



*International periodic scientific journal*

—*ONLINE*

*www.moderntechno.de*

Indexed in  
**INDEXCOPERNICUS**  
(ICV: 84.86)



# **M**ODERN ENGINEERING AND INNOVATIVE TECHNOLOGIES

**Issue №31**  
**Part 1**  
February 2024

*Published by:*  
**Sergeieva&Co**  
*Karlsruhe, Germany*

**Editor:** Shibaev Alexander Grigoryevich, *Doctor of Technical Sciences, Professor, Academician*

**Scientific Secretary:** Kuprienko Sergey, *PhD in technical sciences*

**Editorial board:** More than 350 doctors of science. Full list on page:

<https://www.moderntechno.de/index.php/swj/about/editorialTeam>

**Expert Board of the journal:** Full list on page:

<https://www.moderntechno.de/index.php/swj/expertteam>

The International Scientific Periodical Journal "**Modern engineering and innovative technologies**" has been published since 2017 and has gained considerable recognition among domestic and foreign researchers and scholars.

Periodicity of publication: Quarterly

The journal activity is driven by the following objectives:

- Broadcasting young researchers and scholars outcomes to wide scientific audience
- Fostering knowledge exchange in scientific community
- Promotion of the unification in scientific approach
- Creation of basis for innovation and new scientific approaches as well as discoveries in unknown domains

The journal purposefully acquaints the reader with the original research of authors in various fields of science, the best examples of scientific journalism.

Publications of the journal are intended for a wide readership - all those who love science. The materials published in the journal reflect current problems and affect the interests of the entire public.

Each article in the journal includes general information in English.

The journal is registered in IndexCopernicus, GoogleScholar.

**UDC 08**  
**LBC 94**

**Published by:**

**Sergeieva&Co**

*Lußstr. 13*

*76227 Karlsruhe, Germany*

e-mail: [editor@moderntechno.de](mailto:editor@moderntechno.de)

site: [www.moderntechno.de](http://www.moderntechno.de)

---

Copyright  
© Authors, scientific texts 2024



<http://www.moderntechno.de/index.php/meit/article/view/meit31-00-092>

DOI: 10.30890/2567-5273.2024-31-00-092

УДК 614.9:579. 62:613, 287:613,287.5

## THE CURRENT STATE OF FORENSIC COMMODITY AND FORENSIC VETERINARY EXAMINATION OF FOOD PRODUCTS

## СУЧАСНИЙ СТАН СУДОВО-ТОВАРОЗНАВЧОЇ ТА СУДОВО-ВЕТЕРИНАРНОЇ ЕКСПЕРТИЗИ ХАРЧОВИХ ПРОДУКТІВ

**Bukalova N. V. / Букалова Н. В.**

*PhD in Veterinary Sciences, Associate Professor / Кандидат ветеринарних наук, доцент*

*ORCID: 0000-0003-4856-3040*

*Bila Tserkva National Agrarian University*

*09117, 8/1 Soborna Sq., Bila Tserkva, Ukraine*

*Білоцерківський національний аграрний університет*

*09117, Соборна пл., 8/1, м. Біла Церква, Україна*

**Prylipko T.M. / Приліпко Т. М.,**

*d.a.s., prof. / д.с.н.. проф.*

*ORCID: 0000-0002-8178-207X*

*Publons: AAF-5445-2019*

*Higher education institution Podolsk State University, Kamianets-Podilskyi, Shevchenko,13,32300*

*Заклад вищої освіти Подільський державний університет*

**Bogatko N. M. / Богатко Н. М.**

*Doctor of Veterinary Sciences, Professor / Доктор ветеринарних наук, професор*

*ORCID: 0000-0002-1566-1026*

*Bila Tserkva National Agrarian University*

*09117, 8/1 Soborna Sq., Bila Tserkva, Ukraine*

*Білоцерківський національний аграрний університет*

*09117, Соборна пл., 8/1, м. Біла Церква, Україна*

**Rusnak L.V. / Руснак Л. В.**

*PhD in Law/ доктор філософії в галузі 08*

*Право зі спеціальності 081 Право*

*ORCID:0000-0002-5165-1079*

*Separate structural unit "Kamyants-Podilskyi Vocational College of the Institution of Higher*

