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FARM FACTS

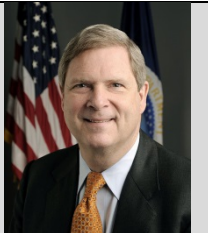







**Texas FFA Association
2016 Senior FFA Quiz
2016-17 Officer Candidate Testing Program**

2016 Texas Farm Facts

WHO'S WHO IN AGRICULTURE

Six agricultural policy makers Texans ought to know

| | |
|---|---|
| <p>U. S. Secretary of Agriculture: Tom Vilsack</p> |  |
| <p>Chairman, U.S. Senate Agriculture, Nutrition and Forestry Committee: Senator Pat Roberts, R-Kansas</p> |  |
| <p>Chairman, U.S. House of Representatives Agriculture Committee: Mike Conaway, R-Texas</p> |  |
| <p>Texas Commissioner of Agriculture: Sid Miller, (Republican)</p> |  |
| <p>Chairman, Texas Senate Committee on Agriculture and Rural Affairs Senator Charles Perry, R-Lubbock</p> |  |
| <p>Chairman, Texas House of Representatives Agriculture and Livestock Committee: Rep. Tracy O. King, D-Batesville</p> |  |

1. GENERAL INFORMATION

WHERE DOES YOUR Food Dollar Go?

81¢ OFF-FARM ...

Costs (marketing expenses associated with processing, wholesaling, distributing and retailing of food products) account for 81 cents of every retail dollar spent on food.

19¢ FARMERS & RANCHERS ...

Receive only 19 cents out of every retail dollar spent on food that is eaten at home and away from home. In 1980, farmers received 31 cents out of every retail dollar spent on food in America.

Texas Farm Bureau Graphic



OTHER COSTS ...

Include property taxes & insurance; accounting & professional services; promotion; bad debts; and many miscellaneous items.

Where does this information in this guide come from?

The United States Constitution mandates a census of the population every ten years for the purpose of allocating representation in Congress. The first population census was conducted in 1790 and counts continue to be taken at the beginning of every new decade. As a result of the gathering of this information, in 1840 the economic census was created and focused on manufacturing, trades, mining, commerce, navigation & agriculture, as an extension of the sixth decennial population census. The Census of Agriculture (COA) remained part of the U.S. population census until August 6, 1996, when President Clinton signed the Appropriations Bill which enacted a transfer of the COA from the U.S. Census Bureau (which is part of the U.S. Department of Commerce) to the United States Department of Agriculture's National Agricultural Statistics Service (USDA NASS). Today, the COA is taken every five years and is taken in years ending in "2" or "7" (ex: 2007, 2012, 2017). The majority of data in this guide comes from census and survey results.

Legislative authority for the COA comes from the Census of Agriculture Act of 1997. The Act does not mandate what data the COA will collect. The Act:

- requires that the Secretary of Agriculture conduct a COA in 1998 and every fifth year thereafter to collect data relating to the year immediately preceding the year in which the Census is taken;
- provides for penalties for refusing to respond to the Census or for giving fraudulent answers;
- identifies the area to be covered as all fifty states, the District of Columbia, Puerto Rico, the Northern Marina Islands, the U.S. Virgin Islands and Guam;
- mandates cooperation between the Secretary of Agriculture and the Secretary of Commerce; and
- requires protection on confidentiality of any data provided by individuals and firms.

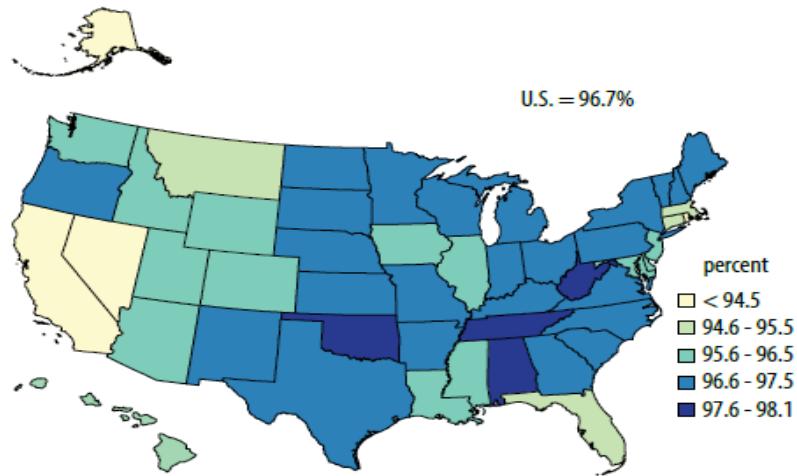
According to the 2002 Census of Agriculture, “Data is routinely used by farm organizations, businesses, state departments of agriculture, elected representatives and legislative bodies at all levels of government, public and private sector analysts and colleges and universities.” COA data is used to:

- Evaluate, change, promote and formulate farm and rural policies and programs that help agricultural producers;
- Study historical trends, assess current conditions and plan for the future;
- Formulate market strategies, provide more efficient production and distribution systems and locate agriculture-related enterprises;
- Make energy projections for geographic areas and forecast needs for agricultural producers and their communities;
- Allocate local and national funds for farm programs. Example: agricultural research, soil conservation program and land grant colleges and universities; and
- Plan for geographic-specific operations during drought and emergency outbreaks of diseases or infestations of pests.

The 2012 Census of Agriculture Farm Topology Report classifies all farms into unique categories based on three criteria: who owns the operation, whether farming is the principal operator’s primary occupation, and gross cash farm cash income (GCFI). GCFI includes not just crop and livestock sales receipts, but also fees for delivering commodities under product contracts, government payments, and farm related income.

- Small Family Farms - 88% of U.S. farms (GCFI <\$350,000). This includes three subcategories:
 - *Retirement*: Farm whose principal operator is retired but continues to farm on a small scale
 - *Primary occupation off-farm*. Farms whose principal operator has a primary occupation other than farming
 - *Primary occupation on-farm*. Farms whose principal operator’s primary occupation is farming. These can be either low-sales farms (GCFI <\$150,000) or moderate-sales farms (GCFI \$150,000 to \$349,999)
- Midsize Family Farms - 6% of U.S. farms (GCFI \$350,000 to \$999,999)
- Large-scale Family Farms - 3% of U.S. farms (GCFI \$1 million or more). This includes two subcategories:
 - *Large family farms* (GCFI \$1,000,000 to \$4,999,999)
 - *Very large family farms* (GCFI is \$5 million or more)
- Non-Family Farms: 3% of U.S. farms whose principal operator and persons related to the operator do not own a majority of the business.

Family Farms as Percent of Total Farms, by State, 2012



Source: USDA NASS, 2012 Census of Agriculture.

Facts:

Source: USDA NASS, 2012 Census of Agriculture

- 97% of the 2.1 million farms in the U.S. are family owned operations
- 88% of all U.S. farms are small family farms (see size categories above)
- The average size of a U.S. farm is approximately 523 acres
- Farmers and ranchers make up less than 2% of the population
- 85% of small family farm principal operators are males and 15% are female
- 68% of small family farms have internet access and 32% do not

| 2012 Census of Agriculture - Market Value of Ag Products Sold in Texas | | | | |
|---|---------|-----------------|---------------|------------------|
| <i>Source: USDA NASS, 2012 Census of Agriculture</i> | | | | |
| Item | Farms | Sales (\$1,000) | Rank by Sales | % of Total Sales |
| Cattle & Calves | 116,891 | 13,013,127 | 1 | 51.3 |
| Grains, oilseeds, dry beans, and dry peas | 13,098 | 3,049,522 | 2 | 12 |
| Poultry & Eggs | 10,806 | 2,624,759 | 3 | 10.3 |
| Milk from cows | 698 | 1,698,624 | 4 | 6.7 |
| Cotton & cottonseed | 7,025 | 1,698,264 | 4 | 6.7 |
| Nursery, greenhouse, floriculture & sod | 1,828 | 1,011,669 | 6 | 4 |
| Other crops & hay | 59,289 | 958,088 | 7 | 3.8 |
| Vegetables, melons, potatoes & sweet potatoes | 2,276 | 474,949 | 8 | 1.9 |
| Fruits, tree nuts & berries | 5,108 | 251,647 | 9 | 1 |
| Hogs & pigs | 2,906 | 239,358 | 10 | 0.9 |
| Horses, ponies, mules, burros & donkeys | 15,402 | 149,103 | 11 | 0.6 |
| Sheep, goats, wool, mohair & milk | 19,241 | 122,053 | 12 | 0.5 |
| Aquaculture | 257 | 82,033 | 13 | 0.3 |
| Other animals & other animal products | 4,417 | 79,891 | 14 | 0.3 |
| Cut Christmas trees & short rotation woody crops | 108 | 2,446 | 15 | (z) |
| Total sales | 248,809 | 25,375,581 | (x) | 100 |

| Top Texas Crops | | | |
|--|------------------------|----------------------|-------------------------|
| <i>Source: Texas Department of Agriculture</i> | | | |
| Rank in TX | Commodity | Cash Receipts | Percent of Total |
| 1 | Cattle and Calves | \$10.5 billion | 46.4 |
| 2 | Cotton, Lint, and Seed | \$2.2 billion | 9.8 |
| 3 | Dairy Products, Milk | \$1.8 billion | 7.9 |
| 4 | Broilers | \$1.7 billion | 7.7 |
| 5 | Greenhouse and Nursery | \$1.3 billion | 5.6 |
| 6 | Corn | \$1.2 billion | 5.1 |
| 7 | Sorghum Grain | \$594 million | 2.6 |
| 8 | Wheat | \$538 million | 2.4 |
| 9 | Chicken Eggs | \$439 million | 1.9 |
| 10 | Hay | \$357 million | 1.6 |
| 11 | Peanuts | \$204 million | 0.9 |
| 12 | Rice | \$163 million | 0.7 |
| 13 | Hogs | \$144 million | 0.6 |
| 14 | Potatoes | \$127 million | 0.6 |
| 15 | Pecans | \$75 million | 0.3 |
| All Others | Others | \$1.4 billion | 5.9 |

| Texas's National Rank for Selected Commodity Exports | | |
|---|----------------------|----------------------|
| <i>Source: Texas Department of Agriculture</i> | | |
| Rank in U.S. | Commodity | Cash Receipts |
| 1 | Cotton & cottonseed | \$1.6 billion |
| 1 | Beef | \$855 million |
| 1 | Hides & skins | \$431 million |
| 2 | Seeds for planting | \$244 million |
| 4 | Tree nuts | \$66 million |
| 4 | Rice | \$119 million |
| 6 | Broilers | \$323 million |
| 6 | Milk & milk products | \$248 million |
| 9 | Wheat | \$286 million |
| 10 | Feeds & fodders | \$172 million |
| 10 | Grain products | \$171 million |
| 11 | Fresh fruits | \$54 million |
| 13 | Corn | \$157 million |
| 13 | Sugar | \$27 million |
| 15 | Fresh vegetables | \$39 million |

2. BEEF

| Texas Cattle Inventory | |
|--|--------------|
| <i>Source: USDA NASS (survey Jan. 2016 - not census)</i> | |
| Beef Cows | 4.29 million |
| Milk Cows | 460 thousand |
| Calves | 11.7 million |
| | |

| Top Counties – All Beef Cows | |
|--|--------|
| <i>Source: USDA NASS, 2012 Census of Agriculture</i> | |
| 1. Lavaca | 80,800 |
| 2. Gonzales | 79,800 |
| 3. Fayette | 76,000 |
| 4. DeWitt | 66,000 |
| 5. Leon | 65,000 |

| Top Counties- Cattle/Calves | |
|--|----------------------------|
| <i>Source: USDA NASS, 2012 Census of Agriculture</i> | |
| 1. Deaf Smith | 570,000 |
| 2. Castro | 470,000 |
| 3. Parmer | 460,000 |
| 4. Hartley | 290,000 |
| 5. Hansford | 270,000 |
| Texas Top 5 Total | 2, 060, 000 million |

| Top States – All Cattle and Calves | |
|--|--------------|
| <i>Source: USDA NASS, 2012 Census of Agriculture</i> | |
| 1. Texas | 13.9 million |
| 2. Kansas | 6.6 million |
| 3. Nebraska | 6.4 million |
| 4. California | 5.3 million |
| 5. Oklahoma | 5.3million |

