

MICROWAVING MEATS

LESSON 7

Extension Family Resource Management Specialists
The Texas A&M University System

Skim the lesson and experiments before beginning any of these activities. Of the many experiments included, please do:

- One defrosting experiment,
- The experiment using poultry pieces,
- The experiment using browning agents,
- At least two additional experiments.

Note any questions or problems you have with the lesson or experiments.

In this lesson, you will defrost as well as prepare

meats and main dishes. Information is included about: Defrosting using the microwave oven, Selecting and caring for meat to be microwaved, Browning and browning agents, Using cooking bags, Microwaving meats, poultry and fish, Microwaving main dishes.

Preparing Meats

Successful microwaving begins with selection and storage. Poor quality meat is ruined by freezing or by cooking. Obtain information on selecting and storing meat from your county Extension office.

Meat characteristics affect the way they cook and their effects are more tender than very lean meat. Fat will transmit the heat to the outside of meat helps it cook faster and may form this layer of fat.

Microwave energy away from the surface at intervals to speed cooking and prevent charring. Use a baster to baste meat. 1 inch of the surface reflects the heat around it so that meat cook faster. Poultry should be surrounded by more than 1 inch of water when cooking.

Meats and main dishes. Information is included about:

- Defrosting using the microwave oven,
- Selecting and caring for meat to be microwaved,
- Browning and browning agents,
- Using cooking bags,
- Microwaving meats, poultry and fish,
- Microwaving main dishes.

Lean tender cuts and grades of meat need steam to tenderize. Other techniques such as browning, cooking

CONTENTS

	<u>page</u>
I. Defrosting	3
● general principles	3
● defrosting meats	3
II. Techniques in Preparing Meats	3
● selection and storage	3
● characteristics of meat and microwaving	3
● browning meat	3
● standing time	4
● tests for doneness	4
● cooking bags	4
III. Microwaving Meats	5
● tender roasts	5
● tender steaks	5
● less-tender steaks	5
● ground meats	5
● pork chops	5
● poultry	6
● fish	6
IV. Main Dishes and Casseroles	6
● cookware	6
● techniques	6

I. Defrosting

● *General principles.* Defrosting is often done in the microwave oven. This handy technique for busy cooks can be done once a few principles are mastered.

Ice absorbs microwave energy slowly, while water and moisture respond rapidly. Where microwaves penetrate frozen foods and moisture appears, melting is exaggerated. Defrosting techniques which redistribute microwave energy help foods defrost evenly and quickly. Without them, vulnerable spots, edges or thin areas will start to cook before centers or thick areas are defrosted.

Several techniques help distribute microwave energy evenly during defrosting. Stir vegetables, casseroles and saucy foods part way through defrosting. Turn or rotate foods which cannot be stirred, such as pieces of meat, layered casseroles or cakes. Separate pieces, such as chicken parts, fish fillets, or remove the thawed section of ground meats as soon as possible. Let large items stand to complete defrosting. Foods continue to defrost after they are removed from the microwave.

● *Defrosting meats.* If your oven has a defrost setting, use it for defrosting meats. However, microwave energy can defrost meats even if there is no defrost setting. An oven with only one power setting can be used to defrost by cycling the oven on and off manually. Defrosting is done best at 30 percent power, but 50 percent power can also be used.

Proper freezing and careful defrosting retain the quality of meat. If the meat is wrapped in paper or plastic, it may be defrosted in the wrappings until they can be removed easily. Unwrapping the meat speeds defrosting. Plastic trays used for prepackaged meat insulate the meat, while juices absorbed by the paper liner will draw microwave energy. If meat is wrapped in aluminum foil, remove foil before beginning to defrost. Place on plate or dish suitable for microwave cooking. If meat package is tied with metal rings, clips or wires, remove these before placing the meat in the oven.

To calculate defrosting time for certain cuts and weights of meat, follow the charts in your oven's use and care manual. As the weight of meat increases, more defrosting time is required.

Frozen meat begins to lose juices as it defrosts. Elevate the meat on a roasting rack or inverted sauc-

minutes in a preheated broiler or fry pan in a preheated browning utensil. If microwaves in 3 to 4 minutes.

er so juices in the dish cannot cause surface cooking. Using small pieces of foil, shield areas that become warm before defrosting is completed. Shielding prevents these areas from cooking before the entire cut of meat is defrosted. For example, the tips of chicken wings or legs may need shielding. Shielding with small amounts of foil is acceptable in many ovens, but **check your use and care manual before placing any metal in your oven**, especially in older microwave ovens. Defrost only as long as necessary. Usually meat can be separated into pieces, crumbled or sliced. Meat should range from cool to cold to the touch with little or no running juice. It is not necessary to defrost after this point because most meats will begin to cook.

II. Techniques in Preparing Meats

● *Selection and storage.* Successfully microwaving meats begins with selection and storage. Poor quality meat is never improved by freezing or by cooking. Obtain additional information on selecting and storing meats from your county Extension office.

● *Characteristics.* Meat characteristics affect the way it cooks. These characteristics and their effects are:

● Well-marbled meats may be more tender than very lean meat. The fat (marbling) will intensify the heat and cause the meat to cook to a more tender state.

