

# Vivisection in education: ethical and legal issues

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## Abstract

### Vivisection in education: ethical and legal aspects

Vivisection is a usual practice among universities with biological areas courses. This work investigates legislation, sentence and legitimacy of the animal model that have been discussed over the last decades. The discussion about animals involves their condition of property and moral rights allocation, with sentence likely to be the basis for moral consideration. Federal laws 9605/98 and 11974/08 regulate the use of animals in Brazil. However, animal models extrapolation is not always possible, and it may compromise scientific research and the learning process. Vivisection may be therefore abandoned or substituted in some classes, with the aim of improving education quality and ensuring the compliance with animal rights laws. We suggest a growing supply of more alternative methods to vivisection, since its prohibition without replacement would compromise education and scientific development, becoming not morally acceptable.

**Key words:** Vivisection. Alternatives to animal testing. Education.

## Resumo

A vivisseção constitui prática usual e arraigada nas faculdades das áreas biológicas. Nas últimas décadas, tem-se questionado a legislação, ciência e legitimidade do modelo animal, aspectos investigados neste trabalho. A discussão acerca dos animais envolve sua condição de propriedade e atribuição de direitos morais, podendo a ciência ser base para a consideração de seu *status* moral. As leis 9.605/98 e 11.974/08 regulamentam a utilização de animais no Brasil. Contudo, a extrapolação do modelo animal nem sempre é possível, podendo comprometer a pesquisa científica e o aprendizado, de modo que a vivisseção pode ser dispensada ou substituída em algumas aulas, com vistas a qualidade da educação e ao cumprimento das leis dos direitos animais. Sugere-se o incremento da oferta de métodos alternativos a vivisseção, considerando-se que sua proibição, sem métodos substitutivos, comprometeria o aprendizado e o avanço científico, não sendo moralmente aceitável.

**Palavras-chave:** Vivisseção. Alternativas ao uso de animais. Ensino.

## Resumen

### La vivisección en la educación: aspectos éticos y legales

La vivisección constituye una práctica normal y arraigada en facultades biológicas. En las últimas décadas se ha cuestionado la legislación, ciencia y legitimidad del modelo animal, aspectos investigados en este trabajo. El debate acerca de los animales implica su condición de bienes y la asignación de derechos morales, y puede ser la capacidad de sufrir o sentir placer o felicidad la base para la consideración de el estatus moral de los animales. La Ley 9605/98 y 11974/08 reglamenta el uso de animales en Brasil. Sin embargo, la extrapolación del modelo animal no siempre es posible, pudiendo comprometer la investigación científica y aprendizaje, de manera que la vivisección pueden omitirse o substituirse en algunas clases, destinada a la calidad de la educación y al cumplimiento de las leyes de los derechos de los animales. Se sugiere el incremento de la oferta de métodos alternativos a la vivisección, porque su prohibición sin sustitución pondría en peligro el aprendizaje y el avance científico, no siendo moralmente aceptable.

**Palabras-clave:** Vivisección. Alternativas al uso de animales. Educación.

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## Vivisection in education: ethical and legal issues

Vivisection, defined as surgery performed on live animals for physiologic studies<sup>1,2</sup>, is an usual and rooted practice in the biological areas schools. Both in teaching and in research practice, this form of use of animals is based on the principle that the phenomena observed in laboratory animals can be extrapolated to other species, among which man or the same species subjected to different conditions.

The relationship between men and animals, established since pre-history, changed during the course of scientific development, allowing the emergence of a succession of philosophical views. In the anthropocentric view prevalent in Western history, the utility value of animals overwhelms their intrinsic value, often establishing a sharp division between man and other species. Aristotle, Descartes and Kant were thinkers who considered animals morally distant from humans, while Pythagoras, Voltaire and Schopenhauer attributed to them a higher moral status.

Among the mentioned thinkers, René Descartes was possibly the one who had the greatest influence on the vision of man over other animal species and, consequently, about the treatment accorded to them. Descartes<sup>3</sup> considered animals devoid of soul and reason, an idea that led to a belief in the inability of animals to feel pain.

This idea has facilitated the establishment of animal experimentation in the seventeenth century, which is reinforced by the fact that scientific research started to be more invasive and experimental in this period<sup>4</sup>. In the 19<sup>th</sup> century, based on animal studies, the physiologist Claude Bernard affirmed the rules of experimental medicine - which still govern the experimental procedures in medical and biological areas. Since then, the formation of many professionals in these areas was rooted in the principle of the animal model.

