



Culinary Techniques

FOR HEALTHY SCHOOL MEALS


Preparing Vegetables

National Food Service Management Institute
The University of Mississippi
Culinary Techniques for Healthy School Meals

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National Food Service Management Institute The University of Mississippi

Building the Future Through Child Nutrition

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The purpose of the National Food Service Management Institute is to improve the operation of child nutrition programs through research, education and training, and information dissemination. The Administrative Offices and Divisions of Information Services and Education and Training are located in Oxford. The Division of Applied Research is located at The University of Southern Mississippi in Hattiesburg.

MISSION

The mission of the National Food Service Management Institute is to provide information and services that promote the continuous improvement of child nutrition programs.

VISION

The vision of the National Food Service Management Institute is to be the leader in providing education, research, and resources to promote excellence in child nutrition programs.

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Preparing Vegetables

Objectives

- Improve the quality of vegetables served.
- Improve the variety of vegetables served.
- Improve the appeal of vegetables served.

Main Ideas in This Lesson

- The way a vegetable is prepared affects its nutrient content.
- Overcooking vegetables destroys nutrients and results in poor texture, appearance, and taste.
- Vegetables should be cooked in batches for just-in-time service so they are at their peak of quality.
- There are many techniques for cooking vegetables. This lesson describes steaming, stir-frying, and roasting.
- Instead of using just salt and butter or margarine to season vegetables, try new seasonings that include herbs or spices.

Preparation for Learning

Review the list of recipes with each Culinary Technique. The recipes are available at:

U.S. Department of Agriculture, Food and Nutrition Service, & National Food Service Management Institute. (2005). *USDA recipes for child care*. University, MS: Author.

Available online at <http://www.nfsmi.org>

U.S. Department of Agriculture, Food and Nutrition Service, & National Food Service Management Institute. (2006). *USDA recipes for schools*. University, MS: Author.

Available online at <http://www.nfsmi.org>

Practice or Application

Prepare one or more of the recipes listed with one of the Culinary Techniques.

Additional Suggestions

- Look at a serving of canned green beans to demonstrate the green color of an overcooked vegetable.
- View a serving of correctly cooked broccoli to demonstrate the bright green color of a correctly cooked green vegetable. The color should be like spring grass.
- Use the Seasoning Sensational Vegetables chart to describe various ways to use herbs and spices. Consider some herbs and spices you would like to try, using the suggestions on the Seasoning Sensational Vegetables chart.



Important Terms

Blanch

To dip a food into boiling water for a very short time and then to chill very quickly to briefly and partially cook it.

Culinary

Relating to the kitchen or cooking. An example of use is to describe food preparation skills as culinary skills.

Culinary Technique

A step-by-step food preparation method. The culinary techniques discussed in this lesson include steaming, stir-frying, and roasting.

Just-In-Time Preparation

This term is used throughout the lessons to mean preparing a menu item in small enough quantities so that it will be at its peak of quality when placed on the serving line. This preparation schedule avoids holding any food for a long time. Other terms that mean the same thing are *batch cooking* and *cooking to the line*.

Mise en Place (meez-un-plahss)

A French term used by chefs and other food professionals to describe all the different things that have to be done to get ready up to the point of cooking. Translated, it means *put in place*. It includes all the *get ready steps* in food preparation such as using the recipe to assemble the equipment needed and getting ingredients ready to combine.

Nutrients

The chemical substances found in food that nourish the body. There are six classes of nutrients: proteins, carbohydrates, fats, water, minerals, and vitamins.

Steaming

A moist-heat cooking technique in which heat is transferred from steam to the food being cooked by direct contact.

Stir-Frying

A dry-heat cooking technique similar to sautéing. Foods are cooked over very high heat using little fat while stirring briskly and constantly.

Roasting

Foods are cooked in the oven, using dry heat. When vegetables are roasted, they are generally sweeter and more tender.

Water-Soluble Vitamins

Vitamins that can dissolve in water and thus can be lost during food preparation. They include the B vitamins and vitamin C.

Seasonal Produce

Fruits and vegetables that are peak at a particular time of the year. Typically this produce is more flavorful and less expensive. Seasonality of produce will depend on region.



Getting Ready

Wash, rinse, sanitize, and air-dry all food-contact surfaces, equipment, and utensils that will be in contact with produce, such as cutting boards, knives, and sinks.