● Even layers of fat on the outside of meat helps it microwave evenly. If the fat cover is heavier in one area, the meat next to it will cook faster and may overcook. You may wish to trim this layer of fat evenly.

● Drippings attract microwave energy away from the meat. Remove the drippings at intervals to speed cooking and prevent spatters. Use a baster.

● Bone located within 1 inch of the surface reflects microwave energy into the meat around it so those areas cook faster.

● Center bones surrounded by more than 1 inch of meat have little effect on cooking.

● Boneless meat takes longer to cook, but cooks more evenly.

● Evenly shaped meat cooks more evenly than irregular shaped pieces. When irregular shapes are microwaved, shield with foil or use a special arrangement of the pieces. For example, a rump roast may require shielding, and chicken legs may require a special arrangement.

● Thick pieces cook in the center by heat conduction as they would conventionally.

● Small or thin pieces cook faster than large, thick ones.

● Less tender cuts and grades of meat need steam to tenderize. Other techniques such as covers, cooking bags, the addition of liquids and marinades, and slow



Agent	Foods	Comment
Soy or teriyaki sauce	hamburger, beef, lamb, pork, poultry	brush on meat, rub into poultry
Barbecue sauce	hamburger, beef, lamb, pork, poultry	brush on or pour over
Melted butter and paprika	poultry	brush on butter; sprinkle with paprika
Brown bouquet sauce and melted butter	hamburger, beef, lamb, pork, poultry	brush on meat, rub into poultry
Worcestershire or steak sauce and water	hamburger, beef, lamb, pork	brush on meat
Onion soup or gravy mix, bouillon granules	hamburger, beef, lamb	sprinkle on before microwaving
Taco seasoning mix	hamburgers, savory quick breads	sprinkle before microwaving
Jelly, preserves or glazes	ham, poultry	glaze on ham during last 10 minutes or after microwaving poultry half of the cooking time

Table 1. Browning agents for microwaving meat.

cooking are used in microwaving less tender meats.

● **Browning meat.** In conventional and microwave cooking, meat browns when fat rises to the surface and gets hot enough to carbonize or partially burn. In conventional cooking this happens automatically unless the meat is steamed or cooked in liquid. Surface moisture evaporates and the outside of the meat becomes dry and hard.

In microwave cooking, a fatty meat cooked longer than 10 minutes will brown. Small pieces and nonfatty cuts do not brown the same way as conventionally cooked foods because there is no caramelization of fat. Small pieces of meat do change color and look cooked.

Small pieces and nonfatty cuts of meat may be browned using any of the methods in Table 1. These browning agents add flavor as well as color to meat.

Other browning techniques include:

- Browning skillets may be used.
- Some ovens feature browning units.
- Place strips of bacon over meat loaf or roast. The bacon will baste and flavor the meat as it cooks.
- Coatings give poultry flavor and eye appeal. (See experiment on browning agents and experiment on poultry pieces.)
- **Standing time.** Standing time is part of the cooking process and should not be omitted. Meat continues to cook and tenderize during standing. Complete standing time before testing for doneness. Microwave the product longer if it is not done.
- **Tests for doneness.** Tests for doneness vary with the type of meat and cooking method. Wait until standing time is completed to test for doneness.
- **Beef and pork:** The most accurate test for a large, tender roast is internal temperature. Use a meat thermometer, a microwave meat thermometer or an automatic temperature probe. A conventional meat thermometer may be used outside of the oven, but must be removed during microwaving. Some microwave thermometers can be inserted before the

roast is placed in the oven while other special instant reading microwave thermometers may be used after cooking. A temperature probe should be inserted when the roast is turned over and the oven is set to cook by temperature.

Less tender cuts are done when they have darkened in color, are fork tender, and split at the fibers. Tender steaks and chops are microwaved to the doneness preferred and served immediately without standing time. Primarily, sight and touch will determine doneness as will inserting a knife between bone and meat to observe the color. (See experiment.) Doneness of ground meat is determined by inserting a knife in the center to observe color.

- **Poultry:** On whole poultry, legs will move freely and the flesh will feel soft when pressed. Juices will run clear yellow when the breast meat under the wing is pierced with a skewer. When cut between the inner thigh and breast, or next to the thigh bone, meat will show no pink. An automatic temperature probe can turn the oven off before a bird is done because of any hot, melted fat that runs down the probe.
- **Fish:** Fish is done when flesh flakes easily with a fork. The center should still be slightly translucent.

● **Cooking bags.** Oven-proof cooking bags may be used, but only with meats which are not turned over during cooking. Because the top of the bag is slashed, turning it over would cause moisture to spill.

Chicken, meat loaf, chops, small pieces of less tender beef cuts in sauce, and other meats which might otherwise be cooked in a covered casserole or covered with waxed paper, may be cooked in cooking bags. Larger roasts such as beef, ham, pork and turkey are not cooked as easily in bags because they need to be turned over. Check doneness at the minimum specified time.

Do not use metal twist-ties on cooking bags. Secure open end with string, cord or multiple thicknesses of heavy, nonmetallic thread. Or, cut a 1/2-inch band from the open end of the bag. Use the cut strip of plastic to tie around the end of the bag.

After tying the filled bag closed, cut a 2-inch criss-cross slash in the top to allow free escape of steam.



