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Selected issues related to the use of firearms for unlawful killing of animals

Summary

The issue of post-mortem examination of animals, whose death occurred as a result of suffered gunshot wounds, is very rarely discussed in literature, most often on the occasion of researching into and describing other problems. This article presents an attempt to bring together the achievements of veterinary forensics in this area. As a starting point, the current legal regulation was adopted, pointing to penal sanctions resulting from the illegal use of weapons in relation to animals. Subsequently, the possibilities of using modern imaging techniques in post-mortem examinations carried out by veterinarians at the request of law enforcement agencies were presented. The scientific reports discussed herein have been supplemented by examples of sectional examinations carried out at the request of law enforcement agencies in Polish scientific institutions. The article indicates that the results of examination of gunshot wounds suffered by people in various circumstances may be used for the purpose of issuing forensic veterinary opinions, just as the results of examination of gunshot wounds of large mammals may be helpful in examining the effects of gunshot injuries in humans.

Key words: animals, law, weapons, imaging tests

Veterinary forensics is a young science whose aim is to establish the causes of death of an animal if there are grounds for suspecting that an offence has been committed. The results provided to law enforcement authorities by forensic experts must be reliable, obtained as a result of unbiased analysis. They are often the result of the work of a multi-person team of specialists in various fields (Sapierzyński et al., 2017). Due to the increase in the number of court cases related to animal abuse and severe sentences, opinions issued by a forensic veterinarian are becoming more and more common. According to Article 1(1) of the Animal Protection Act (Journal of Laws 2017, item 1840, consolidated text, as amended), an animal is defined as a live creature, capable of suffering, deserving to be respected, protected and cared for by humans. Post-mortem examination of an animal's corpse can be commissioned by the owner, the Police, the Public Prosecutor's Office or a court. The results obtained enable the identification of the causes of death of the animal, which is of key importance for the further legal proceedings (Kraś, 2016).

The applicable legal order provides for penalties for killing an animal, as defined in the Animal Protection Act. Such an act constitutes a criminal offence. The penalty can be a fine, restriction of liberty or imprisonment of up to three years. If this offence involves particular cruelty, it is considered by the legislature as a qualified act punishable by a more severe imprisonment from 3 months up to 5 years. In addition to the penalties mentioned above, the court may also impose a penal measure in the form of a ban on keeping animals for

a period of between one and fifteen years. It is worth noting that, when issuing a judgment, the court usually imposes this type of ban. When dealing with an offence covered by Article 35(2) of the Animal Protection Act, i.e. when the offender's actions involve particular cruelty, the court, apart from imprisonment, imposes the above mentioned penal measure on a mandatory basis.

In the case of a conviction for an offence involving, inter alia, killing (including with particular cruelty) or abuse of an animal, the court may additionally prohibit the exercise of a particular profession, specific activity or activities which require a permit and which are related to the care of animals in any form.

If the offender has committed an offence in connection with the exercise of a profession, activity or activities subject to authorisation which are related to the use of or influencing animals, the court, as a criminal measure, obligatorily prohibits:

1) exercising any or specified professions,
2) performing any or specified activities, or
3) performing any or specified activities requiring a permit.

An additional sanction may be the forfeiture of tools and objects that were used to commit the crime. In the event of conviction, the court additionally pronounces a fine in the amount of PLN 1 000 to PLN 100 000, which is transferred for animal protection purposes (the court indicates a specific purpose). If a person who has committed an act works with animals, he or she may lose the right to exercise this profession. It should be emphasized that, in general terms, inciting to perform a punishable act on animals is also punishable.

With regard to persons holding a licence for hunting firearms, in accordance to Article 18(1)(2) in conjunction with Article 15(1)(6) of the Arms and Ammunition Act (Journal of Laws 2017, item 1839, as amended), apart from punishment for the committed offence consisting in killing an animal, it is also possible to revoke the licence. A firearms licence is revoked by an administrative decision of the police authority.

