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Theoretical justification and praxeological significance of the stages of expert research of a living animal

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Abstract

The relevance of this study is determined by the need to develop the theoretical foundations of forensic veterinary medicine as a science and educational discipline, namely, to justify, test and put into practice the methods, means, and methodology of expert research of specific objects. The purpose of this study was to argue the meaning and outline the functions of each of the stages of expert examination of live animals in forensic veterinary examination. The methodological framework of this study included a systematic approach determined by the specific features of the subject under study and associated with the use of general scientific and special scientific methods, including analysis, synthesis, induction, deduction, analogy, formal-logical, comparative-legal, system-structural methods, modelling, observation, description, analysis of the practice of forensic veterinary examination, special methods, the functions of which are performed by methods of intravital clinical forensic veterinary diagnostics of animals. Based on the conducted research and generalization of the practice of forensic veterinary examination of live animals, it is argued in the work that this process consists of four stages: preparatory, analytical, comparative and synthesis stage. The separation of

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certain stages was substantiated, due to the diverse nature of the tasks that the forensic expert solves, the application of algorithms and methods of forensic examination of animals of different complexity, and the involvement of various technical techniques and equipment at each particular stage. The study proved that the sequence of applying the stages of the forensic veterinary examination of a live animal contributes to the correct assessment of the detected signs of injury or health disorder of the animal based on their comprehensive assessment, is designed to solve intermediate expert tasks, trace the process of conducting the examination and evaluate the obtained results for the justified establishment of a forensic veterinary diagnosis and formation of an expert's opinion. It was proved that the rules (methodical recommendations) of the forensic veterinary determination of the degree of severity of damage caused to the animal's health, the method of forensic veterinary examination of animals to establish their mutilation, and the method of forensic veterinary examination of animal corpses are the basis of the conducted research. The theoretical substantiation of the stages of the expert examination of a live animal and the coverage of their praxeological significance will be positively reflected in the conduct of a forensic veterinary examination and compilation of the results of forensic veterinary examinations

Keywords: forensic veterinary examination; forensic expert; injuries; diseases; research algorithm; effective activity

Introduction

One of the types of forensic examination is forensic veterinary examination, which, starting from 2019, has been actively developing at the National Research Centre "Ex. Prof. M.S. Bokarius Institute of Forensic Examinations" of the Ministry of Justice of Ukraine (NRC IFE) (Kliuiev, 2019; Derecha, 2021). One of the most difficult problems in the theory and practice of forensic veterinary examination is the development of rational approaches to the organization of the procedure for carrying out an expert examination, specifically a live examinee animal because of the objectivity, reasonableness, correctness, and truthfulness of the forensic expert's conclusion depend on this, as a source of evidence for judicial proceedings (Brownlie & Munro, 2016). Such issues are now raised on the pages of scientific publications not only in Ukraine, but also in other countries (Listos *et al.*, 2015; Munro *et al.*, 2020; Rebollada-Merino *et al.*, 2020).

Since the forensic veterinary examination in the forensic examination institutions of the Ministry of Justice of Ukraine was started only a few years ago, its conceptual theoretical provisions are currently at the stage of development and approval, and therefore, they require experimental and practical substantiation, including the stages of expert examination of live animals animal under examination and their use in forensic veterinary examination.

Forensic expert activity both in Ukraine and abroad is a clearly regulated activity (Simakova-Efremian, 2017; Order of the Ministry of Justice…, 1998; Law of Ukraine "On Forensic Examination", 1994). However, the process of developing expert methods, methodical recommendations, and reference literature on forensic veterinary examination has only just begun in Ukraine, specifically at the NRC IFE, since this class of forensic examination was introduced in the system of

specialized expert institutions of Ukraine only in 2019. In a relatively short time, the arsenal of forensic veterinary examination has been replenished with the latest scientific research, including on the forensic veterinary examination of live examinee animals. In co-authorship, the author of this paper was the first to develop the rules of forensic veterinary determination of the degree of severity of damage caused to the health of the examinee animal; the preparation of the methodology of the forensic veterinary examination of a live examinee animal is underway. Cases of forensic veterinary examination of live animals with signs of mutilation are analysed in detail. For the first time in world practice, the concept "animal mutilation" was defined, its signs were outlined and distinguished, and its classification was developed, the degrees of restriction of the animal's vital activity due to mutilation were substantiated; the order of forensic veterinary examination was developed to establish mutilation of animals (Yatsenko & Parilovsky, 2022).

A step-by-step solution to the problem of forensic veterinary examination of live examinee animals will enrich forensic expertise with new data, increase the requests of law enforcement agencies and courts and their opportunities for justified qualification of crimes and misdemeanours against the health and life of animals, and society will receive a fair trial (Lockwood *et al.*, 2019; Munro, 2022).

Considering the stages of forensic veterinary research during the implementation of a specific expert task is conditioned upon the need to use certain research methods, methods, and tools that belong to the competence of a forensic expert (Shcherbakovskyi, 2015).

The outlined specificity of the subject and objects of the forensic veterinary examination determines the specific features of the stages of expert research. At each stage, objective patterns for acquiring new knowledge are revealed. The basis of any stage is the corresponding tested expert procedures, the nature of the properties of the object of forensic examination, the practice of solving analogous expert tasks, etc. are considered. Compliance with the algorithm for conducting forensic veterinary research at each stage allows obtaining reliable, objective, and effective research results, which are expressed in their effectiveness, verification, and admissibility from the standpoint of the law.

Notably, the stages of expert research and their application in the forensic veterinary examination of animal corpses are comprehensively substantiated by the author of this paper (Yatsenko, 2022). However, currently Ukrainian scientific sources lack a sufficient theoretical framework for forensic veterinary examination, specifically a systematic analysis and clear differentiation of stages research of live examinee animals with an outline of individual expert operations at particular stages, which determines the relevance of this study.

Expert research is a cognitive activity of a forensic expert, which is based on the latest achievements of science and technology, their familiarity with modern Ukrainian and foreign effective research methods, and personal skills.

During a forensic veterinary expert examination of a live examinee animal, similarly to an animal cadaver (Yatsenko, 2022), it is appropriate to distinguish four stages: preparatory (preliminary examination), analytical (separate examination), comparative, and synthesizing (evaluation).

The purpose of this study was to cover the essence, argue the meaning, outline the functions of the stages of expert examination of live examinee animals in forensic veterinary examination.

Various scientific methods were used in this study, considering the specifics of the subject, the

purpose, and tasks of the study, namely: dialectical, logic methods (formal-legal, system-structural analysis, modelling, analysis, synthesis, induction, deduction), general cognitive methods (description, observation, comparison, measurement), special methods, the functions of which are performed by methodologies (methods of intravital clinical forensic veterinary diagnostics of animals), and forensic expert methods. The indicated research methods were used during forensic veterinary examinations on animal cruelty during 2010-2021 at the National Research Centre "Ex. Prof. M.S. Bokarius Institute of Forensic Expertise" of the Ministry of Justice of Ukraine (Kharkiv).

Preparatory stage of expert research

At the preparatory, first stage of the expert research, the forensic expert performs the following actions:

- reads the document on the appointment of a forensic veterinary examination or the involvement of a forensic expert, received by the state expert institution;
- clarifies the category of the case for which a forensic veterinary examination is prescribed;
- establishes the object to be investigated (a living examinee animal);
- studies the provided materials: their type, name, paying special attention to veterinary documents;
- establishes the method of delivery of the examinee animal;
- determines the compliance of the materials and objects received by the expert institution (forensic expert) with the information specified in the procedural document on the appointment of the forensic expert (recruitment of the forensic expert);
- determines the list of issues to be resolved by the forensic veterinary expert;
- verifies the presence of information in the case materials that may provide an opportunity to exercise the right to expert initiative during a forensic veterinary examination of an animal examinee to expert examination;
- outlines the subject of the forensic veterinary examination, proceeding from the content of the questions raised in the procedural document on the appointment of this examination;
- verifies the connection of the object with the subject of the forensic veterinary examination;
- selects regulations, methods, and sources of special literature to be used during the forensic veterinary examination;
- creates an algorithm for solving the tasks set, which includes the correct, substantiated, and appropriate sequence and content of actions to achieve the result of expert research. A block diagram can be used to visualize the algorithm.

