Maharishi Honey

Laboratory Results

Laboratory for Trade and Environment
Hamburg

C-10-03

Madhu Taste 4

Item Tested	Range	Result	Comments
Water	13.5-20.5% less than 18% is ideal	17.4%	Anything below 18 % is good German Law says it should be less than 21% Organic standard is 18%
HMF (Hydroxymethyl-furfural)	0-40 mg/kg	19.60 mg/kg	*Indicator of whether the honey has been heated.* Each time honey is heated, a chemical HMF is created. Freshly extracted honey contains very little or almost no HMF.
Diastase Activity	3-50	22.7	*Indicator of how the bees are working to change starch into sugar. It is influenced by honey storage and heating and is thus an indicator of honey freshness and over-heating.* Present standard is that it should not be lower than 8.
Invertase Activity	0-200	46.7	It is particularly sensitive to heat and storage damage and is used as a freshness indicator. It is an indicator of whether the honey has been heated. Enzymes are not stable at high temperatures.
Sugar Spectrum	0.9-1.9	1.10	Measures the fructose/glucose ratio. Looking at the ratio we can determine if there is any adulteration, if any artificial honey or sweeteners were added. Reducing Sugars: Fructose, Glucose, Turanose, Maltose, Isomaltose, Maltotriose. Reducing Sugars give energy.
Electrical Conductivity	0.1-1.5	0.626 mS/cm	Measures the mineral content of the honey. The higher the mineral content, the higher the electrical conductivity. The range varies with the different kinds of honey, for example, blossom honey—up to 0.5, mixed blossom/honeydew—0.1-0.79, forest/honeydew—0.8

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Element Analysis—Minerals			They indicate nutritional value.
a. Potassium	100-4700 mg/kg	910	
b. Calcium	5-260 mg/kg	165	
c. Magnesium	7-126 mg/kg	108	
d. Sodium	6-400 mg/kg	48	
e. Phosphorus	23-58 mg/kg	74	
f. Iron	1-20 mg/kg	3	
g. Manganese	<1.0-9.5 mg/kg	13	
h. Silicon	14-72 mg/kg	83	
i. Zinc	1.6-5.1 mg/kg	0.5	
j. Copper	0.2-0.5 mg/kg	<0.1	
k. Chloride	23-201 mg/kg	420	
l. Chromium	0-0.15 mg/kg	<0.2	
m. Selenium	0.05 mg/kg	<0.2	
Bee Treatments	Amitraz <0.005 mg/kg Phenol <0.05 mg/kg	Not detectable	Measures whether specific drugs like Amitraz and Phenol where given to the bees to get rid of Varroa. This should be zero. Ours is less than zero and **not detectable** which means there is no trace of these drugs in our honey. Amitraz measured <0.005 mg/kg. Phenol measured <0.05 mg/kg. The lab explained that in today's methods, they tested to the lowest level that is possible with methods for detectable substances. In the future, the limits may be lower. At present in certificates, you have to say the limit you have found where it does not exist, thus our results. The lab confirmed that they found no trace of Bee treatments.
Heavy Metals		Not detectable	The lab explained that in today's methods, they tested to the lowest level that is possible with methods for detectable substances. In the future, the limits may be lower. At present in certificates, you have to say the limit you have found where it does not exist, thus our result. The lab confirmed that they found no trace of heavy metals.
a. Cadmium	no range	<0.01 mg/kg	
b. Lead	0.05-1.8 mg/kg	<0.05	
c. Mercury	no range	<0.005	

Item Tested	Range	Result	Comments
Protein	0.1-1.3	0.5 %	Which is the normal content for blossom honey.
Free Acid or Acidity	10-50 mmol/kg	50.9 mmol/kg	This is an important quality criterion because honey fermentation causes an increase in acidity. *The content of free acid exceeds the limit of the directive 2001/110/EC (honey) from 20.12.2001. The European Standards for Honey say that free acid should not be more than 50mg/kg. There is no limit for acidity in USA.*
Antibiotics		Not detectable	(Sultonamides, Tetracyclines, Streptomycin)
Honey; % sugar from C4 plants, C13 Isotope Analysis	0-5	0.0 % -26.1 No adulteration	This analysis assessed if there was an adulteration to the honey with cane sugars or corn syrup. The lab confirmed that this is pure honey.
Vitamins			
a. C	1-4 mg/100g	<1.0 mg/100g	
b. Vitamin B1	0-0.004 mg/100g	<0.01 mg/100g	
c. Vitamin B2	0.02-0.10	0.053 mg/100g	
d. Vitamin B6	NA	0.018 mg/100g	
e. Niacin	NA	0.11 mg/100g	
f. Folic acid	NA	40 µg/100g	
g. Pantothenic acid	NA	0.18 mg/100g	
h. Biotin	NA	1.1 µg/kg	
64 Chloropesticides		Not detectable	The lab explained that in today's methods, they tested to the lowest level that is possible with methods for detectable substances. In the future, the limits may be lower. At present in certificates, you have to say the limit you have found where it does not exist, thus our result. The lab confirmed that they found no trace of Chloropesticides.
Pollen Analysis			Various. The pollen spectrum of the honey corresponds to honey from Central-South America. Number of counted pollen: 500.

