

Microwave Workshop for Inservices in 2006

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Objectives

To introduce the new microwave projects and helpers guide, specifically, Level A.
To introduce concepts that are not contained in the Level A project book.

New Microwave Projects

The new microwave projects consist of:

- A. Bag of Tricks
- B. Micro Magicians
- C. Amazing Rays
- D. Presto Meals

There is also a helper guide which gives the scope and sequence for each of the projects, including the recipes, life skills, and activities. The helper's guide includes information on the food guide pyramid, eating disorders, smart food shopping, food safety and food borne illness, what to do with leftovers, a glossary, and special tips on baking in the microwave oven.

More information about microwaves and the new food guide pyramid is included in the revised 2005 4-H foods leader guide videos.

Project A - Just to get you started, let's look at Project A.

The project gives an introduction telling how a microwave works.

Principle: Microwaves cause the molecules to vibrate and create heat. In a regular oven, food is heated.

Misconception: Some people think that microwaves heat the food from the inside out, meaning the middle gets done faster than the outside. Try cooking a TV dinner with a solid meat product inside!

Wattage is another section. Wattage can be found on the label, the owner's manual or metal label on the oven. Some microwave ovens have 650 watts; others can have 1,200 watts or more.

Principle: Microwave ovens with greater wattage heat faster. Often you will have better success making recipes from the cookbook that comes with your oven. Of course, feel free to experiment with recipes from other cookbooks.

Testing

Measure 1 cup of water and place in the measuring cup. Heat on high for 1 minute. If the water is hot and the container is cool, generally it is safe to use.

Exception: A suitable microwave container, through the process of conduction, can become hot. Always use potholders and plan a place to set the hot food.

Show

Show examples of containers that are not suitable: plastic storage containers, such as margarine tubs; take-out containers; plastic syrup or honey containers; cracked dishes; metal dishes or cookware; crystal glasses; or containers with a metal ring.

Paper bags may contain some metal in the bag or the printed wording. People also sometimes forget and put metal twist ties or metal butter wrappers in the microwave oven. (The worst case of meltdown I have seen is with the 1950s freezer containers.)

The project doesn't tell why metal should not be used in a microwave oven. It is because the waves create an electrical current between the metal and the magnetron tube. It creates an arc. The microwave oven should be stopped immediately! Arcing is not good for the dish, the food, or the oven!

The hot chocolate recipe is designed to be used with the testing experiment.

Final recommendation: Buy only microwave safe cookware and paper products for the microwave oven.

Hot Spots

Another container that should not be used in the microwave oven is Styrofoam cups! Instead, use large marshmallows.

Microwave ovens can have hot spots. A turntable helps. But, if you have an old oven or want to test the distribution of rays in the oven, set up a grid 9 large marshmallows on a piece of waxed paper. Set the oven for 15-30 seconds and check the mallows for variations in meltdown! (You can eat the marshmallows after the experiment!)

On page 11, there is a recommendation to rotate a food, but if a microwave oven has a turntable, there is NO need to rotate the food. Stirring is helpful, if it can be done. But, sometimes, the product cannot be stirred (i.e., a cake, etc.).

Keeping it Clean (p. 12)

The project goes through a variety of covers, but why not just use a plastic microwave cover?

Of the hundreds of microwave gadgets available on the market, probably the most useful is a clear plastic microwave plate cover. The cover keeps explosions off the walls of the oven and the moisture close to the food. When the food is cooked, flip the cover over, transfer the food inside and you have a tray that is cool to the touch!

Radiation can be transmitted outside your microwave oven, though manufacturers keep the emissions to a very low level. Food around the microwave seal, however, can allow even more radiation to escape. Keep the oven—especially the seal—clean and dry. If you are worried about radiation, stand an arms length away from the oven while it is cooking. Some extension offices, appliance dealers, and the state Departments of Health have radiation testers.

Explosions

The hot dog experiment on page 12 does not include information on poking the skin of the frankfurter to prevent explosion.

Many foods have some kind of skin. Foods, such as cocoa, puddings, and even coffee, can develop a skin or a coating. If steam builds under foods, such as egg yolk, potato, frankfurters, fruit, and even hot drinks, there is a chance of explosion. Stir drinks, pierce foods in several places, or cut a wedge or slit around the circumference. Slits cut around fruit, such as a baked apple, also help keep the food's shape.

