BEYOND GUESSWORK:

EFFECTIVELY USING FOOD THERMOMETERS IN YOUR KITCHEN

BY JESSY SADLER, SNS

PICTURE THIS: It's finally Saturday night and you're hosting a long-awaited dinner party for friends featuring a beautiful golden herb-roasted chicken you have been eager to showcase. The smell of warm, gooey chocolate chip cookie goodness is filling your home. With anticipation, you carve into the chicken, ready to impress your guests. The timer dings and dread washes over you. The inside of the chicken roast is uneven: dry and gray in some parts, and disturbingly pink in others. When pulling the cookie sheet from the oven, you find dark rock-hard pucks staring back at you. Both of these scenarios—the undercooked chicken and the burnt cookies—could have been avoided with a simple tool: a food thermometer—the secret weapon to serving safe food.

To gain a deeper understanding of current day-to-day food safety practices, the Economic Research Service (ERS), a federal statistical agency responsible for economic research and analysis, investigated the practices of at-home meal preparers. They focused on data collected from 2014 to 2016 specifically related to home cooking using the American Time Use Survey—Eating and Health Module (ATUS-EHM). The ATUS-EHM included a question for individuals responsible for food choices and preparation regarding thermometer use: "Was a food or meat thermometer used when preparing any meals with meat, poultry, or seafood in the previous 7 days?" According to Rhodes et al., based on responses received, the ERS estimated that only 13.7 percent of at-home meal preparers, or 19.5 million people, used a food thermometer while preparing meals with meat, poultry, or seafood.

UNDERSTANDING FOOD SAFETY

Foodborne illness is a significant concern, and its economic burden is substantial. According to Scallan et al., data from the U.S. Centers for Disease Control and Prevention (CDC) suggested an estimated 9.4 million cases of foodborne illnesses per year caused by 31 pathogens led to approximately 56,000 hospitalizations and 1,400 deaths each year. In a peer-review by Hoffmann et al., ERS research suggested that more than 95 percent of these cases were linked to just 15 pathogens. In 2018, the economic impact of these pathogens exceeded $17 billion, marking a $2 billion or 13 percent increase from 2013.

These costs are often preventable. USDA's Food Safety and Inspection Service (FSIS), the Food and Drug Administration (FDA), and the CDC provide information on the importance of many food safety topics including hand-washing, avoiding cross contamination of cooking surfaces, and cooking foods to the appropriate temperature ranges that inactivate pathogen growth. Developed by the

U.S. Food and Drug Administration (FDA), the U.S. Food Code serves as the blueprint of guidelines and regulations that food establishments must follow to ensure the safe handling and preparation of food. The 2022 Food Code §3-501.16 reminds us to not let cooked food linger in the temperature "Danger Zone," a temperature range of 41°F to 135°F (5°C to 57°C) where harmful bacteria multiply rapidly, increasing the risk of foodborne illness. The simple act of using food thermometers is crucial in preventing foodborne illness by ensuring that food has reached the appropriate internal temperatures where bacteria are destroyed, thus reducing the risk of foodborne illness and promoting safe cooking practices.

DO NOT LET COOKED FOOD LINGER in the temperature "Danger Zone," a temperature range of 41˚F to 135˚F (5˚C to 57˚C) where harmful bacteria multiply rapidly, increasing the risk of foodborne illness.

CHOOSING THE RIGHT FOOD THERMOMETER

When it comes to cooking, achieving the perfect temperature is crucial for both food safety and flavor. Food thermometers come in various types, each serving specific cooking needs and preferences. Whether you're searing a steak, roasting a chicken, or making a batch of fudge, understanding the differences and utilizing the appropriate thermometer ensures efficiency and safety.

Key factors to consider when choosing a food thermometer include accuracy, speed of readings, and temperature range. Precision guarantees exact measurements, while quick readings can be essential for any time-sensitive checks. The temperature range should align with the foods you are preparing.

Tailoring thermometers to specific tasks is crucial; for example, probe thermometers are ideal for

checking the internal temperature of meats, while candy thermometers are designed for accurately measuring high temperatures required for candy making. In §4-201.12 of the 2022 Food Code, most food thermometers should not have sensors or stems made of glass unless they are encased in a shatterproof coating. Food thermometers come in several types and styles, such as dial or digital, and vary in level of technology.

Here is a summary of thermometers commonly used in kitchens. For a more detailed list, visit the USDA's Food Safety and Inspection Service (FSIS) website.

Thermocouple Digital Instant-Read Thermometers: These are the most versatile and commonly used thermometers in the kitchen. As the name suggests, instant-read thermometers provide a quick temperature reading when inserted into the food. They're ideal for foods that cook quickly or need precise temperature control, such as steaks, chops, and chicken breasts.

Oven Safe Bimetallic Thermometers: For larger cuts of meat or dishes that cook over extended periods, probe thermometers are a great option. These devices have a long, heat-resistant probe connected to a digital display. The probe can be left in the meat while it cooks in the oven or on the grill, allowing you to monitor the internal temperature without opening the door and losing heat.

