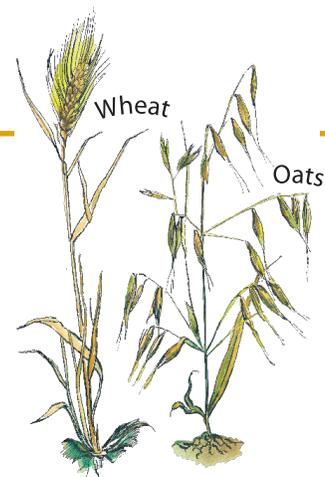


Classroom Bites

Grains



Did You Know

- Montana fields grow an impressive amount of grains including wheat, barley, oats, and corn. Montana is the 3rd top producer of wheat and barley, 17th for oats, and 37th for corn. Wheat production in 2013 was valued over \$1.3 billion, which includes 203,070,000 bushels!
- Wheat is classified by the season in which it is grown, hardness, color, and other factors (e.g., hard red winter wheat). Spring wheat is planted in spring and harvested in late summer. Winter wheat is planted in the fall and harvested in the spring or summer, depending on the conditions. Spring wheat is the most common variety in Montana, accounting for over half of our wheat production.
- Kamut, grown in Montana, is an ancient variety of wheat and is an excellent source of the mineral selenium.
- Barley has played an important role in many cultures throughout history. In ancient Egypt, barley was used in religious ceremonies, while in Rome, gladiators believed barley gave them extra strength.
- Despite their many health benefits and popularity as a breakfast food, only about 5% of oats are used for human consumption, while the rest are used in products and animal feeds.
- What's in a bushel? One US bushel is approximately 8 gallons of dry crops. One bushel of wheat weighs about 60 pounds.

Selection

The process of refining grains to make flour and other products removes the fiber and some of the nutrients from the grain. Therefore, select at least half of your grains from whole grain sources. Whole grain sources include whole wheat bread, oatmeal, whole corn, and hulled barley. Although most refined grains are enriched—the nutrients are added back in after processing—they are lacking the fiber of the original whole grain.

Storage

Keep whole grains and flour stored in a cool, dry place in airtight containers. To extend shelf life, store in the refrigerator or freezer.

Preparation

Barley. Prior to use, wash carefully. To cook, use 1 cup hulled barley to 3 cups water or broth, bring to a boil then simmer for 45-60 minutes. Yields approximately 3 1/2 cups.

Cornmeal. To cook, use 1 cup cornmeal to 4 cups water or broth, bring to a boil then simmer for 25-30 minutes. Yields approximately 2 1/2 cups.

Oats. To cook, use 1 cup steel cut oats to 4 cups water or broth, bring to a boil then simmer for 20 minutes. Yields approximately 4 cups. Use 1 cup rolled oats to 2 1/2 cups water. Bring to water to boil, add rolled oats, simmer for 5 minutes stirring occasionally.

Wheat. Prior to use, wash and soak wheat berries for 10-12 hours in water. To cook, use 1 cup wheat berries to 4 cups water or broth, bring to a boil then simmer for 45-60 minutes. Yields approximately 3 cups.

Cooking

Breakfast. Use in parfaits, prepare hot for cereal, or roast with dried fruit to make granola.

Ground. Grains can be ground using electric or hand mills. Depending on the types of grain, the flour can be used in products such as breads, muffins, cake, crepes, tortillas, or various desserts.

Pasta. To cook, use approximately 1 cup pasta to 6 cups water or broth, bring to a boil then simmer for 8-12 minutes or until tender. Add to cold salads with chopped vegetables or make a hot dish with tomato sauce and chopped vegetables.

Pilaf, Risotto, Soups, Stews or Stir-fry. Add cooked grains for added nutrients and texture.

Pop. Drizzle cooking oil in a heated pan and add low-sodium seasonings, if desired. Put several corn kernels in the pan. When the kernels pop, add 1/3 cup corn kernels evenly in the pan, cover with lid and remove from heat for 30 seconds. Return to heat and gently shake the pan while kernels pop.

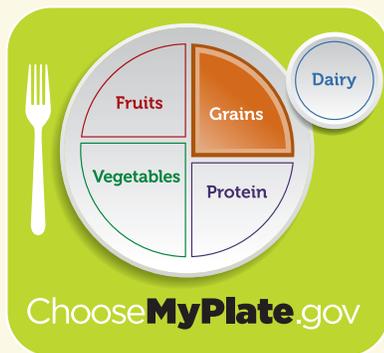
Salad. Chill grains after cooking. Combine with chopped vegetables, such as tomatoes and broccoli, then toss with a balsamic, Italian, or another vinaigrette dressing. Add to a pasta or green salad for fiber. Ideal for wheat berries and hulled barley.

