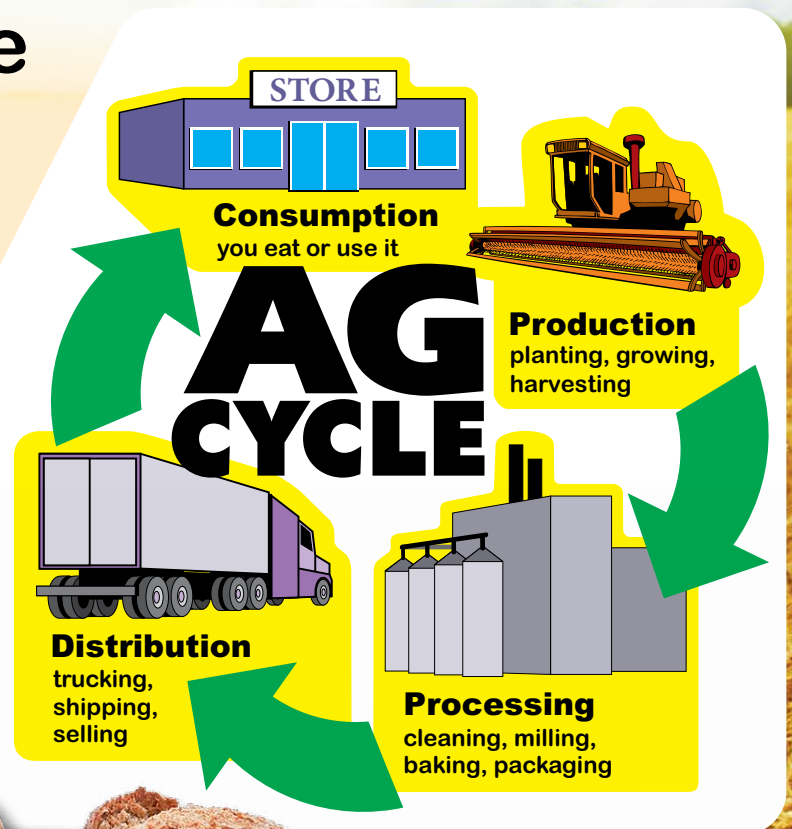


WHEAT

The Staff of Life

Wheat is called the staff of life because it's a basic food in diets all around the world. List some of the foods you eat that are made from wheat.

In this Ag Mag, you'll learn about wheat production, processing, distribution and consumption.



North Dakota usually is the #1 or #2 wheat-producing state in the country.

North Dakota farmers produce enough wheat to make more than 11 billion loaves of bread.



Wheat Production

Classes of Wheat

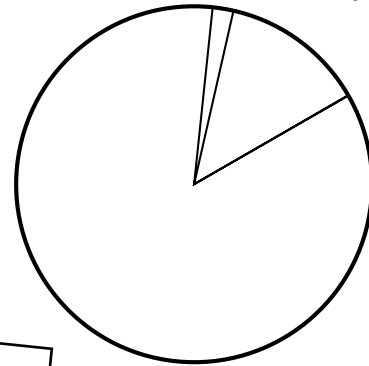
Three of the six classes of wheat are grown in North Dakota. Our state's farmers harvest about 7 million acres of wheat each year. An acre is about the size of a football field, so that's more than about 15% of our state's land area in wheat.

Hard Red Spring Wheat makes delicious yeast breads, dinner rolls and bagels. North Dakota grows almost half of the nation's hard red spring wheat. North Dakota farmers harvest about 6 million acres each year.

Durum is used to make pasta, couscous and some breads. North Dakota grows about 60% of the nation's durum. North Dakota farmers harvest about 800,000 acres each year.

Winter Wheat is grown in very small amounts in North Dakota. This wheat is planted in the fall, and the seedlings are dormant (inactive, not growing) during the winter. Winter wheat requires this cold period before growing again in the spring and summer. North Dakota producers harvest about 100,000 acres each year. Winter wheat also is used to make yeast breads and rolls.

Classes of Wheat in North Dakota



Hard Red Spring
 Durum Winter

Color or draw designs in the pie chart and legend to illustrate what proportion of North Dakota's wheat is hard red spring, durum and winter wheat.