Extra Bite (p. 13)

Lemon squeezed into the cup, is a good idea, but not many people are going to buy fresh lemons just to create a good odor in the microwave. Get real! This cleaning exercise can be used in place of the cocoa exercise related to testing containers. (I am looking for a tasty cocoa recipe that doesn't contain so much fat and sugar.) It would be a highly useful thing to replace the cocoa experiment if the microwave is dirty at your club site (and you don't want to say this). Just do a quick clean up.

To clean the microwave, put a small microwave safe container with water in the oven and spray the oven liberally with water. Set on high for 1 minute. Wait one more minute to open the door and wipe out with a paper towel. Remove and scrub the turntable in the sink (with dish detergent and hot water) every few days or when a spill occurs. Rinse completely and dry with paper towels. Keep kitchen cleaners, dishrags, and sponges (which tend to harbor bacteria) out of the microwave oven.

Some like to use the microwave to heating devices used for medical conditions. If you use the oven for these and for food, be sure the oven is cleaned before the device goes in and when the device comes out. Wrapping the device with a paper towel and/or placing it on a clean plate for heating can reduce the need for constant cleaning. Follow the directions carefully.

Show the information on the food guide pyramid. The section in the video leader guide is very quick and easy to understand. People still ask if microwave ovens keep the food more nutritious. Food that is cooked in less water (preventing leaching of nutrients) and less fat have advantages.

What is ultimately important is how the food is handled, stored, prepared, and whether it is eaten!

Scrambled Start

Test the recipe beforehand. Members may want to evaluate the difference between making 1 egg and 10 eggs in a microwave. Question (that the book doesn't ask): If you are going to make 10 scrambled eggs, is it faster to make them in a microwave than on the top of a range?

Since the general tips suggest that yolks cook faster than the whites. This is a good time to point out that the whites and yolks should be scrambled well, so there aren't any hot spots in the eggs.

Also

Fat and sugar cook the fastest in the microwave. If you eat a heated jelly donut, for example, realize that the donut can barely be warm and the jelly scalding. The same is true of stuffed frankfurters and sauces that are not well mixed. Water filled foods, such as pasta, are very slow to heat up; adding a thin layer of sauce that contains sugar or fat, can speed the process.

2b - Awesome Apples

The experiment that is used is one to prevent browning of apples. It is good to point out to people that the substance does not have to be lemon juice or Fruit Fresh. It can be any fruit with Vitamin C: grapefruit juice, lime, etc. Even soda pop with citric acid works well as a way to prevent browning.

With the baked apple—again—I would cut a ring around the apple to prevent explosion, and also to keep the apple's shape.

2c - Snacks

Snacks, of course, work well in the microwave oven. 4-H members may want to experiment with certain cheeses. Most know how mozzarella reacts to heat, but others might be surprised. (Example: The Velveeta Commercial).

Power levels can be an important way to improve the taste of a food. Encourage youth to learn how to reduce the power level on their machine.

Popcorn treats: I have a technique to heat microwave popcorn without burning it.

Instead of setting microwave popcorn for the 4 minutes recommended and listening for the corn to stop popping, set the microwave for 2 minutes and let the corn sit in the oven for 1 minute to complete popping! To improve the popped to unpopped kernel ratio, set the "oven side down" portion of the bag on an inverted saucer or shallow bowl to improve the access of the bag to the microwaves. Open the bag by pulling on opposite corners (away from your face and fingers) to release the steam. Place contents in a serving bowl to serve, as the bag is usually very hot.

3b - Snacks in a Snap

The granola, deals with the three main principles of microwave oven, except one. It is still true that foods cook faster in the microwave when they are similar in shape and size and arranged in a ring or a donut shape.

Also, most foods do not need rotating if there is a turntable in the oven.

Note: The smores experiment might be used instead of the marshmallow experiment for the hot spot testing!

3c - Fabulous Fudge

The fudge recipe is okay, but it is a lot of sugar and fat. I would challenge the 4-H members to make the fudge without greasing the bottom and sides with butter or margarine and to use wax paper instead or a silicone baking pan. I also would have them try low-fat or fat-free evaporated milk.

This fabulous fudge might be a way to share the taste of different types of nuts on the product. Each 4-H member could make their fudge with different nuts and be able to spell and describe the taste of each kind of nut.

4a - When the young people are checking out the breakfast meals, they might also be checking out the hundreds of microwave foods and collecting wrappers.