However, the use of animals for studies of anatomy, visualization of physiological processes and surgical training has raised questions of an ethical and moral nature, arising from a concern about the quality of education, a humanitarian vision about animals and the growing

environmental awareness that has occurred in last decades. In this transition, a conflict started between traditionalism and a new scientific insight about animals, which encouraged discussion on Vivisection in the scientific, political and legal areas.

This study shall only consider Vivisection in university education, discussing the matter with regard to ethical issues, legislation and the implications for teaching courses in biological areas.

### Ethical aspects

The anthropocentric paradigm led man to attribute to animals an almost exclusively utility value, considering in a lesser manner the interests of nonhuman species in a position of speciesist character. Speciesism, a term coined by psychologist Richard Ryder in the 1970s, is the doctrine, which supports the moral distinction between species. It recognizes the superiority of the interests of some over others, in a manner comparable to racism or sexism. In the late 20<sup>th</sup> century, with the deepening of discussions about the relationship between man, animals and environment, speciesism has begun to permeate ethical questions.

Man, whose scientific advances propitiate an increasing dominance over nature and other species, has not yet established criteria to guide his/her own behavior, differing on the moral classification of living beings. Recognizing the other in the subject condition in a relationship and giving moral consideration to this subject means to attribute to it interests and moral claims that can be recognized in a relevant moral level<sup>5</sup>.

For some thinkers, only man is able to recognize and respond to these interests and is the only species worthy of moral consideration. In the Kantian view, reason is the criteria for moral inclusion, thus excluding the non-human species from the sphere of morality<sup>6</sup>. However, the ability of man to recognize and respond to interests and moral claims does not justify the attribution of moral consideration uniquely to humans due to the fact that other species also present interests and demands intrinsic to their own survival

Although it is plausible to question the existence of an inherent morality to animals and the environment, it is inevitable to recognize that human morality itself can take upon itself a less anthropocentric condition, extending it to the planet and other species that inhabit it in the aim of preserving life on the planet.

In this respect, it seems that the concept of moral consideration has been confused with that of moral rights, and this refers to the individual ability to take responsibility. This is a condition that can, in fact, be unique to man, which can give him/her different moral rights. However, it is indisputable that recognizable interests are shared with other species and man may not be the only morally considerable species. While recognizing the interests of other species is only based on anthropocentrism, or the consideration that the ecological balance is essential to the survival of the man himself, some level of acceptance of these interests is inevitable.

In parallel, some authors consider that simply being alive may be sufficient to insert a subject in the moral community. For Goodpaster <sup>7</sup>, moral considerations do not rank the interests of different subjects, not distinguishing man from other species in the moral community. However, the author also considers the concept of moral relevance, which, unlike consideration, admits conflict and hierarchy of interest.

Such issues of moral relevance can be discussed in the context of the execution of vivisection practices, considering that the use of alternative methods can damage the scientific teaching and development. This is a situation where the need to advance the knowledge is set up against the equally important concept of respect for life <sup>8</sup> - hence the conflict between the value of animal life and the value of science. One can also treat the conflict as an opposition between the value of animal life and human life, as science is for the benefit of humanity. For centuries, Vivisection was an important tool for the scientific development

of man, with a view to improvements in health and other benefits of his/her own species. Thus, abolishing it or replacing it would be against the interests of the human species in a moral competition situation.

Still referring to the conflict between the value of animal life and that of science, it is important to mention the problem of the animal research model. The legitimacy of the animal model has been questioned in the scientific community, since the extrapolation process - in which this method is based - is not always possible. Studies done with laboratory animals can provide inconclusive or erroneous data that could compromise the development of science. This possibility is also contrary to the interests of the human species on the question of moral relevance, requiring, therefore, further research to determine the legitimacy of the vivisectionist practice. This discussion also extends to vivisection in education, due to the consequences of this practice in the training of teachers and researchers.

One may wonder, finally, if man has a moral obligation to animals and to what extent human interests may trump the interests of other species. Under the traditional philosophical point of view, the responsibility arises from freedom, making man morally responsible for his actions, which requires fundamentally the awareness of the acts <sup>9</sup>. Knowledge and technology give the man great power over other species; however, such freedom makes him morally responsible for his actions. This responsibility relates not only to the animals belonging to his moral sphere, but also for the subjects of their own species, for which scientific development exists and seeks benefits, direct or indirect.

### Animal suffering

Suffering is an important aspect in determining the moral conduct of man to animals. Historically, the idea of animal suffering is relatively recent due to the influence of thinkers such as Descartes and Kant, who contributed to the belief of animals' inability to feel pain

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The pain, when considered, could also be subdued, because man, being the only species included in the moral sphere, could justify the use of animals even in notoriously painful practices. Only in the second half of the twentieth century, a more humanitarian attitude towards animals was adopted and new discussions of ethical and philosophical nature, coupled with evidence of the ability of animals feel pain, changed the prevailing moral standards.