At the preparatory stage of an expert examination of a live animal, pursuant to Item 5.5 of the Rules for the Forensic-Veterinary Determination of the Degree of Severity of Damage to the Animal's Health (Methodological Recommendations) (hereinafter – the Rules) (Yatsenko & Parilovsky, 2021), if for objective forensic veterinary examination or an expert study the forensic expert is not provided with the necessary veterinary or other documents essential for determining the damage caused to the health of the animal, the forensic expert submits a request for the provision of the relevant documents within the period prescribed by the Departmental Instruction (Order of the Ministry of Justice..., 1998).

Example: "On xx.xx.20xx, G.O.P., the investigator of the investigative department of the I……yi police department of the Main Directorate of the National Police in My…… region, the senior lieutenant of the police, was sent a request to provide additional materials, including a dog of the Spaniel

breed"; or: "On xx.xx.20xx, to the address of T.P.Sh., the prosecutor of the K.... City Prosecutor's Office of the V... region, the request of the expert was sent regarding the need to conduct additional examination on a dog named Rex".

Analytical stage of expert research (separate research)

At this stage, the forensic expert conducts a clinical forensic-veterinary examination of each living examinee animal separately, if there are several of them, separate parts of the body, body systems to effectively solve the expert tasks set in the procedural document on the appointment of a forensic veterinary examination by an authorized person or body. As a result of a separate study, two groups of signs are distinguished: those that characterize the physiological norm, and those that characterize damage or disease. The latter will be analysed by a forensic-veterinary expert and used to make a forensic-veterinary diagnosis and draft an expert's opinion.

During the expert examination, an analysis of the registration and anamnestic data of the examinee animal, research of veterinary documents available in the materials of the criminal proceedings or case (if before the forensic veterinary examination the examinee animal was provided with veterinary care in veterinary medicine institutions, etc.), a clinical forensic-veterinary examination is carried out, instrumental, imaging, and laboratory studies are performed (Fig. 1)

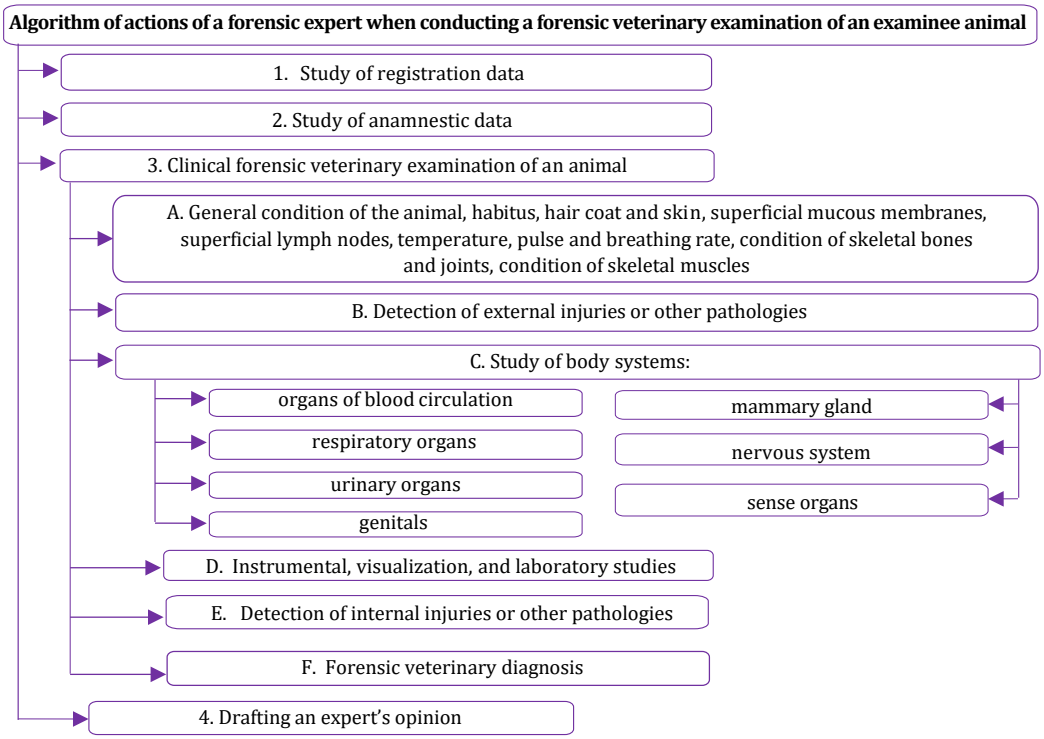

Figure 1. Block diagram "Algorithm of the forensic veterinary examination of a living examinee animal"

Source: Author's development

Before the start of the direct clinical forensic veterinary examination of a live examinee animal, the forensic expert examines the veterinary documents provided as part of the criminal proceedings. The object of the study can be the results of haematological studies, ultrasound examination protocol, radiographs, and their description, computer or magnetic resonance imaging protocol, intraocular pressure measurement results, ophthalmological examination results, conclusions of specialized veterinary medicine specialists, an extract from an outpatient journal or history diseases from the clinic of veterinary medicine, etc. Researched veterinary documents drafted by veterinary medicine specialists at the time of injury to the animal or in the early post-traumatic period can serve as auxiliary material for clarifying the clinical condition of the animal (mild, moderate, or severe), if a forensic veterinary examination of a live examinee animal is conducted directly by a forensic expert and the main one, if a forensic veterinary examination is conducted based on the materials of a criminal proceeding or case.

According to Item 5.6 of the Rules (Yatsenko & Parilovsky, 2021), during a forensic veterinary examination or expert examination, a forensic expert must examine the originals of veterinary or other documents related to the subject of the forensic veterinary examination. In exceptional cases, it is possible to use duly certified copies of veterinary documents with the signature of the veterinarian who provided veterinary care to the animal, made according to the originals, if the latter comprehensively reflect information on the nature, localization and clinical picture of the course of injuries, as well as other necessary information, which is essential for examination.

At the same time, pursuant to Item 5.7 of the Rules (Yatsenko & Parilovsky, 2021), under certain circumstances, a forensic veterinary expert may use the results of research conducted with the involvement of specialized veterinary medicine specialists who specialize in a certain field of veterinary medicine: internal medicine, surgery, reproductology, cardiology, traumatology, endocrinology, neurology, etc., without examining the affected animal personally. In this case, such information about the results of research should be presented in the form of a written advisory opinion of a specialist with their personal signature, duly certified. Such veterinary documents must state where, when, and by whom the examinee animal was examined; what objective data were established therewith; what conclusions the involved veterinary medicine specialist reached.

Pursuant to the requirements of Item 5.36 of the Rules (Yatsenko & Parilovsky, 2021), the phenomena of deformation of parts of the animal's body as a result of injury can be assessed by a forensic veterinary expert 21-30 days after the injury after the regression of traumatic oedema of soft tissues, therefore, in the specified period, it is necessary to carry out a repeated clinical examination of the examinee animal with the preparation of relevant veterinary documents, which will outline the results of these examinations and the duration of regression of injuries in the post-traumatic period.

In addition, pursuant to the requirements of Item 5.36 of the Rules (Yatsenko & Parilovsky, 2021), the issue of repairability or irreparability of damage to the animal's exterior can only be resolved based on the results determined over time and having the final appearance of post-traumatic damage without surgical intervention, after as the injured soft tissues or skeletal bone fractures have completely healed, but not earlier than 60-90 days after the injury, and therefore, after the indicated period, it is necessary to conduct a repeated forensic veterinary examination of the examinee animal.

