# OKLAHOMA AGRICULTURE #AgDoesntStop

AGRICULTURE EMPLOYS 321,454 PEOPLE IN OUR STATE

**445 ACRES** AVERAGE FARM SIZE

> **35** Million Acres of Farmland







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# **WHAT IS AGRICULTURE?**



**Agriculture:** the science, art, or practice of cultivating the soil, producing crops, and raising livestock; and in varying degrees, the preparation and marketing of the resulting products. Agriculture is an integral part of fulfilling our basic needs as a human: food, clothing, and shelter.

**Farming:** the production of food and fiber derived from plants and animals. In order for farmers to get their crops and animals to market, they must understand science, mathematics, economics, and business.

**Food:** any nutritious substance people or animals eat or drink; made from the raw products taken from the farm. Some foods can be eaten in their raw form (example: corn), but also can be processed to make many different types of products (chips, tortillas). Some food products can also be processed to make medicines, household products, and even fuel.

**Fabric:** natural fibers are produced on a farm. Wool and cotton are the two most important. These are used to make gloves, socks, suits, coats, and other products including carpet, blankets, and curtains. The fibers are made into thread or yarn and then knitted or woven into fabric or cloth.

Landscaping Materials: includes flowers, ornamental plants, and grass for recreation and beauty.

Forestry: many forests are cultivated and grown to provide paper and other wood products.

**Science:** systematic knowledge of the physical or material world gained through observation and experimentation. The science involved in agriculture includes the knowledge of animal and plant biology, ecosystems, soil, water, weather, and chemistry.

IN 2019, OKLAHOMA HARVESTED OVER 70 MILLION BUSHELS OF WINTER WHEAT; 5.1 MILLION TONS OF HAY; AND 18 MILLION POUNDS OF PECANS.



# AGRICULTURE IN THE SOONER STATE Top 10 Agricultural Products Based on Cash Receipts in 2019





Cattle & Calves

**\$729 MILLION Broilers** 



OKLAHOMA HAS 5.3 MILLION CATTLE; 4.4 MILLION CHICKENS; 2.1 MILLION HOGS; 84,000 MEAT GOATS; AND 50,000 SHEEP.







Dairy Products & Milk \$148 MILLION





Cash Receipts: total amount of crops or livestock sold in a calendar year

# **CATTLE AND CALVES**

Oklahoma has 5.2 million head of cattle and ranks 4th in the nation in the total number of cattle. Oklahoma actually has more cattle than humans! South Dakota, Nebraska, Montana, North Dakota, Wyoming, Kansas, Idaho, and Iowa also have more cattle than people.

Cattle are an important source of food and part of a healthy diet. Beef, dairy products, and milk all come from cattle. Beef cattle are used primarily for their beef – you may have heard the popular slogan 'Beef – It's What's For Dinner.' Beef contains 50 nutrients essential to good health. No other single food contains all these nutrients.



Beef, dairy products, and milk all come from cattle, but cattle are used for many other things as well. Did you

know cattle are also used to make sports equipment, vehicles, and medicine? One cowhide can produce enough leather to make 20 footballs, 18 soccer balls, 18 volleyballs, or 12 basketballs.

# It may not be a "cow"!

Heifer - young female that has not given birth
Cow - older female that has given birth
Bull - male with the ability to breed
Steer - castrated male
Calf - offspring

**Polled** - without horns

**Ruminant** - stomach with four compartments that allows the easy digestion of grass and hay

**Stocker calves** - calves who weigh 350-450 pounds who will be grazed on lush wheat pastures in Oklahoma until they reach weights of 600-700 pounds

**Feedlot** - a fenced-in area where cattle are fed for the last 300-400 pounds of their growth before slaughter

# Did you know?

Oklahoma has 5.2 million beef cattle and ranks 4th in the nation in cattle and calf production.





Angus



**Brahman** 



Charolais



Hereford



Limousin

# Common Beef Breeds

**Angus** – black breed; naturally polled; known for high quality meat

**Brahman** – breed characterized by a large hump over top of shoulder and neck; very light gray to red or even black with a lot of loose skin and short glossy hair; very hardy and adaptable to a wide range of climates

Charolais – large white breed with pink muzzle and pale hooves; heavy muscled

Hereford – dark red to red-yellow with white face, crest, underbelly, feet, and tail; known for being fast-growing and their longevity

**Limousin** – large golden-red or black breed; golden-red color has a lighter color on stomach, muzzle, and around eyes

Maine Anjou – traditionally red with white markings, but more commonly found today in solid black or red color; black with white markings are also common; known for feed efficiency and calm disposition

**Red Angus** – red breed; naturally polled; excellent mothers with high quality beef

Simmental – gold, red, or black in color with white accents; great mothering ability and beef yields

**Texas Longhorn** – all different colors; no two are alike in color pattern, size, or horn length; breed known for being the "living symbol of the old west" and their lean meat



Maine Anjou



**Red Angus** 



Simmental



**Texas Longhorn** 



# **Influential People**

Temple Grandin was diagnosed with autism as a young girl in the 1950s. As a young girl, she spent the summer at her aunt's ranch in Arizona and became very interested in cattle. She realized they were visual thinkers and, like her, cattle "think in pictures." Temple Grandin earned her master's and doctoral degrees in Animal Science and invented the curved chute system for moving cattle. This system allows cattle to be moved calmly without causing pain, stress, and fear. Today, half of the cattle in the United States and Canada meat processing plants are handled with equipment she designed. In 2010, Dr. Grandin was inducted into the National Cowgirl Hall of Fame and was also named one of Time magazine's 100 most influential people.

# **SWINE**



**Berkshire** 



Chester



Cross



Duroc

Today, Oklahoma has over two million head of hogs and ranks 8th in United States pork production. Hogs are the 2nd largest agricultural enterprise in Oklahoma and provide over 12,000 Oklahomans with jobs. Pork is the most widely consumed meat in the world. There are just under 2,000 Oklahoma farms that raise swine.

Hogs were one of the first animals to be domesticated - around 6,000 years ago in China. The Spanish explorer, Hernando DeSoto, brought the first swine to the new world in 1539. You may hear hogs referred to as swine or pigs also they all refer to the same animal!

Hogs are actually very smart animals! In fact, they are known to be in the top 10 of the smartest animals in the world. They learn to push a lever in the barnyard to get a drink of water or some food. They have also been taught to tumble, race, pull carts, dance and hunt. There have even been soldier pigs who have been used to sniff out mines in battlefields.

Hogs are unable to sweat, so they roll around in the mud to keep cool. Not only do hogs provide us meat, but they are also commonly used in the medical field. Pig heart valves can be used to replace damaged human heart valves, and hogs are a source of nearly 40 drugs and pharmaceuticals on the market, including insulin.

Prior to 1991, swine production had been a small but important agricultural industry in Oklahoma. Although Oklahoma is not in the corn belt, where most swine is produced, several factors have helped to power Oklahoma's growth as a major pork-producing state. Oklahoma's favorable climate relative to the Midwest was a major factor. Lower costs for land and labor also played an important role.

### IF A PIG'S BREED NAME ENDS IN SHIRE, IT TELLS YOU THAT THE PIG'S EARS WILL BE ERECT (STAND UP) AND NOT DROOPY.

# TYPICAL U.S. MARKET HOG LIFEYCLE FAROWING GROWING FINISHING Gestation: 114 days Diet: corn/soybean meal Diet: corn/soybean meal 2-3 lbs. at birth Diet: corn/soybean meal Diet: corn/soybean meal 13-15 lbs. at weaning Total Gain: 50-60 lbs Diet: corn/soybean meal



8

# **PIG MATH**

Methods of livestock identification are commonly used with producers to identify the animal and their pedigree. In many animals you will find ear tags, similar to ear rings in humans, but ear-notching is used in pigs. Pigs are very inquisitive and playful animals, so it makes ear tags dangerous as they get pulled out and can permanently damage the ear. Using an ear-notcher when the pigs are babies, producers are able to make small notches to represent a universal code to identify the pigs. It is permanent, cannot get lost, and is easily visible - you will just have to learn some simple math!

The pig's RIGHT ear represents the LITTER number on the FARM. Think of it as the pig's last name. The LEFT ear represents the INDIVIDUAL number, or its # in that LITTER, like the pig's name.

All pigs from the same litter must have the same ear notches in the right ear. The left ear will have different notches to show the individual pig's number in the litter, so each pig will have a different combination of notches in the left ear.

The pig's RIGHT ear is the litter # on the FARM.



The pig's LEFT ear is the individual # in the LITTER.