From the 70's, Peter Singer and Tom Regan encouraged further discussions on the moral consideration of animals, establishing the sentience, or the ability to feel pain and pleasure, as the relevant criterion for the moral consideration of animals. For Singer<sup>10</sup>, sentience gives animals the same interests as man on moral, which judgments should be based, in agreement with the Goodpaster<sup>7</sup> idea of moral consideration

The pain may be characterized by physiological and behavioral mechanisms. The animals, among which are included humans, respond similarly to certain types of stimuli. Throughout evolutionary history, pain has enabled the survival of animals, for it allowed them to identify the danger through tissue damage. After the painful sensation caused by the stimulation of specific receptors, the animal seeks to eliminate and thereafter prevent the cause of pain preparing for defense or escape, and preserving itself from physical damage. We know today that nerve transmission occurs by the same mechanism in all animals, from cnidarians, in the evolutionary scale. The neurophysiological mechanisms of pain were identified and studied in several organisms, but most information on the subject has come from vertebrate animals.

The lack of information about animal suffering in less derived species may be related to man's lower moral concern with species that are phylogenetically more distant. This can be explained by some moral psychology aspects pointed out by Rollin<sup>11</sup>. According to him, the man prioritizes the subjects with which it has a greater relationship of love and friendship, Aristotle defined the term *philia*.

It is established, thus, a rational bias that results in differentiated ethical treatment between different animals, in which the greater moral concern can be attributed, among animals, to pets.

The lesser knowledge, combined with lower moral concern for some species, leads to gaps in the discussion of vivisection, reflected in legislation. This fact can be seen in Law 11,974<sup>12</sup>, which regulates the use of animals in teaching and scientific research in Brazil, applicable only to animal species classified as phylum Chordata, subphylum Vertebrata..

### Legal aspects

The discussion in the legal sphere has two important points: the property status of animals and the attribution of moral rights to them. On the one hand, the basic interests of animals are considered, which must be addressed in law, sometimes including animals in the same moral community of humans, positioning itself against the property status of animals. Secondly, welfarism considers the use of animals as resources, not assigning them specific moral rights, but seeking the humane treatment of animals.

The legislation concerning the use of animals tries to follow some principles, such as verifying the actual need of the experiment, which shall be replaced, reduced or enhanced where possible, and to regulate the care of the animal. The responsibility for authorizing an experiment based on ethical decisions and commonly assigned to a group - in this case, ethics committees or commissions. These committees are comprised of people with expertise in the area related to the experiment, knowledge of ethics, people involved in animal protection issues and representatives of society. The decision to perform or not an experiment is made based on the advice of the ethics committee<sup>13</sup>. In Brazil, laws 9,605/98 and 1,1974/08 govern the humanitarian use of animals.

Article 32 of Law 9,605/98 (Chapter V of the Law on Environmental Crimes')<sup>14</sup> prohibits the act of abuse, mistreatment, injure or maiming of wild,

domestic or domesticated, native and exotic animals, with provided penalties of three months to one year detention, in addition to a fine. It is considered cruelty to *strike, injure or mutilate voluntarily any organ or economy tissue, except for castration, only for domestic animals, or other surgeries practiced in exclusive benefit of the animal and those required for the defense of man, or in the interest of science*. Although the surgeries performed in the interest of science are not specified, the same law considers vivisection a criminal practice when the existing replacement methods are not adopted, culminating in the offenders sentence of three months to one year in prison, in addition to a fine.

Alternatives to animal use in education comprehend biological in vitro systems, epidemiological and clinical studies, autopsy/biopsy, computer simulations, mathematical models, use of bodies and clinical practice. The Ethical Principles in Animal Experimentation postulate in its Article. 69, considers the development possibility of alternative methods such as mathematical models, computer simulations, in vitro biological systems, using the smallest possible number of animal specimens, if characterized as the only plausible alternative. If there are alternative methods, incur in the same penalties of Law 9,605/98 those who perform painful or cruel experiments on live animals, even for educational or scientific purposes, the penalty being increased by one sixth to one-third if the animal's death occurs.

The other Brazilian law is Law 11,974 <sup>12</sup>, of October 8, 2008 laying down procedures for the scientific use of animals. After some modifications, this law, known as Arouca's Law, came into force in order to regulate the creation and use of animals in teaching and scientific research throughout the country. Additionally, it establishes the National Council for Control of Animal Experimentation (Concea) as the agency responsible for humanitarian use of animals, in addition to making mandatory the establishment of ethics committees in the use of animals (Ceua) in educational and research institutions.