Infrared Thermometers: Infrared thermometers offer a non-contact way of measuring surface temperatures. While they don't measure internal temperatures, these are particularly useful tools for checking the temperature of cooking surfaces like griddles, pots, and pans, ensuring they're properly preheated before adding food.

Bimetallic Stemmed Thermometers: These traditional thermometers are not designed to remain in the food while in the oven. They typically feature a dial face and a stainless-steel stem that goes into the food. Though not as quick as instant-read or digital probes, they should be used near the end of the estimated cooking time to check for final cooking temperatures. Because this food thermometer senses temperature from its tip and up the stem for 2 to 2 1/2 inches, these thermometers must be inserted at least 3 inches into the food.

Candy Thermometers: Specialized for high-temperature cooking, these thermometers can read temperatures well above the boiling point of water, up to 400°F. They are essential tools for making candy and caramel. Candy thermometers usually come with a clip to attach them to the side of a pot, ensuring they stay submerged in the cooking liquid without touching the bottom, which could affect the reading.

Refrigerator and Freezer Thermometers: Refrigerator and freezer thermometers are essential for maintaining food safety and quality in both residential and commercial settings. These thermometers are specifically designed to monitor the air temperature inside refrigerators and freezers, ensuring that perishable foods are stored at the appropriate temperatures to prevent spoilage and bacterial growth. It is best to place your thermometer in the warmest part of the appliance, located towards the front and top of the unit.

REFRIGERATOR AND FREEZER THERMOMETERS are essential for maintaining food safety and quality in both residential and commercial settings.

CHECKING THE ACCURACY OF A FOOD THERMOMETER

Calibrating your thermometer is crucial to ensuring accurate temperature readings in your cooking processes. To properly calibrate a thermometer, the FSIS recommends either one of the two methods listed here: the ice-point method or boiling-point method.

Ice Water Method:

1. Fill a glass with ice and then add potable cold water, ensuring the glass is completely filled. Stir the mixture for a few minutes to ensure the water is uniformly cold.
2. Place the thermometer's probe into the ice water, ensuring it doesn't touch the sides or bottom of the glass. Wait for the temperature reading to stabilize.
3. A properly calibrated thermometer should read 32°F (0°C) in the ice water. If the reading is off, consult your thermometer's manual on how to adjust it. Some digital thermometers have a calibration button, while analog thermometers might have a calibration nut under the thermometer's head you can turn.

Boiling Water Method:

1. Bring a pot of potable tap water to a rolling boil.
2. Carefully immerse the thermometer's probe into the boiling water, ensuring it doesn't touch the sides or bottom of the pot. Hold it in the center of the boiling water, and wait until the reading stabilizes, about 30 seconds.
3. At sea level, the thermometer should read 212°F (100°C). If you're at a higher altitude, the boiling point decreases by about 1°F for every 500 feet above sea level. If the thermometer's reading is inaccurate, refer to the manual for recalibration instructions.

USING THE ICE WATER METHOD, a properly calibrated thermometer should read 32˚F (0˚C).

Even if the food thermometer cannot be calibrated, it should still be checked regularly for accuracy using either method. Calibrating a food thermometer should occur:

- **Before first use:** Verify the accuracy of the thermometer right out of the box.
- **After an extreme temperature change:** Recalibrate if the thermometer has been exposed to extremely high or low temperatures.
- **After dropping the thermometer:** Any physical damage or impact can affect its accuracy.
- **At regular intervals:** It's good practice to calibrate your food thermometer periodically to maintain its precision.

PLACING THE THERMOMETER CORRECTLY

Thermometer placement is vital for obtaining accurate temperature readings in various types of food. For meats, and poultry such as chicken and turkey, it is important to insert the thermometer probe into the thickest part of the meat, away from bones and fatty areas due to variations in heat distribution. In some instances, the food thermometer may be inserted sideways if necessary. When the food is irregularly shaped, the temperature should be checked in several places.

In casseroles or dishes, it is best to check the temperature in multiple places, especially aiming for the center to capture an accurate temperature reading of the overall dish. This ensures that all parts of the dish, especially the denser or thicker sections, are adequately cooked and

REFERENCES

Scan QR code to view the list of Works Cited for this article.

