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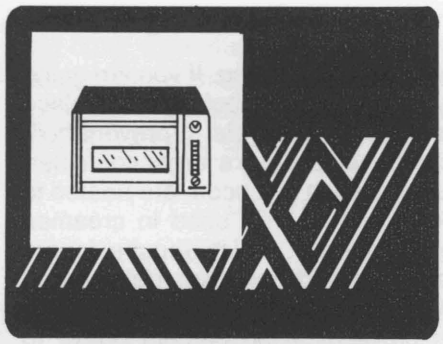

MICROWAVING MILK, EGGS AND CHEESE

LESSON 5

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

Lesson 5 contains information and experiments using eggs, cheese and milk. These protein foods react differently in a microwave. Prolonged cooking will toughen them.

If you have been a microwave owner for several months, you have probably prepared dishes using eggs, cheese and milk. Perhaps you've discovered simplified cooking techniques. Please share these ideas with your county Extension agent.

This lesson explains nutritional contributions to the diet, protein cookery, how to prepare combination dishes, underloading and cooking that continues after food is removed from a microwave.

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I. Nutritional Contribution to the Diet

Milk and cheese are included in the milk and dairy products food group in the *Daily Food Guide.* Eggs are included in the meat group, but all three are important sources of protein in the diet. The protein in milk, cheese and eggs builds and repairs body tissues, helps the body to fight infection and supplies energy. As with other protein foods, such as meats, high heat and prolonged cooking will produce a tough, dry product. Length of cooking time will be an important factor in this lesson.

Milk, a concentrated source of calcium, is often excluded from adult diets. A research program conducted by Lincoln University found people were lacking calcium. If you do not drink milk, perhaps you are consuming some every day in custard, pudding, yogurt, ice cream, over cereal, or mixed as nonfat dry milk in casseroles or creamed soups.

Calcium works with other nutrients in the body to promote growth and good health. It helps to make teeth hard and bones strong. It helps to calm nerves, clot blood and make muscles work properly. Including milk and cheese in the diet not only provides protein and calcium, but other nutrients as well. Milk and cheese are sources of Vitamim A, potassium, phosphorus, and riboflavin (B_2), as well as carbohydrate and fat.

If you are concerned about weight, choose lowfat forms of milk. The nutrient content is about the same as whole milk except the fat has been removed.

Eggs provide iron in the diet. The yolk, the area of greatest concentration, also the area containing the most cholesterol, is important in body functions. It is the fat source which carries fat-soluble vitamins throughout the body.

The key to a good diet is eating moderate amounts of a variety of foods. This will provide nutrients the body needs, and when well planned can cut your grocery costs.

Since this lesson includes saucemaking, calories are important. Any time water, broth or milk are thickened, as in white sauce or cheese sauce, calories increase.

II. Underloading

Protein products can be cooked slower with the defrost cycle or a low power setting. (Experiment with this. *All recipes call for medium power.)*

Another way to slow cooking is by placing a container of water in the oven as an underload protection. (The water will absorb some of the microwaves, reducing the number available for cooking.)

III. Milk

Microwaving exaggerates boiling. If you are going to microwave 1 cup of liquid to the boiling point, place it in a 1-quart measure or casserole to prevent boilovers. If you double the recipe, use a larger container.

Hot milk beverages, such as cocoa, are heated to just below the boiling point. Milk used in creamed soups or scalloped potatoes, which require longer cooking time, may foam and boil over. Use a large enough container. When heating canned soups diluted with milk, microwave at 50 percent power to prevent overcooking.

IV. Eggs

Eggs illustrate the difference between conventional and microwave cooking. On the range top, eggs cook first in the outer, or white, portion. In the microwave, the egg yolk, which contains more fat, attracts the microwaves first. If you microwave an egg until the white is firm, the yolk will toughen. *Standing time is necessary to cook the white completely without hardening the yolk,* especially in a dish where the two are mixed together, such as scrambled eggs.

If you have ever seen an egg blow out of a custard cup, you probably will remember to puncture the membrane of the yolk before microwaving. It's the same principle as a baked potato—building steam pressure. Hardcooking eggs in the shell builds pressure, too. For recipes requiring hard-cooked eggs, use conventional cooking methods.