Beef Choices

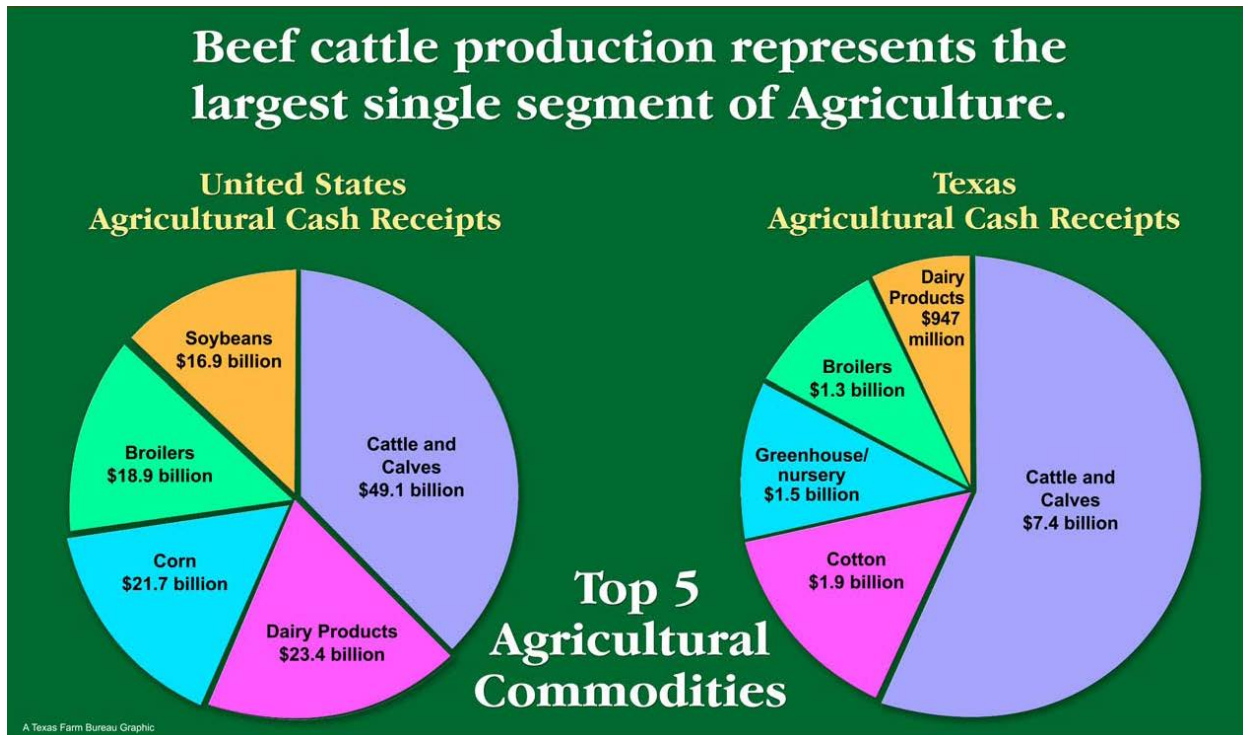
Beef producers offer a variety of beef choices to meet the changing lifestyles and nutritional needs of consumers. While each offers something different, they all share three common values: taste, nutrition and safety.

- **Grain-fed Beef** – The most widely produced and tends to be less expensive. The cattle spend most of their lives eating grass in a pasture before moving to a feedlot where they are fed a high-energy, grain diet.
- **Grass-finished Beef** – The cattle are raised on grass pastures their entire lives. Producing in large volumes is difficult in North America where few regions have the growing season to make it possible.
- **Certified Organic Beef** – The cattle must be fed 100% organic feed and must be certified through the USDA’s Agricultural Marketing System. In addition, these cattle can not be given hormones to promote growth or antibiotics. If antibiotics are needed they are not withheld but the animal must be permanently removed from the program.
- **Natural/Branded Beef** – By definition, most beef is natural. According to the USDA “natural” may be used on a beef label if the beef does not contain artificial flavoring, coloring, chemical preservatives or

any other artificial or synthetic ingredient. Producers raising cattle for beef marketed with a “natural” label may follow different production practices in order to brand their beef.

Beef Cattle Production Systems

- **Cow-calf**- Ranchers produce the cattle for the stocker market or feedlot (commercial operations) or other breeding herds (purebred operations).
- **Feedlot** – Raises calves until they weigh 900 to 1,400 pounds and market them to packer operations.
- **Stocker** – Ranchers graze weaned calves until they weigh as much as 900 pounds, and then market them to the feedlots.



Cash Receipts

Each year, over 5 million calves are born on more than 130,000 cow-calf operations in Texas. The nearly 1 million beef cattle operations in the United States produce over 24 billion pounds of beef which generates about \$80 billion in retail beef sales. Increased productivity is the main contributor to growth in U.S. agriculture.

- Beef production per cow has increased from about 400 pounds in the mid-1960s to almost 600 pounds today.
- This means more business opportunities for the producers and cost saving for consumers.

Addressing Misconceptions of Beef Production

Myth: Beef production uses outrageous amounts of water, feed and land that should be used for something else.

Truth: It takes 2.6 pounds of grain and 435 gallons* of water to produce a pound of beef in the U.S. 85% of the nation’s grazing lands are not suitable for farming. Cattle eat forages that humans cannot consume and convert them into a nutrient-dense food. (*Considers all factors including direct consumption, irrigation of pastures and crops, and carcass processing.)

Beef Production Quick Facts

- Most cattle farms and ranches are family owned. For many producers, cattle raising is a family tradition passed down through generations.
- Cattle have a nine-month gestation period.

- Calves are weaned from cows at six to 10 months of age.
- Weanling cattle are typically “backgrounded” in stocker cattle operations before going to a feedlot at 12-18 months of age
- Growth promotants are often administered in the form of a small pellet placed under the skin behind the animal’s ear. Most growth promotants are naturally occurring hormones like estrogen. These products are approved by the Food and Drug Administration after rigorous scientific tests, similar to those required to approve human medications.
- Cattle spend four to six months in a feedlot. Feedlot pens typically allow about 125 to 250 square feet of room per animal. Rations are 70 to 90 percent grain.
- According to the USDA, there are about 815 fixed auction facilities in the United States.
- Cattle are usually slaughtered at 18 to 20 months of age and weigh between 1,100 and 1,250 pounds.
- The Humane Slaughter Act (passed in 1958 and updated in 1978 and 2002) dictates strict animal handling and slaughtering standards for packing plants. These facilities are under continuous federal inspection, with Food Safety and Inspection Service (FSIS) personnel present in plants to ensure compliance with all regulations.
- The Food Safety and Inspection Service (FSIS), a public health agency in the U.S. Department of Agriculture, is responsible for ensuring compliance with slaughter regulations and that the nation's commercial supply of meat, poultry, and egg products is safe, wholesome, and correctly labeled and packaged.
- The Agricultural Marketing Service of the USDA grades the carcasses by evaluating characteristics including marbling (distribution of internal flecks of fat, contributing to tenderness and taste) and the age of the animal. Grading is voluntary.
- Ultimately, consumers dictate the actions of the beef production chain, from pasture to plate, by determining what kinds of beef they will buy and at what price. Beef producers read demand signals from the meat case and customers throughout the production chain. For instance, beef cattle are now much leaner than just a decade ago as a result of the consumer demand for products with less fat. Consequently, there are now 29 cuts of beef that meet government guidelines for lean, such as the tenderloin, sirloin and 95% lean ground beef.
- The hide from one beef animal can be made into: 20 footballs or 12 basketballs or 18 soccer balls or 12 baseball gloves or 18 volleyballs or 144 baseballs
- Beef byproducts allow 99% of every beef animal to be utilized.

Beef Checkoff Program

What is the beef checkoff?

The Beef Checkoff Program is a producer-funded marketing and research program designed to increase domestic and/or international demand for beef. This can be done through promotion, research and new product development, and a variety of other marketing tools. The Cattlemen’s Beef Board and USDA oversee the collection and spending of checkoff funds.

How can checkoff dollars be used?

As mandated by law, checkoff dollars must be invested in programs to increase consumer demand for beef and create opportunities to enhance producer profitability. The Beef Act defines six program categories: promotion, research, consumer information, industry information, foreign marketing and producer communications. The law does not allow beef checkoff dollars to be invested in production research that is not aimed at improving the end beef product.

3. DAIRY

Production

The United States has more than 9 million milk cows and produces approximately 171 billion pounds of milk annually.

| Top States Dairy Production | | | |
|---|------------------------------------|---|-------------------------------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | | | |
| Top States | Milk Cows (Million hd.) | Milk Production (Billion lbs.) | Milk Sales (\$ Billions) |
| 1. California | 1.8 | 40.6 | \$6.9 |
| 2. Wisconsin | 1.3 | 24 | \$5 |
| 3. New York | 0.6 | 12.1 | \$2.4 |
| 4. Idaho | 0.6 | 11.5 | \$2.3 |
| 5. Pennsylvania | 0.5 | 10.6 | \$2 |
| 6. Texas | 0.4 | 10.2 | \$1.7 |

| Texas Dairy Production | |
|---|-------------------------------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | |
| Top Counties | Milk Cows (Thousand hd.) |
| 1. Erath | 52.0 |
| 2. Deaf Smith | 42.0 |
| 3. Castro | 36.5 |
| 4. Parmer | 36.5 |
| 5. Hartley | 25.0 |

Dairy Farm Characteristics

In 2012, 77% of dairy farms were family owned or individually owned and they accounted for 45% of milk sales.

History of the Dairy Industry

In the early 1600s, immigrants brought cattle with them from Europe to supply their families with dairy products and meat. In rural America, milk and milk products were made primarily for home or local use. However, with the movement of population from the farms to the cities, it became necessary to mass produce and improve the quality of milk. Significant inventions such as commercial milk bottles, milking machines, tuberculin tests for cattle, pasteurization equipment, refrigerated milk tank cars and automatic bottling machines all contributed towards making milk a healthful and commercially viable product.

