

European and Mexican regulations on animal welfare in experimental and cultured aquatic animals

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ABSTRACT

Objective: To analyze the differences between the regulatory frameworks of the European Union and Mexico in terms of aquatic animal protection and welfare, in order to propose improvements in Mexican legislation.

Design/methodology/approach: Comparative study of legislative frameworks, the European Union regulatory framework on animal welfare, the current situation of Mexican regulations and the identification of gaps and areas of opportunity.

Results: The European Union has a comprehensive legislative framework that includes the regulation of animal husbandry, animal experimentation and transport, as well as aquatic organisms. Mexico has significant deficiencies, *i.e.*, the absence of a General Animal Welfare Law and a clear lack of specific regulation for aquatic animals.

Limitations on study/implications: There is no general animal welfare law for Mexico; therefore, improvements are proposed in consideration of the European Union's regulatory framework.

Keywords: Aquatic animals, legislation, bioethics, Mexico, European Union.

Citation: Soro Mateo, B., Aréchiga-Palomera, M. A., Chong-Carrillo, O., & Vega-Villasante, F. (2025). European and Mexican regulations on animal welfare in experimental and cultured aquatic animals. *Agro Productividad*. <https://doi.org/10.32854/pmpz3p47>

Academic Editor: Jorge Cadena Iñiguez

Associate Editor: Dra. Lucero del Mar Ruiz Posadas

Guest Editor: Daniel Alejandro Cadena Zamudio

Received: November 26, 2024.

Accepted: February 12, 2025.

Published on-line: May XX, 2025.

Agro Productividad, 18(4). April. 2025. pp: 187-197.

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INTRODUCTION

Animal abuse in Mexico is not a sporadic or uncommon phenomenon. According to Giles Navarro (2023), the problem of animal abuse is much bigger than what can be seen through the cases documented in social networks. Mexico ranks first in Latin America in animal abuse and third worldwide (Berlanga, 2021). Also according to Berlanga (2021) between 2019 and 2020, 2,490 complaints were received for animal mistreatment, however, only 101 aggressors were linked to process and 18 sentences were issued for this crime, while only fourteen aggressors had as a penalty the deprivation of their freedom in the whole country so it is estimated that the punishment rate for animal mistreatment

in Mexico is less than 0.01%. The above figures are practically originated by situations in which the welfare of companion and wild animals is compromised, without considering experimental animals or animals used in livestock production and aquaculture. If these were taken into account, the figures would surely increase to much higher levels.

The concept of “animal welfare”, defined by the World Organization for Animal Health as “the physical and mental state of an animal in relation to the conditions in which it lives and dies”, has been included in numerous national and international regulations; thus, Article 13 of the Treaty on the Functioning of the European Union states that animals are sentient beings “when formulating and implementing the Union’s policies on agriculture, fisheries, transport, internal market, research and technological development and space...”.

In relation to animal experimentation, according to Serra Palao (2021), mentioning Kolar (2006 and 2015) and Leyton (2010), this practice is carried out under five main areas: basic research, research for biomedical and pharmaceutical purposes, for industrial and commercial purposes, for educational purposes and finally, in the military field. In the case of research aimed at developing or improving production capacities within the agricultural field (in which aquaculture production could be included), this can be included within the “commercial” field. Serra Palao mentions that in the European Union alone, in 2020, nine million animals were used for experimentation. In the Report from the Commission to the European Parliament and the Council (Report 2019 on statistics on the use of animals for scientific purposes in the Member States of the European Union in 2015-2017; Comisión Europea, 2020) and which is cited by the same author, the number of animals subjected to experimentation is counted. In the case of aquatic organisms, it is established that for zebrafish, *Danio rerio*, and “other fish” (without defining species) a total of 3,799,499 individuals subjected to experimentation is accumulated. This figure is the highest of all reported species and is only below the corresponding number for mice, which is 17,408,496. Another aquatic species reported are cephalopods with individuals subjected to experimentation totaling 25,260. In this same report, the term “animal welfare” is mentioned in relation to the protection of the natural environment in the interest of the health or welfare of humans or animals and the preservation of species. Furthermore, in relation to the reuse of the total number of animals used in experimental procedures, based on the principle of the three Rs, mentioning that it is only allowed considering the actual level of severity experienced by the animal and its health and welfare.