Equipment Needed

- Produce sink
- Cutting boards
- Slicing equipment
- Knives

Washing Fresh Vegetables

1. Follow state or local health department requirements.
2. Wash hands using the proper procedure.
3. Wash, rinse, sanitize, and air-dry all food-contact surfaces, equipment, and utensils that will be in contact with produce, such as cutting boards, knives, and sinks.
4. Wash all raw vegetables thoroughly before combining with other ingredients, including
 - a. Unpeeled fresh vegetables that are served whole or cut into pieces.
 - b. Vegetables that are peeled and cut to use in cooking or served ready-to-eat.
5. Wash fresh produce vigorously under cold running water or by using chemicals that comply with the *FDA Food Code*. Packaged vegetables labeled as being previously washed and ready-to-eat are not required to be washed.
6. Scrub the surface of firm vegetables using a clean and sanitized brush designated for this purpose.
7. Remove any damaged or bruised areas.
8. Label, date, and refrigerate fresh-cut items.





Vegetables and Healthy School Meals

Menu-Planning Practices for Healthy School Meals

- Increase the amounts and variety of vegetables offered because vegetables differ in nutrient content.
- Offer a dark green or deep orange vegetable three to four times a week.
- Plan a vitamin C-rich vegetable or fruit daily.
- Try using herbs, spices, and lemon for seasonings in place of part of the salt.

Purchasing Practices for Healthy School Meals

- Purchase fresh and frozen vegetables, where feasible, to substitute for canned vegetables, which are higher in sodium.
- Purchase oven-ready fries, instead of fries for deep-fat frying. Check and compare the fat content of the oven-ready fries to the deep-fat fries. Many times, the oven ready fries have been processed with a coating of oil to make them brown, resulting in a high fat content. Try oven-ready sweet potato fries for added nutrients.
- Look to local farmers as an alternative to purchasing fresh produce. Check out www.farmtoschool.org.

Children should eat 1 to 3 cups of vegetables each day.

According to *MyPyramid*:

- eating a diet rich in fruits and vegetables as part of an overall healthy diet may reduce risk for stroke and perhaps other cardiovascular diseases.
- eating a diet rich in fruits and vegetables as part of an overall healthy diet may reduce risk for type 2 diabetes.
- eating a diet rich in fruits and vegetables as part of an overall healthy diet may protect against certain cancers, such as mouth, stomach, and colorectal cancers.
- diets rich in foods containing fiber, such as fruits and vegetables, may reduce the risk of coronary heart disease.
- eating fruits and vegetables rich in potassium as part of an overall healthy diet may reduce the risk of developing kidney stones and may

help to decrease bone loss.

- eating foods such as vegetables that are low in calories per cup instead of some other higher-calorie food may be useful in helping to lower calorie intake.

Vegetables are packed with nutrients for children:

- most vegetables are naturally low in fat and calories. None have cholesterol. (Sauces or seasonings may add fat, calories, or cholesterol.)
- vegetables are important sources of many nutrients, including potassium, dietary fiber, folate (folic acid), vitamin A, vitamin E, and vitamin C.
- diets rich in potassium may help to maintain healthy blood pressure. Vegetable sources of potassium include sweet potatoes, white potatoes, white beans, tomato products (paste, sauce, and juice), beet greens, soybeans, lima beans, winter squash, spinach, lentils, kidney beans, and split peas.
- dietary fiber from vegetables, as part of an overall healthy diet, helps reduce blood cholesterol levels and may lower risk of heart disease. Fiber is important for proper bowel function. It helps reduce constipation and diverticulosis. Fiber-containing foods such as vegetables help provide a feeling of fullness with fewer calories.
- Vitamin A keeps eyes and skin healthy and helps to protect against infections.
- Vitamin E helps protect vitamin A and essential fatty acids from cell oxidation.
- Vitamin C helps heal cuts and wounds and keeps teeth and gums healthy. Vitamin C aids in iron absorption.

Keeping the Nutrients

The way a vegetable is prepared can affect the nutrient content. Some nutrients can be destroyed by heat and some dissolve in water. The culinary techniques described in this lesson are based on culinary principles designed to keep the nutrients in vegetables.

Remember, keep the nutrients in vegetables.

- Keep the vegetables in big pieces.
- Cook in just a little water (if any).
- Cook only a short time.





Culinary Principles

There are several culinary techniques used to prepare vegetables, including steaming, stir-frying, roasting, boiling, sautéing, and others. A recipe will describe the right culinary technique as part of the directions. By using the right culinary technique, a foodservice professional can be sure to

- maintain the nutrients in the vegetable and
- meet the quality standards for the vegetable.

The culinary technique explains the step-by-step method to prepare the vegetable. However, foodservice professionals need to know why the steps should be completed a certain way. Basic principles of vegetable preparation explain why.

Basic Principles of Cooking Vegetables to Maintain Nutrients

Cook vegetables in the smallest amount of liquid possible.

Vegetables have some vitamins that dissolve in water and are lost when the cooking liquid is discarded. Water soluble vitamins are vitamins that dissolve in water. The common water soluble vitamins are C and the B vitamins riboflavin, thiamin, and niacin.

Cook vegetables the shortest amount of time for the desired tenderness.