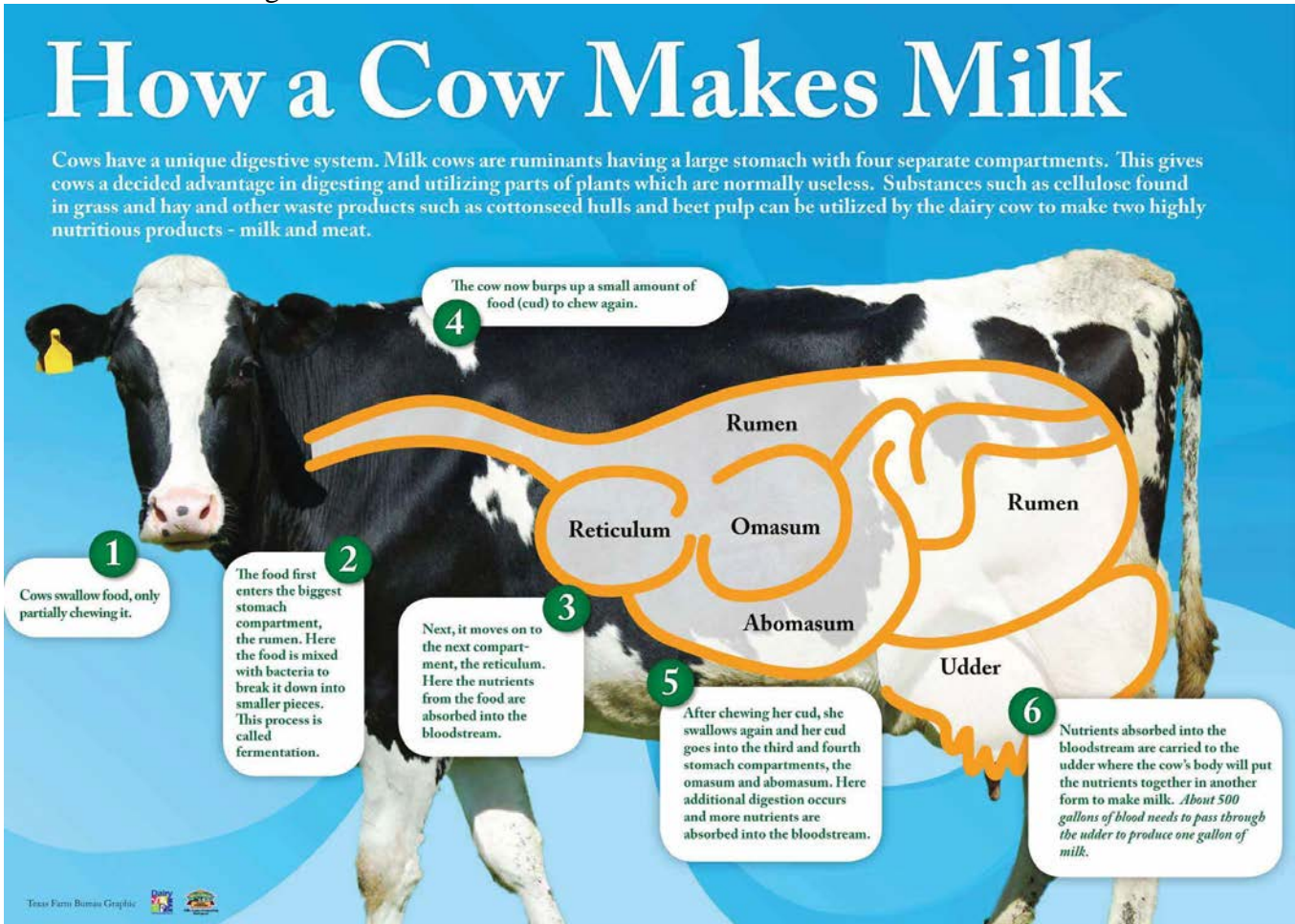
In addition to education, regulations were necessary to ensure a safe food supply. With the passage of the Meat Inspection Act of 1890 and its amendment in 1906, Congress authorized USDA inspectors to enforce standards of sanitation and hygiene in the meat and dairy industries. Today, dairy farming uses the latest scientific research to provide consumers with a safe product while also boosting efficiency, taking care of their animals, and protecting our environment and natural resources.

Breeds of Dairy Cows

There are six main breeds of dairy cows:

1. Holstein: Originated in Europe and has the highest milk production of all dairy breeds.
2. Ayshire: Originated in Scotland and is known for strength and efficiency of milk production.

3. Brown Swiss: Originated from Switzerland and is known for being hearty and rugged, having superior feet and legs, as well as its very quiet behavior.
4. Guernsey: Originated in the English Channel and is known to be hearty and adaptable and for the yellow color of their milk.
5. Jersey: Originated in the Island of Jersey (off the coast of France) and is known to produce more butterfat than any other dairy breed.
6. Milking Shorthorn: Originated in England and is known for high levels of fertility, grazing efficiency, and ease of management.



Nutrition

Milk contains 16 essential nutrients:

1. **Protein:** Helps build and repair body tissues, including muscles and bones, and plays a role in the creation of antibodies which fight infection.
2. **Vitamin A:** Aids bone and tooth development. Also aids in the maintenance of night vision and healthy skin.
3. **Vitamin B₁₂:** Aids in red blood cell formation.
4. **Vitamin B₆:** Factor in the conversion of food into energy and tissue formation, including bones.
5. **Riboflavin:** Factor in the conversion of food into energy and tissue formation.
6. **Niacin:** Aids in normal growth, and is a factor in the conversion of food into energy and tissue formation, including bones.
7. **Thiamine:** Releases energy from carbohydrate and aids normal growth.
8. **Pantothenic acid:** Factor in the conversion of food into energy and tissue formation, including bones.
9. **Folate:** Aids in red blood cell formation.
10. **Vitamin D:** Enhances calcium and phosphorus absorption, on which strong bones and teeth depend.

11. Calcium: Aids in the formation and maintenance of strong bones and healthy teeth.
12. Magnesium: Factor in bone and teeth health, conversion of food into energy and tissue formation.
13. Phosphorus: Factor in the formation and maintenance of strong bones and healthy teeth.
14. Potassium: Aids in the correct functioning of nerves and muscles.
15. Zinc: Factor in tissue formation, including bones, and conversion of food into energy.
16. Selenium: Factor in the correct functioning of the immune system, due to its antioxidant effect.

Environmental Issues on Dairy Farms

Most dairy farmers live and work on their farms, so it's important to them to protect the land, water and air for their families, surrounding communities and future generations. Environmental practices on all dairy farms are tightly regulated by both federal and state agencies. While requirements vary from state to state, most dairy farmers consistently meet or exceed these regulations. Dairy farmers employ a wide range of environmentally sound practices, ranging from basic manure management programs to high-tech systems that convert cow manure to electricity.

Water Conservation

Dairy farmers use water responsibly in their milking parlors, manure management and storage. For example, wastewater is recycled to flush feed alleys and irrigate fields. When manure is used as a soil treatment, the water-holding capacity of soil is increased by 20 %, resulting in reduced groundwater needed to grow crops.

Air Quality

Dairy farmers protect air quality by following proper manure storage practices and maintaining clean facilities. University researchers and industry manufacturers continually work with dairy farmers to identify new ways to control odor.

Farm Management Practices

Dairies work with the Environmental Protection Agency (EPA), Natural Resources Conservation Service (NRCS), state departments of agriculture and local governments to ensure our nation's natural resources are protected. As part of the regulation process, dairies are regularly inspected by state and federal employees to ensure clean water and minimize environmental impacts in years to come.

Sustainability

Methane digesters convert manure into methane-rich biogas, a renewable fuel that generates electricity. Farms can generate enough electricity to run their operations and can sell the excess energy back to local utility companies. Dairy producers spend millions of their own dollars each year, in partnerships with land grant universities, to identify new strategies to protect the natural resources of dairies across the country.

Fun Facts

- In an average day, a dairy cow will eat about 90 pounds of feed, drink a bathtub full of water and produce 5 to 6 gallons of milk. That's about 80 glasses of milk!
- Cows spend up to 8 hours of their day eating.
- A dairy cow can't produce milk until she's had a calf
- About 500 gallons of blood need to pass through the udder to produce 1 gallon of milk!
- There are more than 200 varieties of cheese produced in the U.S and more than 1,400 varieties in the world.
- It takes approximately 350 squirts to make a gallon of milk
- How much MILK does it take?
 - 39 cups of milk to make 1 pound of butter
 - 1 cup of milk to make 8oz. of yogurt
 - 11 cups of milk to make ½ gallon of ice cream

4. POULTRY

Turkeys Produced

- Texas—7.3 million head
- U.S.—256 million head (7.1 billion lbs.)
- 16.7 lbs per person OR 5 billion lbs. per year!

Broilers Produced

- Texas—4.7 billion head
- U.S.—8.9 billion head (46.8 billion lbs.)
- 85.9 lbs. per person OR 29.6 billion lbs. per year!

Table Eggs Produced

- 254 eggs per person OR 6.4 billion dozen per year!

Feed Consumption in Texas

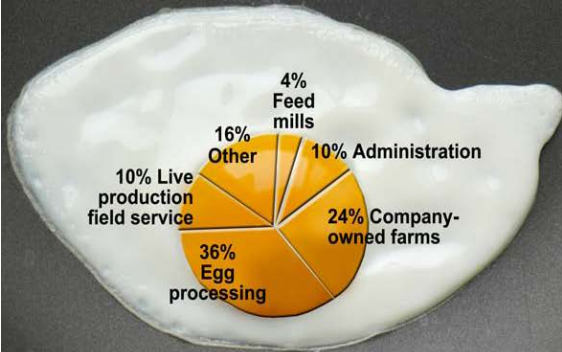
- Broilers & Turkeys: 3.32 million tons of feed milled, 64% from grain, 23% from soybeans
- Layers for Egg Production: 521,000 tons of feed milled, 61% from grain, 19% from soybean meal

The Egg From Hatchery to Table

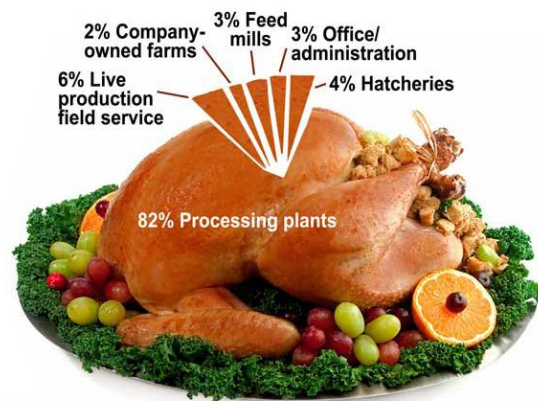
1. Laying Houses: At a modern egg farm, hens are kept in large laying houses where the light and temperature are controlled and the hens are safe from predators. Inside the houses the hens are kept in cages. The hens are fed a balanced diet high in vitamins and minerals.
2. Laying & Collecting: When a hen lays an egg it rolls down onto a conveyor belt with all the other eggs that carries them to the processing facility. Hundreds of eggs can be moving along the conveyor belt at any one time.
3. Cleaning: First, the eggs are washed to remove dirt and debris, and then sanitized to remove bacteria from the shell. A light coating of mineral oil is sprayed on the egg to seal the tiny pores in the shell. This process slows down aging and prevents bacteria from entering the pores.
4. Candling and Grading: The eggs are passed over a very strong light called candling. The strong light allows a worker, called the Candler, to inspect the exterior and contents without cracking the shell. The Candler grades the eggs AA, A or B, based on the quality of the interior and exterior. Eggs that don't meet the guidelines are removed.
5. Sorting: Next, a machine automatically sorts the eggs according to size.
6. Sizing: Eggs can be Jumbo, Extra Large, Large, Medium, Small or Peewee. Generally, a hen lays larger eggs as she gets older. The breed of the hen also is a factor in egg size, along with nutrition, and environment.
7. Packing: A special machine carefully places the eggs, small end down, in cartons that protect them from breakage. The cartons are marked with the grade and size.
8. Cooling: After packing, the eggs are placed in a large refrigerated room where they are cooled to 45 degrees F to maintain quality and freshness.
9. Shipping: The eggs are shipped to grocery stores in refrigerated trucks. Typically, an egg reaches the grocery store shelf just 3 to 4 days after it was laid.
10. Marketing: To maintain freshness and quality, the grocery store keeps the eggs in a refrigerated display case where they are purchased by the consumer.

Poultry Related Employment in Texas

Employment in the Texas Egg Industry



Employment in the Texas Broiler and Turkey Industry



The Texas poultry industry employs more than 11,500 people and produces jobs for more than 47,000 Texans outside the poultry industry.

