

DOI: 10.37000/abbsl.2026.118.19

UDC: 636.083:614.9

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ANIMAL WELFARE - HISTORY OF DEVELOPMENT AND ITS SIGNIFICANCE

Abstract

The review article highlights the stages of securing animal welfare at the legislative level. The main concepts of the “Five Freedoms” and their use for determining animal welfare, which affect the production of safe and high-quality products, are revealed. Legislative documents on the regulation of animal welfare issues in the areas of: breeding; transportation of animals using specially equipped techniques; pre-slaughter handling at meat processing plants in appropriate conditions with the participation of qualified personnel; slaughter using modern equipment and methods that ensure instant loss of consciousness and completely exclude its recovery until the end of the process.

It has been emphasized that the low level of welfare during transportation and pre-slaughter handling causes the development of stress phenomena in animals, which affects the reduction of glycogen levels in muscle tissues. This, in turn, changes the nature of meat maturation. A large amount of lactic acid accumulates in it, which leads to a rapid decrease in pH, a reduction in the shelf life of meat and its rapid spoilage. In addition, the meat of animals slaughtered under stress has worse organoleptic characteristics.

Negligence in handling animals during transport and pre-slaughter handling can lead to disorders such as: PSE and DFD.

According to research results, the prevalence of PSE is from 10 to 32% and DFD is from 10 to 35% worldwide. Both of these phenomena are directly related to the stress that animals experience before slaughter.

Therefore, research into animal welfare during transport and slaughter is a key factor in improving the quality and sanitary safety of meat.

Keywords: *animal welfare, five freedoms, needs, adaptation, stress. Ethology*

Introduction. Intensive livestock farming technologies and the transition to new methods of keeping are accompanied by physiological and psychological disorders, changes in animal behavior, etc. Without knowledge of animal behavior, it is impossible to determine the optimal options for keeping, care and feeding systems that ensure the preservation of health and the maximum production of high-quality products from animals.

Therefore, the **purpose** of our work is to highlight the basic concepts of animal welfare that affect the production of safe and high-quality products.

Analysis of recent research and publications. Animal welfare is part of the Community policy "from farm to fork", as well as a priority in the context of developing a more sustainable policy for food production. Animal welfare was established in legislation many years later. The first animal welfare law was issued in Britain (1822) regarding the protection of cattle, horses and sheep. And the Society for the Prevention of Cruelty to Animals was founded in 1824, which later, in 1840, was named the Royal Society for the Prevention of Cruelty to Animals (RSPCA).

The first slaughterhouses for centralized slaughter of animals with standard slaughter methods were founded in ancient times, a thousand years ago.

The development of equipment for mechanical and electrical stunning of animals in Europe began in the early 19th century. In 1933, the "Slaughter of Animals Act" law was issued, the main requirement of which was the stunning of animals before slaughter.

In 1964, Ruth Harrison wrote an "Animal Machines" book on modern farming in the UK, drawing attention to the "industrial farming" of pigs, chickens and calves under extreme conditions of confinement. The UK government, in response to the public concern this book had raised, set up the Bramble Committee in 1965. This committee concluded that animal welfare included mental as well as physical well-being, and that any animal kept by humans should at least be protected from unnecessary suffering [10-13].

The Brambell Committee established the concept of the "Five Freedoms". They proposed (and are still developing) ideas and principles that provide a simple, logical and comprehensive framework for analysing animal welfare in any production system. The "Five Freedoms" are the main welfare criteria that describe how these principles can be implemented.

The World Society for the Protection of Animals (WSPA) in partnership with the Veterinary Faculty of the University of Bristol (England) has been developing scientific research on animal welfare for the past 50 years. This research focuses on the following concepts: welfare is the path to a correct understanding of animals; ethics is

the actions of people in relation to animals; welfare law is how people should treat animals (legislative protection) [7].

The World Veterinary Association (2000) recognized animal welfare as a scientific discipline that includes applied aspects of ethology, bioethics, the concepts of suffering and welfare. Modern intensive technologies for the production of livestock products should be based on the principles of ethology. Ethology (from the Greek “etos” - character, disposition, behavior, logos - teaching, word, thought) is the science of the biological foundations of animal behavior and the study of the patterns of interaction between organisms and the environment. The subject of ethology is the arrangement of designs of interaction between people and each living being with the environment. Ethology thinks about both components of natural intuitively and obtained in the prepare of life, as well as all encompassing (entirety life form) behavior. Behavior is considered as a work of the living being, which reflects the prepare of adjustment of creatures to the outside environment. Reflex associations and organic rhythms created on the premise of neurohumoral direction ensure the living being an dynamic shape of adjustment to conceivable changes in the environment [1]. Scientists who deal with welfare problems tend to express different points of view regarding what is more important in determining the welfare of animals.

Animal welfare is a comprehensive term giving us an understanding of the current state of an animal.