The heating pattern of your oven may affect the way eggs cook. If your oven has an uneven pattern, you may have difficulty with poached or shirred eggs and omelet mixtures. Experiment to see what will work. *Use 50 percent power setting in recipes to prepare eggs.*

V. Cheese

The high fat content of cheese attracts microwave energy. It melts quickly and toughens easily. Natural hard cheese becomes stringy if overcooked. Processed and softer cheese does not become stringy, but will toughen if cooked too long. Follow these rules of thumb:

- If cheese is included in a casserole, such as macaroni and cheese, and will need to be heated for a long period, use 50 percent power.

- If you have only a high power setting, cycle the power on and off such as—on 30 seconds, off 30 seconds—or stir the mixture frequently.
- Add cheese to the top of casserole at the end of the microwave cooking time.

VI. Sauces—Starch Cookery

When a starch such as flour or cornstarch is mixed with a liquid and heated, it gels. It requires constant stirring. When using the microwave, you will not have to stir the sauce as often. Wire whisks and forks are good stirring tools.

Sauces thickened with cornstarch thicken more rapidly and need less stirring than flour-based sauces.

Check the time required to prepare sauces in the microwave. Is it more or less than conventional cooking?

EXPERIMENTS

Several of the experiments in this lesson will be combinations of milk, cheese and eggs. Information in Lesson 3 on pie crusts, and the maraconi and cheese recipe may help you complete these. Don't be afraid to try an experiment just to see if you like it. If someone in your family doesn't like the dish, freeze what's left to have when they are not home.

These recipes do not need to be prepared all at once. Prepare the recipes when they fit into your meal plan and write your reactions. Time how long it takes for the mixture to begin to boil.

Experiment 1—Milk

A scalloped potato recipe illustrates how milk foams when cooked for long periods. If your family does not like potatoes fixed this way, substitute a potato soup recipe and follow the same principles. In one recipe make a white sauce mixture; in the other, just layer the ingredients, pour milk over the layers, and microwave.

*Scalloped Potatoes**

- 3 tablespoons butter
- 2 tablespoons flour
- 1 teaspoon salt
- ¼ teaspoon pepper
- 3½ to 4 cups thinly sliced white potatoes (about 3)
- 2 tablespoons minced onions
- 3 cups milk

Place butter in 4-cup measuring container. Microwave on high until melted. Blend in flour and seasonings. Gradually stir in milk. Microwave on high 8 to 10 minutes, stirring every 3 minutes.

Layer half of potatoes, onion and sauce in greased 2-quart casserole. Repeat layers and cover.

Microwave on high 17 to 19 minutes, stirring after 10 minutes. Remove from oven and let stand 5 minutes before serving.

*Reprinted with permission from *G. E. Microwave Cookbook.*

*Scalloped Potatoes**

- 5 to 6 medium sliced potatoes
- 4½ tablespoons flour
- 1¼ teaspoons salt
- 1½ cups scalded milk
- 3 tablespoons butter
- Paprika

Arrange half of sliced potatoes in glass baking dish. Combine flour with salt. Sprinkle half on potatoes. Repeat layer. Pour milk over potatoes. Dot with butter. Sprinkle generously with paprika. Microwave 20 minutes, or until potatoes are barely tender.

Using a tube pan eliminates the center where foods do not cook as rapidly. In a casserole, stir hot foods on outside of dish toward center. Top casserole with a dash of paprika and grated cheese.

*Reprinted with permission from *Amana Radarange Cookbook.*

Your Reactions

1. I cooked scalloped potatoes or potato soup for the milk experiment. (Circle one.)

2. After how many minutes did it come to a boil? _____

3. Describe the consistency of the milk mixture when removed from the oven.

_____

4. Do you like potatoes cooked this way?
Yes __ No __

5. If no, what changes would you make? _____

_____

_____

Questions or comments:

The microwave is ideal for heating water for instant beverages as well as for soup. It should take less than 2 minutes to boil a cup of water in your microwave. Compare the cost of instant beverages in individual packages with beverages made at home. Can you make one at home that compares in flavor and price to the commercially made? A beverage made with cocoa and sugar will cost less to prepare. See if you like the flavor. All hot chocolate beverages will be rich in calories.

