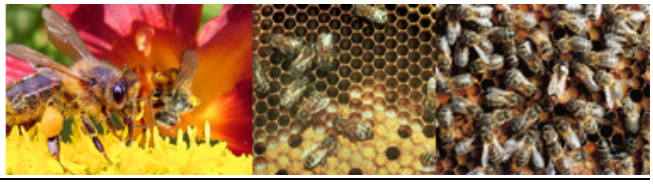
HONEY HARVESTING AND TRANSPORT

Food and Agriculture Organization of the United Nations



HONEY HARVESTING AND TRANSPORT

1.- General information

The harvesting and transport of honey should follow some procedures, aiming at an efficient collection, but mainly to maintain its original characteristics, therefore the quality of the final product.

The harvest of honey should not be accomplished in rainy days or when the relative humidity is high, because this would lead to an increased moisture indexes in the honey. The beekeeper should decided for those hours which there is less air humidity on the sunny days. When harvesting, the beekeeper should not throw smoke directly on the honeycombs; this should be performed at small amounts, by using the bee smoker far away from the frames of honeycombs. These procedures are followed in order to reduce the incorporation of the smokeable smell into both honey and beeswax, as well as detritus from the bee smoker. After harvesting, the frames of honeycombs should not stay exposed to the sun for long periods because high temperatures can lead to the an increased hydroxymetylfurfural content (HMF) in the honey, reduced content of the main enzymes in honey (invertase, glucose oxidase and diastase), therefore endangering the honey quality.

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A.-Harvesting honey

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Many methods are available to separate bees from their honey combs. Honeycombs can be taken out one at a time and bees may be removed by shaking and brushing. Whole supers can be cleared of bees with a strong air blower (bee blower). An inner cover or special board with a one-way bee escape can be placed below the honey super. Up to one deep, or two shallow supers, can thus be cleared in 24 hours, if enough space is available below. This method cannot be recommended if colonies are sitting unprotected in the sun, which might melt the combs in the now unventilated supers. None of these three methods will contaminate the harvested honey. The use of unpleasant smelling chemicals to drive bees away is a technique preferred by many beekeepers because it is quick and easy. Some of the chemicals are illegal for use in many countries, leave unpleasant flavours and odours, are toxic and are absorbed by wax and honey.

All equipments used for honey processing should be addressed to this purpose only, and should be clean on such as way to avoid any possible contamination of the product by any substances found there.

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In order to avoid contaminationt the honeycombs should not be directly placed on the ground. The beekeeper should place them directly in a special transporting barrow, from which the base is preferentially a stainless steel tray or other material appropriate for food. They should be covered on such a way to avoid pillage, mainly at the end of the nectar flow season.

B.-Transporting from apiary to the extracting room

The vehicle used in transporting the supers containing honeycombs to the extracting room should be prepared in the previous day, as subjected to a hygienic process. It is necessary that the vehicle did not recently transport any material that might have left some type of toxic residue, or otherwise has strong odor. Besides, the surface of the vehicle load area should be covered with nontoxic material, properly cleaned and free from impurities, in order to avoid the direct contact of the supers containing honeycombs with the floor.

In case the vehicle has an open load compartment, the use of canvases that can cover the supers containing honeycombs is recommended; so avoiding the honey be contaminated by dust, earth and other contamination or by the residues from the combustion of the vehicle

engine (mainly in cases of the diesel oil-moved motors). In addition, this procedure avoids the bees to plundering the honey. So, an appropriately dimensioned canvas can cover the floor of the vehicle and cover the upper surface of the supers, therefore efficiently involving the whole load.

During the arrangement of the supers in the vehicle, it is recommended that this vehicle does not stay under the driect light of the sun, which may negatively affect the quality of the honey. For accommodation of the load, a hive cover placed on the lower canvas may be used. So performing as base for the piling of the supers, as well as a cover upon them that will impede the access of the bees during the formation of this supers pile. During their placement in the vehicle, the supers should be always covered by canvas until the total fulfillment of the load.