Wheat is Measured in Bushels

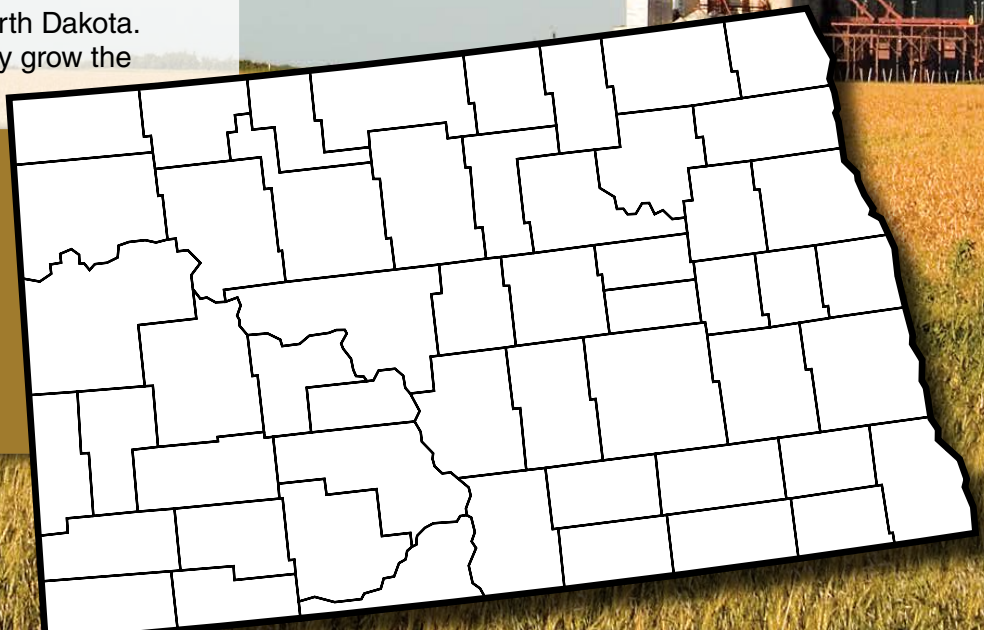
One bushel of wheat has about 1 million kernels and weighs 60 pounds. Is that more or less than you weigh? Farmers weigh the truck when it's full of wheat and then weigh the truck after the wheat has been unloaded to figure out how many pounds — and bushels — of wheat were unloaded.

WHEAT EMPTIED FROM TRUCK INTO GRAIN ELEVATOR

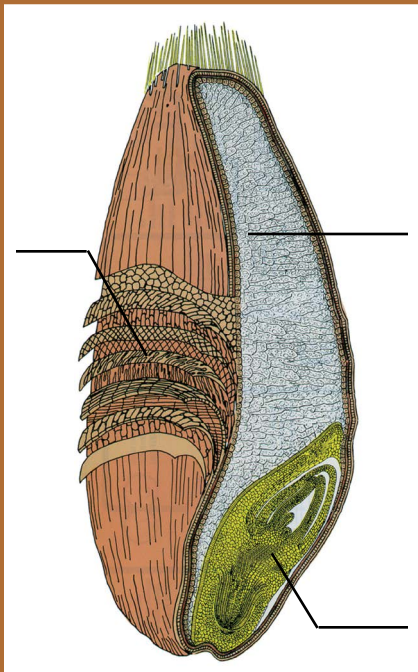
Where the Wheat Grows

Wheat is grown all across North Dakota. Color the counties that usually grow the most hard red spring wheat.

- | | |
|-----------|---------|
| Benson | Pembina |
| Bottineau | Ramsey |
| Hettinger | Towner |
| McLean | Walsh |
| Morton | Ward |
| Mountrail | |



The Wheat Kernel and Wheat Plant



The kernel is the seed from which the wheat plant grows. It's also the part we grind to make flour or semolina, which is coarse durum flour. Each tiny kernel contains three parts that are separated during the milling process.

Identify the parts of the wheat kernel above with these letters: A, B and C.

- A Bran is the hard outer cover of the seed that is in layers. It is the kernel's skin.
- B Germ is the part of the seed that sprouts and grows into a new plant.
- C Endosperm is the biggest part of the kernel (about 83%). It is the food source for the sprouting new plant. This part is ground into white flour and semolina. Whole wheat flour includes the endosperm, bran and germ.

Wheat is an annual grass. Annual means it lives only one year, so it's different from the grass in your lawn that grows back every spring, which is called perennial. The wheat plant grows 2 to 4 feet high and has long, narrow leaves that turn a beautiful golden color at harvest time.

Identify the parts on this wheat plant to the right with these letters: A, B, C, D and E.

- A On the wheat plant, the head contains the kernels.
- B Bristlelike spikes called the beard cover the kernels.
- C The stem supports the head.
- D The leaves use sunshine to make food through the process of photosynthesis.
- E The roots hold the plant in the soil and allow the plant to use nutrients and water from the soil.



North Dakota produces enough durum each year to make 6.5 billion servings of spaghetti.

