AgMag

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AGRICULTURE, THE LAND AND YOU

What would people living in towns and cities do if there were no farmers? Where would they get food? Wool? Building supplies? Flowers, trees and shrubs? What would growers do if there were no consumers to buy their food or wool or wood or shrubs? What would it be like if each of us had to grow everything we need all by ourselves?

- City people and growers need each other. We are **interdependent**. We buy and sell among ourselves so everyone can get the food, shelter and clothing they need. It all starts with agriculture. Agriculture grows what we need and changes it to forms we can use. Getting those things into our hands is part of agriculture, too.
- When you put on a soccer jersey or play on a sod field, do you think about an agriculture connection? When you write a note, do you think about the tree fiber that went into the paper? As you eat your cereal, do you think about the soil, the water and the workers between the grain field and your cereal bowl?
- Agriculture starts with soil, seeds, water and energy from the sun. It continues as millions of workers and billions of dollars change and move agricultural products from the land to you. Agricultural products come to you through supermarkets, lumberyards, drugstores, clothing shops, Christmas tree lots, garden centers, restaurants and dozens of other places.

Ag makes the world go round!
Could you have an ag-less day?

There's just no way!

Cafeteria Photo Courtesy North Trail Elementary School, Farmington, MN

STEPS ALONG THE WAY!

Where do the supplies come from that are made (processed) into the things we eat, wear and use every day? The **raw materials** come from the land, through the work of farmers and growers. Those raw materials are possible only because of the **natural** and **renewable resources** of Planet Earth. Your wool sweater, your strawberry jam sandwich, your hockey stick—they're all thanks to renewable resources.

What happens to the raw materials between the land and you? It depends on the product. Which goes through more steps: grain between the field and your cereal box or carrots between the field and your salad bowl? What about your quarter-pound burger? It started out as a thousand-pound steer eating corn, soybean meal and grass. Your bread began as "amber waves of grain" and your wooden hockey stick as a tree.

Raw materials go through a cycle of processes before they get to us in forms we can use. After all, a handful of wheat kernels or a hunk of wool freshly sheared from a sheep wouldn't do us much good in these forms. The food, clothes and other things we use from agriculture all go through a cycle that:

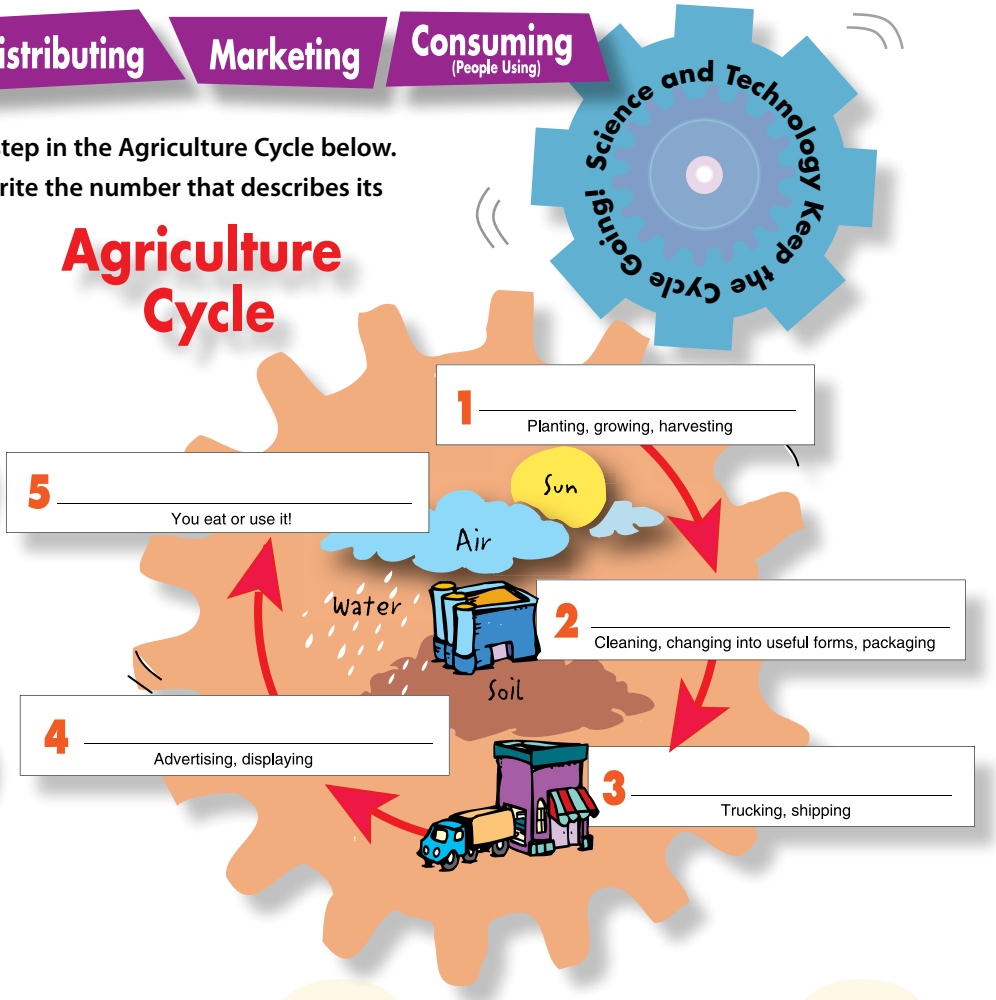
- starts with sunshine, water, soil and plants
- uses energy and equipment
- changes raw materials into many different things
- gets agriculture products to us in forms we can use!