Know what the quadrants are worth. Starting at the bottom quadrant nearest the pig's head, multiply each quadrant by three as you work your way around to the top. The first quadrant is worth 1, second quadrant is worth 3, third quadrant is worth 9, and the last quadrant at the top of the ear is worth 27. But remember if the tip of the ear is notched, it is worth 81.

Add the notches together. Once you know what each notch is worth, add them together. There will never be more than 2 notches in any one quadrant, as 3 notches in the 1 quadrant would be equal to 1 notch in the 2nd quadrant.



Now that you know the value of the notches you

have, you can read them! Looking at the pig from the front, you can read from your left to your right, and it will be the pig's litter # on the farm (Your Left = Pig's Right Ear), followed by their Individual # in their litter (Your Right = Pig's Left Ear). State the litter number followed by a dash and then the individual number. For example, this pig would be identified as 24-4.





Hampshire



**Poland China** 



Spot



Yorkshire Photos courtesy of Legacy Livestock Imaging

# **BROILERS**

Oklahoma raises 197 million broiler chickens that produce 1.5 billion pounds of product each year. Oklahoma ranks 13th in the nation for broiler production, and employs over 27,000 people in the industry.

A broiler is a chicken that is bred and raised specifically for meat production. These chickens are typically white. Their breeding is important for the optimal health and size to provide the best quality product for the consumer.

Broiler chickens are raised in large, open structures called houses. The houses' climates are regulated, and they are well ventilated. The chickens are able to roam, explore, eat, and be with other chickens. Some chickens, such as free-range chickens, would have varying access to the outdoors. The farms will receive the chicks when they are less than 24 hours old.

It will take a broiler chicken about seven weeks to reach market weight, which is four to seven pounds. Chickens are then taken to a processing plant, where they are humanely processed, and will start the journey to the grocery store or market.

Five of the major integrators of broilers and turkeys have multiple plant locations across the state of Oklahoma.



Both male and female chickens are raised in broiler production.



Poultry production in Oklahoma is located primarily in the eastern 1/3 of the state.





# WHEAT

Oklahoma ranks 5th in the nation in the production of winter wheat and produced more than 110 million bushels in 2019.

# **KERNEL OF WHEAT**

The kernel is the seed from which the wheat plant grows. There are about 50 kernels in a head of wheat and 15,000 kernels in a pound!





The modern combine harvester, or simply combine, is a versatile machine designed to efficiently harvest a variety of grain crops. The name derives from its combining three separate harvesting operations— reaping, threshing, and winnowing —into a single process.

Most of the wheat grown in Oklahoma is hard red winter wheat. Unlike other crops, it is planted in the fall and harvested in late spring or early summer. The wheat plant then grows about six inches before the first frost. When the weather gets cold, the tillers (new wheat stalks) stop growing. During this dormant period, cattle may graze the young plants. In the spring, cattle are moved, and the wheat begins to grow again. In late spring or early summer, the plants fade from dark green to tan and then to golden brown. Then, the wheat is ready for harvest.

Farmers use huge combines to harvest their wheat. A combine removes the wheat head from the stalk and the kernels from the wheat head. Kernels travel from the field by truck to storage bins. Kernels may be dried and stored on the farm or may go to the nearby grain elevators. Wheat must be dried to prevent mold and spoilage.

Harvested wheat may be either sold for food or cleaned and saved to be planted next year. Wheat for food is taken to a mill to be made into flour.

Wheat is the major ingredient in most breads, rolls, crackers, cookies, cakes, spaghetti...and the list goes on! It is a high carbohydrate food that contains valuable protein, minerals, and vitamins.



# COTTON

# FROM BLOOM TO HARVEST



About two months after planting, flower buds, called squares, appear on the plant.



Three weeks later the blossoms open. The petals change colors as they mature. First, they are creamy white.



The pollinated bloom will become pink on the second day.



After three days, the flowers wither and fall, leaving the developing boll. As the boll ripens, it turns brown.



The fibers continue to expand in the warm sun. Finally, they split the boll apart, and the fluffy cotton bursts out.

Oklahoma farmers harvested 460,000 acres of cotton in 2019, which is equal to 659,000 bales. Each cotton bale weighs about 480 pounds. Most Oklahoma cotton is grown in the southwestern part of the state.

Cotton farmers plant cotton late in the spring. They use mechanical planters that can plant seeds in as many as eight rows at a time. Cotton is harvested in the fall. Most of the cotton is harvested by machine. After the cotton is harvested, it is stored in the field as large modules. Then, it is loaded onto trailers or trucks and taken to the cotton gin.

# ONE BALE OF Cotton Makes:

- 215 pairs of jeans
- 690 terry bath towels
- 1,217 men's T-shirts
- 1,256 pillow cases
- 313,600 \$100 dollar bills

# **ELI WHITNEY: INVENTION OF THE COTTON GIN**

Eli Whitney was born in 1765. In 1792, after graduating from Yale College, Eli Whitney headed south to live on a plantation near Savannah, Georgia. There, Whitney learned about cotton production and how difficult the entire process was. Cotton plants contain seeds that are difficult to separate from the soft fibers. The plants grown in the south had to be cleaned by hand, which took the average worker one day to clean one pound of cotton. Whitney's invention, the cotton gin, was



patented in 1794. The gin worked like a strainer. Cotton was run through a wooden drum embedded with a series of hooks that caught the fibers and drug them through the nest. The mesh was too fine to let the seeds through, but the hooks were able to easily pull



the cotton fibers through. The first hand-cranked machine could clean 50 pounds of cotton per day, but later versions could be powered by a horse or even a steam engine and clean more. Eli Whitney's invention was very impactful for agriculture and cotton.

# U.S. CURRENCY IS MADE OF 75% COTTON



# **SOYBEANS**

Animal agriculture is the #1 user of soybeans. Poultry and livestock rely on nutrient-dense soybean meal. Poultry consume 67% of soybeans produced, pigs consume nearly 21%, and dairy cattle consume just over 10%.

In 1804, a Yankee clipper ship brought soybeans to the United States. When leaving China, sailors loaded the ship with soybeans as inexpensive ballast. When they arrived in the US, they dumped the soybeans to make room for cargo.

In 1829, US farmers first grew soybeans. They raised a variety for soy sauce. During the Civil War, soldiers used soybeans as coffee berries to brew coffee when real coffee was scarce. In the late 1800s, farmers began to grow soybeans as forage for cattle.

In 1904, George Washington Carver began studying the soybean. His discoveries changed the way people thought about the soybean: no longer was it just a forage crop, it became a valuable source of protein and oil.



Today, more soybeans are grown in the US than anywhere else in the world. Farmers in more than 30 states grow soybeans. Some of the better known soybean products include soy meal, soy flour, soy milk, tofu, meat substitutes, tempeh, soy sauce, infant formula, biodiesel fuel, and animal feed. Soybeans also find their way into candles, cleaning products and haircare products.

In 2019, Oklahoma farmers harvested 440,000 acres of soybeans and produced 12.7 million bushels.

The bushy, green soybean plant is a legume, which means it naturally increases soil health by adding nitrogen to the soil.

In Oklahoma, soybeans are planted in the spring and harvested in the fall. Plants can produce up to 80 pods per plant with each pod containing two to four pea-sized beans.

#### One acre of soybeans can produce 82,368 crayons.

### MAKING SOYBEANS Into Money

Paul is an Oklahoma soybean farmer. He farms his soybeans and sells them to the grain elevator after harvest. Paul needs to know the weight of his crop in order to determine how much he will be paid. Soybeans are weighed by the bushel. On average, Paul can plan on getting 49 bushels per acre from his fields. One bushel of soybeans weighs 60 pounds.

If Paul harvested 50 acres of soybeans, how many bushels will he have?

Based on the answer above, how many pounds of soybeans will he have?

The grain elevator agreed to pay Paul \$7.50 per bushel for his crop of soybeans. How much money will he get paid?



# DAIRY

### 12 It takes 12 pounds of Milk to make one gallon of ice cream.

# 13

ONE SERVING OF MILK PROVIDES 13 ESSENTIAL NUTRIENTS YOUR BODY NEEDS, INCLUDING: CALCIUM, PROTEIN, VITAMIN D, PHOSPHORUS, VITAMIN A, RIBOFLAVIN, VITAMIN B12, PANTOTHENIC ACID, NIACIN, ZINC, SELENIUM, IODINE, AND POTASSIUM.

> **23** It takes 23 pounds of milk to make one pound of butter.

# 300

THE AVERAGE DAIRY COW Consumes 300 Pounds of Water Per Day.

2002

MILK WAS NAMED OKLAHOMA'S Official state beverage on November 2, 2002. Oklahoma has about 150 licensed dairy herds. The average Oklahoma dairy cow produces about 5.9 gallons of milk per day, which equals over 2,146 gallons of milk per year.

