

Thermometers: Making Sure Your Food Is Safe

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Purpose:

The purpose of this lesson is to help participants choose and correctly use a food thermometer when cooking and reheating foods.

What The Nutrition Educator Needs To Know To Answer Questions:

What Causes Food borne Illness?

Bacterial growth is the main cause of foodborne illness in the United States. Bacteria grow very well in moist, high protein foods, like meat, poultry, fish and egg dishes. Bacteria also grow well in leftovers. Bacteria are killed when meat, poultry, fish, egg dishes and leftovers are cooked to a temperature that is high enough to kill bacteria. Under-cooking these foods is a major cause of foodborne illness. Cooking foods all the way through is a big step towards preventing food borne illness, but it is not a guarantee.

Raw eggs have a 1 in 10,000 chance of having some bad bacteria (Salmonella). The more eggs you pool together, the more risk that you will have bad bacteria in the eggs you are going to eat. We do not think people should eat raw eggs. People who want to eat raw eggs, can buy a raw egg product in the supermarket that has been pasteurized like milk and other dairy products to kill bad bacteria.

Do A Lot Of People Get Foodborne Illnesses?

Food safety and health experts estimate that “food borne disease causes approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths in

the United States each year.”¹ Most of the time we only hear about the worst cases. Often people think they just have a 24-hour bug, the stomach flu, a headache or dizziness.

If Meat And Poultry Are No Longer Pink Inside, Are They Safe To Eat?

You may have heard that meat and poultry are done when they are no longer pink inside or their juices run clear. New research shows that this is not an accurate way to tell if they are safe to eat. Even if meat and poultry are no longer pink and the juices look clear, they can still be unsafe.² And some meat still looks pink and juicy, but is safe to eat!

Why Do I Need To Use A Food Thermometer?

The only way to know if foods are fully cooked is to use a food thermometer. This is a simple tool that can help keep you and your family from getting sick. Use a thermometer when you bake, roast, broil, fry, make a casserole or reheat foods. Use a food thermometer every time you make meat, fish, poultry or egg dishes, and every time you reheat foods that have already been cooked.

What Kind Of Food Thermometer Should I Use?

To decide which food thermometer is best, you should learn how they differ. Knowing this will also help you to decide when to insert the thermometer during cooking.

Types Of Food Thermometers Available And How To Use Them:

1. Oven Proof:

- often called meat thermometers and are good to use when cooking large pieces of meat and casseroles;
- is placed in the food when the food begins to cook and stays there during the whole cook time;
- is easy to read; and
- where you put it matters—see page 4 and the **Food Thermometer Photo Kit** to learn where to put it.

¹, National Center for Immunization and Respiratory Diseases: Division of Bacterial Diseases. October 25, 2005. Available at:

http://www.cdc.gov/ncidod/dbmd/diseaseinfo/foodborneinfections_g.htm#howmanycases

² USDA Food Safety and Inspection Service Fact Sheets, “Meat Preparation.” Revised April 2003. available at: http://www.fsis.usda.gov/Fact_Sheets/Color_of_Cooked_Ground_Beef/index.asp,

2. Digital and Instant-Read:

- are not oven proof and should not be left in the food while it cooks;
- is placed in the food near the end of the cook time and removed after temperature is read;
- gives a reading of the food's temperature within 15 seconds from when its stem is placed 2 inches into the food;
- some are microwave safe; and
- where you put it matters— see page 4 and the **Food Thermometer Photo Kit** to learn where to put it.

3. Pop-up:

- is used only once; and
- is already in food when you buy the food
- The US Department of Agriculture, Food Safety and Inspection Service recommends that you use a regular food thermometer to be sure your food is done.

When you buy a food thermometer, read the package to make sure you are buying one that will work for the type of foods you make. Look for a thermometer that is sturdy, made from stainless steel and has an easy-to-read dial that will not break. Thermometers cost between \$2 and \$20. You do not need to buy a high cost thermometer. You can find good ones in dollar stores.

At What Temperature Is Food Safe To Eat?

Foods should be cooked to the temperatures listed in the chart on the next page. It is safe to cook foods to a higher temperature than the ones listed, but not to lower ones. If foods are not heated to these internal temperatures, there is greater risk of getting sick from a food borne illness.