The steps in the boxes below are part of most agriculture cycles.

Producing | **Processing** | **Distributing** | **Marketing** | **Consuming** (People Using)

- **Using the words above, label each step in the Agriculture Cycle below.**
- **In the circle on each photograph, write the number that describes its place on the agriculture cycle.**

Agriculture Cycle



Products with more steps in their cycles have more impact on Earth's resources. Why?

_____
_____
_____

Why are sun, air, water and soil part of the agriculture cycle?

_____
_____
_____

Photos Courtesy University of Minnesota Agricultural Experiment Station

Plants AND Animals

They're the only living things that make their own food. They are also the source of food for every other living thing. Plants become our medicines, fibers, paper products, cosmetics, spices and building materials. We burn plants for fuels. That includes wood as well as the fossil fuels that came from plants eons ago. We eat plants — roots, leaves, stems and fruits. Everything else we eat also eats plants! Finally, we depend on plants for the oxygen we breathe. Without plants, we would not survive.

Only about one-fifth of the land in the United States is suitable for growing crops. The rest has poor soil, too little rainfall, or rocky, rough surfaces that machinery can't handle. Forests cover millions of acres. Even though we can't grow food crops on these lands, **livestock** can often graze there. As livestock eat grass, they turn it into food and fiber people can use. Animals provide the eggs, milk, fish, burgers, steaks, chops and roasts that give us protein. They produce the wool and leather people use for clothes, shoes and baseball gloves. Animal fats are important in soaps, cleaners, cosmetics, paints, plastics and much more. Thanks to animals, we have better lives.

Think & Discuss

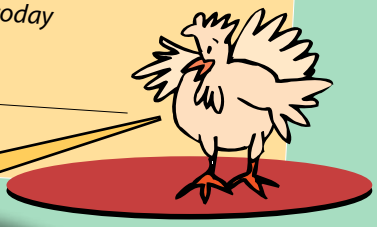
More than half the world's population depends on rice for a daily meal. Another one-third eats wheat in some form every day. One-fourth uses corn and corn products every day. Soybeans are another major crop for both people and animals. More than three-fourths of U.S. farm animals are fed corn and soybeans.

What have you eaten or used today that came from rice, wheat, corn or soybeans?

Think & Discuss

Millions of people around the globe depend on animals for food, clothing and shelter.

What have you eaten or used today that came from animals?



Did you say pizza? Read on!

Plants and Animals on Your Plate!

Next time you bite into a pizza, take a closer look at what you are eating. Pause for a moment and think about all the things from both animals and plants that went into the making of your pizza.

Do you know pizza can be a good nutritional choice? Make a list of the ingredients in your favorite pizza, and compare them to a food guide pyramid. A balance of vegetables (and sometimes even fruits), meat, dairy products and crust can give you foods from all the different food groups.