III. Microwaving Meats

- **Tender roasts.** Choose a good quality roast, and store it properly. Poor quality meat will never improve after storage and cooking. If meat comes from the freezer, make sure it has been wrapped and defrosted properly.

Because an irregular-shaped roast cooks in an uneven pattern, choose a roast that has a symmetrical shape. A small roast cooks best, but if it's too small, it cooks before it browns.

The roast should be compact. If it is thinner in one area than another, the thinner part will be done before the thick part, just as in conventional cooking. Expect a long, thin roast to cook faster than a short, squat roast.

Bony roasts, such as standing ribs of beef or pork loin, generally cook best with bones attached to the roast as it cooks. Most roasts will keep their shape if tied with heavy string before cooking. The tying may also give better cooking results.

Shield areas that cook first with small amounts of foil. Foil prevents overcooking on outside areas while the interior of the roast gets done. Do not add salt to meat before cooking because salt toughens the outer layer of meat. Garlic powder and other nonsalty seasonings such as pepper may be added before cooking.

Place meats on a trivet or roasting rack so they are out of juices which form in the bottom of the dish. An inverted saucer may be used as a trivet.

It is common for fat on a roast to pop or explode loudly during cooking. Covering meat with waxed paper reduces this, and keeps the oven cleaner.

Remove drippings from the dish to shorten cooking time. If the drippings collect, energy will be divided between the roast and the drippings. When drippings are removed, the roast absorbs more energy and cooks faster. A meat baster or a spoon can be used.

Place a temperature probe where it does not touch the bone or fat. Metal meat thermometers may also be used, but should not be placed in the oven. They are placed in meat after it is removed from the oven.

Standing time allows heat which builds in outer areas of the roast to spread to the innermost areas. Standing time assures that the center of a well-done roast is done.

- **Tender steaks.** A browning grill or dish gives tender steaks seared color, surface and flavor. The method for microwaving steaks is similar to conventional cooking, but the time is much shorter. Conventionally, a rare steak 1½ inches thick will take from 10 to 30

minutes in a preheated broiler or fry pan. In a preheated browning utensil, it microwaves in 3 to 4 minutes.

- **Less-Tender Meat.** Microwave less-tender meat such as round steak, flank steak or cubed steak in liquid at 30 percent to 50 percent power. Steam produced by the liquid softens the meat during its longer, slower cooking at the lower power settings. If power levels higher than medium (50 percent) are used, meat will not be as tender. Less liquid is needed for microwaving because there is little evaporation. Sometimes chopped onion or celery produce sufficient moisture.

Use a tight cover to hold in steam. If your casserole lid does not fit tightly, lay a sheet of waxed paper or plastic wrap between the dish and lid for a snug fit.

Several methods of tenderizing can be used before cooking. Commercial tenderizers may be used as long as they are not highly seasoned because microwaving may exaggerate the flavor. Cuts may be purchased already tenderized by mechanical means or by tenderizing agents added at the market. Finally, a marinade may partially tenderize the meat and flavor it.

- **Ground meat.** Ground meats defrost and cook quickly in the microwave. They may be cooked with or without a browning dish, on a paper or suitable pottery plate.

For juicy hamburgers, cover the patties with waxed paper. For a drier surface, microwave uncovered and turn patties over after half of the cooking time. Let the patties stand a few minutes, still covered with waxed paper. On removal from the oven, hamburgers will look gray, but they will brown after standing.

Browning agents may be used when cooking ground meats. These include barbecue sauce, teriyaki sauce, onion soup mix, brown bouquet sauce or butter. Thickness and type of ground meat determine cooking time. Fattier hamburgers take less time to cook than lean ones.

A paper plate lined with a double thickness of paper towel gives you "no cleanup" convenience. Cover patties with a single paper towel. For lower calorie ground meats, place patties on a trivet, or use a roasting rack. Cover with waxed paper and rotate the dish one half-turn after half the cooking time. The fat will drain into the dish.

Ground meats may be extended with soy protein, oatmeal, crushed cornflakes, crackers or bread crumbs. Extended ground meats microwave in ½ to 1 minute less time per patty and give greater volume per pound of meat.

- **Pork chops.** Pork chops dry out rapidly unless kept moist. Seal the surface with crumbs, mask the chops with sauce or microwave tightly covered to keep them moist. Thick pork chops are juicier and more tender than thin ones because they have less opportunity to lose moisture.

• **Poultry.** Choose plump 2½-pound or heavier broiler-fryers with light-colored, smooth skin. Avoid fryers with thick yellow skins and stewing hens because their skin does not tenderize.

Plain, microwaved chicken pieces have a light, golden color. Whole chickens and turkeys brown more. For more brown color, use a browning agent or coating. (See chart.)

The maximum size for a microwaved turkey is 12 to 14 pounds. Roast large birds conventionally. If you have a small microwave oven, test the cavity size. Place turkey in oven and check it on all sides. There should be 3 inches between turkey and oven walls, and at least 2 inches between the top of the oven and the upper side of the turkey.

During microwaving, baste the turkey occasionally and check through the oven door for areas which are browning too fast. Shield those and leave the shields on when you turn the turkey.

