K-STATE Research and Extension

N.A.C. Nutrition & Activity for Communities

Bone up on Your Calcium

Discussion

1. Brainstorm dairy products:

- milk (flavored, whole, skim, etc.)
- cheese (various kinds)
- yogurt

2. Inform youth on daily requirements for dairy products.

- 3 servings per day
- 1 serving = 1 cup of milk or yogurt, or 1½ ounces natural cheese, or 2 ounces processed cheese

3. Compare fat content in milk.

- All milk has about the same amount of calcium.
- Whole milk and 2% have much higher fat content.
- Drink more low-fat 1% or fat-free skim milk.

USDA: Nutrition information per serving (1 cup):

Milk Type	Fat	Calories	Sugar	Calcium (based on recommendation for 9-18 year olds 1300mg/day)
Skim milk	0 grams	83	12.3 grams	25%
1%	2.37 grams	102	12.7 grams	23%
2%	4.66 grams	122	12 grams	24%
Whole	7.81 grams	146	11.7 grams	23%
Chocolate	2.75 grams	159	24.7 grams	25%
2% Strawberry	4.46 grams	176	25.9 grams	23%
Soymilk	3.59 grams	105	8.91 grams	23%

4. Talk about the importance of calcium in the diet. Calcium plays a role in these bodily functions:

- dense bone formation
- bone strength
- blood clotting
- nerve impulses
- muscle contractions

5. Discuss some signs of calcium deficiency:

- stunted growth
- impaired muscle contractions
- stress fractures
- muscle cramps
- osteoporosis

Learner Objectives

Participants will be able to:

- explain the role of calcium in the diet;
- identify sources of calcium;
- discuss the relationship between physical activity and bone health; and
- identify one goal or action (individually or as a group) related to increasing low-fat dairy intake.

Materials

- One soft object per youth (bean bags, balls)
- Music
- Whistle
- Cones
- Long rope
- Large area to run around

6. Brainstorm sources of calcium:

- dairy products
- dark green leafy vegetables
- dried figs
- calcium fortified fruit juices
- canned fish with edible bones (e.g., salmon)
- tofu

7. Talk about the importance of physical activity for bone health.

- Weight-bearing activities stimulate bone formation. Examples are walking, strength training, dancing, kick-boxing, tennis.
- Physical activity triggers nerve impulses that activate body chemicals to deposit calcium in bones.
- Exercise strengthens muscles that pull or tug on bones.
- Physical activity improves strength, balance, and coordination.

Activities

Play "Clean Your Room"

Purpose:

- Get youth moving and physically active
- Coordination, throwing

Instructions:

- Divide youth into two groups.
- Place half of the soft objects (see page 1) on the floor in front of each group's physical activity area.
- At the start cue (whistle/music), each side will clean their room by throwing the soft objects over to the other side as fast as they can. The object of the game is to have the cleanest room.
- On the stop signal (whistle/music), participants make an "x" with their body (jumping jack stance) and drop any objects in their hands. Count the remaining balls left on each side to determine which team has the cleanest room.

Go through "Activities to Increase Strength"

- Do at least one set of each exercise.
- Discuss with youth which exercises are harder/easier.
- Talk about what muscles or body parts are being worked.

Activities to Increase Strength

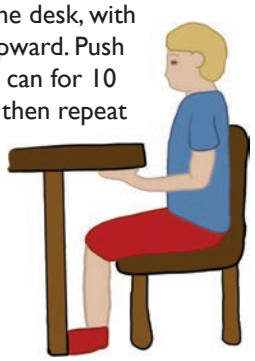
Chest Press

While sitting at desk, put palms together, chest high. Push hands together as hard as you can for 10 seconds. Rest, then repeat seven times.

Desk Press

While sitting at desk, place hands (palms down) on desk. Press down as hard as you can for 10 seconds. Rest, then repeat seven times.

Reverse Desk Press

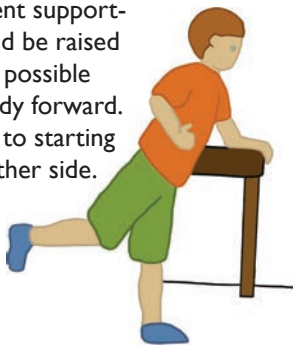


While sitting at desk, place hands under the desk, with palms facing upward. Push as hard as you can for 10 seconds. Rest, then repeat seven times.

Quad Squat

Stand to the side of the desk with one hand grasping the desk. Slowly bend down only to the point where the thighs (top of your leg) are parallel with the floor. Do eight knee bends.

Rear Leg Extension

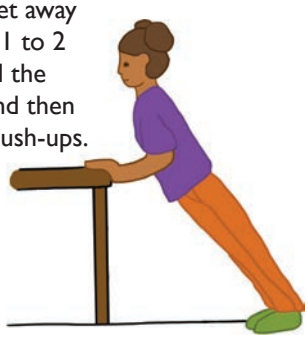


Stand to the side of the desk, with one hand grasping the desk. The weight is just forward of the slightly bent supporting leg. The working leg should be raised straight behind, only as far as possible without tipping the upper body forward. Hold for six seconds. Return to starting position and repeat on the other side. Do eight repetitions.

