

Calcium and Vitamin D

Main objectives: To describe the importance of consuming calcium and vitamin D. To discuss different types of dairy as well as other sources of calcium. To emphasize consuming low fat dairy products, since dairy contains saturated fat.

Essential Discussion Topics:

- *What is calcium?* It is a mineral that helps your bones grow and allows your nerves and muscles to work correctly. The calcium you eat is stored in your bones and in your teeth. To grow, you need to eat calcium so it can be added onto your bones. The mass of your bones grows most when you are between the ages of 9 and 18 but doesn't actually stop until you are 30. Our body always removes and replaces small amounts of calcium from our bones so you need calcium throughout your lifetime.
- *Why are strong bones important?* Your bones are important to help you stand, to make you into the shape of a person. Muscles need bones so you can move. Your bones are important for protecting important parts of your body, such as your heart and lungs. What would happen if you didn't get enough calcium for your bones? If you don't eat enough calcium, your bones will become thin and weak. When someone's bones are too thin and break easily, it is called osteoporosis. Osteoporosis usually doesn't happen until someone is older, but it's important to eat enough calcium now so you don't have those problems later on.
- *What else do we need to eat for strong bones?*
 - **Vitamin D.** You can get vitamin D from sunlight, so during the summer it is easy to get vitamin D. All milk has vitamin D added to it as well. Vitamin D helps your body to actually use the calcium you consume.
 - You also need **weight-bearing physical activity** for your body to form stronger bones. This means staying active and on your feet so that your legs will carry your body weight. What are some activities that keep you on your feet?
- *Where do we get calcium?*
 - Dairy products are the most commonly thought of sources of calcium. Discuss how dairy is any food coming from the milk of a cow, sheep, or goat (or more animals, I suppose).
 - There are also foods that aren't dairy that contain calcium. Some people don't like dairy or can't eat it (lactose intolerance). Beans and some vegetables (like broccoli) are sources of calcium, as well as fortified products like soy milk and tofu, and other types of non-dairy milk.

Supplemental Discussion Topics:

- *Where does milk come from?* Cows can drink as much water as a full bath tub and eat 90 pounds of food a day, something they can accomplish since they have 4 stomachs. Only female cows produce milk. Milk that we drink was in a cow (about) two days ago, but it

goes through a process where is cleaned and made so that we are able to drink it. It is pasteurized (heated) to kill off bacteria and homogenized so all of the fat stays suspended. A cow can hold 25-50 pounds of milk and produces about 90 glasses of milk a day.

- *How do we make dairy products out of milk?* For many, it's a matter of taking out (or concentrating) the fat found in milk. Milk comes out of the cow as whole milk. Removing the fat gives you skim milk. Concentrating the fat gives you cream. If you mix the cream together enough, you remove most of the liquid and end up with butter. If you add certain bacteria to milk, they eat the sugar (lactose) in the milk and cause it to solidify (due to acid being produced), making yogurt. Cheese is made by using bacteria to coagulate milk, then removing the curdled pieces and pressing them into a mold. After allowing it to dry and press together over time, you end up with a solid cheese.
- *What do the different types of milk mean?* The percentage is the amount of fat in milk so 2% is 2% fat so 1% has less fat, and skim has no fat. The fat percentage is by weight, not by calories. You don't just add 2% more calories to 2% milk, but actually much more. Other factors, like calcium and protein, do not vary at all between the different types of milk. Flavored milk, like chocolate milk, has a lot of added sugar and calories. If you're going to make this choice, consider choosing low-fat or fat-free milk and products.

Activities:

- *Calcium Collector:* Materials available at:
http://www.umpquadairy.com/wpcontent/uploads/2013/07/mm_calcium_collector.pdf
 - Students should be divided into pairs and each group given a pair of dice, one food list and a scorecard. To begin, each player rolls one die – the student who rolls the higher number goes first. Player 1 rolls one die and looks at the category of foods that matches the number. Player 1 should select a food from the list and add the calcium point to his/her scorecard. They should also scratch off that food from the food list so it cannot be used again. The object of the game is to be the first student to collect 1,300 calcium points, which (in mg) is the recommended daily value!
- *Line up the calcium:* Have 10 students come to the front of the class. Hand a card to each student with a food item pictured or written on the card. Have the students face the class so everyone can see the food on each card. Have students (with the help of classmates) line up in order from least calcium to most calcium. Once the order is set, provide the correct answers along with important key points and rationale.

	Food Item	Calcium	Rationale
1.	1 oz cream cheese	20 mg	Cream cheese is mostly fat and thus contains less calcium than you may think
2.	1 hard-boiled egg	30 mg	Eggs are usually found next to other dairy items in the grocery store, but they are not actually dairy

3.	½ cup cooked broccoli	40 mg	
4.	½ cup cottage cheese	80 mg	Cottage cheese is only the curds and the whey has been removed (which contains some milk)
5.	1 ounce cheddar cheese	205 mg	“Hard” cheese are higher in calcium than softer cheese
6.	6 oz. calcium-fortified orange juice	250 mg	
7.	1 cup milk	300 mg	
8.	1 cup fruit yogurt	345 mg	
9.	3 oz. sardines with bones	370 mg	
10.	8 oz. vegetable lasagna	450 mg	This is a “combination food” that contains calcium from several sources

Food Activities:

- *Milk taste test challenge:* Different types of milk vary only by their fat content. Protein does not change between skim and whole milk. Because many students will likely argue that they only like a certain kind of milk (like 2% or whole), we want to do this blind taste test to see if they can actually tell the difference. The point isn't to trick the students, but rather to get them tasting and thinking about the actual differences between the types of milk, while we gently encourage switching to low fat (1%) or non-fat milk. Pour out samples of milk (whole, 2%, 1%, skim), keeping the bottles covered so the class cannot determine which type of milk it is. Have them write down what type they think it is. Reveal the answers to the class afterwards.

Snack Ideas:

- *Cheese and Cracker Plate:* Serve low fat cheese (low fat mozzarella is generally well received) with whole grain crackers and fruit. Consider showing students portable cheese options – such as string cheese or mini cheese wheels, which may be more fun to eat.
- *Greek Yogurt with Fruit:* Greek yogurt is a great option for a snack given the amount of protein packed into each serving. Consider serving a plain yogurt (less sugar!) with fresh fruit.