



Republika e Kosovës
Republika Kosova-Republic of Kosovo
Qeveria -Vlada-Government

Ministria e Bujqësisë, Pylltarisë dhe Zhvillimit Rural
Ministarstvo Poljoprivrede, Šumarstva i Ruralnog Razvoja - Ministry of
Agriculture, Forestry and Rural Development

Minister of the Ministry of Agriculture, Forestry and Rural Development,

Pursuant to Article 36, of the Law No. 02/L-111 on Apiculture (Official Gazette, No. 35/15.08.2008), article 8 sub paragraph 1.4, Article 15 Appendix 1, point 11 of the Regulation (GRK)-No.02/2021 on the Areas of Administrative Responsibilities of the Office of the Prime Minister and Ministries (30.03.2021) as well as Article 38, paragraph 6 of the Rules and Procedure No. 09/2011 of the Government of the Republic of Kosovo (Official Gazette, No.15, 12.09.2011), Issues the following:

ADMINISTRATIVE INSTRUCTION (MAFRD) - NO. 07 /2023
ON THE QUALITY OF HONEY AND OTHER BEE PRODUCTS

GENERAL PROVISIONS

Article 1
Purpose

The present administrative instruction defines the minimum conditions for honey quality, storage, methods for control and sampling for the realization of physical, chemical and biological analyzes of honey.

Article 2
Scope

The provisions of this administrative instruction are obligatory for implementation by the Food and Veterinary Agency, natural and legal persons, who deal with the basic production of honey, the minimum conditions for the quality of honey and honey products that are into circulation as well as quality control methods, sampling methods and physical, chemical and microbiological analyzes of products.

Article 3
Definitions

1. Expressions used in this administrative instruction have the following meaning:

- 1.1. **Honey** - means the natural product of bees that is produced from nectar of honey plants, secretions of plant parts or vital secretions of plants, which are collected by bees;
 - 1.2. **Honey in hives** - means honey deposited by bees in closed wax hives built by bees;
 - 1.3. **Drained honey** - means the honey obtained after the draining process;
 - 1.4. **Harvested honey** - means honey obtained by centrifugation;
 - 1.5. **De- crystallized honey** - means honey obtained after heating at a temperature that does not exceed 45 ° C;
 - 1.6. **Filtered honey** - means honey obtained by the filtration method, which removes foreign inorganic and organic materials and a part of pollen;
 - 1.7. **Industrial or processing honey** - means processed honey that is used in the baking industry or as an ingredient in food products that may not have the characteristics taste and aroma of honey that may be fermented or have begun the fermentation process;
 - 1.8. **Honey or nectar from leaves** - means honey obtained from the secretion of *Hemiptera* insects living on plants or from the secretion of parts of living plants.
 - 1.9. **Honey with hives or containing parts of hives** - means honey that contains hives or parts of hives;
 - 1.10. **Honey with nectar** - means the production of yielding plant nectar produced from the nectar of yielding plant nectar flowers that meet the conditions according to Appendix 1 of this Administrative Instruction, which has the specific aroma and taste of the yielding plant nectar;
 - 1.11. **FVA**, means the Food and Veterinary Agency;
 - 1.12. **Person**, means a natural and legal person.
2. Other expressions used in this administrative instruction have the same meaning as specified in the Law No. 02/L-111 on Apiculture.

Article 4

Composition and properties of honey

1. Honey consists of sugars, mainly: fructose and glucose, other substances: organic acids, enzymes and solid particles derived from the stages of honey formation. The color of honey varies, according to the type of honey, from colorless to dark brown, in a viscous fluid state, partially or completely crystalized, it has a taste and aroma of plant origin.
2. When placed on the market as honey or used in products intended for consumption, no ingredients are added, including food additives or other additions.

3. Expect from paragraph 2 of this article, products from point 3 of Appendix 1 of this administrative instruction may have foreign flavors that are the result of the presence of acids or enzymatic fermentation reactions or their deactivation.
4. Expect from paragraph 2 of this article, pollen or other components of honey can be removed from honey, expect when this is necessary to preserve the general organic or inorganic properties.
5. When placed on the market as honey or used in any production intended for human consumption, honey must meet the criteria defined in Appendix 1 of this administrative instruction.

