Welcome!

These Cows, Calcium, and Cheese handouts are set up to help you access information quickly and easily. Below you will find videos, worksheets, games, and other fun support materials to help students learn!

To Navigate through these handouts, click on the number of the section you wish to view, in the Table of Contents.

To return to the Table of Contents, click on Cow Icon.

Click the Cow Icon to Get Started
# Cows

**Social Studies**

1. How Now Brown Cow – Make a “Cow Pizza!” – K-5th Grade  
   See Activity Guide  2-3

Peek Inside a Cow

The Cowfactory

MyPlate

Cow Facts and Figures

“Beyond the Bovine: Jobs On and Off the Farm” – Video. Found at [cabotcheese.coop/nutrition-activities](http://cabotcheese.coop/nutrition-activities).

2. Beyond the Bovine: Jobs On and Off the Farm – K-5th Grade  
   See Activity Guide  4-5

Beyond the Bovine Place Map

Does School Matter? Survey

“Beyond the Bovine: Jobs On and Off the Farm” – Video. Found at [cabotcheese.coop/nutrition-activities](http://cabotcheese.coop/nutrition-activities).

View with activity in guide at [cabotcheese.coop/nutrition-activities](http://cabotcheese.coop/nutrition-activities).


3. Create a Dairy Day – K-4th Grade  
   See Activity Guide  6-7

In Vermont we celebrate Dairy Day every June on the lawn in front of our Capitol in Montpelier. You too can celebrate Dairy Day to help keep children in touch with where their food comes from. In Activity Guide.

Healthy Snack Recipes

Fun with Calcium

Fun Dairy Facts

**Calcium**

Science•Language Arts•Health•Physical Education• Technology

1. Linking Calcium to Health – 5th-9th Grade  
   See Activity Guide  8-9

Calcium Health Facts

Calcium Cow-Q-Later

**Cheese**

Science

1. The “Udderly” Fascinating Truth About Lactose and the Foods We Eat – K-9th Grade  
   See Activity Guide  10-11

Healthy Snack Recipes

Lactose Intolerance

Dairy Calcium Sheet

2. Make Dairy Foods in Your Classroom – K-9th Grade  
   See Activity Guide  12-13


**Language Arts**

1. Trick or Treat Your Friends to a Quick ‘n Healthy Snack – K-5th Grade  
   See Activity Guide  14-15

MyPlate

Judging Form for Quick & Healthy Snack Presentation

**Cabot Creamery Co-operative**


Co-operatives. More Than Just Co-operation! – K-9th Grade  
   See Activity Guide  16-17

**Resources**

- Glossary of Vocowbulary Words
- Print and Internet Resource Guide

**Udderly Wonderful Tips & Tidbits**

Tips on Assessment of Students Progress

Sample Tool KWL

Sample Tool Checklist

Sample Assessment Tool

Tips for Families

Fun with Calcium

MyPlate
A cow is a ruminant, and has four stomach compartments:
Color the numbered sections as follows to form a diagram of the cow digestive system – part of her unique COWFACTORY!

**1. Green**
The RUMEN is the “first stomach” and is also called the paunch, or storehouse. It is the largest chamber, and in a mature COW, the rumen accounts for about 80% of the stomach capacity. When a COW eats, food passes first into the rumen where it is broken down by billions of tiny “bugs” (microorganisms) that live in the cow’s rumen. The COW is unique in that she can eat a very large amount of food at one time, then lie down and take it easy, and chew her food again. This process is known as ruminating, but we know it as “chewing her cud.” What she actually does is “burp” up a bit of her food and rechew it as cud.

**2. Blue**
The RETICULUM is the “second stomach” or honeycomb, which receives the food after it has been rechewed as cud.

**3. Red**
The OMASUM is the “third stomach” and is also known as the manypiles. The omasum grinds the food.

**4. Orange**
The ABOMASUM or “fourth stomach” is the true stomach, which means it is the compartment similar to that of a simple stomach in humans, where digestion is completed.
### Grains
- **6 oz daily, 3 or more whole grains**
- **1 oz grains =**
  - 1 slice bread
  - 1 cup breakfast cereal
  - 1/2 cup cooked rice, cereal or pasta
  - 1 small corn or flour tortilla, 6” diameter

**Source of:** Fiber, B vitamins, magnesium

**Health Benefit:** Decrease risk for heart disease and high blood cholesterol levels

**Make half your grains whole:**
- Stock your pantry with whole grain staples: whole-wheat breads & rolls, cereal, brown rice.
- When eating out, order whole grain cereal for breakfast.
- Try brown rice or whole-wheat pasta.
- Use rolled oats or crushed whole grain cereal as a breadcrumb for baked chicken or fish.

### Vegetables
- **2 1/2 cups or more daily**
- **1 cup vegetables =**
  - 2 medium carrots
  - 1 large ear corn
  - 1 large tomato
  - 1 large green or red pepper
  - 1 medium potato

**Source of:** Vitamin A, potassium, fiber, vitamin C

**Health Benefit:** Decrease risk for stroke, type 2 diabetes, some cancers

**Make half your plate fruit and veggies:**
- Have a main dish salad for lunch or dinner.
- Add chopped vegetables to pasta sauce, lasagne and pizza.
- Keep a bowl of cut up vegetables, like broccoli, red pepper and carrots for quick snacks.
- Shred carrots or zucchini into meatloaf, casseroles and quick breads.

### Fruits
- **2 cups or more daily**
- **1 cup fruit =**
  - 1 small apple
  - 1 banana
  - 8 large strawberries
  - 1/2 cup dried fruit, like raisins or prunes

**Source of:** Vitamin C, potassium, fiber, folate

**Health Benefit:** Decrease risk for type 2 diabetes, stroke, heart disease, some cancers

**Make half your plate fruit and veggies:**
- Slice bananas or strawberries on your cereal.
- Make a fruit smoothie by blending fat free milk with fresh or frozen fruit.
- Pack fruit in lunches — try tangerine, grapes or a peach.
- Select canned fruit in 100% fruit juice or water rather than syrup.