Do not use a temperature probe when microwaving turkey. Hot fat can run down the probe and turn the oven off before the turkey is done. If you check temperature with a conventional thermometer, allow at least 1 minute before reading it. Standing time allows the interior to finish cooking without toughening the delicate breast meat.

To microwave chicken pieces, arrange them in a baking dish so the meatiest portions are to the outside. Brush with a browning agent or add sauce ingredients. Cover poultry pieces with waxed paper. For drier chicken, uncover during the second half of the cooking time if microwaving four or more pieces.

A whole chicken in a cooking bag may be microwaved without special attention. The meat will be tender and moist. If you do not use a cooking bag, or if you prefer a drier surface, microwave chicken covered with waxed paper. Turn the chicken over after half the time. Microwave chicken at 75 percent power rather than 100 percent. This will eliminate excessive handling and shielding.

• **Fish.** Fillets and steaks may be microwaved several ways. Microwave them in sauce for rich flavor. Steam or poach them for a delicate, but simple dish. Smother partially cooked fillets in crumbs and cream for scalloped fish. Whether cooked conventionally or microwaved, juices of salmon or halibut steaks coagulate on the surface of the fish. To eliminate this, line the dish with a paper towel to absorb excess juices before microwaving, then turn over to serve.



IV. Main Dishes and Casseroles

Most main dishes cook well in the microwave oven. They are fast and easy. Not only can the final product be heated to serving temperature, but any cooking necessary to prepare the casserole can be done using the microwave. Check each step in some of your favorite main dish recipes to see what can be cooked in the microwave. Examples would include cooking pasta, browning ground meats and making cream sauce.

• **Cookware.** Use an adequate size dish to accommodate the high boiling of juices and sauces in casseroles. Milk-based sauces are especially prone to boilover. The shape of the container is especially important when cooking main dishes and casseroles that cannot be stirred. Choose a round container, a tube pan, or make the container into a tube pan by setting a glass in the middle of a round container.

To shorten cooking time and prevent spatters, use a covered casserole. When heating foods on a serving plate or in a dish without a cover, cover the food with waxed paper or plastic wrap. Prick or slash plastic wrap and remove carefully to prevent steam burns.

• **Techniques.** If the main dish can be stirred, divide the cooking time into two or three shorter segments, and stir the casserole once or twice. Stirring will distribute the heat evenly throughout the food. (Warm food from the outer edges will be moved toward the center, and cold food will be moved from the center toward the outer edges.) Stirring foods promotes faster heating.

If the main dish cannot be stirred, turn the dish once or twice, rotate the food, rearrange it, or turn it over. These procedures promote even heating. Most main dishes and casseroles are microwaved using full (100 percent) power. Exceptions might be those with considerable amounts of cheese. (See Lesson 5.)

Add toppings toward or at the end of cooking. For example, cheese toppings are best added the last 1 or 2 minutes. This allows cheese to melt, but not toughen. Crumb or chip-type toppings may be added during the last few minutes of cooking or after the casserole has cooked. The topping will stay crisp if added just before serving.

A probe can be used to determine doneness of a casserole. Before inserting the temperature probe, completely defrost frozen foods. Heat fully-cooked foods to 150 to 160 degrees. Place the probe in the center of the food.

Casseroles may be made ahead of time and refrigerated for later use. For longer storage, freeze the main dish or casserole. Most conventional main dish and casserole recipes may be converted for use in the microwave.

EXPERIMENTS

Experiment 1—Defrosting Ground Meats

These experiments are instructions for defrosting cuts of meat. You may want to refer to this section in the future when you defrost meats. For now, choose one set of procedures, then answer the questions at the end of the experiment.

50 percent power = 3¾ to 4¾ minutes per pound

30 percent power = 5 to 7 minutes per pound or follow times given per pound in your use and care manual

1. Figure total time needed for the weight of the meat using 30 percent power.
2. Place paper or plastic package in oven. Defrost for one-third of the time.
3. Turn package over. Defrost for second third of the time.
4. Open package. Scrape and remove soft pieces. Set aside.
5. Place remaining meat in dish that will later be used for cooking. Break up with fork. Defrost remaining time.
6. Interrupt defrosting of amounts over 1 pound part way through last period to remove soft pieces.
7. Let meat stand 5 minutes (for 1 pound) to 10 minutes (over 1 pound) until meat is softened, but still icy.

Variations

- Defrost meat at 50 percent power.
- Defrost meat without removing the thawed pieces during the last third of defrosting time.

Experiment 2—Defrosting Large Roasts

	<u>50 percent power</u>	<u>30 percent power</u>
Beef	5½ to 6½ min./lb.	8½ to 12½ min./lb. or time given in use and care manual
Pork	6¼ to 8¼ min./lb.	10½ to 13¾ min./lb.

1. Figure the total time needed for defrosting weight of meat using 30 percent power.
2. Place plastic or paper-wrapped package in oven. Defrost for one-fourth of the total time.
3. Remove all packaging. Place on rack or inverted saucer in a baking dish.
4. Feel roast for warm areas, and shield these areas with pieces of foil. Turn roast over onto rack or saucer in baking dish.
5. Defrost for second fourth of the time, or until surface yields to pressure. Turn over. Let stand 10 minutes.
6. Defrost for third one-fourth of time. Shield warm areas. Turn roast over. Defrost remaining time.
7. Let stand 20 to 30 minutes or until a skewer can be inserted in the center.

