

What's the Buzz? Bees are Vital to our Ecosystem

Aug 16, 2023 · Animal Story



Have you eaten today? Did you start your morning with a cup of coffee or a glass of orange juice?

If yes, then you need to thank the bees for your meal.

"One out of every three bites of food you eat, on average would not be possible without a bee," Schanee Anderson, Curator of Farms and Education, said.

Honeybees can be found all across America, and most of the world.

In 1976, they became the state insect of Kansas after a petition was signed by over 2000 schoolchildren. The Kansas House Bill making it official says, "The honeybee is like all Kansans in that it is proud; only fights in defense of something it cherishes; is a friendly bundle of energy; is always helping others throughout its lifetime; is a strong, hard worker with limitless abilities; and is a mirror of virtue, triumph and glory... The honeybee, by making its honey, gives not only to Kansans but also to all the world's peoples a gift which is sweet and wholesome, something which all Kansans strive to emulate in other ways."

Honeybees of course make honey.

These bees have a special honey stomach where they store the nectar; they consume. After returning to the hive, bees will regurgitate the nectar into the mouth of another bee. This bee then regurgitates the nectar again into the mouth of a different bee.

The addition of digestive enzymes into the nectar transforms it from a complex sugar into a simple monosaccharide.

The nectar is then deposited into a honeycomb cell. The bees beat their wings against the honeycomb, creating an air current that evaporates and thickens the nectar. A wax cap is placed over the cell and the honey solidifies.

"The honey tastes like whatever they're collecting from. So, for example, if they get macadamia nut nectar, the honey tastes like macadamia nuts," Anderson said. "If the bees are pollinating hops, then it tastes a little more like beer."

The most common types of honey sold in stores comes from clover, wildflower, or orange blossoms.

The Makeup of a Hive

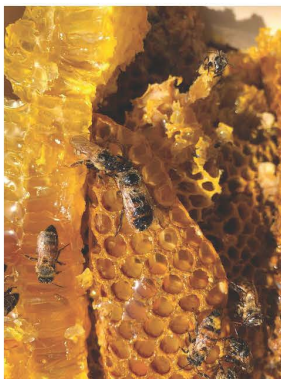
While honeybees are just one species of bee, within the honeybee hive, there are three different types of bees.

At the bottom of the bee hierarchy is the drone bee. These are males that develop from unfertilized eggs and do not possess stingers. Their only purpose is to aid in reproduction. Once mature, they leave the hive looking for a queen bee to mate with. If a drone is successful in reproducing, they die. If they fail, they return to the hive to eat, rest, and try again the next day.

"The drones are the ones that are kind of the freeloaders of the hive," Anderson said. "Drones generally are allowed to live within the hive unless resources become short. If resources become short, the worker bees are known to kick them out before winter comes, to their demise."

Worker bees, as their name suggests, do the work maintaining the hive. Around 95% of a hive is made up of worker bees, who are all females and possess stingers. They have a lifespan of around three weeks once leaving the hive. This is due to the dangers they face, such as being eaten, hit by cars, or sprayed with pesticides.

"The worker bees are the ones that regularly go in and out. But there's also a set of worker bees that will stay in and just take care of the queen," Anderson said. "And there's a set of worker bees that will just take care of the comb."



Bees on a honeycomb

In each hive, there is only one queen bee. Queen bees are not born- they are made.

"The colony makes her," Anderson said. "They choose an egg cell that they will feed a special food to, to make her larger and be egg producing."

The queen bee is the largest bee in the hive. She has an elongated shape and a stinger. Her job is to produce eggs.

Hives will often split in two if they get too large. A new queen will be made and half of the colony will leave with her to start a new hive.

Sedgwick County Zoo's Bees and Honey

At the Sedgwick County Zoo, there are three places where honeybees can be found.

In the North American Prairie habitat, there is a tree stump that is home to wild honeybees.

"This is such a joy for me because years ago, we had a natural hive in that living tree. There was a storm, the tree fell," Anderson said. "We kept the tree to try and keep the hive there. The hive stayed maybe the season, and then it left. And that was five or six years ago."

But for unknown reasons, the bees have returned to the tree stump and are cultivating a hive there.