*Education "Podilskyi State University"*

*Відокремлений структурний підрозділ "Кам'янець-Подільський фаховий коледж Закладу*

*вищої освіти "Подільський державний університет"*

**Bogatko A. F. / Богатко А. Ф.**

*Assistant / асистент*

*ORCID: 0000-0001-8089-5884*

*Bila Tserkva National Agrarian University*

*09117, 8/1 Soborna Sq., Bila Tserkva, Ukraine*

*Білоцерківський національний аграрний університет*

*09117, Соборна пл., 8/1, м. Біла Церква, Україна*

**Abstract.** The article highlights aspects of the current state of forensic and veterinary examination of food products. Forensic commodity expertise is a study by an expert commodity expert or veterinary medicine specialist of any issues, the solution of which requires the application of special knowledge in this field. During the forensic veterinary examination, the consumer properties of goods are evaluated according to organoleptic, physico-chemical and other quality indicators, safety indicators (microbiological, toxicological, mycological, radiological), as well as their quantitative characteristics, which is carried out by experts by conducting tests (measurements) , studying the information on the marking and researching the corresponding product accompanying documents.



*The active development of trade in food products, their presence in foreign economic transactions, in certain cases necessitate the appointment of forensic examinations. The subject of forensic examination of food products is factual data in the case, which are established by a forensic expert on the basis of special knowledge, as a result of their research, their relations (connections) of products with the phenomena of the surrounding reality (various influences) and functionally related processes (packaging, transportation, storage), carried out within the limits of current legal norms, with the aim of obtaining an evidentiary base for investigation and court. The subject of examination of food products makes it possible to correctly define the range of tasks and choose an expert or experts.*

**Keywords:** food products, forensic commodity examination, evidence base, expert, legal norms, commodity accompanying documents.

The active development of trade in food products, their presence in foreign economic operations, in certain cases necessitate the appointment of forensic examinations. With the development of market relations, the range of food products on the territory of Ukraine has significantly expanded and is constantly updated, in connection with which categories of cases regarding offenses and crimes in the economic sphere are being formed in judicial and investigative practice, including violations of customs rules, falsification of raw materials and finished products, etc. . An analysis of the expert practice of conducting forensic commodity examinations of food products in scientific research institutes of forensic examinations of the Ministry of Justice of Ukraine over the past five years shows that they constitute the majority of all commodity examinations assigned in criminal cases. Questions decided by experts primarily concern the determination of the value of the investigated objects [2, 3].

The object of commodity-veterinary examination is units of food products, as well as any material objects containing information about the commodity origin of the object of research: accompanying documentation, technical descriptions and recommendations for the use, storage and movement of products. In matters of investigating cases of economic disputes between business entities and, in particular, regarding food products of animal origin, judicial and investigative bodies often appoint a forensic veterinary examination. However, the specifics of such an examination for formulating a conclusion at the request of law enforcement agencies in veterinary medicine are currently not sufficiently developed and tested.

The following circumstances are determined during the forensic commodity-veterinary examination: deliberate change of data recorded in the accompanying documentation, containing information about the quality and quantity of the produced goods; distortion of methods of marking goods and product label data; intentional change in the volume of products spoiled as a result of non-compliance with the conditions of transportation or storage; violation of the product sorting procedure, product acceptance, testing or rejection rules. In addition to violations committed during the production of goods and product quality assessment, the commodity-veterinary examination establishes the presence of substances harmful to human health or the environment in the examined objects. In addition, the criteria for product evaluation are also its product characteristics, technical or technological condition, consumer value and purchase attractiveness. A large number of commodity expert examinations are carried out in the process of consideration of cases brought under



civil lawsuits related to the division of property, compensation for damages for spoilage or damage to property, sale of low-quality goods, etc. [4].

