

Sugar: More than Just a Sweetener

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Introduction

U.S. consumers eat an average of 74 pounds of added sugars per year. That equals about 23 teaspoons every day, or 345 calories. Added sugar is defined as sugar not naturally occurring in the food. This could be sugar used to sweeten beverages or to make jams, jellies and other sweet treats.

At the same time, sugar serves multiple purposes in food. Nonnutritive sweeteners can be used to replace sugar. However, sweeteners do not have the ability to replace all the roles sugar plays in the foods' chemical reactions. This lesson will cover the variety of sugars and nonnutritive sweeteners available and the functions of sugar.

Note: Nonnutritive is the current terminology for artificial sweeteners.

Objectives

After the lesson, participants should:

- have a greater knowledge of the variety of sugars,
- have a greater knowledge of non-nutritive sweeteners,
- have a greater knowledge of the roles of sugar in food, and
- have experienced an example of replacing sugar with nonnutritive sweeteners.

Intended Audiences

This lesson is written for the primary grocery shopper and cooks in the household. The goal is to help them understand the functions sugar serves in food and to choose when and if to replace sugar with nonnutritive sweeteners.

Before the Lesson

Review the materials in this Leader's Guide and the Fact Sheet (MF2929). A slide show is also available by e-mail request from reu-bank@ksu.edu. The slide show outlines the materials in the fact sheet and could be used for guiding a group through the material.

Select a teaching demonstration. Two are provided with this lesson. Prepare the materials as listed for either one. Both can be used as a taste test and prepared as part of the lesson or in advance, based on the time available.

For additional background information, visit The Sugar Association (www.sugar.org). The publications *How Well Do You Know Sugar* and *The Functional Role of Sugar in Cooking and Baking* are available for download or order.

Copy and distribute the evaluation on page 4 for participants to complete after the lesson.

Introduction Suggestions

Adult education research shows that getting participants involved in the beginning of a lesson will increase attention and information retention. Even if group members know each other, select one of these options for them to share about themselves or try to answer.

- How many types of sugars do you have in your kitchen?
- Thinking of sugar, name a role it plays in our food.
- What are your experiences using non-nutritive sweeteners?
- Have you cooked or baked with nonnutritive sweeteners?

- Name a food you have tried with non-nutritive sweetener.
- How many calories are in a teaspoon of sugar? (15)
a tablespoon of sugar? (45)
a cup of sugar? (720)

Share correct answers after everybody gets a chance to guess.

Community Awareness Activities

- Educational displays at health or county fairs.
- Presentations to groups such as parents and parent educators, service clubs, older adults, diabetic support groups, and business organizations.
- Host taste-tests at community festivals or grocery stores.

Drink Taste Testing

Supplies

2 packages unsweetened drink mix (each yields 2 quarts)

¼ cup (or equivalent) of each sweetener available in your area:

- acesulfame potassium
- aspartame
- saccharin
- stevia
- sucralose
- sugar

1 gallon cold water

6 pint containers

Small cups for sampling

Directions

Mix both packages of drink mix into the gallon of water. Add the equivalent of ¼ cup of sugar to each pint container. Divide the unsweetened drink mix among the six pint containers. (Two pints will be left.) Mix together and label containers.

This will provide eight 2-ounce servings of each of the six drinks. Nutrition Facts labels

Nutrition Facts	
Serving Size (237g)	
Servings Per Container	
Amount Per Serving	
Calories 0	Calories from Fat 0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 0g	0%
Dietary Fiber 0g	0%
Sugars 0g	
Protein 0g	
Vitamin A 0%	Vitamin C 0%
Calcium 0%	Iron 0%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Saturated Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

Drink mix made with nonnutritive sweetener

Nutrition Facts	
Serving Size (262g)	
Servings Per Container	
Amount Per Serving	
Calories 100	Calories from Fat 0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 25g	8%
Dietary Fiber 0g	0%
Sugars 25g	
Protein 0g	
Vitamin A 0%	Vitamin C 0%
Calcium 0%	Iron 0%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Saturated Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

Drink mix made with sugar

are included for a serving size of 8 ounces. These could be displayed with samples.

