



# PATH TO THE PLATE YOUTH EXPO



## HONEY AND YOUR HEALTH

### *Participant Objectives:*

- ◆ Learn the importance of the honey industry.
- ◆ Explore the production of honey and growth cycle of honey bees.
- ◆ Identify the health benefits of including honey in a well-balanced diet.
- ◆ Identify common products of honey.

### *Talking Points for Volunteers:*

The following talking points should be utilized when implementing a Path to the Plate Youth Expo event. Any additional talking points should be approved by the local county extension agent and/or planning committee.

### *Commodity Production*

*Say: What do you call a person who keeps bees?*

- A person who keeps or farms bee is a beekeeper. They are also called honey farmers – especially if their main purpose of keeping bees is to sell honey – apiculturists or apiarists. A bee yard is technically called an apiary, which is where the term apiarist and apiculturist comes from.

*Say: Would you keep bees?*

*What would be your reason for having a bee hive?*

- There are three types of beekeepers, based on how many hives they have and what they use their hives for. Most people are backyard beekeepers – they only have a few hives in their backyard or property. They usually keep bees for fun, to pollinate their garden, because they enjoy helping nature and the environment, or use the product honey bees make for themselves. These beekeepers will get honey from their bees, but not quite enough to sell other than at a farmer’s market. They usually gather honey for themselves or to give to friends and family.
- Someone that has several hives, but usually less than 100 is considered a Sideline beekeeper. Sideliners have a regular job but uses their bees as an additional source or income. They may sell honey, wax, pollen or mead. They may also “rent” their bees to farmers for a cost. Those bees help pollinate the farmer’s crops.

**PRODUCTION CYCLE OF HONEY BEES**

Beekeepers are also known as honey farmers, apiarists, or apiculturists.

| HOBBYIST BEEKEEPER   | SIDELINE BEEKEEPER   | COMMERCIAL BEEKEEPER   |
|--|--|--|
|  |  |  |
| Typically owns a few hives for fun, environmental stewardship, pollination of gardens, or personal use for honey or wax. | Often has several hives and makes a profit on honey bees and their products, but relies on another source of income to meet their needs. | Can have 100's to 1,000's of bee hives. Manages honey bees for pollination, honey production, and honey bee products. Some even breed/sell queens. |

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- Another way a sideliners might make a profit from bees is by selling hives to other beekeepers. During the spring when the bee hives are starting to grow, beekeepers can “split” their hives and make two hives from one large hive.

*Say: How many bees do you think you would need if beekeeping was your full time job?*

- Commercial beekeepers have 100’s to 1000’s of hives! Their full-time job is beekeeping. A commercial beekeeper could do a number of things with their bees. Many lease their bees for pollination and will travel all over the United States to take 100’s of hives to crops. Cotton, almonds, citrus, and watermelons are just a few examples of crops that require bees for pollinating. The more they are pollinated, the more fruit and veggies are produced and the happier the farmer. Have you ever seen a trailer full of bee hives driving down the highway?
- Commercial beekeepers may also use their bees for honey, wax, or pollen production. They could also sell hives every year. Some even breed their own queens and sell the queens to other beekeepers.
- A commercial beekeeper usually has employees to help them care for their bees. It could take weeks to check on 100 hives, imagine how long the days would be for 1000 hives!

**Types of Bees**

*Say: What types of honey bees are there in a hive?*

- There are three types of bees inside a honey bee hive. A queen, workers, and drones.

*Say: Which bee is the most important bee in the hive?*

- Queen - There is always only one queen in a hive and she is the absolute most important part of the hive. The queen is largest bee, with a long abdomen. The queen is responsible for laying eggs, but beyond that, she does much more. Queens control the colony through chemicals that she emits called pheromones. Worker bees “smell” these pheromones with their antennae. Different pheromones may tell the workers when it’s time to start foraging for food. She’ll do this especially when she detects spring is around the corner and she knows she’ll be laying many eggs that will hatch into larvae and need to be fed nectar and pollen. Queens also initiate swarms, which may happen when they are overcrowded in the hive. A queen will only mate one time with several drones (males honey bees) and then she never leaves her nest again, unless she needs a larger home. Queens never



**TYPES OF HONEY BEES**

**QUEENS**  
The most important bee in the hive! She lays all the eggs, coordinates swarms, stimulates foraging, and is cared for by worker bees inside the hive. She controls everything happening inside the hive with chemicals called pheromones. Queens can live up to 5 years, but most are productive for 2 years.