Vegetables have some vitamins that are destroyed by heat so long cooking means they provide less vitamins.

For vegetables that have a skin, scrub well and cook with the skin on whenever possible. If the vegetable must be peeled, peel as thinly as possible.

Vegetables usually have a valuable layer of nutrients which is right under the skin. Peeling can remove many nutrients. (Examples: potatoes, carrots, parsnips, turnips.)

When vegetables are cut, use a sharp blade and cut in the largest pieces that are desirable for the recipe. Pieces should be uniform to allow for even cooking. Large pieces help preserve the nutrient content of the vegetable.

A sharp blade in a piece of equipment or a knife will make a clean cut instead of bruising the vegetable. Bruising causes a rapid loss of vitamin C from some green, leafy vegetables such as cabbage and other greens.

Follow the recipe or directions for cooking a vegetable.

Recipes and general directions for cooking a vegetable are based on using the right culinary technique. Adding some ingredients actually destroys certain nutrients. For example, adding baking soda to green vegetables during cooking destroys some B vitamins as well as vitamin C.

Cook vegetables just-in-time for service on the line.

Holding vegetables after cooking causes loss of nutritive value and quality. Plan food production so that vegetables can be cooked and immediately placed on the serving line. Remember that cooking will continue when the vegetable is placed on the steam table. Vegetables are best when they are held for less than 20 minutes.



Culinary Principles, *continued*

Basic Principles of Cooking Vegetables to Meet Quality Standards

Cook vegetables so they have an appealing appearance. Follow the recipe or directions for cooking a vegetable to maintain a bright color.

Green Vegetables

Recipes/directions for cooking green vegetables have been developed to keep the green color. The green comes from chlorophyll, a color that is affected by both heat and acid. When a green vegetable is cooked some acid is released in the steam. When steam cannot escape, it condenses to water that has the acid in it. Then, it falls back on the food turning it a dull olive-green color. This is why correct cooking and holding of green vegetables is so important to maintain the bright green color. Overcooking some green vegetables turns them a dull olive-green or even gives them a yellow-look. This can easily be seen in overcooked broccoli and cabbage.

For the same reason, an acid such as lemon juice should never be added to a green vegetable during cooking. The acid will cause the vegetable to turn an olive green color and keep it from softening during cooking.

It is also a mistake to add baking soda to green vegetables. Although this makes the green color brighter, it destroys vitamins and can cause some vegetables, like broccoli, to feel slippery.

Canned green beans are a good standard to use to judge an overcooked green vegetable. The dull olive-green color means a green vegetable is overcooked. Correctly cooked green vegetables should be the color of fresh grass in the spring. What color are your green vegetables?

Orange and Yellow Vegetables

The color of orange and yellow vegetables is more stable than green. During cooking the orange may become more yellow, but there is little change. Follow the recipe or directions to

avoid overcooking these vegetables because they begin to have a mushy appearance and texture.

Cook vegetables so they have appropriate texture. The texture that is appropriate for a vegetable varies with the vegetable and with the recipe. Follow the recipe or directions for exact cooking times to get the right texture. Cooking times will vary depending on whether the vegetable is fresh, frozen, or canned. Canned vegetables only need to be heated. The canning process completely cooks them. Follow directions or a recipe for the correct cooking times for fresh or frozen vegetables.

Vegetables are softened during the cooking process. Undercooking may make them too crisp while overcooking makes some vegetables mushy. Adding baking soda to the water in vegetables makes them mushy or slippery while adding an acid, like lemon juice, prevents the vegetable from softening. Never add an ingredient unless it is called for in the recipe.

Cook vegetables for good flavor typical of the vegetable.

All vegetables have some change of flavor during cooking. For some vegetables the change may be slight while others have a big change in flavor.

Follow the recipe or directions for exact cooking times to have a good flavor. The flavor of a vegetable is affected by the way it is cooked and by the seasonings added to it. Overcooking is the biggest problem when it comes to flavor. Vegetables in the cabbage family (cabbage, broccoli, cauliflower) develop a very strong, sulfur-flavor when they are overcooked. Some vegetables may become bitter with overcooking. Other vegetables may become flat or dull. Have you ever tasted cabbage that had a sulfur taste? That taste comes from overcooking.



Culinary Principles, *continued*

Cooking in too much water also affects the flavor of vegetables because some parts of the vegetables that affect flavor are dissolved and lost in the water.

Use appropriate seasonings for vegetables for a good flavor. Properly cooked vegetables do not need a lot of salt, butter, or margarine for best flavor. In fact, adding too much salt and adding fat can mask the natural flavor of vegetables. Follow the recipe or directions for best flavor. This lesson includes information on new ways to season vegetables in the attached chart, Seasoning Sensational Vegetables.