Article 5 **Honey products and other bee products**

Honey products and other bee products that are used for human consumption or for the needs of the processing industry must meet the criteria defined in Appendix 2 of this administrative instruction.

Article 6 **The composition of honey according to the type of plant - monoflora**

1. In order that the honey to be named according to the type of plant or monoflora, it must contain at least the amount of insoluble sediment of pollen grains of the same plant species;
 - 1.1. Robinia *Robina Pseudoacacia L.* 20%;
 - 1.2. Lime *Tilia sp.* 25%;
 - 1.3. Swedish turnip *Brassica napus L.* 60%;
 - 1.4. Phacelia caraipella leaves *Phacelia tanacetifolia Benth.* 60%;
 - 1.5. Cultivated sunflower *Helianthus annuus L.* 40%;
 - 1.6. Cultivated alfalfa *Medicago sativa* 30%;
 - 1.7. Common sage *Salvia officinalis L.* 15%;
 - 1.8. Chestnut *Castanea sativa Mill.* 85%;
 - 1.9. Common heather *Calluna vulgaris Hull.* 20%;
 - 1.10. Rosemary *Rosmarinus officinalis L.* 30%;
 - 1.11. Lavander broad leafed *Lavandula sp L.* 20%;
 - 1.12. Bramble bush *Paliurus spinal* 20%;
 - 1.13. Winter savory *Satureja montona L.* 20%;

- 1.14. Common dandelion *Taraxacum officinale* Weber 20%;
 - 1.15. Strawberry tree *Arbutus unedo* L. 10% dhe
 - 1.16. Lemon *Citrus limoni* spp. 10%.
2. Honey to be named according to the type of plant for other yielding plant nectar must contain at least 45% insoluble sediments of pollen grains of the same plant species.

Article 7 Declaration

1. The producer of honey, honey products and bee products must have the declaration which contain the data defined in articles 37 and 38 of the relevant Law on Apiculture as follow:
 - 1.1. Designation of the production or trade name;
 - 1.2. Name and quantity of manufacture;
 - 1.3. Date of production (packaging) and expiration date;
 - 1.4. Net quantity of production;
 - 1.5. For honey origin from plant and method of production;
 - 1.6. If honey and honey products are mixed with other products, the ration of participation in % must be declared and
 - 1.7. Other data of interest to the consumer.
2. In addition to the data from paragraph 1 of this article, the declaration must also contain the data of the laboratory in which the quality control analyzes were performed.
3. The declaration for imported honey and honey products, in addition to the data defined by Article 37 of the relevant Law on Apiculture, must also contain the data that it is an imported product, be in accordance with the relevant Law on the use of languages in Kosovo and the name of the country where it was produced.

Article 8 Honey storage

Honey is stored in closed packaging in dry, dark and ventilated places at a temperature of 18 – 20° C and a relative air humidity of up to 80%.

Article 9
Parameters of physic – chemical analysis and waste

1. The methods of physic – chemical analysis and waste, which are used to control the quality of honey and other bee products, are done according to the definition of:

- 1.1. Reduced sugars;
- 1.2. Sucrose;
- 1.3. Moisture in honey;
- 1.4. Substances insoluble in water – gravimetric method;
- 1.5. Dry matter;
- 1.6. Acidity (pH);
- 1.7. Diastase activity;
- 1.8. Hydroxymethylfurfurol;
- 1.9. Pollen analyzes in honey;
- 1.10. Moisture in bee nectar and pollen;
- 1.11. Proteins in bee nectar;
- 1.12. Propolis extract and propolis dissolution in alcohol, water and other solutions.

2. Determination of antibiotic and pesticides in bees, honey and other bee products are regulated by the legislation in force for veterinary and food.

Article 10
Quality control of honey, honey products and other bee products

1. In order to determine the suitability of honey, honey products and other bee products with the quality standards required according to this administrative instruction, for the purpose of official control, the known analytical methods, the methods internationally approved by the European Community and Codex Alimentarius: PSO 7.2.K-26; PSO 7.2.K-27; DIN 10750; DIN 10759:2016-12; DIN 10753:2000-12; DIN 10743:2013-05 and DIN 10751-3:2000-02 and methods recognized by local institutions for standardization.

