

NORTH DAKOTA

# Ag Mag

A Magazine about Agriculture for North Dakota Students

Spring 2017



# WHEAT

## The Staff of Life

Wheat is called the staff of life because it's a basic food in diets all around the world. North Dakota farmers grow more wheat than any other crop.

### Agriculture!

It's farming and ranching and much, much more. It's the production, processing, distribution and consumption of our food, fiber, forestry and biofuel products.

### Think about the agriculture cycle in your area of North Dakota.

#### Production

List some of the crops and livestock grown.

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#### Distribution

What are some of the ways agricultural products are transported?

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#### Processing

Name some agricultural processing facilities.

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#### Consumption

What are your favorite foods to eat, natural fibers to wear, and forestry and bioenergy products to use?

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North Dakota produces enough durum each year to make 12 billion servings of spaghetti.





# Wheat Production

## Classes of Wheat

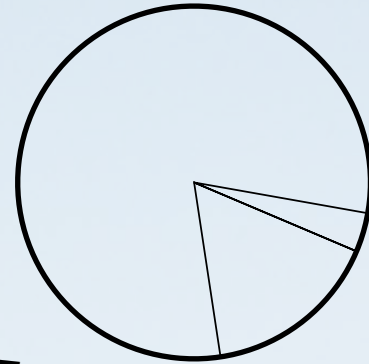
Three of the six classes of wheat are grown in North Dakota. Our state's farmers harvest an average of 8 million acres of wheat each year. An acre is about the size of a football field, so that's about one-fifth of our state's land area in wheat.

**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 an average of 6.5 million acres of hard red spring wheat.

**Durum** is used to make pasta, couscous and some breads. North Dakota grows about 60 percent of the nation's durum. North Dakota farmers harvest an average of 1.2 million acres of durum.

**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 300,000 acres of winter wheat on average. Winter wheat also is used to make yeast breads and rolls.

## Classes of Wheat in North Dakota



- Hard Red Spring
- Durum
- Winter

Use this pie chart to show what proportion of North Dakota's wheat is durum, how much is hard red spring and how much is winter. Be sure to include a legend with colors or designs so others will understand which segment of the pie represents which class of wheat.

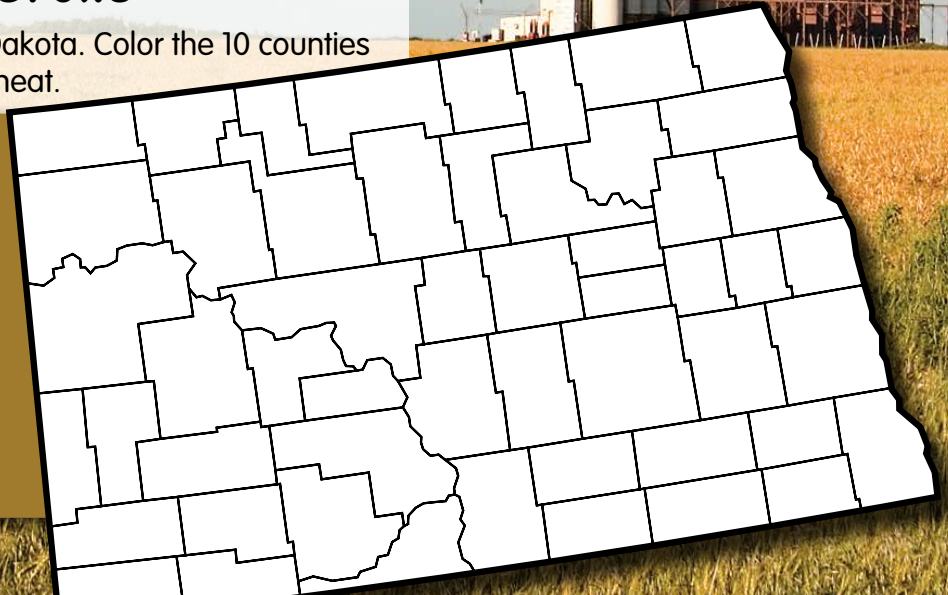
## Wheat is Measured in Bushels

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.

