



Session 4: Maniacs On the “Moo”ve

Content Learning Objectives:

- Learn the importance of dairy products/calcium in the diet.
- Explain what weight bearing exercise is and how it is important for strong bones.
- List dairy products and other non-dairy foods rich in calcium.
- Prepare three food items that contain dairy products.
- Reinforce the importance of healthy eating and physical activity through various fun activities, interactive games and taste testing opportunities.

Key Components:

- What is calcium? Why is it important for your body?
 - *Calcium makes bones and teeth strong.* You have more than 200 bones. They hold up your body, and along with your muscles, keep you moving. Bones are mostly collagen, a protein that is like a soft framework for bones, and calcium phosphate, a mineral that makes bones hard. When your body makes new bone tissue, it first lays down a framework of collagen. Then tiny crystals of calcium from your blood spread throughout your collagen framework. The hard crystals fill in all the nooks and crannies. This is what makes bones strong and flexible. (Show picture of skeleton and ask students to name some of the bones using quiz.)
 - *Help your muscles relax and contract.* (Have youth flex their arm muscle.) Calcium helps your muscles work so you can flex your muscle to throw a ball. It helps send out nerve impulses. If you touch something hot, your brain quickly gets the message to say “Ouch!” and move your hand away.
 - *Aid in blood clotting.* If you happen to get a cut, calcium helps to stop the bleeding and begin the healing process.
- Besides calcium and collagen, bones also contain water, minerals, and cells that continually change and grow. Bones are always growing; that is why you are not the same height today as you were when you were a baby. As bones grow, your body deposits great amounts of calcium during your growing years (infancy –mid 20’s). Bones are usually their strongest in your mid 20’s. As we grow older, calcium withdrawals exceed deposits of new bone. (To demonstrate the amount of calcium in the body at various ages and explain the relationship between bone development and the body’s need for calcium, show flour bag calcium display.) If your body does not get enough calcium, it takes it from your bones. This can then make your bones weak. Osteoporosis is a disease that causes bones to become so fragile that they break. (Have youth touch the soft shell egg experiment and or show them examples of a healthy bone and one with osteoporosis.)

- How do you make strong bones?
 - Your body cannot make its own calcium, so it is up to you to supply it daily.
 - Dairy products like milk, yogurt, and cheese are the best sources of calcium. Dairy products are also good sources of certain vitamins (riboflavin, vitamin A and vitamin D), minerals (phosphorous, potassium), and protein. Where on MyPyramid do we find dairy products? (Show MyPyramid Food Guide Chart)
 - Non-dairy foods that also have calcium are broccoli and dark greens such as collards, kale, turnip, and spinach, fish with edible bones such as sardines and salmon, or foods with calcium added such as: orange juice, soy milk or tofu, or cereal products.
 - Running, jumping, and dancing also help to make your bones stronger. Activities that work against gravity (the force that keeps us from floating into outer space) makes muscles stronger, and muscles push and pull against bones, making them even stronger. Things that we do that cause this to happen are called “weight bearing” activities. What are some activities that you do that would be weight bearing and therefore help make strong bones?
- How much calcium should you get daily?
 - There are new guidelines that say that teens 9-18 years should get 1300 mg/day. A cup of milk and 6 ounces of yogurt have approximately 300 mg of calcium. (Play “Calcium Line-Up” game)
 - Food Labels: Calcium content varies depending on ingredients for many foods. Check food labels to see how much calcium is in different foods.
- Play “Calcium Tag” (Directions listed in experiential learning activities section)
- Prepare recipes
- Evaluate sessions using “Calcium All –Stars” worksheet

Experiential Learning Activities:

- Skeleton Picture/Diagram
- Calcium Display:
Directions: Measure in five heavy-duty plastic bags the following amounts of flour. Label each bag with the appropriate age group.

<u>Age Group</u>	<u>Amount of Calcium</u>	<u>Amount of Flour in Bag</u>
Infancy	1 ounce	¼ cup
10 years	14 ounces	3 ½ cups
15 years	28 ounces	7 cups
20 years	2 pounds and more	11 cups
Woman with osteoporosis	1 pound	6 ½ cups

Note: 1 ounce of flour is equal to ¼ cup

- Soft Shell Egg Experiment
 - egg (hard boiled is less messy if you accidentally break one, but raw will work too)
 - 1 cup vinegar
 - clear jar or glass

Directions: Pour 1 cup vinegar into jar; add egg, leave the egg in the vinegar for one day; record what you see, remove the egg and feel it.