Regarding teaching activities, the Ceua must maintain an updated registry of the didactic procedures performed, which should be

whenever possible, photographed, filmed or recorded, to enable its reproduction for future practices. When the use of animals is deemed necessary, their number should be the minimum necessary to produce conclusive results, sparing them to the maximum from suffering. Concea should monitor and evaluate the introduction of alternative techniques to replace animal use in teaching and research, and the Ceua is responsible for compliance with this provision in the universities.

The role of ethics committees in the evaluation of vivisection practices raises some criticism <sup>13</sup>, as the low representation of groups specializing in ethical and animal welfare issues compared to the group of researchers and teachers that use animals, which may not provide adequate discussion of an experiment. Furthermore, the ethics of a validation project may not ensure the correct use of animals due to a disability or lack of supervision during the execution of the experiment.

Another important legal aspect concerns the right to conscientious objection according to which students, faculty and staff may refuse to participate in practical classes using animals without thereby suffer punishment or disapproval. Based on freedom of conscience, one can declare conscientious objection when religious, philosophical or humanitarian principles of the person are opposed to the legal system of the society, constituting a kind of violation to obligations of reasonable conscience and of little publicity, aiming at the most, to an alternative treatment of the law. According to Article 99 of Chapter I of the Constitution - Individual and Collective Rights and Duties - no employee or civil servant can suffer functional penalty in the event of declaration of conscientious objection that legitimizes refusal of the practice or of cooperation in carrying out animal experiments.

### Animal model

As for the legitimacy of the animal model, extrapolation of the investigated processes in animals to humans or animals kept in different conditions is not always possible. Although the use of related species for studies is preferred,

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the phylogenetic and anatomical similarities between the animal model and the target species does not imply similar physiological behavior and does not guarantee the validity of data extrapolation<sup>15,16</sup>, being more important the similarity of the phenomena investigated in both species. The inappropriate choice of model can affect the research results and their interpretation, which is not always taught to students of biological areas because of the ingrained nature of the use of animals in universities. The anatomical and physiological differences and even the influence of artificial environmental conditions can induce the researcher to error - another possibility rarely addressed during the learning process.

Another problem concerns the use of the animals themselves during the learning process, i.e., the simple fact that the class involved animals, especially live animals. Traditional education may leave much to be desired if the students focus more on the procedure itself than on the objectives of the lesson, which may occur in view of ethical conflict faced by having to consider and handle animals as disposable didactic materials, especially at the beginning of courses. The psychological denial, reassuring the students and the transfer of responsibility for the violent practice to the institution may also have negative consequences in shaping the student's character.

In turn, the fear of reprisals from teachers and peers leads many students not to question the methodology applied in the classroom. Desensitization occurs during the course, i.e., the decrease in student sensitivity when manipulating animals because of familiarization. Such a change, in addition to not inspiring the search for effective alternative methods of teaching, can seriously compromise the ethical and humane posture that is expected of a biological or health professional.

Additionally, the psychological distress experienced by the student may reduce their capacity for observation and reasoning, impairing their learning<sup>17</sup>.

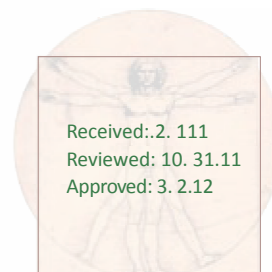
The negative pedagogical implications mentioned lead to the questioning of the technician nature of the courses in which commonly tasks are taught without proper questioning of their goals in practical lessons that are too theoretical and that come down to statements that may already be found in books. As for the effectiveness of alternative methods, such as studies of Carpenter *et al*<sup>18</sup>, Greenfield *et al*<sup>19</sup>, Pavletic *et al*<sup>20</sup>, on surgical training, and Diniz<sup>21</sup>, on cytological techniques, the same learning efficiency was found when comparing traditional and alternative methods of teaching without the problem of bridging between species. Despite the limitations of animal models in teaching and research, a simple ban on vivisection in education would not be acceptable because it would undermine the learning and training of students. However, more studies are needed to prove the effectiveness of the alternatives, reaching out to other disciplines and courses considering the objectives and resources of each class.

## Final considerations

Despite the need for further studies to determine the possibility of replacement animals in teaching, one can say that vivisection may be waived or replaced in some classes, aiming the quality of the training and compliance with the laws on animal rights. The conflict placed on this moral issue must be mediated by increased supply of alternative methods to animal use in teaching and research, considering that the prohibition in using animals without replacement by other methods undermine learning and scientific advancement, not being morally acceptable.

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## Authors' participation in the work

The authors participated jointly in the production of the paper.