### Dairy
- **3 cups or more daily**
- **1 cup dairy =**
  - 1/2 oz of cheese
  - 1 cup of yogurt
  - 1/3 cup shredded cheese
  - 1 cup pudding made with milk

**Source of:** Calcium, Vitamin D, protein, potassium

**Health Benefit:** Improve bone mass and blood pressure, maintain healthy weight, better quality diet

**Switch to fat-free or low-fat milk:**
- Drink milk at most meals.
- Add low-fat milk instead of water to hot cereals, soups, and box mixes.
- Top casseroles, soups, stews or veggies with shredded low-fat cheese.
- Make a yogurt dip for fruits or vegetables.
- Top a baked potato with low fat cheese or yogurt.

### Protein
- **5 1/2 oz daily**
- **1 oz protein =**
  - 1 oz cooked lean meat, poultry, fish
  - 1 egg
  - 1/4 cup cooked dry beans
  - 1 Tbsp peanut butter

**Source of:** Protein, iron, zinc, potassium, magnesium

**Health Benefit:** Building blocks for muscles, bones, skin and blood, decrease risk of anemia

**Go lean with protein:**
- Bake, broil, roast or grill lean meats, poultry & fish instead of frying.
- Serve dry beans or peas as a main dish or as part of a meal often.
- Have nuts or seeds for a snack, on salads or in main dishes.
- Choose fish more often for lunch or dinner.

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Note: Servings are based on a 2,000 calorie diet.
Eat the MyPlate Way

Breakfast:
½ whole wheat bagel with
2 tsp low fat cream cheese
1 string cheese
1 small banana
1 cup coffee or tea

Lunch:
Roast beef sandwich
1 whole grain roll
3 oz lean roast beef
½ oz part skim mozzarella cheese
2 slices tomato
2 leaves romaine lettuce
1 tsp yellow mustard
½ cup carrot sticks
2 tbsp fat free ranch dressing
1 oz baked potato chips
1 glass iced tea

Dinner:
Hawaiian pizza with
2 slices cheese pizza
1 oz Canadian bacon
½ cup pineapple
2 tbsp mushrooms
2 tbsp chopped onions
Spinach salad with
1 cup baby spinach leaves
¼ cup tangerine slices
2 tbsp almond slivers
2 tbsp fat-free salad dressing
1 cup fat-free milk
1 small oatmeal cookie

Snack:
Fruit parfait with
½ cup diced peaches and berries
½ cup fat free fruit yogurt
½ cup low fat granola

Remember:
- Choose foods and beverages that are low in added sugars.
- Use low fat and fat free salad dressings and mayonnaise.
- Check Nutrition Facts label to keep sodium low.
- Find your balance between food and physical activity.

Be Active Every Day

Make physical activity a regular part of your day - EVERY day!
Being physically active is important to live a long, healthy, happy life. It can help relieve stress, lower your risk of chronic disease, build and maintain bones. Physical activity increases the amount of calories your body burns and can help you get down to a healthy weight and stay there.

Choose activities that you enjoy and will do regularly!

At home:
Start a neighborhood walking group
Push the baby in a stroller
Enjoy an afternoon bike ride with your kids
Walk up and down the soccer or softball field sidelines while watching the kids play.

At play:
Walk, jog, skate or cycle
Swim or do water aerobics
Take a class in martial arts, dance or yoga
Golf (pull cart or carry clubs)
Play basketball, softball or soccer
Take a nature walk

At work:
Get off the bus or subway one stop early and walk the rest of the way
Replace a coffee break with a brisk 10 minute walk.
Take part in an exercise program at work or a nearby gym
Join the office softball or bowling team.

Remember:
- Physical activity and nutrition work together for better health.
- HAVE FUN while being active!
Did You Know?

• Cows weigh between 1,000 and 1,400 pounds, depending on their breed!
• A cow’s udder can hold between 25 and 50 pounds of milk!
• Cows eat between 90 and 95 pounds of food per day!
• Cows drink between 35 and 40 gallons of water per day!
• Milk in the store was in the cow only 2 days ago!
• Cows have a stomach with 4 separate compartments!
• Cows can smell odors from 6 miles away!
• Over half of all ice cream sales are vanilla flavored!
• A cow’s jaw moves 41,630 times a day!
• If you ate like a cow, you would consume 10 pounds of food a day!
• A cow chews 50 times per minute!
• Cows are allelomimetic (mimicking). They follow the leader!
• Cows get to be boss of the herd by pushing and shoving!
• A cow stands up and lays down about 14 times a day!
• The Holstein breed of dairy cow gives the most milk!
• Cows can see color!
• The pattern of black and white on a Holstein cow is different for each animal – just like a snowflake, no two Holsteins look alike!

How Much Does a Cow Weigh?

To gauge the size of a cow: Use a regular scale and weigh one volunteer student. How many students would equal the weight of one cow? (An average size Holstein weighs 1,400 pounds.) Gather enough students of the same size in the front of a class to complete the illustration.
OR:

Write your weight on a piece of paper and have one student or the teacher gather all the papers. On the chalkboard, mark individual weights one at a time until the total equals 1,400 pounds. How many students equal the weight of a cow?

How Many Pints of Milk Make Up a Quart?

This is an effective method to teach pints, quarts and gallons. Use empty dairy containers or milk cartons from lunch.
Bring in quart and gallon size containers. Ask students to demonstrate the following:
2 cups = 1 pint
2 pints = 1 quart
4 quarts = 1 gallon

How Many Cups of Water Does a Cow Drink Daily?