Serve vegetables at the right temperature.

When vegetables are placed on the serving line, they should be between 160 °F and 180 °F. By

cooking vegetables just in time for service, they do not have to be held long and will have better quality as well as maintain their temperature. The serving line should be set to hold the hot foods above an internal temperature of 135 °F.

For many students, meals at school provide most of the vegetables in their diet. Just as important, meals at school are an ideal way for students to learn to eat new foods, including unfamiliar vegetables. It is important that vegetables be prepared so they look good, taste good, and provide their important nutrients.





Flavor Enhancement

Herbs, spices, fruit juices, or citrus zest can enhance the flavors of vegetable dishes.

Seasoning Sensational Vegetables											50 1/4 cup Proportions				
Product	Amount	Ginger Powder	Dill*	Tarragon*	Mint*	American	Asian**	Cajun	Curry	Indian	Italian	Mexican	Tex Mex	Water	Oil
Baked Beans															
Dried	2 lbs					3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Canned	#10 (7 lbs)					3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Black-Eyed Peas															
Dried	2 lbs		4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp		3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Frozen	5 lbs		4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp		3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Canned	5 lbs drained wt		4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp		3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Broccoli (chopped)															
Fresh	5 lbs trimmed stems 2.5 lbs + florets 2.5 lbs = 5 lbs					3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Frozen	5 lbs 4.5 lbs thawed & cooked					3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Carrots															
Fresh	5 lbs trimmed	1 tsp	4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp		3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Frozen	5 lbs	1 tsp	4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp		3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Canned	5 lbs drained wt	1 tsp	4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp		3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Cauliflower															
Fresh	5 lbs (aprx. 3.5 heads)		4 Tbsp/ 2 Tbsp			3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Frozen	5 lbs					3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz

Seasoning Sensational Vegetables													50 1/4 cup Proportions		
Product	Amount	Ginger Powder	Dill*	Tarragon*	Mint*	American	Asian**	Cajun	Curry	Indian	Italian	Mexican	Tex Mex	Water	Oil
Collard Greens															
Frozen	5 lbs					3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Green Beans															
Fresh	5 lbs		4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp		3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Frozen	5 lbs		4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp		3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Canned (approx.1 #10)	5 lbs drained wt					3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Green Peas															
Frozen	5 lbs		4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp	2 Tbsp/ 1 Tbsp	3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Canned (approx.1 #10)	5 lbs drained wt		4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp	2 Tbsp/ 1 Tbsp	3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Mixed Vegetables															
Frozen	5 lbs		4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp		3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Canned (approx.1 #10)	5 lbs drained wt		4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp		3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Potatoes, French Fries															
Frozen	4 lbs					3 Tbsp		2 Tbsp		2 Tbsp		2 Tbsp			
Spinach															
Frozen cooked & drained wt	6 lbs 14 lbs 13 oz					3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Whole Kernel Corn															
Frozen	5 lbs		4 Tbsp/ 2 Tbsp	2 Tbsp/ 1 Tbsp		3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz
Canned (approx.1 #10)	5 lbs drained wt					3 Tbsp	6 Tbsp		4 Tbsp		6 Tbsp		5 Tbsp	4 oz	2 oz

Seasoning Mix: Mix herbs and spices in oil, add water and let stand for 15 minutes. Stir and add to cooked vegetables.

*1st measurement is fresh, 2nd is dry

**Asian recipe: Should use 1 oz. sesame oil and 1 oz neutral oil like peanut or corn oil.

Dry Mix: Should be sprinkled over potatoes after they have been fried and drained.

50 1/4 cup Proportions

Spice Mixture Chart

Mixture	Salt	Pepper	Garlic Powder	Onion Powder	Ginger Powder	Curry Powder	Chili Powder	Cumin	Dry Mustard	Paprika	Oregano	Tarragon	Basil	Parsley
American	1 tsp	1 tsp	2 tsp	2 tsp										1 Tbsp
Asian	1 tsp		1 Tbsp	3 Tbsp	2 tsp				2 tsp					2 tsp
Cajun	3/4 tsp	1 tsp	2 tsp	2 tsp						1/4 tsp				
Curry	1 tsp	1/2 tsp	1 Tbsp	1 1/2 Tbsp	1 tsp	1 tsp						1 tsp		
Indian	1 tsp		2 tsp	1 tsp		2 tsp								
Italian	1 tsp	1/2 tsp	2 1/2 Tbsp	2 Tbsp							1 tsp		2 tsp	
Mexican	1 tsp		2 tsp	1 tsp			2 tsp							
Tex Mex	1 tsp	1/2 tsp	1 Tbsp	1 1/2 Tbsp			4 tsp	1/2 tsp		1/2 tsp	1 tsp			