Temperature Taking Tips

Foods are safely cooked when they are heated for a long enough time and at a high enough temperature to kill most of the bacteria that causes food borne illness. You can find cooking times in recipes or in a cooking timetable listed in a cookbook. Before teaching your class, be sure to find a cooking timetable. If you need help, ask your supervisor. Be prepared to show your class one of these tables and tell them that it is a guide. Cooking time is not as important as the final internal temperature of the cooked food, so it is still very important to always use a thermometer.

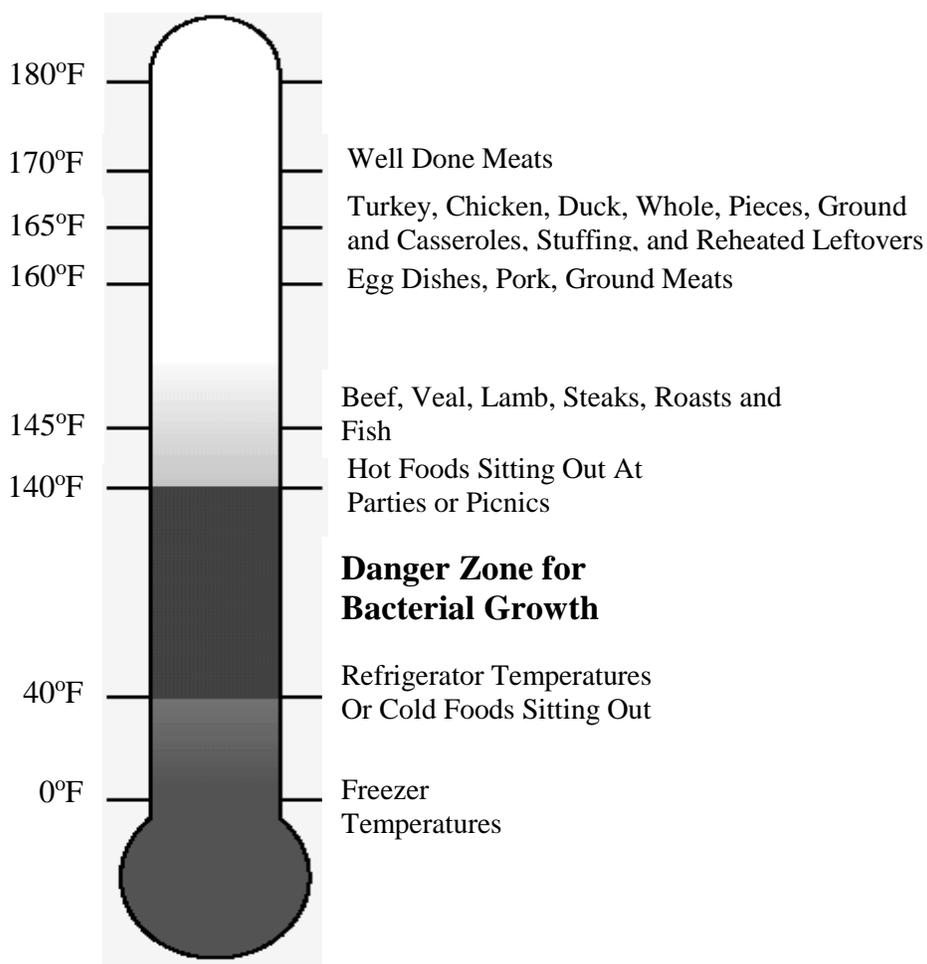
Place food thermometers in the right place to get the best reading. Here are some tips on where to place the thermometer:

Where Should The Thermometer Be Placed?

- into the thickest part of the food;
- sideways into the food, not straight down;
- with 2 to 3 inches of the stem inside the food. Some thermometers have a mark on the stem that shows how deep it should go;
- with the stem not touching the bone or fat in meat, fish and poultry; and
- with the stem not touching the sides and bottom of the cooking pan

There are pictures with this lesson that show how to place the thermometer.

