

# FARM ANIMAL WELFARE CONCEPT: FROM BEGINNINGS TO INTEGRATION IN MODERN PRODUCTION SYSTEMS

**Dušica Ostojić Andrić<sup>1</sup>, Slavča Hristov<sup>2</sup>, Radica Đedović<sup>2</sup>, Vlada Pantelić<sup>1</sup>, Dragan Nikšić<sup>1</sup>, Blagoje Dimitrijević<sup>3</sup>, Nataša Tolimir<sup>4</sup>**

<sup>1</sup>Institute for Animal Husbandry, Zemun-Belgrade, Republic of Serbia

<sup>2</sup>Faculty of Agriculture, University of Belgrade, Zemun-Belgrade, Republic of Serbia

<sup>3</sup>Faculty of Veterinary Medicine, University of Belgrade, Belgrade, Republic of Serbia

<sup>4</sup>Institute for the Application of Science in Agriculture, Belgrade, Republic of Serbia

\*Corresponding author: andricdusica.iah@gmail.com

Review paper

**Abstract:** The farm animal welfare science has undergone a thorny path of development, often disputed because of its lack of measurability and the purpose of existence. At the very beginning, primarily based on moral and ethical attitudes, over time it pointed to the importance of meeting the needs of animals and the consequences of their neglect and exhaustion in the conditions of intensive livestock production. An important segment of its development was the definition and development of methodologies for the assessment of welfare indicators, which made it measurable and accepted as a scientific discipline with the knowledge applicable and useful in modern production systems. This paper is a concise review of the evolution of the animal welfare science, but also an indication of its future in the context of the development of "symbiotic" connections with the concepts of sustainable agriculture and food safety as integral parts of the modern ecological movement arose from a unified concern for the welfare of people and animals, a care for planetary welfare in general.

**Key words:** farm animal welfare, development, importance, legislation, production systems, achievements

## Introduction

### *Moral origin and subject of animal welfare*

Providing animal welfare has always been important, but people's knowledge of it has changed over time, especially since recently. The attitude of people about what is and what is not moral probable has changed to a lesser degree

during the millennium (*Broom, 2011*). According to utilitarianism, it is morally acceptable for humans to use animals for the production of food, work, entertainment and company, for the production of natural fibres and clothing and footwear materials and for scientific purposes in a way that does not cause animal suffering. This view is contrary to the attitudes of the advocates for animal rights, who consider it ethically unacceptable for humans to exploit animals as their property (*Vučinić, 2006*). Many animal welfare discussions are based on what people do or should do about it. Also, philosophers and the public are often concerned with the issue of killing animals for human consumption and clothing as well as for research purposes (*Fraser, 2008*). These are important ethical issues, but according to *Broom (2011)*, not the essential issues of animal welfare. The subject of welfare is what happens to animals before they die, including their treatment just before death, often before the slaughter itself or the way they are killed. However, as *Haynes (2008)* points out, with this view there is a danger of neglecting or inadequately considering the ethical question: is it or is it not acceptable to kill animals? Therefore, scientific research on the welfare of animals should not be based solely on ethics, however scientific knowledge cannot be gained without understanding ethical attitudes.

### *The significance of welfare*

Caring for the welfare of farm animals contributes not only to animals, but also to people while at the same time generating benefits for the environmental protection. Improving the welfare of farm animals increases their productivity (*McInerney, 1998*). This is to a lesser extent applicable in developed countries where land prices and labour costs are high, so the food production in conditions of welfare consideration is also expensive. However, many developing countries have extensive agriculture and low labour costs that give them an edge in the agricultural market, especially if they are oriented towards highly valued organic foods and the market for products deriving from production based on respect of basic welfare principles, the so called *animal-welfare market*. This is of particular importance given that in the developed countries, the demand for these types of products is growing, along with the development of consumer awareness of the welfare of farm animals, as well as the concern about the quality of food consumed on a daily basis (*Wandel and Bugge, 1997; Blokhuis et al., 2003; Ostojić Andrić et al., 2012*). A modern consumer defines the notion of food quality not only through its edible quality and hygienic correctness, but also through the state of welfare of the animal from which it was derived. In this way, animal welfare has become an important part of the general concept of food quality (*Blokhuis, 2007*). Numerous studies (*Gregory, 1993; Scanga et al., 1998; Lindenlauf et al., 2010*) have shown that the animal farming in inadequate conditions undoubtedly negatively affects the quality of the obtained foods and on human health. Animal products can have reduced nutritional and edible quality due to neuro-hormonal reactions resulting

from exposure of animals to acute or chronic stress (*Moberg and Mench, 2000*). The health status of animals as an important indicator of their well-being is also influencing the food quality (*Ostojić Andrić et al., 2015, 2016*). Studies of the relationship of well-being and quality of milk (*Bergamo et al., 2003; Butler et al., 2011*) show that milk of cows reared on pasture contains a higher share of omega-3 fatty acids, as well as a more favourable omega-6 and omega-3 fatty acids ratio, higher vitamin E and beta-carotene content.

