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# ANALYSIS OF ECONOMIC ASPECTS OF ORGANIC BEEKEEPING PRODUCTION

Yuliia Aleskerova<sup>1</sup>, Volodimir Todosiichuk<sup>2</sup>

**Abstract.** *The purpose* is to study and analyse the prospects for development of economic aspects of organic beekeeping in Ukraine. The article deals with the main trends of greening of life, in particular those related to the beekeeping industry. The most promising activities are outlined and a number of factors that can be used by the entities to form the entrepreneurial potential of rural theories are identified. Beekeeping is the oldest human industry with a centuries-old history and Ukraine is recognized in the world as the homeland of cultural beekeeping. This branch of agriculture in the country provides both pollination of entomophilous crops and the production of various beekeeping products for the needs of the population and for various industries. *Methodology.* The expediency of introducing organic beekeeping methods is reflected. Requirements for production of organic beekeeping according to the Ukrainian legislation and regarding the requirements of the EU are covered. *Results.* The certification procedure is described and the certification bodies operating in the territory of Ukraine are characterized. The trends and the state of the organic beekeeping market are reflected, the concepts of “price” and “value” of organic produce are defined. A number of factors affecting the functioning of the beekeeping industry were identified, risks identified and measures taken to minimize them. *Value/originality.* For effective functioning of the industry it is suggested to use marketing channels and marketing strategies based on foreign experience and taking into account the Ukrainian specificity. The problems of organic beekeeping have been generalized, the main priorities have been identified and the ways of realization of the set tasks have been proposed. Therefore for the effective functioning of the organic beekeeping industry, it is first necessary: to use available natural and climatic potential (protected areas and certified agricultural lands); to develop special regulations and certification system that are adapted to international and European requirements and implement them in production and society; to create an effective mechanism of state support for enterprises that transform their own production and are in the transition period (low credit rates, legal support, compensation for the cost of organic certification) and control; to support and stimulate the development of the organic market through the dissemination of information, the establishment of advisory services and research and educational centers; to enter the international market of organic products as a finished product with its own brand and added value and not just raw materials. All this will increase the number of organic enterprises, employment and the income of producers.

**Key words:** market, beekeeping, organic produce, efficiency, margin, strategy, marketing management, price and value, certification, risks.

**JEL Classification:** M31, L66, Q13

## 1. Introduction

In today's world the main trends in the development and improvement of quality of life are the greening of life, the economical use of resources and the development of technologies for the production of food safe for life. Food safety

is becoming an important factor in consumer choice, because agricultural products produced without the use of fertilizers, chemicals and harmful feed additives are not only a guarantee of environmental cleanliness but also human health.

*Corresponding author:*

<sup>1</sup> Vinnytsia National Agrarian University, Ukraine.

E-mail: aleskerovaaleskerova@gmail.com

ORCID: <https://orcid.org/0000-0003-3072-4854>

ResearcherID: M-6099-2018

<sup>2</sup> Vinnytsia National Agrarian University, Ukraine.

E-mail: tvltv2@ukr.net

ORCID: <https://orcid.org/0000-0002-3498-1295>

Organic production is the most promising activity in rural areas under these conditions. In particular, the formation and development of the market of organic beekeeping products plays an important role. Effectively using the unique qualities of business entities, opportunities, resources and competencies of the rural socio-economic system can contribute not only to the promotion and development of organic beekeeping but also the formation of entrepreneurial potential of rural areas. The margin in the production of organic products, including beekeeping products is several times higher than in the production of traditional ones which is an additional stimulus and factor for the growth of entrepreneurial potential of both rural areas and the economy as a whole. In addition, by providing the population with quality, safe food, organic production helps to improve the health of the nation and increase the level of food security of the country.

The purpose is to study and analyse the prospects for development of economic aspects of organic beekeeping in Ukraine.