Safe Cooking Temperatures



**Always Cook
Foods To A Safe
Temperature**

³ United States Department of Agriculture, Food Safety and Inspection, Food Safety Education Fact Sheet, "Is it done yet?" September 2007. Available at: http://www.fsis.usda.gov/PDF/IsItDoneYet_Magnet.pdf

Slow Cookers – How to Safely Use Them

We have said before that food must move through the danger zone of 40° to 140° in 2 hours to keep microbes from growing. It is key that any food you cook in your slow cooker must reach 140° in 2 hours.

You can test your slow cooker by filling it 2/3 full of cold water. Set it at low and check the water temperature in 2 hours. It should be at least 140°. The slow cooker should then be able to heat the water to at least 160° by the time it is done. If not, then you can start from the beginning with cold water filling 2/3 of your slow cooker and try a higher setting. In two hours, you can check your slow cooker again. The water should be at 140°. It should reach 160° when it is done. If your slow cooker cannot heat the water to those temperatures at any setting in the right amount of time then you should not use it.

How Do I Safely Cook Stuffing?

There is more risk of getting foodborne illness if you prepare a chicken or turkey with the stuffing inside than if you cook it in a separate pan. When stuffing is cooked inside a bird, it may not get hot enough to kill all the bad bacteria. And in order to make sure the stuffing has gotten hot enough to be safe, you may overcook the bird. It is better to cook stuffing in a separate pan instead of cooking it inside the chicken or turkey. Mix the wet and dry ingredients just before putting it into the casserole-like dish. The stuffing should be moist, not dry. Cook it in the oven at 325°F for 30-40 minutes. Measure the internal temperature of the stuffing with a thermometer. It must reach 165°F to be safe.

If you choose to stuff your chicken or turkey, make sure it is stuffed loosely. Mix the wet and dry ingredients just before filling the cavity. Then quickly place the chicken or turkey in the oven. The chicken or turkey is done when the internal temperature, within the stuffing, has reached 165°F.³

If you choose to let the flavors mix, you may let the chicken or turkey sit with the stuffing inside for 20 more minutes. This is called stand time. Stand time is the time that the meat or poultry sits out to cool after cooking. As the meat cools, the steam from inside the stuffing cavity warms the stuffing, and brings it to a higher temperature.⁴ Although it is okay to let cooked foods stand for 20 minutes, cooked foods should still be refrigerated within one hour after cooking.

⁴ United States Department of Agriculture Food Safety and Inspection Service, Fact Sheets: Poultry Preparation; “Turkey Basics: Stuffing,” November 6, 2007, Available at: http://www.fsis.usda.gov/Fact_Sheets/Turkey_Basics_Stuffing/index.asp.

Reheating Foods

Reheat foods to 165°F. If reheating soups and gravies, heat them to a rolling boil.

Serving Foods

Always keep hot, cooked foods at 140°F or higher. Cold foods should be kept at 40°F or lower. If hot foods will be kept out at room temperature for more than one hour, put them on a hot plate, burner or over a pan of boiling water. Cold foods should be kept on ice.

Washing Up Your Food Thermometer

After each use, wash the stem of the thermometer with hot, soapy water and rinse well. If the food was not cooked to the right internal temperature the first time you tested it, wash the thermometer before putting it back into the food.

For Additional Reading:

United States Department of Agriculture, Food Safety and Inspection Service, Food Safety Education, “Is it Done Yet?”

http://www.fsis.usda.gov/Is_It_Done_Yet/index.asp.

Dietary Guidelines for Americans 2005, United States Department of Health and Human Services.

<http://www.health.gov/dietaryguidelines/dga2005/document/pdf/Chapter10.pdf>

Thermometers: Making Sure Your Food Is Safe

Main Themes:

Nutrition & Diet

Cooking & Food Storage

Shopping

Budgeting

Safety & Sanitation

Materials Needed:

Activity 1

Food thermometers—instant-read, digital or oven proof

Food Thermometer Photo Kit—1 set per class. This can be found at the end of the lesson.

Handouts:

Safely Cooked Meats—1 per participant

Or use USDA Food Safety Handouts – “Is it Done Yet?” at:

http://www.fsis.usda.gov/PDF/IsItDoneYet_Magnet.pdf

http://www.fsis.usda.gov/PDF/IsItDoneYet_Print_Ad_Lasagne.pdf

Activity 2

Assorted markers, colored pencils, or crayons—1 for every 3 or 4 participants

White or colored paper or poster board—1 for every 3 or 4 participants

Chalk board and chalk or poster board and markers

Scissors, tape and glue, if you like

Preparation Needed Prior To Lesson:

Food Thermometer Photo Kit

Laminate the photos, if you have time.