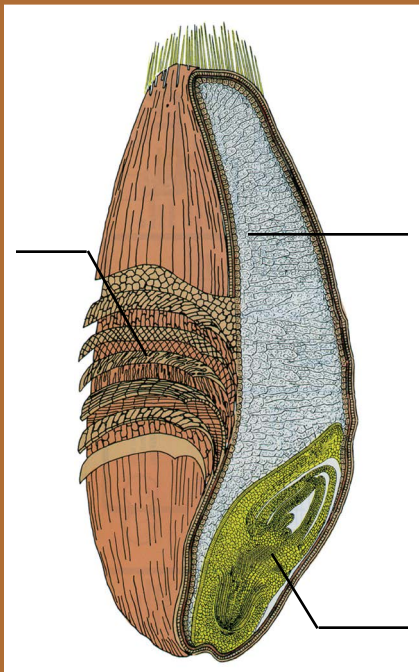
## Where the Wheat Grows

Wheat is grown all across North Dakota. Color the 10 counties that on average grow the most wheat.

- Cavalier – 14.7 million bushels
- Ward – 14.1 million bushels
- Williams – 13.4 million bushels
- Bottineau – 12.6 million bushels
- McLean – 12.2 million bushels
- Stark – 9.2 million bushels
- Walsh – 9.2 million bushels
- Pembina – 8.9 million bushels
- Mountrail – 8.9 million bushels
- Renville – 8.7 million bushels



# 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. Each tiny kernel contains three parts that are separated during the milling process.

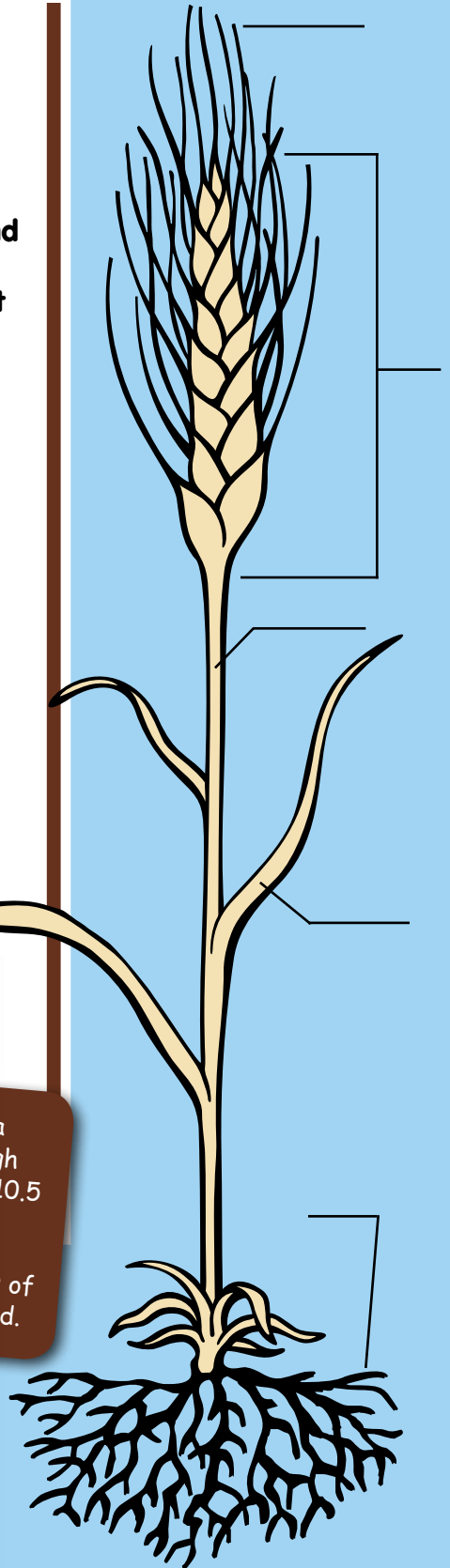
Identify the parts of the wheat kernel with these letters.

- 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 percent). 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 with these letters.

- 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.

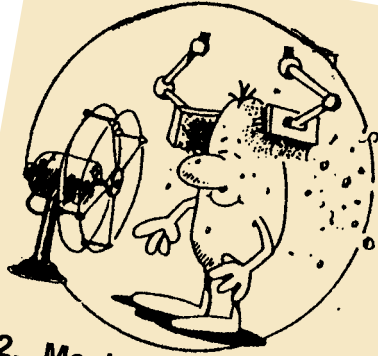




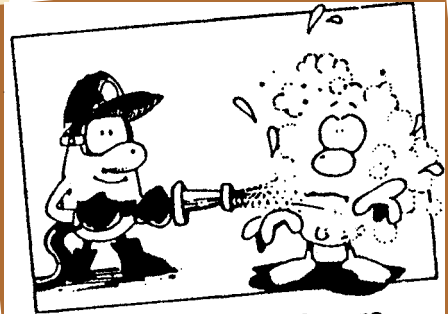
# Wheat Processing



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.

