



**Report compiled by  
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Do you remember when you got your first microwave oven? I sure remember when I got mine. I was excited but apprehensive. I heard so many stories about how unsafe it was to use microwave ovens. I wanted the convenience of using a microwave but was afraid to use it for more than heating water. I started doing some research so I could find out for myself the ins and outs of using a microwave.

Now I use a microwave for just about everything and seldom use my oven anymore. Considering it is over 100 degrees in the summer where I live, my microwave a truly a life-saver as well as a time-saver.

I created this Tip Sheet so you could learn some of the things I did about using a microwave. Even now, there are stories out there that just don't convey the truth about microwave ovens. I hope that this Tip Sheet will set your mind at ease. But more than that, I hope you learn some habits to develop so you can use your microwave in the best interest of your family.

## **TIP ONE**

### ***STANDING TIME***

Ever put something in the microwave for a few minutes but felt it wasn't done cooking? So you put it back in for a few more minutes and then it was overcooked? Let me explain why.

Microwaves don't actually cook your food. Microwave ovens heat food by oscillating waves of energy through food at a rate of 2450 million times per second. These waves cause food molecules to rub together at a rapid pace. This creates friction, which in turn creates heat. The heat is what cooks our food. These food molecules do not come to a halt when the microwave goes off. By allowing food to stand 20 to 25% of the cooking time gives the molecules a chance to stop. During this time your food is continuing to cook.

Hence, if a recipe calls for 20 minutes cooking time, make sure to let it stand for five to six minutes more.

## **TIP TWO**

### ***ATTRACTION TO FAT, SUGAR AND WATER***

Foods high in fat, sugar, and water will cook faster in the microwave than foods without these ingredients.

## TIP THREE

### ***THE CENTER OF FOOD***

Microwaves penetrate 1½ inches from the top, bottom and each side. You can use a thermometer to check and make sure the food has reached a safe internal temperature.

Here are some safe internal temperatures:

- Beef, veal, lamb steaks, roasts and chops: 145° F.
- All cuts of pork: 160° F.
- Ground beef, veal and lamb: 160° F.
- Egg dishes and casseroles: 160° F.
- Leftovers: 165° F.
- All poultry: 165° F.

## TIP FOUR

### ***COOKING VEGETABLES***

Several factors influence the cooking time for vegetables. These factors include age, texture, freshness, size, and shape among other things. Young vegetables that are small are the best choices for microwaving. The thickest parts of the vegetables should be placed toward the outside of the dish since they will cook faster. Leave a small space between vegetables like baked potatoes, squash, and other larger vegetables.

## TIP FIVE

### ***PLASTICS CONTAINERS***

Microwaves actually bounce off metals. Glass, paper, or plastic containers should be used in the microwave, but they must be labeled as microwave safe.

Plastic storage containers such as margarine tubs, takeout containers, whipped topping bowls, foam cups, bowls, plates and trays should not be used in the microwave. These containers can release harmful chemicals into your food when they are heated.

In recent years there have been rumors going around that microwaving food in plastic containers releases cancer-causing agents into the food. This is simply not the case.

“If you are cooking with plastics or using plastic utensils, the best thing to do is to follow the directions and only use plastics that are specifically meant for cooking.”<sup>1</sup>

[Click here to learn about high quality plastic containers that are microwave safe.](#)

## **TIP SIX**

### ***BABY FORMULA***

Heating baby formula in a microwave oven poses a risk due to the potential for the temperature to exceed an acceptable level for consumption by an infant. There is the chance of hot spots in the formula because microwaves tend to heat the upper area of the liquid more than the lower area. It is recommended that consumers shake the bottle thoroughly and check the temperature before giving it to a child.

## **TIP SEVEN**

### ***CASSEROLES, MEATS AND VEGETABLES***

Arrange foods uniformly in a covered dish. Tight fitting covers provide a steaming effect helping to completely cook foods and destroy bacteria.

## **TIP EIGHT**

### ***CLEANING YOUR MICROWAVE***

Begin by mixing 1 cup of water with 1 Tbs. Vanilla or lemon juice in a microwave safe container. Then cook on high 5 minutes or until very steamy. Next, remove the container and wipe the inside of your microwave with damp cloth. Not only will you have a clean microwave, but your kitchen will smell nice too.

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<sup>1</sup> Rolf Halden, PhD, PE, assistant professor in the Department of Environmental Health Sciences and the Center for Water and Health at the Johns Hopkins Bloomberg School of Public Health.

## TIP NINE

### ***COOKING MEAT AND POULTRY***

Meat and poultry should be cooked six minutes per pound. Cooking longer could make your meat or chicken rubbery. Cooking for less time may not kill bacteria living in uncooked sections of the meat or poultry.

## TIP TEN

### ***COOKING FISH***

Fish does not need to be cooked for six minutes a pound. Fish has a high water content and since microwaves are attracted to water, fish will cook faster. Cook fish at 3 minutes per pound.

## TIP ELEVEN

### ***COOKING EGGS***

Cook eggs for 1 minute 15 second per egg unless mixed with other ingredients.

FYI: Do not cook eggs still in the shell. They will explode and make a very big mess in your microwave.

## TIP TWELVE

### ***STIR OR ROTATE FOODS***

Since foods and liquid both cook unevenly in a microwave, stirring or rotating is important. If your microwave does not have a turn-table make sure to stir contents halfway through the cooking time.