Time The Activity Is Expected To Take:

Before You Begin: 5 minutes

Activity 1: 15 - 20 minutes

Activity 2: 35 - 45 minutes

Next Week's Goals: 5 minutes

Thermometers: Where To Stick ‘Em

Lesson Plan

Before You Begin (about 5 minutes)

1. Ask the participants if they worked on their goals from the last lesson. Ask them which goals they worked on and how or what they did to work on them. Try to get people to tell the class what they did. If they did not work on the goals, ask them to work on them before the next class.
2. Tell the participants what the objectives are for today’s lessons.

Activity 1: Thermometer Question And Answer (15 - 20 minutes)

1. Start the class by saying that eating undercooked meat, poultry, fish or eggs can make people very sick. This can also happen with foods that are not heated to a high enough internal temperature. Ask the class the following questions and give them a chance to answer.

There are no right answers to the first two questions.

Question: Have you or anyone you know had gas pains or diarrhea just a few hours after eating? Was the pain gone the next day? Or have you or anyone you know ever had vomiting or diarrhea that only lasted a day or two?

Answer: Participants’ answers will vary.

Question: What do you think caused the gas pains, vomiting or diarrhea? Did you think that you had the stomach flu?

Answer: Participants’ answers will vary.

The following questions have right answers. After asking each of these questions, allow the participants to give answers. Direct them to the right answers. If the correct answer is not given, tell the class the answers provided.

Question: Does anyone think that food might have caused this? If so, how does it do this and what can be done to stop it?

Answer: Food may have caused the illness if it was undercooked.

Undercooked foods may have enough bacteria in them to make us sick. Use a food thermometer to make sure that foods are fully cooked and safe, to help avoid getting sick.

Question: Does anyone know what foodborne illness or food poisoning is?

Answer: Foodborne illness is sometimes called food poisoning. You can get a foodborne illness by eating undercooked foods or foods that have not been reheated to the right internal temperature. This could cause sleepiness, chills, a mild fever, upset stomach, diarrhea, vomiting, cramps, vision problems and death.

Question: Who is at the greatest risk for getting very sick from foodborne illness?

Answer: Foodborne illness is most likely to affect:

- Infants and children
- Pregnant women
- Older adults
- Those with liver disease, diabetes, cancer, HIV infection (and AIDS), organ transplants and other diseases

NOTE: Some of these people have weakened or less developed immune systems. This is why they are more easily infected by bacteria from undercooked foods.

Question: Can anyone guess why a person is more likely to become sick from eating ground meat than other cuts of meat, like steaks, chops or roasts?

Answer: Bacteria can be found on any cut of meat, poultry, fish or eggs. With steaks, chops and roasts, the bacteria stay mostly on the outside and are killed when you cook the meat completely. With ground meat, the bacteria that are living on the outside get mixed throughout the meat when it is ground. That is why both the temperature on the outside **AND** inside of the food must be high enough to kill all the bacteria.

Question: How can you tell when ground meat has a hot enough internal temperature to kill harmful bacteria?

Answer: To be sure that all the harmful bacteria have been killed, the meat must be cooked to a high enough internal temperature. Measure the internal temperature using a food thermometer. Ground beef is safe to eat when it is at least 160°F.

Hold up a food thermometer for the class to view. Allow participants to hold it if they choose.

Question: If a hamburger is no longer pink inside, is it done?

Answer: Maybe or maybe not. To be sure the hamburger is done, check its inside temperature with a food thermometer.

Question: Is it necessary to reheat leftovers?

Answer: All leftovers should be reheated until the entire dish is at least 165°F. If reheating soups and gravies, they should be heated to a rolling boil.

