BIOLOGICAL HONEY AND ITS ATTAINMENT PRINCIPLES

Şt. Lazăr[1], O.C.Vornicu[2]

[1]Faculty of Animal Sciences, University of Agricultural Science and Veterinary Medicine „Ion Ionescu de la Brad" Iasi, Romania
[2]O.C. Beekeeping Bases, Iasi, Romania

Abstract

In order to obtain biological beekeeping products, some safety principles are required:

- *the environmental quality;*
- *the biological material and beehive quality;*
- *the gathering conditions and bee feeding;*
- *the use of some adequate technology in order to obtain honey, its harvesting and packaging;*
- *the use of prophylactic measures and the specific treatment used in order to obtain ecological products, and the application of some technological processes and curative actions that will not influence the ecological properties of the honey;*
- *the use of some quality regulations regarding the organoleptical and fizico-chemical properties of honey;*

Key words: biological honey, regulations, quality, ecological products, properties

At this stage, there is a greater concern for obtaining ecological agro-alimentary products that require very precise regulations to obtain natural products, unpolluted.

The technologies used in this purpose are usually the known ones, but they have to respect some principles related to the surrounding environment in the obtaining of biological beekeeping product, using some adequate technologies to obtain, harvest and package honey, respecting some quality regulations of honey regarding the contents of a series of chemical composition elements, prophylactic measures and treatment specific to obtaining ecological products and applying some technological processes and cleaning actions that will not influence the ecological quality of the honey.

To ensure the success in obtaining some ecological products, the use of some integrated technologies that will not affect in any way the tropic chain soil-plant-bees-beekeeping product is necessary. For example – ecological honey will not be obtained through the participation of bees that harvest plants that have been pesticide treated, or other chemically treated plants or soil etc.

1. Regarding the apiary spot choice

The apiary must be placed in an area that has to ensure some minimal distances necessary to ensure the conditions of obtaining ecological beekeeping products. On a 1.5 km range, no treatment to the agricultural crop (biological agricultural area or "wild") is allowed. Placing the apiary at a distance smaller than 3 km towards any polluted risk area is not permitted, and for the crop in this area that ensures the nectar and pollen sources for bees, technologies specific to obtaining ecological products have to be used.

The inspection and certification organizations can establish supplementary measures to insure these conditions.

2. Regarding the biological material

When choosing the biological material, we have to take into account its adaptation capacity to the local environment conditions, its vitality and resistance to diseases. The best choices are the European breeds and their local varieties.

The new families have to be constituted by dividing the best families or by

acquisition of swarms or families from institutions that respect the methodological regulations to obtain ecological honey. If not, a conversion period of one year has to the covered, period in which the beeswax is replaced, and naturally, the bees are replaced too. The queens and the respective swarms will be placed in beehives with beeches acquisitioned from the ecological production units. If this is respected, the conversion period is not necessary.

3. Regarding the beehives and the other beekeeping equipment

The beehives have to be manufactured from wood. Some annexes of the hives or other beekeeping equipment have to be manufactured from natural or neutral material, according to environment or the beehive products.

Treating the beehives for protection with substances based on carbonyl or creosols is not allowed, but impregnation with microcrystalline beeswax is accepted at a temperature between 135-150ºC. Impregnates and vegetal paints, vegetal, animal and mineral oils and wax, natural and mineral pigments, mineral salts not toxic for the environment and for the products of the hives, natural and calcined earth can be used. In the interior of the beehives only natural products are used, as: propolis, beeswax and vegetal oils.

For the artificial honeycomb bought from the outside, the buyer has to guarantee the strict conditioning specific of the biological wax. So, in order to rebuild the necessary honeycomb, the beekeeper can use wax from lids or from the frames bought from the stores in the ecological production units and only in special situations, when on market there is no ecologically produced beeswax, the approval of the inspection and certification institutions is necessary with the condition that this is from the wax lids resulted from the honey comes towards extraction.

Only recommended products will be used for removing pests, and for cleaning and disinfecting the beekeeping inventory. For the protection of deposits and of honeycomb against moth, sulfuric acid in the form of bands for burning and escape of SO_2 can be used; for the disinfection of the inventory acetic acid or sodium hypochlorite can be used in the case of Nosema Apis infestation. An efficient method of destroying the spores of *Nosema Apis* is the sterilization of the corpses. Sodium lye, potassium lye and sodium hypochlorite can be used for cleaning the inventory.

4. Regarding the bee feeding conditions

Bee feeding has to be done with honey and pollen. Honey and pollen left in the beehive as food is preferable to be from the respective family and to be given in sufficient quantities to ensure the survival of the colony during the winter period.

Artificial feeding of the bees has to be done with honey obtained from the ecological apiculture and, if possible, from the same apiary. In exceptional situations, when there is no biological honey that could confer enough sanitary guarantees, the feeding with bio replacements is accepted.

The inspection and certification institutes may authorize, in artificial feeding through derogation from the before mentioned stipulations, the use of sugar syrup or molasses obtained from ecological agriculture instead of the ecologically produced honey. Artificial feeding of the bees is allowed between the last harvesting of honey and 15 days before the start of the harvesting in the next year. Bee feeding with approved products through derogation will be registered in apiary books regarding the product type, the dates, the quantities and the hive in which they are used. Bio replacements can be used too, produced in a centralized mode, 7 kg S.U. replacement for each family is recommended, distributed for two winters, and in particular cases, such as coniferous manna areas, 10 kg S.U. can be administered. In the areas with continental or mountain climate, families that are unified may benefit of about 10 kg S.U. bio replacements.