Use 16 one-cup containers and a one-gallon jug.
If 16 cups equal one gallon and a cow drinks 35 gallons of water a day, complete the equation:
How many cups does a cow drink in one day?

How Many Cups of Milk Will a Cow Give Per Day?

If a cow produces 60 pounds of milk per day AND one gallon of milk weighs about 8.5 pounds AND there are 16 cups in a gallon: How many cups of milk does a cow produce daily?

Credits: Adapted from an activity shared by Geraldine A. Brown, Education Coordinator, Billings Farm and Museum, Woodstock, Vermont and the Cabot Ag in the Classroom activities and resources – first edition.
Beyond the Bovine Place Map

**Farmer**
What do you think a farmer needs to know to run a family farm?

**Truck Driver**
What does getting a CDL (Commercial Driving License) entail?

**Quality Assurance Lab Technologist**
Besides antibiotics, what else does May test the milk for?

**Direct Store Delivery Person**
What kind of math skills do you think Jeremy needs to do his job well?

**Cheese Maker**
What workplace skills are necessary for Marcel to do his job well?

**Farm Equipment Maintenance**
What types of skills do you think a mechanic will need in the future?

**Marketing, Sales and Customer Service**
How do you design a label or package so that a customer will buy the product?
Do you know how you learn best? Is it through listening? Watching? Reading? Using your hands? List all the ways you like to learn.

What qualities does an ideal job need to have for you? For example: Does it need to be outside work? With people? List the qualities of your ideal job.

What skills do you think you will need for that ideal job? For example: Technology skills? List all the skills required for your ideal job.

What have you learned, are learning now, or may want to learn in the future that will help you gain skills of your ideal job?

Bring it all together - To have a career I enjoy, I will need:

Create a presentation to the class

Choose a job from the video or from research on the internet (see resource section). Work alone or in groups. Tell, act, display or do an activity with the class that demonstrates information about that job. The information should help the class know why you chose that particular job, what skills that job requires and how those skills are linked (or not) to what you are learning now.
Yipes Stripes
With a cheese plane, cut long slices from the widest side of a bar of Cabot Cheddar Cheese. Stack with alternating slices of reduced-fat bologna and cut into fun shapes with small cookie cutters. Serve with clusters of grapes or grape tomatoes.

Total Calcium: 200mg

Apple Fractions
Cut red and green apples into wedges, removing the cores, and toss them with a little lemon juice to prevent browning; fan them on a plate with alternating slices of Cabot Cheddar Cheese.

Hard cheeses like cheddar are rich in protein and calcium, and kids need about 1,300 milligrams of calcium every day to help build strong bones and teeth. Raw apples have lots of dietary fiber, important for fighting cholesterol, and crunching them helps to clean those teeth as well!

Total Calcium: 410mg

Gobblers
Fold thin rounds of deli-sliced, low-fat turkey or roast beef in half, then top with low-fat cottage cheese and a sprinkle of dried cranberries; roll into cones.

Sliced turkey is protein-rich, cottage cheese is a good source of calcium and protein, and dried cranberries have lots of vitamin C.

Total Calcium: 48mg

Muffin Heads
Top toasted English muffin halves with a thin layer of spaghetti sauce and slices of Cabot Cheddar Cheese; broil until the cheese is melted and top with a silly vegetable face!

A whole-grain muffin is a good choice, topped with nutritious cheese and good-for-you tomato sauce, which contains the protective anti-oxidant lycopene.

Total Calcium: 258mg

For more great snacks, visit: cabotcheese.coop/recipes
**Tijuana Triangles**
Cut corn tortillas into 6 triangles. Top with canned diced mild green chilies, Cabot Shredded 50% Light Cheddar Cheese and a sprinkle of chili powder. Broil until the cheese begins to bubble.

*Our Light Cheddar Cheese has just as much calcium as regular cheddar, but only half the fat, an excellent choice for healthy snacking.*

Total Calcium: 393mg

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**Melt-Downs**
Toast half a whole wheat bagel, top with a tomato slice, then sprinkle with grated cheese and toasted almonds; broil or microwave until the cheese is melted.

*Besides the protein- and calcium-rich cheese, whole wheat bread products are higher than white flour versions in fiber, vitamins and minerals; 6 to 11 servings of grains such as bread, cereal, rice or pasta are recommended for kids per day.*

Total Calcium: 250mg with toasted almonds, 200mg with shredded ham

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**Puzzlements**
Make a sandwich of two slices of whole wheat bread, sliced Cabot Cheddar Cheese and thin slices of tomato. Grill in a nonstick skillet. Cut up into about 5 pieces and mix them up for reassembly before devouring.

*The calcium in cheese helps prevent bone fractures when kids are little and osteoporosis when they grow up.*

Total Calcium: 228mg

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**Bat Boys**
Spread a thin round of deli-sliced ham with low-fat mayonnaise and sprinkle with Cabot Shredded Cheddar Cheese. Place a sesame breadstick or pretzel rod on one edge and roll up tightly.

*High-protein choices like cheese or low-fat sliced meats provide a burst of energy when spirits are sagging.*

Total Calcium: 204mg

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**Crazy Bobs**
Thread skewers with alternating chunks of Cabot Cheddar Cheese and fruits like whole strawberries and grapes or chunks of pineapple or banana; for a veggie version, use red and yellow cherry tomatoes and sugar snap peas.

*Kid-pleasing cheese is a great way to get children into the habit of including 2 to 4 servings of fruits and 3 to 5 servings of vegetables in their daily diet.*

Total Calcium: 406mg

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For more snacks, visit: [cabotcheese.coop/recipes](http://cabotcheese.coop/recipes)
LACTOSE INTOLERANT?

