food.

Unlike viruses, bacteria are capable of reproducing in foods. Rapid growth of bacteria occurs when potentially hazardous foods have been time and temperature abused.

Potentially hazardous foods include, but are not limited to: meats, poultry, eggs, dairy products, seafood, cooked grains, cooked vegetables, cooked legumes, cut melons, sprouts, and garlic in oil preparations.

Time and temperature abuse involves allowing potentially hazardous foods to remain in the temperature danger zone, 140°F - 41°F, for more than 4 hours.

Controlling pathogenic bacteria in foods includes the following:

Cooking *** -Foods must be cooked to the required temperatures and times necessary to destroy pathogens. These temperatures vary depending on the foods involved. Chapter 3 of the FDA Food Code lists cooking times and temperatures for various foods
<http://vm.cfsan.fda.gov>

Holding *** -Hot foods should be held at or above 140°F and cold foods should be held at or below 41°F. If this cannot be accomplished then foods held at ambient temperatures after 4 hours should be discarded.

Cooling *** -Cool foods rapidly from 140°F(135°F) to 70°F within 2 hours and within a total of 6 hours to 45°F (41°F). Foods prepared from ambient temperature ingredients, such as tuna salad, must be cooled to 45°F (41°F) within 4 hours. Rapid cooling of food can be accomplished by putting the food into shallow pans and/or reducing it to smaller or thinner portions before placing it in refrigeration. Submerging the food container in an ice bath and stirring it regularly, or using rapid cooling equipment such as a blast chiller is also effective. In addition, food containers that transfer heat, as well as adding ice as an ingredient can help with the cooling process. Keeping a cooling temperature/time log can be helpful in determining if the method used is cooling foods to the proper temperature in the allotted time.

Reheating *** -Foods should be reheated rapidly, within 2 hours, to 165°F or above before

hot holding. Reheat commercially processed foods to 140 before hot holding. Previously cooked, cooled foods that are reheated for immediate service can be served at any temperature. Reheat foods only once. Do not use hot holding equipment or slow cookers, such as a crock-pot, to reheat foods.

Cross-contamination - Cross-contamination of food occurs when bacteria is transferred from one food item to another. This can be prevented by using separate utensils and equipment for different types of foods. Another option is to wash, rinse, and sanitize equipment and utensils between use on different types of food. Some examples of where cross-contamination can occur are: between raw poultry and other raw meats; between raw vegetables and cold cuts; between raw meats and ready-to-eat foods such as salads, etc.

Hand washing and personal hygiene - Humans carry bacteria all over their bodies. It is important to know that "healthy" food handlers can transmit pathogenic bacteria to other individuals through their contact with food. Food handlers must wash their hands frequently. It is especially important that hands are washed after using the toilet, coughing, sneezing, smoking, eating, drinking, handling raw meats, garbage, cleaning, or any other time hands may have been contaminated. Smoking, eating, or drinking should occur in designated areas only and hands must be thoroughly washed after these activities. Always minimize hand contact

***** Use metal-stemmed probe thermometers to check food temperatures.**

DO NOT USE GLASS THERMOMETERS!

Viruses:

Viruses are microscopic organisms that are found in living organisms. The viruses involved in

foodborne illnesses generally come from humans either via food handlers or from foods contaminated at the source.

Viruses do not reproduce in foods but rather need a living host to reproduce. Therefore time and temperature abuse, and potentially hazardous foods are of no importance when it comes to controlling viruses. In addition, cooling, hot holding, and cold holding are not important factors in controlling viruses. But don't forget that these are very important considerations in preventing the growth of bacteria.

The following factors are important in controlling viruses in foods:

Source-Obtaining foods from a reputable source is very important. Specifically, shellfish obtained from waters contaminated by human sewage have been associated with a number of viral outbreaks. Viral gastroenteritis outbreaks have also been associated with fresh produce that has been contaminated with human waste.

Handwashing and personal hygiene -Because fecal-oral transmission is a major route for getting viruses from the foodhandler and into food that is consumed, handwashing is especially important. Hands must be washed thoroughly after using the toilet. This includes not only handwashing after a bowel movement but also after urinating. Again, hand contact

with food should be minimized when preparing foods that will not be thoroughly cooked.

Cooking - For foods like shellfish that may have come from contaminated waters, thorough cooking is important. The CDC's Control of Communicable Diseases Manual recommends cooking shellfish from contaminated waters to 185°F-194°F for 4 minutes or steaming for 90 seconds before eating. Because shellfish are filter feeders, contaminants may be concentrated in their bodies during this feeding process and a high cooking temperature is necessary to kill these contaminants. Shellfish should always be obtained from non-contaminated waters. Avoiding raw or undercooked shellfish is especially important for children, the elderly, and immunocompromised individuals.

Reheating - If cooked foods have been contaminated after the cooking process, reheating to the proper temperature of 165 F or above can destroy this contamination.

Washing - Cleaning fresh produce may help reduce the level of contaminants.

Note: References to times, and temperatures were taken from the 1999 FDA Food Code. If you have specific questions, please contact your local health department or the Department of Public Health. Further references are found on the "LINKS" page.

References:

FDA Food Code 1999

Control of Communicable Diseases, Sixteen Edition, Abram S. Benenson, Editor

Web Sites of Interest:

www.cfsan.fda.gov

<http://vm.cfsan.fda.gov/>