Have participants sample and share observations about the different types of nonnutritive sweeteners compared to sugar.

Cake Taste Testing

Ingredients

½ cup shortening

1 cup sugar (or equivalent for each nonnutritive sweetener used)

2 eggs

1 teaspoon vanilla extract

1¼ cups plus 2 tablespoons all-purpose flour

1½ teaspoons baking powder

½ teaspoon salt

¾ cup plus 2 tablespoons milk

Directions

Preheat oven to 350 degrees F. Grease and flour one 9-inch cake pan (round or square).

Using an electric mixer, cream together shortening and sugar (or nonnutritive sweetener).

Beat in eggs and vanilla.

Nutrition Facts	
Serving Size (69g)	
Servings Per Container	
Amount Per Serving	
Calories 200	Calories from Fat 110
% Daily Value*	
Total Fat 13g	19%
Saturated Fat 4.5g	24%
Cholesterol 55mg	19%
Sodium 240mg	10%
Total Carbohydrate 17g	6%
Dietary Fiber less than 1g	2%
Sugars 2g	
Protein 4g	
Vitamin A 2%	Vitamin C 0%
Calcium 8%	Iron 6%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
Calories: 2,000 2,500	
Total Fat	Less than 65g 80g
Saturated Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	

Yellow cake made with nonnutritive sweetener

In a separate bowl, combine flour, baking powder, and salt. Add to creamed mixture alternately with milk. Mix well. Pour batter into prepared pan.

Bake 30 minutes or until toothpick inserted into center of cake comes out clean.

Label with the type of sweetener used. Cool.

Repeat for each type of sweetener you choose to have in the taste testing.

When baking cakes, expect mixed results. Saccharin and aspartame break down when heated. Remember to read labels carefully. Some baking versions of nonnutritive sweeteners are made with a large percentage of sugar.

Nutrition Labels are provided to include with display of sample cakes. If possible, let participants evaluate whole cakes before slicing to serve. This allows them to see which ones work the best for baking.

Each cake will yield 24 sample size servings. The nutrition labels are calculated on nine servings per cake.

Nutrition Facts	
Serving Size (90g)	
Servings Per Container	
Amount Per Serving	
Calories 280	Calories from Fat 110
% Daily Value*	
Total Fat 13g	19%
Saturated Fat 4.5g	24%
Cholesterol 55mg	19%
Sodium 240mg	10%
Total Carbohydrate 38g	13%
Dietary Fiber less than 1g	2%
Sugars 24g	
Protein 4g	
Vitamin A 2%	Vitamin C 0%
Calcium 8%	Iron 6%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
Calories: 2,000 2,500	
Total Fat	Less than 65g 80g
Saturated Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	

Yellow cake made with sugar

References and Resources

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Evaluation

Please copy and distribute.

Please mark how much you agree with the following five statements:

I am more knowledgeable about the different types of sugar after the lesson.

Completely Agree Agree Neutral Disagree Completely Disagree

I am more knowledgeable about the different nonnutritive sweeteners after the lesson.

Completely Agree Agree Neutral Disagree Completely Disagree

I am more knowledgeable about the functions of sugar after the lesson.

Completely Agree Agree Neutral Disagree Completely Disagree

I am more comfortable substituting nonnutritive sweeteners for sugar after the lesson.

Completely Agree Agree Neutral Disagree Completely Disagree

The taste-testing samples reinforced the information about the difference in sweeteners.

Completely Agree Agree Neutral Disagree Completely Disagree

Please share other comments or suggestions about the lesson.

Return completed evaluations to: Robin Eubank, K-State Research and Extension - Barber County Extension Office, 118 E. Washington, Medicine Lodge, KS 67104.

Survey may also be completed online at <http://www.surveymonkey.com/s/NHQHWL6>

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