Meat Food Safety

All poultry products found in retail stores are inspected by the USDA for evidence of illness. Turkeys and chickens are hormone and steroid free, only antibiotics are provided to the birds to prevent disease to ensure that consumers receive a healthy product. A withdrawal period is required therefore assuring that no residues are present in the bird's system at time of processing.

Egg Facts

- Most popular chicken breed raised for egg production is the White Leghorn.
- Eggs are used as ingredients in such foods as cakes and cookies, or they can be scrambled, fried, poached, or hard-boiled.
- A hen requires 24 to 26 hours to produce an egg. Thirty minutes later, she starts the process over again
- The egg shell may have as many as 17,000 tiny pores over its surface. Through them, the egg can absorb flavors and odors. Storing them in their cartons helps keep them fresh.
- Eggs age more in one day at room temperature than in one week in the refrigerator.
- Eggs are included in the meat group on the food pyramid because they are the highest quality protein available after mother's milk.
- The average laying hen begins producing eggs at 5 to 6 months of age and can produce between 250 and 300 eggs per year.

5. PORK

Source: Texas Pork Producers

History

Pigs were originally domesticated in China around 4900 BC and by 1500 B.C. they had spread and were being raised in Europe. Although Christopher Columbus took eight pigs on his voyage to Cuba in 1493, it was Hernando de Soto who should be dubbed "the father of the American pork industry" since he introduced America to its first 13 pigs in Tampa Bay, FL., in 1539. By the time of de Soto's death three years later, his pig herd had grown to 700 head, not including the ones his troops consumed.

Pig production spread throughout the new colonies and as time past, pioneers who headed west would take their herds with them. As western herds grew, so did the need for pork processing facilities. Packing plants began to spring up in major cities and were first commercially harvested in Cincinnati. Refrigerated railroad cars

transformed the meat industry when it was introduced shortly after the Civil War. It enabled packing plants to be centrally located near points of production instead of near points of consumption.

Today, the U.S. is one of the world's leading pork-producing countries as well as the largest pork exporter.

Pork Production

- The United States produces approximately 21,077,595 pounds of pork a year.
- The U.S. is the third top pork producing country in the world.

| Top U.S. Hog Raising States | |
|---|-----------------|
| <i>Source: 2014 Pork Stats, Pork Checkoff</i> | |
| State | All Hogs & Pigs |
| 1. Iowa | 20,500,000 |
| 2. N. Carolina | 8,700,000 |
| 3. Minnesota | 8,000,000 |
| 4. Illinois | 4,700,000 |
| 15. Texas | 860,000 |

| State Hog Production Facts | |
|---|----------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | |
| Inventory | 860 K |
| Farrowed Sows | 178K |
| Pigs per litter | 8.6 |
| Cash Receipts | \$143.9M |

Breeds

There are over 180 species of pigs in the world, found on every continent except Antarctica. Some major swine breeds are:

- Berkshire
 - Characteristics: Black with white on legs, snout and tail; Erect ears
 - The Berkshire breed originated in England and was brought to America in 1823.
- Chester White
 - Characteristics: White; Drooped Ears
 - The Chester White breed originated in Chester County, Pennsylvania during the mid-1800s. At first it was called the Chester County White, but later the "county" was dropped.
- Duroc
 - Characteristics: Red; Drooped Ears
 - This hog originated in the eastern United States and in the Corn Belt during in the early 1800s.
- Hampshire
 - Characteristics: Black with white belt; Erect Ears
 - The Hampshire breed originated from the "Old English Breed" which originated in southern Scotland and Northern England. The breed was imported to American between 1825 and 1835.
- Poland China
 - Characteristics: Black with white on legs, snout and tail; Drooped Ears
 - The origin of the Poland China breed has its beginning in the Miami Valley, Butler and Warren counties of Ohio during the early 1800s.
- Spotted
 - Characteristics: Black and white spots; Drooped Ears
 - Spots descend from the Spotted hogs which trace a part of their ancestry to the original Poland China. This breed was developed during the late 1800s.
- Yorkshire
 - Characteristics: White; Erect Ears
 - The Yorkshire breed was developed in England in the county of York. The first Yorkshires in the United States were brought to Ohio around 1830.

Facts

- The pork industry supports more than 800,000 jobs in the U.S.
- Pork is the world's most widely eaten meat
- On average, a market hog weighing 265 lbs will produce 371 servings of lean pork
- Pigs do not have sweat glands, so they use water or mud to cool off
- Pigs are the fourth most intelligent animal

Pharmaceutical Facts

- Pig pancreas glands are an important source of insulin hormone used to treat diabetes. Pig insulin is especially important because its chemical structure most nearly resembles that of humans.
- Specially selected and treated hog skin, because of its similarity to human skin, is used in treating massive burns in humans, injuries that have removed large areas of skin and in healing persistent skin ulcers.
- Hog heart valves, specially preserved and treated, are surgically implanted in humans to replace heart valves weakened by disease or injury. Since the first operation in 1971, tens of thousands of hog heart valves have been successfully implanted in human recipients of all ages.

6. SHEEP & GOATS

| Texas-TOP 5 COUNTIES – Sheep and Lamb | | | |
|---|----------------------------------|-----------------|--------------------------------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | | | |
| Counties | Number of Head (Thousand) | Counties | Wool Produced (Thousand lbs.) |
| Crockett | 64.0 | Crockett | 285.0 |
| Val Verde | 58.0 | Val Verde | 230.0 |
| Tom Green | 42.5 | Pecos | 175.0 |
| Pecos | 41.5 | Tom Green | 165.0 |
| Gillespie | 36.5 | Gillespie | 120.0 |

| TOP 5 STATES-All Sheep and Lamb and Total Wool Production | |
|--|---|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | |
| State | Number of Head-Sheep and Lamb (Thousand) |
| 1. Texas | 700.0 |
| 2. California | 570.0 |
| 3. Colorado | 435.0 |
| 4. Wyoming | 375.0 |
| 5. Utah | 295.0 |

| Top 5 States- Value of All Sheep and Lambs | |
|---|--------------------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | |
| State | Value (\$million) |
| 1. California | 100.3 |
| 2. Texas | 99.4 |
| 3. Wyoming | 69.8 |
| 4. Colorado | 69.2 |
| 5. Utah | 60.5 |

| Texas-Top 5 Goat Counties | | | |
|---|-------------------------------|---------------|-------------------------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | | | |
| County | Angora (Thousand Head) | County | Mohair (Thousand Head) |
| 1. Edwards | 21.5 | 1. Edwards | 110.0 |
| 2. Val Verde | 6.7 | 2. Val Verde | 36.0 |
| 3. Crockett | 3.2 | 3. Gillespie | 20.0 |
| 4. Gillespie | 2.8 | 4. Crockett | 18.0 |
| 5. Kendall | 2.5 | 5. Mills | 16.3 |

| United States-Top 5 Goats | | | |
|--|---------------------------|---------------|-------------------------------|
| Source: USDA NASS 2012 Census of Agriculture | | | |
| State | Angora (Thousand Head) | County | Total Meat and Other Goats |
| 1. Texas | 85.0 | 1. Texas | 855.0 |
| 2. Arizona | 23.0 | 2. Tennessee | 121.0 |
| 3. N. Mexico | 11.5 | 3. California | 96.5 |
| 4. California | 3.5 | 4. Oklahoma | 91.0 |
| 5. Oregon | 2.4 | 5. Missouri | 83.5 |



Sheep and Goats

There are over 7,000 sheep and lamb operations in Texas and over 68,000 in the United States. They produce over 194 million pounds of lamb and mutton (meat) per year worth nearly \$175 million.

United States goat inventory by type (3-year average)

- **Angora** – 260,000 head
- **Milk** – 290,000 head
- **Meat** – 2,300,000 head

Ruminants

Sheep and Goats are called ruminants because they are hooved, cud-chewing animals that lack upper incisor teeth and have a four-compartment stomach. These compartments are the rumen, the reticulum, the omasum, and the abomasum.

- When grazing – plant material is chewed a little before being swallowed. Part-digested food is stored in the rumen where it is broken down in to cud by bacterial action.
- When ruminating – cud is regurgitated and chewed again while the ruminant is lying down. The food swallowed for the second time bypasses the rumen. The food is finally processed by acids and digestive enzymes in the other stomach chambers

Other ruminants include cattle, buffalo, deer, elk and giraffes.

Grazing for Hire

In Texas, landowners are using sheep and goats to control unwanted vegetation and brush, such as broadleaf weeds and cedar. This helps the environment by controlling wildfires, improving grass pastures, and adding fertility to the soil. Goats can be pastured with sheep and cattle because each species prefers different plants. Goats prefer brush, tree leaves, and rough browse plants, while cattle and sheep prefer grass.

Predators

Predators are animals such as coyotes, mountain lions, bobcats, dogs and other types of meat-eating animals that hunt for food.

- **Texas – Cost of Sheep & Lamb Losses**
 - Coyotes - \$2,800,000
 - Bobcats - \$818,000
 - Dogs - \$705,000
 - Other - \$442,000
 - Eagles - \$320,000
- **United States – Cost of Sheep & Lamb Losses**
 - Coyotes - \$11,100,000
 - Dogs - \$2,400,000
 - Other - \$1,300,000
 - Mountain Lions, cougars, etc. - \$1,000,000
 - Bobcats - \$910,000

Preventative Measures – ranchers often use guardian animals such as dogs, donkeys and llamas to protect their herds from predators.

Goat Breeds

In the United States, there are three primary breed types and over 60 recognized domestic breeds of goats in the world: Angor (popular for fiber), Nubian (popular for milk), Boer (popular for meat)

Separating the Sheep from the Goats

- Two distinct species and genus
 - Sheep have 54 chromosomes
 - Goats have 60 chromosomes
- *Look at their tails*
 - Sheep tails hang down
 - Goat tails point up
- *What do they eat?*

- Sheep are grazers, preferring to eat short, tender grass and clover. They like weeds and can graze very close to the soil surface.
- Goats are browsers, preferring to eat leaves, twigs, vines and woody shrubs. They will stand on their hind legs to eat vegetation.
- *Watch their behavior*
 - Sheep have a strong flock mentality that provides the best defense against predators.
 - Goats are very curious and independent. They are adaptable and can be raised successfully in any part of the U.S.

Facts

- There are two kinds of goats raised for fiber. The Angora goat (mohair) and the Cashmere goat (cashmere). While all goats have hair, the hair from these two breeds is particularly soft, warm, luxurious and woven into fine apparel.
- Goat meat is termed either cabrito or chevon, depending on the goat's age at harvest. The meat is unique in flavor and palatability. It is leaner than many other red meats and usually less tender, it is also very low in fat and cholesterol.
- Goat meat is the most highly consumed meat in the world; and more goats' milk is consumed worldwide than cow's milk!
- Lamb is the meat of a sheep under one year of age. Mutton is the meat of a sheep over one year of age.
- Wool is categorized into four major types: long wool, fine wool, medium wool and carpet wool.
- One pound of wool can make 10 miles of yarn.
- Most medium wool breeds have been selected for meat production rather than wool quality.

Because sheep and goats are adaptable to a wide range of climates and management systems, they can produce food and fiber by utilizing land that is otherwise unsuitable for other types of agriculture.

7. EQUINE

Horse Racing

A competition for horses ridden by jockeys within a given area and over a prescribed distance, under the control of appointed officials. Thoroughbreds are the most popular horse breed in the racing industry, but other breeds also race on Texas racetracks such as: Quarter Horses, Paint Horses, Arabians, and Appaloosas. There are currently five racetracks in Texas and more than 950,000 industry participants.

Therapeutic Riding

An equine-assisted activity that improves balance, joint mobility, coordination, muscle tone and posture. It can ease symptoms of a wide variety of disabilities including brain injuries, multiple sclerosis, hearing or visual impairments, muscular dystrophy, cerebral palsy, learning disabilities, Down syndrome, and cardiovascular disease. Plus, it's great for helping students improve motor skills, self-esteem, concentration and problem-solving abilities.