*Hot Cocoa**

2½ tablespoons cocoa
3 tablespoons sugar
Dash salt
¼ cup hot water
1¾ cup milk

Combine cocoa, sugar and salt in 1-quart casserole. Stir in water until smooth. Microwave on high 45 seconds to 1¼ minutes, or until mixture boils rapidly. Add milk. Microwave on high, 2 to 3½ minutes, or until heated through.

Tips: Beat until frothy. If desired, add marshmallows the last 15 to 30 seconds of cooking.

*Adapted with permission from *Amana Radarange Cookbook.*

Experiment 2—Eggs

(Complete two of three experiments.)

The size of the eggs used influences the volume and moisture content of foods. Most recipes use large eggs unless otherwise specified. When you use small eggs, expect a smaller volume. This concept is important in volume of cakes, omelets, souffles and other egg dishes.

Compare the quality of custards prepared by different procedures. Select two of the following methods. Prepare them at different times, then record the reactions.

- Cook as recipe directs.
- Cook with defrost cycle.
- Cook with underload protection.
- Cook with foil shield around the top edge. (Cut a circle of foil to fit dish. Cut circle out of center like a donut.)

Baked Custard

1¾ cup milk
¼ cup sugar
3 eggs
¼ teaspoon salt
½ teaspoon vanilla
Nutmeg

In 4-cup container, measure milk. Add sugar, eggs, salt and vanilla. Beat with rotary beater until well mixed. Pour into four or five 6-ounce custard cups, filling ¾ full. Sprinkle with nutmeg. Cook, uncovered, 4¼ to 5 minutes or until they start to bubble (high power).

Your Reactions

1. Which methods did you use? _____

2. Describe appearance of custard for each method you used. _____

_____

_____

_____

3. Describe the texture of the interior of each method you used. _____

_____

_____

_____

4. Was there a difference in flavor? Yes __ No __

If yes, describe the difference. _____

_____

5. Did you like it? Yes __ No __

Omelets by microwave do not crust or brown because they are not made on a hot surface. Use a 9- or 10-inch pie plate to cook an omelet. Use the following recipe or one of your favorites. This recipe serves two.

Bacon Omelet

1 tablespoon margarine
¼ cup thinly sliced onions
4 beaten eggs
5 to 6 strips cooked, crumbled bacon
2 tablespoons heavy cream
1 teaspoon prepared mustard
⅛ teaspoon pepper
salt to taste

Melt butter in pie plate—30 seconds in microwave. Stir in onions. Cook 30 seconds to 1 minute. Mix remaining ingredients. Pour into pie plate. Cook 2 to 4 minutes on high. Lift edges at 2-minute intervals to let uncooked portion run to sides of dish. Let stand 3 minutes. Fold. Turn onto warm platter.

Tips: Omelets can be made using leftover bits of meat. Cheese can be sprinkled over omelets or cooked vegetables can be added.

Your Reactions

1. Have you made omelets by conventional methods? Yes __ No __

2. Describe the appearance of the omelet. _____

_____

3. Did it cook evenly? Yes __ No __

If not, try preparing one at medium power.

4. Did you like the omelet? Yes __ No __

Quiche has become very popular. You can use leftovers to make a hearty brunch or evening meal. Quiche can be baked in a crust or without a crust. If

you prefer a crust, refer to Lesson 4 on microwaving pie crust. Pour the mixture into a *baked* crust. There are many variations in recipes. The following recipe contains common ingredients. If you prefer another recipe, feel free to use it.

Quiche Lorraine

- 9 to 10 bacon slices, cooked and crumbled
- 1 cup shredded Swiss cheese
- ¼ cup minced onion
- 4 eggs
- 1 13-ounce can evaporated milk
- ¾ teaspoon salt
- ¼ teaspoon sugar
- ⅛ teaspoon pepper

Sprinkle bacon, cheese and onion in 9-inch pie plate. Beat eggs, milk and seasonings with rotary beater until well blended. Pour over bacon mixture. Bake in microwave 9 minutes. Stir every 3 minutes. Let stand 10 minutes before serving. Serves four.