Pursuant to the requirements of Item 7.31 of the Methods of forensic veterinary examination of animals to establish its mutilation, the duration of the forensic veterinary examination of an examinee animal to establish its mutilation should not exceed 90 calendar days (Yatsenko, 2021).

According to veterinary documents, high-quality photographs with their detailed description, a forensic veterinary examination of a live animal is carried out to establish its mutilation, if such an animal cannot be delivered to a forensic expert for its direct examination, but only in cases where the signs of mutilation are evident, which is consistent with Item 7.10 of the Methods of forensic veterinary examination of animals to establish their mutilation (Yatsenko, 2021).

By studying the registration data of a live examinee animal, its identification features are established, noting its species, nickname, or individual number; the date of the clinical forensic examination, the number, and content of the animal's passport, age, sex, body weight, breed (cross or poultry line), coat or feather colour; ownership (data about the owner of the animal), special signs, date of illness or injury of the animal; type of economic use of the animal (e.g., service dog, domestic cat, dairy cow, etc.).

Example: "The type of animal is a domestic cat. The nickname is Victoria. Gender – female. Age – 7 months. The colour of the fur is brown grey. Special signs – absent. Belongs to _____ (*indicate the name and initials, address of the owner or guardian*). The date of injury is xx.xx.202x. During the forensic veterinary examination of the European cat, the owner of the animal, N.T.M., was present. Date and place of forensic veterinary examination – CE "Treatment of animals" (358 Haharina Avenue, Kharkiv). _____ (*date*)".

To analyse the anamnestic data and the circumstances under which the animal suffered health damage in the form of injury or illness, the forensic veterinary expert uses information from the procedural document on the appointment of a forensic veterinary examination (resolution or decision), the protocol of the inspection of the scene of the incident or data from other veterinary documents (extract from the medical history, card of an ambulatory sick animal, etc.), which is consistent with Item 2.1 of the Departmental Instruction.

If necessary, the forensic expert can petition the authorized person or body that appointed the forensic veterinary examination to clarify certain issues related to the subject or object of the examination during the interrogation of any participant in the process, pursuant to paragraph 5 of Item 2.1 of the Departmental Instruction (Order of the Ministry of Justice…, 1998).

Example: "From the resolution of the inquirer – F.V.S., the inspector of the investigative department of the L…….th District Police Department of the Main Department of the National Police in the P……..th region on the appointment of a forensic veterinary examination dated xx.xx.202x, it is known that "on xx.xx.202x at approximately 3 p.m. 45 min., Sh.E.V., staying at his place of residence, at the address: 59 V....y Ave., L....y, treated the kitten cruelly, hung it from the window of the house, tied with a rope by the neck".

During the clinical forensic-veterinary examination of a live examinee animal, the forensic expert must establish objective data obtained using clinical, instrumental, imaging, laboratory research, which is consistent with the requirements of paragraph 4, Item 2.2 of the Departmental Instruction (Order of the Ministry of Justice…, 1998), as well as with Item 5.1 of the Rules (Yatsenko & Parilovsky, 2021). At this stage of the expert examination, the nature of the damage (wound, abrasion, bruise, etc.), painful changes in organs or parts of the body, if any, are diagnosed. Organs

without morpho-functional changes are noted separately. The algorithm of the clinical forensic veterinary examination of a live animal is not permanent, it can be adjusted, depending on the injured area or organs (*Status localis*), the nature of the damage, the age of its occurrence, as well as considering the circumstances of causing damage to the animal's health, its species affiliation, age, sex, physiological state of the issues raised for the decision of the forensic expert in the procedural document on the appointment of a forensic veterinary examination. Obtaining an objective and correct forensic veterinary diagnosis is influenced by a correctly constructed research algorithm.

During a clinical forensic veterinary examination of a live examinee animal to determine the degree of severity of damage caused to its health, it is mandatory and a priority to examine the general condition of the animal, its habitus, skin and hair coat, visible mucous membranes, superficially located lymph nodes, bones of the skeleton, joints, skeletal muscles, temperature parameters, pulse and breathing rate, and also indicates whether the animal has clinical signs of infectious diseases.

As an example, we will cite the algorithm of clinical forensic veterinary research of the habitus of an examinee animal, which helps distinguish a sick animal from a healthy one. For this, the forensic veterinary expert determines the general state of the animal: satisfactory, depressed (apathy, stupor, sopor, coma), agitated (fear, nervousness, fury, aggressiveness); position of the body in space: physiological, unnatural (forced standing or forced lying down), pose: natural or unnatural ("observer", "pendulum-like oscillation", "sitting or lying dog", "Egyptian sphinx", "astronomer", etc.); movements: natural or forced (aimless wandering, manege, roller-like and rotational, back-and-forth, etc.); constitution (tender, dense, rough, loose), as well as the animal's reaction to manipulation.

Example: "The general condition of the cat named Victoria is satisfactory. The position of the animal in space is physiological, natural. The pose is natural. The cat carefully changes it in space. The movements of the auricles and the tail are active. The body structure of the animal is correct, symmetrical. Fatness is average; the constitution is dense; temperament – good; coordination of movements – preserved, natural, careful. During the forensic veterinary examination, the animal is socialized and shows no aggression. The animal observes the environment with interest and fear (in the premises of the veterinary clinic)".

Analogous algorithms of clinical forensic veterinary research are developed to determine the condition of skin and hair, visible mucous membranes, superficially located lymph nodes, bones of the skeleton, joints, skeletal muscles.

Next, the forensic veterinary expert determines the parameters of the temperature, pulse rate and respiration of the examinee animal, as well as indicates whether it has clinical signs of infectious diseases.

Example: "Rectal body temperature is 39.0°C (physiological norm – 38.0…39.5°C). Pulse on a. femoralis: 125 bpm (physiological norm – 110-130 bpm). The frequency of breathing is 25 breaths/min (physiological norm – 20-30 breaths/min). No clinical signs of infectious diseases were found".

After completing the examination of the general condition of the animal, its habitus, skin and hair cover, visible mucous membranes, superficially located lymph nodes, bones of the skeleton, joints and skeletal muscles, the forensic veterinary expert directs attention to the examination of injuries found on the animal's body, noting their localization, quantity, nature.

Example: "Post-traumatic surgical removal of the right eyeball" or "the wound in the area of the

dorsal surface of the left wrist is an open, clogged, not deep, non-penetrating wound. The bottom of the wound channel is the bones of the wrist, the edges of the wound and the walls of the wound channel are soaked with blood, swollen, the wound is painful to the touch, hot, the wound lumen is gaping; the wound is not contaminated, contains a small amount of serous-purulent exudate", or "complete loss of the right eye, and therefore permanent loss of visual function in the right eye", or "traumatic atrophy of the right temporal muscle".

Next, at the stage of the analytical (separate) expert examination, the forensic veterinary expert proceeds to the clinical forensic examination of the state of organ systems, specifically: blood circulation, breathing, urination, genitals, mammary gland, nervous system, sense. A complete examination of all body systems is necessary because the animal cannot indicate pain sensations in the body, so they must be detected by a forensic veterinary expert using special methods, as well as an examination of the body systems will make it possible to detect complications of the main injury or disease, accompanying and background pathologies. Thus, when examining the internal organs, the expert establishes their position in the body (natural or displaced), the limits of the percussive field (not increased, increased, decreased), features of organ sensitivity (painful or painless), size (not increased, increased, decreased), mobility (moderately mobile, not mobile, markedly mobile), consistency (moderately dense, dense, loose), symmetry (symmetric, asymmetric – for paired organs), as well as skin temperature in the projection of the location of the organ (moderately warm, hot, cold).

