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MONITORING OF SEPARATED QUALITY INDICATORS OF NATURAL POLYFLORAL HONEY OF ODESSA TRADE NETWORK

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The article presents the results of study of the separated physicochemical parameters of May polyfloral honey samples that is realized on Odessa agrofood markets. The importance of a comprehensive approach to establishing the quality of natral honey is shown. The obtained results are analyzed and compared with the requirements of the current DSTU 4497: 2005. The conformity of physicochemical parameters of May honey to the current standards has been established.

The article also presents the results of a study of samples of May honey for adulteration with starch or flour, chalk, starch molasses and sugar syrup. Despite the compliance of the samples with physicochemical parameters to the current standard, 8.3% of samples with sugar syrup admixture were found.

***Key words**: natural honey, physico-chemical parameters of honey, quality of honey, falsification.*

Formulation of the problem. Natural honey is a valuable food product, which, moreover, is endowed with medicinal properties. However, it is characterized by a high cost, which encourages dishonest producers to counterfeit it, especially if it is a product that is not exported and sold in agri-food markets. In addition, the falsification of honey reduces its benefits to the body [5].

Falsifiers can have gonadotropic, embryotropic, carcinogenic effects, which can lead to impaired reproductive function, accelerate the aging process, reduce life expectancy and more. In total, there are more than 40 indicators for assessing the quality of honey. In our country, the assessment of the quality of bee honey is carried out on 10 parameters: water content, content of reducing sugars, sucrose content, diastase number, aroma, taste, qualitative reaction to oxymethylfurfural, the presence of mechanical impurities. In general, the study shows that the properties of honey largely depend on its maturity, storage conditions and processing methods [7].

Literature sources indicate that the most common ways to falsify bee honey are the addition of sugar syrup, artificial invert sugar, starch, gelatin [8, 9]. Identify falsified samples of bee honey organoleptically quite problematic [9].

Modern industry literature points to types of honey that are not natural and should be considered as counterfeits of natural products: sugar honey, artificial honey and honey from fruit and berry juices. European Union Directive 74/409 of 20 December 2001 clearly defined honey as a 100% bee product from which nothing should be removed or added. EU legislation, as well as the national standard for honey is based on the following: pollen research, physicochemical research (measurement of humidity, GMF, diastase, etc.), analysis of sugars by chromatography [10].

Today, the Ukrainian honey market is one of the most promising of all agro-industrial industries in the country [6].

The comparative analysis of the requirements of the current regulatory documentation on the quality of honey conducted by scientists indicated the need to determine the consumer characteristics of honey to ensure compliance with its quality indicators to current standards [2].

Literature data show that in order to prevent mass falsification of honey by processing enterprises and dishonest beekeepers, it is necessary to develop and approve methods of detecting falsifications, equip laboratories, train specialists, hold seminars with beekeepers and consumers of beekeeping products [4].

At the same time, a number of studies indicate that most samples of natural honey sold on the domestic market, in terms of organoleptic and physicochemical properties meet the current DSTU 4497: 2005 "Natural honey" [3, 6, 11].

One of the indicators of honey quality and its naturalness is the diastasis number. This indicator determines whether the honey has been heated, the duration of its storage. In general, the diastase number is the activity of honey enzymes that enter the product from the nectar of flowers and the secretions of

the salivary glands of bees. Depending on the botanical variety of honey, the diastasis number ranges from zero to 50 units Goethe and more. Honey with a high content of diastase includes buckwheat and padeva, and with low – acacia and sunflower [1].

Ensuring the quality and safety of beekeeping products must be carried out at all levels - from manufacturer, supplier to retailer. In accordance with EU standards, quality control and safety of honey, in addition to organoleptic and physicochemical parameters, also provides for the determination of maximum residues of antibiotics, sulfonamides, pesticides, heavy metals, radionuclides, GMO pollen. The authors note that it is necessary to be able to distinguish high-quality and useful honey from cheap counterfeit. They emphasize that with the help of special laboratory tests it is possible to determine the safety and quality of honey and its compliance with the State Standard of Ukraine [12].

Thus, the available literature data indicate the relevance of the issue of determining the quality of natural honey in modern conditions and establishing its falsification in order to prevent low-quality product to consumers.

The goal of the work. The purpose of the work was to determine some indicators of the quality of natural polyfloral honey sold in the agro-industrial markets of Odessa.

Materials and methods. For research purposes, it was selected 6 samples of May honey at two agro-industrial markets of Odessa (only 12 samples). The presence of pollen grains, mass fraction of water, mass fraction of reducing sugars, mass fraction of sucrose, diastase number, hydroxymethylfurfural content, acidity, presence in the samples were determined.

The research was carried out according to the generally accepted methods defined in the current DSTU 4497: 2005 [3].

In addition, all samples were examined for falsification with starch or flour, chalk, starch molasses, sugar syrup.

Results and discussion. During the determination of quality indicators of natural May honey, the results presented in table 1 were obtained.

Table 1 shows that in most respects the test samples meet the requirements of the current DSTU, are characteristic of the product of the first grade. Thus, the presence of plant pollen in honey and honey indicates its naturalness. The mass share of water was higher in the samples purchased on the agro-industrial market "New" and amounted to 15.5 ± 0.8%, which is within the norm. The mass fraction of reducing sugars in the samples ranged from 70.0 ± 2.5–75.0 ± 3.0% and was higher in the samples purchased on the Novy market. However, all indicators met the current standards.

