

EVALUATION OF QUALITY INDICATORS OF HONEY OF DIFFERENT ORIGIN

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Ukrainian beekeeping has a huge potential for increasing exports, as the number of new markets for these products has been growing exponentially in recent years. According to the official data of the European Integration Portal of Ukraine, according to which today Ukraine is one of the six largest producers of honey in the world and annually provides up to 5% of world production, and is the second (after China) largest exporter of honey to the EU.

The great importance of bee honey production is due to the needs of the domestic market for consumption by the population and as an industrial raw material, as well as the provision of foreign exchange earnings from its sale on the world market under conditions of high competitiveness. Therefore, improving the system for assessing the quality and safety of bee honey and its harmonization with international requirements is an extremely important task for Ukraine.

Ukraine is considered one of the world's suppliers of honey, especially for the American and European markets.

In the context of globalization of the world economy to ensure the competitiveness of products of the beekeeping industry of Ukraine, the problem of ensuring the quality and safety of products in accordance with international requirements is especially acute.

Honey quality is a concept that covers a fairly wide range of characteristics and properties of this unique product. During the storage of honey, from the moment of pumping, it undergoes many natural biochemical processes. As a result, its composition is constantly changing, and the product itself is called "alive".

Sources of influence on the quality and safety of beekeeping products can be factors of the natural environment, agricultural production, technology of bee colonies, species of honey plants, new subspecies and breeds of bees, etc.

The article evaluates the quality indicators of honey for its naturalness and quality as a food product obtained in home apiaries of Ukraine in different regions. Evaluation of the quality and naturalness of honey of different botanical origin was carried out according to the requirements of national standards. Honey quality indicators such as mass fraction of water, diastase number, hydroxymethylfurfural (GMF) content, mass fraction of reducing sugars, mass fraction of sucrose, proline content, acidity, electrical conductivity, qualitative reaction for the presence of paddy and mass fraction of selenium were studied.

Analysis of the results of the study of honey showed that the mass fraction of water, diastase number, acidity - all samples belong to the highest grade; by mass fraction of reducing sugars - I, IV, VI samples received the highest grade, III and V samples received - I grade, and only II sample belongs to the II grade; by mass fraction of sucrose - only goldenrod honey (VI sample) received the I grade, and the others belong to the II grade; for GMF - only acacia honey received the highest grade, V and VI samples received the I grade, and samples I, II, IV received the II grade, according to the content of proline I, III, VI and V samples received the highest grade, VI sample - I grade, II test - II grade; in terms of electrical conductivity, all honey samples belong to the II grade. Summarizing all the results, it is established that the highest grade includes I, III, VI samples, and II, IV, V samples - I grade.

The obtained results will be used for further formation of a database of honey quality indicators and assessment of data stability over time.

Key words: honey, analysis, quality indicators, standard

Introduction. It is known that honey is a unique product of beekeeping and is characterized by the content of active substances, valuable and necessary for the vital functions of the human body. Due to its beneficial properties, honey is used as a high-quality food product and an effective tool in the treatment of human medicine. Quality and safety control of beekeeping products, its harmonization with world

requirements are becoming increasingly important for Ukraine due to the significant demand for these products abroad.

Problem. Improving the quality of food is an objective process due to a large number of regulations and a high level of control, as well as the ever-increasing demands of consumers. [1, 2].

Honey is a product produced by honey bees from the nectar of plants from natural and agricultural biocenoses, the condition of which significantly affects the performance of the finished product. Sources of influence on the quality and safety of beekeeping products can be factors of the natural environment, agricultural production, technology of bee colonies, species of honey plants, new subspecies and breeds of bees, etc. [3,6].

An important point in obtaining quality products are areas of production: conditions for honey collection, quality of raw materials, production technology, inventory and equipment, sanitary and hygienic working conditions of producers, quality of storage, packaging, transportation, sales conditions, as well as factors of consumption: consumption and assimilation by the human body. [1, 3, 5].

Honey is a biomonitor for collecting information about the environment, condition and assessment of soil, water, plant and air pollution. Therefore, substantiation of the use of certain indicators as criteria for assessing the quality and safety of honey is an important area of research [1, 2, 4].

Analysis of recent research on the topic. Ukraine is considered one of the world's suppliers of honey, especially for the American and European markets.