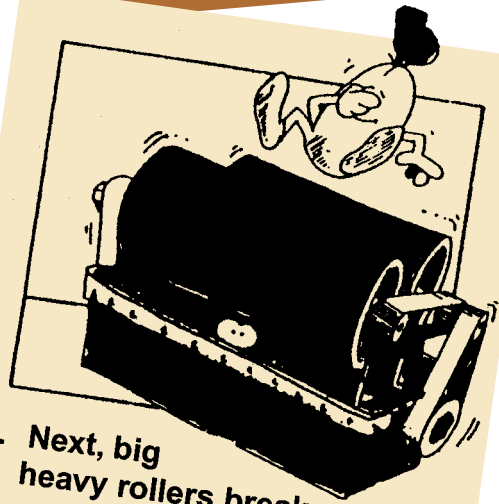
Milling is the process of grinding the wheat into flour or semolina. To make white flour, the bran and germ must be carefully separated from the endosperm. Whole wheat flour includes the endosperm, bran and germ.

Gluten is the protein in wheat flour that helps yeast breads stretch when they rise. Gluten works like bubble gum. The gluten 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 bubbles.

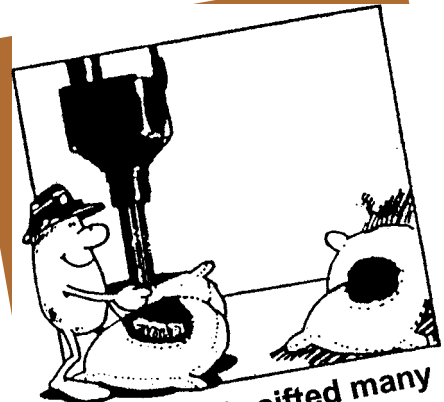
When durum is milled, the product is called semolina rather than flour. Semolina resembles fine sand or sugar and is yellow or amber. Semolina and water are mixed together to make pasta dough. The dough is kneaded and then forced through dies (metal disks with holes) to create more than 300 pasta shapes. 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.

North Dakota has several flour mills and pasta plants. Use the North Dakota map from Where the Wheat Grows on page 2 to identify the seven towns that have wheat processing facilities:

North Dakota Mill and Elevator, Grand Forks  
Dakota Growers Pasta Company, Carrington  
Cando Pasta, Cando  
Philadelphia Macaroni Co., Grand Forks  
Golden Plains Frozen Foods, Leeds  
Minot Milling, Minot  
Horizon Milling, Fairmount  
Abbiamo Pasta, Casselton



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

Jon Lee

Bread Poets Baking Co.

Bismarck, North Dakota

When you walk into Bread Poets Baking Co. in Bismarck, you are greeted with the aroma of fresh-baked bread. With the slogan "Where Bread is an Art Form," the bakery specializes in making different types of bread and using North Dakota wheat to make its flour.

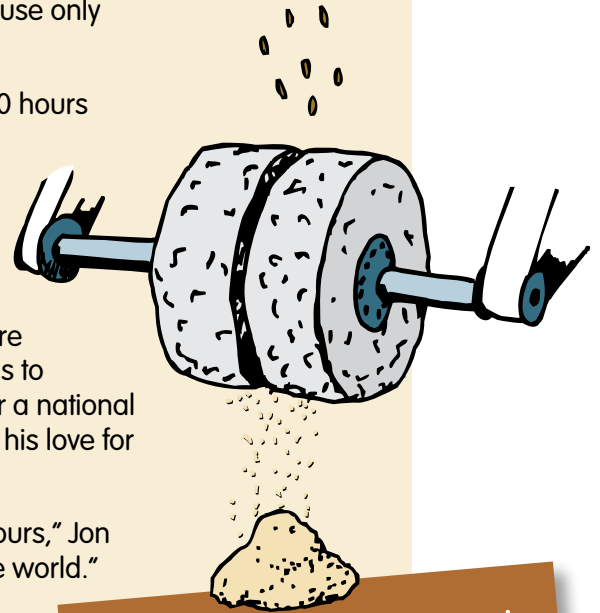
Jon Lee, owner of Bread Poets, puts a lot of work into making a loaf of bread. Each loaf is hand-kneaded and takes more than six hours from start to finish.

"We grind our wheat fresh daily in our own stone burr mill. This process ensures the absolute freshest product possible," Jon says. "We use only high-protein northern Great Plains wheat."

Bread Poets believes in freshness, with all breads sold within 30 hours of being pulled from the oven. Honey wheat, cheddar garlic, cinnamon log and Dakota seed are just a few of the varieties.