2. Internationally recognized methods for the control of physical, chemical and biological parameters of honey, honey products and other bee products are defined in Appendix 4 of this administrative instruction.

3. Analyzes for the official control of the quality and safety of honey, honey products and other bee products are taken by the Food and Veterinary Agency.

4. The procedures for taking samples and storing the results of the analyzes are done according to the relevant legislation in force for the procedures for taking official samples and storing the results of the analyses.

Article 11 Sampling procedure

1. Sampling of honey is done with the method of case and
2. The number of samples to be taken is determined based on the following table:

| Type of packing | Amount from which the sample is taken (unit) | No. of the units packaged which are taken as sample | Overall measures of taken samples (in grams) |
|--|--|---|--|
| Bulk in charging | 1 | 1 | 500 |
| | 2 up to 5 | 2 | 500 |
| | over 5 up to 60 | 3 | 1000 |
| | over 60 up to 80 | 4 | 1000 |
| | over 80 up to 100 | 5 | 1000 |
| If the number of charges is over one hundred, the sampling is increased by 1 (one). | | | |

Table 2: Taken of samples in jars

| Type of packing | The quantity from which the sample is taken | No. of packaging units which are taken as a sample | Total weight of sample taken (gr) |
|---|---|--|-----------------------------------|
| Jars | from 1 to 100 | 1 | 700 |
| | from 100 to 500 | 2 | 700 |
| | from 500 to 1000 | 3 | 700 |
| | from 1000 to 10,000 | 4 | 500 |
| If the quantity is greater than 10,000 jars, 1 (one) additional sample is taken from each of the 2500 jars | | | |

Article 12 Samples for official control

1. The number of samples for official control on an annual basis, according to the National Plan for quality and safety control of honey, honey products and other bee products, is 1 (one) sample for production up to 1 ton, while for production over 1 ton 2 (two) analyses.
2. Expenses for the control according to paragraph 1 of this article carried FVA and
3. Expenses for the commercial control of honey, honey products and other bee products are become by the beekeeper or operator.

Article 13
Appendixes

1. Component part of this Administrative Instruction are the following:
 - 1.1. Appendix 1 Honey used for consumption or used in products intended for human consumption;
 - 1.2. Appendix 2 Bee products;
 - 1.3. Appendix 3 Other products based on honey and other bee products;
 - 1.4. Appendix 4 Methods for the control of physical, chemical and biological parameters of honey, honey products and other bee products, and
 - 1.5. Appendix 5 Substances that are classified as residues for which honey must be analyzed.

Article 14
Implementation

The Food and Veterinary Agency is obliged to implement this administrative instruction.

Article 15
Punitive measures

Failure to implement this administrative instruction, natural and legal persons shall be fined for minor offences according to Article 2 of the Law No. 08/L-088 on Amendment and Supplements to Law No. 02/L-111 on Apiculture.

Article 16
Entry into force

This administrative instruction shall enter into force seven (7) days after publication in the Official Gazette of the Republic of Kosovo.


Faton PEÇI
Minister of the Ministry of Agriculture, Forestry and Rural Development

26 / 07 .2023

Appendix 1

Honey that is used for consumption or that is used in products intended for human consumption must meet the composition criteria as follows:

| | |
|--|---|
| Point 1. Amount of sugar | |
| a) Amount of fructose and glucose | |
| – Flower honey /Nectar | At least 60 g/100 g |
| – Honey, honey mixed with flower honey | At least 45 g/100 g |
| b) Amount of sucrose | |
| – General | At most 5 g/100 g |
| – For plants: (<i>Robinia pseudoacacia</i>), (<i>Medicago sativa</i>), (<i>Hedysarum</i> spp.), (<i>Eucalyptus camadulensis</i>), (<i>Eucryphia lucida</i>), (<i>Eucryphia milligani</i>) and (<i>Citrus</i> spp.) | At most 10 g/100 g |
| – For plants: (<i>Lavandula</i> spp.), (<i>Borago officinalis</i>) | At most 15 g/100 g |
| Point 2. Amount of water | |
| – General | At most 20% |
| – Scots heather (<i>Calluna vulgaris</i>) and honey for baking | At most 23% |
| – Honey for baking from Scotch (<i>Calluna vulgaris</i>) | At most 25% |
| Point 3. Amount of substances insoluble in water | |
| – General | At most 0,1 g/100 g |
| – Pressed honey | At most 0,5 g/100 g |
| Point 4. Electrical conductivity | |
| – Types of honey not listed below and their mixtures. | At most 0,8 mS/cm |
| – Chestnut honey and their mixture, with the exception of the species listed below: | At most 0,8 mS/cm |
| – Excluding plants: (<i>Arbutus unedo</i>), (<i>Erica</i> spp.), (<i>Eucalyptus</i> spp.), (<i>Tilia</i> spp.), (<i>Vulgaris Calluna</i>), (<i>Leptospermum scoparium</i>) and (<i>Melaleuca</i> spp.) | |
| Point 5. Free acids | |
| – General | At most 50 mEq acid in 1000 g |
| – Industrial honey | At most 80 mEq acid in 1000 g |
| Point 6. Diastase and Hydroxymethylfurfural (HMF) activity is determined after processing and mixing | |
| a) diastase activity (according to Schade) | |
| – general except honey for baking | At least 8 |
| – Honey with a low level of natural enzymes (eg, citrus honey) and with an amount of HMF not more than 15 mg / kg | At least 3 |
| b) HMF | |
| – general except honey for baking | At most 40 mg / kg (considering as it is under a) |
| – Honey of tropical origin and their mixture | At most 80 mg / kg |

Appendix 2

Bee products

Milk of bee

1. Milk of bee is a product of the mammary glands of worker bees with a milky color, stable consistency with a characteristic taste and aroma.
2. Milk of bee should not be extracted 72 hours after the larvae are planted and should not come from a closed hive.
3. The chemical composition (averages) of milk of bee is as follows water 66% sugar 13%, protein 11 – 12%, fat 5% and vitamin 6%

Trading:

1. Milk of bee can be marketed in its original form, as stabilized or lyophilized.
2. Milk of bee that is marketed in its original form must meet the following criteria:
 - a) Contain at least 30% dry matter and
 - b) The protein content should be at least 11%

Storage and sustainable term of bee milk:

1. Milk of bee in its original form should be stored in hermetically sealed glass containers in dark and cold places:
 - a) At temperature from 4° C up to 8° C sustainable term is 6 (six) months and
 - b) At temperature from -18° C up to -16° C sustainable term is 12 (twelve) months.
2. The sustainable term of the milk of bees is up to 2 (two) years.
3. Stabilization with stabilizers of chemical origin is not allowed.

Pollen

1. Pollen is a product of worker bees that is collected from flowers, usually in the form of granules located in the cells of the hives/bee bread.
2. According to the method of extraction, the pollen can be collected by means of equipment or extracted from the cells of the stalks. Pollen extracted from the pollen cells is called Preserved or Fermented Pollen.
3. Chemical composition (averages): Albumin 20%, Fat 19.8%, Sugar 28.4%, Mineral matter (Fe, Cu, Mn, Zn, Mb, Ba, P etc.) in traces and vitamins (A, B complex, P and E) on the trial.

Pollen trade:

1. Pollen is marketed in the form of dried or ground granules, it must be stored at a temperature of 18° C.
2. Pollen for trading must meet the following conditions:
 - a) As dried must keep at least 92% dry matter while fresh it must contain at least 60% dry matter;
 - b) It must have a characteristic taste;
 - c) Should not be dried at a temperature higher than 40° C;
 - d) It must not contain insects or parts of their organs, remain of insect excrement or waste from the disposal site;
 - e) It must not be spoiled or lose its organoleptic properties.

Pollen storage and sustainable term:

1. Fresh pollen should be stored in hermetically sealed packing at a temperature of up to 18° C in dark places, mixed with honey and lyophilized

2. The sustainable term of fresh pollen is 12 (twelve) months, while mixed with honey 24 (twenty-four) months.

Propolis

1. Propolis is a bee product consisting of a mixture of natural beeswax and resin that bees collect from woody plants.
2. Chemical composition (averages): Resin 55%, Essential oils 10%, Wax 30%, Other matter 5%.