Ranching

Cattle have been raised and herded in Texas by men on horseback since the Spanish conquistadors introduced cows and horses to the area around 1541. Today they are still used on ranches to gather and work cattle, check fences, and various other labor intensive jobs. A good ranch horse must be versatile and perform activities such as herding, cutting, roping, and reining. They should have keen cow sense, high endurance, and a gentle disposition. Most of the competitive sports performed on horseback today are based on activities that are performed on a working ranch.

Recreational Riding

A popular pastime that strengthens your body and mind while exploring the great outdoors on the back of your horse. Almost 4 million horses are used for recreation—more than any other use. Trail riding is an ever growing

industry with many of our state and federal parks, forests, and wilderness areas becoming available to be explored on the back of a horse for a unique adventure. It has also become a potential income for landowners who may want to diversify their ranching operation by allowing trail riders to come in and ride and experience the country.

As a large, economically diverse industry, the United States horse industry contributes significantly to the American economy. The following statistics are from the American Horse Council Foundation's 2005 National Economic Impact Study.

The horse industry contributes approximately *\$39 billion* in direct economic impact to the U.S. economy, and supports *1.4 million* jobs on a full-time basis. When indirect and induced spending are included, the industry's economic impact reaches *\$102 billion*.

Cutting Horse Competition

The cutting horse has always been and will continue to be a ranch necessity with the objective being to separate a particular cow from the herd. In competition the objective is the same except for the rider and horse are being judged on the agility and athleticism of the horse and how well they demonstrate their ability to control the cow, maintaining proper position with the cow, and keeping it from getting back to the herd. Once the cow is cut from the herd the reins are no longer used and the horse is guided only from the rider's leg pressure. Horses move from side to side, swinging both front feet from the left side to the right side, never moving their hind legs at times.

Horse Show Competition

Probably the most common competitive riding activity because there is something for every rider, from beginner to the advanced. Horse Shows have a variety of classes such as Western which can include pleasure, horsemanship, trail, reining, cutting, working cowhorse, versatility, and various speed events. English classes can include hunter, equitation, jumping, pleasure driving, and dressage to name a few. Also there are halter and equestrians with disabilities classes. The rider usually has a predetermined pattern of maneuvers with emphasis placed on ability to ride with quality and precise control of the horse. The horse is usually evaluated on his conformation, balance, structural correctness, and degree of muscling. The horse should be guided with little or no resistance.

Rodeo Events

Rodeo events consist of two types of competition – roughstock events and timed events. In roughstock events the contestant's score is equally dependent upon his performance and the horse's performance during an 8 second ride. A perfect score is 100 points. In timed events contestants compete against the clock, as well as against each other.

- **Barrel Racing** – a timed event to the hundredth of a second, the horse is ridden as fast as possible around a cloverleaf pattern of three barrels without knocking a barrel over, which is a five-second penalty. A proven barrel racing horse can cost \$50,000 to \$100,000.
- **Steer Wrestling** – A timed event with the world record sitting at 2.4 seconds, steer wrestling is the quickest event in rodeo. The contestant, also known as a "bulldogger" rides alongside a running steer, leans over onto the steer and off his horse at about 30 mph, and attempts to stop the steer, twist it to the ground, with the steer ending up on his side with all feet facing the same direction.
- **Team Roping** – A timed event that requires close cooperation and timing between two skilled ropers, a header and a heeler, and their horses. When the steer is released from the chute the header ropes the steer – around both horns, around the horn and the head, or around the neck. After the header makes his catch, the

heeler then attempts to rope both hind legs. If he catches only one foot the team is assessed five-second penalty. The clock is stopped when there is no slack in their ropes and their horses are facing each other.

- **Tie-Down Roping** – A timed event, where a calf is released with a head start and the cowboy pursues the calf on horseback. The horse is trained to stop as soon as the cowboy ropes the calf. At that point the cowboy dismounts, sprints to the calf, and throws it by hand on its side, called flanking it. The roper then ties any three legs together with a pigging string – a short, looped rope. When the roper is finished he throws his hands in the air as a signal to stop the clock. The roper then remounts his horse, rides forward to create slack in the rope and waits six seconds to see if the calf remains tied. If the calf kicks free, the roper receives no time.
- **Saddle Bronc Riding** – A roughstock event where the rider has to use a regulation saddle, one rein attached to a halter, and is not allowed to touch the saddle, the horse, or himself with his free hand. Throughout the 8-second ride the judges score the horse's bucking action, the cowboy's control of the horse, and the cowboy's spurring action.
- **Bareback Riding** – A roughstock event consisting of riding a bucking bronc bareback for 8 seconds using only a rigging made of leather with a handle and a strap that is placed atop the horse's withers and secured with a cinch to stay aboard. A bareback rider is judged on his spurring technique, the degree to which his toes remain turned out while he is spurring and his willingness to take whatever might come during his ride.

Some key industry statistics and economic indicators:

- **Estimated number of horses in the U.S.:** 9.2 million
- **Estimated number of horses in Texas:**
- **Estimated number of horses by activity:**
 - Recreation- 3,906,923
 - Showing- 2,718,954
 - Racing- 844,531
 - Other- 1,752, 439
- **Estimated number of horses by breed:**
 - Quarter Horse- 3,288,203
 - Thoroughbred- 1,291,807
 - Other- 4,642,739

| <i>Generation of Annual Taxes</i> | | |
|--|----------------------|----------------------|
| <i>Source: American Horse Council Foundation</i> | | |
| | United States | Texas |
| Federal | \$588 million | \$41 million |
| State | \$1 billion | \$43 million |
| Local | \$275 million | \$26 million |
| Total | \$1.9 billion | \$110 million |

| <i>Generation of Employment</i> | | |
|--|----------------------|---------------|
| <i>Source: American Horse Council Foundation</i> | | |
| | United States | Texas |
| Direct | 453,600 | 32,200 |
| Indirect | 957,700 | 64,100 |
| Total | 1,411,300 | 96,300 |

| Indirect Impact of Equine by Category | | |
|--|---------------------------------------|----------------------|
| | <i>Source: American Horse Council</i> | |
| | United States | Texas |
| Horse-related Goods (feed, tack, etc.) | \$13.5 billion | \$595 million |
| Horse-related Services (boarding, training) | \$18.2 billion | \$649 million |
| Horse-related Transportation (trailer) | \$5.0 billion | \$266 million |
| Overhead (utilities, office supplies, etc) | \$6.2 billion | \$258 million |
| Capital Expenses (equipment & structures) | \$16.5 billion | \$330 million |
| Other Expenses | \$3.3 billion | \$86 million |
| Total Indirect Expenditures | \$62.7 billion | \$2.2 billion |

Indirect Impacts are purchases made by industry suppliers to support the manufacturing and delivery of their respective products.

| Economic Impact of Equine by Activity | | | | |
|--|---------------------------------------|-----------------------|--------------------------------|--------------------|
| | <i>Source: American Horse Council</i> | | | |
| | United States | | Texas | |
| Activity | Direct & Indirect Impact Total | Direct Impact | Direct & Indirect Impact Total | Direct Impact |
| Racing | \$26.1 billion | \$10.7 billion | \$848 million | \$506 million |
| Showing | \$28.8 billion | \$10.8 billion | \$1.9 billion | \$1.1 billion |
| Recreation | \$32.0 billion | \$11.9 billion | \$1.5 billion | \$900 million |
| Other | \$14.7 billion | \$5.5 billion | \$898 million | \$518 million |
| TOTAL | \$101.6 billion | \$38.9 billion | \$5.2 billion | \$3 billion |

Direct Impacts are purchases made by individuals directly in the horse industry on goods and services required specifically for the horse industry.

Facts

- Horses can sleep both lying down and standing up and spend approximately 90% of their life on their feet
- You can tell how old a horse is by its teeth
- Adult horses have 12 incisors and 24 molars
- Horses can drink up to ten gallons of water per day
- Horses can run shortly after birth
- A 1,000 pound mare produces four gallons of milk per day for her foal
- Domestic horses have a lifespan of around 25 years
- Horses have around 205 bones in their skeleton
- Horses are herbivores (plant eaters)
- Because horse’s eyes are on the side of their head they are capable of seeing nearly 360 degrees at one time
- Horses gallop at around 44 kph (27 mph)
- The fastest recorded sprinting speed of a horse was 88 kph (55 mph)
- A male horse is called a stallion

- A female horse is called a mare
- A young male horse is called a colt
- A young female horse is called a filly

8. CORN

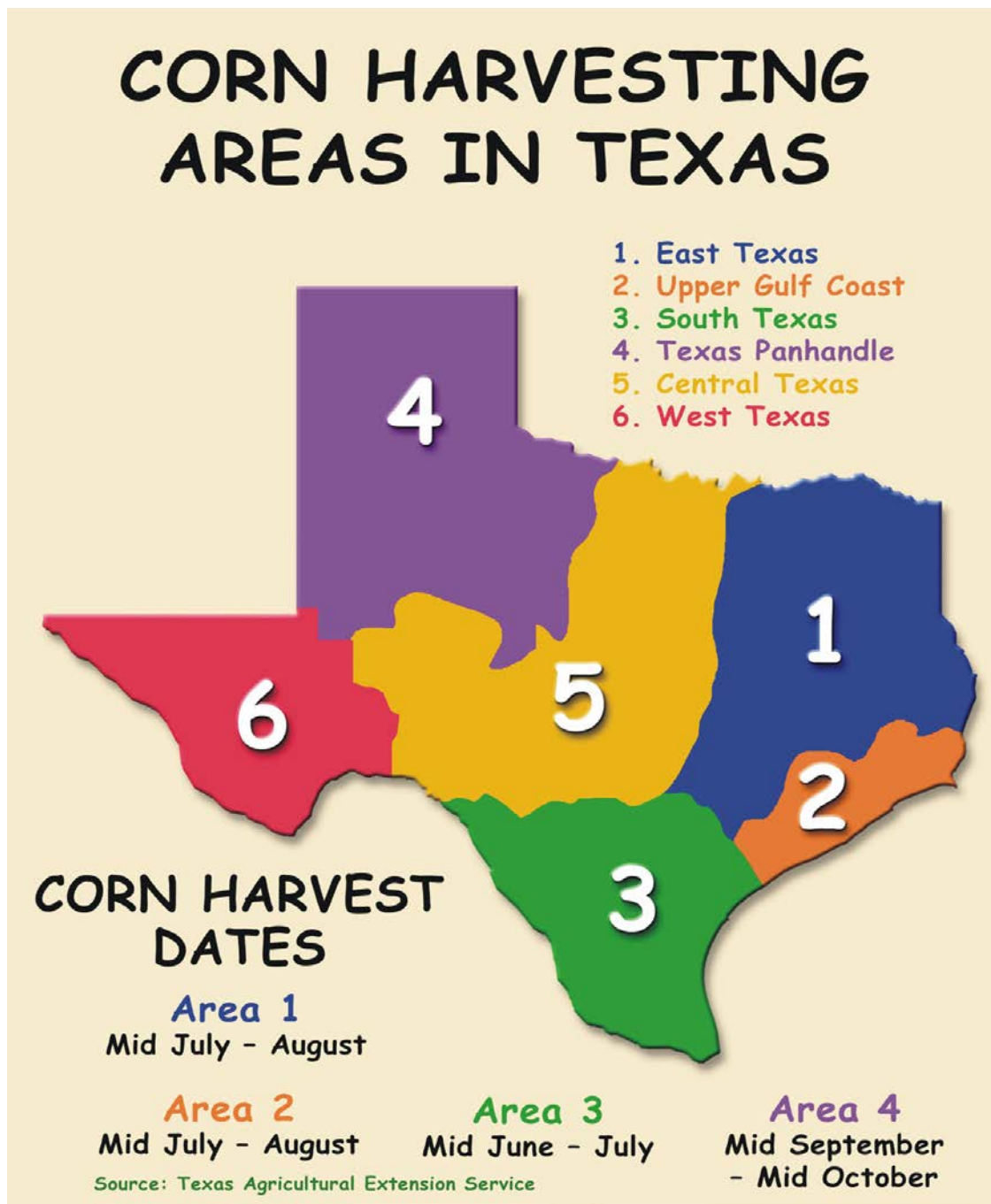
| Texas Corn Production Facts | |
|---|--------------|
| <i>Source: National Agriculture Statistic Service</i> | |
| Acres Planted | 2.3 M |
| Acres Harvested | 1.97 M |
| Average Yield | 135 bushel |
| Total | 265 M/bushel |
| Worth | \$1.1 B |