Milk comes from dairy cows. Cows spend about 6.5 hours eating every day and eat about 90 pounds of food in that time. A cow's body uses part of the food she eats to grow and stay healthy. Her body uses another part of the food to make milk in the udder.

The cows go to the milking parlor where the dairy farmer washes their teats. A milking machine with four teat cups is attached to the cow. The milk is cooled to 38°F and stored in refrigerated storage tanks.

A milk truck comes to pick up the milk daily and take it to the processing plant. The truck driver tests a sample of the milk before pumping it into the truck to make sure it's safe to drink.

Milk trucks have very large metal tanks to carry the milk. Each truck has a special feature to keep it cool; it's like a thermos on wheels... it's insulated.

At the processing plant, raw milk is sampled and checked again and then, pumped from the milk truck into a storage tank. Next, the milk is sent to be homogenized and pasteurized.

Homogenized means it is the same all the way through. In this step, the butter fat is broken up and mixed into the rest of the milk. Pasteurization

is quickly heating the milk to 160°F, which kills any bacteria in the milk.

Milk is then poured into containers, or made into a variety of dairy products. It takes about two days from the time milk leaves the cow until the time it reaches the grocery store. At the grocery store, milk is kept refrigerated at 40°F or lower.







# **DAIRY BREEDS** The seven major dairy breeds in the US



Holstein



Jersey





Guernsey





**Brown Swiss** 



# **Milking Shorthorn**



# **Technology Advancement**

The Ferguson Family Dairy Center at Oklahoma State University has been able to advance in technology with the use of their new Delaval robotic milking system. The robotic milker is a Delaval VMS V300 equipped with a camera that allows the robot to do everything from cleaning the teats, to milking the cows, and even post sanitation of the cows.

Robotic milking is cutting edge technology allowing cows to visit the robot to be milked as often they would like. The cow enters the holding pen where she can walk into the robot once the cow before her is finished. The robot reads her RFID (radio-frequency identification) tag as she walks in. Once in the robotic milker, the cow is fed a pelleted treat for coming in on her own. The robot sanitizes and cleans the teats prior to milking and post sanitizes the teats afterwards. Once she is milked, she is let out and can return to her pen without the need of human interaction for any of the milking process. While she is on her way out, the robot cleans itself while the next cow is on her way in.



The robot also allows the dairy to monitor production from each teat of the cow. In the DelPro database you can see the number of times she has visited the robot, how much she eats, if she has any incomplete milkings, and more.

The robot allows students at the dairy center to have a hands-on experience with technology that is moving the dairy industry forward. The main goal of a robot is to lessen the labor force needed on a dairy farm. Not only does the robot free up labor needs but provides advantages in udder health, milk quality, and a low-stress environment for the cows.

Photos and information provided by Leeanne Van der Laan, Sr. Herd Manager at Ferguson Family Dairy Center

# HAY



In 2019, Oklahoma farmers produced more than 5.9 million tons of hay from more than 3 million harvested acres. Oklahoma has excellent conditions for growing hay, which requires plenty of rain and then hot dry weather for harvest. In 2019, hay ranked number four of all the state's agricultural commodities.

Haymaking involves cutting, gathering, drying, and storing grasses or legumes, like alfalfa or clover. Hay is best made during late June, July, and August.

Common plants used for making hay in Oklahoma are alfalfa, wild and prairie grasses, sorghum/sudan crosses, sudan, bermuda, lespedeza, soybean, peanut, and small grains like wheat, rye, and oats. Most hay is now baled in huge round bales, although they can also be produced in small or large square bales.

# FARMERS HELPING FARMERS

Most round balers produce bales weighing 600-2,000 pounds. The bales are either left in the field until they are used or moved to storage.

Hay is most commonly fed to livestock, such as cattle, horses, sheep, or goats during colder months of the year when grass may not be available. Different types of hay are better for different species of livestock, and some species are picky about the type and quality of hay they eat. Premium alfalfa hay goes to feed the state's large equine (horse) population.

Before machinery, most haymaking was done by family members, male and female, working with neighbors and casual help. Hired men usually got the heavy work, such as pitching hay or building stacks. Women and older children often did the raking and drove the teams of horses. Smaller children brought lunches and cold drinks to the hayfield. Today, machinery does much of the work.

A swather, or windrower, is a farm implement that cuts hay or small grain crops and forms them into a windrow. They aid harvesting by speeding up the process of drying the crop down to a moisture content suitable for harvesting and storage.

Once the hay has been swathed and is nearly dry, it's ready to rake. A hay rake turns the hay one more time to dry the bottom and forms it into a windrow ready to be baled.

A baler, most often called a hay baler, is used to compress the hay into compact bales that are easy to handle, transport, and store.

### **HAY DIRECTORY**

The Oklahoma Department of Agriculture, Food, and Forestry provides producers an in-state and out-of-state hay directory. Hay producers and brokers can list their hay types, location, and contact information. Buyers can search the in-state directory by county, and then contact the seller to discuss pricing information. Oklahoma also publishes a weekly hay report that recaps trades for alfalfa, wheat, and grass hay. You can view the hay report at https:// ag.ok.gov/divisions/marketdevelopment/ under Market Reports or find the hay directory at https://ag.ok.gov/hay/

Oklahoma is well accustomed to natural disasters - severe weather, wildfires, and flooding. Farmers are also ready to help each other whenever needed in Oklahoma and throughout the United States. During a national disaster, farmers have to continue to feed their livestock, even if food may not be available. In March of 2017, over 1,000 square miles at the Oklahoma-Kansas border were burned with 16,000 miles of fencing destroyed. States as far away as South Dakota donated hay and resources to farmers in the area. Oklahoma and Kansas farmers then paid it forward by donating 200 bales of hay when eastern Oklahoma and other states experienced severe flooding.







Oklahoma farmers harvested 330,000 acres of corn for grain in 2019. This is equal to more than 45.2 million bushels and 20,000 acres of corn for silage. In Oklahoma, corn is harvested for either grain or silage, with most of the grain going to dairies, feedlots, and poultry operations. Corn is produced across much of our state, although mostly in the eastern part of the state and in the Panhandle, where the crop is irrigated.

About 60 percent of the corn harvested in the US is fed to livestock, and 25 percent is exported. The rest is used to make a variety of products. Corn is measured in bushels, and a bushel is equal to about 72,800 kernels of corn. It takes about 25 gallons of water to grow one ear of corn.

# CORN



# VOCABULARY

**Maize:** another name for corn. In several other countries, maize is the preferred term.

**Husk:** the leaves that grow around and protect the ear. Fresh corn husks are green and pliable. Field corn husks are brown, dry, and brittle.

**Field corn:** type of corn used to make feed for livestock. It is taller than sweet corn and has thicker leaves. It is also left in the field until the kernels are dry.

**Stalk:** the main stem of the plant. Some corn plants will grow up to eight feet tall, and most of the height is from the stalk.

**Tassel:** the male flower portion of the corn plant. The corn plant has both male and female flower parts, but they are not part of the same flower. The tassel grows out of the top of the plant, and the female part (the ear) grows between the leaves and stalk.

**Silage:** the entire corn plant that is harvested while green in the summer. The whole plant is chopped up and held in an air-tight container to ferment. It is stored and used as cattle feed throughout the year.



THE AVERAGE EAR OF Corn has 800 kernels In 16 rows.





# EGGS

In 2019, 705.5 million eggs were produced on Oklahoma layer farms. The US produces about 75 billion eggs per year, which is about 10% of the world's supply. With 25 billion chickens in the world, there are more of them than any other bird species. Farmers raise poultry for eggs and for their meat.

Hens start laying at 22 weeks of age. Laying hens produce about 240 eggs each year, but this number can increase or decrease depending on several circumstances. During the hen's most productive period, she may lay an egg about six out of every seven days. Eggs hatch in 21 days. The hen requires at least 25 hours to produce an egg. Thirty minutes later, she starts all over again. A good layer will lay 206-280 eggs a year during her most productive period. Chickens do not lay eggs until they receive a light cue, either from natural sunlight or artificial light. The light stimulates a gland near the chicken's eye, which triggers the release of an egg cell from the chicken's ovary. A chicken will lay bigger and stronger eggs if the lighting is changed to make her think a day is 28 hours long. Chicken producers place nests in their hen houses so the hens will lay their eggs in places that are safe and protected.