 - Why is the shell soft? What happened? Eggs contain something called "calcium carbonate". This is what makes them hard. Vinegar is an acid known as acetic acid. When calcium carbonate (the egg) and acetic acid (the vinegar) combine, a chemical reaction takes place and carbon dioxide (a gas) is released. This is what the bubbles are made of. The chemical reaction keeps happening until all of the carbon in the egg is used up -- it takes about a day. When you take the egg out of the vinegar it's soft because all of the carbon floated out of the egg in those little bubbles.

- Osteoporosis Examples (Use pictures or plastic display examples)

- Calcium Line-Up Game: Collect pictures of foods some that are good sources of calcium and others that are not. Give each youth one of the pictures and ask them to line up with the person holding the food with the most calcium to the one holding the least amount. Be sure youth do not know the amount of calcium in each food item until they have lined up. Discuss which types of foods seem to have more calcium. What foods could they put together and eat in order to get enough calcium (1300 mg) for one day? (Calcium Rich Foods handout)

- Physical Activity: Calcium Tag
 - *Equipment needed:* some type of coin to be used for "Heads and Tails", method to designate lines in the playing area.
 - *How to play:* Divide the group into two teams. Each team must come up with a team name that is a food rich in calcium. For example: Chocolate Milk or Cheddar Cheese. The two teams line up in straight lines, parallel to each other, about four or five feet apart. The leader assigns each team a side of the coin (Milk – heads, Cheese – tails). The leader flips the coin and yells out the name of the team that won the toss. If he yells Milk, the Milk team must turn around and run, with the Cheese team in hot pursuit. If any of the Cheese succeeds in touching a member (or members) of the Milk team before crossing a given line (20-60 feet away), he or she is considered a captive of the Cheese and must aid the Cheese when play continues. Play begins again in the two lines, but those captured are on the other team's side now. Play continues until everyone is on one team. The team that captures all the members of the other team is the winner.

- Sanitize food preparation area, properly wash hands and prepare recipes:
 - Udderly Delicious Parfaits
 - Purple Cows
 - Bessie Tic Tac Toe Tostados

Handouts:

- Skeleton Picture and Quiz
- “Calcium Rich Foods”
- “Munchin’ Maniac Go On the “Moo”ve Recipes
- “Calcium All-Stars” evaluation worksheet

Lesson Materials:

- Calcium display (bags of flour)
- Soft shell eggs from vinegar
- MyPyramid Food Guide Chart <http://www.mypyramid.gov/>
- Osteoporosis and normal bone pictures
- Calcium Line Up Game: cardboard food models with varying amounts of calcium labeled on the back and Calcium Content Key Handout
- Calcium Tag: coin to be used for “Heads and Tails”,
- Recipe ingredients and equipment

MUNCHIN'MANIACS

Maniacs On the "Moo"ve Recipes

UDDERLY DELICIOUS PARFAITS

Makes: 1 parfait

Ingredients:

- 2 inch thick angel food cake slice
- ¼ cup fresh or frozen strawberries
- ¼ cup blueberries
- ½ cup prepared sugar free vanilla pudding
- whipped topping for garnish (optional)

Directions:

Place the cake slices on the cutting board. Use a knife to cut the cake into 1-inch cubes. Wash strawberries and blue berries. Place the strawberries on a cutting board. Use a knife to remove the green stems. Slice the strawberries, cutting from top of each berry to the bottom. Place one fourth of the cake cubes in the bottom of each glass. Add one-fourth of the strawberries and blueberries to each glass. Top with one-fourth of the prepared vanilla pudding. Repeat the layers. Top with whipped cream. Serve the parfaits immediately.

Serving: 1 recipe

Nutrition Analysis per serving: Calories 184 kcal, Protein 6.2 g, Fat 3 g, Carbohydrates 35 g, Fiber 2.2 g, Calcium 197 mg, Sodium 384 mg

Udderly Delicious Parfaits Shopping List-10 Participants Yield: 10 parfaits

Ingredients	Purchase	Individual
Angel food cake loaf	2 small loafs or 1 med. cake	1-2" slice
Strawberries, whole	2 ½ cups	¼ cup
Blueberries, fresh or frozen	2 ½ cups	¼ cup
Vanilla sugar free pudding	2 (1 ounce) boxes	¼ cup
Skim milk	4 cups	
Whipped cream	1 carton or can	Spoon full

- Have 2 groups (2-3 children per group) prepare pudding to be shared.