An example can be a case, which has found a final judgement in the Voivodeship Administrative Court, which upheld the decision initially issued by the Voivodeship Police Commander and then upheld by the Commander-in-Chief of the Police. The case concerned the shooting of a bird under strict species protection – common buzzard, which was then hit with a stick on the head, thus causing its death. The court found that the police authorities, by revoking the authorization to possess weapons, acted in accordance with the law in force. The court stated that: "(...) the assessment of the case was made correctly, recognizing the fact that the conviction of C.S. for an act under Article 35(1) of the Animal Protection Act gives rise to a well-founded fear that he might use weapons against the interests of security or public order". The accused defended himself by arguing, among other things, that he had to kill the bird so that it would not suffer after the shooting. However, the experts concluded that if the veterinarian had helped the bird, it would have survived despite being shot, because the wound was not fatal.

In the judgment, the court also referred to the assessment of the district court, which examined the case in question, indicating that "When assessing the act committed by C.S., the court stated unequivocally that the killing of the bird was unjustified and did not find any excuse, either legal or moral, and the claim of the hunter that the injured bird should have been killed in order to shorten its suffering was considered absurd and deserving disapproval, as the bird's condition was not agonal and promised a return to health. In fact, according to the expert's opinion, incompetent attempt at killing the bird with a stick caused its further injuries".

In the justification, the court, taking into account all the circumstances, decided that the decision of the Commander-in-Chief of the Police revoking the firearms licence is justified and stressed that: "(...) by committing an intentional offence, the plaintiff deliberately violated law and the nature and circumstances of that act give rise to a well-founded fear that he might use the weapons in his possession against their intended use, i.e. against the interests of security or public order[1]". This judgment has universal value, since the question of criminal liability for the offences referred to in Article 35(1), (1a) and (2) may concern other animal species, not only those under protection.

It should be noted that the Penal Code also provides for criminal liability for offences involving damage to the environment. According to Article 181 § 1 of the Penal Code (Journal of Laws 2017, item 2204, consolidated text, as amended) causing destruction in the plant or animal world to a significant extent is penalized by imprisonment from three months to five years. This offence can be committed either intentionally or unintentionally, and if it is an unintentional act, then criminal liability may take the form of a fine, restriction of liberty or a prison sentence of up to two years.

An act consisting in destroying or damaging plants or animals in protected areas or plants or animals subject to species protection is also subject to penalization and the same criminal liability. However, it is important that these actions cause significant damage. In the case of unintentional actions, the penalty is a fine or restriction of liberty.

Article 6 of the Animal Protection Act introduces a general standard for the prohibition of killing animals, with the exception of situations provided for in this provision. This Article indicates that killing of animals is possible when it concerns the slaughter of farm animals, immediate killing for epidemiological reasons, or hunting as a method of forest management (Journal of Laws 2017, item 1295, consolidated text, as amended).

[1] Judgment of the Voivodeship Administrative Court in Warsaw of 16 September 2010, case file no. II SA/Wa 270/10.

In the light of the above Act (Journal of Laws 2017, item 1840, consolidated text, as amended), it should become a social norm that such acts as abuse or killing animals in an act of unexplained aggression are punishable and entail quick and inevitable penal repression. Unfortunately, despite the fact that the Act has been in force for 21 years, it was not until the last half of the current decade that an increase in the number of such court cases and a much greater sensitivity of law enforcement agencies, media and opinions have been observed. The current increase in awareness in this area and in the activity of animal welfare organizations bring positive effects in terms of providing protection for the most defenceless creatures.

In the course of their practice, forensic pathologists meet with cases involving bite to death by other animals, blunt force injuries, poisoning, manifestations of inhumane treatment, and, recently, an increasing number of gunshot wounds from firearms or pneumatic weapons. The methodology of a forensic veterinarian's work consists in examining the mechanisms of impact of various injuries or factors on the animal's body. Unfortunately, despite more severe penalties for abuse or inhumane treatment of animals, as many as 300 such cases were reported in 2015 alone. The problem of research conducted in this area stems from the fact that as many as 32% of respondents expressed a negative attitude towards the way in which law enforcement agencies approach reporting such events. A very high number of acts of violence and animal abuse are still not reported or treated leniently by law enforcement agencies (Kraś, 2016).

When dealing with a corpse of an animal which has been delivered to the veterinarian or to the Police with unexplained causes of death, a post-mortem examination should be carried out. The purpose of such examination should be to clarify whether the animal's death was influenced by third parties, whether it was an accident or whether the death was due to natural causes. It is accepted in literature that post-mortem examinations should be carried out in each case, as the animal's body may contain many anomalies which could have contributed to a greater or lesser extent to its premature death (Sapierzyński et al., 2017; Listos et al., 2018).