The eggshell is a hard, three-layered container composed of calcium carbonate. Its purpose is to protect the enclosed embryo from the weight of the parent's body while the bird develops inside, although most eggs sold commercially in the grocery store have not been fertilized. Hens will lay eggs with or without having been in the presence of a rooster. For an egg to become fertilized and produce a baby chick, a hen and rooster must mate prior to the formation and laying of the egg. Each



egg shell has a coating or covering, called a bloom, that seals its pores, prevents bacteria from getting inside, and reduces moisture loss. Eggs are washed before they are sent to the market. This is necessary for cleanliness but removes the bloom. To restore this protection, packers give the eggs a light coating of edible mineral oil. Properly handled and stored, eggs rarely spoil but will simply dry up if kept long enough.

Although the exact shape of an egg is as individual as the hen herself, most eggs are roughly eggshaped. Some abnormalities that can be found in the shells of fresh eggs are ridges, bulges, and rough texture. Eggs having any of these abnormalities would get poor eggshell ratings from the US Department of Agriculture (USDA). Some extreme oddities in eggshell shapes include shells that are long, appear bent, or look as though they have been mashed in on one side. It would be very rare to find any of these shapes on grocery store shelves. The size of an egg is an inherited characteristic, and poultry breeders spend large amounts of time and effort to select strains for egg size. When a pullet (a young hen less than a year old) first begins laying eggs, her eggs are small. After 15 to 20 days of laying, the size of her eggs will reach the size of a standard grocery store egg. Egg size varies greatly from one kind of bird to another. Eggs can also come in a variety of colors, depending on the breed of the chicken. They can be white to cream, green, pink, blue, and even chocolate brown.

#### USDA gives eggs different grades based on their quality. This affects where eggs are sold and how they are used.



USDA GRADE AA is the freshest egg found in retail

markets. When broken, the yolk and white stay compact, covering a small area. The white is firm and thick; the yolk is round and stands up.



USDA GRADE A eggs are also marketed to retail consumers.

When broken, the yolk and white spread out a little. The whites are thinner but still firm; the yolk is round and stands up a little less than a Grade AA eggs.



**USDA GRADE B** eggs are sold to institutions and bakeries, and are not typically sold to retail consumers as table eggs. These eggs are great for hard cooking.

### LOOK FOR THE SHIELD

Many states require egg cartons to show a grade, but only eggs examined by a USDA grader bear the USDA grade shield.

# GOATS

Oklahoma ranks 5th nationally in meat goat production. Oklahoma meat goat producers had 84,000 goats and kids in 2020. Milk goats totaled 7,000 head. The Boer goat is the most popular breed of goat in Oklahoma. They are raised for their meat.

Although Boer is the most common in Oklahoma, there are over 210 breeds of meat and dairy goats. Of the 450 million goats in the world, only 6-8 percent of them are in North America. The main products associated with goats are meat, milk, cheese, mohair, and cashmere. Worldwide, more people eat the meat and drink the milk of goats than any other single animal. Goats are inexpensive to maintain, therefore making an important protein source for many people around the world. Goat milk can successfully replace cow's milk for people who are lactoseintolerant. Goat's milk does not contain lactose.

Goats are ruminant animals. The gestation period for goats is five months. Twins are common, but single or triplet births are not rare.





donkeys or guardian dogs, are kept in pastures with sheep to scare off possible predators.

Lambs are ready for market when they weigh between 125-145 pounds. Lamb meat is an outstanding source of vitamins and minerals. The meat from grown sheep is called mutton, and the meat from young sheep is called lamb. One sheep produces eight to ten pounds of wool per year. Sheep are the only source of lanolin - grease that comes from wool before it has been washed. Lanolin is used in lotions and cosmetics.

The most common breeds used as show animals throughout Oklahoma are Dorper, Dorset, Hampshire, Natural, Shropshire, Southdown, and Suffolks. Crosses of several breeds are commonly raised as well, including crosses with the Rambouillet breed. Breed selection for sheep producers will depend on what time of year they would like to lamb, wool quality, lambing percentage, growth rate, forage utilization, or mothering ability.

One pound of wool can make 10 miles of yarn. Sheep are ruminants.







# FORESTRY

Over 28 percent of Oklahoma is forested. Oklahoma has 12.5 million acres of forest and woodlands, and they are among the most diverse in the nation. They range from the dense pine and hardwood stands of eastern Oklahoma, through the unique Cross Timbers of the central counties, and the riparian forests of our western rivers. Oklahoma's forest industry directly contributes more than three billion dollars annually to our state's economy. In addition to having an economic impact, these trees and forests provide clean air and water, wildlife habitat, and incredible recreational opportunities.

Oklahoma Forestry Services is dedicated to the conservation, management, and protection of these valuable natural resources. Foresters provide technical assistance to individuals and communities throughout the state. They work together to conserve our present forests, increase their productivity, and ensure for their long term health so all Oklahomans continue to enjoy these benefits. Some of the management practices include Management Plans, Forest and Tree Health Advice, Timber Stand Improvement, Tree Seedlings, Prescribed Burning, Water Quality Assistance, windbreaks, and shelterbelts. OFS is also the primary agency responsible for the suppression of wildland fire in all 77 counties. Personnel provide initial attack on 6.4 million acres of timberland in the eastern counties and suppression assistance to fire departments across the remainder of the state in the form of wildland fire crews, aircraft, and tactical

support when needed for wildfires. Forestry ranks among the top 10 employers in 40 of the 50 states.

### DIFFERENT TYPES OF TREES/FORESTS IN OKLAHOMA:

#### **Oak-Hickory Forest**

The majority of Oklahoma forestland is oak-hickory. Oak-hickory forests provide food, cover, and nesting sites for numerous wildlife species.

#### **Oak-Southern Pine Forest**

Commercially, the most valuable wood is generated from southern oakpine forests, which are in the far southeastern corner of Oklahoma on more than five million acres extending into five counties.

#### **Pinon Pine-Juniper Forest**

Tucked away in the northwestern most corner of the Panhandle, Oklahoma has approximately 2,000 acres of piñon pine and juniper forestland. Used locally for firewood or fence posts, these trees have no other commercial value.

#### **Redcedar Forests**

Scattered across Oklahoma in a three to four million-acre range are redcedar forests, which have popped up in ever increasing numbers after wildfires were largely contained or eliminated. Many ranchers have had their rangelands overwhelmed by what many call an "invasion" of redcedar. Redcedar has many commercial uses. Seventeen sawmills have opened across the state to utilize the products these trees provide, which include: cedar oil, litter box chips, lumber for hope chests, and insect repellent.











# **PRECISION AGRICULTURE**

Precision agriculture makes the practice of farming more accurate and controlled when it comes to the growing of crops and raising livestock. It includes managing production inputs (seed, fertilizer, lime, pesticides, feed, etc.) on a site-specific basis to increase profits, reduce waste, and maintain environmental quality. Farmers are using this technology to use less to grow more. A key component of this farm management approach is the use of information technology and a wide array of items such as GPS guidance, control systems, sensors, robotics, drones, autonomous vehicles, variable rate technology, GPS-based soil sampling, automated hardware, telematics, and software.

Precision agriculture was born with the introduction of GPS guidance for tractors in the early 1990s, and the adoption of this technology is now so widespread globally that it's probably the most commonly-used example of precision ag today. John Deere was the first to introduce this technology using GPS location data from satellites. A GPS-connected controller in a farmer's tractor automatically steers the equipment based on the coordinates of a field. This reduces steering errors by drivers and therefore any overlap passes on the field. Computer applications can be used to create farm plans, field maps, crop scouting, and yield maps. Remote sensing technology has been used since the 1960s and is used to help monitor and manage land, water, and other resources. It helps determine why crops might be stressed at a certain point or if there is enough moisture in the soil. Remote sensing technology is most commonly found in satellites or drones. In turn, all the precision agricultural technology advancements result in less wasted seed, fertilizer, fuel, and time.

At its most basic level, precision agronomics takes the role of an agronomist and helps make the methods they use more accurate and scalable.

The primary aim of precision agriculture and precision agronomics is to ensure profitability, efficiency, and sustainability while protecting the environment. This is achieved by using the big data gathered by this technology to guide both immediate and future decisions on everything from where in the field to apply a particular rate to when it's best to apply chemical, fertilizer, or seed.

To learn more about Precision Agriculture visit this website: agfundernews.com/what-is-precision-agriculture.html



# **SPECIALTY CROPS**

### Berries (Strawberries, Blackberries, and Blueberries)

Strawberries are commonly grown in home gardens and on several youpick farms in Oklahoma. They are the only fruit with seeds on the outside rather than the inside, and they are the first fruit to ripen in the spring. The strawberry is Oklahoma's state fruit!