Trading:

The propolis that is marketed must meet the following conditions:

- a) It must contain at least 35% extractives with alcohol;
- b) It must not contain tar, tar – related substances or tar soot;
- c) It must not contain more than 5% of bee or mechanical waste and
- d) It must not contain more than 30% beeswax.

Beeswax

1. Beeswax is a product of the wax glands of worker bees, which is used for the construction of hive cells;
2. It consists of complex mixtures of lipids and hydrocarbons and
3. It is extracted from the cell over of the cells

Trading:

Beeswax is trading as:

- a) Unpurified wax;
- b) Purified wax (Cera flava)
- c) Purified white wax (Cera alba) and
- d) Wax sheet.

Bee venom:

Bee venom is the secretion of the venom glands of worker bees.

Trading:

Bee venom is trading as a dried white crystallized powder.

Sustainable term:

The sustainable term of bee venom is 12 (twelve) months

Appendix 3

Other products based on honey and other bee products

Definitions:

1. Products based on honey and other bee products are a mixture of honey with other bee products: bee milk, pollen, propolis, etc. or a mixture of honey of other bee products.
2. Honey and other bee products can be added to medical plan or their extract (valerian, thyme, birch, etc.).
3. Products from points 1 and 2 can be in the form of drops, tablets, capsules, cream and syrup.
4. Honey to which other bee products are added is not considered Honey enriched with ingredients.

Honey with additives

1. Honey with additives is considered the mixture of honey with nutrient such as trees, extracts of trees and vegetables, dairy products, cocoa, vegetable fats, and medicinal plants or their extract also be added.
2. Honey with additives must contain at least 60% of honey in the finished product.

Quality requirements:

1. For the production of honey – based products and other bee products, honey and other bee products must meet the requirements according to the standards of this administrative instruction.
2. For the production of honey – based products and other bee products, the producer must have the production specification according to the type of production.

Appendix 4

Methods for controlling the physical, chemical and biological parameters of honey, honey products and other bee products and other bee products.

General

1. Reagents which are used for control analyses for the chemical properties of honey, honey products and other bee products must have the required properties of analytical purity, while the water must be distilled.
2. Two samples must be taken for each analysis.
3. The laboratory equipment used to control the chemical properties of honey, honey products and other bee products must be certified. The test must be done according to the technical recommendations of the equipment manufacturer.

Control of physical properties:

Determination of electrical conductivity

- The electrical conductivity is determined in an aqueous solution of honey with a content of 20% distilled water and 20% dry matter of honey at a temperature of 20 ° C .
- C. The results are expressed with the unit m S/cm – 1 (milliSimens/centimeter – 1).
- Electrical conductivity of honey containing 20 gr. LTH (dry matter) dissolved in 100 ml of distilled water according to the Vorwöhlov method is brought from 1 – 5 units.
- To perform the analysis, a solution of Potassium Chloride (KCl) M1 is used.
- Polarization should be as short as possible.
- The cell constant (K) is calculated according to the formula: $K = \underline{11,691 \times 1/G}$.
- The calculation of the electrical conductivity results is calculated according to the formula $\underline{SH = K \times G}$.

Control of chemical properties:

Determination of reduced sugar

- For determination of reduced sugar is used Fehling's solution A and B and invert sugar solution (10 g/l water) of pure sucrose are used for the determination of reduced sugar.
- For analysis, 25 g is needed, homogenized honey.
- For each analysis for the determination of reducing sugar with Fehling's solutions, it is done according to the type of solution. For laboratory conditions, depending on the way solutions A and B are combined, Fehling's solutions are divided into I and II.
- The calculation of the value of reduced sugar is expressed in g/100 g of honey, while the results are calculated according to the type of solution:

For solution I, the calculation is made according to the formula.

$$\text{Invert sugar content } C = \frac{25}{W_1} \times \frac{1000}{Y_1}$$

For solution II, the calculation is made according to the formula.

$$\text{Invert sugar content } C = \frac{2}{W_2} \times \frac{1000}{Y_2}$$

For the determination of reduced sugar, it is also allowed to use the Method according to Luff – Schoorlu

- For the analysis of reduced sugar according to the Luff – Schoorly Method, Luffov's solution is used