Straight Leg Flexion

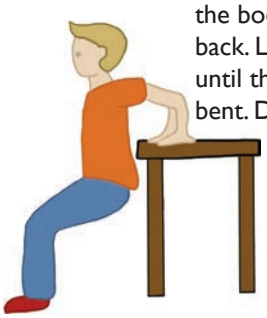
Stand to the side of the desk, with one hand grasping the desk. The weight is on the supporting leg. Lift the leg in front without leaning forward or backward. Hold for six seconds. Return to starting position and repeat on the other side. Do eight repetitions.

Desk Push-Up



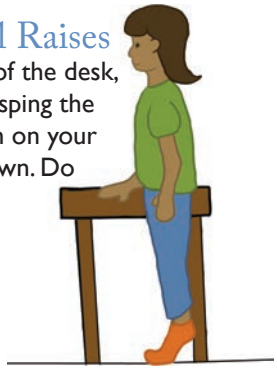
Face the desk, hands grasping the edge of the desk. Place feet away from desk approximately 1 to 2 feet. Lower the body until the chest touches the desk and then come back up. Do eight push-ups.

Desk Dips



Face away from the desk, hands grasping the edge of the desk with feet slightly forward so the weight of the body is off center to the back. Lower the body only until the knees are slightly bent. Do eight desk dips.

Tip Toe Heel Raises



Stand to the side of the desk, with one hand grasping the desk. Raise up high on your toes then back down. Do eight heel raises.

Remember to:

- Make sure the desks are secure or pushed up against a wall.
- Breathe out on the hard part of the movement.

Resource Sheet

Fun Facts:

- The human body contains more calcium than any other mineral.
- Ninety-nine percent of the body's calcium is in the bones.
- One percent of calcium is contained in body fluids and cells.
- Forty percent of bone mass is formed during adolescence.
- After adolescence you no longer add bone mineral density; therefore, it is important to get calcium now so you can be sure to have healthy bones for the rest of your life!

Cool Calcium:

- reduces risk for high blood pressure (hypertension),
- may help offer protection from abnormal cell growth in colon, and
- reduces risk of health problems such as kidney stones, breast cancer, and obesity.

Mighty Milk (from the National Dairy Council)

- Milk contains nine essential nutrients, making it one of the most nutrient-rich beverages you can enjoy. Just one 8-ounce serving of milk puts you well on your way to meeting the Daily Value (recommended intake for those on a 2,000 calorie diet) for calcium, riboflavin, and other key nutrients.

Calcium — 25% Daily Value

- An 8-ounce serving of milk provides 25% of the Daily Value of calcium. Calcium helps build and maintain strong bones and teeth. This mineral also plays an important role in nerve function, muscle contraction, and blood clotting.

Vitamin D — 15% Daily Value

- When fortified, a glass of milk provides about 15% of the Daily Value for vitamin D. Vitamin D helps promote the absorption of calcium and enhances bone mineralization. Milk is one of the few dietary sources of this important nutrient.

Protein — 16% Daily Value

- The protein in milk is high quality, which means it contains all of the essential amino acids or "building blocks" of protein. Protein builds and repairs muscle tissue, and serves as a source of energy during high-powered endurance exercise. An 8-ounce glass of milk provides about 16% of the Daily Value for protein.

Potassium — 10% Daily Value

- Potassium regulates the body's fluid balance and helps maintain normal blood pressure. It's also needed for muscle activity and contraction. By providing 10% of

the Daily Value of potassium, milk contains more than the leading sports drink.

Vitamin A — 15% Daily Value

- A glass of milk provides 15% of the Daily Value of vitamin A. This nutrient helps maintain normal vision and skin. It also helps regulate cell growth and maintains the integrity of the immune system.

Vitamin B_{12} — 50% Daily Value

- Vitamin B_{12} helps build red blood cells that carry oxygen from the lungs to working muscles. Just one 8-ounce glass of milk provides about 50% of the Daily Value for this vitamin.

Riboflavin — 30% Daily Value

- Milk is an excellent source of riboflavin, providing 30% of the Daily Value. Riboflavin, also known as vitamin B_2, helps convert food into energy — a process crucial for exercising muscles.

Niacin — 15% Daily Value (or niacin equivalent)

- Niacin is important for the normal function of many enzymes in the body, and is involved in the metabolism of sugars and fatty acids. A glass of milk contains 15% of the Daily Value for niacin.

Phosphorus — 20% Daily Value

- Phosphorus helps strengthen bones and generates energy in your body's cells. Providing 20% of the Daily Value, milk is an excellent source of phosphorus.