Blackberries grow wild all over Oklahoma, but they are also produced by home growers and commercial operations. Blackberries sold as fresh fruit are harvested by hand. Those sold for processing are harvested by machines that shake the fruit from the bush. More than 90 percent of the blackberries grown commercially in the US are sold for processing.

Blueberries are the most widely grown fruit crop in the US. Blueberries grow in clusters and range in size from a small pea to a marble. They are deep in color, ranging from blue to maroon to purple-black and feature a white-gray waxy "bloom" covering the surface serving as a protective coat.

# Watermelon

Watermelon is Oklahoma's state vegetable. Watermelons are considered both a fruit and a vegetable. Scientifically, watermelons are fruits. They are considered a vegetable because they are planted from seeds, harvested, and cleared from the field like other vegetables. They are also a part of the Cucurbit family, which includes squash and pumpkins. Watermelons are 92% water, so they help your body stay hydrated. Rush Springs, OK has a watermelon festival every year on the second Saturday in August.

# Grapes

Oklahoma's climate and soils are favorable to grow all kinds of grapes. Grapegrowing is the largest food industry in the world. There are more than 60 species and 8,000 varieties of grapes, and they can all be used to make juice and/or wine.

A steady increase in grape production has occurred since the mid-1990s and recently, a resurgence of the grape growing and wine making industries in Oklahoma has led to an increase of vineyards. Cabernet Sauvignon is the most widely planted grape cultivar in Oklahoma.

# Peaches

The first ripe peaches appear in June. Most of the peaches grown in Oklahoma are consumed within the state and are hand harvested. Peach production includes spraying regularly for pests, pruning either early in the spring or as soon as the leaves start dropping in the fall, grading, choosing and setting out new trees, fertilizing, and thinning the tiny green fruit so each peach has space to develop. Orchards in Stratford and Porter continue to be the areas where most of Oklahoma's peaches are produced. Peach festivals are held each July in Stratford and Porter.











# **Christmas Trees**

Scotch pine and Virginia pine are the two most common species grown for Christmas trees in Oklahoma. On a well-managed Christmas tree farm, 90 percent of the land is occupied by vigorously growing tree crops at all times. With an average tree production cycle of 10 years, counted from the time a seedling is planted, this ensures the farmer a regular annual crop ready for harvest. It takes an average of seven years to grow a Christmas tree to the standard retail sale height of six feet. There are close to 15,000 farms growing Christmas trees in the US, and over 100,000 people are employed full or part time in the industry.



# Pecans

Today, pecans are widely available throughout Oklahoma. There are over 1,000 varieties of pecans, many named for Native American Indian tribes. Pecan trees range in height from 70 to 100 feet but sometimes grow to 150 feet or more. Native pecan trees over 150 years old may have trunks well over 3 feet in diameter. Okmulgee holds the world record for largest pecan pie, pecan cookie, pecan brownie, and biggest ice cream and cookie party. Each June, Okmulgee rolls out the welcome mat to thousands of its closest friends as the annual Pecan Festival comes to town.



# Honey

Bees make honey from nectar. Nectar is a sweet liquid found inside flower blossoms. Bees pollinate flowers as they fly from one to another, gathering nectar. Pollen is sticky and clings to the honeybee's body. When the bee flies to the next flower, the pollen will rub or fall off. One worker bee actually makes only 1/12 of a teaspoon of honey in her lifetime. But working together, a colony of bees may bring in as much as 50 pounds of nectar in a day and make 200 or 300 pounds of honey in a year. Honeybees are the only insects that produce food eaten by humans. In 2018, Oklahoma had about 2,000 beekeepers, which is a person who raises honeybees.



# **Mushrooms**

A mushroom is not a true vegetable, since it has no leaves, roots, or seeds and does not need light to grow. However, the National Agricultural Statistics Service includes mushrooms in the vegetable category for statistics purposes. Mushrooms are canned, pickled, and frozen, but drying mushrooms is the oldest and most commonly used way to preserve them.

J-M Farms is located in Miami, OK and has been in business for over 40 years. They grow button, crimini, shiitake, and portabella.

The US is the 2nd largest producer of mushrooms, following China.

# **GET GROWING!**

Vegetables, fruits, herbs, or flowers can be grown in a garden. Gardens can be grown in urban or rural areas, but they may look different depending on the space available. Container gardening might be the best option for apartment residents. Gardeners who have plenty of space and light available might choose to plant their garden in the ground. Many schools also have gardens providing opportunities for their students to learn and grow their own food. Farmers markets are also available for consumers to buy fresh fruits and vegetables directly from a farmer or gardener. Oklahoma's climate and growing season will affect which Oklahoma-grown fresh fruits and vegetables can be found at farmer's markets. Use the chart to find out what will be in season!



If you want to grow your own garden, scan this to find out when to plant those fruits and vegetables!



Scan this to find the farmer's market near you to stock up on your favorite locally grown produce, meat, eggs, dairy, honey, and cut flowers!

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Apple												
Asparagus												
Beets												
Blackberries												
Blackeye Peas												
Blueberries												
Broccoli												
Cabbage												
Cantaloupe												
Carrots												
Cauliflower												
Cucumbers												
Cut Flowers												
Eggplant												
Eggs												
Garlic												
Green Beans												
Greens												
Herbs												
Honey												
Lettuce												
Okra												
Onions												
Peaches												
Pears												
Peas: English, Snap & Snow												
Peppers												
Plants: Bedding & Potted												
Potatoes												
Pumpkins												
Radishes												
Raspberries												
Rhubarb												
Spinach												
Squash: Summer & Winter												
Strawberries												
Sweet Corn												
Sweet Potatoes												
Tomatoes: Green & Red												
Tomatillo												
Turnips												
Watermelon												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

# Farm to School

Farm to School allows schools to feature and expose students to a variety of locally produced foods in the school nutrition program. The program looks slightly different in every school site. The program can include procurement, or purchasing, of local foods that are served in the school meal or in the classroom, educational activities related to agriculture or food, or school gardens, which provide students with hands-on learning experiences.

Farm to School programs connect schools and local farmers. These schools procure from local farmers and include farm fresh foods in meals and snacks. The most effective farm to school programs incorporate nutrition-based curriculum and provide students with learning opportunities such as cooking demonstrations, gardening, farm visits, and other lessons that incorporate agricultural themes. Research shows when children have increased access to high quality fresh fruits and vegetables, as in farm to school programs, they will eat more servings of these healthy foods, thereby improving both their eating habits and nutritional health.



# **VEGETABLE COMPANION PLANTS**

Companion planting in gardening and agriculture is the planting of different crops in proximity for any of a number of different reasons, including pest control, pollination, providing habitat for beneficial insects, maximizing use of space, and to otherwise increase crop productivity.

#### Tomato



Basil, an herb, helps tomatoes produce greater yields, and it repels both flies and mosquitoes. Marigolds are another good companion, repelling nematodes and other garden pests.



Basil



Basil is a good friend to peppers, helping repel aphids, spider mites, mosquitoes, and flies. It's also thought basil improves the pepper's flavor.



#### Lettuce



Mint helps keep away the slugs that feed on lettuce leaves. Chives and garlic help repel aphids.

Cucumbers help attract cucumber beetles away from radishes. Radishes also do well among carrots because they are harvested before the carrots and they loosen the soil as

the carrots start to take off.



Radishes

**Cucumbers and Carrots** 

#### Sweet Corn



Green beans fix nitrogen in the soil, which corn needs to grow.



# WHAT IS YOUR CAREER PATH?



# AGRICULTURAL CAREER PATHS

# Agribusiness Systems

Animal Systems

Biotechnology Systems

Environmental Service Systems

Food Products & Processing Systems

> National Resources Systems

**Plant Systems** 

Power, Structural & Technical Systems

> Agricultural Education

### **Start Career**

Are you ready to start your career? Many high school students receive training from a Career Tech center while still in high school! If you are

interested in going straight into the work force, there is a place for you in agriculture. You may bring a skill set and experience equally valuable to the role. You may have numerous experiences from ride-alongs, job shadows, part-time work, or helping on the family farm. Maybe you've participated in volunteer activities which strengthened your organizational or leadership skills. Build these experiences into your résumé, then share what you've learned in an interview. There are several agricultural careers that do not require a college degree.

### **Career and Technology Education**

Some students attend a local Career and Technology Center (CTE) while in high school, but there is opportunity to attend after high school! CTE encompasses a broad range of types of education, from classroom learning to certification programs to work-based learning opportunities outside the classroom. Their programs help youth and adults prepare for a wide range of careers that are in high-demand, and many are high-wage careers. Programs include agriculture, food and natural resources, STEM, welding, and many more. CTE centers also generally cost less than attending college.