Beekeeping is the oldest human industry with a centuries-old history and Ukraine is recognized in the world as the homeland of cultural beekeeping. This branch of agriculture in the country provides both pollination of entomophilous crops and the production of various beekeeping products for the needs of the population and for various industries.

As of 2019, there are about 90 thousand beekeepers in Ukraine who serve 2 million bee colonies. The honey base in Ukraine has 6 million hectares of sunflowers which provide a honey harvest of about 40 kg / bee colony. Analysis of the structure of honey produced in Ukraine shows that the main share of it is sunflower honey (65%) and the main producers of honey in the country are Vinnytsia, Donetsk, Dnipropetrovsk, Zaporizhzhia, Zhytomyr, Mykolaiv, Poltava and Kirovohrad regions, providing 70% of all Ukrainian honey production.

Being the leader in the ranking of European honey producers and the third largest exporter in the world (67.8 thousand tons), Ukraine offers encouraging prospects for exports and foreign exchange earnings (133 million USD). Producing 6% of the world's honey (more than 100 thousand tons of honey per year), Ukraine supplies honey to 35 countries (the USA, Germany, Poland).

68 producers and processors of honey have an export permit. The largest share of exports (75%) falls on Poland and Germany. This is partly due to the signing of an Association Agreement with the EU which provides for the abolition of import duties on most products exported from Ukraine. For honey (commodity code 040900) the rate of import duty is 0% when applying quotas. The size of quotas under the Agreement is – 5000 tons/year with a gradual increase over 5 years to 6000 tons/year. For already used quotas the rate is 17.3%. In order to obtain preferential access to the EU market (reduction of the import duty rate) it is necessary to confirm the origin (“nationality”) of the goods from Ukraine and obtain a Certificate EUR.1. The rule of origin “Goods made entirely in Ukraine” applies to honey, i.e. only honey produced entirely in Ukraine.

## **2. Economic crisis effects on consumer behaviour**

The main consumers of honey in the world are the United States and the European Union, which take almost equal positions. Ukraine has more than doubled its honey exports to Europe in the last five years but China remains the main supplier of honey to the EU. Argentina is also intensifying competition which has increased honey supplies to the EU by almost 3.5 times. However, the increase in Ukrainian honey production by six times since 2012 has not been confirmed by the number of bee colonies. In general, the dynamics of exports had a positive trend until 2017 but in 2018 – exports of Ukrainian honey decreased by 98 million USD or 49.4 thousand tons which is 27%. Losing the leading position of the largest exporters of honey, in 2018, Ukraine took fifth place against third place in 2017. This year, according to preliminary data, the situation has improved somewhat. Thus, in January-October 2019, 37.9 thousand tons of honey worth 72.5 million USD were exported, which is 43% more than the same period in 2018. It should be noted that export pricing in the honey market is carried out in a market environment formed by key global players.

Many farmers understand the feasibility and importance of combining two components of agricultural production in the way that the technology of production and beekeeping as an effective means of increasing yields and improving the quality of fruits, vegetables, industrial and

other crops. Thus, beekeeping can be considered as a significant ecological and economic factor of agricultural production. Organic beekeeping is of particular importance in this regard; it combines not only as close as possible to natural methods of beekeeping but also to confirm the compliance of these methods with the established rules and requirements. The emergence and formation of the sphere of organic agricultural production is due to the global needs of balanced development of the agro-ecological system. Organic production is a holistic system of management and production of food products in combination with the preservation of biological diversity of nature, high standards of proper animal husbandry, technologies for the production of products made from processes of natural (organic) origin and from natural substances.

The world leader in the production and export of organic honey is Brazil (about 40 thousand tons, up to 20 thousand tons of exports), Argentina – 1300 tons, Mexico – 1150 tons. Turkey, which produces more than 400 tons of organic honey, is actively following this path. Among European countries, organic production in Bulgaria is developing at a rapid pace. The Association of Organic Beekeeping of this state has significantly expanded over the decades and already has more than 45,000 bee families in production. Armenia has managed to sell organic honey to South Korea.