Season. For added flavor, cook grains in water, broth, or tomatoes. To enhance flavor, experiment with allspice, basil, cinnamon, chili powder, celery seed, cloves, garlic, ginger, nutmeg, oregano, sage, and thyme.

Adapted from the Grains Food Fact Sheet developed by Montana State University Extension. For the full fact sheet and other resources, visit: <https://nutrition.msuextension.org/>.

Nutrition Information

When the grain kernel is intact (the bran and germ haven't been removed in processing), it is rich in fiber and many minerals, B vitamins, and folic acid. However, when it is processed to make white flour, the fiber and most of the vitamins and minerals are lost. All grains are rich in carbohydrates. Fiber is necessary to maintain a healthy digestive system. Gluten is contained in the endosperm of many grains and creates the texture and volume of bread by stretching and capturing gasses released by yeast or other leavening agents. While some individuals may have Celiac Disease, have a wheat allergy, or are sensitive to gluten, most people are able to eat gluten-containing grains without issue. Oats do not contain gluten, however, they are often stored or processed with wheat, and therefore are not usually acceptable for those with gluten intolerances.



Recipes

Tasty Tabbouleh

Tabbouleh (Tuh-BOO-lee), also spelled tabouli, comes from the word tabboula, which means "Middle Eastern Cookery" in Arabic. Tabbouleh is originally from the mountains of Syria and Lebanon. This easy recipe can easily be made in the classroom with student assistance, and provides an opportunity to connect nutrition, culture, and geography. Bulgur wheat is whole wheat that has been cracked and partially cooked.

Adapted from: Chop Chop

Servings

4

Ingredients

- 1/2 cup bulgur wheat
- 1 cup warm water
- 2 large ripe tomatoes, cored and diced (about 1 1/2-2 cups)
- 1 cucumber, diced
- 2-3 scallions, chopped (use both the green and white parts)
- 1 bunch flat leaf parsley leaves, chopped
- 1 small bunch mint leaves, chopped (optional)
- 2 Tbsp olive oil
- 1 Tbsp fresh lemon juice
- Pinch of salt

Directions

1. Put the bulgur into the mixing bowl. Pour 1 cup warm water into the bowl. Cover and let sit until the bulgur is soft, at least 2 hours or refrigerate overnight.
2. After the bulgur is soft, add the tomatoes, cucumber, scallions, parsley, mint if using, olive oil, and lemon juice or red wine vinegar. Mix everything together.
3. Cover the bowl and refrigerate at least 1 hour, up to overnight.

Oatmeal On-The-Go Breakfast Bars

This is a great recipe for grab-and-go breakfasts or a tasty snack!

Adapted from *Weelicious.com*

Servings

18 bars

Ingredients

2 cups old fashioned oats

1 cup whole wheat flour

1 1/2 tsp cinnamon

Pinch of salt

1 tsp baking powder

1 1/2 cup milk (any kind of milk — rice, almond, soy, cow's — will work) or water

1/4 cup brown sugar

1/2 cup applesauce (or baked squash or pumpkin puree if available)

1 large egg

1 tsp vanilla

3/4 cup dried fruit (cranberries, raisins, blueberries, cherries, etc.) optional

1/2 cup nuts (walnuts, sunflower seeds, pumpkin seeds, etc.) optional

Preparation

1. Preheat oven to 375°F.
2. Place the oats, flour, cinnamon, salt, and baking powder in a bowl and stir to combine.
3. In a separate bowl, mix the milk, applesauce, egg, sugar, and vanilla.
4. Pour the dry ingredients into the wet mixture, stir to combine and then stir in the dried fruits and nuts.
5. Pour the oatmeal mixture into a greased 9 x11 inch baking dish.
6. Bake for 30 minutes or until thickened and golden.
7. Cool, cut into squares, and serve. Refrigerating: allow to cool, cut into squares, place in an airtight container and refrigerate up to 5 days. Freezing: allow to cool, cut into squares, and place in a plastic bag to freeze up to 4 months. When ready, allow to defrost in fridge for 24-48 hours.

Activities

What Makes a Whole Grain?

Adapted from: *Lesson 6: Whole Grains*, created by Nicki Jimenez, FoodCorps Member and Whole Grains Lesson, *Eat Smart, Be Smart* curriculum.

Time

45 minutes

Objectives

This lesson presents the difference between refined and whole grain products and ways to identify wheat seed parts and functions. Students should be able to:

- Describe the difference between refined grains and whole grains.
- Know the importance of eating whole grain foods and identify examples of them.
- Identify the three parts of a wheat kernel and their function.