A number of regulations in force in the WTO and the EU set requirements for the quality and safety of honey, in particular in the EU Regulations 178/2002, 396/2005, 853/2004; in Codex Alimentarius 12-1981 and in Council Directives 2001/110/EC and 96/23/EC, and in Ukraine - DSTU 4497:2005. Directive 2001/110/EC and CAC 12-1981 approved the General Veterinary Medicine, Quality and Safety of Livestock Products rules on the composition of different types of honey, provides basic information on labeling.

A number of studies conducted by domestic scientists indicate the compliance of Ukrainian honey, in most cases, with the current DSTU in terms of physicochemical and organoleptic parameters. However, there are isolated cases of falsification of this sweet product.

The purpose of research. The main purpose of the research was to check the main quality indicators of honey of different origins for their compliance with the requirements of Ukrainian standards.

Materials and methods of research. Studies of the quality of honey on physico-chemical parameters were carried out in accordance with the methods specified in DSTU 4497:2005 "Natural honey. Technical conditions "on the basis of the Ukrainian laboratory of quality and safety of agro-industrial products.

The following parameters were investigated: mass fraction of water, diastase number, hydroxymethylfurfural content, mass fraction of reducing sugars, mass fraction of sucrose, proline content, acidity, electrical conductivity and qualitative reaction to the presence of fall. For research 6 samples of honey of a different botanical origin were taken - 1st sample - sunflower honey from the Mykolaiv area, the 2nd test - rapeseed from the Mykolaiv area, the 3rd test - acacia honey from the Odessa area, the IVth test - sunflower honey. From Odessa region, V-a test - sunflower honey from Vinnytsia region, VI-a test - goldsmith honey from Vinnytsia region. Scores (from 0 to 5) and the corresponding characteristic were determined for each quality indicator, which allowed to determine the affiliation of the honey sample to a certain variety. Thus, if the average amount was 23 or higher points, then honey was attributed to the product of the highest grade, 18-22 points - to the first, 13-17 points - the second grade.

Research results. Mass fraction of water is an indicator that indicates the maturity of honey and compliance with the technology of obtaining this product. Elevated water content causes the development of pathogenic microflora, fermentation, stratification or fermentation of honey. Diastasis number of honey indicates its enzymatic activity and is the main indicator of naturalness. The presence of hydroxymethylfurfural in an amount of more than 25 mg/kg confirms the heating of honey at a temperature of more than 40 °C. This process leads to the loss of its nutritional value and reduced medicinal properties. Therefore, these quality indicators sufficiently characterize the quality of honey. Analysis of the results of the study of honey showed that the mass fraction of water, diastase number, acidity - all samples belong to the highest grade; by mass fraction of reducing sugars - I, IV, VI

samples received the highest grade, III and V samples received - I grade, and only II sample belongs to the II grade; by mass fraction of sucrose - only goldenrod honey (VI sample) received the I grade, and the others belong to the II grade; for GMF - only acacia honey received the highest grade, V and VI samples received the I grade, and samples I, II, IV received the II grade, according to the content of proline I, III, VI and V samples received the highest grade, VI sample - I grade, II test - II grade; in terms of electrical conductivity, all honey samples belong to the II grade. Summarizing all the results, it is established that the highest grade includes I, III, VI samples, and II, IV, V samples - I grade.

Tabl.1. Physico-chemical analysis of flower honey samples

Sample	Mass fraction of water, %	Mass fraction of reducing sugars, %	Mass fraction of sucrose, %	Diastasis number of honey, Goethe units	Hydroxymethylfurfural, mg / kg	Proline content, mg per 1 kg	Acidity, milliequivalents of sodium hydroxide (0.1 mol / DM ³ per 1 kg	Electrical conductivity, ms / cm	Qualitative reaction to the presence of a fall	Mass fraction of selenium (Se), mg / kg	Variety of honey, according to DSTU 4497:2005
I	16,4	86,88	10,09	29,76	26,9	398,64	32,0	3,53	neg.	<0,01	H
II	16,4	69,33	6,73	21,75	32,2	195,94	26,5	2,44	neg.	<0,01	I
III	16,2	79,87	6,71	39,74	10,0	373,11	32,0	3,97	neg.	<0,01	H
IV	15,4	85,40	14,37	25,04	27,0	377,62	28,0	2,65	neg.	<0,01	I
V	17,8	79,76	14,42	46,41	10,5	341,58	34,5	3,32	neg.	<0,01	I
VI	17,0	80,46	5,68	41,17	18,4	262,76	29,5	3,81	neg.	<0,01	H

Conclusions. According to DSTU 4497: 2005, honey has the highest grade according to physicochemical analysis: goldenrod honey of Vinnytsia region, sunflower honey of Mykolaiv region and acacia honey of Odessa region.