| Top Texas Corn Producing Counties | | | | |
|--|------------|----------------------|-----------------|----------------------|
| Corn for Grain (5 yr. average) | | | | |
| <i>Source: Texas Farm Bureau</i> | | | | |
| | County | Production (bushels) | Harvested Acres | Yield/Acre (bushels) |
| 1 | Dallam | 24.7 mil | 125,860 | 196 |
| 2 | Hartley | 20.6 mil | 104,160 | 198 |
| 3 | Sherman | 13.3 mil | 68,000 | 195 |
| 4 | Castro | 12.7 mil | 63,020 | 202 |
| 5 | Moore | 12.2 mil | 60,900 | 201 |
| 6 | Falls | 6.2 mil | 70,120 | 88 |
| 7 | Williamson | 6.1 mil | 82,980 | 73 |
| 8 | Hansford | 5.6 mil | 27,960 | 200 |
| 9 | Parmer | 5.5 mil | 27,740 | 200 |
| 10 | Bell | 4.8 mil | 65,740 | 73 |

| Top Corn Producing States | | |
|----------------------------------|----------------------|-----------------|
| Corn for Grain | | |
| (5 yr. average) | | |
| <i>Source: Texas Farm Bureau</i> | | |
| State | Production (bushels) | Harvested Acres |
| 1. Iowa | 2 bil | 12 mil |
| 2. Illinois | 1.7 bil | 11.3 mil |
| 3. Nebraska | 1.2 bil | 7.8 mil |
| 4. Minnesota | 1 bil | 6.7 mil |
| 5. Indiana | 824.7 mil | 5.5 mil |
| 12. Texas | 201.8 mil | 1.7 mil |

Corn Facts

- Depending on conditions, around 22,000 to 25,000 individual corn plants are grown on one acre of land
- The majority of corn grown in Texas is “dent” corn used for animal feed
- Texas corn farmers plant around two million acres of corn each year
- Depending upon the type equipment used, Texas farmers plant 150-300 acres of corn per 12-14 hour day
- A single corn seed produces a plant that yields about 800 kernels of corn per ear
- The average corn ear has 16 rows. Corn ears always have an even number of rows
- In Texas, an average corn plant is approximately 7-8 feet tall
- A bushel of corn is measured by weight: 56 pounds



* Corn grown in Area 5 will typically follow the timeline of Area 1. Corn is not typically grown in area 6.

Where does Texas corn end up?

- The great majority of Texas corn production goes to feed livestock.
- Nearly all the feed corn produced on the High Plains goes to local feed yards.
- Low Plains and Cross Timbers feed corn is sold to elevators for merchandising or fed locally to livestock.
- Elevators handle most of the feed corn produced in the Blacklands and Edwards Plateau.
- East Texas and South Texas feed corn is marketed through grain elevators with some used by local livestock and poultry feeders.
- Local and port elevators are the primary destinations of the feed corn produced in the Upper Coast, Coastal Bend and Lower Valley.

Texas Corn Harvest Niblets

- The Northern High Plains accounts for almost two-thirds of the total Texas corn production.
- The statewide average yield for corn is around 140 bushels per acre.
- Texas corn farmers produce over 230 million bushels of corn each year.
- The value of the Texas corn crop is around \$600 million annually.

Corn Plant Growth

- **Germination and Emergence**
Seedling reaches the surface in 8 to 12 days, at which time it splits open revealing the first leaves of the corn plant. Within approximately 72 days all leaves, ears, buds, and tassel which will be present in a mature plant are established. (Number of days depends upon location, seed variety, weather, and other conditions)
- **Tasseling**
At about 75 days the last branch of the tassel is completely visible, the plant has reached full height, and the pollen shed begins. (Number of days depends upon location, seed variety, weather, and other conditions.)
- **Silking**
Silks are visible at about 81 days and pollination is completed by the pollen shedding tassels in two to three days. Kernel development begins immediately after pollination. (Number of days depends upon location, seed variety, weather, and other conditions.)
- **Dent**
At approximately 114 – 119 days nearly all kernels are dented or denting (drying process leaves actual dent in kernel). Kernels at this stage have about 55% moisture. (Number of days depends upon location, seed variety, weather, and other conditions.)
- **Physiological Maturity (Harvest)**
At 145 to 160 days after planting, all kernels have attained maximum dry weight and maturity. At grain harvest, corn is ready to be harvested at 13-15% moisture. (Number of days depends upon location, seed variety, weather, and other conditions.)

9. COTTON

Cotton is a fiber, feed and food crop. About 2/3 of the harvested crop is composed of the seed, which is crushed to separate its three products: oil, meal and hulls. Cottonseed oil is a common component of many food items, used primarily as a cooking oil, shortening and salad dressing. The oil is used extensively in the preparation of snacks such as crackers, cookies and chips. The meal and hulls are used as livestock, poultry and fish feed, and is also used as fertilizer.

| Texas Cotton Production | |
|---|-------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | |
| Acres Planted | 6.6 M |
| Acres Harvested | 3.9 M |
| Average Yield | 623.0 lbs. |
| Total | 5.0 M bales |
| Worth | \$1.7 B |

| Top Texas Cotton Producing Counties | | | | |
|---|---------|--------------------|-----------------|--------------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | | | | |
| Rank | County | Production (Bales) | Harvested Acres | Yield/Acre (Bales) |
| 1 | Hale | 483,000 | 262.1 | 1.8 |
| 2 | Gaines | 346,200 | 204.4 | 1.7 |
| 3 | Lamb | 339,500 | 193 | 1.8 |
| 4 | Hockley | 279,700 | 212 | 1.3 |
| 5 | Floyd | 254,400 | 164 | 1.6 |
| 6 | Lubbock | 247,800 | 193.5 | 1.3 |
| 7 | Crosby | 214,700 | 181 | 1.2 |
| 8 | Terry | 214,200 | 150.8 | 1.4 |
| 9 | Parmer | 191,200 | 75.8 | 2.5 |
| 10 | Castro | 166,800 | 74.5 | 2.2 |

| U.S. Top States Upland Cotton | | | | |
|---|-------------|--------------------|-----------------|--------------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | | | | |
| Rank | State | Production (Bales) | Harvested Acres | Yield/Acre (Bales) |
| 1 | Texas | 5.8 mil | 4.1 mil | 1.4 |
| 2 | Arkansas | 2.5 mil | 1.1 mil | 2.2 |
| 3 | Georgia | 2.3 mil | 1.3 mil | 1.7 |
| 4 | Mississippi | 2.1 mil | 1.2 mil | 1.7 |
| 5 | Tennessee | 1.3 mil | 695 tho | 2 |
| | U.S. Total: | 20.8 mil | 12.4 mil | 1.7 |

Cotton Production

The Cotton Belt spans the southern half of the U.S., stretching from Virginia to California. Cotton production covers more than 14 million acres, or about 22,000 square miles of the U.S. Cotton contributes over \$1.6 billion to the Texas economy. Texas produces about 25% of the entire U.S. crop and plants over 5 million acres annually. That's over 8,000 square miles of cotton fields! Currently, there are about 245 active cotton gins in

Texas. Of those gins, approximately 65% are in West Texas, 20% are located along the Texas coast, and the remaining gins are in Central Texas.

Eli Whitney invented the cotton gin in 1793. This cotton gin consisted of cranks, pulleys and hooks and maintained an output of 50 pounds per day. Prior to this invention, it took about 20 hours of work to produce 1 kilogram of cotton. Improvements have been made to the original design of the gin. The cotton gin increased cotton production and lowered costs, resulting in cotton becoming the cheapest and most widely used textile fabric in the world.

Today, the ginning process removes trash, dries, moisturizes & sorts the cotton. During the final process, the fiber is compressed into a bale, with a total weight of about 480 pounds. Once the cotton is harvested and baled, it is stored in modules for protection against the weather. On average, a module can hold 13 to 15 bales of cotton.



By-Products

There are three primary products derived from cotton production: cotton lint, linters and cottonseed.

1. Cotton Lint

- Raw fiber from the cotton plant which is pressed into bales at the cotton gin
- Bales are purchased by textile mills and processed in stages into yarn and cloth

2. Linters

- Short fibers that cling to the seed
- Provide cellulose for making items like plastics, paper products and cosmetics

3. Cottonseed

About 2/3 of harvested crop is composed of the seed, which is crushed to separate its three products: oil, meal and hulls.

- Cottonseed Oil
 - The oil is the cottonseed's most valuable by-product.
 - It is used in cooking oil, shortening, salad dressing and in preparation of snack foods like chips, crackers and cookies.
 - Products such as soaps, cosmetics, pharmaceuticals and textile finishes also contain cottonseed oil.
- Meal
 - Meal is the second most valuable by-product of cottonseed.
 - The meal is high in protein and used to feed all classes of livestock and poultry.
- Hulls
 - Cotton hulls are used for feed, fertilizer, fuel and packing.

Exports:

About 31% of the U.S. cotton supply is exported, that's 6 to 9 million bales of raw cotton! The annual value of exported cotton exceeds \$3 billion.

Cotton Facts:

- Texas is the leading cotton-producing state
- Every year, approximately 8 to 9 million bales of cotton are used by U.S. textile industries
- Cotton can grow continuously without hurting the soil
- The cotton industry in the U.S. provides jobs for more than 440,000 Americans
- The first T-shirts were elbow and hip length undershirts issued to sailors in the U.S. navy in 1880. The shirt resembled a perfect “T” when laid on a flat surface, which is how it got its name.
- U.S. paper currency is made up of 75% cotton and 25% linen. This means there is 3/4 of a pound of cotton in each pound of dollar bills!

WHAT IS Produced from a Bale?