In accordance with the List of types of examinations performed at the Research Institute of Forensic Examinations and the List of Expert Specialties for which Forensic Examinations are conducted, commodity examination includes, in particular, the examination of food products. In addition, according to the "Scientific and Methodological Recommendations on the Preparation and Appointment of Forensic Examinations and Expert Studies", the study of food products is also carried out in the procedures of forensic examinations of substances and products (food products and food raw materials). Therefore, the objects of forensic commodity-veterinary and forensic examination include food products for public consumption [2]. The subject of the forensic examination of food products is the factual data in the case, which are established by the forensic expert on the basis of special knowledge, as a result of their research, their relations (connections) of products with the phenomena of the surrounding reality (various influences) and functionally related to them processes (packaging, transportation, storage), carried out within the limits of current legal norms, with the aim of obtaining an evidence base for investigation and court. The subject of examination of food products makes it possible to correctly define the range of tasks and choose an expert or experts.

The objects provided to the expert for research are, in particular, food products imported into Ukraine, namely, their characteristics both at the stage of passage and after the customs control procedure, which are seized for typical offenses: violation of customs rules in the part of false declaration, related to providing the customs authority with information on the name, number, codes of UKTZED; delivery to the territory of Ukraine of both low-quality products and those with signs of falsification; embezzlement; partial or complete loss of marketability, in insurance cases, accidents, fires, etc. [1]. This forms the main tasks [6] of the forensic-commodity examination of food products, which consist in solving questions by an expert regarding the value of commercial products; their belonging to the classification categories adopted in the production and trade sphere; characteristics of research objects, in accordance with the requirements of UKTZED; changes in product quality indicators; compliance with the current rules regarding packaging and transportation, conditions and shelf life of food products, establishment of the method of production of products: industrial or home-made, the name of the manufacturer and the country of manufacture.

An essential part of orders for conducting forensic commodity and forensic veterinary examination of food products for public consumption are the following most common questions that are asked for its solution: what is the value of the research object both on the territory of Ukraine and abroad? What is the name and purpose of the products? does the labeling correspond to the actual characteristics of the product? Does the quality of food products meet the requirements of standards, technical conditions according to organoleptic indicators? Is the product safe, does it pose a threat to human health and life?

Taking into account the essential role of the object of forensic commodity and forensic veterinary examination, the study of which depends on the objective and





subjective assessment of the expert, it is advisable to substantiate the classification of food products and determine the main conceptual provisions of such examinations, which will ensure their motivation [8]. Products and documents containing information about them (test report, certificate of conformity, order of the state veterinary and phytosanitary control bodies that determine the industry) can be the objects of research for conducting forensic and veterinary forensic examination of food products sales of products).

There is a huge range of issues [8, 9] that can be resolved by a commodity expert, both by examining the object itself and the provided documents with information about the product, for example: establishing the compliance of packaging, labeling, transportation and storage conditions with the requirements regulatory document; determination of the possible impact of various factors that reduce the quality of the product; establishment of a decrease in the level of product quality (its cost); the presence of signs of deterioration; establishing compliance of product quality with basic data (requirements of scientific and technical documentation, contract, certificate); establishing the term and conditions of storage; determining the value of food products, etc.

Issues can also be resolved comprehensively, with the involvement of forensic experts from other specialties (biologists, chemists, veterinary specialists, technologists), experts from certified and accredited testing centers and state laboratories. For conducting forensic and veterinary examination of food products, the "Methodical recommendations on the appointment and conduct of forensic examinations of food products for the purpose of determining their value" and "Methodical recommendations on the assessment of confiscated and other property that becomes state property" are used ". However, these two methods contain only general approaches to conducting examinations, therefore, in expert practice, the "Methodical recommendations for the study of certain groups of food products" developed by specialists of the Chamber of Commerce and Industry of Ukraine are sometimes used. Their number is limited, and some of them do not meet modern regulatory requirements at all [2, 10, 13].

To assign products to a certain food group or subgroup, experts are guided by the generally accepted classification, according to which all food products are divided according to the origin of the main raw materials into the following three subclasses: plant origin (cereal and flour products; vegetables, fruits, mushrooms, products of their processing; starch , honey, sugar; confectionery); of animal origin (milk and milk products; meat and meat products; eggs, their processing products; products from fish and non-fish objects of aquaculture); of mixed origin: (edible fats; flavor products – group formed by purpose; food concentrates; baby food products – group formed by purpose). Food products are divided into groups by raw materials and manufacturing technology, purpose and type. When identifying food products, the main terms and definitions are followed, because their status is fixed by the legislation of Ukraine: food product, food products for special dietary consumption, functional food product, food and dietary supplements, unprocessed food product of animal origin, plant products - food products of plant origin [ 8]. These products in market conditions stand out among similar ones based on generally recognized



consumer properties.