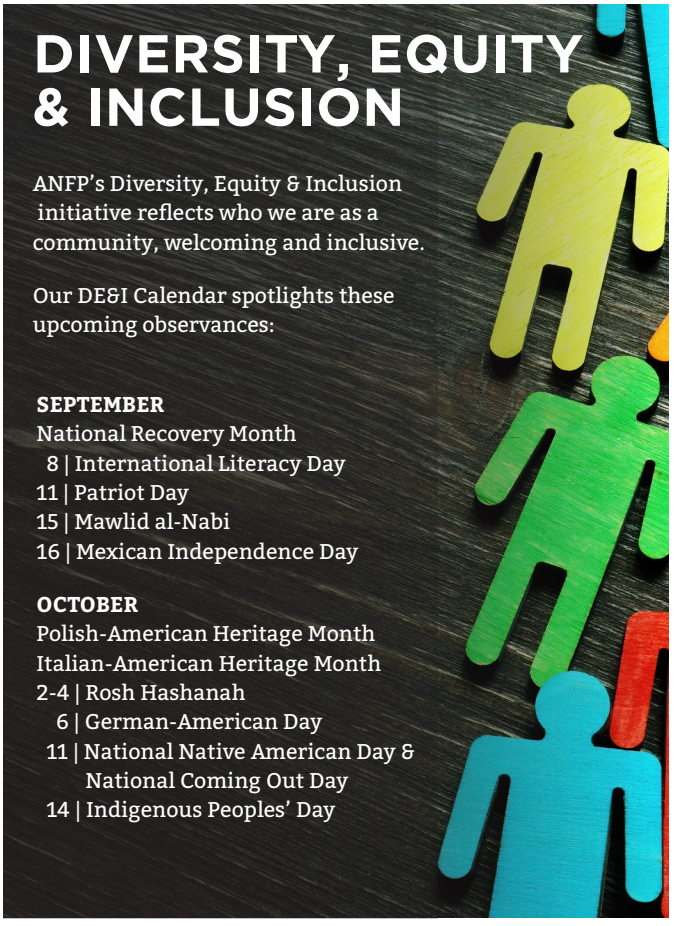
safe for consumption. When testing liquids, submerge the thermometer probe in the center of the liquid, away from the bottom and sides of the container to avoid distorted readings.

SUMMING IT UP

By choosing the appropriate type of food thermometer, following proper calibration procedures, and ensuring correct placement for accurate readings in foods, individuals can enhance their cooking experience and promote food safety. The FSIS has a thermometer and temperature recommendation guide that can be used to streamline your cooking process, ensuring that you cook foods to the correct internal temperatures and produce perfectly cooked meals every time.

JESSY SADLER, SNS | sadler.jessy@gmail.com

Jessy Sadler has worked in school food service for eight years and is currently the Nutrition Director in Urbandale, Iowa. She holds a School Nutrition Specialist (SNS) credential with a Master's Degree in Nutrition Science from Eastern Michigan University and a B.S. in Nutrition and Dietetics with a minor in Wellness from Bradley University. Sadler is a certified ServSafe Instructor and Proctor, and provides food safety training to many professional groups such as schools, restaurants, and healthcare facilities.



CE QUESTIONS | FOOD PROTECTION CONNECTION

This **Level I SANITATION AND SAFETY** article assumes that the reader has introductory knowledge of the topic. The desired outcome is to ensure a basic understanding and explanation of the concepts of the subject matter and recalling of related facts.

CBDM continuing competence
where education advances performance

Reading *Beyond Guesswork: Effectively Using Food Thermometers in Your Kitchen* and successfully completing these questions online in the ANFP Marketplace has been approved for 1 hour of Sanitation continuing education for CDM, CFPPs. To earn 1 SAN CE hour, visit **www.ANFPonline.org/market** and select **Edge CE Articles** within the Publications section. Purchase the article and complete the quiz.

1. What is the correct final temperature reading for a properly calibrated thermometer when placed in ice water?
   A. 0°F (-18°C)
   B. 32˚F (0˚C)
   C. 41˚F (5˚C)
2. The most common and versatile food thermometer used in cooking is:
   A. Infrared thermometer
   B. Probe thermometer
   C. Thermocouple thermometer
3. What is the primary function of the U.S. Food Code?
   A. To define ethical principles for food production companies
   B. To establish guidelines and regulations for food handling and food safety
   C. To outline the different types of foodborne illnesses
4. A probe thermometer is suited for which type of food?
   A. Meat
   B. Salads
   C. Soup
5. According to the Food Code, unless encased in a shatterproof coating, food thermometers should not be made of what type of material?
   A. Plastic
   B. Wood
   C. Glass
6. When checking the temperature of casseroles, the best location to place the thermometer should be:
   A. Near the edges
   B. In the center
   C. In the center and several other places
7. According to the Food Code, bacterial growth and higher chance of foodborne illness occur at what temperature range?
   A. 32˚F to 212˚F (0˚C to 100˚C)
   B. 41˚F to 135˚F (5˚C to 57˚C)
   C. 50˚F to 140˚F (10˚C to 60˚C)
8. For a bimetallic stemmed thermometer to provide an accurate internal temperature, what is the minimum recommended depth into the food?
   A. At least 2 inches
   B. At least 3 inches
   C. Any depth

1 SAN HR CE CBDM APPROVED

MAKE YOUR CE HOURS AUDIT PROOF

ATTENTION CDM, CFPPs! Purchase your online CE products in the ANFP Marketplace and your completed CE hours will be automatically reported in your continuing education record. This includes all ANFP online courses, archived webinars, and online CE articles.