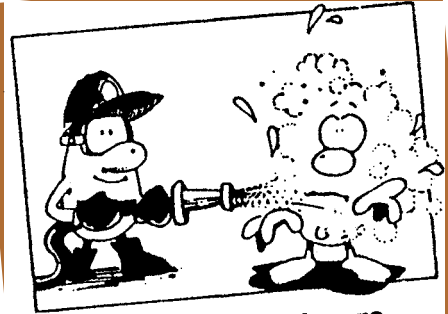
Wheat Processing



1. At the flour mill, the wheat kernels are cleaned to remove dust and pieces of straw.



2. Mechanical cleaners also remove weeds, seeds and other parts of plants.



3. Then the kernels are washed in a stream of water to take away stones and dirt.

Wheat Processing Story

Use these words to complete the story about wheat processing: endosperm, yeast, durum, gluten, dough, semolina, bubbles, milling.

_____ is the process of grinding the wheat into flour or semolina. To make white flour, the bran and germ must be carefully separated from the _____. Whole wheat flour includes the endosperm, bran and germ.

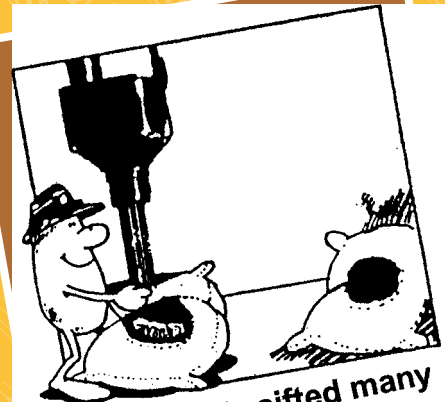
Gluten is the protein in wheat flour that helps _____ breads stretch when they rise.

Gluten works like bubble gum. The _____ traps the air bubbles from the yeast and keeps them in the dough. The tiny holes in a slice of bread are formed by gluten _____.

When _____ is milled, the product is called _____ rather than flour. Semolina resembles fine sand or sugar and is yellow or amber. Semolina and water are mixed together to make pasta dough. The _____ is kneaded and then forced through dies (metal disks with holes) to create more than 300 pasta shapes. The wet pasta is carefully dried before packaging and shipping. When good-quality pasta is cooked in water, it retains its yellow color, its shape and its firmness.



4. Next, big heavy rollers break up the wheat and crush it.



5. It then is sifted many times to give us flour.

Career Corner

Peter and Jess Dargis

Bread Poets

Bismarck, North Dakota

People have been going to Bread Poets in Bismarck to get delicious breads for 25 years. Peter and Jess Dargis are Bread Poets' new owners, who, a little over a year ago, took on a new challenge.

With no commercial baking experience, Peter and Jess had to learn how to bake but also how to run a small business. They were excited to learn how to do every job at the bakery, including each step of the bread-making process.

They make all the doughs from scratch, which begins with yeast activated by water and then adding flour, honey and sometimes other ingredients. After letting the dough rise, they weigh, divide, roll and pan the doughs. After the loaves are baked, taken out of the pans and cooled, they're sliced, bagged and labeled to be sold in the store or delivered to local grocery stores.

All the white flour used at Bread Poets comes from North Dakota-grown wheat from the North Dakota Mill and Elevator in Grand Forks.

"We mill our own whole wheat flour at the bakery in a stone burr mill, which is a machine that has two large millstones: one that spins and one that is stationary. The wheat kernels are crushed into flour between them," Peter said.

"We make different types of breads and sweet treats. The most popular is our Cinnamon Logs," Peter said. "We also make soft, delicious sandwich bread — our Poets White and Poets Wheat — and some different grain breads. Our most popular grain bread is the Maah Daah Hey Trail bread, which is named after a hiking and biking trail near Medora, North Dakota. This bread contains our whole wheat flour, white flour, rolled oats and for an added crunch, a mixture of millet (a small, round whole grain), sunflower seeds and flax seeds."

After working in information technology, Peter made a big change to own and run a bakery.

"Baking is very hands-on and requires a lot of physical work," Peter said. "I get to create something for people to eat and enjoy every day!"

Jess maintains a career in accounting while also helping at the bakery. She grew up baking with her mother, including baking one of the new products at Bread Poets: Caramel Bites.

"I grew up in Bismarck eating Bread Poets bread," Jess said. "Now our daughters Belle and Hope get to be taste testers for the delicious treats we make at the bakery."