A special case is that of animals under species protection in Poland or in the European Union. In such a situation, the causes of death should be determined immediately, and in the event of detecting criminal human activity, appropriate charges should be pressed for posing a threat to the continuity of the endangered species (Ludwiniak et al., 2017).

In the literature, the most frequent subject of post-mortem gunshot examinations are people, which is not surprising for obvious reasons. Forensic and traumatic medicine represent the most extensive areas of post-mortem examinations. In order to be able to carry out this kind of examination in terms of gunshots, it is necessary to be well acquainted with the ballistics of firearms. The source of knowledge in this field is the constantly expanding professional literature, including the following references: Jamroziak, 2016; Bradley-Siemens et al., 2016; Stefanopoulos et al., 2014. The knowledge of the projectile's trajectory and velocity (based on which its kinetic energy can be calculated) as well as of the properties of exposed tissue can be used to determine the calibre, type of weapon, distance of firing, or even to predict what injuries are likely to occur in certain initial conditions. An important issue to mention is the constant increase in the number of types of ammunition designed to maximize the range of penetration and internal injuries once the target has been reached. Both practice and scientific research must keep up with these changes, which is a prerequisite for successful identification of the offender and determining the impact on the injured person, not only from anatomical, but also psychological point of view. This knowledge is used in the subsequent treatment of post-traumatic shocks, suffered, inter alia, by war veterans or active military personnel (McLay et al., 2012). The results of human studies can in many cases be transferred to post-mortem examinations of shot animals and used for forensic veterinary medicine purposes.

In modern post-mortem animal examinations, a separate group is distinguished, consisting of corpses containing pellets, bullets or foreign bodies pierced into the body with high kinetic energy (e.g. ailerons, arrows). Often, due to the lack of involvement of law enforcement agencies and low probability of finding the perpetrator, such cases are discontinued without taking any procedural steps (Drwęski, 2012). The situation is different in the case of animals used by uniformed services, which, by virtue of their service, are most at risk of loss of life or health. Due high training costs, their wounds and injuries are not underestimated (Baker et al., 2013).

When analysing available publications and scientific reports, one encounters works related to the shooting of large animals, including wild game, resulting from hunting and poaching activities (Drwęski, 2012). An example of this type of studies is the post-mortem examination of wild boar, which showed the presence of gunshot-related anomalies in the dentition. In further stages of the study it was found that the change in the morphology of the dentition did not impair the function of food intake, and the wound itself was caused by a ricocheting bullet. The studies described above prove that contemporary poaching in European countries is dominated mostly by illegal hunters.

An interesting source of information on the behaviour of large animals after injury due to the use of firearms are two works published by Gibson and others (2015a, 2015b). The authors discuss post-mortem lesions caused by slaughter and take into account the behavioural experiences of animals. Unfortunately,

such studies still focus mainly on large mammals (Sobhakumari et al., 2018). Another interesting morphological analysis carried out by Martin et al. (2017) describes shot injuries to game animals. In the course of the study, the authors compared different types of munitions in terms of their traumatic impact. This publication is a very rich source of knowledge about the importance of the calibre of a projectile in hunting. A shot fired does not always result in immediate death, which exposes the animal to additional suffering. In veterinary forensics dealing with small mammals, this issue is very often ignored for the sake of analysis of rare clinical cases, e.g. carbon monoxide poisoning in a domestic cat (Mörner et al., 2013). Such studies are rarely undertaken by researchers because of the extremely scarce research material.

X-ray images are used to identify foreign bodies and basic skeletal injuries (Jankowski et al., 2008); figure 1 shows an image of a dead cat with visible foreign bodies.

The tests carried out at the Toolmark and Ballistic Department, Central Forensic Laboratory of the Police revealed that foreign bodies extracted from a cat's corpse were two flat-head Diabolo pellets cal. 4.5mm (fig. 2). The pellets have a mass of approx. 0.48 g each. On their surfaces, impressions of the barrel thread are visible, enabling individual identification tests of the weapon to be carried out.