Variations

- Defrost the meat according to instructions, but do not shield the warm areas with foil.
- Defrost using 50 percent power instead of the 30 percent power.

Experiment 3—Defrosting Small Steaks and Chops

	<u>50 percent power</u>	<u>30 percent power</u>
Beef	3 to 4 min./lb.	5½ to 7 min./lb. or follow the time given in your use and care manual
Pork	3½ to 6 min./lb.	6 to 10 min./lb.

1. Figure the total defrosting time for the weight of the package using 30 percent power.
2. Remove as much wrapping as possible. Separate steaks or chops with a knife, if stacked. Arrange on a rack.
3. Defrost for half the total time. Remove any remaining wrapping. Turn over.
4. Defrost for second half of the time. Let stand 5 minutes or until steaks can be pierced to the center.

Variation

- Defrost using 50 percent power instead of 30 percent.

Experiment 4—Defrosting Poultry

	50 percent power	30 percent power
Whole chicken	3 to 5½ min./lb.	5 to 9 min./lb.
Duckling	4 to 6 min./lb.	7½ to 10 min./lb.
Cornish hens	5 to 7 min./lb.	8½ to 11½ min./lb.

1. Figure the total time needed for the weight of your bird using 30 percent power.
2. Unwrap fat poultry (duckling and cornish hens). Leave others in plastic package with twist-ties removed.
3. Place bird in baking dish, breast side down. Cover unwrapped poultry with waxed paper. Defrost for half the time using 30 percent power.
4. Shield warm spots and leg tips with foil. Turn breast side up.
5. Defrost for second half of time. Spread legs and wings from body. Loosen giblets and neck.
6. Let stand 5 minutes. Remove giblets. Rinse cavity with cool water until no longer icy.

Variation

- Defrost using 50 percent power.

Experiment 5—Defrosting Poultry Pieces

	50 percent power	30 percent power
chicken quarters	4½ to 5½ min./lb.	5½ to 9 min./lb.
chicken pieces	2½ to 5 min./lb.	4½ to 8½ min./lb.

1. Figure the total time needed to defrost the weight of poultry or use times indicated in your use and care manual.
2. Place paper or plastic-wrapped package in oven. Defrost for half the total time using 30 percent power.
3. Turn package over. Defrost for one-fourth total time.
4. Unwrap and separate pieces. Arrange in baking dish with meatiest parts to outside. Defrost remaining time.
5. Let stand 5 minutes or until pieces feel soft but still cold. Wash before using.

Variation

- Use 50 percent power for defrosting.

Your Reactions

1. What meat was defrosted and what procedure was

used? _____

2. What techniques were used to distribute microwave radiation? _____

3. Was the meat defrosted to your satisfaction?
Yes ___ No ___

If not, what was wrong? _____

Questions or comments:

Experiments 6-17—Introduction

Meats can be cooked successfully in the microwave, depending on the meat to be prepared, the preparation method chosen and length of time cooked.

Before trying any of these experiments, read or review the corresponding section of the lesson. The lesson contains background information which explains why certain procedures are necessary.

Experiment 6—Browning Agents

Ground beef can be prepared quickly in the microwave. To give hamburger a deeper brown color, a variety of toppings can be used:

soy or teriyaki sauce	onion soup mix
barbecue sauce	gravy mix
brown bouquet sauce	bouillon granules
worcestershire or steak sauce	taco seasoning mix

1. Shape ground beef into patties.
2. Leave at least one patty plain. On each of the other patties, use a browning agent.
3. Place on baking dish and cover patties with waxed paper. For a drier surface, microwave uncovered.

4. Microwave on full power. Allow 4 to 5 minutes per pound. After half of cooking time, rotate the dish one half-turn.

5. Let patties stand 2 to 3 minutes after cooking.

Procedure may be repeated several times using a different browning agent each time.

Your Reactions

1. Describe the appearance of the plain hamburger. Would it be acceptable to your family? Yes ___ No ___

2. List browning agent or agents used. Describe your family's evaluation of each.

Agent	Reaction
_____	_____
_____	_____
_____	_____

3. Compare microwaved hamburgers with conventionally cooked hamburgers. Which do your family prefer? _____

Questions or comments:

4. Turn steak over. Microwave second side.

5. Test for doneness.

Rare: Steak will be well-browned, but no juices appear on the surface. Meat gives easily when touched.

Medium-rare: The moment a drop of juice appears on the surface of the steak, it's ready. Meat is slightly springy and resistant when touched.

Medium: Juices appear on the surface and meat starts to firm.

Well: Juices cover surface, which is firm and does not yield to pressure.

Bone-in steaks may also be tested by inserting a _____ to observe _____

Experiment 7—Poultry Pieces

Coatings give chicken flavor, variety and an attractive finish. To reduce calories, remove chicken skin and the fat beneath. The coatings will adhere to and flavor the meat directly. Each of these recipes will

coat 2½ to 3 pounds of chicken pieces. Choose one of these to use for the experiment. You may want to try more later.