Easy and Quick Ideas to Eat More Low-Fat Dairy

1. Cut up your favorite fruits into pieces (or drain canned fruit packed in 100% juice) and toss in low-fat vanilla yogurt for a quick fruit salad.
2. Make string cheese octopuses by pulling apart one end of the string cheese into six or eight "tentacles."
3. Blend up smoothies using low-fat milk, yogurt, and your favorite frozen fruit or try this one:

Chocolate Banana Peanut Butter Smoothie Recipe

Ingredients:

- 1 cup fat-free chocolate milk or low-fat chocolate soy milk
- 1 ripe banana
- 1 tablespoon peanut butter**
- 4 to 6 ice cubes

** For kids with peanut allergies, substitute with sunflower seed butter, almond butter, soy nut butter, or another nut-free option. Nutrition information may vary depending on the substituted ingredient.

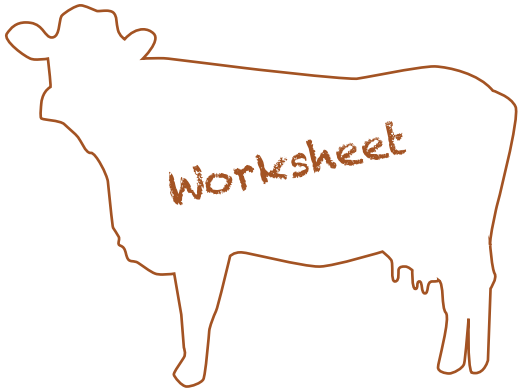
Directions:

Before you begin: Wash your hands.

Combine all the ingredients in a blender or a food processor; blend until smooth.

Nutrition Information
Serving size: 1 smoothie
Calories: 330; Total Fat: 13g; Saturated Fat: 2.5g; Cholesterol: 0mg; Sodium: 180mg; Total Carbohydrate: 44g; Dietary Fiber: 4g; Protein: 15g

Source: Recipe created by Catherine Hoffmann, MS, RD. Accessed from the Academy of Nutrition and Dietetics *https://www.eatright.org/recipes/beverages/chocolate-banana-peanut-butter-smoothie-recipe*



1 Name a dairy product you might eat at each meal of the day. What can **you** do to help get three servings of low-fat dairy each day?

Breakfast: _____

Lunch: _____

Supper: _____

2 If you have ½ cup yogurt for breakfast and ½ cup milk with your lunch, how much of your daily intake of dairy products are you lacking?

_____

_____

3 What are some weight-bearing activities you can do to help you have strong, healthy bones?

_____

_____

_____

4 Which vitamin in milk helps maintain healthy vision?

_____

5 How many ounces are in 3 cups?

_____

_____

_____

6 What is the function of calcium?

_____

_____

_____

7 If you drink 3 cups of milk a day, how much of your daily recommended value of calcium are you getting?

_____

Kansas School Wellness Policy Model Guideline — Nutrition Education			
Requirements achieved in this lesson:	**Implementing**	**Transitioning**	**Modeling**
	All students in grades K-12 will have the opportunity to participate in culturally relevant activities, as appropriate, and a variety of learning experiences that support development of healthful eating habits that are based on the most recent Dietary Guidelines for Americans and evidence-based information.	District administrators inform teachers and other school personnel about opportunities to participate in professional development on nutrition and on teaching nutrition.	The wellness committee, teachers and other school personnel participate in nutrition education-related professional development at least once a year.
Topic	Basic nutrient requirements for calcium		

Kansas School Wellness Policy Model Guideline — Physical Activity			
Physical Activity Throughout the Day			
Requirements achieved in this lesson:	**Implementing**	**Transitioning**	**Modeling**
	Elementary school students have at least 15 minutes a day of supervised recess (not including time spent getting to and from the playground), preferably outdoors. Supervisory staff encourage moderate to vigorous physical activity.	Elementary school students have two supervised recess periods per day (not including time spent getting to and from the playground), totaling at least 20 minutes. Supervisory staff encourage moderate to vigorous physical activity.	Elementary school students have two supervised recess periods per day, totaling at least 30 minutes (not including time spent getting to and from the playground), with one being offered in the morning. Supervisory staff encourage moderate to vigorous physical activity.

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- Skim milk: https://fdc.nal.usda.gov/fdc-app.html#/food-details/1097521/nutrients
- 1%: https://fdc.nal.usda.gov/fdc-app.html#/food-details/173441/nutrients
- 2%: https://fdc.nal.usda.gov/fdc-app.html#/food-details/746778/nutrients
- Whole: https://fdc.nal.usda.gov/fdc-app.html#/food-details/1097512/nutrients
- Chocolate: https://fdc.nal.usda.gov/fdc-app.html#/food-details/2340850/nutrients
- 2% Strawberry "reduced fat": https://fdc.nal.usda.gov/fdc-app.html#/food-details/1097678/nutrients
- Soymilk: https://fdc.nal.usda.gov/fdc-app.html#/food-details/1097542/nutrients

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Answer Key

1. Breakfast: skim milk, Lunch: low-fat yogurt, Supper: reduced-fat cheddar cheese
2. ½ + ½ = 1; 3-1 = 2 cups
3. Running, dancing, pushups, walking
4. Vitamin A
5. 8 × 3 = 24
6. Builds and maintains strong bones.
7. 30 × 3 = 90%

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The authors gratefully acknowledge the work of the original author, Tandalayo Kidd, Ph.D., and her team.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service
MF3006 rev. **November 2024**