2. End the question and answer session by telling the class that heating foods to a safe internal temperature is an important way to make sure that you and your family do not get a foodborne illness.
3. Ask if anyone uses a food thermometer at home. If a participant uses a food thermometer, have her or him tell the class where she or he places the thermometer. Have her or him tell the class why she or he places the thermometer in that place.
4. Check to see if the participant places the thermometer in the right place. If the volunteer places it in the wrong place, correct him or her. Tell the class that the thermometer should be placed:
 - into the thickest part of the food, even if it means placing it sideways, rather than straight down;
 - with 2 to 3 inches of the stem of the thermometer inside the food;
 - with the stem not touching the bone or fat in meat, fish and poultry;
 - with the stem not touching the sides and bottom of the cooking pan.
5. Pass around the **Food Thermometer Photo Kit**. Tell the participants that these pictures show the correct placement of the thermometer.
6. After the pictures have been passed around the room, ask the class if they have any questions about where to place the thermometer.
7. Tell the class that you want to talk with them about safe ways to make stuffing. Ask the group:
 - Who here likes to eat stuffing?
 - How many people make stuffing inside the chicken or turkey?
 - How many people make stuffing in a separate dish?
8. Ask the class to avoid making stuffing inside the turkey or chicken. This is because stuffing inside a bird may not get hot enough to kill all of the harmful bacteria. Tell them that the safest way to cook stuffing is to put it in a dish and cook it in the oven at 325°F.
9. If they still plan to make their stuffing inside the turkey or chicken, tell them to stuff it loosely and to cook it right after stuffing it. For stuffing inside meat or poultry, they should measure the internal temperature of the stuffing and make sure it is 165°F.

10. Pass out the **Safely Cooked Meats** handout. Ask participants if they have any questions about the handout. Tell participants to hang it in their kitchen to use when they cook.

Activity 2: Thermometers – Sell the Idea (35 - 45 minutes)

1. Split the class into groups of three or four people. Tell the class that each group is a company that sells food thermometers. Each group must create an advertisement to be used on TV or in a video to sell thermometers. List TV commercials, a video or a skit as ideas.
2. Pass out markers, colored pencils or crayons and paper or poster board.
3. Have each group think about what would make them want to use a thermometer. Have them write down all their ideas. Have them choose one or two of their best ideas.
4. Each group should use its best ideas to come up with a way to sell thermometers and to talk people into using them. They can make up information about their businesses. Tell them that they must include all the facts about using thermometers in their campaign, including:
 - What type they are selling
Oven-proof, digital or instant-read
Note: Give a short description of each type of thermometer to the class.
This can be found in the background information.
 - How to use them
 - When to use them
 - Where to put them
 - Why you need to use them
 - Where to buy them
Thermometers are sold in most supermarkets or discount department stores.
5. As the participants start to work, write down the directions for steps 3 and 4 on a chalkboard or poster board. This way the groups can look at them while they are working.
6. After 30 minutes of group work, have each group perform or show their ad to the class. Ask each group to tell:
 - why they chose their ideas;
 - how these ideas will sell thermometers;
 - what ideas they chose not to use and why they decided not to use them.

Next Week's Goals (5 minutes)

1. Ask the participants to name one thing that they learned in today's class that they will use. Make sure that each learning objective is mentioned, and if not, be sure to re-state that objective. Remind them to work on meeting their new goals before the next class. Let them know that they will be asked what changes they made at the next class.
2. Invite comments, suggestions or questions.
3. Thank the participants for coming. Tell them what the next lesson will be about.

For the Teacher: What Makes This Lesson Behaviorally Focused?

- Activity 1 is behaviorally focused because participants are asked about their experiences with foodborne illness. During the activity, the participants are also asked if they use a food thermometer in their homes. Those who do use them describe where they place the thermometer and why they place it in that spot. At the end of the activity, participants see the right place to insert the thermometer by passing around the pictures. They are asked to use a thermometer and to refer to the handout when they cook.
- Activity 2 is behaviorally focused. Participants work together to think of ideas that would cause them to change their behavior and use a thermometer.
- In Next Week's Goals, the participants are asked to name one thing that they learned during the class that they will use. They choose the behaviors that they will work on during the coming week.