HOW CAN CHEDDAR CHEESE BE LACTOSE-FREE?
During the cheese making process the milk is separated into curds and whey. Most of the lactose in milk is found in the whey, which is not used to make the cheese. When cheese is naturally aged, any remaining lactose is completely broken down into simpler sugars your body can digest. Therefore, aged cheddar cheese contains zero grams of lactose.

CHECK OUT THE LACTOSE CONTENT FOR YOURSELF
Lactose is the only sugar naturally found in cheese. Read the nutrition label; if it contains zero grams of sugar, then it does not contain any lactose.

2005 DIETARY GUIDELINES FOR AMERICANS
New Dietary Guidelines recommend consuming 3 cups per day of fat-free or low-fat dairy products. For those of you who are lactose intolerant the guidelines recommend choosing alternatives within the milk food group, such as yogurt, lactose-free milk and aged cheddar cheeses.

Latest research: Many well controlled studies have demonstrated that the vast majority of lactose intolerant individuals are able to consume a serving of milk, cheese or yogurt per meal as part of a nutritious diet without experiencing symptoms. You can also build your tolerance to lactose by including dairy foods in your diet on a regular basis.

TIPS FOR ENJOYING DAIRY DAILY
• Drink milk with meals or snacks.
• Eat yogurt with active cultures. The friendly bacteria in yogurt helps you digest the lactose.
• Eat aged cheeses such as Colby, Jack, Swiss, Parmesan and of course Cheddar. All these cheeses contain low or no lactose.

By adding dairy foods back into your diet you can help prevent osteoporosis, hypertension, strokes and colon cancer. Dairy foods provide important nutrients such as calcium, protein, riboflavin and phosphorus. Eating dairy foods daily is the easiest way to get calcium in your diet. The recommended amount of calcium per day needed for adults is between 1000 and 1200 mg.

PIZZA BIANCA
MAKES 4 SERVINGS

2 pound white or whole-wheat pizza dough
2 tablespoons olive oil, plus more to brush baking sheet
2 teaspoons minced garlic
2 cups grated Cabot Cheddar (your favorite flavor)
2 tablespoons coarsely chopped fresh rosemary leaves or 1/4 cup torn fresh basil leaves

1. Place rack in lower third of oven and preheat oven to 450°F. Brush large baking sheet generously with oil.
2. On floured work surface, roll dough out into rectangle the size of baking sheet, letting it rest for several minutes if it becomes too springy to work with. Transfer to prepared baking sheet.
3. In small skillet, heat oil over medium heat; add garlic and cook, stirring, until garlic is fragrant and just beginning to color, about 1 minute. Immediately brush mixture all over top of dough. 4. Sprinkle with cheese and scatter rosemary or basil on top. Bake for 12-15 minutes, or until golden on top and browned underneath. Serve hot or at room temperature.

For more info on how Cabot cheese fits into your healthy lifestyle, visit us at cabotcheese.coop/healthy-us
healthinfo@cabotcheese.coop
Cows, Calcium and Cheese: Nutrition Activities for the K-9 Classroom

6. Udderly Wonderful Tips & Tidbits

Your body counts on you
to be active and to eat in a healthy way to strengthen your bones and build lean muscle. So let’s get going! Here are three fun, easy steps to a healthier, moo’vin’ life.

Three Steps for Stronger Bones & Leaner Bodies

1. Eat foods that are rich in calcium like milk, cheese and yogurt.
2. Exercise daily and enjoy bone-building sports like soccer, basketball, running, or dancing.
3. Yoga, jumping rope and karate help improve balance and prevent falls.

How much activity do you need to stay strong?
30 minutes is all it takes to keep your heart and muscles strong. Take your dog for a walk or ride your bike. To challenge yourself, try 15 minutes of more intense activities like jogging or one-on-one basketball. Whatever activity you choose, make everyday an active day.

Bone Up on Healthy Habits!

Strong bones and bodies require calcium to keep them going.

How Much?
The Institute of Medicine recommends dairy intake for your age group is shown below.

<table>
<thead>
<tr>
<th>Age</th>
<th>Mg/Day</th>
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</thead>
<tbody>
<tr>
<td>4-8</td>
<td>1,000</td>
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<tr>
<td>9-13</td>
<td>1,300</td>
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<tr>
<td>14-18</td>
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<tr>
<td>31-50</td>
<td>1,000</td>
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<tr>
<td>51-70 males</td>
<td>1,000</td>
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<tr>
<td>51-70 females</td>
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</table>

Jump into health with this Bone-Building, Jump Roping Song.

You can jump alone or ask your friends to join you.

Hey my bones are strong
Because I had a lot of calcium
I said
Hey my heart beats on
Because I ate and drank lots of calcium
I said
Hey my teeth are white
Because calcium is what I had last night
I said
Hey my skin is smooth
Because food with calcium is what I choose
I said
Hey my hair has shine
Because I think that calcium is so divine
Strong strong strong hair teeth bones
Strong strong strong hair teeth bones
This all because of calcium
I said Boom – I broke my back
That must mean
Get calcium! See!
Milk, cheese and broccoli!
Are what we need to be healthy
I said milk, cheese and broccoli!
Are what we need to be healthy
And also dance and exercise
Are necessary parts of our healthy lives
I said dance and exercise
Are necessary parts of our healthy lives
Dairyaiayo No soda soda soda
Dairyaiayo No soda soda soda
C-A-L-C-I-U-M

Parents Corner

Tips for Parents
Our country is in a calcium crisis! 9 out of 10 women, 7 out of 10 men and 3 out of 4 teenagers do not consume enough calcium daily. You need to fill your child’s bone bank. It is a lot like saving for education: the more you can save when they are young, the longer it will last as they get older.

Stay Healthy for Life
When it comes to trimming the waistline, research indicates eating 3-Every-Day of Dairy - 3 servings of milk, cheese, or yogurt every day as part of a reduced-calorie diet - can help burn more fat and give better results than just cutting calories alone.

