



# Honey quality control

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## INTRODUCTION

Honey is the natural sweet substance that bees produce from the nectar of plants or from secretions of living parts of plants, which they collect, transform, deposit, dehydrate, store, and leave in the honey comb to ripen and mature. According to International Honey Commission, pure honey should be lacking any food ingredient, objectionable matter, flavour, aroma, or pollutant absorbed from foreign matter during its processing and storage. Furthermore, pure honey should not have begun to ferment and no constituent particular to honey may be removed, except where this is unavoidable.

**Proline** is one of the 20 main amino acids that is present in large amounts in honey. It is used as a criterion of honey ripeness.

**HMF** is an organic compound derived from dehydration of fructose, and its amount increases according to the temperature and the periods involved. It shows whether honey has been overheated.

**Sugars** are carbohydrates found in nectar or honeydew. The most predominant ones in honey are fructose and glucose, which gives it its keeping quality, energy value, and viscosity.

**Moisture** is the amount of water in honey, and is a criterion that determines the capability of honey to remain stable and to resist spoilage by yeast fermentation.

## OBJECTIVES

To check whether a sample meets the honey quality standard according to the draft CL 1998/12-S of the Codex Alimentarius, the Draft 96/0114 (CNS) of the EU and Proposal for new international standard for market exchange and consumer interest.

PARAMETERS	INTERNATIONAL REQUIREMENTS (QUALITY STANDARDS)
Moisture content	$\leq 21\%$
Acid value	$\leq 40\text{meq/Kg}$
Proline	$\geq 180\text{mg/Kg}$
Hydroxymethylfurfural (HMF)	$\leq 50\text{mg/Kg}$
Diastase activity	$\geq 8$ Schade units
Electrical conductivity	$\leq 0.8\text{mS/cm}$
Invertase activity	
• Unheated honeys	$\geq 10$
• Honeys with low enzymatic activity	$\geq 4$
Sugars	
• (Fru+Glu)	$\geq 60$
• Sucrose	$\leq 5$

## PARAMETERS

**Acidity** is that bitter taste of honey that results because glucose is converted to gluconic acid by the enzyme glucose oxidase that the bees introduce. It is a good criterion to tell the ability of honey to resist spoilage and microbial attack.

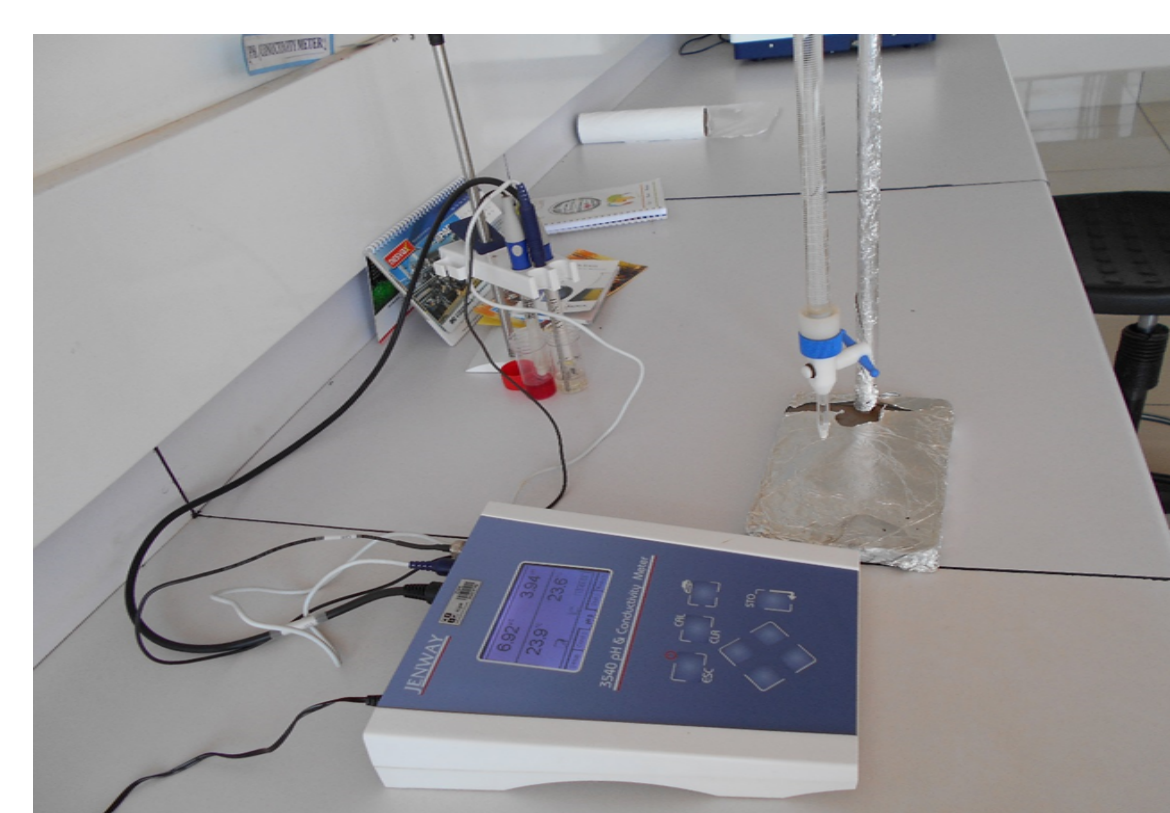
**Conductivity** is the measurement of a sample's ability to conduct electrical current. It is a good criterion to tell the botanical origin of the honey.

**Invertase** is an enzyme secreted by bees and it converts/"inverts" sucrose in the nectar or honeydew to fructose and glucose. Its activity tells more about the amount of fructose, glucose, and sucrose present in honey.

**Diastase** is an enzyme that bees introduce, which speeds up the breakdown of starch to maltose and other minor sugars. It is regarded as an indicator of the amount of starch and minor sugars expected in honey.

**N/B:** Both invertase and diastase are heat-sensitive enzymes; hence they can also be used to show whether the honey has been overheated.

## METHODS



### pH/conductivity meter

**Titrimetric method**, used in determining conductivity and acidity. The pH is measured and the solution titrated with 0.1M sodium hydroxide solution to pH 8.30 using pH/conductivity meter.



### UV/Vis spectrophotometer

**Spectrophotometric method**, used in determining proline, diastase, and invertase based on the absorption of the UV/Vis rays at different wavelengths.



### High performance liquid chromatography (HPLC)

**Chromatographic method**, used to determine HMF and sugars, where peaks are identified on the basis of their retention times.



### Hand – held refractometer

**Refractometric method**, used in determining moisture content based on the principle that refractive index increases with solids content.

## REFERENCES

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