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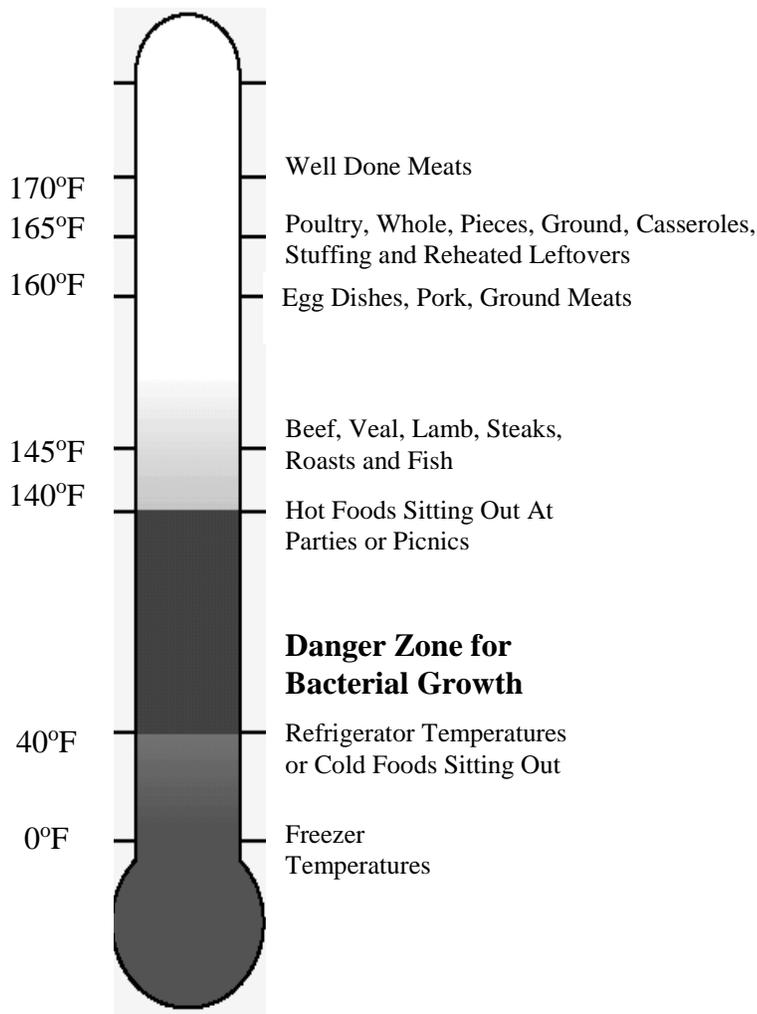
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Safely Cooked Meats

Is it **DONE** YET?

Safe Cooking Temperatures



Always Cook Foods To A Safe Temperature Before Eating

Ground Meat and Ground Poultry

- Put the thermometer into the thickest part of the food. For thin patties, insert it sideways.

Beef, Pork, Lamb, Veal and Ham-Roasts, Steaks or Chops

- Put the thermometer into the thickest part.
- For thin pieces of meat insert it sideways.
- Keep it away from the bone, fat and gristle.
- Keep it from touching the pan.

Poultry and Fish

- Put the thermometer into the thickest part. Do not touch the bone or any part of the pan.

Stuffing

- To make stuffing in a dish: It is safest to cook stuffing this way. Mix the wet and dry ingredients and cook right away at 325°F for 30-40 minutes.
- To make stuffing in the chicken or turkey: Mix the wet and dry ingredients. Loosely stuff the bird and cook it right away. Check the temperature of the stuffing and make sure it is 165 °F.

Casseroles and Egg Dishes

- Put the thermometer at a steep angle into the thickest part of the food.

Re-heating Foods

- Re-heat foods all the way through. Soups and gravies should be re-heated to a rolling boil.