## TIP THIRTEEN

### ***POTHOLDERS***

Use them when microwaving in glass containers. The glass really retains the heat so you can burn your fingers or hands.

## TIP FOURTEEN

## **"HOT SPOTS"**

Dampen a paper towel and lay flat in the bottom of your microwave. Then heat for 1 minute on high. Look for dry spots on the paper towel. These represent your microwave's "hot spots".

## **TIP FIFTEEN**

### ***YOUR MICROWAVE'S WATTAGE***

Most new models tell you on the inside door panel what their wattage is. If you can't find the wattage, here is a simple wattage test.

Boil 1 cup room temperature water in your microwave.

If it takes three minutes to boil your oven is 600 watts.

If it boils in less than 3 minutes your oven is higher than 600 watts.

If it takes more than 3 minutes to boil your oven is lower than 600 watts.

## **TIP SIXTEEN**

### ***PIERCING FOODS***

Pierce hot dogs and baking potatoes with a fork before putting them into the microwave to keep them from exploding. Make sure to heat hot dogs thoroughly.

## **TIP SEVENTEEN**

### ***STUFFED POULTRY***

It is not recommended that you cook stuffed chicken or turkey in the microwave. The stuffing should be cooked separately. If you try to cook stuffing in the poultry the stuffing may not reach the temperature needed to destroy harmful bacteria.

## **TIP EIGHTEEN**

### ***LARGE CUTS OF MEAT***

Cook large cuts of meat on medium power. If you cook on high power the outside will be done but the center of the cut may not be cooked.

## TIP NINETEEN

### **CANNING**

Don't use your microwave for canning. This is an explosion waiting to happen. The Food and Drug Administration "recommends that microwave ovens not be used in home canning. It is believed that neither microwave ovens nor conventional ovens produce or maintain temperatures high enough to kill the harmful bacteria that occur in some foods while canning."<sup>2</sup>

## TIP TWENTY

### **DEFROSTING**

Food should be removed from foam trays and plastic wrappings before they are put in the microwave to defrost. Foam and plastic wrappings are not stable at higher temperatures. Once they melt or warp they will release chemicals into your food.

## TIP TWENTY-ONE

### **THAWING**

When thawing meat and poultry some areas may begin to cook during the thawing process. Once cooking has started, it must be completed. Holding onto food that has been thawed in the microwave before cooking it will not allow harmful bacteria to be destroyed.

## TIP TWENTY-TWO

### **MONEY AND ENERGY**

If you cook 100 hours in a conventional oven it will cost you approximately \$75 in energy. If you cook that same 100 hours in the microwave, it will cost you approximately \$3.

Because of how fast foods cook in the microwave, "cooking is more energy-efficient and food is more nutritious" than food cooked in a conventional oven.<sup>3</sup>

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<sup>2</sup> <http://www.fda.gov/radiation-emittingproducts/resourcesforyourradiationemittingproducts/c>

<sup>3</sup> Sandra Bastin, Ph.D., R.D., L.D. State Extension Specialist in Food and Nutrition

## TIP TWENTY-THREE

### **MICROWAVE PLASTIC WRAP**

Microwave plastic wrap is safe to use, but make sure it doesn't actually touch the food you are cooking.

## TIP TWENTY-FOUR

### **NEVER USE**

Never use plastic storage bags, brown paper or plastic grocery bags, twist ties, newspapers, or aluminum foil in the microwave. "These products are made of materials that do not heat well and could possibly ignite."<sup>4</sup>

Here's a little more on aluminum foil.

Microwaves are absorbed by food, but they cannot pass through metal. Hence, if you wrap food in aluminum foil and place it in the microwave oven, then the microwaves can't penetrate the foil and get to the food. If they can't get to the food, the food will never cook.

Additionally, operating the oven empty or when the food is completely wrapped in aluminum foil can cause damage to the oven.

## TIP TWENTY-FIVE

### **THE BIGGEST CONCERNS**

Areas of uneven cooking are one of the biggest safety concerns when cooking in the microwave. If there are under-cooked areas present, bacteria can thrive in these areas. "Gastro-intestinal illness can then occur ranging from minor stomach discomfort to vomiting and diarrhea."<sup>5</sup>

Three ways to help prevent having these uncooked areas are:

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<sup>4</sup> Sandra Bastin, Ph.D., R.D., L.D. State Extension Specialist in Food and Nutrition

<sup>5</sup> Sandra Bastin, Ph.D., R.D., L.D. State Extension Specialist in Food and Nutrition

1. Uniformly arranging food on the dish before putting in your microwave
2. Covering foods being cooked helps to retain the steaming process
3. Stirring or rotating food several times during the cooking process will also help.

## CONCLUDING REMARKS

The Food and Drug Administration is one of the world's most respected regulatory bodies. They have conducted research on microwave ovens to assure that those using these ovens would be safe. For over 30 years microwave ovens have been in use. It is estimated that approximately 90% of American families use them.

I think it is important to remember that heating food is considered a very effective means of eliminating harmful organisms from food. Microwave ovens certainly have their place in our kitchens and we can be assured that the FDA would not approve of their marketing if they were not safe for us to use.

Do you feel more comfortable about cooking in your microwave oven after reading this report?

[Click here for "54 Microwave Recipes](#)

## RESOURCES

Rolf Halden, PhD, PE, assistant professor in the Department of Environmental Health Sciences and the Center for Water and Health at the Johns Hopkins Bloomberg School of Public Health.

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United States Department of Agriculture <http://www.fsis.usda.gov>

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