### College

Many agricultural careers do require college degrees, so college may be a great path! Some careers only require an associate degree, which can be earned at a two year college. Universities offer bachelor's and advanced degrees. Many two and four year colleges and universities offer a wide variety of degrees in agricultural fields, including horticulture, agriculture education, veterinary medicine, and many more. Oklahoma State University is one of Oklahoma's Land Grant Universities. Many students choose to attend Oklahoma State University for a four year agricultural degree, but there are a variety of options throughout the state depending on career choice.



### Check out Career and Technology Centers in Oklahoma!

Which agricultural career might be best for you? Scan the QR code to take the career finder quiz to find out!



FFA partnered with Discovery Education and AgCareers.com to create Ag Explorer – a site filled with resources for students of all ages to explore agriculture careers.

### **KELLI PAYNE, PRESIDENT OF OKLAHOMA NATIONAL STOCKYARDS**

Kelli has been with the Oklahoma National Stockyards since 2018. She served as a liaison in 2018 and moved to General Manager in 2019.

Why did you become interested in your current career?
 A Growing up as a fifth generation cow/calf producer, I always saw myself involved with the cattle industry and agriculture in general. My father had a commission company at the Oklahoma National Stockyards, so I grew up working in the alleys with him. However, my current position was never on my radar.

# ${f Q}$ How did you get to where you are today in your career?

A I was very active in 4-H and FFA through school and decided at an early age I wanted to attend Oklahoma State University. I tried to take advantage of every opportunity I could, especially in college. I was actively involved in a number of agriculture student organizations and served on the Dairy Judging Team, as well. I served as an intern in two different states and had the opportunity to work for Congressman Wes Watkins for a number of years. He was an excellent teacher and mentor to me. My degree is Animal Science with a Livestock Merchandising emphasis, so I guess I had that part right.

# AGRICULTURAL CAREER Connections



### ${f Q}$ What do you love about your career?

A Everyday is different than the day before! Meeting new people and nurturing relationships with longtime friends in the industry is very dear to me. I think the trends with consumers versus what we face in the agricultural world is very interesting. I love to learn from others and enjoy open tours or forums at the Stockyards. Being able to share my passion for agriculture with the public on a very regular basis is truly rewarding. I also love helping youth explore the different aspects of the agricultural world.

### $\mathbf{Q}$ What does a normal day look like at your work?

A Just as we experience in our day to day farming and ranching lives, no two days are the same. You help out where you can: receiving cattle, loading cattle, adjusting float valves on water tanks, etc. My phone rings A LOT. I'm not a big fan of sitting in an office, but some days demand it. I do spend a bit of time each



morning checking on news and issues that affect the livestock industry and agriculture. Trade shows, tours, and speaking engagements fill in the gaps.

# **Q** What advice do you have for young people looking to go into this field?

A Nurture your contacts and relationships. There are terrific people all over the world willing to assist you! Lean on their knowledge and learn from their wisdom. Seek out leaders in the field of your choice and get to know them. Learn from everyone and every experience!



#### SAM HALVERSON, RANCH MANAGER AT HALVERSON RANCH

#### Sam has been the Ranch Manager at Halverson Ranch since 2014.

# **Q** Why did you become interested in your current career?

igta I was raised in this lifestyle. Ranching was something I always loved to do.



# Q How did you get to where you are today in your career?

While growing up, I showed cattle through 4-H and helped with my dad's commercial cattle operation. I played college baseball and knew that was never a lifelong career choice, but I always wanted to attend Texas Christian University Ranch Management program. In 2014, I attended TCU Ranch Management, which has set me up to succeed as I have come back home to take over my family's cattle operation. I have taken my family's operation from a 125 commercial cow herd to 350 cows, which are half recips and half registered cattle with emphasis on raising show heifers. I am very lucky to have two cattlemen that I look up to and have mentored me throughout the years. In junior high, I met John Griswold of Griswold Cattle Company in Stillwater, Oklahoma. He inspired me to take my commercial cows to a registered herd, and he gave me this advice - never be afraid to take a risk. The second man is my dad, Rusty Halverson. I have watched my whole life as he has put blood, sweat, and tears into our ranch. He has a work ethic like no other and can fix anything with his own two hands.

# Q What do you love about your career?

A It's something new every day. My favorite part of the year is calving season in the fall and spring and welcoming new genetics to the ranch.

# $\mathbf{Q}$ What does a normal day look like at your work?

A There is no such thing as a normal day. One day you might be calving, and the next day you might be fixing the roof on your barn.

 $\mathbf{Q}$  What advice do you have for young people looking to go into this field?  $\wedge$  Find mentors, and don't be afraid to ask questions!

### TRAVIS JONES, RESOURCE CONSERVATIONIST WITH THE USDA NRCS (NATURAL RESOURCE CONSERVATION SERVICE)

Travis has worked for NRCS since 2012. Previously, he worked for the DOI National Park Service as a Prescribed Fire Specialist (5 years), and he worked for the USDA United States Forest Service as a Wildland Firefighter (5.5 years).

# **Q** Why did you become interested in your current career?

A I have always enjoyed helping people. In the field of conservation, we work with agriculture producers to help them identify and address natural resource concerns on private agriculture lands. Conservation of our natural resources is often overlooked by many who are separated from the field of agriculture. It is important to know where your food and fiber comes from as well as who is producing and providing it.

### **Q** How did you get to where you are today in your career? A Land management, conservation, and rangeland sciences are all

pretty specific disciplines that require a good deal of education as well as experience. My experience with both the USFS and NPS allowed me time to build my prescribed fire knowledge

# AGRICULTURAL CAREER Connections



and experience. I have a B.S. degree from Oklahoma State University in Rangeland Ecology and Land Management. Plant Identification, general ecology, landscape ecology, etc., are all important classes I use on a daily basis.

# **Q** What do you love about your career?

A I get to work with some great farmers and ranchers who are doing everything they can to help the land and provide agricultural products for a global marketplace. I like being able to help them identify or fix a resource concern on their property knowing I have in some small sense, been a positive influence on the way their operation works.

# $\mathbf{Q}$ What does a normal day look like at your work?

A There is no normal day at my work. There is no predicting the weather, who will call, or what challenge may face me when I get to the office. One day we may be assisting our local Conservation District monitor watershed structures; the next day I may be helping an urban producer identify native forbs and grasses.



# **Q** What advice do you have for young people looking to go into this field?

A Conservation of our natural resources has been important and will always be important, not just for local producers, but for all of us on this earth. There is no more land being made, and the land we do have which can produce an agricultural product is shrinking by the day. This field will require the technological savvy of your generation to build efficiencies and develop new improved methods to conserve our resources for generations to come.

# **AGRICULTURAL CAREER**

onnections

### TOM FANNING, MANAGER, BUFFALO FEEDERS, LLI 32,000 Head Custom Cattle Feed Yard

Tom has been the manager of Buffalo Feeders since 1992.

### Why did you become interested in your current career?

A M undergraduate degree is from Oklahoma State University in Agricultural Economics, Farm & Ranch Management. My master's degree from Troy State University (Alabama) is in management. After my military service, I researched agricultural fields in the southern plains of the US and felt the cattle feeding industry was a combination of everything in agriculture. Animal welfare, livestock nutrition, marketing, risk management, grain procurement, feed mill production and maintenance, environmental sciences, leadership, accounting - it all comes together at the feedyard.

#### How did you get to where you are today in your career?

I enlisted in the US Army Reserves and was in ROTC (Reserve Officer Training Corps) while at OSU. After graduation, I entered Active Duty Military service as a second Lieutenant in the Infantry. I completed many training courses including Ranger Training. I served in Germany as a platoon leader, scout platoon leader, and executive officer for a rifle company that guarded the Pershing Mobile Nuclear missiles and the removal of chemical weapons from Germany during the buildup to the first Gulf War. I returned to Ft. Benning, Georgia, and completed my master's degree and left military service as an Infantry Captain. I went to work for Cargill in Texas as a management trainee in their cattle feeding division. I worked in jobs such as feed mill manager, animal health supervisor, feed delivery manager, operations manager, and in feeder cattle procurement. After nine years I had the opportunity to head a privately owned feedyard in Texas. Eventually, I had the opportunity to move to Oklahoma where my wife and I raised our family, and I manage Buffalo Feedyard.

#### What do you love about your career?

A I get the opportunity to meet people from all over the nation. I have customers from Florida, to New Jersey, to Illinois, and every state between. I am able to help customers improve their results by implementing unique management techniques that reduce feed expenses, improve health, limit market risk, and improve profits. There are never two days the same, and we love helping people achieve their goals and improving their cattle business.