500 Servings

Spice Mixture Chart

Mixture	Salt	Pepper	Garlic Powder	Onion Powder	Ginger Powder	Curry Powder	Chili Powder	Cumin	Dry Mustard	Paprika	Oregano	Tarragon	Basil	Parsley
American	3 Tbsp + 1 tsp	3 Tbsp + 1 tsp	6 Tbsp + 2 tsp	6 Tbsp + 2 tsp										1/2 c + 2 Tbsp
Asian	3 Tbsp + 1 tsp		1/2 c + 2 Tbsp	1 3/4 c + 2 Tbsp	6 Tbsp + 2 tsp				6 Tbsp + 2 tsp					6 Tbsp + 2 tsp
Cajun	2 Tbsp + 1 1/2 tsp	3 Tbsp + 1 tsp	6 Tbsp + 2 tsp	6 Tbsp + 2 tsp						2 1/2 tsp				
Curry	3 Tbsp + 1 tsp	1 Tbsp + 2 tsp	1/2 c + 2 Tbsp	3/4 c + 3 Tbsp	3 Tbsp + 1 tsp	3 Tbsp + 1 tsp						3 Tbsp + 1 tsp		
Indian	3 Tbsp + 1 tsp		6 Tbsp + 2 tsp	3 Tbsp + 1 tsp		6 Tbsp + 2 tsp								
Italian	3 Tbsp + 1 tsp	1 Tbsp + 2 tsp	1 1/2 c + 1 tsp	1 1/4 c							3 Tbsp + 1 tsp		6 Tbsp + 2 tsp	
Mexican	3 Tbsp + 1 tsp		6 Tbsp + 2 tsp	3 Tbsp + 1 tsp			6 Tbsp + 2 tsp							
Tex Mex	3 Tbsp + 1 tsp	1 Tbsp + 2 tsp	1/2 c + 2 Tbsp	3/4 c + 3 Tbsp			3/4 c + 4 tsp	1 Tbsp + 2 tsp		1 Tbsp + 2 tsp	2 Tbsp + 1 tsp			



Culinary Technique Steaming Vegetables in a Steamer

1. **Place approximately 50, 1/4-cup servings of the fresh or frozen vegetable in a 12 x 20 x 2-inch counter pan.**
Do not place a larger amount of vegetables in the pan in order to allow room for the steam to circulate around the vegetables.
Do not add any liquid.
2. **Steam uncovered at 5 pounds pressure, for a compartment steamer.**
Follow the recipe or refer to the chart on page 13.
Follow manufacturers directions for steamers operating at other pressures or when using convection steamers or combination ovens.
3. **Drain the excess liquid from the cooked vegetable.**
4. **Season with herbs and spices. Do not add butter or margarine. Limit salt to 1/2 teaspoon for 50 cup servings.**
5. **Serve the hot vegetable at once.**