Equipment List: (Work Group: 1 participant)

- | | |
|-------------------------|-----------------------------|
| 10 6-ounce plastic cups | 2 medium sized mixing bowls |
| 10 plastic spoons | 2 whisks |
| 10 plastic knives | 2 liquid measuring cups |
| 5 cutting boards | paper towels |

BESSIE TIC TAC TOE TOSTADOS

Makes: 1 tostado

Ingredients:

6 (1/2 inch long) thin green pepper slices
2 black olives
1 slice American cheese
2 tablespoons fat-free chili with beans
1 soft tostado or taco shell

Directions:

On the cutting board, cut the black olives in half through the middle. Cut the cheese slice into thin strips. Place the tostada shell in a baking pan. Put ¼ cup of the chili mixture onto the tostada shell. Spread the chili mixture evenly over the tostada. Spread the mixture to about ½ inch from the edge of each shell. Arrange the cheese strips on the tostada so they look like tic-tac-toe board. Fill in the blocks with black olive halves for O's and make X's out of the green pepper slices. In 350° F oven, put the baking pan. Bake for 2 to 3 minutes or till cheese just starts to melt. Using hot pads remove the baking pan from oven and take off the tostadas with a pancake turner. Serve immediately.

Serving: 1 recipe

Nutrition Analysis per serving: Calories 197 kcal, Protein 8 g, Fat 8 g, Carbohydrates 24 g, Fiber 3 g, Calcium 157 mg, Sodium 525 mg

Bessie Tic Tac Toe Tostados Shopping List-10 Participants Yield: 10 Tostados

Ingredients	Purchase	Individual
Green peppers, large	1	6 ½ inch long strips
Black olives	20 olives	2 olives
*American cheese slices	10 slices	1 slice
Fat-free chili with beans	1 (15 ounce) can	2 tablespoons
Packaged soft taco shells	10	1

- Precut green pepper strips (6 thin strips ½ inches long per youth)

Equipment: (Work Group: 1 participant)

10 large plates
10 plastic forks
*toaster oven
5 cutting boards
10 plastic knives
can opener (for instructor)

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*baking pans to hold 10 tostado shells
*hot pads
*pancake turner (for instructor)
paper towels

*If no electricity available, use spray can of cheese and do not heat tostada shells

PURPLE COWS

Makes: 4 (8 ounce) servings

Ingredients:

2 cups low fat vanilla ice cream
6 ounces frozen grape juice concentrate
1 ½ cups skim milk

Directions:

Soften 1-pint (2 cups) vanilla ice cream by setting it out of the freezer while you're getting the other ingredients together. Use a can opener to open one 6-ounce can frozen grape juice concentrate. Use a rubber scraper to empty the can of concentrate into a blender container. Measure 1 ½ cups milk. Add milk to blender container. Spoon the softened ice cream into blender container. Cover the blender. Blend till smooth. Turn off the blender. Pour into 4 (8-ounce) glasses. Serve at once.

Serving: 8 ounces (1 cup)

Nutrition Analysis per serving: Calories 189 kcal, Protein 6 g, Fat 2 g,
Carbohydrates 41 g, Fiber 0.5 g, Calcium 216 mg, Sodium 107 mg

Purple Cows Shopping List-10 Participants

Yield: 10- 6 ounce servings

Ingredients	Purchase	Group 5
Vanilla ice cream	1 ½ quarts	2 cups
*Frozen grape juice concentrate	3 (6 ounce) containers	6 oz container
Skim milk	1 quart	1 ½ cup milk

- Have youth work in groups of 4 with one person placing in the blender the milk, another the grape juice, another the ice cream and the last person pushing the blender button.

Equipment: (Work Group: 4-5 participants)

*2 blenders
2 glass measure cups
2 spatulas
6 oz. drinking cups
paper towels
ice cream scoop (instructor)

*If no electricity, use reconstituted grape juice and vanilla ice cream as floats.



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