#### What does a normal day look like at your work?

We start at 6:00 am, feeding 400 pens by 9:00 am. At the same time we are manufacturing feed, shipping market ready cattle, and looking through each pen to ensure they are healthy, have fresh feed, and clean water. Throughout the day I talk with customers, commodity brokers, packer buyers, and farmers to negotiate sales of cattle, manage risk, or purchase feed ingredients for the mill. We produce approximately 850,000 pounds of feed every day of the year.

#### What advice do you have for young people looking to go into this field?

Investigate all aspects of the cattle industry. There is a place for you that fits your skills and aptitude. Don't be afraid to start out at the bottom and learn from the ground up. Most skills needed here are learned on the job. We look for people that are honest, have a strong work ethic, and want to be part of a winning team. That makes for a successful day and a positive experience for everyone involved. Be humble; have discipline; and you will succeed.

# CAMI WALLIS, DVM, CVA, VETERINARIAN AND VETERINARY ACUPUNCTURIST

#### Cami has been a veterinarian since 2014.

# AGRICULTURAL CAREER Connections

#### Why did you become interested in your current career?

Growing up around agriculture played a huge role in my career choice. I fell in love with animals from the very beginning and was so grateful for an upbringing that allowed me to learn so much and have raw experiences. I was involved in farming grains, baling hay, and raising livestock on a cow calf ranch. I also was active in the local 4-H and FFA Chapters where my knowledge was expanded and new experiences were encouraged. My heart was set on becoming a veterinarian and solidified as I became involved in college classes and organizations at Oklahoma State University.

#### How did you get to where you are today in your career?

A I have been blessed with great mentors, but overall I do praise the sovereign hand of my Father, Lord, and Savior Jesus Christ. I had several excellent ag instructors and extension agents that developed my skills in high school as well as a huge supportive family who are all involved in agriculture and the family business. I went to OSU for my undergraduate degree where I received a B.S. in Animal Science with a biotechnology option. I entered into a family



of agriculturally-minded lifelong friends and was involved in many collegiate organizations including Ag Ambassadors and traveling with the Oklahoma Ag Leadership Encounter. I worked at a Texas feedlot and local veterinary clinics.

I started vet school at OSU where I was able to travel and gain further internship experiences including working at an equine facility in Texas, a theriogenology externship in Texas, a Pfizer bovine externship in North Dakota, and other veterinary clinics in Oklahoma. Upon finishing veterinary school, I started work at a mixed animal practice in Oswego, Kansas. I was thankful for the hard-working staff and the high volume case-load that allowed significant growth in a very short time. I worked there for three and a half years until I married and moved back to Oklahoma.

I have been doing relief veterinary work traveling to fill in at other veterinary clinics. It is my honor and privilege now to be able to offer an alternative option for my colleagues to keep their businesses open and to keep care available for their patients if they want to travel or take family time. In 2018, I also pursued schooling for veterinary acupuncture through the International Veterinary Acupuncture Society and now offer acupuncture to small and large animals for pain control, healing, and in some instances a drug-free approach.

#### What do you love about your career?

My favorite part about veterinary practice is working with animals. I also love the science of medicine; being able to treat and make our patients comfortable, see them improve with treatment, the challenge of diagnosing the underlying cause, and the vast options for treatments in today's advanced medical field. But, I have also grown to enjoy the people in my current job of relief veterinary work.

#### What does a normal day look like at your work?

A Right now every single day is different. The most consistent part of my day is morning coffee, a car drive less than one hour, and worship music. Most days consist of examining patients, running diagnostic tests, educating owners, and administering treatments. Even in normal general practice, every day is different and includes a wide range of needs including surgery, emergency, ophthalmology, theriogenology, internal medicine, dermatology, and more.

#### What advice do you have for young people looking to go into this field?

A Work hard but designate time for life as well. It takes a hard line of work-life balance in any field, but especially in the medical field. Carving out time to spend investing in others, investing in your spiritual growth, and time to enjoy the outdoors has been a very important lesson for me. I think it's also important to be prepared for the financial investment and the time it takes through extended schooling. It is definitely a rewarding career, but the days can be very busy and look much different than one might expect. I would encourage anyone to spend time volunteering in a vet clinic before making the decision to pursue it as a career.

# AGRICULTURAL CAREER Connections

#### MIKE CARROLL, GAME WARDEN SUPERVISOR

Mike has been a game warden since 2004. He has 29 years experience in law enforcement.

### **Q** Why did you become interested in your current career?

 $\triangle$  It is the best way to pair my love of the outdoors with my law enforcement career.

### Q How did you get to where you are today in that career?

A I started with the Stephens County Sheriff's Department as a deputy sheriff; then worked at the Alcoholic Beverage Laws Enforcement Commission; followed by the Inspector General's office; and I am currently at the Oklahoma Department of Wildlife Conservation. I have a Bachelor of Science in Agricultural Education and Animal Science.

### **Q** What do you love about your career?

As a game warden, I enjoy the freedom and flexibility. My truck is my office, and I patrol when and where I want depending on the hunting or fishing seasons. Most of my activities are dictated by phone calls received on complaints of illegal activity or areas of heavy usage.

### $\mathbf{Q}$ What does a normal day look like at your work?

A No two days are ever the same, and there is no set schedule. Some days I may work eight to five, and other days I might not go to work until dark and work all night. It really depends on the time of year and seasons that are open. As a game warden, you also work every weekend because that is when the majority of people are usually out enjoying the outdoors.

### $\mathbf{Q}$ What advice do you have for young people looking to go into this career field?

A Being a game warden is a great career. We meet a lot of good, interesting people out hunting, fishing, and enjoying the outdoors. Just remember, there is no set schedule and most of the time you are on patrol by yourself, so you have to be self-disciplined and motivated to get the job done.

### **RITA WIEDEMANN, GROWER/FARMER**

Rita was born and raised on a farm. She is a fifth generation farmer on her family's land. She has been selling seasonal produce to the public since 2013.

### $\mathbf{\mathcal{Q}}$ Why did you become interested in your current career?

A I have always had a garden in my adult life. I gradually started selling my produce at a roadside stand on another piece of the property and gradually grew more and more produce as well as adding high tunnels and U pick strawberries. I left my career as a nurse in 2016 to focus on building a business on our land.

#### How did you get to where you are today in your career?

A My main mentor was always Harry Duepree. I am privileged to have him as a neighbor. Most everything I have learned has been from experience, research, as well as other farmers. A lot of people want to take a class, and that's great. But, you do not truly understand the concept without understanding weather and being able to adapt to seasonal changes. We learn from our own experiences. Farming constantly changes from day to day. We are constantly pivoting, and you must be able to multi-task.

# AGRICULTURAL CAREER Connections



#### What do you love about your career?

m A Being outside and working in the dirt. I also love trying new vegetables and flowers.

#### What does a normal day look like at your work?

A I start the day with exercise then animal chores. Then, it's head to the garden and start watering and checking crops. Depending on time of season, I will be on the tractor tilling or planting. We also have months here and there waiting on crops to grow to be able to sell. I use those "breaks" to stay caught up at home and add new flower gardens or focal points for customers and photographers.

#### What advice do you have to young people looking to go into this field?

A Be patient, take your time, do not expand until you have management practices down on what you are currently growing. If you can't manage a small garden then you can't manage a big one. You can grow more food on a smaller scale with good management practices.





# AGRICULTURAL CAREER

MICAH ANDERSON SR. Extension Educator for Horticulture, Research, and Teaching Langston University

Micah has been an Extension Educator at Langston University since 2018. He previously worked as an autobody technician for 26 years. He then moved to the Oklahoma Department of Agriculture where he worked as a Market Development Coordinator for the Plasticulture Program, specifically working with minority and underserved farmers.

indra 5500

# **Q** Why did you become interested in your current career?

A Several things led me to my current career. I think one important thing was that I wanted to show my son how to grow food, and it sparked a desire in me to start growing again. Since I grew up on a farm, I started missing several things I experienced as a kid. One thing I really missed was driving a tractor, and that experience helped me get the job at the Oklahoma Department of Agriculture. After working with OSU Extension at the Oklahoma Department of Agriculture, I wanted to become one. I feel blessed that is my current position at Langston University.

# Q How did you get to where you are today in your career?

A While growing up on our family farm, I was mentored by my father, who was mentored by his father-in-law. My father was a tough and hard teacher, but I believe it really has helped me as an adult. I also was involved in Haskell FFA where I went to school in Haskell, OK. I participated in the tractor driving contest and won a crop production award. I also believe that speaking in my church while I was growing up helped me learn to speak in front of people today. I earned my associate degree from Oklahoma State University Institute of Technology in Okmulgee, Oklahoma.