Jon graduated from North Dakota State University with a degree in mass communication and business. While in college, he interned with the North Dakota Ag Foundation and worked closely with the North Dakota Wheat Commission, where he developed an appreciation for agriculture and what it means to the state. After college, Jon worked as a business consultant for a national franchise. However, his desire to get back to North Dakota and his love for the baking industry brought him back to the state.

"There is no better place than North Dakota for a business like ours," Jon says. "Wheat from this region is considered to be the best in the world."



"We grind our wheat fresh daily in our own stone burr mill. This process ensures the absolute freshest product possible."



# Wheat Distribution



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## 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



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|---------------------|----------------------|
| _____ 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.

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

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# Wheat Consumption



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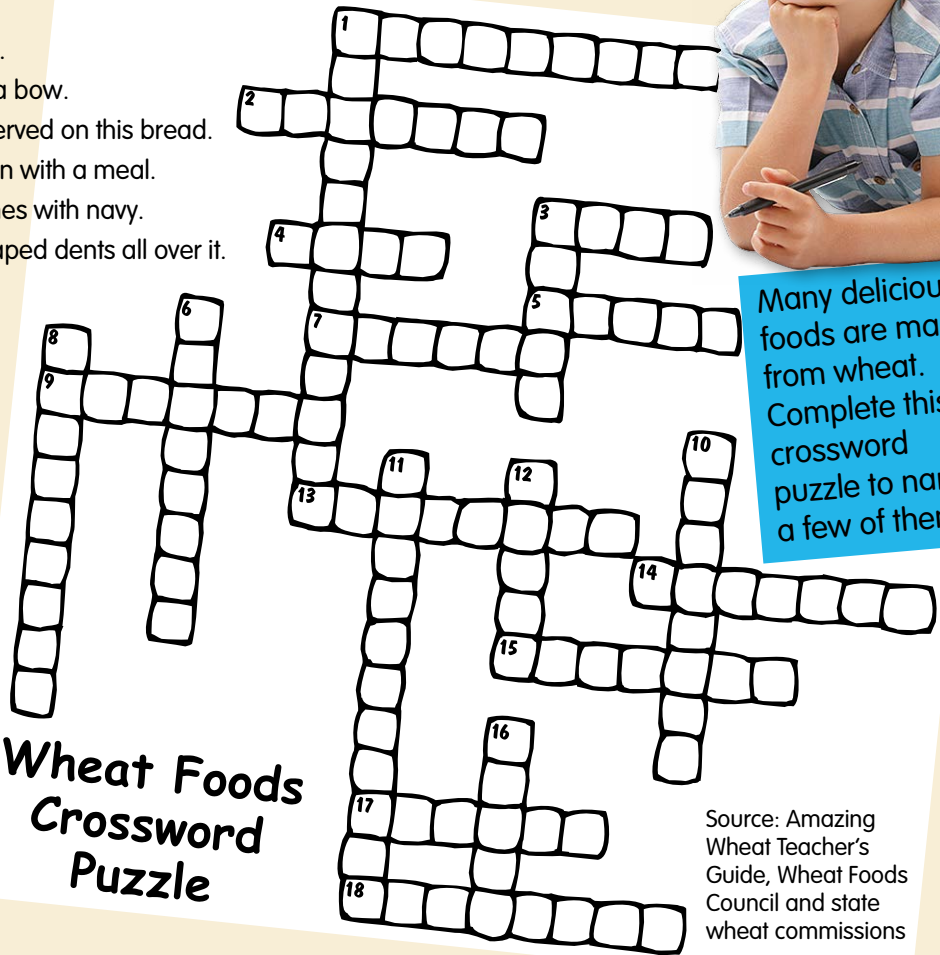
## Across

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 \_\_\_\_\_.

## 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.

## Wheat Foods Crossword Puzzle



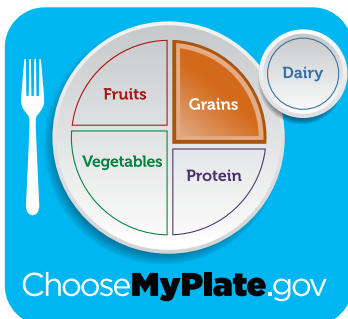
Many delicious foods are made from wheat. Complete this crossword puzzle to name a few of them.

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

## 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.choosemyplate.gov](http://www.choosemyplate.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?

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

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

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For more information about wheat, check out:  
[www.ndwheat.com](http://www.ndwheat.com) and [www.ars.usda.gov/oc/kids](http://www.ars.usda.gov/oc/kids)

David Haasser, NDSU

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