Exercise Tips for You and Your Kids
Drink plenty of water. Warm up before you work out and stretch afterwards. Be smart and wear a helmet.

Remember
You are a role model for your children. Exercise, eat healthy foods and celebrate the results together as a family.

cabotcheese.coop
Fun Dairy Facts
From the farmers who own Cabot

Did you know?

It takes about 10 quarts of farm milk (about 2.5 gallons or 9.5 liters) to make one pound of Cabot butter.

It takes almost 5 quarts of farm milk (about 1.2 gallons or 4.75 liters) to make one pound of Cabot cheddar cheese (and most other types of hard cheese).

It takes almost 4 quarts of farm milk (1 gallon or 3.8 liters) to make one pound of Cabot cottage cheese.

It takes about 3 quarts of farm milk (3/4 of a gallon or 2.85 liters) to make a half-gallon container of ice cream.

cabotcheese.coop
America is in a Calcium Crisis: 9 out of 10 women, 7 out of 10 men, and 3 out of 4 teenagers do not get enough calcium. After the age of 11, no age group achieves even 75% of the calcium it needs. Calcium deficiency is a chronic public health problem that begins early in life. Low calcium intake is one of the most significant nutrient deficiencies identified in the federal government's Healthy People 2010.

Dairy Calcium Benefits
Calcium helps to strengthen bones and tooth enamel. Research has also shown that calcium may reduce hypertension, lower blood pressure, reduce the risk of colon cancer, and help to maintain a healthy weight.

Osteoporosis is a Pediatric Disease with Geriatric Consequences
By the age of 20, the average young person has acquired roughly 98% of his/her skeletal mass. Building strong bones during childhood and adolescence is the best defense against developing osteoporosis later in life. Yet, 9 out of 10 girls and 7 out of 10 boys fail to meet the current calcium recommendations. According to the National Institutes of Health (NIH), American children and teens are in the midst of a “calcium crisis.” Children’s bones are like a bank account where they can deposit and save calcium to help them have enough later in life, so it is critical that they get enough calcium during these formative years.

Low Calcium Intake
When there's not enough calcium in the bloodstream, the body attempts to pull calcium from the bones, which thins and weakens them. This causes osteoporosis, which leads to breaks and fractures. Osteoporosis affects 10 million Americans, mostly women. An additional 18 million Americans already have low bone mass, osteopenia, which places them at high risk.

Improving Calcium Intake
The American Dietetic Association recommends the following calcium intake by age group:

- 4-8 1,000 mg/day
- 9-13 1,300 mg/day
- 14-18 1,300 mg/day
- 19-30 1,000 mg/day
- 31-50 1,000 mg/day
- 51-70 male 1,000 mg/day
- 51-70 female 1,200 mg/day

Parents, by serving as role models, can shape their children's food and beverage choices, calcium intake, and future risk of osteoporosis. Calcium rich foods such as milk, cheese, yogurt, broccoli, salmon, and almonds should be consumed 4-5 times a day.

Exercise for Stronger Bones
Only about 38 percent of teens get enough exercise (see footnote 6 below). Exercise can improve your strength, balance and coordination which will help to reduce your risk of falls and bone injuries. Best bone-building exercises are weight-bearing which both stimulate bone formation and strengthen muscles. For optimum bone health, choose sports that involve jumping and running, such as basketball, volleyball, soccer, martial arts, gymnastic or dance, to name a few. Experts recommend that you do 25 to 40 minutes of aerobic activity three or more times a week and some type of muscle strengthening activity and stretching at least twice a week. Most importantly, best bone health gains come from a combination of weight-bearing exercise and a calcium-rich diet.

Supplements vs. Dairy Calcium
Research suggests that calcium from dairy has a longer lasting bone health benefit than calcium supplements. Relying on supplements means you're probably skimping on other nutrients that help the body absorb calcium. Vitamin D, for example, helps carry calcium into the bones and increases absorption in the bloodstream—you'll get both from a glass of milk, but not a supplement. Dairy calcium also provides protein, Vitamins A and B12, Riboflavin, Phosphorus, Niacin, and Potassium. In addition, encouraging dairy consumption during childhood and adolescence may help form well balanced eating habits in adulthood.

Healthy Teeth
Calcium helps prevent gum disease and strengthen tooth enamel. Individuals who do not get the recommended amount of calcium are nearly twice as likely to develop periodontal disease later in life.

Lactose Intolerance
A New England Journal of Medicine study determined that almost everyone could tolerate up to 12 grams of lactose per day without experiencing symptoms of lactose intolerance. Hard cheese, such as cheddar, does not contain lactose and a 1 oz bar offers 20% of the recommended daily calcium intake (210mg).

Blood Pressure
Study funded by the National Institutes of Health concluded that a combination diet, rich in fruits, vegetables and low fat dairy foods as a source of increased calcium, and low in saturated fats, led to “significantly reduced levels of blood pressure.” The diet was as effective as the most commonly prescribed medications in lowering blood pressure.
Calcium-rich foods such as milk, cheese and yogurt should be consumed three times a day for children to develop healthy bones. Since bones and muscles can’t survive on calcium alone, remember to exercise a minimum of 30 minutes a day for best results.

Count the number of calcium-rich servings you eat each day this week in the chart below. Also list the days you exercise a minimum of 30 minutes. Have your friends and family do the same.

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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Key**
- Cheese
- Milk
- Yogurt
- Exercise
Dairy foods provide calcium in a form that your body can use, which is key to a healthy diet. Dairy foods also provide nutrients, such as protein, phosphorus, and riboflavin.

Calcium is a mineral that your body uses to build bones and teeth, regulate muscle contractions, help prevent osteoporosis, reduce levels of hypertension, and lower the risk of colon cancer.