- Calculation of the sucrose content according to the Luff – Schoorlu Method is done with the formula:

$$\text{Invert sugar content (\%)} = \frac{VxV_2Xa}{OkxV_1xV_3X1000} \times 100$$

Determination of sucrose

- For the determination of sucrose, the Sucrose Hydrolysis Method is used.
- For analysis according to the Sucrose Hydrolysis Method, Fehligov's solution and B, the same as that used for the determination of reduced sugar, is used.
- The result of the analysis, the content of source in (g/100g) honey, is determined according to the formula:

Mass of sucrose (g/100g) honey = amount of sugar after inversion – amount of invert sugar after inversion x 0.95.

Determination of water in honey

- The refractometric method is used to determine the water in honey
- Refractometer is used to determine the water in honey according to the refractometric Method.
- The solution for the determination of water in honey according to the refractometric Method must be kept at a temperature of 20°C.
- To calculate the water content in honey according to the refractometer method, a standardized table is used according to laboratory practices.
- For the correction of the results when the temperature is higher than 20°C, the value of 0,00023 while for each degree lower than the temperature 20°C, the value is decreased by 0,00023.
- To calculate the results before and after drying the contents in the container, it is done with the formula:

$$\text{Water content} = \frac{\alpha - 100}{Ok}$$

Determination of substances insoluble in water

- The Gravimetric Method is used for the determination of substances insoluble in water
- For the determination of substances insoluble in water according to the gravimetric Method, a solution containing 20g is used. Honey in distilled water at a temperature of 80°C
- The solution is filtered in filters with hole dimensions of 15 – 40 µm, then the filter strip is cleaned with warm water up 80°C in order to clean the amount of sugar, which must be verified with the Mohru Method.
- The mass of the tape must be dried at a temperature of 135°C and then cooled.
- Determination the amount of substances insoluble in water is calculated according to the formula:

$$\text{Amount of matter insoluble in water} = \frac{100 \times \text{amount of water}}{\text{Amount of sample}}$$

Determination of the ash

- To determine the ash, the method of burning the ingredients at a temperature of 600°C;
- The quantity of the sample for the determination of ash in honey, honey products and other bee products is 5 – 10 gr.
- The sample is burned in the Bunsenov furnace at a temperature of 600°C.

- Before measuring the mass, it must be cooled.
- Amount of ash expressed in g/100 g. Is done according to the formula:

$$\text{Amount of ash (g/100 g)} = \frac{\text{Waste} \times 100}{\text{Weight mass}}$$

Determination of acidity

- The phenolphthalein titration method is used to determine acidity.
- The reagents used are: Sodium Hydroxide (NaOH) solution 0.1 mol/l without carbonate, 1% Phenolphthalein (m/V) neutralized in Ethanol and CO₂ – free distilled water obtained by boiling.
- The mass of the sample must be 10 g., mass of 10 g. Dissolved in 75 ml. Distilled water to which 0.1 mol of sodium hydroxide solution (NaOH) 0.1 and 4-5 drops of phenolphthalein are added as indicators. The color change of the solution should occur within 10 seconds.
- Acidity is expressed in millions of acid/kg and is calculated according to the formula:

$$\text{Acidity} = 10 \times V$$

- Acidity can also be determined with pH meter. The average of pH of Honey is 8.3.

Determination of diastase activity

- The determination of diastase is based on the hydrolysis of a solution containing 1% starch enzyme mixture and 1 g. Honey at a temperature of 40 °C for 1 (one) hour.
- The reagents used for the analysis are: Iodine mother solution, Iodine solution which is obtained by mixing 20 g. Potassium iodide with 30 – 40 ml. Water to which 5 ml is added. Iodine stock solution, Acetate buffers with pH 5.3, Sodium Chloride (NaCl) solution, Soluble Starch and Water for Starch solution.
- The sample must be buffered before mixing with Sodium Chloride.
- Diastase activity is expressed in ml of 1% solution per g. Honey at a temperature of 40 °C.
- The number of diastases is calculated according to the formula:

$$\text{Number of diastases} = \frac{60}{t} \times \frac{0,10}{0,01} \times \frac{1,0}{2} = \frac{300}{t}$$