4b - You might also make the chili dip with regular cheese, a.k.a. the Velveeta commercial. Or, try the cheesy dip on page 35.

4c - I would rather the 4-H members create a baked potato bar. First, putting the baked potatoes in the microwave and/or the oven to determine which is faster and better. Second, have the young people create a bar. One option could be leftover chili or cheesy dip.

Large amounts of food, such as baked potatoes for five or more, might be better baked in a conventional oven as they can heat in the same time or less. It is also easier to keep baked potatoes warm in a conventional oven.

It is also important that 4-H members learn this principle of food safety related to potatoes cooked in an oven or microwave

If you like to wrap potatoes in foil after baking, keep them on the counter or on the table no more than 1-2 hours. Wrapping in foil can create an anaerobic situation, where deadly spores can grow. (Truth be told, this is considered the deadliest form of food poisoning.) Put any leftover potatoes in the refrigerator quickly or cut up the potatoes and place in a storage container for hash browns the next morning. Any baked potatoes or yams in foil wrappers left on a counter overnight should be tossed!

A fun recipe might be what is called a cup cake (a cake made in a mug):

Because it is a good food storage practice to cool small amounts of food in containers in the refrigerator, some folks like to put small amounts of casserole, or cake (that can later be topped with pudding or fruit), in half-filled microwave-safe coffee mugs. Covered, these can be placed in the microwave for a minute or two, and with a quick stir, used for snacks, a quick dinner before a meeting, etc.

A couple other uses for a microwave. Others can be found in microwave cookbooks:

If you purchase a new microwave oven and they offer a cookbook for an additional price, it is a good investment. Try a new recipe every week to expand the use of your oven.

Thrift stores, flea markets and garage sales are good, inexpensive places to locate old, but interesting microwave cookbooks and microwave gadgets you want to try.

If you like to grill kebobs on the barbecue, but the cut potatoes, apples, and other solid foods never seem to get done as fast as the other foods. Pre-cook them in the microwave before the picnic, slide them on the skewer, grill with the other foods, and enjoy!

A microwave oven can be a good proofing box for bread. Heat up a cup of water for 1 minute. Remove the cup. Wipe down the oven. Place the bowl of yeast dough covered with a clean towel and keep the door closed. No additional heating is required.

It is still true that a microwave oven magnetron needs to work on food, particularly food that has water molecules. Do not start the microwave oven without food and if you are in doubt, put a microwave-safe cup with water in the oven, as well as the food.

Also, make sure that you punch in the correct time 3 minutes, instead of 30 minutes and stay in the kitchen while the food is cooking.

Microwave Fair Exhibits

(Note: For the Farm Show, all posters must be 14" x 22").

Bag of Tricks (A)

- a. Poster microwave safe equipment, or breakfast bites comparison, or power levels, calcium or one or more aspects of the food pyramid
- b. Granola in ½ pint canning jar with screwable lid
- c. 2-3 of a food-safe snack made in the microwave oven
- d. 1 food safe dessert made in microwave (entire dessert)
- e. 4 pieces of microwave fudge

Micro Magicians (B)

- a. Poster on arranging food in a microwave oven, or cooking ground beef, or meal planning, or one or more vitamins and minerals.

- b. Layer upside down cake (pineapple, peach, or apple)
- c. 4 apple brownies, or 4 fudge brownies, or 4 other bar cookies

Amazing Rays (C)

- a. Poster on pasta cooking tips or making casseroles, or reheating leftovers in the microwave, or meat cookery in the microwave, or defrosting and browning
- b. 1 layer coffee cake (entire cake)
- c. 4 pieces of microwave peanut brittle
- d. 4 pieces of toffee, or 4 pieces of other chocolate candy made in the microwave

Presto Meals (D)

- a. Poster on microwave oven comparison shopping, or benefits of microwave cooking, or tips for selecting foods to microwave, or holding times, or breakfast, or use of oven cooking bags, or microwave cleaning, or shielding and venting
- b. Make-it-your-own microwave recipe poster. Include recipe card and product and picture or drawing of the recipe you developed.
- c. 1 unfrosted layer cake (chocolate, carrot, applesauce) made in microwave oven
- d. 4 cupcakes made in microwave oven
- e. 1 bundt cake (any type) made in microwave oven
- f. 1 cherry or pecan pie made in microwave oven using recipe in project book
- g. One 8-oz. jar of grape jelly or one 8 oz. jar of strawberry jam using recipe in project book.