A closer look at the statistics of gunshot wounds reveals that head and spine areas are most frequently injured (Bioch-Bogusławska et al., 2008; Osemlak et al., 2005). In the case of headshots, it was noted that an increasing percentage of patients could be saved. The extent and severity of the injury is determined by the place where the projectile hits the body, as well as the projectile's energy, deformation capacity and calibre. The kinetic energy of a projectile translates into whether it will ricochet within the head cavities, causing even greater damage, or will pass through.

In situations where ballistics and post-mortem examinations require more detailed analysis, computed tomography (CT), magnetic resonance (MR) or micro-CT (mCT) may also be used. These methods are less frequently used for post-mortem examinations of animals due to their cost, lower availability of specialist equipment in veterinary facilities and lack of medical indications for such detailed imaging.

Special attention should be paid to magnetic resonance. The MR image is created as a result of vibrations of atoms under the influence of a magnetic field generated by a strong electromagnet. However, this method becomes completely useless or even dangerous if there are even traces of the material used to construct the projectile in the corpse under examination (Jamroziak et al., 2016). Magnetic resonance may be substituted by computed tomography. An example is the post-mortem examination of the corpses of two moles and the common buzzard, the aim of which

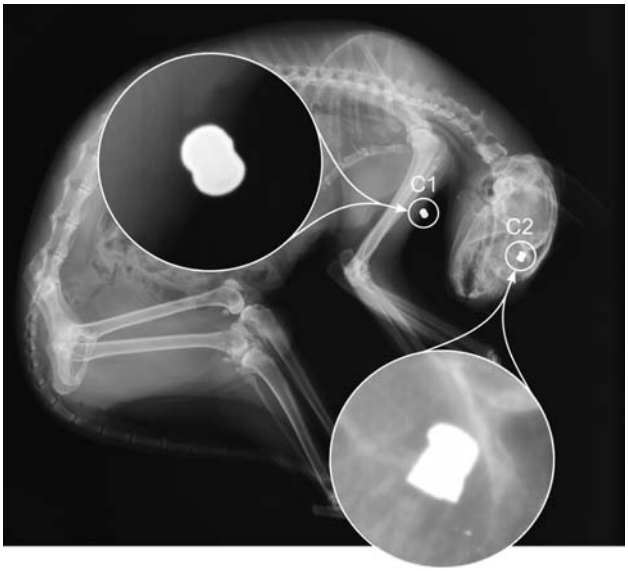

Fig. 1. Domestic cat; C1, C2 – foreign bodies, X-ray – side position.

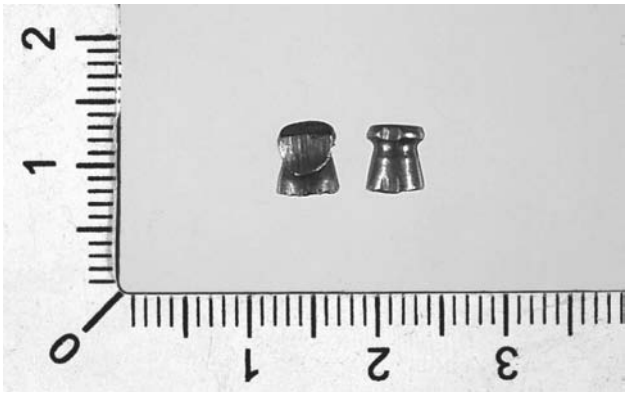

Fig. 2. Foreign bodies extracted from the corpse of the cat. Left side – C2, right side – C1.

was to determine the cause of death of these animals by means of multi-slice tomography. Despite the lack of visible shot wounds, this type of analysis proved successful in the above cases, allowing for a spatial presentation of injuries in the animals examined (Ludwiniak et al., 2017; Pankowski et al., 2018).

As regards micro-CT, the studies on the so-called GSR (gun-shot residues) deserve attention, as this method makes it possible to identify the wound in terms of its origin. It was used, inter alia, to identify shot wounds of charred tissues for GSR traces (Fais et al., 2013). The results obtained allowed the detection of injuries caused by the use of firearms in bodies that had been burnt. To the same extent, but for slightly different purposes, the micro-CT technique was used by Cecchetto et al. (2011, 2012). The authors showed, among other things, that it is possible to objectively determine the shooting distance on the basis of the

analysis of traces of GSR in the wound. Additionally, Giraudo et al. (2016) proved that the micro-CT test can be useful when it is difficult to distinguish between textile-coated inlet and outlet wounds. There are no similar studies on animals in the literature, except, where pig or sheep body fragments are used as a substitute for the human body. Nevertheless, this technique appears to be very promising for forensics and ballistics.