In Ukraine on August 2, 2019, the Law “On Basic Principles and Requirements for Organic Production, Circulation and Labeling of Organic Products” came into force, which defined the basic principles, requirements of legal regulation of the organic market, legal bases of central executive bodies, subjects of the market of organic products and directions of state policy in the specified spheres, including beekeeping products. According to this law, all producers of organic products and certification bodies must be entered in the relevant registers to operate in the market of organic products of Ukraine by February 2, 2021. To date, the so-called transformation period is underway to introduce appropriate adjustments and implement all legal and organizational procedures of market participants.

This document is valid until June 6, 2020, then the Procedure (detailed rules) of organic production and circulation of organic products, which contains additional requirements for organic beekeeping, come into force. Let us consider these

rules and their difference from the current ones in more detail.

Accordingly, when selecting bee breeds, it is not required to use only local ecotypes of honey bee (*Apis mellifera*) and it is recommended to give preference to local ecotypes of honey bee (*Apis mellifera*) in accordance with the requirements of breed zoning. And in the case of renewal of apiaries it is allowed to replace not 10% but 20% of queens and swarms with inorganic queens and swarms per year, provided that the queens and worker bees are placed in hives with honeycomb of organic origin. However, this requirement does not apply to the transition period for apiaries.

The rules of the transition period, during which the wax should be replaced with wax from organic beekeeping, are described in more detail. The use of wax of inorganic origin is allowed during the formation of apiaries or during the transition period to the extent necessary to ensure the viability of bee colonies, only if the wax of organic origin is not on the market of organic products when the wax is not contaminated with substances prohibited for use during production of organic products or wax is obtained from sealed cells.

The requirements for the location of apiaries within a radius of three kilometers to the sources of nectar and pollen of mainly organic plants and/or wild plants, forests or plants that have not been treated with substances prohibited for use in organic production have not changed. However, the requirements of the Law of Ukraine “On Beekeeping” must be additionally taken into account when placing apiaries. It is determined that hives are made of natural materials and not mainly of natural materials that do not pose a threat to the environment or agricultural products. The requirements for the production of beeswax in organic units and the use of only such natural products as propolis, wax and vegetable oils remained unchanged. This part already prohibits the treatment of the inner part of the hives with paints and/or other chemicals. During the pumping of honey, the use of chemically synthesized repellents is prohibited, as well as the pumping of honey from honeycombs in the presence of brood. As in the previous rules it is determined that after the end of the productive season in the hives should be left for the winter stocks of organic honey and pollen, sufficient for the life of bees. Feeding of bee colonies is also prohibited with the similar exception when the



survival of bees is endangered due to climatic conditions between the last pumping of honey and 15 days before the start of the next honey harvest period. It is allowed to feed bees with organic honey, organic sugar syrup or organic sugar. To protect frames, hives and honeycombs, in particular from pests, the detailed rules allow the use of only rodenticides (only for use in traps) and the relevant substances approved by the detailed rules and the certification body. The use of physical methods for disinfection of apiaries (steam or open fire) is maintained from June 2020. Destruction of drone brood is allowed without changes only to prevent the spread of the *Varroa* destructor mite. The requirements for the treatment of bee colonies and the application of a transition period to them remained similar. Operators engaged in organic beekeeping will be required under the new requirements to record in the logbook in addition to information on the use of feed (type, date, number and hives where they are used) and data on the withdrawal, processing and storage of beekeeping products and information on honey extraction and honey pumping operations. Thus, additional requirements include the obligation of operators to record information on the use of feed, the process of production of beekeeping products and the movement of organic products. However, in terms of requirements, detailed rules for the production of organic products (raw materials) of beekeeping are more detailed, in particular, the requirements for the placement of apiaries and feeding bees in the winter.

