



Kansas Association For Family & Community Education

Leader Guide and Member Handout



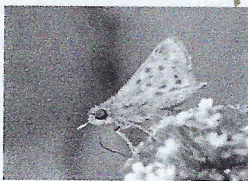
Hummingbirds



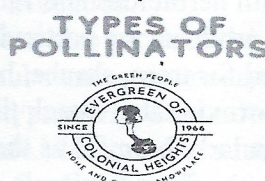
Honeybees



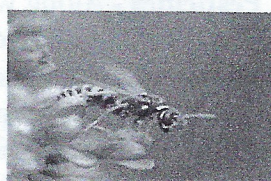
Butterflies



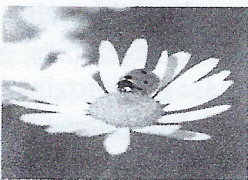
Moths



YOU!



Wasps



Beetles



Bats

More than Honey: Understanding Bees and Pollinators

2027 Kansas FCE Education Program Year

Written by Linda Hess, Kansas FCE EPC member

Educational Goals:

- Learn about roles and importance of pollinators
- Learn about threats to pollinators and what we can do
- Learn about honeybees and honey benefits in diets and medicines

Community Activities:

- Create an educational display about pollinators
- Create pollinator habitats
- Create an educational display about bees and honey
- Support local bee producers
- Explore and share honey recipes

What are pollinators? Pollinators are anything that helps carry pollen from the male to female portion of a flower. Wind, water, insects, birds, animals and humans all can be pollinators.

Why are pollinators important? One of every three bites of our food is dependent on pollinators as almost all seed-bearing plants require pollination. This includes 80% of the over 1,400 types of crop plants producing all our foods and many industrial products. Pollination is essential for ensuring food security and the survival of ecosystems. The USDA estimates that pollinated foods are annually worth 15 to \$24 million dollars in the United States and 3 trillion dollars globally.

What is happening to pollinators? Pollinator numbers are rapidly declining, causing concern for global food security. Monarch butterfly numbers are decreasing, along with several species of bumble bees. Even managed bee colonies have declined. Various threats have been identified.

Habitat loss - Human development is reducing habitat. Manicured lawns and non-native plants impact pollinators. **Pesticides** - Along with herbicides and fungicides, pesticides are physically damaging to pollinators. Many synthetic products are particularly harmful. **Neonicotinoids** are present in popular, common products used for trees, shrubs, houseplants, gardens, even pet flea and tick treatments! Neonicotinoids are **neurotoxins** that attack the nervous system of insects causing convulsions before death. They are particularly harmful as they have residual effects; every part of the treated plant becomes toxic, poisoning birds and animals. Eventually, the neurotoxins leach into the soil, ending up in streams and water supplies, affecting fish and anything that drinks the water. Traces of neonicotinoids are found in honey and common fruits and vegetables, potentially posing a neurological health threat to humans. Most of us already have these neurotoxins in our bodies from pesticide use. **Parasites and pathogens** - Parasites are organisms, like mites or lice, that live in or on a host. Pathogens are bacteria, fungi or virus that attack the host. These are particularly dangerous to honeybee colonies. **Non-native and invasive species** - Tropical varieties of plants often cannot support needs of pollinators (non-native milkweed does not help Monarchs). In Southern states kudzu is an invasive, nearly impossible-to-kill plant that grows over everything, killing native plants and threatening pollinators and crops. **Climate change** - Changes in temperature, severe weather patterns, natural disasters and fires create challenges for pollinators as well as all living things.

How can we help? We can plant native flowering plants in place of manicured lawns. Consider adding a butterfly garden or bird feeder. Don't forget that insects and birds need water. Limit use of synthetic pesticides and herbicides, researching those products to reduce harm. Support local organic farmers and honey producers.

Although this is a global concern we can all help in some way to protect pollinators and help ensure food security.



Bees--More than pollinators!

Bees are responsible for pollinating many of our vegetables, including watermelon, squash, pumpkins, zucchini, cucumbers, and broccoli. Fruits that depend on bee pollination include apples, blueberries, cherries, strawberries, and avocados.

Honeybees are essential as pollinators but also produce the only food produced by insects that humans consume. **Honey** contains all substances necessary to sustain life, including vitamins, minerals and antioxidants. and, if stored properly, does not spoil. (Honey may crystallize but can be gently warmed to restore its liquid nature.) Intended to sustain life in the bee colony, it has been used throughout human history as both food and medicine. In Egypt (3,000 BC) honey was used as a sweetener and as a tribute. It was used in offerings in Sumerian, Assyrian, and Babylonian (2,000BC) and Greek(700BC) cultures. Greeks also made a drink called mead. The Bible, in Exodus 3:8, refers to Palestine as the "land of milk and honey." In medieval Germany beer was sweetened and peasants paid honey and beeswax to their lords. Spanish explorers in the 1500's found that natives in Mexico and Central America had developed beekeeping. In the 1600's, American settlers introduced the European honeybee to the colonies.

Today, the honey industry in the United States involves 2.6 million honeybee colonies with production valued at \$360 million. Production is declining due to decreasing farmland and prices are rising. The top three honey-producing states are North Dakota, South Dakota, and California. Per capita consumption of honey is 1.31 pounds per year, so much of our honey is imported from Argentina, Brazil, and Canada.