Each internal organ of the subject animal is examined according to the procedure established in forensic veterinary practice. As an example, we will give the algorithm of a clinical forensic veterinary examination of the heart. For this, the forensic veterinary expert determines the general condition of the animal: natural or depressed, detects forced postures (extended neck, lowered head, widely spaced thoracic limbs), animal behaviour (groaning when lying down, standing up and defecating, avoiding sudden movements and turns); the presence of cold, painless, spilled, dough-like swellings in the area of the intermaxillary space, under the chest, abdomen, lower parts of the pelvic limbs; bluish skin, decreased skeletal muscle tone; heartbeat (moderate in strength or increased); percussive borders of the heart (unchanged or shifted), percussive sound (dull or dull, tympanic), area of relative cardiac dullness (reduced or increased); sensitivity of the heart area (painful or painless). When examining heart tones, the expert determines their rhythmicity, clarity, the presence of extraneous noises, timbre, strength (intensification or weakening of the first and second tones, as well as their lengthening, splitting, bifurcation or accentuation), the presence of heart sounds.

Example: "The field of percussive blunting of the heart has not changed. There is no pain reaction of the cat during percussion of the heart area. Heart sounds are moderately sonorous and clear. There are no extraneous sounds in the heart, as well as extracardiac (murmurs)". Analogous algorithms of clinical forensic and veterinary research are developed to determine the condition of other organs of the body systems, specifically the organs of respiration, urination, genitals, mammary gland, nervous system, sense organs.

Example: "During the clinical forensic examination of the respiratory organs, it was established that respiratory movements are calm, symmetrical, rhythmic. A thoracic type of breathing is observed. There are no coughs, wheezing, and runny nose. The contours of the nostrils are clear, even, unchanged. Nostrils and nasal passages are

free. Nasal cavity without extraneous contents, oedemas, swellings, wounds, erosions, haemorrhages. The trachea and larynx occupy a natural anatomical position, the skin in the projection of these organs is moderately warm, they are painless during palpation. A laryngeal type of breathing is registered in the larynx. The chest is round, symmetrical, the skin in its projection is moderately warm, not painful upon palpation, there are no oedemas and emphysema in the subcutaneous tissue. A clear atympanic (pulmonary) sound and only basic bronchopulmonary respiratory sounds are revealed in the projection of the lungs. There are no pathological breathing noises".

Under certain circumstances, there is a need to use instrumental x-ray, ultrasonographic, tomographic, and other imaging methods to study a living examinee animal (Boysen *et al.*, 2004). As a visual example, we can illustrate the results of a computer tomography study of the head of a dog named Rex, which was deliberately hit by a car (Fig. 2): "A series of computer tomography of the head of a dog named Rex reveals a consolidating fracture of the dorsal plate of the frontal sinus on the left, up to 13.0 mm long. Pneumaticity of the left frontal sinus is not reduced. Pneumaticity of the sphenoid sinus is partially reduced by the soft-tissue component, with a density of up to ±146 HU. The pneumaticity of the cells of the lattice labyrinth has not changed, except for the rostral (front) sections, where hypertrophy of the parietal mucous membrane is established. Fluid in the paranasal sinuses and signs of distortion of the bony part of the nasal septum were not detected. Temporomandibular joints are symmetrical, there are no bone-destructive changes. The area of the sella turcica and the chiasmatic area are unchanged. The external and internal auditory canals are symmetrical, no tumours were found in them. The pneumaticity of the tympanic membranes is preserved. Auditory ossicles (hammer, stirrup, and anvil) are traced on the right and left. The tympanic septum on the left is traced fragmentarily, with signs of its damage, the thickness is up to 1.2 mm on the left, up to 1.0 mm on the right. On a series of computer tomograms of the orbits and facial skeleton in the projection of the orbital cavities, no additional formations are identified, the orbital cavities are symmetrical. Bone-destructive changes were not detected, the bony canals of the optic nerves were symmetrical and not deformed. Eyeballs without deformations. The muscles of the eyeballs are symmetrical, their size and structure are without visible changes. Retrobulbar space without volumetric formations, retrobulbar tissue is homogeneous. *Conclusion*. CT image of a consolidation compression fracture of the frontal bone on the left. Fragmentation of the tympanic septum on the left with signs of damage".

Figure 2. Compressed multifragmentary fracture of the frontal bone of the skull on the left side, with prolapse of the fragments into the left frontal sinus in the dog named Rex. Computed tomography. Screenshot from the disc

Source: archive of the NRC "Ex. Prof. M.S. Bokarius Institute of Forensic Expertise". 2021

Ultrasonography (ultrasound diagnosis) is a fairly widespread method of research, which is an auxiliary, clarifying method of diagnosis during a forensic veterinary examination of a live examinee animal, which allows providing an expert assessment of the state of internal organs, assessing the severity of the animal's bodily injuries, especially in the case of combined trauma, when damage to the organs of the musculoskeletal system and internal organs is registered. As an illustrative example, we can cite the results of an ultrasonographic examination of the same sub-expert dog named Rex, which was deliberately run over by a car and which was the subject of a forensic veterinary examination by the author of this scientific publication: "The borders of the liver are not enlarged, its contours are even, unclear, echogenicity is unchanged, the structure of the parenchyma is heterogeneous; network of blood vessels without specific features. Gallbladder: painless, its dimensions are 4.74×2.91, regular shape; wall thickness – up to 0.10 cm; filled with an anechoic liquid of uniform consistency. Stomach: the structure of the membranes is not disturbed, the echogenicity is unchanged; the thickness of its wall is up to 0.39 cm. Small intestine: the structure of the membranes of the intestinal wall is unchanged; echogenicity is unchanged; wall thickness – up to 0.27 cm; intestinal peristalsis is visualized, it is active. Abdominal lymph nodes without anatomical features. Spleen: contours are uneven, clear, it is enlarged; the structure of the parenchyma is heterogeneous, elevated; splenic veins are not dilated. The pancreas was not examined due to diagnostic difficulties. Right kidney: located anatomically correctly, contours are even, clear; size – 6.65×3.34 cm, the renal pelvis is not expanded; the thickness of the parenchyma is up to 0.60 cm. Left kidney: anatomically correct, its contours are even and clear; cortico-medullary differentiation is pronounced; size – 6.91×3.68 cm; the renal pelvis is not expanded; the thickness of the parenchyma is up to 0.62 cm. Bladder: moderately full, its shape is correct; wall thickness is 0.17 cm; its cavity is anechoic; a small amount of sediment is observed in it. Prostate gland: size 2.66×3.61 cm, capsule preserved, smooth, clear contours; the echo structure is uniform, coarse-grained. *Conclusion*. Signs of diffuse changes in the parenchyma of the liver and spleen, splenomegaly (enlargement of the spleen)".

In most forensic cases, it is impossible to assess the clinical condition of the subject animal and objectively establish the severity of the damage caused to the animal's health without laboratory studies of the biological material of the animal's body (blood, faeces, urine, stomach contents, bile, cerebrospinal fluid, secretions, milk, etc.) using methods: haematological, toxicological, histological, cytological, microbiological, immunological, parasitological, etc. It is advisable to systematize the results of laboratory tests into those that do not deviate from the established norms, and those that differ from the norm towards increase and decrease. The evaluation of the results of the application of instrumental and laboratory methods of forensic veterinary research must be reasoned, complete, motivated, scientifically based, clear, concise, understandable, based on factual data and special veterinary knowledge. Such an approach will provide substantiation of the detected changes in relation to the condition of the already examined organs of the body, and in the aggregate establish the correct forensic veterinary diagnosis.

As a vivid example, we can illustrate the results of the haematological examination of the same examinee dog named Rex, which was deliberately run over by a car and which was the subject of a forensic veterinary examination by the

author of this paper: "*Clinical blood analysis dated xx.xx.20xx*. Among the parameters under study, the number of eosinophils is higher than normal (result – 8%, normal – 0-6%, excess by 33%). Other parameters are within the physiological norm, namely: erythrocytes, average erythrocyte volume, distribution of erythrocytes, haemoglobin content, average haemoglobin content in erythrocytes, average concentration of haemoglobin in erythrocytes, haematocrit, leukocytes, segmented neutrophils, monocytes, lymphocytes, erythrocyte sedimentation rate, platelet content, average platelet volume, platelet distribution, thrombocrit.