Compliance with the rules of production by operators is confirmed by annual certification. The certification body is chosen at the discretion of the manufacturer depending on a number of factors and is confirmed by the conclusion of the contract. If the circulation or production of organic products meets the established requirements and current legislation, the manufacturer is issued a special certificate for a period of 15 months. The certificate indicates the name of the enterprise, the code of the state register, industry, status of organic products, the validity of the certificate and information about the authority that issued it. And if the products are planned to be exported, an agreement with a foreign certification body is additionally concluded.

The certification decision is made after inspection in the presence of all necessary documents. Therefore, an important point of successful

completion of the inspection is the degree of preparation of the operator for inspection. From the moment of making a positive decision comes a transitional (conversion) period, lasting from one year. It should also be borne in mind that the cost of certification depends on a number of factors: type of production, quantity of land and producers certified and includes directly the cost of the certificate and laboratory tests. Inspections are not included in the cost of certification and are paid extra. The procedure for certification of production and circulation of organic products is approved by the Cabinet of Ministers of Ukraine and all operators of the organic products market must be included in the register of organic producers, which is regulated by the Ministry of Agrarian Policy. Draft regulations are being developed. It should also be borne in mind that the duration of the transition period in beekeeping is from one year during which products cannot be labeled and sold as organic.

Each country that produces organic honey must first comply with national standards for organic products if it is an exporter, then the requirements of the importing country. The standards specify the requirements for technologies of maintenance, breeding and production, rules and procedures for certification and control.

As of 2020, there are 18 certification bodies on the Ukrainian market; organic products certified by them can be easily exported from Ukraine to the European Union where the cost of these products is much higher. Only one of the certification bodies is Ukrainian – “Organic Standard”. It was founded in 2007 as part of the Swiss-Ukrainian project “Organic Certification and Market Development in Ukraine”. Its main activity is inspection and certification of organic production of crop production, animal husbandry, harvesting of wild products, beekeeping, aquaculture, fertilizers and their export-import. “Organic Standard” certifies beekeeping products based on the requirements of importing countries. In 2019, about 70 apiaries are to be certified by Organic Standard. Basically these are farms that keep from 100 to 1000 hives. Not only producers but also honey processors which are large exporters, are certified. According to Organic Standard, in 2018 about 400 tons of organic honey were exported.

They regulate the requirements for the origin, reproduction of animals, the conditions of keeping animals (requirements for the location of

apiaries, hives, wax and the use of inorganic wax), fattening and feed (origin of bee feed, features of bee feeding), treatment and health (features of bee care, disease prevention, treatment in case of illness or infection of families), production and processing (requirements for pumping honey, parallel production in beekeeping, requirements for equipment and utensils used in the production process). Criteria that differ or are not reflected in the above rules are the following:

- the competent authority may grant temporary permits for the reproduction of apiaries by inorganic bees only in the event of high bee mortality caused by health problems or cataclysms in the absence of the possibility of using bees from organic apiaries;
- apiaries should be located at a sufficient distance from sources that can cause contamination of bee products or deterioration of bee health. The apiary location area is registered (on a map of the appropriate scale with a list of hive locations) and the hives are identified. The certification body should inform about the movement of apiaries in the agreed term;
- bee wax for new families must be produced in organic units and accordingly, not contaminated with substances that are not allowed for use in organic production;
- the use of chemically synthesized traditional veterinary drugs or antibiotics for prophylactic purposes is prohibited;
- in order to protect frames, hives and honeycombs, in particular from pests, it is allowed to use only rodenticides (only for use in traps) and appropriate products;
- if despite all preventive measures, families become ill or infected with parasites, treatment should be started immediately and if necessary families should be isolated;
- veterinary medicinal products may be used in organic beekeeping only if such use is permitted in the Member State concerned;
- during the pumping of honey it is forbidden to use chemically synthesized repellents. It is also forbidden to pump honey from honeycombs with brood;
- information on the removal of frames and pumping of honey is entered in the log of the apiary;
- if it is necessary to enable or maintain organic production for a particular farm in the presence of climatic, geographical or structural constraints, the operator may have organic and non-organic

beekeeping units on the same farm for pollination, provided that all organic production rules are complied with except regarding the location of apiaries. In this case, the product cannot be sold as organic.