ONE BALE OF COTTON CAN MAKE

| | | |
|---------|--|--------------------|
| 215 | | Jeans |
| 249 | | Bed Sheets |
| 690 | | Terry Bath Towels |
| 765 | | Men's Dress Shirts |
| 1,217 | | Men's T-Shirts |
| 1,256 | | Pillowcases |
| 2,104 | | Boxer Shorts |
| 3,085 | | Diapers |
| 4,321 | | Mid-calf socks |
| 313,600 | | \$100 Bills |

Texas Farm Bureau Copyright

10. GRAIN SORGHUM

Grain Sorghum, also called milo, is a member of the grass family. The round starchy seed’s tolerance for heat and drought plays a critical role in agriculture production throughout the state of Texas. Not only is it an important grain crop, it is also very important as a forage, hay, and silage crop generating more than **\$1 billion** for Texas annually.

| Top Texas Sorghum Counties | |
|--|----------------------------|
| <i>Source: USDA NASS Census of Agriculture, 2012</i> | |
| County | Sorghum Sales (\$ million) |
| 1. Hildago | 63.6 |
| 2. Willacy | 50.4 |
| 3. Nueces | 41.7 |
| 4. Cameron | 37.5 |
| 5. San Patricio | 32.7 |

| United States Sorghum Production Top 5 States in Grain and Silage | |
|--|--------------------|
| <i>Source: USDA NASS Census of Agriculture, 2012</i> | |
| State | Sales (\$ million) |
| 1. Texas | 743.3 |
| 2. Kansas | 579.4 |
| 3. Louisiana | 75.4 |
| 4. Arkansas | 70.9 |
| 5. S. Dakota | 39.7 |

| Texas Sorghum Production Facts | |
|---|-------------|
| <i>Source: USDA NASS Census of Agriculture 2012</i> | |
| Acres Planted | 2.3 M |
| Acres Harvested | 1.9 M |
| Average Yield | 59.0 bu. |
| Total | 112.1 M bu. |
| Worth | \$703 M |

History

Grain Sorghum is one of the oldest known grains originating in Africa and India. Benjamin Franklin is credited with introducing the first crop to the United States in the 1700s. Before the 1940s, most grain sorghums were 5 to 7 feet tall, which created harvesting problems. Today, sorghums have two or three dwarfing genes in them and are 2 to 4 feet tall.

Varieties

Grain Sorghum is a drought-tolerant, versatile grain with many varieties. Some varieties can be used in the cereal, snack food, baking and brewing industries. These varieties contain a white berry, and tan glumes on a tan plant. Other varieties are used in the U.S. for livestock feed, pet food, industry and ethanol. These may include yellow, red and bronze sorghums.

Growing Grain Sorghum in Texas

Grain Sorghum is well suited for Texas because it does not require much water and it grows well during the long, hot summers. Most grain sorghum is not irrigated.



Grain Sorghum seeds are planted in rows during the spring, March to April, when soil temperatures exceed 65 degrees F.

The plant begins to produce leaves and the stem begins to grow.



Growth is not very rapid until the plant is about 10 inches tall. This is because the plant is establishing a root system and taking up nutrients rapidly.

The production of the head that holds the round seeds begins to develop at the top of the plant.



The new leaves are a brilliant green and the seeds darken to a color depending on variety, usually red in Texas. Other varieties may be white, yellow, or bronze.

When the grain sorghum plant reaches maturity and is ready for harvest, it is approximately four feet high, the leaves have turned to a light brown, and the seeds have hardened.



The grain is loaded onto trucks and stored at the farm in a grain bin to sell later or delivered to a local grain elevator where it is then sold to many different industries.

Farmers use combines to harvest their sorghum. The combine cuts the seed head off and threshes or removes the seed from the head.



Grain that is stored in bins must be stored at specific temperatures and moisture content until it is used for seed, animal feed, or sold to industries for food and non-food uses, or to export to another country.

While most other grains are sold by the bushel, grain sorghum is commonly sold by the hundred weights (cwt - increments of 100 pounds).

Texas Farm Bureau Graphic

Sorghum's Food Characteristics and Uses

- Health Food: Gluten Free & Antioxidant Dense
- Attributes: Absorbs & Enhances Flavors and is Environmentally Friendly
- Processing Possibilities: Baked Goods, Popped, Malting, Grits & Couscous, and Chips

Grain Sorghum Uses

- **Livestock Feed:**
 - The seed can be ground or mixed into feed for dairy cattle.
 - The entire plant can be made into high-moisture grain silage when cut at 25-30% moisture.
 - After grain has been harvested, livestock can be pastured on sorghum stubble utilizing both roughage and dropped seed heads.
 - Pet food manufacturers include this highly digestible carbohydrate grain to their feed formulations.
 - Distillers grain, an ethanol by-product, is a valuable feed for both feedlot cattle and dairy cows.
- **Industry**
 - Used as a substitute for wood to make wallboard for the housing industry.
 - Used in biodegradable packaging material that does not conduct static electricity. This is beneficial for the shipping of electronic equipment.
- **Fuel**
 - About 15% of the U.S. grain sorghum crop currently is used for ethanol production with one bushel producing the same amount of ethanol as one bushel of corn.
 - Sorghum is the only crop that can effectively be utilized into starch, sugar, and cellulose ethanol production.
- **Human Consumption**
 - Worldwide, sorghum is a food grain for humans.
 - Used in snack foods in the U.S. and Japan such as granola bars and cereals, baked products, dry snack cakes, and more.
 - Replaces wheat flour with a gluten-free flour for use in a variety of baked goods.
 - Worldwide, about 49% of the sorghum consumed is for food. Sorghum provides an important part of the diet for many people in the world in the form of unleavened breads, boiled porridge or gruel, malted beverages, and specialty foods such as popped grain and beer.

11. WHEAT

In 2012, the U.S. wheat industry had sales of \$15.8 billion, accounting for 4 percent of total U.S. agriculture sales. Wheat production occurs in many states but is concentrated in the northern and southern plains and the northwestern states. The 2012 Census of Agriculture provides a comprehensive picture of the wheat industry, as well as the oilseed and grain sector overall.

| Texas TOP 5 COUNTIES For Wheat Production | |
|---|------------------------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | |
| County | Production (Million bushels) |
| 1. Ochiltree | 4.6 |
| 2. Wilbarger | 3.7 |
| 3. Hansford | 3.5 |
| 4. Sherman | 2.9 |
| 5. Wichita | 2.8 |

| U.S. Wheat Production TOP 5 STATES | |
|---|-------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | |
| State | Sales (\$M) |
| 1. N. Dakota | 2.5 |
| 2. Kansas | 2.5 |
| 3. Montana | 1.4 |
| 4. Washington | 1.1 |
| 8. Texas | .6 |

| State Wheat Production Facts | |
|---|------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | |
| Acres Planted | 5.7 M |
| Acres Harvested | 3.0 M |
| Average Yield | 32.0 bu. |
| Total | 96.0 M bu. |
| Worth | \$653 M |

Wheat Kernel

The wheat kernel is the seed from which the plant grows. Each tiny seed contains three distinct parts that are separated during the milling process to produce flour.

- **Germ – 2.5% of the kernel weight**
 - Embryo of the seed
 - Separated from white flour
 - Included in whole wheat flour
 - Available separately
- **Endosperm – 83% of the kernel weight**
 - Source of white flour
- **Bran – 14.5% of the kernel weight**
 - Included in whole wheat flour
 - Available separately
 - Separated from white flour

Varieties

There are two types of wheat planted in the U.S: Winter wheat is planted in September and harvested the following summer. Winter wheat makes up 70-80% of U.S. production. Spring wheat is planted in April or May and harvested in August or September. There are several hundred varieties of wheat produced in the United States, all of which fall into one of six recognized classes. Classes are determined by time of year they are planted and harvested, hardness, color and shape of kernels.

- **Hard Red Winter and Hard Red Spring** - Produces high-grade flour used to make bread, hamburger buns and biscuits.
- **Hard White and Soft White** - Soft wheat that produces flour used for cereals, cookies and cakes.
- **Durum** - Contains the most protein and produces a course, golden amber product called semolina that is used to make premium pasta products like spaghetti noodles and macaroni.
- **Soft Red Winter** - Produces flour that is desirable for baked goods that have a tender, flaky or crisp texture, like cakes, doughnuts, cookies and crackers.

Texas produces Hard Red Winter and Soft Red Winter Wheat. Hard Red Winter is the dominant class in U.S. exports and the largest class produced each year. On average, in the U.S., one acre yields 37.1 bushels of wheat.

Wheat and Livestock

- Much of the wheat used for livestock and poultry feed is a by-product of the flour milling industry.
- The green forage may be grazed by livestock or used as hay or silage.
- In many areas, wheat serves a dual purpose —grazed by livestock in the fall and early spring and then harvested as a grain crop when it matures.
- Wheat straw is used for livestock bedding.

Wheat Facts:

- Wheat is a member of the grass family.
- More than 17,000 years ago, people gathered the seeds, rubbed off the husks and ate the kernels raw, parched or simmered.
- Wheat is grown on more land area worldwide than any other crop and is third to rice and corn in total world production.
- More foods are made with wheat than any other cereal grain.
- Because wheat is such a versatile crop, it is being harvested somewhere in the world every month of the year.
- One bushel weighs 60 pounds and contains approximately one million individual kernels.
- There are two types of wheat planted in the U.S. Winter wheat – planted in September and harvested the following summer and Spring wheat – planted in April or May and harvested in August or September
- 60 pounds of wheat (a bushel) produces...
 - 60 pounds of whole wheat flour
 - 42 pounds of white flour
 - 42 commercial loaves of white bread
 - 90 loaves of whole wheat bread
 - 42 pounds of pasta
 - 45 boxes of wheat flake cereal
 - 210 servings of spaghetti

12. RICE

Although rice is produced over vast areas of the world, the physical requirements for growing rice are limited to certain areas. Production typically requires high average temperatures during the growing season, a plentiful supply of water applied in a timely fashion, a smooth land surface for uniform flooding and drainage, and a subsoil hardpan that prevents water loss. There are approximately 2.7 million acres dedicated to rice farming in the U.S.

Production

Rice has been produced commercially in American for more than 300 years. Today, rice farming in the U.S. has become a precise science, a world of specialized equipment, lasers and computers. Producers in the U.S. can apply seed aerially in dry or flooded fields, or drill or broadcast seed into dry fields. Planting typically begins in early March in Texas.

As the seedlings mature, they draw nutrients from the water. The same water keeps the weed population under control. Rice is a unique grass species where its leaves and stems have internal air spaces through which air is collected and passed down the root cells. Eventually, small green flowers take shape and pollinate and soon rice grains begin to form in their husks. The paddies of rice change from green to golden yellow to the pale color of straw.

When the rice plant matures, the leaves are opened, the water is drained and the soil is given time to dry. Harvest begins in early or mid-July, using a combine to cut the rough rice from the straw. After the rice has been harvested, it is shaken to loosen the hulls.

Virtually all U.S. rice is marketed as whole-kernel milled product. Once sold, the rice is screened to remove stones, loose chaff and stalks. The rice is then slowly dried by warm air to reduce any moisture, and then screened again to remove any dust particles.

| Top 5 Texas Counties for Rice Production | |
|---|---------------------------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | |
| County | Production (million lbs) |
| 1. Wharton | 370.6 |
| 2. Colorado | 229.3 |
| 3. Matagorda | 151.4 |
| 4. Brazoria | 104.4 |
| 5. Jefferson | 98.5 |
| Texas Total | 1.4 bil |

| Top 5 States for Rice Production | |
|---|------------------------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | |
| State | Total Acres Harvested |
| 1. Arkansas | 1,553,800 |
| 2. California | 524,400 |
| 3. Louisiana | 517,800 |
| 4. Mississippi | 247,400 |
| 5. Texas | 204,202 |

| State Rice Production Facts | |
|---|------------|
| <i>Source: USDA NASS 2012 Census of Agriculture</i> | |
| Acres Planted | 135 K |
| Acres Harvested | 134 K |
| Average Yield | 8,370 lbs. |
| Total | 11.2 M |
| Worth | \$167M |

Rice - A Global Staple

Rice is the primary staple for more than half the world's population, with Asia and Africa being the largest consuming regions. Developing countries have long depended on its versatility and high caloric value. The United States is the second largest exporter of rice, (first is Thailand). The United States now exports about half of all the rice it grows.