Item Tested	Range	Result	Comments
Phosphorous Pesticides		Not detectable	Tested 9. These pesticides revolve around Phosphorus functionality. The lab explained that in today's methods, they tested to the lowest level that is possible with methods for detectable substances. In the future, the limits may be lower. At present in certificates, you have to say the limit you have found where it does not exist, thus our result. The lab confirmed that they found no trace of Phosphorous Pesticides.
Total Antioxidant Status	NA	8.42 mmol/kg	
Glucose oxidase	0.3-11	16.6 µg/g	Glucose oxidase is an enzyme, which is produced by H_2O_2, hydrogen peroxide.
Iodine	0.016-0.021mg/kg	0.22 mg/kg	
Sulfate	43-151 mg/kg	132 mg/kg	
Microbiological Tests			
a. Aerobic mesophilic		CFU/g: 40	Aerobic mesophilic colony count—no range available but it meets the limit from Swiss hygienic legislation
b. Moulds	CFU/g: 10 to the fourth power	CFU/g: <10	
c. Yeasts	CFU/g: 10 to the fifth power	CFU/g: <10	
d. Mesophilic Sulphite-reducing clostridia	CFU/g: 10 to the fourth power	CFU/g: <0.3	
e. Bacillus cereus	CFU/g<10 to the fourth power	CFU/g: 20	
Sensoric findings			Sweet like honey, a little like Honeydew

Item Tested	Range	Result	Comments
Amino acids			
a. Asparagine	NA	5.0 mg/kg	Primary or Essential Amino acids found in Maharishi Honey: 1. Arginine 2. Histidine 3. Valine 4. Isoleucine 5. Lysine 6. Leucine 7. Phenylalanine
b. Cysteic acid	NA	Not present	
c. Aspartic acid	3-109	12.9 mg/kg	
d. Hydroxyproline	NA	Not found	
e. Glutamine	NA	61.2 mg/kg	
f. Threonine	4-38	16.1 mg/kg	
g. Serine	1-236	25.4 mg/kg	
h. Glutamic acid	13-190	13.1 mg/kg	
i. Proline	180-800	872.8 mg/kg	
j. Glycine	3-44	11.6 mg/kg	
k. Alanine	3-105	31.3 mg/kg	
l. Valine	2-105	19.3 mg/kg	
m. Cystine	0-61	Not present	
n. Methionine	0-27	15.1 mg/kg	
o. Isoleucine	1-11	10.2 mg/kg	
p. Leucine	3-57	15.1 mg/kg	
q. Tyrosine	8-69	38.0 mg/kg	
r. Phenylalanine	3-160	95.5 mg/kg	
s. Hydroxilysine	NA	Not present	
t. Tryptophan	NA	Not present	
u. Omithine	NA	0.7 mg/kg	
v. Lysine	1-62	16.1 mg/kg	
w. Histidine	6-107	11.3 mg/kg	
x. Arginine	0-58	18.5 mg/kg	
y. Methylhistidine	NA	Not present	
z. Taurine	NA	Not present	

Item Tested	Range	Result	Comments
Antibacterial Activity			positive (up to third dilution 1:8)
Flavanoids	NA	Not able to test	
Chloramphenical	NA	<0.1 mg/kg	The lab did this test twice and confirmed that there is no chloramphenical in this honey.
Water insolubles	NA	0.020 g/100g	
Ethanol	< 50 mg/kg <20 in Germany	6.9 mg/kg	The lower the result the better. A high level could mean fermentation in the Honey.
Glycerole	< 300 mg/kg	748 mg/kg	Hamburg lab stated that it is not harmful (2.3.04) Glycerol is an alcohol that is produced as a result of microbiological fermentation. This can occur only if moisture content of honey is too high. When the water content in honey is above 22%, the sugars in honey can begin to ferment. However, per United States Department of Agriculture (USDA) standards, US honey contains between 15-20% moisture (18.6% is the industry average in the USA) and at these low levels, fermentation cannot begin. There are no limits for Glycerol established internationally because the adherence to moisture level precludes the presence of fermentation products. The amount produced would be very small, particularly since honey is typically kept in small containers, at room temperature and in relatively low moisture levels. It would probably be unnoticeable to humans. (Comments from consultant for the National Honey Board in USA)