Biochemical analysis of blood dated xx.xx .20xx. Among the indicators under study, higher than the norm are alkaline phosphatase (result – 130 units/l, norm – 10.6-76.0 units/l, excess by 71%) and AST (result – 51.0 units/l, norm – 8.9-43.0 units/l, an excess of 19%). Other indicators are within the physiological norm, namely: the content of glucose, creatinine, urea, alpha amylase, albumins, globulins, alanine aminotransferase (ALT), gamma-glutamyltransferase (HGT), cholesterol, triglycerides; the level of total protein, albumin-globulin ratio, total bilirubin".

Images obtained during instrumental, apparatus, or laboratory tests in the form of X-rays, CDs with recording of CT images, images of the results of ultrasonographic research, etc., as well as the results of laboratory tests, must be kept in supervisory expert proceedings and at the request of the body (person) who appointed the forensic veterinary examination, can be provided to them for perusal, and in most cases, their images are placed in photo tables, which are appendices to the forensic expert's opinion.

After carrying out clinical, instrumental, imaging, and laboratory examinations of the examinee animal, the forensic veterinary expert formulates a forensic veterinary diagnosis of the essence of the disease or injury and the condition of the sick (injured) animal, formulated based on the anamnesis data, the results of clinical and laboratory examinations, expressed in nosological terms stipulated by generally accepted classifications and nomenclature of diseases and reflects the cause, mechanism of development, pathomorphological signs and functional manifestations of the disease or injury. It is formulated accurately, fully, clearly, concisely, logically, without any explanations or justifications.

The structure of the diagnosis involves a sequential presentation of nosological forms: the main disease (damage), complications, accompanying and background pathology.

Example: "Forensic veterinary diagnosis: multiple, mechanical, bruised, open, superficial, non-penetrating wounds of the thoracic and pelvic limbs, areas of the neck, contusion of the chest, wound in the area of the left knee fold".

As a result of a separate study, two sets of signs are distinguished: general (without morpho-functional changes) and separate (with morpho-functional changes characterizing the organs or parts of the body of a living examinee animal, in an amount sufficient to establish a forensic-veterinary diagnosis).

For instance, in the case of an object with prickly properties, the diagnostic signs are a gaping wound in the area of the mandibular space with penetration into the sublingual space; a gaping wound up to 2 cm in the upper part of the neck in the projection of the middle sagittal line; in the case of a hard object with a limited surface, diagnostic signs can be traumatic fractures of the crowns of teeth 104 (upper right canine), 103 (upper right third incisor), 202 (upper left second incisor), numerous haematomas of soft tissues of the head; in the case of an open craniocerebral injury, the diagnostic signs will be as follows: a

fracture of the branch of the left mandibular bone, a closed wound of the occipital region on the left, a haemorrhage in the skin flap of the head on the left, a bruise on the left auricle; in the case of a closed abdominal injury, the diagnostic signs are haemorrhage in the greater omentum, complete transverse fractures of the 7-10th ribs on the right along the midline of the height of the right costal wall with damage to the intercostal muscles and parietal peritoneum, rupture of the right lateral lobe of the liver.

During the analytical forensic veterinary examination of a living examinee animal, a set of methods is used, namely the general ones: the dialectical method and the methods of logic (analysis, synthesis, induction, deduction, formalization, idealization, abstraction, etc.), observation, measurement, description, construction of hypotheses, planning, modelling, etc., separate methods (instrumental and laboratory, namely radiodiagnostic methods: radiographic, fluoroscopic methods, magnetic resonance tomography, spiral computer tomography, ultrasonographic research, haematological, parasitological and microbiological methods, microscopy, forensic photography, etc.) special methods, the functions of which are performed by methods of solving particular expert tasks, namely the method of clinical forensic-veterinary research, etc. (Yatsenko, 2021).

Conducting a forensic veterinary clinical examination of a living examinee animal at the analytical stage requires the forensic expert to use various technical means. For this purpose, it is possible to use both simple devices (measuring ruler, magnifying glass, microscopes of various functional purposes, scales, a source of ultraviolet and infrared light, a camera, a tape measure with a measuring metal tape, measuring cylinders, glasses made of ordinary glass to protect the eyes) and tools (tweezers; probes, button and grooved; injection syringes; cuvettes; basins; tanks; glassware for placing biological material, glass bottles), as well as complex analytical equipment (plesimeter, percussion hammer, phonendoscope, stethoscope, maximum mercury thermometers, electrothermometers, x-ray machines, ultrasonography machines, endoscopes, sphygmographs, oscillographs, phlebograms, electrocardiographs, electroencephalographs, biochemical blood analysers, microscopes, etc.).

When conducting a forensic veterinary examination of a living animal, a forensic expert removes biopsies for histological, histochemical or cytological analysis, biological fluids of the body, specifically blood, urine, faeces, bile, transudate, exudate, synovium, stomach contents for additional instrumental and laboratory tests, in particular, physical, biochemical, chemical, microscopic, bacteriological, virological, mycological, parasitological, toxicological, immunological, molecular genetic studies, etc. Thus, when examining the damaged area, it is possible to detect foreign inclusions, namely wood particles, soot, gunpowder grains, metal particles, glass fragments, mineral oils, dirt, etc. Various research methods are used to detect them, including luminescence in ultraviolet rays, gas-liquid chromatography, photographing an object in infrared rays, the method of colour prints and emission spectral analysis, histological examination, microscopy, radiography, centrifugation of washings with distilled water, colour test with cresol red, stereomicroscopy, etc.

Often, to solve certain expert tasks, the special knowledge and professional competences of a forensic veterinary expert are insufficient, and therefore a complex forensic examination is appointed, e.g., forensic veterinary biological examination, forensic veterinary ballistic examination, forensic veterinary chemical examination, forensic veterinary toxicological examination, etc.,

which expands cognitive capabilities of forensic examination (Simakova-Efremian, 2017).

After the forensic veterinary examination of the objects (living examinee animal), as well as the study of the case materials, considering the expert tasks set for the judicial expert to solve, specified in the procedural document on the appointment of the forensic veterinary examination, the judicial expert puts forward reasonable assumptions about the state objects provided for research (living examinee animals), primary, intermediate and final circumstances to be established during forensic veterinary research, i.e., expert versions. The latter can be general, e.g., determining the degree of severity of damage caused to the animal's health, and individual, using which intermediate expert tasks are solved, for instance, finding out the nature of the damage or the cause of the disease, localization of damage, their number, mechanism, sequence, sequence, time of occurrence, inherent features in the animal's body, which can be used to establish the nature and features of the object that caused bodily harm, etc.

The detailing of individual expert versions may be related to considering the nosology of the disease or the type of injury, specifically mechanical injuries caused by sharp (de Siqueira *et al.*, 2016) or blunt (Bramati *et al.*, 2012; Gottlieb *et al.*, 2017) objects, by high (Bruchim *et al.*, 2009; King *et al.*, 2021) or low temperature (Gethöffer *et al.*, 2022), poisoning (Sniegocki *et al.*, 2019), electric shock (Feng *et al.*, 2021), gunshot injuries (Li *et al.*, 2015), etc. These versions can be investigated in the form of comprehensive forensic research.

Solving the tasks of the forensic veterinary examination is impossible without putting forward a hypothesis, its verification and clarification, correction and reliable, truthful judgment, which will be put into the formulation of the expert's conclusion based on the results of the conducted forensic veterinary examination. From the proposed versions, it is necessary to focus on the one that is most confirmed in forensic veterinary examination. Thus, upon solving the diagnostic expert task regarding the animal's injuries, the forensic veterinary expert found a wound in the dog's chest area with the following characteristics: the shape is irregular-oval, the edges are uneven, with sedimentation and haemorrhages, the ends are in the form of an obtuse angle, in the depth of its corners, tissue membranes are registered, the bottom of the wound is the underlying tissue. The first version can be a closed wound due to the action of a blunt object, the second – a cut wound due to the action of a cutting object. Based on the condition of the analysed expert case, the correct conclusion is the first version, i.e., a closed wound, which was formed as a result of the action of a blunt object because chopped wounds are characterized by a spindle-shaped shape, the edges are even or slightly jagged, the ends of the wound are sharp or M-shaped, the walls are smooth, in the depth of its corners there are no tissue membranes, the length, and depth of the wound prevail over the width.