MyPlate

www.choosemyplate.gov

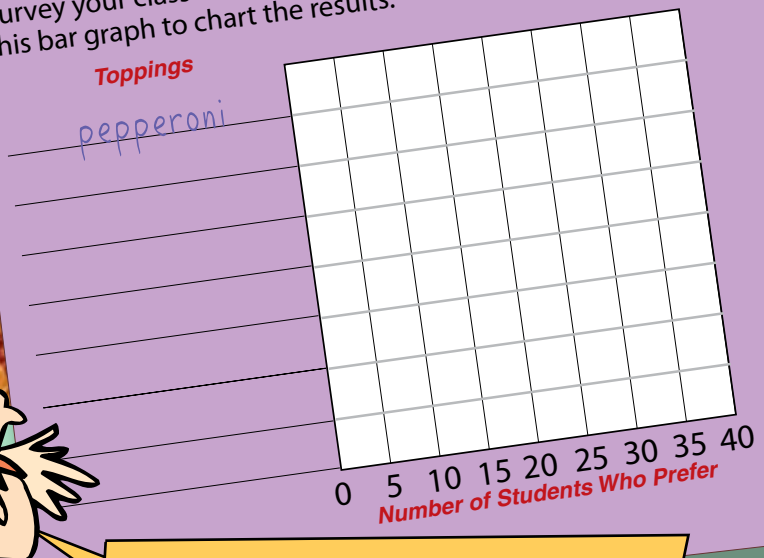
Do you like pizza and other fast foods?

Dig into "The Real Truth About Fast Foods and Nutrition."

library.thinkquest.org/4485/frames.htm

My Favorite Pizza Ingredients

Survey your class to find out their favorite pizza topping. Use this bar graph to chart the results.



What's America's favorite pizza topping?

Pepperoni

People of all ages love pizza. Surveys say kids from 3 to 11 choose pizza over other kinds of food.

From Beet to Sweet

Sugarbeets are planted in early spring. Sugarbeets are root crops. The beets grow underground. Above ground, you'll see rows of leafy green plants.

Meet the Beet

A sugarbeet plant starts from a seed about half the size of a grain of rice. When fully grown, the sugarbeet weighs two to five pounds. Each plant produces one beet.

Western Minnesota and the Red River Valley are the nation's top spots for growing sugarbeets.

Minnesota has four sugarbeet co-op locations. Write the city names next to the dots.

Crookston, Renville, East Grand Forks

*Harvest starts about Oct. 1. It runs for three to four weeks. A machine called a **topper** cuts the leaves off the plants in the field. Toppers can clear an acre in just minutes. A sugarbeet **lifter** pulls the beets from the soil and feeds them into a truck. The leaves are left in the field.*

Sugarbeet Co-Products

With most of the sugar removed, beet pulp gets dried into pellets for livestock feed. **Beet molasses** is another important co-product from sugarbeet processing. It is used in making yeast, chemicals, medicine, livestock feed and even shoe polish! What do you use that contains molasses?

_____

Think & Discuss

- Why do you think the leaves of the plant are left in the field at harvest time? How can they benefit the soil?
- Many western Minnesota communities benefit from sugarbeets. What are some ways local businesses and people other

and Moorhead

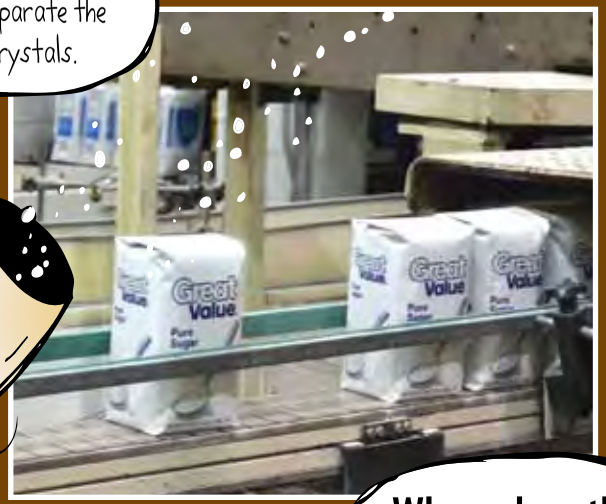
Harvesting starts in October. Processing runs about October to May.

During harvest trucks run 24 hours a day between the fields and factory yards. Truck loads are dumped in giant piles. Some piles stay outside all winter for later processing. Big fans are connected to tubes placed under the beets as they are being piled. The fans pump air into the beet piles to dry them and allow for even freezing. Freezing helps keep beets from spoiling.

- Minnesota's sugar processing is all done through farmer-owned and operated cooperatives (co-ops). Co-ops are all around us. What are they? To learn more about cooperatives, visit: www.go.coop.

Steps at the processing plants:

Raw juice is boiled and spun to separate the sugar crystals.