How Much?
The Institute of Medicine recommends different dairy intake for each age group, as shown below.

<table>
<thead>
<tr>
<th>AGE</th>
<th>MG/DAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-8</td>
<td>800</td>
</tr>
<tr>
<td>9-18</td>
<td>1,300</td>
</tr>
<tr>
<td>19-50</td>
<td>1,000</td>
</tr>
<tr>
<td>51+</td>
<td>1,200</td>
</tr>
</tbody>
</table>

Did you know? Whole milk and skim milk have the same amount of calcium.

Where do I Get Natural Calcium?

- *MILK*
  - 8 oz. glass: 300mg calcium
  - 8 oz. cup: 250mg calcium
  - 2 oz. serving: 400mg calcium

- *YOGURT*
  - 8 oz. cup: 250mg calcium

• Nearly half the children ages 3-5 aren’t getting enough calcium
• 50% of your bones are being built in the teen years
• 3 out of 4 boys and girls do not get enough calcium
<table>
<thead>
<tr>
<th>Snack Name</th>
<th>Appeal Rating</th>
<th>3-Star Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Persuasiveness</td>
<td>Nutritious</td>
</tr>
<tr>
<td></td>
<td>Score 1-3 (3 is highest!)</td>
<td></td>
</tr>
</tbody>
</table>

* Review Appeal and Star listing in Explore and Examine section. Students can add more criteria.
5. Resources

Glossary of Vocabulary Words

**ADVERTISE**
To call the attention of the public to a product or business, especially to encourage purchasing.

**AGRICULTURE**
The science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products.

**APPEAL**
The power of arousing a sympathetic response.

**AUTONOMOUS**
Able to make decisions and act on them as a free and independent moral agent.

**BULL**
Male cow used for breeding, beef or other processed items.

**CALCIUM**
An important nutrient in milk and other dairy products, necessary for strong bones and teeth.

**CALORIES**
Used as a unit of measuring the energy produced by food when oxidized in the body.

**CALF**
A baby cow.

**CARBOHYDRATE**
Group of organic compounds that includes sugars, starches, celluloses, and gums, and serves as a major source of nutrients in the diets of animals.

**CAREER**
A profession for which one trains and which is undertaken as a permanent calling.

**CHEESE**
The fresh or ripened product resulting from the coagulation of the milk protein, which is called casein. This process produces curds, which can be eaten immediately after draining the liquid or can be stored to make aged cheese. (The liquid is called whey.)

**CHOLESTEROL**
A crystalline, fatty alcohol found in animal fats, blood, nerve tissue, and bile.

**CHURN**
Processing equipment for turning cream into butter. In early farming, this was a wooden churn. Modern creameries use giant stainless steel churns.

**COMMERCIAL**
In radio and television, the part of a broadcast devoted to advertising the sponsor's product.

**CONSUMER**
A person who uses goods or services to satisfy his/her needs.

**COW**
Female animal about two years old which has had a calf and can now be milked.

**CULL**
To remove an animal from the herd.

**CUD**
The regurgitated (burped up) mouthful of feed a cow chews on during the digestive cycle.

**CULTURED**
Addition of friendly bacteria to milk which converts milk sugars (lactose) into lactic acid to make cheese, cottage cheese, yogurt, and sour cream.

**CURDS AND WHEY**
First step in cheesemaking where the casein (protein) in milk coagulates after the milk is heated. The whey is drained off for use in processed foods; curds at this stage are known as “squeaky” cheese; further processing results in different types of cheese.

**(% DAILY VALUE (OR %DV)**
Shows how food fits into overall daily diet. Percent daily values are based on a 2,000 calorie diet.

**CRITERIA**
A standard on which a judgment or decision may be based.
5. Resources

DEMOCRATIC
Characterized by free and equal participation in government or in the decision-making processes of an organization or group.

FAT and OILS
Fats and oils (which are liquid fats) are a concentrated source of energy. Fats in the diet are necessary for good health. They make certain vitamins available for use in the body, they cushion vital organs, they make up part of all body cells, and they help to maintain body temperature. Fats also delay pangs of hunger because a food mixture containing fat remains longer in the stomach.

FERMENTATION
The process that occurs after feed is put into a silo; this adds nutrients to the hay or corn silage and helps preserve the feed.

FERTILIZER
A substance (as manure or a chemical mixture) used to make soil more fertile.

FINANCE
The business or art of managing the monetary resources of an organization, country or individual.

FOOD GUIDE PYRAMID
In the early 1990s, the long-standing, traditional basic four food groups were reworked into the more balanced and healthy food guide pyramid. This pyramid has as its base the grain group; on the second level are the fruit and vegetable groups; on the third level are the meat and dairy groups; and at the top are the fats, oils and sweets groups.

FORTIFIED
To strengthen or enrich (food), as by adding vitamins.

FUNGICIDE
An agent that destroys fungi or inhibits their growth.

FUNGI
Any major group (Fungi) of saprophytic and parasitic spore-producing organisms usually classified as plants that lack chlorophyll and include molds, rusts, mildews, smuts, mushrooms and yeasts.

GRAIN
Special mixes that are often made into pellets which contain different nutritional requirements as a supplement to corn silage or hay.

HAY
Dried grass that is either baled into square bales, wrapped into round bales that look like giant marshmallows, or chopped and put into silos.

HEIFER
A young cow that has not produced a calf.

HOMOGENIZATION
Breaking up and dispersing milkfat through milk which results in a smooth uniform texture. (If milk wasn't homogenized, the cream would rise to the top.)

MAMMAL
Any animal who nourishes its young through milk provided by the mammary gland.

MANURE
Waste material resulting after an animal has processed all the feed through the digestive system. Manure is used as a fertilizer on hay fields and in gardens, making the farmer one of the best recyclers in the business!