Determination of hydroxymethylfurfural activity

- To determine the activity of hydroxymethylfurfural, it is done according to Winkler's photometric method or White's method
- The reagents used according to Winkler's photometric method are: Barbituric acid, P-toluidine and distilled water without O₂.
- Calculation of hydroxymethylfurfural according to Winkler's photometric method for mg./100 units is done according to the formula:

$$\text{mg HMF/100g. Honey} = \frac{\text{absorption} \times 19.2}{\text{Residue thickness}}$$

The determine the activity of hydroxymethylfurfural according to White's method, it is done through the absorption of Ultra Violet (UV) waves in the spectrum of 284 nm (manometer).

- The reagents used to determine the activity of hydroxymethylfurfural according to White's method are: Carrez I, Carrez II and strong Methyl bisulphide solution (NaHSO₃).

- Interpretation of results is done according to standardized laboratory tables.
- The results are calculated according to the formula:

$$\approx 49,7 = \frac{126 \times 1000 \times 1000}{16830 \times 10 \times 5} = \text{factor}$$

Biological analyzes of pollen in honey

- For the biological analysis of pollen in honey, 10g are taken, well mixed honey which dissolves in 20ml. Water which the paste is placed in the water bath for heating up to a temperature of 45°C. The warm mass is centrifuged for 15 min. At a speed of 3,500 revolutions. A portion of the sediment is separated with a micropipette and placed on a 15 x 20 mm scaled glass slide, which dries at 45 °C. After slaughter, coloring is done with a solution of fuchsin in gelatin and the meat is dried. Pollen particles are counted with a microscope with a magnification of 200 – 600 times.
- Counting is done according to the type of pollen according to the plant.
- During sample preparation, 2 (two) samples are prepared in parallel.
- According to this method, the botanical origin of honey is also determined.

Determination of water in bee milk and flower pollen

- The control method is based on the predistillation of water from the sample for analysis, which is carried out with specialized equipment and with organic solutions that do not create a reaction with water. The amount of predistillate is measured with a graduated scale.
- For water separation, the apparatus according to Dean – Stark is used.
- The amount of water in pollen is calculated according to the formula:

$$\% \text{ water} = \frac{100 a}{B}$$

Determination of proteins in bee milk

- The control method is based on the biuretic reaction, i.e. the reaction of copper in peptide bonds, during which a violet color is created, which is registered with a spectrophotometer at 546 nm.
- The reagents used for the preparation of the solution for spectrophotometry are: biuretic reagent, sodium hydroxide solution (NaOH) = 0,2 mol/l, stabilizer solution (stabilizers) based on potassium iodide and protein standard with basis from the blood serum for which the amount of proteins or crystallized human albumins has been determined.
- The amount of protein is calculated according to the formula:

$$\text{Protein percentage (\%)} = \frac{(A_v - A_s) \times 100}{\alpha}$$

Determination of dry matter of propolis in alcoholic solution

- Ethyl alcohol is used for the determination of propolis extract in alcoholic solution.
- The amount of 5g of propolis is dissolved in 50g of methanol and left to stand for 12 hours at room temperature. The solution is filtered, 3g are taken from the filtrate. And they are dried at a temperature of 105°C. After heating, the sample is cooled and measured.
- Calculation of the amount of dry matter of propolis is done according to the formula:

$$\text{Dry matter percentage (\%)} = \frac{100 \times b \times c}{d \times (a - c)}$$

Appendix 5

Substances that are classified as residues for which the honey must be analyzed

| Substances that are classified as residues for which the honey must be analyzed: | |
|--|---|
| A6 | Chloramphenicol + Nitrofurans + Nitroimidazoles |
| | Chloramphenicol |
| | Nitrofurans |
| | Metabolites of Nitrofurans |
| | Metabolites of Furaltadone |
| | Metabolites of Furazolidone |
| | Metabolites of Nitrofurazone |
| B1 | Antibacterial substances |
| B2c | Carbamates |
| | Pyrethroids |
| B3a | Organochlorine compounds including PCBS |
| B3b | Organophosphorus compounds |
| B3c | Chemical elements |
| | Residues from antibiotics |
| | Residues from pesticides |