Photos by Kara Haff



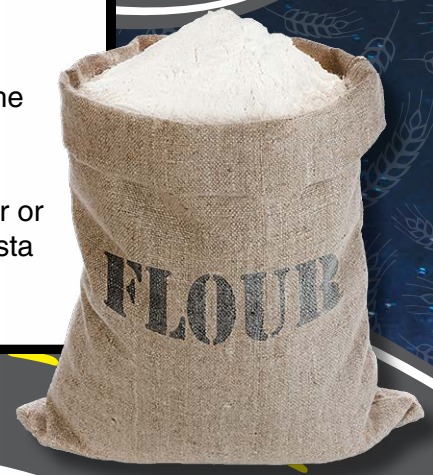
Wheat Distribution



The Journey of Wheat

Wheat travels through many steps from the farm to your dinner table. Think about wheat production, processing, distribution and consumption to number these steps 1-6 in the order in which they happen.

- _____ Elevator sells wheat to mill or to a foreign country
- _____ Farmer produces wheat
- _____ Bakery or pasta manufacturer packages products to sell at grocery store
- _____ Farmer delivers wheat to elevator
- _____ You buy wheat foods at the grocery store
- _____ Mill bags flour to sell at grocery store or sells flour or semolina to bakery or pasta manufacturer



- | | |
|---------------------|----------------------|
| _____ Matzo | A. Mexico |
| _____ Pita | B. Ireland |
| _____ Hamburger Bun | C. America |
| _____ Tortilla | D. Norway |
| _____ Scone | E. Greece |
| _____ Wonton | F. Scotland, England |
| _____ Fry Bread | G. China |
| _____ Croissant | H. Jewish |
| _____ Naan Bread | I. Italy |
| _____ Soda Bread | J. France |
| _____ Lefse | K. Morocco |
| _____ Couscous | L. Native American |
| _____ Spaghetti | M. India |

Around the World

About half of North Dakota's wheat is exported to other countries. Children around the world may eat their wheat as different products than what we eat here.

Use a computer to search and learn about each wheat food. Then write the letter of each wheat food's cultural origin on the line before it.

Adapted from: AgVenture: Exploring Ohio Agriculture, Ohio Agricultural Council and Ohio State University Extension

Wheat Consumption



Across

1. A flaky, rich, crescent-shaped roll.
2. A salted snack food shaped like a bow.
3. Hamburgers and hot dogs are served on this bread.
4. A small, round loaf of bread eaten with a meal.
5. Eaten on mashed potatoes, rhymes with navy.
7. A breakfast food with square-shaped dents all over it.
9. Round and flat, this breakfast food is served with syrup.
13. The outer covering of tacos.
14. A baked dish made of layers of broad, flat pasta, cheese, tomatoes and meat.
15. Small pockets of pasta filled with meat or cheese.
17. A breakfast food served in a bowl and covered with milk.
18. A peanut butter and jelly ____.

Wheat Foods Crossword Puzzle



Source: Amazing Wheat Teacher's Guide, Wheat Foods Council and state wheat commissions

Many delicious foods are made from wheat. Complete this crossword puzzle to name a few of them.

Down

1. A hot, cream-style cereal.
3. A hard, glazed, ring-shaped roll; often spread with cream cheese.
6. A rope candy that is usually red or black.
8. Long, skinny pasta shape often eaten with meatballs.
10. Curved, tubular pasta shape often served with cheese.
11. Long, narrow strips of bread often served with pasta and pizza.
12. Finely-ground wheat kernels used to make bread and other wheat foods.
16. Served toasted for breakfast.

Word Bank

bagel	flour	ravioli
bread	gravy	roll
breadsticks	lasagna	sandwich
buns	licorice	spaghetti
cereal	macaroni	tortilla
Cream of Wheat	pancake	waffle
croissant	pretzel	

Grains in MyPlate

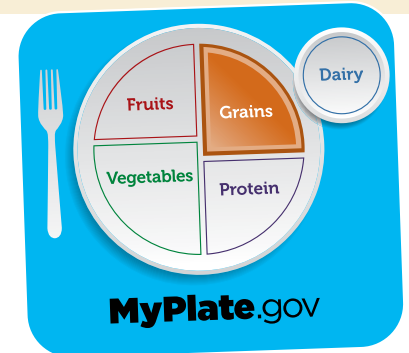
Bread, pasta, oatmeal, rice, barley, breakfast cereals, tortillas and grits are examples of grain products.

The amount of grains you need to eat depends on your age, sex and level of physical activity. Go to www.myplate.gov to learn how many servings of grains you should eat every day.

At least half the grains you eat each day should be whole grains. This means they contain the entire grain kernel. Foods that include whole wheat flour and bulgur (cracked wheat) are whole grains.

Grain-based foods provide complex carbohydrates, which are the best source of time-released energy for our bodies. These foods are usually low in fat and provide fiber, vitamins and iron.

What foods from the Grains group did you eat yesterday? _____



Take this issue of the North Dakota Ag Mag home to share what you've learned about wheat.

For more information about wheat, check out: www.ndwheat.com

A big thank you to the following for providing information for this issue of North Dakota Ag Mag:

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