Table 1. **Physico-chemical parameters of May honey of the trade network of Odessa (n=12, M±m)**

Indexes	Samples of honey purchased at the Cheryomushki agro-industrial market	Samples of honey purchased at the agro-industrial market "New"
The result of pollen analysis	present	present
Mass fraction of water, %	14,7±0,6	15,5±0,8
Mass fraction of reducing sugars, %	70,0±2,5	75,0±3,0
Mass fraction of sucrose, %	4,5±0,2	4,5±0,2
Diastasis number, units Gotte	14,5,0±0,5	16,0±0,8
GMF content, mg / kg	19,5±0,5	12,0±0,8
Acidity, milliequivalents of sodium hydroxide on 1 kg	37,0±1,5	45,0±2,5

The mass fraction of sucrose in the samples was identical and was 4.5 ± 0.2% (according to DSTU).

The diastasis number was higher in the samples from the New market (by 10.3% relative to the indicators in the Cheryomushki market) and was 16.0 ± 0.8 f units Gotte.

As for the content of GMF, it was significantly higher in the samples from the market "Cheryomushki" and was 19.5 ± 0.5 mg/kg, which corresponds to the product of the first grade.

The acidity of honey samples ranged 37.0 ± 1.5-45.0 ± 2.5 milliequivalents of sodium hydroxide per 1 kg, which meets the requirements of the current DSTU. Thus, based on the results of physical and chemical studies, we can conclude that all samples of honey were of good quality and complied with the current DSTU.

The results of the study of samples of May honey are presented in table 2. Thus, falsification with starch or flour was not detected in any sample, chalk - in any sample, starch molasses – in any sample. At the same time, in one sample purchased at the Cheryomushki agro-industrial market, sugar syrup impurities were detected, which is 8.3% of the total number of studies. No sugar syrup impurities were found in the samples of May honey from the New Market.

Table 2. **The results of the study of samples of May honey for falsification (n=12)**

Method of falsification	Samples of honey purchased at the Cheryomushki agro-industrial market	Samples of honey purchased at the agro-industrial market "New"
Starch or flour	negative	negative
Chalk	negative	negative
Starch flow	negative	negative
Sugar syrup	positive	negative

Conclusion. Particular attention should be paid to the quality of polyfloral honey, as consumers often use this product for medicinal purposes. The main indicators that can be used to draw conclusions about the quality of honey are physico-chemical. The analysis of the main physical and chemical parameters of May honey, which is sold on the agro-industrial markets of Odessa, indicated that most of the samples correspond to the first grade according to the current DSTU 4497: 2005. However, it is expedient to supplement the physicochemical study with the definition of falsification, because in 8.3% of the experimental samples the addition of sugar syrup was detected, which is quite problematic to determine organoleptically.

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МОНІТОРИНГ ОКРЕМИХ ЯКІСНИХ ПОКАЗНИКІВ МЕДУ НАТУРАЛЬНОГО ПОЛІФЛОРНОГО ТОРГІВЕЛЬНОЇ МЕРЕЖІ М. ОДЕСИ

Півень О.

У статті наведено результати дослідження окремих фізико-хімічних показників зразків поліфлорного травневого меду, що реалізується на агропромислових ринках м. Одеси. Показано важливість комплексного підходу до встановлення якості меду натурального. Проаналізовано та порівняно отримані результати з вимогами чинного ДСТУ 4497:2005. Встановлено відповідність фізико-хімічних показників меду травневого діючим стандартам.

Також у статті наведено результати дослідження зразків меду травневого на предмет фальсифікації крохмалем або борошном, крейдою, крохмальною патокою та цукровим сиропом. Незважаючи на відповідність зразків за фізико-хімічними показниками діючому стандарту, встановлено 8,3 % зразків із домішкою цукрвового сиропу.

***Ключові слова**: мед натуральний, фізико-хімічні показники меду, якість меду, фальсифікація.*

МОНИТОРИНГ ОТДЕЛЬНЫХ КАЧЕСТВЕННЫХ ПОКАЗАТЕЛЕЙ МЕДА НАТУРАЛЬНОГО ПОЛИФЛОРНОГО ТОРГОВОЙ СЕТИ Г. ОДЕССЫ

Пивень О.

В статье представлены результаты исследования отдельных физико-химических показателей полифлорного майского меда, который реализуется на агропромышленных рынках г. Одессы. Показана важность комплексного подхода к установлению качества меда натурального. Проанализированы и сопоставлены полученные результаты с требованиями действующего ГОСТУ 4497:2005. Установлено соответствие физико-химических показателей меда майского дуйствующим стандартам.

Также в статье отображены результаты исследования образцов меда майского на предмет фальсификации крохмалом или мукой, мелом, крохмальной патокой и сахарным сиропом. Несмотря на соответствие образцов по физико-химическим показателям действующему стандарту, установлено 8,3 % образцов с примесью сахарного сиропа.

***Ключевые слова**: мед натуральный, физико-химические показатели меда, качество меда, фальсификация.*