## The history and definitions of welfare

From the 19th century to the sixties of the 20th century, knowledge of the biological functions of animals increased significantly. At the end of this period, scientific discipline such as ethology and neurobiology became accepted in the scientific community. *Ruth Harrison's* book „*Animal Machines*“, published in 1964, indicated that the animal production industry very often treats animals as machines rather than living beings. That is why the British government in 1965 set up a *Brambell committee* to report on this phenomenon. The famous ethologist *Thorp (1965)*, a member of the committee, emphasized then that understanding animal biology is important as well as that they have their own biological needs, including the need to display appropriate behaviours, and that in case of their denial, frustrations and problems occur in animals. This view of *Brambell's* report became known as the concept of "*five freedoms*" - the basis on which all the following welfare concepts were developed.

In the 1960s of the 20th century, the focus of the discussion on this topic was more based on what people should do to protect animals, and much less on the welfare itself. In the seventies and early eighties, the term animal welfare was used, although not defined, and most researchers did not consider it scientific. Significant progress in the development of the concept of animal welfare was done by ethologist and psychologist research on motivational systems (*Miller, 1959; Hinde, 1970; McFarland and Sibly, 1975*). In the book "*Biology of Behavior*" by *Broom (1981)*, the animals described in it represent as sophisticated decision makers in almost all aspects of their action. This was completely contradictory to the previously very widespread, and later rejected, notion that the animals in their actions were driven exclusively by instincts.

Progress in understanding animal motivations, cognitive abilities and the complexity of social behaviour over the past 30 years has led to an accelerated development of animal welfare studies. A key point of consensus among scientists in this field that animal welfare is measurable and therefore has a scientific character, was achieved in the nineties. However, opinions on what was most important for the welfare were still divided. Veterinarians considered that welfare was adequate if the animal was healthy and, contrary to the ethologists, did not deal with animal feelings. Then, the ethologist *Marion Dawkins* pointed out that

‘welfare’ does not mean ‘just health’ and that an animal with poor welfare may be physically healthy and productive but still suffer from a wide range of negative psychological states like fear, frustration, which was a crucial starting point for this emergent discipline (*Dawkins, 1998*).

Early attempts to define the welfare of animals represented it as a state of harmony of animals with nature or the environment (*Hughes, 1982*). This is a biologically correct fact and the forerunner of later definitions, but it is not measurable and therefore scientifically useless. As the term welfare was used more and more in science, legislation and discussions, there was a clear need for a more precise definition. Finally, *Broom (1986)* presents the definition that is today most widely accepted: *welfare represents the state of the animal created in response to its attempts to struggle with environmental impacts*. In doing so, to „struggle“ means to establish control over mental and physical stability. The welfare can be scientifically measured and varies from very bad to very good. The welfare will be poor if the „struggle“ is difficult, or even impossible. There are different strategies starting from behavioural, physiological, immunological, and others managed by the brain. Feelings, such as pain, fear and various forms of satisfaction, can be part of a combat strategy where feelings are a key factor of welfare. The system can function in a satisfactory way when the struggle is successfully completed or unsuccessful - when the animal suffers. Since one or more strategies can be used as a response to a particular environmental challenge, there is also a wide range of welfare indicators that can be assessed.

## **The concept and methods of welfare assessment**

In the formation of a general concept of welfare, adaptation, stress, needs (freedom) of animals and their rights are key issues. The most important issue in terms of providing welfare is certainly a question of animal needs. According to *Broom and Johnson (1993)*, this need is that part of the animal's biological basis to provide the appropriate resource or response to certain stimuli from the surrounding environment or its body. The idea of providing five basic needs to animals proposed for the first time in the Brambell report (*Brambell, 1965*) has been developed into the generally accepted concept of animal welfare, the so called "Five Great Freedoms" (freedom from discomfort, hunger and thirst, fear and distress, pain, injury and disease, and freedom to express natural behaviour) (*FAWC, 1979*). This concept applies to all animals whose survival depends on man, and the degree of provision of each of these freedoms can be determined by numerous physical, anatomical, physiological, pathological and ethological indicators (*Ostojić Andrić et al., 2013*). Based on this concept, important methods for the assessment of welfare, including the Animal needs index (*Bartussek, H., 1985*), Welfare Quality Assessment Protocol (*WQAP, 2009*), EFSA Risk

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Assessment Method (EFSA, 2012) and the 'Life worth living' approach (Mellor, D.J., 2016) have been constructed.