Try these USDA Recipes that include this Culinary Technique

Cooking Fresh and Frozen Vegetables..... I-1

Mexicali Corn..... I-12

Herbed Broccoli and Cauliflower Polonaise .. I-18

Orange Glazed Carrots I-13A



Vegetable Steamer Chart

Timetable for Cooking or Steaming Fresh or Frozen Vegetables

For 100 Servings, 1/4 Cup Each

Vegetables (As Purchased)	Fresh or Frozen	Amount to Purchase (Pounds)	Ready to Cook (Pounds)	BOILING		STEAMING
				Amount of Water (Quarts)	Cooking Time After Water Boils (Minutes)	Time at 5 Pounds Pressure (Minutes)
Asparagus: spears cuts and tips	Fresh Frozen	20.7 12.3	11.0 12.3	3 1/4 1 1/4	10 to 25 7 to 10	7 to 10 5 to 10
Beans or peas, blackeye	Fresh Frozen	19 8.9	9.7 8.9	2 1/2 1 3/4	30 to 45 15 to 30	20 to 40 20 to 30
Beans, green, cut	Fresh Frozen	9 8.7	7.9 8.7	1 3/4 1	15 to 30 10 to 20	20 to 30 10 to 15
Beans, lima: Baby Fordhook	Fresh Frozen Frozen	21.1 9.2 9.0	9.3 9.2 9.0	2 1/2 1 1/2 1 1/2	15 to 25 12 to 15 6 to 12	15 to 20 10 to 15 12 to 20
Beet greens	Fresh	28.6	13.7	water on leaves	15 to 25	15 to 25
Beets, whole for slicing	Fresh	13.0	9.5	to cover	45 to 60	60 to 75
Broccoli: spears cut or chopped	Fresh Frozen Frozen	10.6 10.4 10.4	8.6 10.4 10.4	2 1/4 1 1/2 1 1/2	10 to 25 10 to 15 6 to 20	7 to 10 5 to 10 10 to 20
Brussel sprouts	Fresh Frozen	11.7 9.6	8.9 9.6	6 1 1/2	10 to 20 10 to 15	5 to 12 5 to 10
Cabbages (green and red): shredded wedges	Fresh Frozen	7.3 11.6	6.5 10.5	1 1/2 1 3/4	10 to 15 15 to 20	5 to 12 12 to 20
Carrots: whole (for slicing) cuts and tips	Fresh Frozen	11.9 9.5	8.3 9.5	2 1/2 1	20 to 30 8 to 10	15 to 30 3 to 5
Cauliflower, flowerets	Fresh Frozen	11.3 10.9	7.0 10.9	4 1/2 1 1/2	15 to 20 10 to 12	8 to 12 4 to 5
Celery, 1" pieces	Fresh	12.4	10.6	3 1/2	15 to 20	10 to 15
Chard	Fresh	15.8	14.5	water on leaves	15 to 25	15 to 25
Collard greens	Fresh Frozen	9.6 10.8	7.1 10.8	3 1/2 1 3/4	20 to 40 30 to 40	15 to 30 20 to 40
Corn: on cob (1/2 medium ear) whole kernel	Fresh Frozen	27 9.1	17.6 9.1	6 or to cover 1 1/2	5 to 15 5 to 10	8 to 10 5 to 10
Eggplant, pieces or slices	Fresh	14.8	12.0	3 1/2	15 to 20	10 to 15
Kale	Fresh Frozen	8.5 10.6	5.7 10.6	2 1 3/4	25 to 45 20 to 30	15 to 35 15 to 30
Mustard greens chopped	Fresh Frozen	7.6 8.6	7.1 8.6	water on leaves 1 3/4	15 to 25 20 to 30	15 to 25 15 to 20
Okra, whole	Fresh Frozen	10.3 8.5	9.0 8.5	2 1 1/4	10 to 15 3 to 5	8 to 15 3 to 5
Onions: Mature, quartered if large	Fresh	14.1	12.4	7	20 to 35	20 to 35

Continued



Vegetable Steamer Chart, *continued*

Timetable for Cooking or Steaming Fresh or Frozen Vegetables

For 100 Servings, 1/4 Cup Each

Vegetables (As Purchased)	Fresh or Frozen	Amount to Purchase (Pounds)	Ready to Cook (Pounds)	BOILING		STEAMING
				Amount of Water (Quarts)	Cooking Time After Water Boils (Minutes)	Time at 5 Pounds Pressure (Minutes)
Parsnips, 3" pieces	Fresh	12.3	10.2	4 3/4	20 to 30	15 to 20
Peas and carrots	Frozen	9.2	9.2	1	8 to 10	3 to 5
Peas, green shelled	Fresh	24.7	9.4	2	10 to 20	10 to 20
	Frozen	9.9	9.9	1	5 to 10	3 to 5
Potatoes, whole	Fresh	11.3	9.2	5	30 to 45	30 to 45
Rutabagas, 1" cubes	Fresh	12	10.2	2 1/2	20 to 30	15 to 30
Soybeans, green	Fresh	14.5	9.4	1 3/4	10 to 20	
Spinach, leaf	Fresh	13.1	11.5	water on leaves 1 1/4	10 to 20	4 to 5
	Frozen	15.3	15.3		5 to 10	5 to 10
Squash, winter: Butternut, pieces mashed	Fresh	13.3	11.2	5 1/4	15 to 30	15 to 20
	Frozen	14.3	14.3			20 to 25 (covered)
Succotash	Frozen	10.6	10.6	2	6 to 15	12 to 20
Sweet potatoes, whole	Fresh	11.0	8.6	5	30 to 45	20 to 40
Turnip green chopped	Fresh	15.4	10.8	water on leaves 1 3/4	15 to 25	15 to 25
	Frozen	10.5	10.5		20 to 30	15 to 20
Vegetables, mixed	Frozen	12.3	12.3	1	12 to 20	12 to 20

NOTE: Cooking times for fresh vegetables are approximate; they can differ with variety, maturity, quality, and size of vegetables.



Culinary Technique Steaming Vegetables in an Oven

1. Place approximately 50, 1/4 cup servings of the fresh or frozen vegetable in a perforated 12 x 20 x 2-inch counter pan. Then place the perforated pan in a 4-inch deep counter pan that contains 2 cups of water.

To allow room for the steam to circulate around the vegetables, do not place a larger amount of vegetables in the pan.

2. Cover both pans tightly with foil.

This arrangement of pans creates a steamer effect in a perforated pan.

3. Place the covered pans in an oven at 350 °F for approximately 20 minutes. Cook the vegetable until it is fork tender.

Times will vary with the vegetables.