In the case of Mexico, Frías-Álvarez and Ortiz-Millán (2024) focused on calculating the total number of animals used for these purposes from January 2015 to October 2021, based on data requested from the National Institute for Transparency, Access to Information and Protection of Personal Data (INAI). Authorized laboratory animal facilities reportedly used 5,437,263 animals in this period. However, the authors caution that these data should be taken with caution due to the absence of an official registry that includes all Mexican institutions that use animals for these purposes. The research revealed the use of a wide range of species from different taxonomic groups, including mammals, birds, reptiles, amphibians, fish and invertebrates. The main purposes of use of these animals included technological development, innovation, laboratory testing, biological production, quality control, diagnostic purposes, basic and applied research, and education. Specific

mention is made of the use of invertebrates in aquaculture research. A total of 185,903,422 invertebrates were reported to have been used for this purpose in the six-year period analyzed. Institutions reporting the use of invertebrate animals for aquaculture research purposes included universities, research centers and specialized aquaculture institutes. The document indicates that fish are the second most used group of animals for scientific purposes in Mexico, with a notable increase in their use compared to other species or animal groups. This increase can be attributed to the expansion of aquaculture research and the development of the home aquarium industry. In particular, zebrafish have been widely used as a model in aquatic ecotoxicology studies.

For aquatic animals subjected to experimentation and aquaculture production, the interest in minimizing conditions of mistreatment that can lead to stress and suffering is practically null in many countries, including Mexico. This may be due to the popular belief that aquatic animals (crustaceans, fish, mollusks) do not perceive pain as mammals do. Aréchiga-Palomera *et al.* (2023) mention that the debate on whether fish can experience pain has been the subject of discussion in the scientific community for the last two decades. Some scientists argue that fish cannot feel pain due to the lack of a cerebral cortex, which they claim is necessary to experience pain. They claim that pain is a subjective experience that requires a conceptual psychological subject, which is not the case for fish. However, other scientists argue that fish can experience pain. They rely on the presence of nociceptive pathways in the nervous systems of fish, which are similar to those of mammals. These pathways are related to the detection of noxious stimuli and trigger behavioral and physiological responses in fish. In addition, the structure and function of the nervous system are broadly similar to those of terrestrial vertebrates, with a central nervous system, consisting of a brain and spinal cord, connected to the sensory organs and muscles by a peripheral nervous system. In general, the sensory organs of fish are remarkably similar in structure and function to those of terrestrial vertebrates, as is the endocrine system, including hormones involved in stress responses (Huntingford and Kadri, 2014). The debate about pain in fish (and other aquatic animals) has implications for the aquaculture and fisheries industry as it relates to animal welfare and ethical issues. This debate can even have epistemological-ethical implications, as can be seen in the work of Henríquez and Pradenas (2022), which discusses the “sentient” capacity of fish and how the acceptance, or not, of this quality could grant a moral status to these animals or, on the contrary, maintain a position in which they are beings without the capacity to experience pain and therefore alien or removed from any legal proposal to guarantee their welfare. Some scientific journals require authorization from animal welfare committees for research involving animals. Although anesthetics are being used to minimize pain in aquatic animal research and handling practices, the debate on whether they can experience pain continues, despite the fact that there is already scientific evidence to prove it.

Celaya-Tentori and Almaraz-Alvarado (2018) mention that the regulatory dynamics, in relation to aquaculture in Mexico, have not kept pace with global demands, and intermittent progress is observed in aquaculture policy instruments, as well as a limited vision in terms of the aquaculture-biotechnology binomial, qualifying this as diffuse and lacking long-term strategies for subregions and species. The authors address the evolution

of aquaculture regulations, highlighting their importance in the global context and pointing out the specific challenges faced by Mexico in this area. In this study it is worth noting that, although the regulations are approached from a historical viewpoint, terms that could allude to animal welfare or protocols that minimize suffering in the handling or slaughter of cultured organisms are not included. The focus is only on regulations, highlighting their importance in the global context and pointing out the challenges faced by Mexico in this area. This is contradictory to say the least, since this country is a member of the World Organization for Animal Health (OIE) organization that among its main concerns and actions are to ensure animal welfare and that has specifically created international standards for farmed fish that, in our experience, are not applied in Mexico. In contrast, Spain, also a signatory to the OIE conventions, apparently does have a regulatory framework that should be applied in the management of farmed fish and other species, through the legislation adopted by the European Union (EU) as a whole. Title 7 of the OIE Aquatic Animal Health Code specifically addresses the welfare of farmed fish and includes aspects of transport, stunning and slaughter. However, it does not address protocols to prevent suffering during the different phases of culture, so welfare is limited to the aspects outlined above. The following regulations stand out: Law 32/2007, of November 7, for the care of animals, in their exploitation, transport, experimentation and slaughter and Royal Decree 1614/2008, of October 3, regarding animal health requirements for aquaculture animals and products, as well as the prevention and control of certain aquatic animal diseases.