Buildings, equipment and utensils must be properly cleaned and disinfected to prevent cross-infection and the spread of disease carriers.

### 3. Differences in consumer spending behaviour among age groups

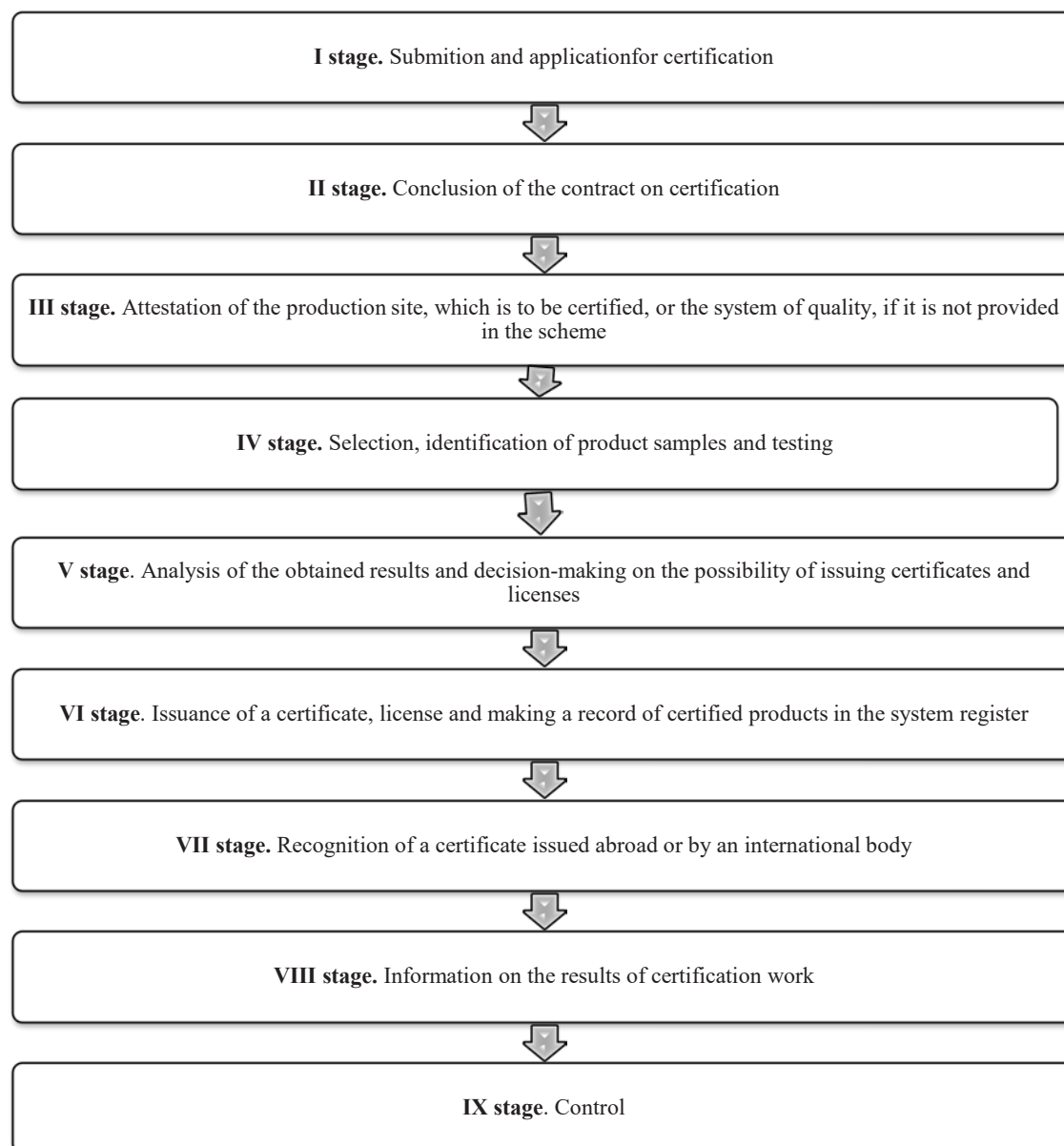
A transition period is established from the moment of application by the owner to the acquisition of the status of an organic apiary. Further, the organic certification of the apiary is carried out annually on a voluntary basis. The stages of certification of organic agricultural products in Ukraine are shown in Figure 1.