Fried Onion Coating

2 3-ounce cans fried onion rings, crushed
 Dip: 1 egg, beaten
 2 tablespoons milk

Savory Cracker Coating

1½ cups (30 to 35) round buttery crackers, finely crushed
 1 1-ounce envelope onion gravy mix
 Dip: 1 egg, beaten
 2 tablespoons milk

Herbed Coating

1½ cups herb-seasoned stuffing mix, finely crushed
 ¾ teaspoon basil leaves
 ⅛ to ¼ teaspoon garlic powder
 Dip: 1 egg, beaten
 2 tablespoons milk, or 1 additional egg
 4 tablespoons butter or margarine, melted

Light Crumb Coating

½ cup mashed potato flakes
 ¼ cup seasoned bread crumbs
 1 teaspoon parsley flakes
 ½ teaspoon salt
 Dip: 5 tablespoons butter or margarine, melted

Corn Meal Coating

2 tablespoons poppy seeds
 2 teaspoons paprika
 ¾ cup cornmeal
 Dip: 2 eggs, beaten
 4 tablespoons butter or margarine, melted

Onion Coating

1 package dry onion soup mix
 Dip: ½ cup melted butter or margarine

Parmesan Coating

½ cup bread or cornflake crumbs
 ¼ cup grated Parmesan cheese
 Dip: ½ cup melted butter
 1 egg, beaten

Crunchy Coating

¾ cup finely crushed potato chips
 Dip: ½ cup melted butter

Instructions for all coatings listed:

1. Combine selected coating ingredients in a shallow dish or on waxed paper.
2. Dip chicken in the dip mixture, then dredge in coating. Press coarse coatings into place after dredging.
3. Place pieces, bone side down, on rack with meatiest parts to the outside. Cover with waxed paper. Microwave on full power 10 minutes.
4. Rearrange so fewer cooked parts are to the outside of the dish. Do not turn chicken over.
5. Microwave on full power an additional 8 to 15 minutes, or until juices run clear and meat near bone is no longer pink.

Your Reactions

1. Describe the flavor and color of the cooked chicken. Was it acceptable to your family? Yes ___ No ___

What kind of coating was used? _____

2. Why was meat arranged in the dish with meatiest parts to the outside?

Questions or comments:

(Experiments 8 through 17 are optional.)

Experiment 8—Cooking Bags

Barbecued Beef Roast*

2½ to 3½ pounds rump roast 1½ cups barbecue sauce

1. Pierce meat thoroughly with a fork. Place in a cooking bag; add sauce. Close bag loosely with a strip cut from the end. Set bag in shallow dish.

2. Marinate at room temperature 3 to 4 hours or overnight in refrigerator.

3. Make six ½-inch slits in top of bag. Microwave at 50 percent power 20 to 25 minutes per pound, until meat is tender, rotating dish one half-turn after half of cooking time.

4. After cooking time is completed, let stand in bag 10 minutes. Serves six to eight.

*Reprinted with permission from *Microwaving Meats*, Microwave Cooking Library.



Your Reactions

1. What methods used in this procedure help to tenderize the meat?

2. Why are slits cut in the cooking bags? _____

Questions or comments:

Questions or comments:

Experiment 6—Browning Agents

Ground beef can be prepared quickly in the microwave. To give hamburger a deeper brown color, a variety of toppings can be used:

Experiment 7—Floury Pieces

Floury pieces of chicken, turkey, or pork can be prepared in the microwave. To reduce charring, use a shallow dish and a microwave-safe cover. The following table shows the cooking times for these meats.

Experiment 9—Browning Skillet

This experiment will give you experience in using a browning skillet and in preparing a steak in the microwave.

Number of steaks	Rare		Medium Rare	
	first side minutes	second side minutes	first side minutes	second side minutes
1 (1-inch thick)	1½	1 to 1½	1½	1¾ to 2
1 (1½-inch thick)	1½	1½ to 1¾	1½	1¾ to 2¾
2 (1½-inch thick)	1½	1½ to 2	1½	2 to 3
4 (1½-inch thick)	2	2 to 2¾	2	2½ to 3¼

Table 2. (Part 1)—Cooking time for steaks.

Number of steaks	Medium		Well Done	
	first side minutes	second side minutes	first side minutes	second side minutes
1 (1-inch thick)	2	1¾ to 2½	2¾ to 3¾	2¾ to 3¾
1 (1½-inch thick)	2	3 to 4	2	3¾ to 4¾
2 (1½-inch thick)	2	3¾ to 4½	2	4½ to 5½
4 (1½-inch thick)	3	3½ to 4¾	3	4½ to 6

Table 2 (Part 2)—Cooking time for steaks.

1. Preheat browning dish or grill as manufacturer directs.
2. Slash fatty rim of steak at 1-inch intervals to prevent curling.
3. Place steak on hot grill. Microwave the first side on full power for time indicated. Do not salt steak until after cooking.
4. Turn steak over. Microwave second side.
5. Test for doneness.

Rare: Steak will be well-browned, but no juices appear on the surface. Meat gives easily when touched.

Medium-rare: The moment a drop of juice appears on the surface of the steak, it's ready. Meat is slightly springy and resistant when touched.

Medium: Juices appear on the surface and meat starts to firm.

Well: Juices cover surface, which is firm and does not yield to pressure.

Bone-in steaks may also be tested by inserting a knife between the bone and the meat to observe color.