MARKETING
The act or business of buying or selling in the market.

MILK
Liquid source of nutrition for mammals; one of the best sources of calcium, protein and other vitamins.

MINERAL
Any naturally occurring substance that is neither vegetable nor animal.

NUTRIENT
To function, the human body must have nutrients. The nutrients known to be essential for human beings are proteins, carbohydrates, fats and oils, minerals, vitamins and water.
5. Resources

NUTRITION
Nourishing or being nourished; the series or processes by which an organism takes in and assimilates food for promoting growth and replacing worn or injured tissues.

OSTEOPOROSIS
A condition that especially affects older women and is characterized by decrease in bone mass with decreased density and enlargement of bone spaces producing porosity and fragility.

PASTEURIZATION
Milk is pasteurized by quickly heating it to 161 degrees Fahrenheit for 15 seconds and then rapidly cooling it; this protects the purity and flavor of milk without affecting its nutrient value.

PHOSPHORUS
Phosphorus works with calcium to make strong bones and teeth. A diet that furnishes enough protein and calcium also provides enough phosphorus. Other important minerals are sodium, potassium, iodine, magnesium, zinc and copper.

PRODUCER
A person who produces (to bring forth, manufacture, bear or yield the product) goods and services. A farm operation or producer produces milk to be sold to the processor.

PROCESSOR
Directing a particular method of doing something, generally involving a number of steps or operations. (For example, one dairy company or processor, processes milk into cheese).

PROTEIN
One or more chains of amino acids that are essential in the diet of animals for the growth and repair of tissue and can be obtained from foods such as meat, fish, eggs, milk and legumes.

SILO or AG BAG
Upright concrete or metal storage unit for feed fermentation; these can also be horizontal (called ground silos made of concrete). Ag Bags are the white marshmallow-looking silos made from plastic bags which process feed the same way but do not require permanent buildings.

SNACK
A light meal, usually one taken between regular meals.

TEATS
Four extensions of the cow’s udder which – when squeezed or sucked – give milk.

TOTAL MIXED RATION
Nutritious and balanced mix of feed for dairy cows; can include any of the following: silage, hay, cottonseed, soybeans.

UDDER
The “bag” under the cow where the milk is held.

VETERINARIAN
A doctor for animals.

VITAMIN
Complex organic substance found in most foods and essential, in small amounts, for the normal functioning of the body.

WHEY
A clear liquid that is separated from the milk during the cheesemaking process.

YOGURT
A mixture of milk, skim milk and/or cream and friendly bacteria, often blended with fruit or other flavorings.
5. Resources

Agriculture

- Vermont Farm Bureau
  www.vtfb.org
- AgDay:
  www.agday.org
- Farm Safety 4 Just Kids:
  www.fs4jk.org
- Vermont Ag in the Classroom:
  www.vermontdairy.com/teachers
- Kids for Conservation:
  http://apps.carleton.edu/student/orgs/kfc/
- USDA National Ag in the Classroom:
  www.agclassroom.org
- The Story of Farming

Dairy Health and Nutrition

- Cabot Creamery:
  cabotcheese.coop
- National Dairy Council:
  www.nationaldairycouncil.org
- American Dairy Association:
  www.adadc.com
- Dairy Management, Inc.:
  www.dairyinfo.com
- Moo Milk:
  www.moomilk.com
- Sci4Kids:
  www.ars.usda.gov/is/kids
- United States Department of Agriculture Team Nutrition:
  www.fns.usda.gov/tn
- American Dietetic Association:
  www.eatright.org
- Basic Egg Facts:
  www.aeb.org
- International Food Information Council:
  www.kidnetic.com
- Center for Disease Control:
  www.cdc.gov/HealthyYouth/healthtopics/index.htm
- Action for Healthy Kids
  www.actionforhealthykids.org
- American School Food Service Association:
  www.schoolnutrition.org
- National Association for Sports and Physical Education (NASPE):
  www.aahperd.org

Career Exploration

- www.ffa.org
- www.careerkids.com
- www.hoards.com
- www.votech.about.com
- www.agnic.org
- www.jobsmart.org/tools/resume
- www.learningforlife.org
- www.FB.org

Middle School Career & Nutrition Curriculum

- The World of Work: Scope it Out
  University of Kentucky Ag Distribution
  131 Scovell Hall, UK, Lexington, KY 40546-0064
- Welcome to the Real World!
  Rockford Extension Center
  431 S. Phelps Ave, Suite 605, Rockford, IL 61108
- Learn and Earn for Fun and Profit
  University of Maryland 301.403.4264
- Food, Culture and Reading Pre-K-Grade 2
  6 lessons highlight what children eat around the world
- Food, Fun and Reading – includes a MyPlate update
  Both programs are available through
  University of Vermont Extension
  Diane Mincher, author
  diane.mincher@uvm.edu 802.388.0511
- Dairy Farming in Vermont–K-4 Standards Based Dairy
  Unit Available through Vermont Ag in the Classroom,
  info@vtfb.org
Each of the activities in this guide address national education standards in the subjects of Language Arts, Social Sciences, Science and Math. Use the assessment tools included below to assess student progress by plugging in your own state standard. For more detailed descriptions of national and specific state standards see Education World listings at: http://www.education-world.com.

### What to Assess
- Knowledge
- Understanding
- Feelings
- Beliefs
- Skills
- Previous Experience
- Misconceptions
- Prior Knowledge
- Multiple Intelligences

### Forms of Assessment
- Products produced from the learning activity. These are concrete manifestations of acquired knowledge and skills.
- Performances showing the actual demonstration of acquired knowledge and skills.
- Anecdotal Observations: informal observations or more formal notes used to assess either task-specific or generalized-standard criteria.
- Assessment tasks, such as surveys, questionnaires, graphic organizers.
- Scoring Guides, such as rubrics and checklists.