The development of food imports involves the main terms defined by EU food legislation. In Regulation (EC) No. 178/2002 of the European Parliament and the Council of 28.01.2002, any processed, partially processed or unprocessed substances or products that intended for consumption. The term "foodstuff" does not include: fodder; live animals, except when their products are ready for human consumption; plants (before harvesting); medicines - according to Directives 65/65/EEC and 92/73/EEC of the Council of the EU; waste and polluting impurities.

Thus, food products include products in natural or processed form that are consumed by humans (including baby and diet food products), bottled drinking water, alcoholic and non-alcoholic products, beverages, tobacco products, chewing gum, food raw materials, food supplements and dietary supplements.

Forensic examination of food products is carried out [1, 4], usually on the basis of documents provided to experts, which contain information about the state and movement of the object of research for a certain period of time, which is of interest to the investigation (court). These are acceptance and delivery documents, product accompanying documents, quality assurance certificates, examination certificates, laboratory test certificates, food product write-off certificates, logs of received cargo, product inspection certificates, storage passport, product passport, storekeeper's book, schedule temperature and relative humidity (RH) in commercial premises and warehouses, etc. The expert may be provided with the conclusions of experts from another field, inspection protocol, document seizure protocol, interrogation protocol, explanatory note, and photographs.

The objects of forensic commodity and forensic veterinary examinations of food products are food products, packaging (container), materials (documents) of criminal, administrative, economic, and civil cases containing information on consumer characteristics, circumstances, regarding operations related to product, conditions of packaging, transportation, reception, storage.

Commodity examination is carried out both at the initiative of the buyer and at the request of the manufacturer or seller who wants to make sure of the appropriate quality of the products. Similar studies are prescribed in the process of investigating criminal cases and court proceedings related to embezzlement, counterfeiting of goods and other crimes. A significant part of such offenses is carried out by hidden methods, which can be detected only by special study of the properties of the food product. The main documents that experts use when determining the quality of food products are the act of laboratory research, which provides for the selection and feasibility of using certain test methods, namely: the method of documentary verification: a method of researching the correctness of the composition to determine their suitability for testing; comparative method (comparison method) – based on comparing the properties of the objects under study to establish their similarity or difference; method of regulatory verification - a method of researching the properties of the object (product, labeling, packaging, transportation, storage, acceptance conditions, tests) set out in the documents to establish their compliance with the regulated norms.

The study [9] of technical, microbiological, chemical indicators characterizing



the stability of the technological process and the formation of consumer properties of the food product makes it possible to substantiate the conclusions of identification (identification), for example, the type of raw material, semi-finished product, manufacturing method, the probability or possibility of attributing the product to the original.

The nomenclature of indicators of the quality of food products is defined in ND. In order to identify the quality of a food product, it is important to establish the limit indicators of the content of components, indicators of their safety, signs of the manufacturing or processing method, the presence of imperfection in the existing technology, spoilage, improper storage, etc. The identification of the quality of the food product ensures the establishment of its actual state, based on the comparison of the quality indicators of the evaluated product with the corresponding base value. In some cases, product quality may improve over time (for example, during ripening of cheeses, aging of cognac, etc.), but in most cases, there is a negative change in product quality, resulting in losses. Depending on the type of changes in the commodity and consumer characteristics of food products that occur during their storage, transportation and sale, losses are divided into qualitative and quantitative.

So, the tasks facing the forensic commodity science and forensic veterinary examinations of food products can be characterized as follows: establishing the commercial property of the object under investigation (that is, determining their place in the existing classification system); analyzing the quality indicators of the object under investigation to establish his condition; establishing the compliance of the commercial and consumer properties of food products with the requirements of the ND, contract, accompanying document, labeling, etc.; determination of the degree of reduction in the quality of the object under study, taking into account its condition; determining compliance of the conditions (method, means) of packaging and storage of food products with the requirements of the regulatory document; establishment of spoilage, loss of food products in specific conditions of storage or transportation; calculation of natural loss (shrinkage) of food products; solving the issue of the possibility of selling, processing or disposing of low-quality food products; determination of the cost of the researched product in the required period of time.