You can watch our bees make honey at the Children's Farm. Here we have a top bar hive, which is triangular in shape and glass on one side. This allows you to watch the bees as they create their honeycomb.

"We really wanted to show people what the natural hive would look like. So we went with a top bar, because it allows people to see the bees making the comb," Anderson said. "We don't really go in. We don't take the honey, we don't harvest it. We don't do anything in those particular hives, because we want them to be as natural as possible."

SCZ does have hives for honey collection. These white hive boxes can be viewed behind the scenes when riding the Safari Express. The honey produced by bees at the Zoo is collected by Wes Wolken of [Bee Ranch](#).

Wolken grew up on a farm, but discovered he was allergic to everything his family grew. When he was around 14 his dad brought home beehives and put Wolken in charge of them.

"I've just been a beekeeper ever since," Wolken said. "So that's about 53 years, I guess."



Wolken (right) talks about bees with Dakota Jover (left) for the latter's annual education series.

[Juniper Clay Canning](#), owned and operated by Sydney Phillips, Wolken's daughter, takes the Zoo honey and prepares it for market.

"Juniper Clay was started because we saw a need. We thought honey was the coolest food, and felt like it was going to be our mission to make it cool again," Phillips said.

Towards the end of August, Wolken starts pulling the honey boxes from the hives. Whatever honey is useable is removed and taken to an extractor. Using a tool Wolken described as looking like a giant fork, the honey is scraped into the extractor.

Centrifugal extraction is a process where the comb is spun at high speeds, separating the frames of the honeycomb and forcing the honey out of the cells. The honey is then filtered until it's clean and ready to jar.

Phillips doesn't just sell raw honey; she infuses it with other natural ingredients. Flavors range from cinnamon and raspberry to garlic and ginger.

"Something that makes Juniper Clay special is how we infuse it. Honey is considered raw when it has never been heated. Our honey is only hand mixed, in small batches, to ensure the quality and purity is kept to high standards," Phillips said. "We use only freeze-dried organic fruits and spices, so not only do you get the benefit of the pure raw honey, but also from what we have mixed into it."

Eating local honey is good for you in more ways than one. Not only are you supporting local small businesses, but using local honey can help with your allergies. While it's by no means a cure-all, the theory goes that since you're eating honey that has local pollen, you'll over time build up a tolerance to the plants that might be giving you hay fever.

Unlike the other animals at Sedgwick County Zoo, the honeybees can come and go as they please.

They leave their hive, collect pollen, and return to produce honey. They can travel as far as they like, and they also can leave anytime they want. People who visit the Zoo regularly might have noticed that our bees were off-exhibit for some time.

"The bees left. That was their choice," Anderson said.



Left: Wild Bees at the Beehive Stump // Middle: Top Bar Beehive at The Farm // Right: Beehives seen on the Safari Express



The Zoo usually houses unwanted bees, which are bees that were found in someone's home and then removed. But bees like the dark, and the top bar hive in the Farms is completely open on one side. Anderson says after the last bee colony left the decision was made to rethink placing bees back in the hive. But a colony that had previously lived in a top bar hive was donated, and now calls the Sedgwick County Zoo home.

"They're doing great. Now tomorrow morning, they could all be gone," Anderson said. "That is the amazing thing with bees is that once they decide that it's time to move on, they're gone."

How We Can Save the Bees

It's not just the Zoo bees that are leaving, it's a worldwide issue.

Bees can experience Colony Collapse Disorder. Wolken says this happens when bees just disappear. It can naturally happen through absconction, when something in the environment is too toxic for the bees to stay, so they leave. This could be anything from someone spraying pesticides to there being too much smoke from a wildfire.

"Bees are in a crisis. There's a lot of debate, whether it's manmade, whether it's natural," Anderson said. "I tend to sit on the side of I don't think it matters, we just have to realize there's a crisis and see what we can do to help out."

The wild bee population declined by nearly 25% in the United States between 2008 and 2013. And this trend is only continuing.

"We are aware that most fungicides, herbicides, and pesticides kill bees," Phillips said.

But the bee crisis is not totally hopeless. There are many ways that individuals can take action to help save the bees. Something as simple as planting native wildflowers can help increase the population.