1. Beets are moved from piles onto a conveyor to be washed.
2. Huge knives slice them into long strips of beet pulp.
3. The pulp is cooked with hot water to release the sugar. This mixture is called raw beet juice.
4. The raw juice is filtered, boiled and spun to separate out the crystals. The crystals drop onto a conveyor belt to dry and cool.
5. A machine fills, bags and boxes the sugar crystals. Now the sugar is ready for shipment to stores and other customers.

Did you know?

Sugarbeet field workers were often migrant workers, following growing and harvest seasons from place to place. When crop protection chemicals, machines and technology replaced human field workers, many of those workers found jobs in the local communities. They and their families now have better education and career opportunities, and have become permanent Minnesotans.

Where does the sugar end up?

In all kinds of things we like to eat and drink

How do you know when there is sugar added to your food?

Q Average sugar content for one sugarbeet is about 16 percent. How many ounces of sugar does a three-pound beet contain?

_____

Q Sugar packets in restaurants are about 1/6 of an ounce each. How many sugar packets would the three-pound sugarbeet fill?

_____

Photos courtesy Red River Valley Sugarbeet Growers Association and Minn-Dak Farmers Cooperative

Photo Courtesy Dave Hansen

More Mouths to Feed

Our world population is now about seven billion people. The population gains 142 people every minute around the clock

How many more people will be in the world in one hour? _____

By this time tomorrow?_____

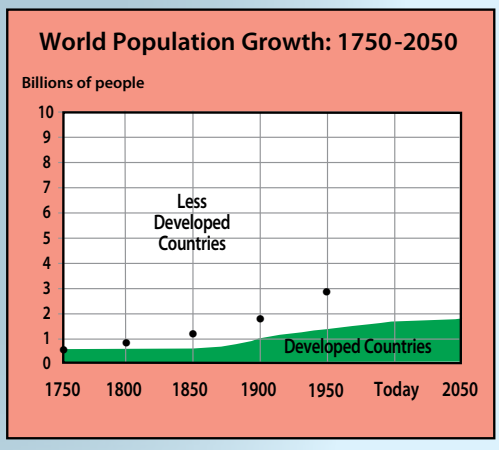
The clock is ticking on the website below to show what's up in world population. Why is this important for us to know?

www.worldpopulationbalance.org

By 2050 the world could have 9.5 billion at the current growth rate. All these people will need food, clothing, water and shelter. Demand will grow for roads, schools, fuel, sewers, power plants, homes, factories, malls and airports. Much farmland continues to be taken out of food production to meet the other demands.

What's Ahead?

Use information above to add dots to the graph for today and for 2050. Then connect all the dots. What trend do you see?



Like today, most of the world's future population will live in less-developed countries, where people have less money and fewer resources. They will live in cities. They will be **consumers**, rather than producers, of food and other resources.

How will we meet the needs of a growing population? Who will provide?

Did you know?

One U.S. farmer can feed 155 people a year.

One World: Helping Each Other

When Things Go Wrong

Imagine life without enough food to eat, fuel to heat or clothes to wear. That's bad enough. But then add the fear of violence, bombs and gunshots. This is everyday life for people in some countries.

What happens to food supplies in any country where war goes on and on? Growing and harvest seasons are interrupted.

What happens to food supplies in countries where hurricanes, tsunamis, earthquakes and other weather events occur? Where people have no money to buy food? Where drought or poor growing seasons cause crop failures? Where there are few or no good roads or railways?

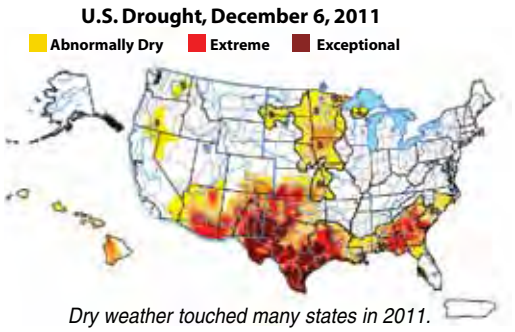
Hope for starving people lies in help from others. Agriculture is the heart of survival: food, clothes, shelter. Countries with good agriculture, like the U.S., can help. Still, getting food and farm products to hungry people is only the first step. More important is making it possible for them to produce more of their own agricultural products.

What are some of the challenges? Ask your teacher for the *Why Are They Hungry?* crossword in the Teacher Guide.