If the texture is tough and rubbery, reduce power to medium and increase cooking time. Heating the milk mixture until it's hot and then pouring it over the meat and cheese mixture will help the quiche to microwave more evenly, allowing the center to set without overcooking the edges. Try other meat with cheese that complements.

Test for doneness. Metal knife inserted in the center will come out coated with partially cooked custard when quiche is done. The center will set during standing time.

Your Reactions

1. Describe the results you had with the quiche. ___

_____

_____

2. What changes would you make? _____

_____

3. Did you like it? Yes __ No __

Experiment 3—Cheese

(Complete at least one experiment.)

If you did not prepare the macaroni and cheese in Lesson 4, you may do so in this lesson as one of your experiments.

Toasted or grilled cheese sandwiches cook best in a browning dish. If you do not have one, toast slices of bread in toaster, butter outside of slices, place cheese between them and place in microwave for ½ minute to melt cheese.

*American-Swiss Fondue**

- 1 clove garlic, halved
- 8 ounces grated cheddar cheese
- 8 ounces grated Swiss cheese
- 3 tablespoons flour
- Dash nutmeg
- 1 cup dry white wine
- Cubes of crusty French bread

Rub a 2-quart casserole with cut garlic. Discard the garlic. Shake cheese, flour and nutmeg together in a small bag. Measure wine into casserole. Microwave at 50 percent power (medium) 3 to 4 minutes until wine is hot but not boiling. Stir in cheese mixture. Microwave until smooth, stirring vigoriously every 2 minutes with fork or wire whisk. Serve hot with bread cubes for dipping. Serves four.

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

Your Reactions

1. What experiment did you complete using cheese? _____

_____

2. Did it become tough or stringy? Yes __ No __

If yes, you will need to change to a lower power setting next time.

3. What other dishes have you prepared in which you have used cheese? _____

_____

4. What other experiment could be included in the cheese section? _____

_____

_____

Experiment 4—Sauces

(thickened with flour)

Prepare white sauce by both methods listed. Time each method from beginning to completion. White

sauce cookery is typical of the preparation of many sauces used as a basic component of many dishes—puddings, creamed soups, fondues and dessert sauces.

White Sauce

2 tablespoons margarine or butter
2 tablespoons flour
½ teaspoon salt
1 cup milk

Method 1: In a 2-cup measure, melt butter (20 seconds). Blend in flour and salt. Gradually stir in milk. Cook uncovered 2 minutes and 30 seconds, or until mixture boils and thickens. Stir occasionally during last half of cooking time. Makes 1 cup sauce.

Method 2: In 2-cup measure, melt butter (20 seconds). Blend in flour and salt. Gradually stir in 3 tablespoons of cold milk. Heat the remaining milk to almost the boiling point. Stir hot milk into the flour paste with constant stirring. Cook sauce until mixture boils and thickens, stirring occasionally.

Your Reactions

1. How long did it take to prepare **Method 1?** ____

2. How long did it take to prepare **Method 2?** ____

3. Were the results different? Yes __ No __

If yes, please describe _____

_____

4. List the ways you use white sauce. _____

_____

Sauces
(thickened with cornstarch)

If you make gingerbread, this lemon sauce can be used as a topping. Record the preparation time for this recipe.

*Lemon Sauce**

2 tablespoons cornstarch
½ cup sugar
Dash of salt
1 cup hot water
2 tablespoons margarine or butter
2 tablespoons lemon juice
2 teaspoons grated lemon rind

In 1-quart measure, blend sugar, cornstarch and salt. Add water, stirring until sugar dissolves. Microwave on high 2 to 5 minutes, or until sauce is clear and thick. Stir with wire whisk or fork. Mix in remaining ingredients. Serve warm or cool. Makes 1½ cups.

*Reprinted with permission from Microwave Cooking Library, *Recipe Conversions.*

Your Reactions

1. How long did it take to make the lemon sauce in your microwave? _____

2. Describe the consistency and texture. _____

_____

3. Any problem with lumps? Yes __ No __
(If yes, you may need to stir a little more often during cooking.)

4. Did you like the lemon sauce? Yes __ No __

5. What other types of sauces have you made in your microwave? _____

_____

_____

6. What changes would you make in Lesson 5? ___

_____

7. Are you enjoying the lessons? Yes __ No __

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