Undoubtedly, sausage products and smoked products occupy a large specific share in the population's diet, and their production is one of the most important in the meat industry. The conditions of the market economy require obtaining a finished product of high quality, which will ensure the competitiveness of products on the world market with the lowest costs and the greatest economic effect.

In matters of investigating disputes between business entities regarding products of animal origin, judicial investigative bodies often appoint a forensic veterinary examination. However, the issues of food product examination in veterinary medicine are not sufficiently developed and tested due to the fact that forensic veterinary examination is the least well-grounded and the least methodologically supported area of applied veterinary medicine. This is due to the fact that until now forensic veterinary examination, as a section of expertology in general, has not been developed. The study of biological material of animal origin and animal husbandry products is carried out without a systematic methodical foundation and the





corresponding legal framework, which not only complicates the work of a specialist, but can also become the basis for drawing an expert opinion[11, 12].

Based on the objectives of the commodity-veterinary examination and the subject of analysis determined by it, the forensic expert is provided with a list of tasks to be solved by the expert. It:

1. Identification of the object of commodity examination, i.e. determination of the ownership of specific samples of products or a certain number of commodity units of the same type (brand, model, grade or species).

2. Determining the conformity of product quality with prescriptions of normative documents (DSTU, GOST, etc.), quality certificates or reference samples.

3. Determination of changes in product quality that occurred as a result of spoilage, the presence of defects and their reflection on product quality.

4. Establishing the conformity of the characteristics specified in the information about the products, recorded on the packaging of the product (label, label, the product itself). The list of product characteristics includes product composition, used raw materials and other materials, etc.

5. Determination of the correctness of the calculation of the natural loss of production.

6. Determination of conformity of the methods and means of product packaging with the prescriptions of regulatory documentation.

7. Establishing compliance with the methods, terms and conditions of goods transportation with the prescriptions of normative documents.

8. Determination of conformity of the terms of operation of the goods with the information specified in the accompanying documents. Analysis of changes in product quality as a result of the influence of certain factors.

9. Determination of the market value of products, as well as changes in value as a result of a violation of its actual condition.

10. Determination of violations committed during the preparation of accompanying documentation, which led to non-compliance with consumer rights.

11. Establishing the facts of violation of the economic activity of the organization, which led to the production and sale of goods of inadequate quality [ 5].

A forensic expert who conducts commodity and veterinary examination answers a fairly wide range of questions related to various characteristics of the investigated object, its scope of application, the condition of the product, preservation factors or circumstances that caused a decrease in its quality. When asking questions, the competence of an expert in the field of commodity-veterinary examination is taken into account. Yes, there is a certain list of questions to which, in particular, a trade expert has no right to answer. For example, a specialist cannot determine whether two parts belong to the same product. To establish such facts, it is necessary to carry out other types of examinations involving material science or traceological analysis [12].

The main questions for the conduct of a commodity-veterinary examination are as follows: Does the quality of the product correspond to the information indicated on the package or in the accompanying documentation? Does the actual amount of the product match the data on the package? What are the actual characteristics of the product? Do the actual characteristics match the markings on the label or packaging?



What are the differences between the established characteristics of the product and the indicators contained on the package or in the accompanying documentation? Does the quality of the studied product meet the prescriptions of the standards developed for this group of goods? What are the deviations of product quality from these standards? Is the realization of the researched products permissible? Is it possible to recycle or dispose of it? Does the packaging meet the requirements of the relevant quality standards? Could the storage conditions affect the change in the quality of the studied product? What rules of product acceptance could have been violated? Does the tested food product have defects? What are the causes of defects? Are the defects of production origin? [13].

Thus, conducting a commodity-veterinary examination allows you to establish the compliance of the product with the classification categories, to determine the causes of defects, defects that affected changes in the quality and safety indicators of the purchased product. The conclusions of an independent expert will be a documentary confirmation of non-compliance of products with regulatory acts and requirements for the protection of consumer rights.

The results of an independent commodity-veterinary examination can be presented as evidence during court proceedings or directly, in the process of communication with representatives of the trade organization in which the purchase was made.