At the stage of a separate expert examination, the forensic veterinary expert, considering the proposed expert versions, compiles an algorithm for the examination of the examinee animal (algorithmic method), which makes provision for the outline of the scope and nature of the expert examination, the involvement of the necessary methods, techniques, and means. Solving algorithmic tasks is possible provided that there is a practice of analogous forensic veterinary research, there are developed research methods, methodical recommendations, and the nature of injuries has typical features. In this case, the forensic expert comes to standard decisions based on the results of the forensic veterinary examination.

An example of such a typical method is the method of clinical forensic veterinary examination of a living examinee animal to determine the degree of severity of damage caused to the health of the animal, as well as mutilation. Thus, for instance, according to the results of the study, it was established that the complete loss of the left eye, which led to the permanent loss of the function of vision in the left eye, is a serious bodily injury based on the permanent loss of the organ and its function, as well as mutilation; closed oblique fracture of the right zygomatic bone is an injury of medium severity based on the duration of the health disorder, i.e., more than 21 days; the traumatic removal of the right lower canine (404 according to the odontological map) and caries in the area of the right scapula are minor injuries that did not cause a short-term health disorder or loss of the ability to perform useful work and have insignificant transient consequences lasting no more than 6 days.

The heuristic method is suitable for those expert tasks for which forensic veterinary methods have not been developed at the time of the examination. Such non-typical situations require a forensic expert to solve by analogy, i.e., using analogous methods that have been tested in the clinical practice of veterinary medicine. The lack of methods of forensic veterinary examination of examinee animals creates a basis for their scientific development, approval, and introduction into expert practice. Thus, Part 1 of Article 299 of the Criminal Code of Ukraine (2001) prescribes criminal liability for bodily harm to an animal resulting in mutilation. The mutilation of an animal under examination is established exclusively using a forensic veterinary examination. However, the methods of its determination did not exist until now. In 2021, the author of this scientific publication jointly developed such a technique at the National Research Centre "Ex. Prof. M.S. Bokarius Institute of Forensic Expertise" of the Ministry of Justice of Ukraine (Yatsenko, 2021).

The specifics of the algorithm and methods of solving the diagnostic expert task depend on the clinical condition of the examinee animal, the type of damage, the informativeness of individual signs (informative, uninformative and non-informative) and directly affect the effectiveness of the research and the degree of its use for drawing expert conclusions.

Example: "At the time of the forensic veterinary examination _____ (*date*), the condition of the dog nicknamed Baron is not life-threatening based on clinical signs of medium severity, and the injuries caused to the animal are compatible with life".

After the end of the separate (analytical) study, the forensic veterinary expert analyses and synthesizes the obtained data and proceeds to a comparative study.

Comparative stage of expert research

The stage is necessary for the analysis of pathologies or injuries detected in an examinee animal during a separate examination and comparing them with the generally known normal structure and function of organs and tissues of the body, establishing the nature of such deviations (regular or random, significant or insignificant), as well as comparing individual injuries between itself, for instance, to find out the sequence of their occurrence, the antiquity of their occurrence, etc. At this stage of the expert examination of a living examinee animal, the identified clinical macroscopic pathognomonic (specific for a particular type of injury or disease) signs are first compared with the results of instrumental and laboratory studies.

At the comparative stage of expert research, the method of comparison is used, the methods of mathematical statistics of measurement results

are used, and at the end of this stage, the forensic veterinary expert formulates a forensic veterinary diagnosis.

After analysing all the results of the research (clinical forensic-veterinary examination, instrumental and laboratory studies), the forensic expert formulates a forensic-veterinary diagnosis – a concise and accurate conclusion about the essence of the disease and/or injury and the condition of the sick animal, formulated by the forensic-veterinary expert based on anamnestic data, the results of a clinical forensic veterinary and laboratory examination, reflecting its nosology, aetiology, pathogenesis and mechanism, pursuant to the generally accepted classifications of veterinary nomenclature, the essence of injuries or diseases, as established during the forensic veterinary examination of animal cadavers (Yatsenko, 2022). Forensic veterinary diagnosis reveals the essence of injuries or diseases of an examinee animal. In the practical forensic veterinary examination of living animals, the diagnosis is made according to aetiological or functional principles. For a forensic veterinary diagnosis, its three-member rubrication is generally accepted for recording the main injury or disease, complication of the main injury or disease, combined, concomitant and background injuries or diseases in the form of nosological units, as described in the previous publication of the author of this study (Yatsenko, 2022).

The principal task of the forensic veterinary expert is to establish the main and immediate cause of the health disorder, determine the severity of the damage caused to the animal's health, and confirm or deny the presence of mutilation.

The use of special veterinary knowledge allows the forensic expert to analyse the results of intermediate expert studies, provide them with an expert assessment and formulate conclusions.

Synthesizing stage (stage of evaluation of expert research)

The synthesis stage is the final step in the complex technological process of expert research on a living examinee animal. At this stage, the forensic expert analyses the results obtained at the previous stages, critically evaluates the variation of alternatives, finally evaluates the obtained data, determines the complex and expert significance, i.e., the diagnostic informativeness of the pathognomonic (most characteristic) signs based on a reasonably applied complex of research methods, which is consistent with Item 1.4 of the Departmental Instruction (Order of the Ministry of Justice..., 1998). Thus, the following signs are inherent in a puncture wound: the entrance wound opening is smaller than the diameter of the injuring object, and the shape of the entrance wound opening depends on the shape of the cross-section of the injuring object, the edge of the wound with deposits and rust from the surface of the injuring object, the wall of the wound canal is smooth, the length of the wound canal exceeds its other parameters, hole fractures are formed in the bones.

This process requires the involvement of the dialectical method and methods of formal logic (analysis, synthesis, deduction, induction) and forms the internal conviction of the expert, based on which the expert's conclusions are based (Vorobchak, 2019). The forensic veterinary expert presents the results of the evaluation stage of the expert study in the synthesizing section of the research part of the expert's opinion.

Signs of damage or painful changes found in a live animal under expert examination are evaluated in a certain sequence: first – signs characterizing the main damage or disease that led to the animal's health disorder; next – signs characterizing complications of the main injury or disease;

and finally – features characterizing competing, concomitant and background injuries or diseases.

The expert assessment of injuries or diseases detected in a living examinee animal is based on the scientific justification of their nature and pathogenesis, based on the latest scientific achievements in the field of veterinary medicine, forensic veterinary expertise and other related sciences.

It is advisable to start the expert assessment of the results of the forensic veterinary examination of a living examinee animal by specifying the animal's species, its sex, age, and physiological characteristics. For instance, if the forensic veterinary expert establishes and states in the expert's opinion that the bodily injuries were caused to a female animal in a state of pregnancy, then this may be a qualifying feature when the court passes a sentence in criminal proceedings.

The results of the forensic veterinary examination of living examinee animals can be recorded by objective evaluation criteria specially developed in the forensic veterinary examination. For instance, in diagnostic forensic veterinary examinations of the kidneys, the forensic expert notes their anatomical position (natural, displaced), mobility (mobile or not), sensitivity (painful or painless), size (enlarged or reduced), nature of the surface (smooth or grooved); contours (clear or not clear), differentiation of cortical and brain zones (well expressed, erased, not expressed, homogeneous, echonegative), renal pelvis (not enlarged, enlarged, contains stones or not), swelling in the area of the chest, intermaxillary space, abdomen, external genitalia and other parts of the body (pronounced, absent).

There are criteria for diagnostic forensic evaluation of other organs and body parts. To automate the registration and analysis of individual clinical signs of a living animal, one can use the "Forensic Veterinary Clinic" information and expert system, which the author of this article developed together with R.G. Kazantsev (certificate of copyright registration for the work No. 112129 dated 23.02.2022).