Drought and Wildfires Hit Texas

Natural disasters happen in the United States, too. This year has been one of the toughest for Texas agriculture. The Lone Star State faced its worst one-year drought in Texas history. Added to that, more than 27,000 Texas wildfires burned 3.9 million acres this fire season. That's more than the combined areas of Delaware, Rhode Island, Washington D.C. and one-third of Connecticut.

The extreme drought has dried up land accross Texas.
Photo Courtesy Texas Farm Bureau



Dry weather touched many states in 2011.

Texas farmers and ranchers have lost their homes and their incomes. Crops and pasturelands have been destroyed. Many cattle died, or were sold or moved to other states with better grazing. Texas' top crops: cattle, cotton, hay, sheep and goats, are all affected.

The problems in Texas affect about 7% of our agriculture. We will all see higher prices for things normally grown in Texas. Yet, we are blessed. Our country has so much good agricultural land and so many different growing areas that we are still able to feed our nation.

Think & Discuss

Give people a fish and you feed them for a day.
Teach them to fish and you feed them for a lifetime.

Agriculture's Biggest Leaps (Part II)

Agriculture has changed in amazing ways in the years since Indians first farmed the land. What have been the biggest achievements in the past 100 years? Some top agricultural engineers asked themselves that question. They came up with a list that we'll explore in your three AgMags this year. Here's Part Two!

Conservation Tillage

Today's farmers use conservation tillage to protect soil. In the past, most farmers plowed (turned over) their soil before planting. Plowed soil is bare soil, easily carried away by wind and rain.

Conservation tillage includes disturbing the soil as little as possible. Soil isn't plowed. Stubble (cornstalks or other plant parts) is left on the field after harvest. Stubble holds soil in place and makes it harder for weeds to grow. Planting is no problem. Special machines press new seeds down through the stubble and into the soil below.

Conservation tillage also saves fuel and labor because gas-powered machinery makes fewer trips over the field.

Photo Courtesy University of Minnesota Agricultural Experiment Station

What happens to the rich topsoil when the wind blows, or when rain flows? In 1982, when most fields were plowed, three billion tons of topsoil were lost.

Photo Courtesy Jodi DeJong-Hughes

What's different? What happens to this topsoil in wind or rain? By 2003, many farmers were using conservation tillage. Losses were cut nearly in half (1.7 billion tons). Today about 70% of corn land and almost 100% of soybean land are conservation tillage.

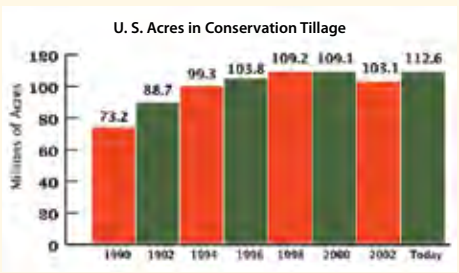


Illustration courtesy American Farm Bureau Federation, 2009

How many millions of acres are in conservation tillage today? How does that compare with 1990? What is the general trend for farmers using conservation tillage?

Photo Courtesy University of Minnesota Agricultural Experiment Station

Tractors can be offices, complete with GPS, computers, cell phones, air conditioniong, music systems and more!

Precision Farming with GPS

Also called **site-specific agriculture**, this new technology is a different way of farming the land. Soils and conditions vary within a field. Site-specific farming is managing areas within fields, rather than farming the same way on the entire field.

A GPS helps farmers know their land better. They can pinpoint locations and measure the soil and other differences within fields. This information helps them know how to best use each area of the field. GPS-guided machinery controls the number of seeds, fertilizer, crop protection chemicals and other things to just the right amounts. Precision farming adds up to better yields.

Seeding Technology

Farmers know good crops begin with good seeds. What happens when new technology and computers are used to plant precisely the right seeds at just the right depth and space the plants exactly right? To plant more seeds per acre and grow them correctly? Crops get better and better. Here's proof:

In 1980, about 21,000 corn seeds were planted per acre. Today, it's 32,000 seeds or more per acre. How many more plants is that per acre?

_____

Extra plants, computer precision planting, new hybrids and fertilizers all add up to more corn yield for farmers!

What Do You Think?

Water erosion on U.S. croplands has gone down by more than 40 percent since 1982. How do you think conservation tillage helped? What else might help save soil?

Did you know?