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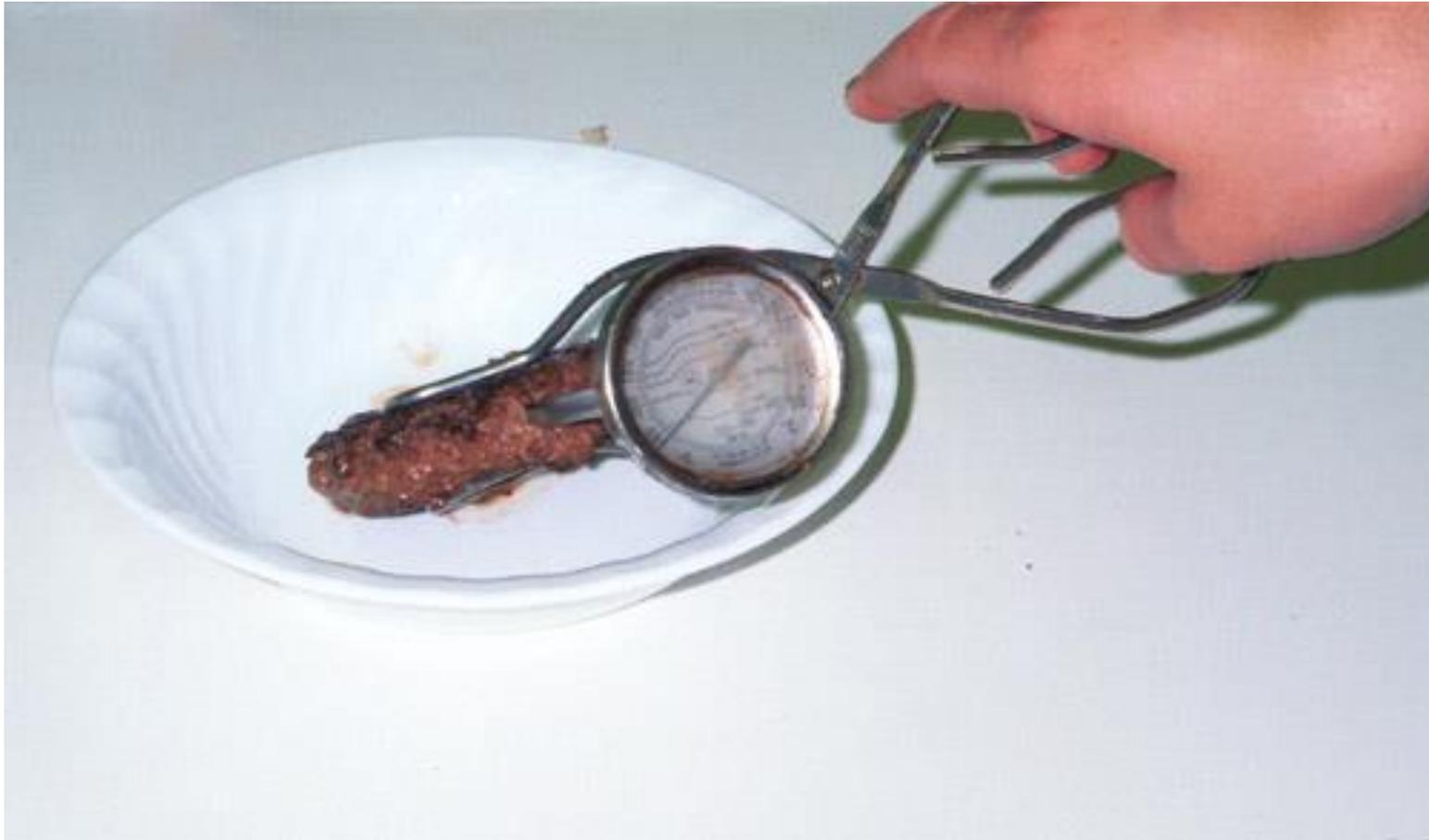


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Insert the thermometer into the side of burgers or meat patties so that the tip of it reaches the center of the patty. Ground beef should reach 160°F. Ground poultry should reach 165°F.



Casseroles should be heated to 165°F and egg dishes should be heated to 160°F. The thermometer should be put into the thickest part of the dish. Keep it away from the edges and bottom of the plate or pan.



Fresh pork and fresh raw ham should be cooked to 160°F. The internal temperature should be taken through the side of the chop or the center of the roast so that the tip is in the center of the meat. Do not touch the bone with the tip. Pre-cooked hams should be reheated to a temperature of 140°F.



Cook meat loaves to 160°F. Measure the internal temperature by placing the thermometer in the center of the loaf. Be careful not to touch the bottom or sides of the pan.



**Put the thermometer directly into the center of the stuffing cavity in the bird.
The stuffing should be 165°F.**



Insert the thermometer into the meatiest part of the turkey, usually between the breast and the thigh. Keep it away from the bones and gristle. The internal temperature should reach 165°F.