Types of Rice

- **Long-grain Rice**
 - Grown almost exclusively in the South
 - Accounts for more than 70% of U.S. rice production
 - Commonly used in frozen dinners, canned soup, and seasoned packaged products
 - Typically cooks dry and grains remain separate, not sticky
 - Preferred by most of the U.S. population
- **Medium-grain Rice**
 - Grown both in California and Arkansas
 - Accounts for more than 25% of U.S. rice production
 - Used in cereal manufacturing
 - Typically cooks moist and clingy
- **Short-grain Rice**
 - Grown almost exclusively in California
 - Accounts for 1 to 2 % of U.S. rice production
 - Used in puddings and desserts
 - Cooks moist and sticky

In the United States, rice growing regions also serve as an important habitat for waterfowl and migratory birds and is an example of how properly managed agriculture can enhance the environment.

Rice Facts

- Rice is cultivated in more than 100 countries and on every continent except Antarctic.
- 96% of the world's rice is eaten in the area in which it is grown.
- Wild rice is not true rice but an aquatic grass variety from a different genus.
- There are more than 40,000 varieties of cultivated rice said to exist.
- Cooked rice swells at least three times its original weight

13. ON-FARM RENEWABLE ENERGY

Source: Texas Wide Open for Business & the Texas Economic Development Division

Traditionally, farming has consisted of either raising animals or planting and harvesting crops. However, in recent years, Texas has built upon its energy experience and trained workforce to take the lead in renewable energy production and services. As a result, Texas has become the top state in wind generation capacity and biodiesel production. The Lone Star State's energy potential is among the largest in the nation, with abundant wind, solar, and biomass resources found across the state's geographically diverse regions. In 2012, more than 57,000 farms produced renewable energy for either the farm's direct use or for sale to others, more than double the number that did so in 2007.

There are 4 main sources of on-farm renewable energy in Texas: Wind, Solar, Biofuels & Biomass. While renewable energy has grown rapidly in Texas, the industry is still evolving. Most renewable technologies are not yet price-competitive with traditional fossil fuel generation. The recent extraordinary growth in shale gas recovery technology drove natural gas prices to record lows throughout most of 2013 and widened the gap for renewable energy to achieve cost parity.

As renewable energy generation continues to advance, the electric infrastructure must adapt to allow growth to continue. The success of the state's RPS and wind industry has led to emerging constraints in transmission capacity. Texas wind resources are greatest in West Texas, while the majority of the population and power demand lies in the eastern half of the state. Furthermore, West Texas wind blows hardest at night when energy demand and prices are low.

The Rural Energy for America Program (REAP) is part of the Energy Title of the 2014 Farm Bill. It provides grants and loan guarantees to agricultural producers and rural small business to help purchase renewable energy systems, make energy efficiency improvements, and perform renewable energy feasibility studies. It also funds an energy audit and technical assistance program to serve ag producers and rural small businesses.

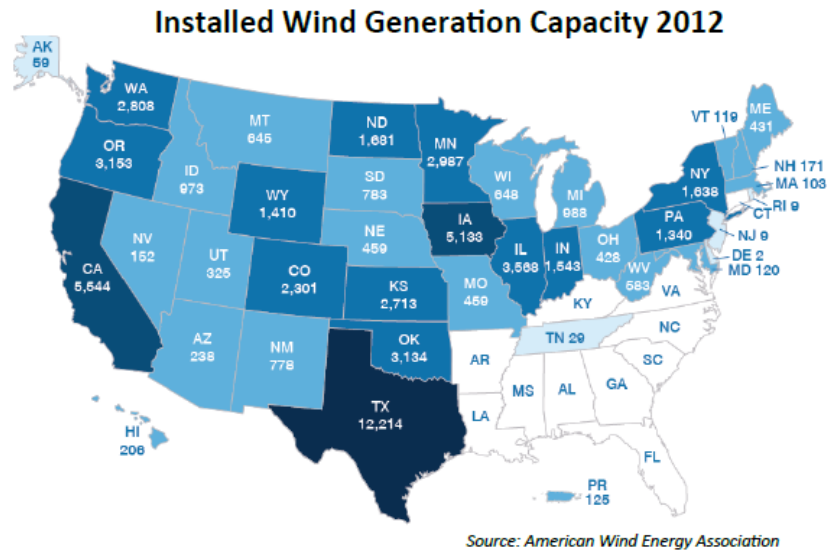
WIND

Wind is a clean, affordable, and renewable energy resource which plays a significant and growing role in the U.S. and Texas energy markets. According to the Wind Energy Foundation, wind is currently the fastest growing source of electricity production globally. Wind generation technology is mature and proven, and increasingly cost competitive. Texas is the leading state for wind energy generation, with over 20% of the nation's installed wind capacity. If Texas were a country, it would rank sixth in installed capacity.

Wind generation has proven popular because it is cheaper than solar, requires no water or other scarce resources, and emits no greenhouse gases. Since windmills must be spaced out to maximize their efficiency, much of the underlying land can still be used for its original purposes, such as agriculture and livestock production.

Texas' world-class wind industry comes from its abundant natural wind resources. With plentiful wind on the Great Plains and along the Gulf Coast, the state ranks first nationally for wind generation potential, according to the American Wind Energy Association (AWEA). The state's Renewable Portfolio Standard, enacted in 1999, also played a major role in encouraging wind energy development in Texas.

Texas is by far the leading state in wind energy generation with 12,214 megawatts (MW) of installed capacity — enough to power over 3.3 million homes. Wind capacity in Texas is 45% greater than in California, the second-ranked state. In 2007, Texas became the first state to reach the milestone of one gigawatt of wind capacity installed in a single year. In 2012 alone, the state added 1,826 MW of wind generating capacity. The state’s largest cluster of wind farms is located in West Texas, where Taylor, Nolan, Scurry, and Sterling counties collectively account for about 33% of the state’s total installed capacity, with over 1,000 MW each.



SOLAR

In the U.S., solar power lags behind wind power in terms of installed capacity, yet solar industry growth is accelerating as equipment prices fall. The most common solar technology is photovoltaics (PV). PV modules are glass-covered semiconductor cells which convert sunlight into an electric current. Although PV systems are frequently used for larger utility-scale projects, their modularity makes them a popular choice for small-scale energy generation near the point of use (also called distributed generation), such as on residential or commercial rooftops.

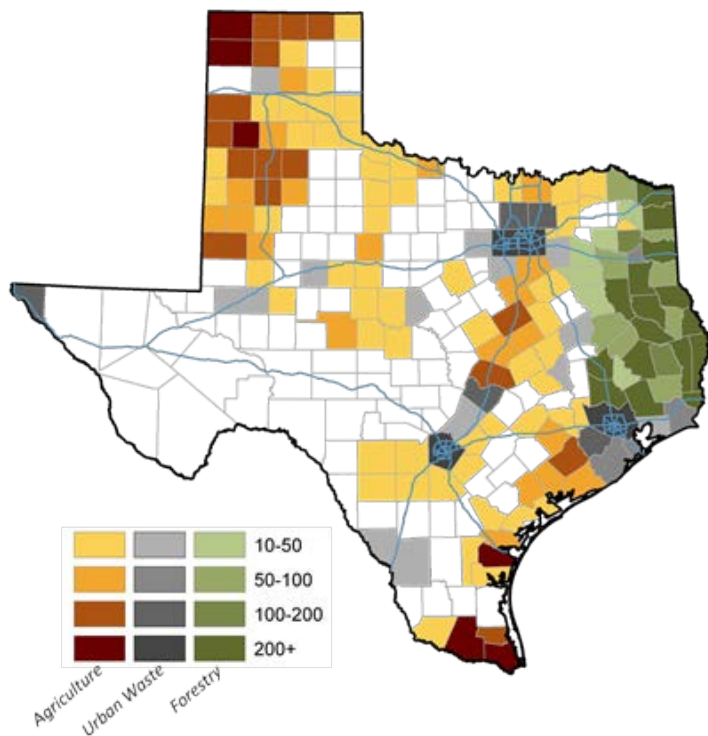
Due to its abundant sunshine, specialized manufacturing base, and growing research institutions, Texas is well positioned to compete in the solar energy market. Texas is ranked No. 1 nationally in solar potential, according to the Texas State Energy Conservation Office. West Texas in particular has some of the nation’s highest levels of solar radiation, making it ideal for utility-scale solar power plants. Large solar farms have also sprouted up elsewhere in the state, including the Austin and San Antonio regions.

BIOFUELS & BIOMASS

Texas has leveraged its position as a center of global petroleum refining to develop a strong lead in the developing biofuels sector. Along with the concentration of refining industry knowledge, Texas also boasts plentiful and diverse biomass resources which provide the raw materials. Biofuels and biomass are related renewable energy sectors that are well established, comprising 5.5% of national energy consumption and 50% of all renewable energy nationally in 2012. While solar and wind energy are primarily sold into the electric grid for residential and commercial users, biofuels and biomass are mostly used in the transportation and industrial sectors. The U.S. transportation sector alone accounted for 26% of renewable energy consumption in 2012, most of which was biofuels.

The biomass industry generates energy largely by burning organic materials, such as wood chips, as a substitute for fossil fuels. Landfills, wastewater treatment plants, and dairy farms are other common sources of biomass material. As the nation’s No. 3 crop & livestock producing state and home to a large forestry industry, Texas is rich in potential biomass resources. The U.S. DOE ranks Texas among the top 10 states for biomass potential, including crop and forest residues, methane emissions, and crops.

Texas Biofuel and Biomass Resources



Biodiesel

Biodiesel is a biofuel typically made from soybean oil, canola oil, animal fat, or waste vegetable oil, and is usually blended with traditional diesel before use. Soybean oil is the most common feedstock for U.S.-produced biodiesel with 67% of the market. Other vegetable oils (23.7%) and animal fats (9.2%) make up the remainder. In 2012, 991 million gallons of biodiesel were produced in the U.S., accounting for approximately 1.8% of national diesel consumption. Biodiesel is less common than ethanol primarily because ethanol benefits from a more favorable set of federal mandates. As of November 2013, Texas was the largest biodiesel producing state, with 428 million gallons of production capacity from thirteen refineries.

Ethanol

Ethanol can be produced from corn and other crops or non-crop plant material rich in sugar or starch, and is usually blended with gasoline. While the Midwestern

corn belt accounts for most of the nation's ethanol production, Texas currently ranks No. 11 nationally for ethanol production capacity. Four ethanol plants with a total of 365 million gallons per year capacity have been built in the Texas Panhandle since 2008.

Biomass

Biomass generation plants use wood products, landfill waste, agricultural byproducts, and livestock waste to generate electricity. Although ethanol and biodiesel have higher profiles, more biomass-derived energy is produced and consumed nationwide, especially in the industrial and commercial energy sectors.

Cellulosic Ethanol

Cellulosic ethanol is produced using a method similar to the corn-based ethanol process, with an additional step added to convert cellulose-rich plant material into starches and sugars. The feedstock for cellulosic ethanol can be almost any plant material, which allows the industry to focus on non-food feedstock. Agricultural and forestry waste are prime candidates, such as corn stalks and cobs, cotton gin trash, and lumber residue.

Algae

Algae biofuels utilize algae as a feedstock. Algae cells are oil-rich and can rapidly grow in either closed tanks or open ponds. The fast-growing characteristics of microalgae make this evolving technology very promising in terms of land use. Algae-derived biofuels are also attractive because microalgae are capable of thriving with brackish water and marginal land, inexpensive resources which don't compete with food crops.

Texas concentrates on creating biofuels using non-food crops and agricultural byproducts, instead of using edible crops. Building on the state's strong agricultural and forestry production base, Texas researchers and businesses are investing in new renewable biofuels and biomass technologies to maintain the state's position as the nation's energy capital.

Texas On-Farm Renewable Energy Headlines

- Texas ranks #1 in the nation for wind energy capacity & biodiesel production

- Southern Power Company's Nacogdoches generating facility in Sacul, TX, is the largest biomass power plant in the nation
- The largest biodiesel plant in the U.S. is the Renewable Biofuels, Inc. production facility located in Port Naches