In general, according to the press service of the Food and Agriculture Organization of the United Nations (FAO), the price of Ukrainian honey is one of the lowest in the world despite the third place among world exporters and is only 1.98 USD per kilogram. The main reason for the low price is that 99% of all honey is exported in barrels, without brand and in fact without added value. Another reason is that about 90% of exported honey is monofloral honey from sunflower. This factor does not take into account the consumer demand of the largest countries importing organic honey. European consumers are focused on a diversity of varieties of honey and innovative products with new interesting flavors (with spices, nuts and berries, herbs, hot honey with pepper, cream-honey, etc.). Using the natural and climatic potential in 2018 Ukraine exported 71% of its honey to the EU, where demand for this product is growing. Thus, European prices for flower honey – about 5.3 EUR / kg, for cream honey – 6.6 EUR/kg. Organic honey is much more expensive: flower honey – 13.3 EUR/kg, and monofloral acacia – 14.1 EUR/kg.

When buying organic products, the consumer pays not only for it but also for the value formed in his or her imagination about the product – quality products, healthy food, health of the buyer and his or her family, environmental protection, reproduction of natural resources, fashion and more. This value in our opinion is the basis of modern pricing of organic products (Figure 2).

Therefore, the value of organic products is proposed to be determined on the basis of





**Figure 1. Stages of certification of organic agricultural products in Ukraine**

*Source: compiled by the authors*

continuous monitoring of consumer preferences, their capabilities, macroeconomic factors, etc. An important component of the additional costs that shape the price of organic products is the cost of certification. For example, the cost of certification in the “Organic Standard” costs from 15 thousand UAH, but it is cheaper than certification by foreign companies and the cost is one of the determining factors in choosing a certification body.

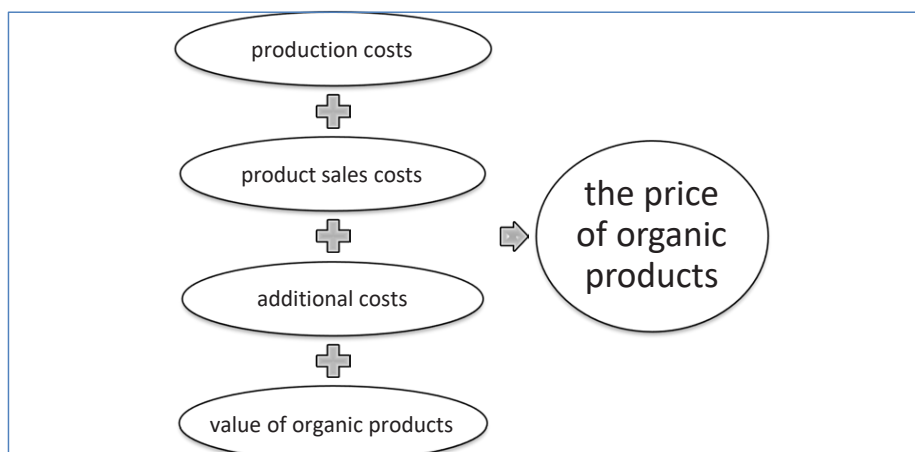
By reducing the energy intensity of agricultural production, it is possible to simultaneously increase the competitiveness of beekeepers in

both domestic and international markets. Forests unlike other agricultural lands are much less exposed to the chemical effects of pesticides, so they can be considered most likely as potential areas for organic beekeeping.