**DRONES**  
The only males in the colony. They may do some foraging and construction, but they eat more than they work. Their main purpose is to mate with virgin queens in the spring and summer. During the winter, they are killed by worker bees to prevent them from eating all the food reserves.

**WORKERS**  
A worker bee will progress through six different jobs during their lifespan.

|   |                                 |   |
|---|---------------------------------|---|
| <b>Housekeepers</b><br>1-2 days           | <b>Nurse Bees</b><br>3-11 days  | <b>Advanced Nurse Bees</b><br>6-11 days |
| <b>Construction Workers</b><br>12-17 days | <b>Guard Bees</b><br>17-20 days | <b>Foragers</b><br>21+ days             |

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forage for food, clean, or do any construction. They are cared for completely by the workers. Queens can live for up to 5 years, but most queens are at their best egg laying for the first two years. Many beekeepers will remove their queens and “requeen” their colony after the queen is 1-2 years old. If the queen dies and the workers cannot raise a new queen, the colony will not survive.

*Say: What do you call the only male bees in a hive?*

- Drones – Drones are the only male honey bees in a hive. They are wide bodied and have huge eyes. They may forage for food and do some work, they are couch potatoes and eat more than they contribute to the hive. Drones are important for mating with queens outside their hive, to produce more hives. In the winter, any surviving drones will be killed off by the workers because otherwise, they would eat too much food and the colony may starve.

*Say: Are worker bees female or male or both?*

- Workers – All workers are females. Workers make up the majority of the colony and have very important jobs. Their jobs are based on age. The younger the worker, the closer they stay to the center of the nest. As they age, their jobs will allow them to move further from the middle and eventually be able to leave the hive.

*Say: Do you think the youngest or oldest workers leave the hive? Why?*

- Housekeepers are the youngest workers. As soon as a honey bee worker emerges from the pupa stage, its job is to clean its cell to make it ready for another egg to be laid. Worker bees are housekeepers for the first 1-2 days of their adult life.
- Nurse Bees – At 3-11 days old, a worker bee is called a nurse bee. She takes care of the queen and larva, feeding and bringing them water.
- Advanced Nurse Bees – Sometimes the queen has died or left the colony and left behind half her hive to raise a new queen. If this happens, Nurse Bees that are 6-11 days old will take the role of Advanced Nurse Bees. Advanced Nurse Bees are able to produce royal jelly, which is produced from a gland in the advanced nurse bee’s head. Other worker and drone larva also get fed royal jelly, but they are not fed royal jelly as long as queens.
- Construction Workers – when workers are at least 12 days old and no older than 17 days old, their bodies are able to make wax. Wax is used to build the honey bee’s home. Construction workers produce wax from glands on the underside of their abdomen. Just like our houses are built from wood and nails, honey bees use wax to build their home. Wax is molded into cells. Cells are always hexagon shaped and identical in size. These cells can be used to store honey, pollen, water, or where the queen lays her eggs.

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- Guard bees – guard bees finally get the chance to venture outside the hive. Guard bees are 17-20 days old and stand at the entrance of hive to protect it. They assess whether a honey bee is a member of the hive or another hive and sting other invaders such as wild animals and humans. When you disturb a nest, guards are the bees that will leave the nest first to sting you.
- Foragers – at 21 days until the end of its life a worker bee has the important job of collecting food for the colony. Foragers gather pollen, nectar and water for the hive. When a forager finds a great nectar or pollen source, they will come back to the hive and perform a dance. A round dance tells the colony the food is less than 100 meters away. The bee not only smells like the flowers it has visited, it has left its scent behind on the flower, which helps the other bees find it. If the food is greater than 100 meters away, they perform a Waggle Dance, which is a figure 8 shape with a waggle in the middle. The direction of the waggle tells the bees which direction the food can be found.
- Worker bees can live 4-6 weeks as adults, but in the winter time, their life expectancy may increase.

### Health and Nutrition

Say: *Do you think honey is healthy? Why?*


- When compared to sugar, honey is a better sweetener. Honey is still high in calories and sugar, but it contains some things that sugar alone does not. The nutrients come from the nectar the honey bees pick up to produce honey.
- Honey also has antimicrobial and antifungal properties to it because of the enzymes from the bee. Honey rarely goes “bad” because of those properties and because of its low water and high sugar content. If you can mix water with honey and don’t refrigerate it, the honey will grow mold.
- Over time, Texas honey may crystalize. This does not mean the honey has gone bad, it only means that the water in honey contains more sugar than it should naturally hold. All you have to do is place honey in a warm water bath to decrystallize it.
- Honey may be one of the only foods that can last nearly forever. Honey has even been found in Egyptian’s tombs and still been edible!

