



The Versatility of Dairy Foods:

Nutrition Explored

Hands-On Activities and Recipes

Submitted by Susan Halpin, Algonquin Regional High School, Northborough, MA

Grade Level: Grades 9-12

Using Dairy Products as Appetizer, Main Dish & Dessert
Hands-on Cooking & Nutrition Explored

This lesson plan has been slightly adapted from the following lesson plans:

http://www.kidsacookin.org/pdfs/02_NP100e_Dairy.pdf

<http://www.nfsmi.org/documentlibraryfiles/PDF/20110831094202.pdf>

Objectives:

Students will be able to :

- Identify foods that belong in the dairy group of the ChooseMyPlate model
- State the serving size and number of servings of dairy foods recommended for each age group.
- Identify the nutrients in dairy products and select low-fat or fat-free dairy foods as part of a healthy diet.

Massachusetts Family & Consumer Science Frameworks

7.15 Analyze factors that influence nutrition and wellness practices across the lifespan;

- 7.16 Evaluate the nutritional needs of individuals and families in relation to health and wellness across the life span;

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- 7.17 Demonstrate ability to acquire, handle, and use foods to meet nutrition and wellness needs of individuals and families across the life span;

Multiple Days – depending on school period lengths and activities chosen

Materials: White board or easel, dry erase marker, small white boards or clipboards for students with paper, dry erase markers for each students, something to erase with either dry eraser or tissues, food models or dairy product containers, bags of perlite, jar with 100 pennies, paper picture of a bone, whole punch

1. What are the foods in the dairy group of the ChooseMyPlate model?

Challenge students to write down as many dairy foods as they can in 2 minutes (have a stop watch or timer). Write list on white board or easel. Provide some kind of prize to the winner.

What mineral do dairy products have in them that make them important to consume each day?

Set up a collection of containers or use food models from various dairy foods. For example, whole milk, 2% milk, 1% milk, skim milk, half and half, light cream, heavy cream

Or Examples of Yogurt with different fat contents

Or Examples of Ice cream with different fat contents

Have index cards with the following 5 clues on them. Have students read the clues out loud, leave the cards visible so students can refer to them.

Have students look at the nutrition facts panels for a mineral that is common between all of the food products as well as use the clue cards. Have them write down the mineral they think is the correct answer.

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Clue Cards

This mineral is in foods that are sometimes frozen or are in refrigerated cases at the store. The foods can have different flavors. (ice cream products)

This mineral is in foods that sometimes have fat, sometimes don't have any fat, or may have reduced fat. (milk, ice cream, yogurt, cottage cheese products)

This mineral is in a solid food that is often shredded and added to foods or is used in slices. (cheese products)

This mineral is in a liquid we drink and use on breakfast cereal. (Milk products)

This mineral is in your bones, teeth and in body fluids. (CALCIUM)

Why is Calcium so important to your body? Have students write their answers on their white boards.

Your skull is a bone that protects what organ? BRAIN

What if our spine, bones in arms and legs, and fingers weren't strong? STAND UPRIGHT, WALK, RUN, PICK UP OBJECTS

When we are born we have about 1/4 cup of calcium in our body.

Show bag with 1/4 cup of perlite.

By the time we are 10 years old we should have about 3 1/2 cups of calcium in our body.

Show bag with 3 1/2 cups of perlite.

By the time we are 15 years old we should have about 7 cups of calcium in our body.

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Show bag with 7 cups of perlite.

Calcium has 2 other functions in your body.

We have calcium in 2 other places of our body

- body fluids
This calcium helps your nerves send messages to your muscles to contract or relax so that you can raise your arm or move your legs, or use your fingers.
- blood
The calcium in your blood stream helps your blood to clot when you get cut so that you don't bleed to death. The calcium in your blood also delivers the messages that help your heart to beat with a regular rhythm and that help you maintain your blood pressure.

Show the jar of 100 pennies.

Let's say that these 100 pennies represent all of the calcium in your body. How many of the pennies do you think are in your bones and how many are in your blood and body fluids?

Would someone want to take a guess and divide the pennies to show what percentage of the calcium in your body is in your bones and what percentage is in your body fluids? Have 2 volunteers guess.

ANSWER

The division is 99 percent—or 99 of the pennies—in your bones, and 1 percent—or one penny—in your blood or body fluids.

Your body will always keep the 1 percent it needs in your blood for the important jobs of helping nerves send messages and blood to clot, and for sending the messages for heart rhythm and blood pressure.

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Where do you think your body gets this calcium for your blood?
Wait for an answer from the group.

ANSWER

The body will take calcium from the bones and increase absorption of calcium from foods eaten.

So using our pennies, when the 1 percent (one penny) of calcium in the blood is used up, your body will replace it with calcium from your bones (one penny) or calcium from your diet. Milk has a nutrient added to it to help you absorb more calcium from foods—vitamin D.

Have you seen vitamin D listed on the Nutrition Facts label? Vitamin D is found only in milk. It is not added to other dairy products.