Presentation of the main research material. Speaking on animal welfare, we are trying to assess the state of an animal from the perspective of the animal itself. The assessment of welfare should be based on the biology of the species and, in particular, on knowledge of the methods that animals use to adapt to environmental conditions. Animal welfare is related to many factors.

It is assumed that neither health nor comfortable conditions for keeping animals can guarantee their well-being which depends on what the animal feels.

According to the European Convention for the Protection of Pet Animals of 13 November 1987, “...man has a ethical commitment to regard all living animals and bear in intellect that pet creatures have a extraordinary relationship with man, considering the significance of pet creatures contributing to the quality of life and their ensuing esteem to society” [8].

“We must define well-being in such a way that it can be easily linked to such concepts as: need, adaptation, control, predictability, feeling, suffering, pain, anxiety, fear, boredom, stress and health” [8].

The definition of animal welfare is complex and can be interpreted from three perspectives: – first, it relates to the physical state of the animal (homeostasis).

“Welfare describes the state of the animal in its attempts to adapt to its environment” [9].

“I believe that an animal is in poor welfare only if physiological systems are disrupted to such an extent that survival and reproduction are threatened” (McGlone, 1993);

– secondly, it highlights the mental state of the animal (mental).

“...neither health, nor the absence of stress, nor physical compliance with norms can be considered as mandatory and/or sufficient grounds for determining that an animal has good welfare. Welfare depends on what the animal feels”.

– and finally, the third definition, interprets welfare from the position of naturalness (telos). “By welfare we must understand not only the deprivation of the animal from pain and suffering, but also all possible assistance to it in the manifestation of its own “animal” nature, which I call “telos”.

The “Five Freedoms” for productive animals have been identified by the Britain's Farm Animal Welfare Council:

1. Opportunity from starvation and thirst
 - by giving get to water and nourishment that bolsters great wellbeing and activity.
2. Opportunity from discomfort
 - by giving an fitting living environment, counting shield and a comfortable put to rest and rest.
3. Opportunity from torment, damage or malady
 - by preventive measures or early diagnosis and treatment.
4. Freedom to exhibit normal behavior
 - by providing sufficient space, appropriate conditions and accommodations, and the company of one's own kind.
5. Freedom from fear and suffering
 - by providing appropriate conditions and relationships that exclude suffering.

The “Five Freedoms” actually provide a relatively comprehensive definition of well-being, encompassing all three aspects.

1. Physical – freedom from hunger and thirst, pain, injury, or disease;
2. Mental or psychic – freedom from fear and suffering;
3. Natural or telos – freedom to engage in normal behavior.

The normal biological functioning of an organism includes the expression “health”. In sick animals, the ability to adapt is reduced and there is a risk that their welfare will be poor. An animal that suffers from severe stress is also susceptible to disease, due to which the body’s immune system is suppressed.

Legislation regulates animal welfare in three areas: breeding, transport and slaughter of animals. The main principle is to avoid causing animals any unnecessary suffering.

The European Tradition highlights the essential standards of creature welfare: Article 3.

1. No one might cause a pet creature pointless torment, enduring or trouble.
2. No one should desert a household animal.

Article 4 – Keeping

1. Any individual who keeps a pet creature or who has concurred to see after it, should be mindful for its wellbeing and welfare.

2. Any individual who is keeping a pet creature or who is looking after it might give accommodation, care and consideration which take account of the ethological needs of the creature in understanding with its species and breed, in specific:

- a) provide it reasonable and adequate nourishment and water;
- b) give it with satisfactory openings for work out;
- c) take all sensible measures to anticipate its escape;

An creature might not be kept as a pet creature on the off chance that:

- a) the conditions of passage 2 over are not met or in case,
- b) in show disdain toward of these conditions being met, the creature cannot adjust itself to captivity.

All age groups of animals should be provided with food according to their age, body weight and vital needs. If they are kept in groups, or there is an automatic feeding system, each individual should have access to food at the same time as the other animals in the group [2, 4, 5, 17].

The EU Directive 91/630 EEC defines the requirements for usable area for certain age and physiological groups of pigs. According to the requirements, the surface area per animal is as follows:

- 0.15 sq. m. - for piglets weighing 10 kg;
- 0.20 sq. m. - for piglets weighing 10 to 20 kg;
- 0.30 sq. m. - for piglets weighing 20 to 30 kg;
- 0.40 sq. m. - for fattening piglets weighing 30 to 50 kg;
- 0.55 sq. m. - for fattening piglets weighing 50 to 85 kg;
- 0.65 sq. m. - for fattening pigs weighing 85 to 110 kg;
- 1.00 sq. m. - for fattening pigs weighing more than 110 kg.

In 2003, the Farm Animal Welfare Committee noted that, in addition to the “Five Freedoms”, from the point of view of animal welfare during slaughter, attention should be paid to all technological processes, namely:

- the transportation of animals, using specially equipped vehicles;
- pre-slaughter handling of animals in a meat processing plant, involving competent personnel and applying appropriate conditions of keeping;
- slaughter of animals, using appropriate equipment and effective slaughter methods that cause instant loss of consciousness and ensure that the animal does not regain consciousness and this process will continue until death.