"Lavender is really good. I have lavender at my house and the bees love it," Anderson said.

In addition to honey from Juniper Clay and books on bees, the Zoo Store also sells a bee-friendly flower seed mix.

Wolken recommends planting mint. Peppermint is not only good for the bees, but it works as a natural pest repellent.



Left: Juniper Clay Honey // Middle: Books on bees // Right: Pollinator-friendly seed mix

Shopping local also helps bees.

"One thing that everyone can do is support their local beekeepers and growers. Visit a farmer's market and chat with the vendors," Phillips said. "Find the ones that align with your food needs and purchase from them. This support helps them continue what they are doing, and will help bring our bee population numbers up."

Leaving beehives you discover alone also helps.

"Please leave wild hives be if you can," Phillips said. "They are just as important to the bee population as the ones that are kept."

Beekeeping for Beginners

Another way to help the bee population is beekeeping. Wolken said that the more people that are involved in beekeeping, the more people that are keeping track of deaths and illnesses within the hives. This makes other keepers more aware of potential health threats that they can prevent in their bees.

In Kansas, beekeeping laws are fairly relaxed. You can backyard bee keep without registering your hive.

Anderson recommends that anyone who wants to get into beekeeping get in contact with a local beekeeper. Wolken teaches a nine-week class on beekeeping through the [Wichita Parks and Recreation Department](#).

"I tell people the good, the bad, and the ugly," Wolken said. "You could possibly lose your bees. You have to take care of them. It's like getting a puppy. So be prepared to take care of your bees and feed them until they grow into their full hive and then you can collect honey."

It takes a lot of hard work to maintain a happy and healthy hive.

"It's rewarding. Bees can pay for themselves. But you're gonna get stung," Wolken said. "They won't appreciate you. But that's how you learn to be a good beekeeper."

In addition to teaching you about beekeeping, Wolken can get you set up to bee keep. Bee Ranch offers hive boxes, equipment, beekeeper suits, and even bees.

"The type of bees we bring into Wichita are Carniolan," Wolken said. "They're the most docile bees in the world. And so, these are really nice ones we bring in, and that we propagate at the Bee Ranch."



Wolken removes a frame from a beehive to collect honey.

Understanding more about bees can also be a tool to help save them.

Many people are afraid of bees, either because they have an allergy or because they are afraid of being stung. But it is easier to avoid a bee sting than one might think.

"The most important thing is to try not to be afraid," Anderson said. "The best thing to do is just try and remain calm. If it lands on you just blow it off of you. The bee doesn't want to sting you."

Bees can only sting once. When a bee stings someone, its stinger is ripped off of its body which leads to its death. The stinger leaks venom, so if you are stung, you want to remove the stinger from your skin as soon as possible.

"Once you're stung, the bee releases a pheromone which puts you as a danger. Once you're stung once you're more likely to continue to be stung," Anderson said. "So, it's important to get as far away from the situation as you can so that the bees don't continue to consider you a threat."

A bee's job is to protect their hive, and they'll risk their own life to do it. As long as you are aware of bees near you and you don't behave in a way that they perceive as a threat, you're unlikely to be stung.

Bees are vitally important to the ecosystem. Everything is connected. The bees pollinate the plants that we eat, but they also pollinate the plants that livestock eat.

"Clover needs to have pollination. Bees are a major pollinator," Anderson said. "If there's not clover or alfalfa, cows don't have fodder to eat. If cows don't have fodder to eat, we don't have cows to eat."

Bees are necessary for all life to thrive- so an effort needs to be made to save the bees. Like dominoes falling, if the bees disappear, so will everything else.

"What's bad for bees is bad for you. And what's bad for you is bad for the bees," Wolken said.

Planting wildflowers, buying local, beekeeping, or even just learning more about bees can make an impact on their population. If everyone looks out for the bees, they'll look out for us.

"If anybody remembers ever watching the [Bee Movie](#) years ago, it's not far off. Besides the talking bees," Anderson said. "The Rose Parade- the whole thing of saving the Rose Parade is completely correct. Without bees, there would be no Rose Parade, there'd be no flowering process. It's such a vital piece of everything."