Based on the above scenario, the objective of this study is to establish the existing legal universe in Mexico, in relation to the animal welfare of aquatic animals subjected to experimentation and aquaculture production, in comparison with that existing in the EU, with the intention of establishing the weaknesses, possible coincidences and opportunities to improve the former based on the experience of the latter.

MATERIALS AND METHODS

An exhaustive database search was conducted to identify relevant documents on animal protection and welfare in the European Union (EU) and Mexico. In the case of the EU, documents were selected from a broad legislative framework aimed at promoting and protecting animal welfare in areas such as animal husbandry, experimentation, transport and companion animal husbandry. The European regulations reviewed included Directive 2010/63/EU, Regulation (EC) No. 1099/2009, Directive 2006/88/EC, Decision 2008/392/EC and Directive 2013/35/EU, all obtained from the Official Journal of the European Union. In addition, Law 7/2023, consulted in the Spanish Official Gazette, was included.

For the context in Mexico, the regulations available in the Official Journal of the Federation were reviewed, given that there is currently no General Animal Welfare Law (despite being proposed and approved, it remains pending enactment). The documents analyzed in the Mexican framework were the General Law of Ecological Equilibrium and Environmental Protection (LGEEPA), the Mexican Official Norm NOM-062-ZOO-1999 and the General Law of Sustainable Fisheries and Aquaculture. A comparative analysis between the European Union (EU) and Mexico was carried out to identify gaps and key areas in Mexico's regulatory framework with respect to animal welfare and protection.

RESULTS AND DISCUSSION

European Union

The European Union (EU) has specific regulations on aquatic animal experimentation in the context of scientific research. The main regulation addressing this issue is Directive 2010/63/EU of the European Parliament and of the Council, which establishes rules for the protection of animals used for scientific purposes. Although this Directive focuses primarily on terrestrial animal experimentation, it also includes specific provisions for the protection of aquatic animals used in research (Table 1). The key aspects related to aquatic animal testing in Directive 2010/63/EU are summarized below:

1. Definition of aquatic animals: The Directive defines “aquatic animals” as vertebrates and cephalopods, such as fish and octopuses, involved in research.
2. Authorization and ethical evaluation: Experiments with aquatic animals must be authorized and evaluated by ethical committees, which guarantee ethical practices and minimization of suffering.
3. The “3R” principle: The Directive encourages the reduction, refinement and replacement of animals in experimentation, to reduce their use and suffering, and to promote alternatives.
4. Animal welfare standards: Establishes appropriate housing, care, feeding and humane euthanasia conditions for experimental animals.
5. Annual reporting and transparency: Member states must submit annual reports on the use of animals in research to promote transparency.

It is clear that Directive 2010/63/EU seeks to balance scientific research with the welfare of experimental animals, terrestrial or aquatic. In addition, Regulation (EC) No. 1099/2009, on the protection of animals at the time of killing, includes fish as part of the vertebrate animals that should be subject to separate rules in relation to the rest, terrestrial, without further elaborating on the possible protocols that could be used. Obviously, there is no mention of aquatic animals when used for experimental purposes and euthanasia or slaughter procedures.

More specifically, Council Directive 2006/88/EC, which deals with animal health requirements for animals and the prevention and control of certain diseases in aquatic animals, focuses on animal health and safety issues in aquaculture. Although its main objective is to protect the health of aquatic animals and to prevent and control diseases, the directive does not directly address animal welfare. However, per se, “protecting health” is already an element that is directly related to animal welfare. While animal welfare is an issue related to the way aquatic animals are reared, handled and transported, Directive 2006/88/EC does not focus on specific aspects of welfare, such as the space available for the animals, their living conditions, their handling or their slaughter.

Mexico

There is no animal welfare law in Mexico. In 2016, the first attempt was made to present a legislative initiative in the Chamber of Deputies to approve a General Animal Welfare

Table 1. Animal Protection and Welfare Regulations in the European Union: approach and role.

Name of Standard	Approach	Role
Directive 2010/63/EU on the protection of animals used for scientific purposes	Regulation of the use of animals in scientific research	Protect animals used in scientific research and promote alternative methods to reduce their use.
Regulation (EC) No. 1099/2009 on the protection of animals at slaughter	Animal welfare standards during slaughter	Ensure animal welfare during slaughter through humane practices and adequate training of personnel.
Directive 2006/88/EC on animal health requirements for aquaculture animals	Aquaculture sanitary control and disease prevention	To protect the health of aquatic animals and prevent the spread of diseases in aquaculture.
Decision 2008/392/EC on arrangements for Internet-based information on aquaculture enterprises	Transparency in the aquaculture industry	Provide transparency and accessibility to information on aquaculture production companies and control of authorized processing establishments.
Directive 2013/35/EU on the protection of animals in scientific procedures.	Animal welfare in scientific research	To ensure a high level of protection and welfare for animals in scientific procedures, also promoting innovation.
Law 7/2023 on the protection of the rights and welfare of animals.	Recognition of animal dignity in society	Recognize the dignity of animals as living beings and regulate behavior towards them in coexistence, without considering them merely as elements of economic activity.

