

HOW TO KEEP YOUR HONEY



NATURALLY SAFE

EVEN THOUGH HONEY MAY BE ONE OF THE MOST MICROBIOLOGICALLY STABLE FOODS IN EXISTENCE...

...Beekeepers still need to take steps to keep honey free of contaminants.

It's a sweet truth that honey is being used as an ingredient in more foods, pharmaceuticals and cosmetics than ever before. Manufacturers of such products often set purchasing specifications that include microbiological criteria. For that reason, beekeepers must pay attention to microorganisms that cause diseases in bees and to yeasts that can spoil honey.

Let's start with the positives.

It's important to remember the safety features naturally associated with honey. Honey's high sugar content, low pH (high acidity), hydrogen peroxide and other antimicrobial factors go a long way in making it one of the safest foods around. However, the antibacterial properties of honey are reduced or removed when honey is combined with other ingredients, especially water. Any microorganisms

present may then have the opportunity to multiply and spoil the product in which the honey has been mixed.

Be sure to always follow Good Manufacturing Practices such as:

- (1) Use stainless steel wherever possible.
 - (2) Wash your equipment on a regular basis and keep equipment dry.
 - (3) Keep honey processing clear of contaminants such as animal waste.
- It is important to process and store honey in a way that minimizes microbial contamination. Avoid handling or storing honey in ways that encourage microbial growth.



If you'd like to learn more...

The other side of this flyer contains in-depth technical information on microorganisms and their relationship to honey. As always, feel free to contact the National Honey Board at 1-800-553-7162 with any questions you may have.

MORE ABOUT MICROORGANISMS

What are microorganisms?

Microorganisms are a group of organisms that typically cannot be seen with the naked eye. Microorganisms may be classed into four groups: fungi (yeasts and molds), bacteria, viruses and parasites. All microorganisms exist in an active, growing phase (the vegetative phase) for all or part of their life cycle. Some microorganisms remain in a dormant, hardy spore form, similar to a seed, until conditions are conducive to growth. Microorganisms have an important role in determining the shelf-stability and safety of food.

Why microorganisms are important to beekeepers.

Beekeepers have to be attentive to the microorganisms that cause diseases in bees and the yeasts that can spoil honey. As consumers become more aware of food safety issues, food manufacturers have become more demanding.

Honey is increasingly being used as an ingredient in different types of foods, pharmaceuticals and cosmetics. Manufacturers of such products often set stringent microbiological standards. And since food processors frequently set purchasing specifications that include microbiological criteria, honey may be subject to tests by honey packers or end users.

Honey suppliers will need to consider the microbiological purchasing specifications that they

may face. Since some microorganisms cannot be removed from honey without destroying the honey, there is a great need for an effective partnership between producer and packer so that the honey meets a food processor's needs and maintains honey's image as a pure product.

How microorganisms get into honey.

Microorganisms can enter honey either while the bees are making the honey (a primary source) or after the honey has been harvested (a secondary source). The primary sources of microorganisms are likely to include pollen, dust, air, dirt, flowers and the bees. Secondary sources of contamination in honey are humans, equipment, containers, insects, animals and water.

Possible routes of transmission into extracted honey would include air (in the honey house or while the honey is being packed), food handlers (from skin infections, sneezing or fecal contamination), cross-contamination (largely from animals or animal products) and equipment (including residues of food and water). Floors, walls and ceilings can also be reservoirs of microorganisms that enter food. Secondary sources of contamination are controlled by standard sanitation and good manufacturing practices.

What microorganisms are found in honey.

Bacteria from the genera *Clostridium* and *Bacillus*, yeasts and molds are the most common microorganisms in honey. Microbiological counts are highly variable. Bacterial counts are often close to zero, but may occasionally reach 10,000 CFU (Colony Forming Units) per gram. An "average" count might be 400 CFU per gram. Typically, yeast and mold counts in honey are less than several hundred CFU per gram if there are any at all.

How to control microorganisms in honey.

Practices that protect the health of the bees are likely to protect the quality of the honey produced by those bees. Since it is very difficult to remove microorganisms from honey, it is more practical to learn how to block their entry. This is done by following honey house sanitation guidelines and good manufacturing practices. More experimentation is needed to identify production techniques that influence microbiological quality.

What happens when honey is combined with other ingredients.

The antimicrobial properties of honey are reduced or removed when honey is combined with other ingredients. Any microorganisms that are present may then have the opportunity to multiply and spoil the food, cosmetic or pharmaceutical product.



For more information on
microorganisms and honey, call
the National Honey Board's
Marcia Cardetti at 1-800-553-7162.