## References

1. Law of Ukraine "On the Safety and Quality of Food Products" dated 12.23.1997 No. 771/97-VR.
2. Methodological recommendations on the appointment and conduct of forensic commodity examinations of food products in order to determine their value ; Kharkiv Research Institute of Forensic Expertise named after Prof. M. S. Bokarius (KNDISE). Kharkiv, 2005. 108 p.
3. MR 4.4.4-108–2004 Periodicity of control of food raw materials and food products according to safety indicators, approved by the Ministry of Health of Ukraine on July 2, 2004 No. 329.
4. Order of the Ministry of Justice of Ukraine "On approval of the Regulation on expert qualification commissions and certification of court experts" dated August 9, 2005 No. 86/5.
5. Fundamentals of forensic examination: a study guide for specialists who intend to obtain or confirm the qualification of a forensic expert / L. M. Golovchenko et al. Kharkiv: Pravo, 2016. 928 p. ISBN 978-966-458-991-5
6. Organizational and procedural foundations of forensic veterinary examination in Ukraine / I. V. Yatsenko et al. Kharkiv, 2009. 108 p.
7. Practice of forensic veterinary examination: Bibliography / I. V. Yatsenko et al. Kharkiv: Styl-Izdat, 2021. 56 p.
8. The procedure for selecting samples of products of animal, plant and biotechnological origin for conducting research, approved by the resolution of the Cabinet of Ministers of Ukraine dated June 14, 2002 p. No. 833.



9. On the establishment of general principles and prescriptions of food legislation, on the establishment of the European Food Safety Authority and on the establishment of procedures for the safety of food products. Regulation No. 178/2002 of the European Parliament and the Council of January 28, 2002.

10. On forensic examination: Law of Ukraine dated February 25, 1994 No. 4038-XII. Date of update: 17.10.2019. URL: <https://zakon.rada.gov.ua/laws/show/4038-12>. (date of application: 01.11.2019).

11. Tertyshnyk V. M., Varava V. V., Sachko O. V. Forensic expertise: a textbook / by general ed. V. M. Tertyshnyk. Kharkiv: Pravo, 2021. 280 p. ISBN 978-966-998-229-2

12. Yunatskyi O.V. Evaluation of an expert's opinion as evidence in court. Theory and practice of forensic activity: materials of the VIII Interdepartmental Conference (November 27, 2019), Kyiv. 2019. P. 477–481.

13. Electronic resource: <http://ptichki.net/novosti/4005-obzor-mjasnogo-i-kolbasnogo-rynka-ukrainy>.

**Анотація.** У статті висвітлені аспекти сучасного стану судово-товарознавчої та судово-ветеринарної експертизи харчових продуктів. Судова товарознавча експертиза – це дослідження експертом товарознавцем чи фахівцем ветеринарної медицини будь-яких питань, вирішення яких вимагає застосування спеціальних знань у цій галузі. Під час проведення судової товарознавчо-ветеринарної експертизи оцінюються споживчі властивості товарів за органолептичними, фізико-хімічними та іншими якісними показниками, показниками безпечності (мікробіологічними, токсикологічними, мікологічними, радіологічними), а також їх кількісними характеристиками, що здійснюється експертами шляхом проведення випробувань (вимірювань), вивчення інформації за маркуванням і дослідження відповідних товарно-супровідних документів.

Активний розвиток торгівлі харчовими продуктами, їх наявність у зовнішньоекономічних операціях, у певних випадках зумовлюють необхідність призначення судових експертиз. Предметом судово-товарознавчої експертизи продовольчих товарів є фактичні дані у справі, які встановлюються судовим експертом на підставі спеціальних знань, у результаті їх дослідження, їх відносин (зв'язків) продукції з явищами навколишньої дійсності (різними впливами) і функціонально пов'язаних з ними процесів (упаковкою, транспортуванням, зберіганням), проведеного в межах чинних правових норм, з метою отримання доказової бази для слідства та суду. Предмет експертизи продовольчих товарів дає змогу правильно визначити коло завдань та обрати експерта або експертів.

**Ключові слова:** харчові продукти, судово-товарознавча експертиза, доказова база, експерт, правові норми, товарно-супровідні документи.