Honeybee facts: Honeybees live in colonies of up to 50,000 insects with specialized duties. Each colony has one queen bee whose purpose is to lay eggs. She can lay 2,000 to 3,00 eggs per day and can live for years. She also emits pheromones that regulate the actions of the other bees. Each egg is laid in a honeycomb cell and hatches into a larva in three days. It is then fed, the cell is sealed, and in about 24 days the pupa stage emerges. The adult bee may become a drone, with a life span of about 8 weeks, whose sole job is to mate with the queen. Worker bees usually live 6 weeks, and some may clean and maintain the hive while others leave the hive to forage for nectar. The nectar is converted into honey by a process of enzymes and regurgitation. Fanning of wings at 200 beats per second evaporates the moisture to produce thick honey. Foragers may fly up to 6 miles, at up to 15 miles per hour in their search. It takes up to 2 million flower visits to produce one pound of honey. One teaspoon of honey is a single bee's life work!

Honey varieties can be labelled with the name of the plant/blossom providing the primary source of the nectar. Among the over 300 varieties are Clover, Tupelo, wildflower, buckwheat, and Manuka. Color and specific qualities depend on the variety. Read labels and do some research.

Honey as Food: The most obvious use of honey is as a sweetener. It is 1½ times sweeter than sugar. It is higher in calories per tablespoon (64) than granulated sugar (49). It does have a slightly lower glycemic index (50-60) compared to sugar (65). Tupelo honey has the lowest glycemic index.

Recommendations when substituting for sugar in baked products include using $\frac{3}{4}$ cup honey to replace 1 cup sugar, reducing liquid by $\frac{1}{4}$ cup and adding $\frac{1}{4}$ tsp baking soda for each cup of sugar replaced. Reduce oven heat by 25 degrees to avoid overbrowning.

Replace Sugar with Honey
Conversion Guide

Sugar	Honey
$\frac{1}{4}$ cup	3 tbsp
$\frac{1}{3}$ cup	3 tbsp
$\frac{1}{2}$ cup	$\frac{1}{3}$ cup
1 cup	$\frac{3}{4}$ cup
2 cups	1.5 cups

Honey as Medicine: Honey has historically been used as a natural medicine. It has anti-inflammatory benefits, antioxidants that protect from cell damage due to free radicals, and antibacterial and antifungal compounds. It has proven useful in treating coughs and sore throats. It promotes wound healing by creating a natural barrier that protects wounds and burns from dehydration and bacterial contamination. Modern medicine has recognized these benefits in medical-grade honey, particularly Manuka honey from New Zealand. (Manuka honey is available in pharmacies and online.)

Raw vs processed? Raw honey is filtered to remove beeswax and dead bees. It retains its natural beneficial properties. It also contains bee pollen which can be a deadly allergen. If you are looking for honey with allergy benefits, locally produced raw honey is best. Processed honey is heat pasteurized, which can strip many health benefits, and may contain antibiotics and added sugar as well as flavorings. It may also be sourced in a different country.

CAUTION!!! Honey (in any form) should never be given to children under one year of age as it can contain botulism spores that can cause a rare, possibly fatal form of food poisoning!

Honey is a fascinating natural food, but if you decide to include it in your diet, be informed about its benefits and possible dangers.

References: NAFCE Hearth Fire Series #82 "Pollinators! They're Not Just Bees" Pamela McIntyre-Albaro, Peggy Martens, and Mary Alice Weber (2025)

Internet search included: National Honey Board (including recipes), Mayo Clinic, USDA and others

Honey Recipes

Honey Cough Syrup

Ingredients:

Zest of 2 lemons (1 ½ T)

½ Cup ginger (peeled,
sliced or ½ tsp ground
ginger

1 cup water 1 cup honey

½ cup lemon juice

In a small saucepan,
combine lemon zest, ginger
and 1 cup water. Bring to a
boil, simmer 5 minutes,
strain into heat-proof
measuring cup. Rinse
saucepan and pour in
honey, Warm the honey on
low heat but do not boil.

Add lemon water and
lemon juice. Stir to form
thick syrup.

Ages 1-5: ½ to 1 tsp / 2

hours Ages 5-12: 1 to 2
tsp./ 2 hours

Ages 12 +: 1 to 2 Tbsp./4
hours ###

Honey Lime Fruit Salad

Ingredients:

4 cups strawberries (sliced)

3 kiwis (peeled and sliced)

1 cup green grapes

¼ cup honey

Juice of 1 lime

Stir honey and lime juice
together. Pour over fruit
mixture. ###

Crunchy Honey Yogurt Breakfast Parfait

2 servings

Ingredients: (save some of
each for garnish)

1 large banana sliced

1/3 cup honey

½ cup plain yogurt

½ cup crunchy granola

½ cup blueberries

Alternate ingredients in
layers. ###

Honey-Peanut Butter Protein Energy Bites

Makes 2 dozen

Ingredients:

1 ¼ cups old fashioned
oats

3 T shredded coconut

½ cup sliced almonds
(finely chopped)

1 T hemp seeds-shelled-
(optional)

1 scoop whey protein
powder

½ cup honey

½ cup dried apricots
(chopped)

½ cup peanut butter

Mix and chill for 30
minutes. Roll into walnut
sized balls.

Last up to 5 days if chilled.
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Recipes: National Honey Board