*Planting the same crops in the same soil year after year uses up the soil nutrients. What is **crop rotation**? How do farmers use it to keep soil healthy?*

A GPS (global positioning system) is part of everyday life for many of us. Hunters and fishers use GPS. Cars, airplanes, cell phones, wristwatches and golf carts have them. Snowboarders in avalanche country carry transponders that have them. How does a GPS work? Do you use one?

AgMag Grab Bag

How is brown sugar different from white sugar?

Brown sugar is sugar crystals with molasses either added or left in during processing.

Flour Power! The Mill City Museum tells the story of Minneapolis's flour-milling past. Visit and get a whiff of the best-smelling museum ever created, or check it out on the Web.

www.millcitymuseum.org/

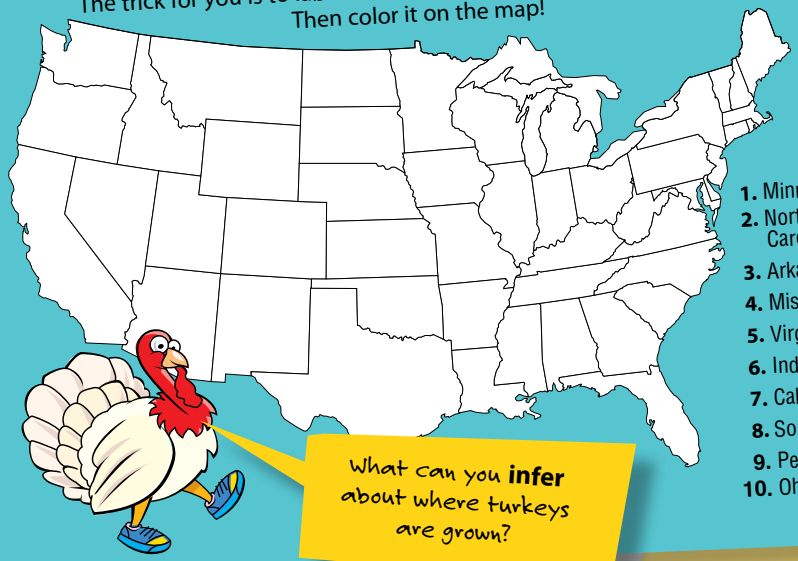
Turkey manure is great organic fertilizer, too. Farmers and gardeners use it to enrich their soils.

Did you know?

- A black-and-white Holstein is the most popular dairy cow in the U.S. A Holstein's spots are like fingerprints. No two cows have exactly the same pattern of spots!
- The fastest growing part of agriculture isn't a food crop. It's horticulture. Look up the word and list two examples of horticulture!

We're TOP Turkey!

In 2010, Minnesota led the nation in turkey production. The top ten turkey-producing states are listed below. The trick for you is to label each state using the postal abbreviation. Then color it on the map!



1. Minnesota
2. North Carolina
3. Arkansas
4. Missouri
5. Virginia
6. Indiana
7. California
8. South Carolina
9. Pennsylvania
10. Ohio

What can you **infer** about where turkeys are grown?

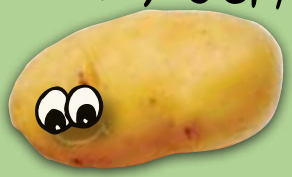
Surfing the NET

Do You Know Where Your Food Comes From?
Discover the stories behind your food favorites using this menu:

games.urbanext.illinois.edu/

As the choices flash before your eyes, click on one to begin. Try this all-star snack favorite: popcorn. Did you know that we have been eating it for 8,000 years? How about apples? Did you know they are related to roses?

Country Corn



Q. What position does a pig play in football??

A. Loinbacker.

Q. Why shouldn't you tell a secret on a farm?

A. Because corn has ears, potatoes have eyes and beans-talk.

YUK or Yum

You've probably eaten gummi worms, but would eating real worms freak you out? Not in some countries. In some parts of Europe, horse meat and pig's ears are common foods. Frogs, rats and monkeys are people foods in other parts of the world.

Someday insects may be farmed for food. Insects are already important foods in places where people would otherwise go hungry. They grow quickly, produce high quality protein, take little growing space and are inexpensive to raise.

Are insects the food of the future?

Something to Talk About Josette Sheeran of the United Nations' World Food Program has said:

"Without food, people have only three options: They riot, they emigrate or they die. None of these are acceptable options".

What are your thoughts?

Did you know?

Clay Co, MN, was number one in the U.S. for sugarbeet production 25 years ago. Which county is first today?

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