### HEALTH CONNECTION

NUTRITION  
FACTS LABEL

| Amount per serving            | % Daily Value* |
|-------------------------------|----------------|
| <b>Calories</b>               | <b>64</b>      |
| <b>Total Fat</b> 0g           | 0%             |
| Saturated Fat 0g              | 0%             |
| Trans Fat 0g                  | 0%             |
| Cholesterol 0mg               | 0%             |
| Sodium 0mg                    | 0%             |
| <b>Total Carbohydrate</b> 17g | <b>6%</b>      |
| Dietary Fiber –g              | –%             |
| <b>Total Sugars</b> 16g       | <b>–%</b>      |
| Includes 0g Added Sugars      | 0%             |
| Protein 0g                    | 0%             |
| Vitamin D 0mcg                | 0%             |
| Calcium 4mg                   | 0%             |
| Iron 0mg                      | 0%             |
| Potassium 204mg               | 6%             |

\*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.




Honey contains many important antioxidants and amino acids.

It contains many vitamins such as:


- Riboflavin and Pantothenic Acid both help your body utilize carbohydrates, fats & proteins for energy
- Vitamin B6 helps with nervous system function & red blood cell formation
- Thiamin and Niacin important for energy metabolism

It also contains many minerals such as:

- Calcium
- Copper
- Potassium
- Magnesium
- Manganese
- Sodium
- Iron
- Phosphorus
- Zinc



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***Products of Honey Bees***

*Say: Honey bees are the most important insects to humans, can you think of reasons why?*

- The most important thing a honey bee does for humans is pollinate. But lucky for us, honey bees also make honey and wax and other products that we can use for human use. Honey bees are the only insect that makes food for humans!

*Say: What do honey bees gather that makes honey?*

- Honey bees gather nectar from flowers, which is a sweet substance that flowers produce. They drink up nectar in a special organ called a honey stomach. Back at the hive, they regurgitate the nectar and place it into cells. The enzymes from their honey stomach help turn the nectar into honey. When enough water is evaporated off the nectar, it turns thick and sticky and becomes the honey we eat .

*Say: What is your favorite way to use honey?*

- Honey is used as a sweetener for many things. Some people put it on biscuits, to sweeten tea or lemonade, on oatmeal – wherever you want! Some people like to eat a tablespoon of honey a day to help with their allergies, because honey does contain small amounts of pollen.

*Say: Where is honey stored inside the hive?*

- The cells that store honey are called honeycomb. Honeycomb is edible to humans and considered a delicacy to some. Some believe it is beneficial for digestive health. Honey comb is chewy and doesn't ever dissolve in your mouth like the honey does.

*Say: What other products do honey bees make?*

*Hint – what do they build their homes from?*

- Honey bees build their hives from wax and we use beeswax to make a variety of products – candles, makeup, and whatever else you might need wax for.

*Say: Other than nectar what else do honey bees gather from flowers?*

- Honey bees also need pollen to feed to their queen and larvae. Pollen is the protein for the bees and the





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queen needs it to lay eggs. Honey bees pack pollen in special spots on their legs called honey baskets. Beekeepers can harvest the pollen that bees pick up and bring back to the nest by using special combs at the entrance of the hive. The combs gently scrape the pollen off the bee as it enters the hive and it is collected in a little tray. Some people like to use the pollen to eat, to flavor food, or to help with their allergies.

*Say: What do honey bees do that is bad?*

- Honey bees do sting, but because they will die when they sting, they only sting if there is a good reason. Scientists have learned that honey bee venom can be very helpful in alleviating arthritis. Beekeepers always say that they don't have arthritis in their hands and thank the bees stinging them for that! People who are very allergic to honey bees are given shots of bee venom to desensitize themselves so that they don't have to use an EpiPen if they are stung.

#### **Conclusion**

*Say: We hope you've enjoyed today's presentation on honey which has been brought to you by Texas A&M AgriLife Extension Service. Hopefully, you have learned the most important fact which is honey bees play a vital part in agriculture and our health.*