### Sample Tools
On the following pages are samples of a graphic organizer, checklist and rubric to use as templates to support the documentation of a student’s progress through doing the Cows, Cheese, and Calcium activities.

### How to Assess
- Scoring Guides
- Graphic Organizers
- Questionnaires/Surveys
- Written Pieces
- Oral Pieces
- Visual Art Pieces
- Anecdotal Observation

### When to Assess
- Pre-assessment. Generally conducted using product or performance task, sometimes done using generalized-standard rubrics and checklists.
- Ongoing Assessment. Regularly conducted through product and performance tasks, periodically done using generalized-standard rubrics and checklists.
- Post-assessment. Generally conducted using a product or performance tasks and generalised-standard rubrics and checklist.

### How to Document Student Progress
- Observation Logs
- Tools (scoring guides)
- Portfolios

Students are asked to first list what they know about the topic being explored, then add what they would like to know or know more about regarding that topic (younger students can draw pictures). When the activity is completed, students fill in the “What I Learned” column and compare those results with the information they put in the first two columns. This task is excellent for helping students identify pre- and misconceptions they might have about a particular topic.

<table>
<thead>
<tr>
<th>What I know</th>
<th>What I want to know more about</th>
<th>What I Learned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
Education Standard
i.e. Students use organizational systems to obtain information from sources (including libraries and the internet). Please check the organizational systems used in preparing this project.

Name: 

Topic: 

Date: 

<table>
<thead>
<tr>
<th>Library Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card Catalog</td>
</tr>
<tr>
<td>Readers' Guide to Periodicals</td>
</tr>
<tr>
<td>Indices (e.g. Agricultural Digest, etc.)</td>
</tr>
<tr>
<td>Microfilm/Microfiche</td>
</tr>
<tr>
<td>Video/Filmstrip Archives</td>
</tr>
<tr>
<td>Other:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Computer Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet</td>
</tr>
<tr>
<td>Informational Software</td>
</tr>
<tr>
<td>E-mail</td>
</tr>
<tr>
<td>Other:</td>
</tr>
<tr>
<td>Others:</td>
</tr>
</tbody>
</table>

Sample Tool Checklist
Cows, Calcium and Cheese: Nutrition Activities for the K-9 Classroom
6. Udderly Wonderful Tips & Tidbits
### Education Standard: Teamwork Rubric

<table>
<thead>
<tr>
<th>criteria</th>
<th>good start</th>
<th>almost there</th>
<th>got it!</th>
<th>wow!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giving it my all and being responsible</td>
<td>Attempts to stay on task but struggles</td>
<td>Is focused on the task some of the time</td>
<td>Is focused on the task most of the time</td>
<td>Is focused on the task the whole time</td>
</tr>
<tr>
<td>Giving it my all and doing my share</td>
<td>Passively contributes</td>
<td>Occasionally contributes</td>
<td>Frequently contributes</td>
<td>Continuously contributes</td>
</tr>
<tr>
<td>Working with others, cooperating &amp; collaborating</td>
<td>Only rarely follows group’s rules and system</td>
<td>Sometimes follows group’s rules and system</td>
<td>Frequently follows group’s rules and system</td>
<td>Always follows group’s rules and system</td>
</tr>
<tr>
<td>Getting the job done, compromising and resolving conflict</td>
<td>Attempts to accept group decision but struggles to not further argue personal points</td>
<td>Usually accepts group decision without further arguing personal points</td>
<td>Always accepts group decision without further arguing personal points</td>
<td>Always accepts and lends support to group decision</td>
</tr>
</tbody>
</table>
**Tips for Families**

**Eat Right**

1. **Make half your grains whole.** Choose whole-grain foods, such as whole-wheat bread, oatmeal, brown rice, and lowfat popcorn, more often.

2. **Vary your veggies.** Go dark green and orange with your vegetables—eat spinach, broccoli, carrots, and sweet potatoes.

3. **Focus on fruits.** Eat them at meals, and at snack time, too. Choose fresh, frozen, canned, or dried, and go easy on the fruit juice.

4. **Get your calcium-rich foods.** To build strong bones serve lowfat and fat-free milk and other milk products several times a day.

5. **Go lean with protein.** Eat lean or lowfat meat, chicken, turkey, and fish. Also, change your tune with more dry beans and peas. Add chick peas, nuts, or seeds to a salad; pinto beans to a burrito; or kidney beans to soup.

6. **Change your oil.** We all need oil. Get yours from fish, nuts, and liquid oils such as corn, soybean, canola, and olive oil.

7. **Don’t sugarcoat it.** Choose foods and beverages that do not have sugar and caloric sweeteners as one of the first ingredients. Added sugars contribute calories with few, if any, nutrients.

**Exercise**

1. **Set a good example.** Be active and get your family to join you. Have fun together. Play with the kids or pets. Go for a walk, tumble in the leaves, or play catch.

2. **Take the President’s Challenge as a family.** Track your individual physical activities together and earn awards for active lifestyles at www.presidentschallenge.org.

3. **Establish a routine.** Set aside time each day as activity time—walk, jog, skate, cycle, or swim. Adults need at least 30 minutes of physical activity most days of the week; children 60 minutes everyday or most days.

4. **Have an activity party.** Make the next birthday party centered on physical activity. Try backyard Olympics, or relay races. Have a bowling or skating party.

5. **Set up a home gym.** Use household items, such as canned foods, as weights. Stairs can substitute for stair machines.

6. **Move it!** Instead of sitting through TV commercials, get up and move. When you talk on the phone, lift weights or walk around. Remember to limit TV watching and computer time.

7. **Give activity gifts.** Give gifts that encourage physical activity—active games or sporting equipment.

**Have Fun!**