At the evaluation stage of the expert diagnostic forensic veterinary examination of a living examinee animal, the forensic expert formulates a forensic veterinary diagnosis, and when drafting the expert's opinion, they rely on objective judgments about the detected and investigated injuries or diseases with an emphasis on a detailed description of the area of damage or the injured organ. The nature, localization, mechanism, order and sequence, the age of the injury, whether the animal felt pain from the injuries in the post-traumatic period, the cause-and-effect relationship between the nature of the injury and the degree of severity of the damage to the animal's health are substantiated with a mandatory consideration of the main, concomitant, and background damage or disease, which are important for the formulation of reliable conclusions.

One of the important issues to be resolved by a forensic expert at the stage of evaluating the results of a forensic veterinary examination of a living examinee animal is a forensic veterinary determination of the degree of severity of damage caused to the health of the animal, which is carried out according to the veterinary criteria developed in co-authorship by the author of the present paper (Yatsenko *et al.*, 2020). This process begins with the detection of signs of severe damage to the animal's health, according to the criterion of danger to life at the time of their occurrence, revealing at least one of the 32 signs regulated by the Rules (Yatsenko & Parilovsky, 2021). Next, they proceed to the analysis of non-life-threatening injuries, which belong to serious injuries, i.e., complete or partial loss of an organ or its functions. The fact of traumatic

termination of pregnancy and disfigurement (distortion) of the animal's exterior are also being investigated.

If the serious degree of damage caused to the animal's health is not confirmed, then the analysis of injuries of a moderate degree of severity is carried out, which is based on the persistence of the loss of the ability to perform useful work for a period of more than 21 days. However, if the signs of an average degree of damage to the animal's health are not confirmed, then this is an injury of a light degree of severity: without a health disorder with short-term consequences, i.e. a duration of up to 6 days, or such that caused a short-term health disorder for a period of from 6 to 21 days (Parilovsky & Yatsenko, 2021).

At the stage of evaluation of the expert forensic veterinary examination of a living examinee animal, the forensic expert must also resolve the question of the age of injury to the animal. Currently, this issue in forensic veterinary examination is not sufficiently researched and experimentally confirmed. In this regard, the forensic expert can state that it is not possible to establish the age of injury to the animal, if the set of signs for this in the examinee animal is insufficient or there are none. If, during the forensic veterinary examination, a sufficient number of signs characterizing the antiquity of the injury to the animal is established, the forensic expert can state categorically that the damage to the subject animal occurred at the time and under the circumstances specified in the procedural document on the appointment of the forensic veterinary examinations.

One of the key and newest issues that must be resolved by a forensic veterinary expert during a forensic veterinary examination of a living examinee animal is the issue of animal mutilation as a result of severe bodily injuries. The significance of the resolution of the specified issue by a forensic expert for the investigation or the court is that, pursuant to Part 1 of Article 299 of the Criminal Code of Ukraine (2001), "cruel treatment of animals belonging to vertebrates, including homeless animals, … if such actions led to bodily harm, mutilation…" is grounds for bringing to criminal responsibility.

As a vivid example, the algorithm of forensic veterinary detection of animal mutilation can be illustrated: "Resolving the question of the mutilation of an examinee dog nicknamed Zhuk, the forensic veterinary expert states that mutilation is persistent disorders of the animal's health as a result of bodily injury or its consequences, congenital defects development, diseases, an accident, which led to the complete or partial loss of any organ or part of the animal's body or to the complete or partial loss of only the functions of the organ or parts of the animal's body, which, when the animal interacts with the external environment, can lead to a permanent loss or significantly limiting the ability to provide physiological manifestations of vital activity on a level with other animals of the same species (feeding, reproduction, orientation, and movement in space, coordination of movements, leading a natural lifestyle, contact with other animals, self-defence, ability to perform useful work, etc.), and also distorts the appearance of the animal due to the disfigurement of body parts as a result of deformation, as well as their physical absence. Proceeding from the data of the veterinary documents provided for examination based on the materials of criminal proceedings No._____ dated xx.xx.20xx, issued by the Veterinary Clinic "World of Nature" (32 M....py St., M_____), the examinee dog's health disorder did not lead to the complete or partial loss of any organ or part of the animal's body or to the complete or partial loss of only the functions of an organ or part of the animal's body, nor did the

animal experience a permanent loss or considerable limitation of the ability to provide physiological manifestations of vital activity, as well as there is no distortion of the animal's appearance due to disfigurement of body parts as a result of deformation, as well as their physical absence. Therefore, there are no signs of mutilation in the examinee dog nicknamed Zhuk".

Admittedly, such a conclusion about the absence of mutilation of an animal after inflicting an injury on it can be made after investigating the circumstances of the case when the injuries were caused (from the materials of the criminal proceedings, as well as the procedural document on the appointment of a forensic veterinary examination), the results of a clinical forensic veterinary examination of the animal, research instrumental and laboratory systems of the body, sources of literature, etc.

Therefore, for the formation of the expert's final opinion, sufficient expert grounds are necessary, which correspond to the principles of the legality of the expert procedure, the independence, and competence of the forensic expert, comprehensiveness, completeness, scientific validity, verification, and the use of the maximum amount of research tools and methods (Shepitko, 2017).

The relationship between the injury to the animal and the damage caused to its health is confirmed or denied by the forensic expert when determining the causality between them.

When solving the question whether the examinee animal felt pain at the time of the injury, as well as in the post-traumatic period, the forensic veterinary expert relies on the data obtained during the examination of the animal, specifically regarding the nature of the injuries, their number, localization, degree of severity etc. Thus, for instance, in the event of a severe injury to an animal, the forensic expert states that at the time of the injury and in the post-traumatic period, the animal felt unbearable pain and suffered from the inflicted physical injuries. If the damage caused to the health of the animal under expert examination turns out to be medium or light, then the forensic expert can note that the animal at the time of the injury and in the post-traumatic period felt moderate pain and suffered for a short time from the inflicted bodily injuries.

During the assessment of the results of the forensic veterinary examinations of a living examinee animal, the forensic expert must make maximum use of special knowledge and expert experience for the correct and objective formulation of the forensic veterinary diagnosis and provide answers to the questions posed in the procedural document on the appointment of a forensic veterinary examination.

At the stage of evaluation of an expert examination, the formulation of conclusions based on the results of a forensic veterinary examination of a living examinee animal is characterized by stages: firstly, intermediate conclusions are accumulated, and on their basis, final conclusions are formed, which are expert tasks for the forensic expert, are an answer to the questions posed in the procedural a document on the appointment of a forensic veterinary examination, as well as a summary of the conducted research of the examinee animal.

The same requirements apply to the opinion of a forensic expert regarding a living examinee animal as to the opinion of an expert regarding the results of a forensic veterinary examination of an animal cadaver (Yatsenko, 2022), and to comply with the rules of its conclusion prescribed by the Departmental Instruction (Order of the Ministry of Justice…, 1998).

"Conclusions" is the culminating section of the final part of the expert's opinion, where the forensic veterinary expert provided answers to

the questions posed in the procedural document on the appointment of a forensic veterinary examination, namely about the species belonging to the examinee animal and its belonging to vertebrates, as well as about its physiological features; the nature of injuries from a veterinary standpoint and their localization; mechanism, sequence, order of occurrence, age of formation, degree of severity of bodily injuries; the possibility of their occurrence with or without the help of external intervention; the danger of injuries to life at the time of their occurrence and what factors determined their danger; the consequences for the health of the animal, which each of the injuries caused led to; defects in the provision of veterinary care to the injured animal, which caused injuries to it; the causality between the physical injuries caused to the animal under the established circumstances and its health disorder; animal mutilation; traumatic termination of pregnancy; exterior damage; traces indicating the infliction of pain on the examinee animal; the effect of long-term deprivation of heat, feed, water, keeping it in harmful conditions on the state of health; whether the physical injuries found in the subject animal caused physical pain and suffering.