4. Drain the excess liquid from the cooked vegetable.
5. Season with herbs and spices. Do not add butter or margarine. Limit salt to 1/2 teaspoon for 50 servings.
6. Serve the hot vegetable at once.

Try these USDA Recipes that include this Culinary Technique

Cooking Fresh and Frozen Vegetables..... I-1

Mexicali Corn..... I-12

Herbed Broccoli and Cauliflower Polonaise .. I-18

Orange Glazed Carrots I-13A



Culinary Technique Stir-Frying Vegetables

1. Decide on the vegetables that will be used for stir-frying and the amount of each to be used.

Make a list of the vegetables to be added in sequence beginning with those that take the longest time to cook.

Some vegetables may need to be blanched or steamed a short time before stir-frying.

Follow the recipe.

When using a stir-fry vegetable mixture, follow the directions on the package.

2. When using fresh vegetables, prepare them for stir-frying.

All the vegetables for stir-frying should be cut in bite-size pieces.

Some vegetables may need to be blanched to prepare them for stir-frying.

Refer to the lesson on preparing salads to review the culinary technique blanching.

3. Heat the pan, add the cooking medium, and heat it.

Most stir-fry recipes require a small amount of oil as the cooking medium.

Some recipes may suggest using broth, juices, or sauces.

Follow the recipe.

4. Add the vegetables that take the longest time to cook. Then add those that take a shorter time.

Vegetables should be in a single layer so they will not steam and cook in their own juices.

Stir the vegetables as they cook making sure all vegetables stay in contact with the heated surface of the pan.

5. Follow the recipe directions to add the flavoring ingredients.

Be careful not to overcook the vegetables.

Some recipes suggest adding the flavoring, then covering and steaming for 2 minutes. If this step is done, remain at the pan and time the steaming, since overcooking will cause the vegetables to lose quality.

6. Serve the stir-fry vegetables at once.

Prepare stir-fry vegetables in batches for just-in-time service because vegetables will continue to cook on the serving line.

Try these USDA Recipes that include this Culinary Technique

Chinese Style Vegetables I-9

Main Dish Stir-Fry Chicken, Beef, Pork D-39



Culinary Technique Roasting Vegetables

1. **Preheat the oven to 325 °F–350 °F.**
2. **Cut vegetables into uniform shape and size.**
3. **Toss vegetables with olive oil.**
Season with pepper, garlic, spices, or herbs. Use no more than 1 teaspoon per 50 portions.
4. **Place vegetables in a single layer on a sheet pan.**
Do not crowd the vegetables as this will cause them to steam.
5. **Bake until vegetables are tender.**



Try these vegetables for roasting:

Asparagus
Beets
Brussels sprouts
Carrots
Corn
Eggplant
Mushrooms
Onions
Parsnips
Peppers
Potatoes
Rutabagas
Summer squash
Sweet potatoes
Tomatoes
Turnips
Zucchini



Culinary Technique Oven-Baked French Fried Potatoes

For best results:

Cook from frozen state using recommended time and temperature.

Always cook to a light golden color. Do not overcook.

When cooking smaller amounts, reduce cooking time.

1. **Preheat the oven to 425 °F–450 °F.**
2. **Remove from the freezer only the amount of French fries to be used within 1 hour.**

Try to remove a full box since the whole box will thaw more slowly.

3. **Place a single layer of French fries on a sheet pan. For best results use 2 1/2 pounds per full sheet pan.**

Bake according to package instructions. Turn once for uniform cooking.

4. **Pour the French fries into a holding bin or pan lined with absorbent paper.**

Hold under a heat lamp at 120 °F–140 °F.

Evenly spread the fries in the bin.

Remember to prepare fries just-in-time for service so they will not have to be held long.

5. **Season fries.**

Limit the salt to 1/2 teaspoon for 50 servings of fries.

Try other seasonings instead of salt. For example:
for 50 servings of fries: combine 2 tablespoons
Spanish paprika and 2 teaspoons onion powder, or
2 teaspoons dried leaf thyme, or basil, or oregano.

There are many excellent potato products that can be cooked in the oven and meet the following criteria:

- 0 grams of trans fats,
- less than 35% calories from total fat,
- less than 10% calories from saturated fat, and
- less than 300 milligrams of sodium.

Follow the package directions for a quality product. Remember to batch cook for just-in-time for service.





Quality Standards

For many students, meals at school provide most of the vegetables in their diet. Meals at school are an ideal way for students to learn to eat new foods, including unfamiliar vegetables. It is important that vegetables be prepared so they look good, taste good, and provide their important nutrients.