## **The legislation, integration and the future of animal welfare**

The legislations in the field of the protection of farm animal welfare are largely present and applied in a large number of countries, enabling a broad ethical and moral framework for public and private action. Within the European Union, a significant number of directives, regulations and strategies for the protection of the welfare of farm animals resulted from the recognition that they have feelings (European Parliament, 2017). Through collaboration with science, these national and supranational regulations and strategies aim to propagate and encourage modern production systems to function according to the principles of protection of welfare. Unfortunately, in some of the largest producing countries, such as China, India and Brazil, legislation in this area is very poor or even absent. In our country, a major shift in this area was made by the adoption of the first Law on Animal Welfare in 2009, which drew public attention, but also enabled better supervision and control of the protection of animal welfare in production.

On a global scale, it is essential that the United Nations (UN) with the document from 2016 (FAO, 2016) have recognized the welfare of farm animals as one of the key factors necessary for securing the concept of sustainable agriculture that is essential for the survival of humanity. In addition, there is an increasing tendency to scientifically analyse, research and present the interconnected animal and human health interactions (Gibbs, 2014; Pinillos *et al.*, 2016). Also, the modern concept of food safety is an integral part of the global ecological modernization of society (CIWF, 2012) and is unambiguously related to the protection of the welfare of farm animals.

Priority, but not an easy task in the coming period, will be the design of production systems that will have to ensure an adequate level of animal welfare, the production of quality and safe food according to environmental principles, while at the same time increasing yields and profitability. As part of this "symbiosis," the science of welfare will have to deal with its biggest enemies: intensifying of the production, inadequate farm conditions as well as farm management, intensive selection, climate change and health and animal behaviour disorders that result from it (Oltenucu and Broom, 2010; Ostojić Andrić *et al.*, 2011, 2016, 2017; Rojas-Downing *et al.*, 2017).

## Conclusion

The animal welfare science over a long period of its constitution succeeded in drawing public attention to the problems of modern animal breeding. Incorporation of the basic principles of welfare, as a result of public and scientific support, is now more and more present in farm animal production. It can be said that the welfare finally found its very important place and justification of existence not only in the ethical and moral sense, but also in the context of an important ally of other sciences in dealing with problems in the sphere of climate change, food safety and human health.

## KONCEPT DOBROBITI FARMSKIH ŽIVOTINJA: OD ZAČETAKA DO INTEGRACIJE U SAVREMENE SISTEME PROIZVODNJE

*Dušica Ostojić Andrić, Slavča Hristov, Radica Đedović, Vlada Pantelić, Dragan Nikšić, Blagoje Dimitrijević, Nataša Tolimir*

## Rezime

Nauka o dobrobiti farmских životinja prošla je trnovit put razvoja, često osporavana zbog svoje nemerljivosti i svrsishodnosti postojanja. U samom početku prvenstveno zasnovana na moralnim i etičkim stavovima, tokom vremena ukazala je na značaj zadovoljenja potreba životinja i posledice njihovog zanemarivanja i iscrpljivanja u uslovima intenzivne stočarske proizvodnje. Važan segment njenog razvoja bili su definisanje i razvoj metodologija za ocenu indikatora dobrobiti, čime je ona postala merljiva i prihvaćena kao naučna disciplina sa saznanjima primenljivim i korisnim u savremenim sistemima proizvodnje. Ovaj rad predstavlja sažet prikaz evolucije nauke o dobrobiti, ali i nagoveštaj njene budućnosti u smislu razvoja „simbiotičkih“ veza sa konceptima održive poljoprivrede i bezbednosti hrane kao integralnih delova savremenog ekološkog pokreta proisteklog iz objedinjene brige o dobrobiti ljudi i životinja, brige o dobrobiti planete generalno.

**Ključne reči:** dobrobit farmских životinja, razvoj, značaj, zakonska regulativa, sistemi proizvodnje, dostignuća

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