When analysing the mechanism of the projectile's action, one should pay attention to its structure and the type of weapon from which it was fired. A separate category will be weapons and pneumatic devices that use compressed air, carbon dioxide or other powder-free methods of launching the projectile. Under current legislation, registration of a pneumatic device that expels a projectile by means of energy not exceeding 17 J is not required (public access devices). In the case of pneumatic weapons in which the energy of the expelled projectile exceeds the above level, registration is required, which results directly from the provisions of the Arms and Ammunition Act (Journal of Laws 2017, item 1839, consolidated text, as amended).

The second category is firearms. They use metal cartridge of different construction placed in a shell containing a propellant and a primer which, when hit by a firing pin, is responsible for the ignition of the charge resulting in a shot. Due to a great variety of firearms and ammunition, intensive tests carried out by ballistic laboratories and analysis of shot wounds are required to give an approximate indication of how a projectile affects a given tissue and what kind of injuries it causes. At the moment of firing, when the trigger is pressed, allowing the firing pin to strike the primer embedded in the shell, the propellant, e.g. in the form of gunpowder, is ignited and the projectile is expelled. These are the only parameters that remain constant throughout the process. When the bullet exits the threaded barrel, which gives it the appropriate torque, its further trajectory is a function of many variables, e.g. each of the environmental factors, while the only known component is the initial kinetic energy of the projectile. As a result, the impact of the projectile will be diametrically different depending on the type of weapon used. For projectiles fired from small arms, the parameters such as energy and range reach values even several times lower than in the case of long weapons.

At this point, it is worth recalling that before the invention of a threaded barrel, shorter-range spherical projectiles were used. This was due to the impossibility of making the projectile rotate around its own axis, unlike those currently used, in the shape of a cone. Achieving higher muzzle velocity and rotation enforced the use of projectiles with pointed tips, and their stabilisation over the trajectory, along with a reduction in air resistance, enabled the kinetic energy to be maintained over a longer distance. Bullets of this type may have much greater and difficult-to-treat effects. As the movement progresses, the projectile gradually loses its energy, becoming more and more prone to air resistance and gravity. At a certain point on the trajectory, it starts to descend towards the ground in an arched manner. Knowledge about the trajectory gives an opportunity to determine the maximum range of an effective shot, which is useful not only on the battlefield, but also in civilian life, e.g. during hunting. However, this knowledge constitutes only a small fraction of the expertise that is necessary in research work focusing on the analysis of the shot wound. Unfortunately, professional literature usually takes a very general and occasional approach to this subject, focusing on other issues (Radziszewski, 2007).

While papers focusing on convalescence and rescue of domestic mammals in the context of veterinary medicine can be found, there are few scientific studies that discuss various cases of wounds in relation to forensic veterinary medicine (Ressel et al., 2016). Such studies would not only find recipients in a group of pathologists, but could also contribute to raising public awareness of the problem of post-mortem examinations. They would also change the approach of law enforcement authorities to such cases, especially when one considers that firearms are currently pointed at animals by poachers, who want to be called hunters.

Cruelty to animals is a global, widespread and extremely difficult problem to combat (de Siqueira et al., 2016). They are threatened not only by the use of firearms but also blunt cutting objects.

Research into this type of behaviour in humans may bring measurable benefits, helping to identify individuals with a tendency to cruelty and violence. According to some researchers, such behaviour is characteristic of serial murderers. However, due to the small size of the test group, this relationship could not be statistically confirmed (Wright et al., 2003). Among the criminal offenders surveyed, this relationship was clearly visible and it is probable that people prone to extreme cruelty may commit their first crimes on defenceless animals. This is another argument in favour of not treating cases involving mutilated animals as unworthy of much attention.

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Sources of figures:
Figure 1: G. Bogiel
Figure 2: D. Markiewicz and A. Nowicka

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