Your Reactions

1. Describe the appearance of the steak, the flavor and the texture. _____

Is it acceptable to your family? Yes ___ No ___

2. What characteristics would you expect the steak to have if it were not cooked in the browning skillet?

3. Why is the steak not salted until after cooking?

Questions or comments:

Experiment 10—Less-Tender Beef

Less-tender cuts of meat can be prepared in the microwave. First, moisture must be present to tenderize the meat. Second, time helps tenderize the meat, too.

Pot Roast Dinner*

2 to 3 pound chuck roast 3 medium carrots cut into
1 envelope onion soup mix 2-inch chunks
¼ cup water 2 medium potatoes cut into
 eighths (peeled)
Gravy: 2 tablespoons flour or 1 tablespoon cornstarch
 ¼ cup water

1. Pierce both sides of meat thoroughly with fork. Place in 12 x 8-inch dish or 3-quart casserole.
2. Sprinkle meat with soup mix. Add water. Cover tightly with either a casserole lid or plastic wrap.
3. Microwave on 50 percent power for 30 minutes.
4. Turn roast over; add vegetables. Cover. Microwave 30 to 45 minutes longer or until meat and vegetables are fork tender.
5. Let stand, covered, 10 minutes.
6. Skim fat from meat drippings. Blend flour into water until smooth. Stir into drippings.
7. Microwave on full power 1½ to 3 minutes or until thickened, stirring one or two times during cooking. Blend well.

*Reprinted with permission from *Microwaving Meats*, Microwave Cooking Library.

Your Reactions

1. Why is meat pierced with a fork before cooking?

2. Why is the meat covered? _____

3. What happens during standing time? _____

4. Describe the roast. _____

Was it acceptable? Yes ___ No ___

5. Did you save time by cooking the pot roast in the microwave? Yes ___ No ___

Questions or comments:

Experiment 11—Tender Roasts

This experiment will give you experience in preparing a tender roast in the microwave, using an automatic temperature probe (optional), or using a meat thermometer and choosing the appropriate cookware.

Pork

1. Insert microwave thermometer. Insert sensor so the tip is in the center of the meatiest area, but not touching any fat or bone. Do not use a regular meat thermometer in the microwave.
2. Place the roast, fattiest side down, on a roasting rack or on an inverted saucer set in a baking dish. Do not salt.
3. Estimate the total roasting time and divide the time in half. Figure 12 to 16 minutes per pound.
4. Microwave on full power for 5 minutes. Reduce power to 50 percent. Microwave remaining part for first half of time. Remove drippings with a baster.
5. Turn the roast over, fat side up. If using a probe, insert it at this time.
6. Microwave for second half of the time, or until roast reaches 165 degrees.
7. Tent loosely with foil. Let stand 5 to 10 minutes or until internal temperature registers 170 degrees.

Variation:

- Follow the same basic procedure to microwave tender beef roasts. Follow times and temperatures given in your use and care manual. Use shielding on larger roasts.

Your Reactions

1. What kind of roast was cooked? _____
2. Describe the roast in terms of appearance, tenderness, flavor and juiciness.

Was the roast acceptable? Yes ___ No ___

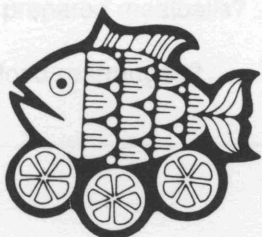
3. Did you use time only, a conventional meat thermometer, a microwave meat thermometer or an automatic probe? _____

Describe the degree of doneness desired and the results obtained.

4. Why is the meat thermometer or probe not supposed to touch bone or fat?

5. Why is a roasting rack or inverted saucer important? _____

Questions or comments:



Experiment 12—Pork Chops

This recipe is ideal for preparing pork chops in the microwave. The sauce keeps the chops moist and helps tenderize.

Chili Pork Chops*

4 pork chops, 1-inch thick 4 green pepper rings
4 onion slices, 1-inch thick 1 12-ounce bottle chili sauce

1. Score fat on chops and place in a 3-quart casserole. Place onion and green pepper slices on top. Pour chili sauce over all. Cover.
2. Place in microwave and cook 17 to 19 minutes giving the dish a half-turn after 9 minutes.

*Reprinted with permission from *The Microwave Guide and Cookbook*, General Electric.

Your Reactions

1. Why is the meat covered with liquid? _____
2. Describe the texture and taste. _____

Is it acceptable to your family? Yes ___ No ___

Questions or comments:

Experiment 13—Fish

Fish with Seasoned Coating

1 pound fish fillets 1 package seasoned coating

1. Coat fillets with seasoned coating.
2. Arrange in a 12 x 8-inch dish with thickest meaty areas to outside edges of dish. Cover with waxed paper.
3. Microwave on full power 6 to 8 minutes, rotating dish one half-turn after 4 minutes, until fish flakes with fork.

Your Reactions

Describe the taste and appearance. _____

Is it acceptable to your family? Yes ___ No ___

Questions or comments:

Experiment 14—Shape of Containers for Main Dishes

After this experiment, you will be better able to choose containers for preparing main dishes.