# **Q** What do you love about your career?

A My career is very rewarding. I am able to work with people every day who want to grow food. I enjoy being able to share my knowledge with them about growing up on a farm and what I have learned over the years. It is satisfying to me to be able to teach people how to provide for themselves and for others. I also enjoy traveling across the state of Oklahoma. I also do research through trials of different varieties of crops, and it helps me to teach others which varieties will work best.

# **Q** What does a normal day look like at your work?

A Each day looks different but keeps me busy. I spend a lot of time on the phone with people who are interested to learn about plasticulture and growing food in general. I do several speaking engagements across the state. I also take care of research trials, so that includes making sure they are watered and fertilized properly. We also put in various teaching gardens throughout the state. Currently, we have been spending a lot of time teaching and promoting the Langston Sustainable Garden School in the historical Black town of Boley, Oklahoma.

#### What advice do you have to young people looking to go into this field?

A I would encourage you because we need young people involved in agriculture! It is a field that will be very rewarding if you put your heart into it. I gained a lot of self-worth and feel valued working in agriculture. Most importantly, everyone has to eat and wear clothes, so the industry is not going anywhere!

# JACOB PALMER, AGRICULTURAL EDUCATION TEACHER AND FFA ADVISOR BALKO PUBLIC SCHOOLS

# Jacob has been the Agricultural Education teacher and FFA Advisor at Balko since 2001.

### • Why did you become interested in your current career? • Being active within my chapter when I was in high school and having a passion for the FFA sparked my interests in the future about

having a passion for the FFA sparked my interests in the future about becoming an Agricultural Education Teacher.

### How did you get to where you are today in your career?

After high school I attended Redlands Community College where I was a member of the Livestock Judging Team. I received my Agriculture Associate in Science from Redlands. I continued my secondary education at Oklahoma State University where I earned my Bachelor of Science in Agriculture in Agricultural Education. I would not be where I am today if I did not have the help of other educators like my ag teacher Allen Hybsha, my student teaching teacher Gary Lynn Randall, and the late Wes Stover as mentor teacher.



### What do you love about your career?

A I enjoy being able to share what I am passionate about as I teach my FFA students about agriculture. Life becomes so much more meaningful and your relationships with others grows when you're able to see success within your program and that of your student's success through Agricultural Education Programs.

### $\mathbf{Q}$ What does a normal day look like at your work?

A I teach six hours a day of classes including Ag Explorations, Intro to Ag Science 1, Intro to Ag Science 2, Ag Communications, Ag Mechanics, and Intro to Animal Science. After school I am checking SAE (Supervised Agricultural Experience) show projects including pigs, sheep, goats, and cattle. When I am not checking projects, I am training and preparing CDE (Career Development Events) teams for various contests.

### What advice do you have to young people looking to go into this field?

Through agricultural education you are able to create personal leadership development and career opportunities that no other teacher is able to. Be confident within yourself that you have the ability to change an individual's life and have the ability to be a positive influence within their life.



# AGRICULTURAL CAREER Connections

# SCIENCE TECHNOLOGY ENGINEERING MATH

# STEM EXPERIMENTS

### Agritourism: Extreme Farm Makeover



# **Ag Aviation**



### The Naked Egg







United States Secretary of Agriculture Tom Vilsack said, "Nearly 10% of US jobs are related to agriculture and the increasingly complex nature of production requires more training and education in science, technology, engineering, and mathematics—the STEM fields—to stay competitive and meet the needs of a growing world for food, fuel, and fiber."

### **CATTLE CORRAL SYSTEM**

Become an agricultural engineer by designing and building a cattle corral system. Individuals or teams will create a cattle corral system for cattle with the following quidelines: 1. Should have at least three turns causing cattle to change directions. 2. End with a squeeze chute or pen to collect cattle. 3. The corral should start wide and narrow as it reaches the squeeze chute, requiring cattle to move in a single line. You should be able to move your cattle (marble) through the corral easily to the end.

#### **Materials:**

- Large oval paper plates with raised edges
- Scissors
- Glue
- Tape
- Cardstock
- Yarn
- Construction Paper
- $\cdot$  Pipe cleaners
- Marbles (to represent cattle)

AFTER completing the challenge, watch this video by Temple Grandin and then modify your chute (if needed).



### PUNKIN' CHUNKIN' CHALLENGE

You are entering the Punkin' Chunkin' Challenge. You can only use supplies provided/ approved by your teacher to build the catapult. The first challenge is to design a pumpkin catapult that will launch your pumpkin farther than anyone else's. The second challenge will be to land in/on a target. The final challenge will be to knock down a solo cup wall.

#### Materials:

- $\cdot$  craft sticks of varying sizes
- rubber bands, yarn, masking tape, pipe cleaners
  water bottle caps,
- condiment cups, spoons, etc. for bucket of catapult
- $\cdot$  cool temp hot glue gun
- target (bulls-eye, bowl, solo cup wall, tape line, etc.)
- yardstick, ruler, or tape measure
- pumpkins (candy, foam, plastic, or real mini pumpkins)
- Worksheets (use the QR code to access worksheets)





### **BUILD A HONEYCOMB**

The most noticeable contents of a beehive, besides the bees themselves, is the honeycomb attached to the walls and interior frames of the hive. Bees construct each cell of the honeycomb to provide a home for raising young and storing honey. For raising young, the queen bee lays her eggs in each cell, the pupa is cared for by worker bees until it hatches. A honeycomb can also be used to store honey. Beekeepers collect honey by removing frames from the hives and then extracting honey from the honeycomb before returning the frames to the hive.

#### Challenge

Build a honeycomb structure that can hold five pounds. Keep adding weight to see how much it can hold!

#### **Suggested Materials:**

Newspaper, cardboard, tape, variety of paper, toothpicks, popsicle sticks, hot glue

from purpleplow.org







Thousands of products are made by Oklahomans every day, and Made in Oklahoma is designed to promote them! There are three tiers to Made in Oklahoma including: Made in Oklahoma Program, MIO Coalition, and Food Export. All of these have coordinators which are housed out of the Oklahoma Department of Agriculture, Food and Forestry, and while they each work with MIO companies, their day-to-day tasks are vastly different.

The MIO Program is free to join and is designed for any company who grows, processes, or manufactures products in our state. This can include everything from barbeque sauce and salsa, to leather items, candles, soap, record keeping books, insect repellent, pet furniture, and much, much more. With nearly 500 companies (and growing) in the program, there is quite a variety of products! Some of the companies in the program operate their business as a 'side-hustle', meaning this is not their full-time job, but rather they enjoy creating and sharing their product with others for a supplemental income. There are a large number of companies in the program who designate this as their full-time business.

Being a MIO member has quite a few perks! Not only do members get to put the MIO logo on their products, but they also have access to MIO promotional items, have the opportunity to be on the *This is Oklahoma* podcast, featured on local news channels, highlighted on social media, and get to participate in various tradeshows, events, and state fairs at a significantly reduced cost.



While the focus of the program is on producers (companies who make a product), MIO is actively growing the retailer side of the program as well. MIO retailers are stores or boutiques across the state who carry MIO products in their store. Additional benefits are available to retailers if they join the MIO Program.

Shopping local companies is crucial to the economic success of communities and the state as a whole. Try to choose a locally made product when shopping. While at the Oklahoma State Fair, Tulsa State Fair, and other events this year, stop by the Made in Oklahoma section to visit with the makers and shop their locally made products!

### Visit the MIO website at madeinoklahoma.net and find a MIO company in your area of the state.

Write the name of the company, where they are located, what they sell, and a fun fact about their company.

# **AGRITOURISM ADVENTURES**

### Visit oklahomaagritourism.com

List the Agritourism activity catergories:

Now, list the different regions featured around the state: \_\_\_\_\_

Find an Agritourism venue located in your region you did not know existed.

Describe the venue. Where is it located? What do they do? What activities do they have?

Find an Agritourism venue you would love to visit and tell why!





Hundreds of farms and ranches across the state invite you to explore and experience the intersection of agriculture and tourism — Oklahoma's Growing Adventure. Pose in the patch, ride around the ranch, help with harvest, find fresh fruit and more! However you want to experience agriculture, let Oklahoma Agritourism be your guide. Start your adventure at OklahomaAgritourism.com.

oklahomaagritourism.com

405.522.5560

@OKAgritourism





Audrey Harmon (405) 740-0160 audrey.harmon@ag.ok.gov **CONTACT US:** 

Melody Aufill (405) 795-0121 melody.aufill@ag.ok.gov

Emily Ague (405) 885-1851 emily.ague@ag.ok.gov

### www.agclassroom.org/ok



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