So, the transportation process becomes more rapid and efficient, thus providing a safe and protected load. For a safe transportation, the supers should be well tied. Therefore avoiding their displacement in the case of abrupt braking, that could lead to the break of the honey combs; mainly if they are constituted of new wax. In those non-asphalted highways presenting irregularities, the vehicle should be slowly driven and with the maximum care.

2.-Bee Products

A.- Honey

"Honey is the natural sweet substance produced by honeybees from the nectar of blossoms or from the secretion of living parts of plants or excretions of plant sucking insects on the living parts of plants, which honeybees collect, transform and combine with specific substances of their own, in the honey comb to ripen and mature. This is the general definition of honey in the Codex Alimentarius (1989) in which all commercially required characteristics of the product are described. Depending on the plant species and environmental conditions, the concentration of sugar in the nectar collected by honeybees in the flower may vary from 4-5% to more than 60%.

Honey constituent	Average
Moisture	17.2
Fructose	38.2
Glucose	31.3
Sucrose	1.3
Maltose	7.3
Higher sugars	1.5
Free acid as Gluconic	0.43
Lactone as Glucolactone	0.14
Total Acid as Gluconic	0.57
Ash	0.169
Nitrogene	0.041
pH	3.91
Diastase	20.8

B.-Propolis Extract

Propolis is a resinous, gummy and balsamic substances collected by the bees from a variety of plants, from leaf buds or exudates from flowers, apical bud tissues, or stem. In Brazil Africanized bees collect propolis from different plants, but the more popular propolis (green propolis) is collected from apical leaf buds of Baccharis dracunculifolia (alecrim). In eastern Europe the main source of propolis is from the poplar trees Populus spp. Since propolis can be a mixture of locally available resins it would be expected to differ from one locality to another and between colonies. In a same area where bees mainly produce green propolis in Brazil, have been observed different types of propolis being produced. However, thereis also a predominance of green propolis. In an area rich in Baccharis all different types of propolis will contain tissues from this specie. Although the color of propolis and his properties can show some differences.

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Honey Composite constituent	Average
Dry extract	Minimum 11% (m/v)
Wax	Minimum 11% (m/v)
Flavonoid compounds	Minimum 0.25% (m/m)
Oxidation activity	Maximum 22 sec.
Alcohol content	Maximum 70° GL (v/v)
Methanol	Maximum 0.4 mg/L

C.-Beewax

The beewax is secreted by the bees through four pairs of abdominal glands and manipulated for construction of the combs in the beehives. Under ideal conditions, the conversion rate of the sugar into wax is from 17:1 to 20:1 due to the biochemical complexity involving this process. An individual scale secreted by one gland each time weighs about 1.1 mg, then 910.000 scales are necessary to produce one kilogram of beeswax. Beewax has a plastic consistency, white color to yellowish at the beginning of the honeycomb construction, and melts easily.

Beewax constituent	Average
Monoesters	35
Hydrocarbons	14
Free Acids	12
Diesters	14
Hydroxy polyesters	8
Hydroxy monoesters	4
Triesters	3
Acid polyester	2
Acid esters	1
Unidentified	7

D.-Pollen

The pollen is the masculine element of the flowers and is microscopically produced in the anthers of plants at flowering stage. It contains the genes of the masculine flower that will fertilize the feminine flower when deposited in its stigma. This transfer can be accomplished under different ways, and the bees are one of the main pollinator in the animal kingdom. The pollen is an important food for the bees. They collect it in the flowers and then transport it to the beehive through their pollen basket located in the external part of the last pair of legs.

Pollen constituent	Average
Moisture (Fresh Pollen)	8 – 16
Moisture (Dry Pollen)	3 – 5
Carbohydrates	25 – 42
Lipids	1 – 14
Protein	11 – 29
Ash	1 - 8
Others	20 - 39

E.-Honey Composite

Honey composite is the mixture of honey with other bee product or phytoterapic extract, that makes it nutritionally richer or provided with therapeutic value.

Some extracts such as watercress, ginger, guaco and others may be added to the honey, as well as other bee products such as pollen, propolis and royal jelly.