Basic Meat Loaf*

1½ pounds lean ground chuck	1 teaspoon salt
½ cup dry bread crumbs	⅛ teaspoon powdered thyme
¾ cup milk	⅛ teaspoon pepper
1 egg	⅛ teaspoon dry mustard
⅓ cup chopped onion	2 tablespoons catsup

1. Combine all ingredients, mixing well.
2. Shape half of recipe into a loaf. Spread half of catsup evenly over the top.
3. Cook 7 to 9 minutes, giving dish one fourth turn every 2 to 3 minutes.
4. Let stand at least 5 minutes before slicing half of recipe.
5. Place second half of recipe in a microwave tube pan or a round microwave safe dish with an inverted glass or custard cup placed in the middle.
6. Microwave for 7 to 9 minutes. Serves six.

*Reprinted with permission from *The Microwave Guide and Cookbook*, General Electric.

Your Reactions

1. Draw the patterns in which the meat cooked for both pans. Where, if at all, did the meat loaf over-bake? _____

What part got done first? _____

Which shape works best? _____

2. Which product do you and your family prefer? _____

Why? _____

3. Compare microwaved meat loaf with meat loaf prepared conventionally. Which does your family prefer? _____

Why? _____

Questions or comments: _____

Experiment 15—Rotating the Dish

After this experiment you will be better able to distribute microwave radiation by rotating and arranging foods.

Chicken 'N Dressing

1 8-ounce package herb-seasoned stuffing mix	1¾ to 2 cups chicken broth
½ cup chopped celery	1 cut-up chicken (2½ to 3½ pound)
¼ cup minced onion	¼ cup butter
2 tablespoons chopped pimiento	Salt
1 egg	Paprika

1. In 12 x 8 x 2-inch dish, toss together stuffing mix, celery, onion, pimiento, egg and broth.
2. Dip chicken pieces into melted butter, place on top of dressing with meatiest pieces to the outside edges of dish. Sprinkle with salt and paprika. Cover with waxed paper.
3. Microwave on full power 18 to 22 minutes, rotating dish a half-turn after 10 minutes.
4. Let stand about 5 minutes before serving. Serves four.

Your Reactions

1. Why were meatiest pieces placed toward the outside of the dish? _____

2. Why was the dish rotated? _____

3. List other types of main dishes or casseroles that would have to be rotated rather than stirred or rearranged. _____

Questions or comments: _____

Experiment 16—Rearranging Foods

After this experiment, you will be better able to distribute microwave radiation by rearranging foods.

Swedish Meatballs*

2 pounds ground chuck	1/2 teaspoon nutmeg
2 cups soft bread crumbs	2 tablespoons unsifted flour
1/2 cup milk	1 cup milk
1 egg	2 tablespoons brown bouquet sauce
1 package onion soup mix	1 cup sour cream
1/2 teaspoon salt	

1. Mix together beef, crumbs, milk, egg, soup mix, salt and nutmeg. Shape meat mixture into 40 balls.
2. Cook 20 balls, or half of the recipe, in a 13-x 9-x 2-inch dish. Cover with waxed paper. Microwave at full power 6 to 8 minutes, rearranging meatballs after 3 minutes. Reserve drippings.
3. Repeat cooking process with remaining meatballs. Do not rearrange meatballs.
4. Observe both pans.
5. To 1/4 cup drippings in dish, add flour, stirring until smooth. Gradually stir in milk and brown bouquet sauce. Microwave on full power 3 to 4 minutes, stirring every minute until thickened.
6. Add sour cream. Stir well.
7. Return meatballs to dish, mixing to coat evenly. Microwave at high 1 to 2 minutes, until hot. Serve over noodles or rice.

*Reprinted with permission from *The Microwave Guide and Cookbook*, General Electric.

Your Reactions

1. Describe the cooking pattern for each pan of meatballs. _____

2. Describe your family's reaction to the main dish. Did they like it more, less, or about the same as conventionally prepared meatballs? _____

3. Why is this food rearranged? _____

Experiment 17—Using a Probe

Easy Beef and Tater Bake

1 pound ground chuck	1 pound package frozen shredded potato nuggets
1 tablespoon instant minced onion	1 can condensed cheddar cheese soup
1/2 teaspoon salt	1 can cream of mushroom soup
1/8 teaspoon pepper	

1. Crumble beef into 2-quart casserole. Place in microwave oven and cook 5 minutes, stirring after 3 minutes. Drain.
2. Distribute onion, salt, pepper and potato nuggets over browned beef.
3. Mix soups together and spoon over top.
4. Cover with plastic wrap. Insert temperature probe into the center. Cook to 150 degrees to 160 degrees. Serves four to six.

Your Reactions

1. Compare this with casseroles cooked by time and casseroles cooked conventionally. Discuss time involved and quality.

2. Describe your reactions to using the temperature probe.

Questions or comments:

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

Adapted with permission from materials originally prepared by the University of Missouri Cooperative Extension Service.

Educational programs conducted by the Texas Agricultural Extension Service serve people of all ages regardless of socioeconomic level, race, color, sex, religion, handicap or national origin.

Cooperative Extension Work in Agriculture and Home Economics, The Texas A&M University System and the United States Department of Agriculture cooperating. Distributed in furtherance of the Acts of Congress of May 8, 1914, as amended, and June 30, 1914.
10M—9-83, New