Honey Harvesting, Extraction, Grading and Labeling

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Honey Harvesting – The Issues

- When to (or not to) harvest
- How to harvest
- How much to take and/or leave when harvesting

When to harvest

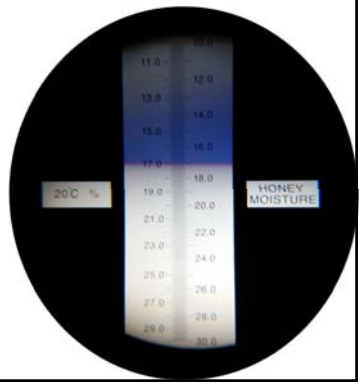
- When frame(s) are at least 90% capped

What's happening in this process?

- Bees are reducing the water content
  - **Plant nectar is predominantly water with some plant sugar**
    - Sugar levels vary by plant, bloom time and weather
  - **Generally bees will cap the honey when they have it dried down to 17-18% moisture content**
  - **Too wet over 19.6% = potential fermentation**
    - In years with continually high humidity they may cap it wetter 20%

Determining Moisture Content

- Use a refractometer



What's happening in this process?

- Bee are curing or ripening the honey
  - **Waiting for the enzyme, invertase to convert the nectar sugar, sucrose, into two simpler sugars, glucose and fructose**

Removing bees from supers

Four approaches

- Brushing
- Blowing
- Bee escapes
- Bee repellents

Regardless of method it is easier to harvest honey when

- Foragers are out
- Whether is warmer
- Avoid days of high humidity

Brushing

- **Brush or rap the bees off frame by frame**
  - Immediately place the frame in an empty box and cover
  - Bees may (will) become defensive

Bee repellent

- Bee Go or Honey Robber – butyric acid – smell like dead, rotting animals (with cherries)
- Fisher Bee Quick or Bee Dun – generally extracts that smell nice
  - **Artificial almond extract, tea tree oil, etc. in combination**
- Require a fume board and adequate temperature to volatilize

Bee escapes

- **Bee escape utilize systems that are difficult for bees to navigate back into**
  - Slower, sometimes unpredictable results
    - Need warm days, chilly nights
  - Avoid Porter bee escapes
    - Plugging

EXTRACTING
FACILITIES AND EQUIPMENT

Facilities and equipment

- ***If*** you're going to sell your honey, you need a separate room dedicated to your food business with commercial-grade equipment.
- You can not extract, process, or bottle your honey in the same kitchen where you cook your family meals, or in any room that's part of your normal living space.

Facilities and equipment

- This room needs washable floors, walls, and ceilings.
- You need adequate light to see well enough to keep things sanitary.
- The room must be properly ventilated to prevent steam and condensation and to keep exhaust air from blowing onto the honey.

Facilities and equipment

- All the doors and windows need to be well-screened so birds, insects and rodents can't enter.
- You need a three-compartment sink or NSF-approved dishwasher for washing your equipment and utensils.
  - **Wash, rinse, sanitize sinks**
  - **Air dry items that are hand washed**
    - No towel drying!!!

Facilities and equipment

- Equipment such as extractors, stoves, sinks, tables, shelving and storage containers must be easily cleanable and in good repair.
  - **No galvanized equipment (lead pre 1994, zinc)**
  - **No copper (gives honey a greenish color)**
  - **No skip welded stainless steel equipment**
    - Look at the seams

Facilities and equipment

- Utensils like pans, bowls, knives and spoons must be smooth, impervious, and easily cleaned.
  - **No wood spoons**
  - **Uncapping knife handle can be wood, but must be smooth (no grooves) and free of cracks or splits.**

Facilities and equipment

- ***If*** you're not selling your honey you have more leeway in your facilities and equipment
  - **What you do need**
    - A clean place that is bee tight
    - Access to plenty of warm or hot water
    - If you have a galvanized extractor coat it with Camcoat or have a baked on lacquer applied

LIQUID HONEY EXTRACTION

Extraction options for liquid honey

- Use an extractor
  - **Different types**
    - Tangential, semi-radial, radial
    - Hand cranked, powered
- Crush and strain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What about filtering and heating?

- Pollen grains range in size from 10 microns up to 100 microns
- 40 mesh screen is 425 microns
- 60 mesh is 250 microns
- 90 mesh is 106 microns

CRUSH AND STRAIN

Crush and Strain

- In Langstroths, use cut comb or thin surplus foundation or go foundationless
- For top bar hives and Warre hives cut the comb off the bars
- Place the comb(s) into a mesh bag or nylon curtain material
  - **Brewers grain or hop bags**
- Crush and mash the comb. Allow to drain.

Facilities and equipment

- Transport and storage
  - **Sanitary operations start long before you extracted the honey..**
    - How were your supers stored before being put on the hive?
    - How did you transport them to the honey house?
    - How/where did you store your bottles and caps prior to packing?
    - How did your supplier handle them?

Facilities and equipment

- Transport and storage
  - **Use food grade storage containers**
    - Food grade plastic pails or bottles
    - Glass jars (discouraged by insurers)

Facilities and equipment

- Transport and storage
  - **What makes a plastic pail or plastic bottle food grade?**
    - The plastic must be FDA approved for the type of food (as must the mold release agents)
    - The liquid colorant used must be FDA approved (e.g. Letica, Contico's and Paragon white pails use FDA approved white colorant)
    - Food grade pails may be stamped NRC – non re-usable container
      - Don't use used pails from bakeries, restaurants, etc as they may add odd flavor(s) to the honey

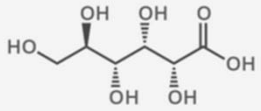
The honey isn't the concern…..

- Honey is generally doesn't suffer from the FAT-TOM issues (what pathogens need to grow)
  - **Food (carbohydrates or proteins)**
  - **Acidity (pathogens grow best at pH of 4.5-7.5)**
  - **Temperature (41ºF-135ºF)**
  - **Time**
  - **Oxygen**
  - **Moisture (honey will ferment if moisture content is too high)**

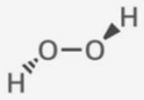
And then there is you…..

- Honey itself isn't the problem, it is the beekeeper, processor, packer and consumer.
  - **Physical contamination**
  - **Chemical contamination**
  - **Biological contamination (generally minimal)**

WHY DOESN'T HONEY GO OFF?



GLUCONIC ACID



HYDROGEN PEROXIDE

Honey has such a low water content, it draws water from its surrounding environment, meaning it can dehydrate bacteria, thus preventing spoilage.

Gluconic acid is the dominant acid in honey, produced by the action of bee secretions on glucose. It, and other acids, give honey a low pH of between 3 and 4; this, along with the fact it also contains small amounts of hydrogen peroxide, makes it too hostile for bacterial growth.

POST EXTRACTION

Post extraction issues

- Storing honey supers
  - **Wet or dry?**
- Wet
  - **Advantage is that wax moths aren't as likely to invade since they are sticky**
  - **Because they are wet, they may drip and/or attract other insects, etc.**
  - **Need ventilation (screen the top and the bottom of the stack)**

Post extraction issues

- Dry
  - **Give the extracted super back to the bees to clean up**
    - Place on top of hive over the inner cover with the telecover on top
    - Don't just set out in the yard as bees, yellow jackets, etc will rob them out and tear up the comb in the process