Before any food is placed on the serving line, it should be evaluated using the Quality Score Card. Follow the recipe or package directions for cooking a vegetable to meet quality standards. The school nutrition manager and assistant who prepared the food should make the determination whether the food product meets the standards on the Quality Score Card. If the decision is made that the food does not meet the quality standards, do the following things:

1. Substitute another similar food on the serving line. Follow the school district procedure for menu substitutions.
2. Use the vegetable another way, if possible, to avoid wasting the food.
3. Determine what happened during preparation that caused the poor quality and make plans to correct the preparation next time.





Quality Score Card for Cooked Vegetables

Date: _____ Name of Menu Item: _____

Proudly Prepared by _____

Quality Scored by _____

Directions: When the food is ready to serve, use this Quality Score Card to evaluate the quality. Mark **YES** when the food meets the standard and **NO** when it does not. Mark **NA** (Not Applicable) when a specific quality standard does not apply to the food being evaluated. Use the **COMMENTS** section to explain why a food does not meet a standard.

Remember, if a food does not meet the quality standards, it should not be placed on the serving line.

Quality Standard	Yes	No	NA	Comments
Appearance				
Bright color typical of the vegetable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Vegetable pieces are similar in size.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Vegetable pieces are intact (pieces are not overcooked with a mushy appearance).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
There is no visible oil or fat.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Garnish is edible and appropriate for the dish.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Texture or Consistency				
Vegetable is at the peak of ripeness.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
All pieces of the vegetable have the same texture.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Flavor and Seasoning				
Vegetable has a definite, good flavor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Seasonings are detectable but not overpowering.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Seasonings enhance the vegetable flavor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
A minimal amount of salt has been added (recipe used).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
A minimal amount or no fat has been added (recipe used).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
If a sauce is used, it complements the vegetable (mild, not overpowering).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Service Temperature				
160 °F – 180 °F	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	





Culinary Application and Practice Activity

Culinary Practice is an activity designed to give foodservice assistants an opportunity to practice preparing vegetables. Use the Culinary Practice Score Card for the activity.

1. Foodservice assistants may work as partners or individually, depending on the directions from the manager. One partner should be someone who cooks and the other, someone who has other responsibilities. Both foodservice assistants should work together to complete the Culinary Practice.
2. The manager and foodservice assistants should discuss the Culinary Practice for Preparing Vegetables. Make a note of the date the Culinary Practice should be completed and discussed with the manager.
3. The manager will approve the recipe to be used for the practice. The recipe should use one of the culinary techniques described in this lesson. Review the steps of the culinary techniques:
 - Culinary Technique: Steaming Vegetables in a Steamer
 - Culinary Technique: Steaming Vegetables in an Oven
 - Culinary Technique: Stir-Frying Vegetables
 - Culinary Technique: Roasting Vegetables
 - Culinary Technique: Oven-Baked French Fried Potatoes
4. The manager and foodservice assistants who prepared the product will evaluate the product before it is placed on the serving line. Use the Quality Score Cards.





Culinary Practice Score Card for Cooked Vegetables

Name(s): _____

(This practice activity may be completed individually or with a partner. The manager will make this assignment at the end of the lesson.)

Purpose: The purpose of the activity is to practice Preparing Vegetables.

Culinary Technique: (Identify the culinary technique that you will use. Refer to the previous pages for a description of each technique.)

Name of the Recipe: _____

Date for Production: _____

Directions: The manager and foodservice assistant(s) will select a recipe for vegetables that includes one of the culinary techniques described in this lesson. Check **YES** or **NO** when each step is completed.

	Yes	No
<i>Plan food production for just-in-time service.</i>		
Did you plan food production for just-in-time service?	<input type="radio"/>	<input type="radio"/>
<i>Review the Quality Score Card and the recipe.</i>		
Did you review the recipe so you are familiar with the ingredients, equipment, and directions?	<input type="radio"/>	<input type="radio"/>
Did you review the Quality Score Card so you will know how the finished product should look and taste?	<input type="radio"/>	<input type="radio"/>
<i>Organize equipment and ingredients.</i>		
Did you assemble all the equipment needed?	<input type="radio"/>	<input type="radio"/>
Did you assemble all of the ingredients needed?	<input type="radio"/>	<input type="radio"/>
<i>Use the right culinary technique.</i>		
Did you use the culinary technique correctly?	<input type="radio"/>	<input type="radio"/>
<i>Deliver a quality product.</i>		
Did you use the Quality Score Card to evaluate the product?	<input type="radio"/>	<input type="radio"/>
Did you review the product with the manager?	<input type="radio"/>	<input type="radio"/>
<i>Discuss the following questions with the manager before serving.</i>		
How can the appearance of the food be improved?		
How can the flavor or taste of the food be improved?		
How can the texture and tenderness of the food be improved?		
How can the service temperature of the food be improved?		

The manager's signature indicates this practice has been completed satisfactorily. The manager should keep this on file or submit it to the central office to document the completion of the lesson.

Name of Manager: _____ **Date Signed:** _____



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