The obtained results will be used for further formation of a database of honey quality indicators and assessment of data stability over time.

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ОЦІНКА ПОКАЗНИКІВ ЯКОСТІ МЕДУ РІЗНОГО ПОХОДЖЕННЯ

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Бджільництво України має величезний потенціал для нарощування експорту, адже кількість нових ринків збуту цієї продукції впродовж останніх років росте в геометричній прогресії. За офіційними даними «Євроінтеграційного порталу України», згідно з якими сьогодні Україна є одним з шести найбільших виробників меду в світі та щороку забезпечує до 5% світового виробництва, а також є другим (після Китаю) найбільшим експортером меду до ЄС.

Велике значення виробництва меду бджололиного зумовлене потребами внутрішнього ринку для споживання населенням і як промислової сировини, а також забезпеченням валютних надходжень від його реалізації на світовому ринку за умов високої конкурентоспроможності.

Тому удосконалення системи оцінки якості і безпечності меду бджолиного та її гармонізація з міжнародними вимогами є надзвичайно актуальним завданням для України.

За умов глобалізації світової економіки для забезпечення конкурентоспроможності продукції галузі бджільництва України особливо гостро постає проблема забезпечення якості та безпеки продукції відповідно до світових вимог.

Якість меду – поняття, яке охоплює доволі широкий загальний набір характеристик і властивостей цього унікального продукту. Упродовж зберігання меду, починаючи з моменту відкачування, у ньому відбувається безліч природних біохімічних процесів. Унаслідок цього, його склад постійно змінюється, а сам продукт називають «живим».

У статті проведено оцінку показників якості меду на його природність та якість як харчового продукту, який отримали на присадибних пасіках України різних регіонів. Оцінку якості та природності меду різного ботаничного походження проводили за вимогами національних стандартів. Досліджували такі показники якості меду, як масова частка води, діастазне число, вміст гідроксиметилфурфуролу (ГМФ), масова частка відновлювальних цукрів, масова частка сахарози, вміст проліну, кислотність, електропровідність, якісна реакція на наявність пади та масова частка селену.

Ключові слова: мед, аналіз, показники якості, стандарт

ОЦЕНКА ПОКАЗАТЕЛЕЙ КАЧЕСТВА МЕДА РАЗЛИЧНОГО ПРОИСХОЖДЕНИЯ

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Пчеловодство Украины имеет огромный потенциал для наращивания экспорта, ведь количество новых рынков сбыта этой продукции на протяжении последних лет растет в геометрической прогрессии. По официальным данным «Евроинтеграционного портала Украины», согласно которым сегодня Украина является одним из шести крупнейших производителей меда в мире и ежегодно обеспечивает до 5% мирового производства, а также является вторым (после Китая) крупнейшим экспортером меда в ЕС.

Большое значение производства меда пчелиного обусловлено потребностями внутреннего рынка для потребления населением и как промышленного сырья, а также обеспечением валютных поступлений от его реализации на мировом рынке в условиях высокой конкурентоспособности. Поэтому совершенствование системы оценки качества и безопасности меда пчелиного и её гармонизация с международными требованиями является чрезвычайно актуальной задачей для Украины.

В условиях глобализации мировой экономики для обеспечения конкурентоспособности продукции отрасли пчеловодства Украины особенно остро стоит проблема обеспечения качества и безопасности продукции в соответствии с мировыми требованиями.

Качество меда - понятие, которое охватывает довольно широкий круг характеристик и свойств этого уникального продукта. За хранение меда, начиная с момента откачки, в нем происходит множество природных биохимических процессов. В результате, его состав постоянно меняется, а сам продукт называют «живым».

В статье предоставлена оценка показателей качества меда на его натуральность и качество как пищевого продукта, полученного на приусадебных пасеках Украины разных регионов. Оценку качества и натуральности меда различного ботанического происхождения проводили с требованиями национальных стандартов. Исследовали такие показатели качества меда, как: массовая доля воды, диастазное число, содержание гидроксиметилфурфуролу (ГМФ), массовая доля возобновляемых сахаров, массовая доля сахарозы, содержание пролина, кислотность, электропроводность, качественная реакция на наличие пади и массовая доля селена.

Ключевые слова: мед, анализ, показатели качества, стандарт