Supplies

- A stalk of wheat or an entire wheat plant
- Flour in small container and other grain products (couscous, which is a tiny pasta made from wheat, bulgur wheat, wheat germ, etc.) in individual containers to demonstrate varying levels of processing.
- Wheat berries (whole)
- "How It's Made: Flour" video (5 min):
<https://www.youtube.com/watch?v=kFP-KBPwn3E>
- Wheat kernel diagram and functions, available at:
<https://agrwbc.mt.gov/FromtheGroundUp-Pages/The-Kernel>
- Printed or written slips for parts of kernel (one of each) reading:
 - I am the **germ**. I contain vitamins, protein, minerals and healthy fats. I help give you energy!
 - I am the **endosperm**. I contain starchy carbohydrates and proteins.
 - I am the **bran**. I contain fiber and B vitamins. I help you stay full and give you energy!
- Props for parts of kernel:
 - Apple
 - Jacket or blanket



Directions

1. Show students the wheat plant and ask them if they know what it is.
 - a. Ask them to name foods that are made of wheat and other grains such as oats, barley, and corn.
 - b. Then ask the students to identify the food group these types of foods are in (grain group) and what key nutrient is found in the grain group (carbohydrates). Point out that protein is also found in grains.
 - c. Pass around the samples of wheat berries (kernels), flour, and/or other wheat products.
2. Explain the process of planting, growing, harvesting, and milling grain to make flour or show the "How It's Made: Flour" video:
<https://www.youtube.com/watch?v=kFP-KBPwn3E>
3. Show wheat kernel diagram on projector or pass out copies. Point out the three plant parts.
4. Ask for three student volunteers to be kernel parts (one needs to be wearing running shoes). Tell the students we are going to "meet" the three parts of a grain:
 - a. Introduce **Germ** (a very energetic student, wearing **RUNNING SHOES**) and have students say "Hi germ!" The germ is wearing running shoes because s/he is going to sprout into a new plant. Have the germ volunteer read the germ lines listed in supplies section.
 - b. Hand second student volunteer an apple and ask him/her to stand next to germ. Introduce **endosperm** and have students say "Hi endosperm!" Explain that endosperm is holding an apple because s/he is the germ's food supply. Have the endosperm volunteer read the endosperm lines listed in supplies section.
 - c. Hand the third student volunteer the blanket (or jacket) and ask him/her to stand behind germ and endosperm with arms outstretched holding blanket around/over the other two. Introduce **bran** and have students say "Hi bran!" Explain that the bran protects rest of seed from sunlight, pests, water and disease. Have the bran volunteer read the bran lines listed in supplies section.
 - d. Thank volunteers and have the other students cheer for them while they return to their seats.

5. Ask students to describe the difference between whole wheat/whole grain and refined or enriched flour? Explain when all three parts (the whole kernel) are milled together it makes whole wheat (aka whole grain) flour. If just the endosperm is used, then it makes white flour.
6. Ask students how whole wheat flour is different nutritionally than white flour, and which is better for our bodies. Whole wheat is a better choice because it contains the fiber (from the bran) and larger amounts of naturally occurring vitamins and minerals. Whole grains are recommended for good health. Point out that white bread is often "enriched" which means manufacturers add back the nutrients lost in the milling (as shown in the video right before the flour is bagged). Encourage students to select whole grain sources for at least half of the grains eaten per day.
7. Close the lesson by reinforcing the importance of enjoying whole grains. As a class, brainstorm a list of whole grains food items that they can enjoy today at lunch, for an afternoon snack, or at dinner. Write these on the board. If the school menu is available, point out the whole grains served on it. Ask students what kind of bread they will choose the next time they eat a sandwich.

Book Nook

Elementary School

Bread, Bread, Bread, by Ann Morris

Corn, by Gail Gibbons

The Wheat We Eat, by Allan Fowler

Pancakes, Pancakes!, by Eric Carle

The Little Red Hen, by Paul Galdone

Tick, Tock, the Popcorn Clock, by Jane Moncure

Middle School

Anna's Corn, by Barbara Santucci

Everybody Bakes Bread, by Norah Dooley



Dig Deeper

For sources and photo credits along with more recipes, lessons, quick activities, resources, and guides, visit: mtharvestofthemonth.org.

4 Montana Harvest of the Month: Grains



The Montana Harvest of the Month program showcases Montana grown foods in Montana schools and communities. This program is a collaboration between Montana Farm to School, Office of Public Instruction, Montana Team Nutrition Program, National Center for Appropriate Technology, Montana State University Extension, Gallatin Valley Farm to School, Montana Department of Agriculture, Montana Organic Association, and FoodCorps Montana. More information and resources are available at: mtharvestofthemonth.org

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