5. Regarding the prevention of diseases and applying treatments to bees

Special attention will be granted to the prevention of disease appearance at bees through measures of organizational, biological and hygienic order.

After these preventing measures are taken, if the families get sick, they will be

immediately treated or moved in isolation hives. Medicines that will be used have to correspond to the ecological production methods. Phytotherapeutical and homeopathic products are recommended in obtaining ecological products. If these products do not prove to be effective in treating some diseases, allopathical chemical substances of synthesis can be used, under the responsibility of authorized personnel, without harming the principles of obtaining the ecological products.

The use of allopathical chemical substances of synthesis in a preventive purpose is not allowed. By derogation, the formic acid, lactic acid, acetic acid and oxalic acid, and other substances as: menthol, thymol, eucalyptol, camphor will be used only in case of *Varroa jacobsoni* infestation. Other treatments applied to bee families will be authorized by the inspection and certification institutions in conformity with valid regulations.

In the period with allopathical chemical substances of synthesis treatment, the colonies have to be treated in isolation hives and all the wax has to be replaced with wax got in conformity with the ecological production regulations. After that, a one year conversion period will be applied.

All the treatments, diagnosis and posology details, administration mode, treatment duration and legal waiting period, will be registered in books and will be communicated to the inspection and certification institutions before commercializing the product as being ecological.

6. Regarding the quality standard and antibiotic residues, pesticides, heavy metals and honey contamination level

For the honey marketed in the world the Codex Alimentarius Standards are considered, while the European Regulations for honey foresees the European Norms, generally close to the first. In the Alimentarius Codex there are specific paragraphs about honey examination, its hygiene and specious honey glucides (tab. 1).

Table 1
Honey quality standard in conformity with the C.L. Regulations 1998/12 – S from Alimentarius Codex and European Union Regulation 96/0114 (C.N.S.)

Quality criterion	**Codex regulations**	**E.U. regulations**
General **humidity**	≤21g/100g	≤21g/100g
Black grass, clover	≤23g/100g	≤23g/100g
Pastry honey	≤25g/100g	≤25g/100g
General **reducing sugars**	≥65g/100g	≥65g/100g
Mildew, mixtures of mildew and floral	≥45g/100g	≥60g/100g
Xanthorrehoea pr.	≥53g/100g	≥53g/100g
General **sacchorose**	≤5g/100g	≤5g/100g
Robinia, Lavandula, Hedysarum, Trifolium, Banksia gr., mildew and mildew mixture, *Medicago, Eucalyptus cam, Banksia men, Rosemarinus*	≤10g/100g	≤10g/100g
Calothamnus san, Eucalyptus scab, Banksia gr., mildew and mildew mixture	≤15g/100g	
General **materials insoluble in water**	≤0.1g/100g	≤0.1g/100g
Pressed honey	≤0.5g/100g	≤0.5g/100g
General **mineral elements (ashes)**	≤0.6g/100g	≤0.6g/100g
Mildew, mildew mixture, chestnut honey	≤1.2g/100g	≤1.2g/100g
Acidity	≤50mlg/kg	≤40mlg/kg
Diastase activity (on Schade scale) after conditioning and mix	≥8	≥8
General (E.U. retail commerce) with low content of enzymes	≥3	≥3
HMF after conditioning and/or homogenizing (regulations) E.U. detailed	≤60mlg/kg	≤40mlg/kg

Starting from 200 for the food and other products in European Union which are to be commercialized the changing of some maximum limits of the residues (M.R.L.) has

become necessary, paying more and more attention to the negative effects made by the residues or their metabolites which can be found in the products consumed by people.

Firm Standard 150/1-2001 stipulates the acceptance of the maximum limits of antibiotics such as: streptomycin 20 ppb (μg/kg) by Eliza and H.P.L.C. methods; tetracycline 10 ppb by Eliza and microbiological; sulfonamides 10 ppb by chromatography in thin layer method.

For pesticides the accepted maximum limits are: αHCH 0.01ppm (mg/kg); βHCH 0.01 ppm; Lindan 0.01 ppm; DDT total 0.05 ppm; PCB 0.20 ppm; other organochlormate 0.20 ppm; residues of organo-phosphoric pesticides 0.02 ppm.

For heavy metals, the maximum limits accepted are: lead 0.20 ppm; arsenium 0.10 ppm; copper 0.50 ppm; cadmium 0.20 ppm; zinc 3.00 ppm; mercury 0.01 ppm.

The maximum level of radioactive contamination accepted is of 10 Bq/kg.

RECOMMENDATIONS:

- to establish methods of evaluating the level of environment pollution and its impact on the quality of beekeeping products;
- to create a protocol on the national level regarding the methods of testing the beekeeping products, compatible to the ones in the E.U. and the other international forums (Alimentarius Codex, F.A.O., Honey International Commission);
- the necessity of creating some zone centers for testing the beekeeping products and for diagnosing the biologic material used in the ecological beekeeping;
- the necessity of mentioning the zone where the honey and the beekeeping products come from in order to avoid the possibility of being falsified on the basis of the characteristics of the respective zone;
- To produce new technologies or improve the existing ones in order to maintain the health of the colonies and obtain harmless products.

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