#### **4. Findings**

However, without the appropriate level of economic effect, producers of organic products lose interest in production, refocus on its profitable types.

The most effective way to avoid the mass extinction of bees is well-established



**Figure 2. The mechanism of price formation for organic products**

*Source: compiled by the authors*

communication between beekeepers and agricultural producers through timely information on the timing and place of use of chemicals in crop production. That is why the specialists of the public organization “Grand-Expert” developed and implemented a system of automatic notification of registered apiaries throughout Ukraine about the planned cultivation of fields, after receiving the relevant information from agricultural producers. This allows you to minimize losses by timely implementation of protective measures. The importance of this issue is also evidenced by the proposed algorithm of actions to prevent bee poisoning “Eight steps to save bees from agrochemicals” by the expert of the sector policy department of GFA Consulting Group (Germany) by Roman Smolov (Figure 3).

This algorithm requires certain consistency of action if the owners of apiaries and agricultural producers are different entities. However, in the end we have more efficient production of not only beekeeping products but also growing crops, fruits and vegetables and improving the ecosystem as a whole.

Entomophilic pollination is especially important in organic production where crop yields are ensured as naturally as possible without agrochemicals.

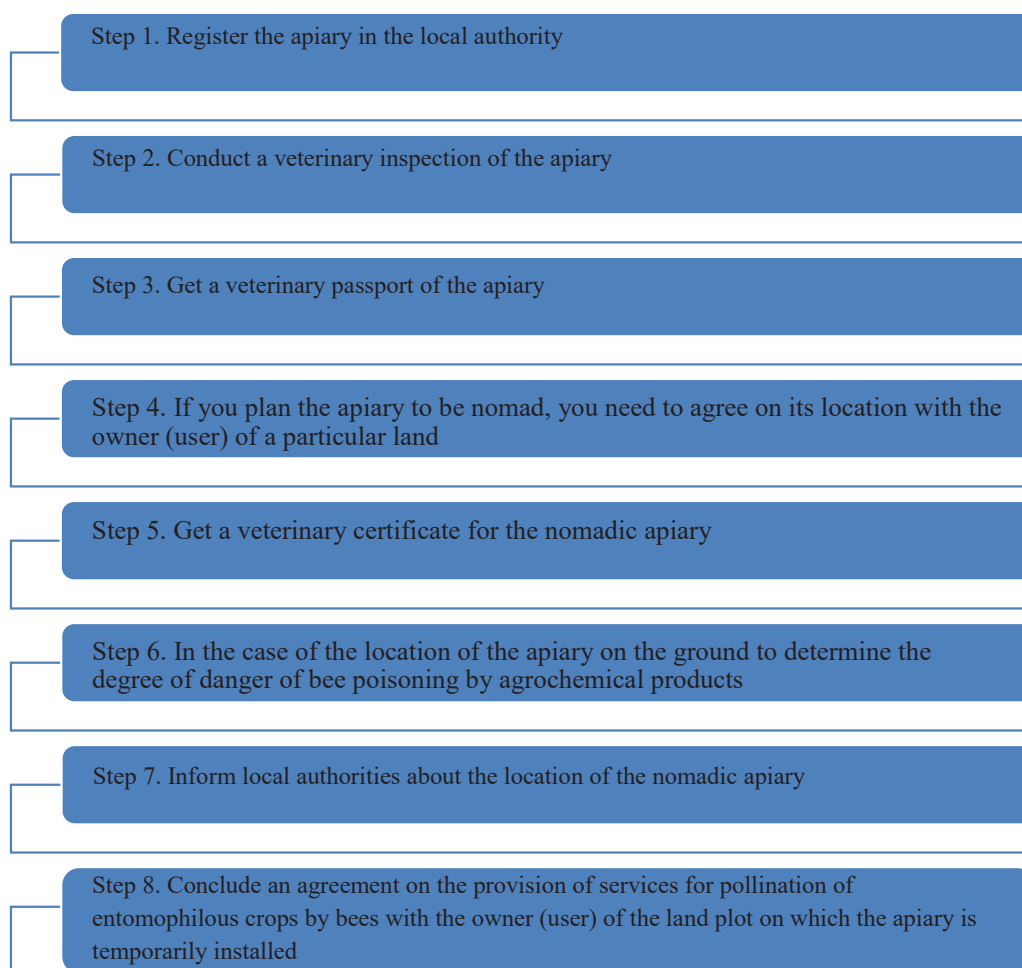
In general, the main risk management measures in organic beekeeping include: modernization of production complexes which increases their production efficiency; production of own organic wax and propolis to prevent unavailability of resources and minimize losses; adjustment of sales chains and quality control systems;