These principles are important to ensure that when assessing any slaughter system, the whole process is considered first and foremost, and not just the slaughter itself [6, 14, 16].

Council Directive 93/119/EC Article 3 on the protection of animals at the time of slaughter and killing provides the following: the animal must be spared any avoidable distress, pain or suffering during transport, restraint, restraint, stunning or slaughter.

Article 4: The buildings, premises and equipment of slaughterhouses, as well as their operations, must be such as to avoid distress, pain or suffering to animals.

Article 7: The food business operator must have the knowledge and skills necessary to carry out his tasks humanely and effectively.

Article 8: The competent authority is responsible for carrying out inspections and implementing official controls.

The manifestations of stress phenomena that occur during poor welfare of pre-slaughter handling and transportation of animals affect the reduction of glycogen in muscle tissue, and thus, the nature of meat maturation. A large amount of lactic acid is formed in it, which leads to a rapid decrease in pH, as a result of which the stability of meat during storage decreases, it quickly deteriorates and can be a source of food toxic infections and toxicosis. In the meat of animals slaughtered in a stressful state, organoleptic indicators deteriorate. The development of stress is accompanied by a decrease in the activity of the immune system, a violation of the functional state of the cardiovascular, respiratory and digestive systems.

Poor handling of animals during transport and pre-slaughter handling can lead to the following:

- PSE (pale soft exudative) - pale, flabby, exudative meat;
- DFD (dark, firm and dry) - dark, dense and dry meat.

PSE occurs mainly in pigs, while DFD also occurs in other animal species. The prevalence of PSE and DFD in pork has been reported by various studies worldwide to be between 10–32% for PSE and 10–35% for DFD. In both cases, PSE and DFD meat occurs due to pre-slaughter stress experienced by live animals [3, 15].

The abovementioned changes in meat usually develop in the first minutes and hours after slaughter of animals and therefore they are most often detected not during pre-slaughter examination, but during the meat processing process.

Therefore, by studying the welfare of animals during transportation and slaughter, it is possible to improve the quality and sanitary assessment of meat.

Conclusions and prospects for further research. Based on the mentioned above definition, animal welfare should cover all aspects of the animal's existence and its interaction with humans.

Animal welfare is related to many factors, among which the breeding, transportation and slaughter of animals are of great importance.

To obtain safe and high-quality pork, it is necessary to adhere to the principles of the "Five Freedoms" and regulatory documents - Directive 91/ 630 EEC and Council Directive 93/119 EU.

The main factors in the formation of PSE and DFD - meat are the presence of stress factors during transportation, pre-slaughter animal handling and slaughter, which is the result of a violation of the welfare of slaughter animals.

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ДОБРОБУТ ТВАРИН - ІСТОРІЯ РОЗВИТКУ ТА ЙОГО ЗНАЧЕННЯ

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Анотація

Оглядова стаття висвітлює етапи закріплення добробуту тварин на законодавчому рівні.

Розкриті основні поняття “П’яти свобод” і їх використання для визначення добробуту тварин, які впливають на виробництво безпечної і якісної продукції. Розглянуто законодавчі документи щодо регулювання питань добробуту тварин у сферах: вирощування; транспортування тварин із використанням спеціально обладнаних засобів; передзабійне утримання на м’ясокомбінатах у відповідних умовах за участю кваліфікованого персоналу; забій із застосуванням сучасного обладнання та методів, які забезпечують моментальну втрату свідомості і повністю виключають її відновлення аж до завершення процесу.

Наголошено, що низький рівень добробуту при транспортуванні й передзабійному утриманні спричиняє розвиток стресових явищ у тварин, що впливає на зниження рівня глікогену в м’язових тканинах. Це, у свою чергу, змінює характер дозрівання м’яса. У ньому накопичується велика кількість молочної кислоти, що веде до стрімкого зниження рН, скорочення терміну зберігання м’яса та його швидкого псування. Крім того, м’ясо тварин, забитих у стані стресу, має гірші органолептичні показники.

Недбале ставлення до тварин у процесі транспортування й передзабійного утримання може спричинити такі порушення як: PSE та DFD.

За результатами досліджень у світовому масштабі поширеність PSE становить від 10 до 32 %, а DFD - від 10 до 35 %. Обидва ці явища безпосередньо пов’язані зі стресом, якого зазнають тварини перед забоєм.

Таким чином, дослідження добробуту тварин під час транспортування і забою є ключовим фактором для підвищення якості та санітарної безпеки м’яса.

Ключові слова: добробут тварин, п’ять свобод, потреби, адаптація, стрес, етологія.

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Стаття пройшла рецензування 23 лютого 2026 року
Стаття опублікована 30 березня 2026 року