I would like to tell you a story about a bone, so you can see what affects bone density (compactness of the bone). As you listen to the story, think about how the bone is affected by certain conditions. Let's say you ate plenty of calcium-rich foods up until about junior high school. You developed this nice dense bone that had lots of calcium stored in it. Because it is dense and has a lot of calcium, it is strong.

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Show the paper bone.

But then you got careless about drinking milk and started to drink soda instead. Using the paper punch, begin punching holes in the paperbone. Continue punching holes in the paper bone as you tell the story.

Maybe you thought it wasn't cool to order milk when you stopped for burgers with the other kids. Let's say you didn't eat many other dairy foods at home either. Your bones were growing in length, but without calcium they weren't getting very dense. Open spaces were developing.

After high school, you got married and after a while became pregnant. Calcium was needed for bone development in the fetus. To keep calcium in your blood, your body was now using lots of calcium from your bones. Then you breastfed your baby—it's the best start for babies—and more calcium was used from your bones. Now you are about 50 and go through menopause.

You don't use estrogen replacement therapy (which helps slow down bone loss), and you still don't drink milk—so lots of calcium is being used from your bones to maintain calcium in your blood. This is how your bone now looks, with lots of open spaces. Do you think this would be a strong bone? This is what a bone with osteoporosis might look like

2. How much Dairy is needed each day at various stages in life? What does a serving size of Dairy look like?

Have students go to the ChooseMyPlate.gov website

<http://www.choosemyplate.gov/food-groups/dairy-amount.html>

3. Choose low-fat or nonfat dairy options

The [Dietary Guidelines for Americans](#) are jointly issued and updated every 5 years by the [Department of Agriculture \(USDA\)](#) and the [Department of Health and Human Services \(HHS\)](#). They provide authoritative advice for Americans

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ages 2 and older about consuming fewer calories, making informed food choices, and being physically active to attain and maintain a healthy weight, reduce risk of chronic disease, and promote overall health.

<http://www.choosemyplate.gov/dietary-guidelines.html>

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4. Assessment:

Test Your Dairy Group IQ

Using the information you just learned about some of the benefits of consuming dairy products, mark the following statements as true or false (T or F).

1. ____ Consuming dairy products are crucial for young children because their bones are still developing, but it is not important for older teens and adults to consume dairy.
2. ____ Dairy products are good sources of calcium, potassium, and vitamin D.
3. ____ Adults should consume about 3 cups of fluid milk, or equivalent dairy foods, per day.
4. ____ Choose dairy products that are higher in fat, such as whole milk and cheese, because they are better sources of calcium than low-fat products.
5. ____ The dairy group includes milk, milk-based desserts (such as pudding or ice cream), cheese, and yogurt.
6. ____ There is no alternative products available for lactose-intolerant individuals, so there is no way for them to obtain the nutrients found in dairy products.
7. ____ The nutrients in dairy products will help you maintain bone mass throughout your life and reduce your risk of osteoporosis.
8. ____ Moderate evidence indicates that intake of dairy products is associated with a reduced risk of cardiovascular disease and type 2 diabetes and with lower blood pressure in adults.
9. ____ Dairy products are not healthy because they are high in fat.
10. ____ Consuming enzyme lactase before consuming milk is an option for those with lactose intolerance.

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Test Your Dairy Group IQ (Answers)

Using the information you just learned about some of the benefits of consuming dairy products, mark the following statements as true or false (T or F).

1. **F** Consuming dairy products are crucial for young children because their bones are still developing, but it is not important for older teens and adults to consume dairy.
2. **T** Dairy products are good sources of calcium, potassium, and vitamin D.
3. **T** Adults should consume about 3 cups of fluid milk, or equivalent dairy foods, per day.
4. **F** Choose dairy products that is higher in fat, such as whole milk and cheese, because they are better sources of calcium than low-fat product.
5. **T** The dairy group includes milk, milk-based desserts (such as pudding or ice cream), cheese, and yogurt.
6. **F** There is no alternative products available for lactose-intolerant individuals, so there is no way for them to obtain the nutrients found in dairy products.
7. **T** The nutrients in dairy products will help you maintain bone mass throughout your life and reduce your risk of osteoporosis.
8. **T** Moderate evidence indicates that intake of dairy products is associated with a reduced risk of cardiovascular disease and type 2 diabetes and with lower blood pressure in adults.
9. **F** Dairy products are not healthy because they are high in fat.
10. **T** Consuming enzyme lactase before consuming milk is an option for those with lactose intolerance.

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Recipes and Additional Activities

- Make Your Own Butter activity
<http://www.scientificamerican.com/article/bring-science-home-shaking-butter/>
- Use Cheese identification app for iPad or PowerPoint presentation after viewing PowerPoint -- sample these cheeses or have identification contest
- Prepare Macaroni and Cheese recipe
http://www.eatingwell.com/recipes/baked_mac_cheese.html
- Make Homemade Vanilla Ice Cream
<http://www.cuisinart.com/recipes/desserts/5200.html>

Additional Resource Links:

<http://www.choosemyplate.gov/food-groups/downloads/TenTips/DGTipsheet5GotYourDairyToday.pdf>

<http://healthymeals.nal.usda.gov/resource-library/bulletin-board-resources/calcium-and-bone-health-bulletin-board-resources>

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