establishing communication with agricultural producers; associations and cooperatives to ensure the exchange of experience and support the development of production.

## 5. Conclusions

Thus, the production of organic beekeeping products in today’s conditions is characterized by a number of different risks. Also, there are a number of factors that hinder the development of organic production: imperfect regulatory and legal support; lack of financial support from the state; low level of awareness of consumers and producers about organic products. For further development of organic production it is advisable to introduce a system of minimizing various types of risks. The most optimal for producers of organic products are the use of the following strategies: “Changes in marketing channels”. It is based on the organization of its own distribution system (retail) which provides services to new visitors and an increased number of warehouses. “Changes in sales organization” provides for the selection of forms and methods of sale, reorganization of trade and the introduction of a system of bonuses for trade intermediaries. “Improving the level of service”. It consists in optimizing the processing of orders, delivery of products to the consumer and improving the packaging of goods.

If organic beekeeping requires the costs of organic farming and beekeeping and generally depends on cooperation with agricultural producers, beekeeping in protected areas is



**Figure 3. Algorithm of actions to prevent bee poisoning**

economically cheaper. The production of organic beekeeping products on already certified lands is also promising. Through cooperation, you can reduce the cost of certification using the so-called system of “group certification”.

Therefore, in modern economic conditions for the further development of the beekeeping industry it is necessary: to carry out technological modernization of production using innovative technologies; to create the infrastructure of the industry with the presence of small-scale production, large industrial beekeeping and service cooperatives; to strengthen selection and breeding work and veterinary support; develop the domestic market. Ways to implement these tasks can be: preferential lending and state support through the allocation of state subsidies; formation of an extensive system of leasing specialized equipment for the beekeeping industry; formation of an effective mechanism for controlling the production, processing and sale of

beekeeping products and strengthening control over compliance with veterinary and sanitary requirements; creation of information base of entomophilous agricultural crops; introduction of an effective mechanism of cooperation with agricultural producers as well as ensuring compliance with the plan of natural zoning of bees, conservation and reproduction of aboriginal bees; popularization of honey as an ecological product and as a substitute for sugar (natural sweetener); creating interesting value-added products (sauces with honey, honey drink, soap, cosmetics), find original varieties (e.g. honey mixes) and valuable properties of honey (emphasize high bactericidal properties).

Therefore for the effective functioning of the organic beekeeping industry it is first necessary: to use available natural and climatic potential (protected areas and certified agricultural lands); to develop special regulations and certification system that are adapted to international and

European requirements and implement them in production and society; to create an effective mechanism of state support for enterprises that transform their own production and are in the transition period (low credit rates, legal support, compensation for the cost of organic certification) and control; to support and stimulate the development of the organic market

through the dissemination of information, the establishment of advisory services and research and educational centers; to enter the international market of organic products as a finished product with its own brand and added value and not just raw materials. All this will increase the number of organic enterprises, increase employment and increase the income of producers.

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