Formation of conclusions is carried out sequentially. Intermediate conclusions are formed at the stage of separate and comparative research, when a forensic expert examines and evaluates each body system separately at various levels of their structural and functional organization, revealed through various research methods, namely clinical examination, instrumental, instrumental, and laboratory. Therewith, the expert must differentiate morphologically and functionally unchanged organs, as well as organs in which such abnormalities are detected. Among the latter, pathognomonic (inherent) changes are necessarily identified, which indicate the nature of the injury or disease and are included in the structure of forensic veterinary diagnosis.

The final conclusions of the forensic expert are formed in the totality of the results of the examination of the entire organism of the examinee animal, considering the intermediate conclusions. They are the answer to the questions posed by the authorized person or body in the procedural document on the appointment of a forensic veterinary examination. These answers should be as clear as possible, well-founded, based on particular pathological changes discovered in the process of researching a living examinee animal. Admittedly, such a conclusion on the absence of mutilation of an animal after inflicting an injury on it can be made after investigating the circumstances of the case in which the injuries were caused (from the materials of the criminal proceedings, as well as the procedural documents on the appointment of a forensic veterinary examination), the results of a clinical forensic veterinary examination of the animal, research instrumental and laboratory systems of the body, sources of literature, etc. Therefore, for the formation of the expert's final opinion, sufficient expert grounds are necessary, which correspond to the principles of the legality of the expert procedure, the independence, and competence of the forensic expert, comprehensiveness, completeness, scientific validity, verification, the use of the maximum possible scope of research tools and methods, as well as admissibility and reliability (Pilyukov, 2018).

The internal conviction of a forensic expert is based on the results of a clinical forensic-veterinary examination of a living examinee animal, which includes an analysis of the morpho-functional state of individual body systems with the involvement of instrumental and laboratory methods, an established forensic-veterinary diagnosis, a study of the materials of criminal

proceedings (cases), an expert assessment of factual data for a particular examination and confidence in the correctness of the expert's conclusion.

In the conclusions of the final part, the forensic expert states the factual data resulting from the results of their own examination obtained at the previous stages of the separate and comparative research, especially emphasizing pathognomonic deviations from the morphological and physiological norm in organs and tissues directly related to bodily injury or disease, states how well-founded, motivated, reasoned, clear, and convincing they are for the perception of the person who appointed a forensic veterinary examination or engaged a forensic veterinary expert to examine a living examinee animal, as well as other participants in the process and confirm the reliability of the formulated conclusions.

In the case of a commission or complex forensic examination, the expert's opinion is formed according to the general rules set out in the Departmental Instruction (Order of the Ministry of Justice…, 1998), considering the same features as during the forensic veterinary examination of an animal cadaver (Yatsenko, 2022).

The solution of diagnostic expert tasks during the forensic-veterinary examination of living examinee animals is based on a set of clinical pathognomonic signs detected in them, the results of laboratory and instrumental studies, and therefore is the basis for a reasonable formulation of answers to the questions posed by an authorized person or body in the document on the appointment of a forensic veterinary examination.

Conclusions

The purpose was achieved in this paper: the essence was covered, the significance was argued, the functions of each stage of the expert examination of living examinee animals in forensic veterinary examination were outlined and substantiated, which will positively affect the conduct and processing of the results of forensic veterinary examinations of living examinee animals, specifically the forensic activity.

Forensic veterinary examination of a living examinee animal is based on general methodological and expert-technological approaches and includes four separate and at the same time interdependent stages: preparatory (preliminary examination), analytical (separate examination), comparative, synthesizing (evaluation). Each previous stage is the basis for the next one, and the effectiveness of the obtained results is enriched with information and acquires greater objectivity.

The stages of a forensic veterinary expert examination of a living examinee animal are determined by various expert tasks, which are solved at each stage by different methods, with which the object is examined, by the specifics of expert technological techniques characteristic of a certain stage.

The significance of the stages of the forensic veterinary expert examination of a living examinee animal is that they: reflect the process of the forensic expert's recognition of the specific state of the object of investigation (the nature of the injuries, their localization, the degree of severity of the damage caused to the animal's health, etc.); affect the solution of intermediate expert tasks; technologically, they help assess the reliability and informativeness of the obtained results of the study of a living examinee animal, depending on the applied set of clinical, instrumental, and laboratory methods and means of conducting the study; affect the logic of generalization of research results and formulation of conclusions; help assess the objectivity, reasonableness, correctness, and veracity of the results obtained during the verification of the expert's opinion.

Considering the fact that the procedures of the forensic veterinary expert examination of a living examinee animal are currently at the stage of development, approval, registration and implementation, for their clear regulation, the author of this scientific work co-authored the methods of forensic veterinary examination of a living examinee animal of the forensic veterinary determination of the degree the severity of the damage caused to the animal's health, the forensic veterinary examination of animals with the purpose of establishing their mutilation.

Scientific-theoretical development of stages of conducting a forensic veterinary examination of a living examinee animal is implemented in practice during a forensic veterinary examination of living animals at the National Research Centre "Ex. Prof. M.S. Bokarius Institute of Forensic Examination", the number of which is constantly increasing.

Prospects for further research lie in the development of a method of forensic veterinary examination of a living examinee animal and established its effectiveness in practical forensic veterinary activity.

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Conflict of interest

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Теоретичне обґрунтування та праксеологічне значення стадій експертного дослідження живої тварини

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Анотація

Актуальність дослідження зумовлено необхідністю розробити теоретичні засади судово-ветеринарної медицини як науки та навчальної дисципліни, зокрема обґрунтувати, апробувати та впровадити в практику способи, засоби та методологію проведення експертного дослідження специфічних об'єктів. Мета роботи – аргументувати значення та окреслити функціїй кожної зі стадій експертного дослідження живих тварин в судово-ветеринарній експертизі. Методологічна основа дослідження – системний підхід, зумовлений специфікою теми роботи й пов'язаний із використанням загальнонаукових і спеціально наукових методів, серед яких: аналіз, синтез, індукція, дедукція, аналогія, формально-логічний, порівняльно-правовий, системно-структурний методи, методи моделювання, спостереження, описування, аналіз практики судово-ветеринарної експертизи, спеціальні методи, функції яких виконують методики прижиттєвої клінічної судово-ветеринарної діагностики тварин. На основі проведених досліджень та узагальнення практики судово-ветеринарної експертизи живих тварин у роботі аргументовано, що цей процес складається із чотирьох стадій: підготовчої, аналітичної, порівняльної та стадії синтезу. Обґрунтовано виокремлення певних стадій, зумовлене різним характером завдань, що вирішує судовий експерт, застосуванням різних за складністю алгоритмів і методів судово-експертного дослідження тварини та залученням різних технічних прийомів і обладнання на кожній конкретній стадії. Доведено, що послідовність застосування стадій судово-ветеринарного дослідження живої тварини сприяє правильній оцінці виявлених ознак ушкодження чи розладу здоров'я тварини на підставі всебічного їх оцінювання, покликана вирішити проміжні експертні завдання, простежити процес проведення експертизи й оцінити здобуті результати для обґрунтованого встановлення судово-ветеринарного діагнозу та формування висновку експерта. Показано, що в основу проведених досліджень закладено правила (методичні рекомендації) судово-ветеринарного визначення ступеня тяжкості шкоди, заподіяної здоров'ю тварини, методику судово-ветеринарного дослідження тварин з метою встановлення їхнього каліцтва, методику судово-ветеринарної експертизи трупів тварин. Теоретичне обгрунтування стадій експертного дослідження живої тварини й розкриття їхнього праксеологічного значення позитивно відобразяться на проведенні судово-ветеринарної експертизи та укладланні результатів судово-ветеринарних досліджень

Ключові слова: судово-ветеринарна експертиза, судовий експерт, ушкодження, захворювання, алгоритм дослідження, ефективна діяльність