Law in Mexico. Apparently, pressures from bullfighting and fighting cocks businessmen, as well as livestock producers, for perceiving damage to their interests, did not favor its approval. This prevents the homologation of state laws, which are very different. Recently, the Mexican Senate approved a reform aimed at guaranteeing the protection, proper treatment, conservation and care of animals. The initiative has already been approved at the federal level and is now under review by state congresses for analysis and eventual ratification, with the aim of granting it constitutional status. The proposal contemplates amendments to several articles of the Constitution and establishes that the Congress will have the power to issue the General Law on Animal Welfare, Care and Protection. The proposed reforms to the constitutional articles are so that study plans and programs must include the care and protection of animals (article 3), prohibit animal mistreatment and guarantee their protection by the State (article 4) and empower the Congress to issue a general law for the protection of animals (article 73). With the required ratification by a majority of state congresses completed, the reform is now on track to attain constitutional status upon its official promulgation. Subsequently, it will be necessary to develop secondary laws to complement these regulations and ensure the comprehensive implementation of animal welfare. However, laws require a regulatory framework that allows their application, and in this sense, aquatic animals for experimentation and cultivation should be included as subjects to be considered for their protection. This would mean modifying the perception of these animals as non-sentient and of little interest to the general population.

At present, the regulations that address animal welfare issues in Mexico are included, in an almost diluted manner, in various Official Standards and laws, which mention the

subject but do not cover all the required aspects, much less all the animal species that could be subject to habitual mistreatment.

The General Law of Ecological Balance and Environmental Protection (LGEEPA) in Mexico has an important component related to animal welfare. In 2019, this law was amended to include specific provisions related to animal protection and welfare. The reforms to the LGEEPA in 2019 created a stronger legal framework for the protection of animals in the country. The LGEEPA includes key points on animal welfare, such as the prohibition of mistreatment and cruelty, the regulation of animal experimentation practices, and the imposition of sanctions for those who fail to comply with these provisions (Table 2).

These reforms to the LGEEPA also recognize the importance of animal welfare in relation to ecological balance and environmental protection, since cruelty to animals can have a negative impact on ecosystems and the quality of life of animals. This inclusion in the LGEEPA apparently reflects Mexico's commitment to the promotion of animal welfare and protection within the framework of its environmental and ecological policy. However, in the absence of a General Animal Welfare Law, its scope is limited and does not cover the entire scenario that should be addressed. The fundamental principles established in this law include providing animals with water, food, an adequate environment for their rest and movement, preventive medical care and treatment when necessary, as well as allowing them to express their natural behavior and ensuring species-appropriate care conditions.

The following paragraphs of this law state that the Federal Government of Mexico is responsible for establishing official standards that define the basic principles of dignified and respectful treatment of animals, addressing aspects such as their capture, captivity, commercialization, quarantine, training, exhibition, exploitation, transport and slaughter. It also has the task of supervising compliance with these standards. However, it does not

Table 2. Animal Protection and Welfare Regulations in Mexico: approach and role.

Name of Standard	Approach	Role
General Animal Welfare Law (proposed)	Animal protection and welfare in Mexico.	Establish federal and homogeneous coverage for the protection of animals, prohibit mistreatment and guarantee the inclusion of animal welfare in educational plans and programs.
General Law of Ecological Equilibrium and Environmental Protection (LGEEPA)	Protection of animals and the ecological environment.	Prohibit animal abuse, regulate experimentation and establish sanctions for non-compliance. Promotes the relationship between animal welfare and ecological balance.
Mexican Official Standard NOM-062-ZOO-1999	Laboratory animal welfare.	Establish standards for housing, care, ethical handling and humane euthanasia of laboratory animals. Requires training of personnel and ethics committees.
General Law for Sustainable Fisheries and Aquaculture	Sustainability and animal welfare in aquaculture and fisheries.	Promotes sustainable aquaculture development, regulates practices for the health of aquatic organisms and encourages ethical practices in captivity. Includes habitat conservation.

report on the mechanisms or protocols that should be implemented to guarantee the above, nor the government agencies that should be involved to achieve such objectives.

The Federal Attorney's Office for Environmental Protection (PROFEPA) is the government institution in charge of supervising and enforcing laws and regulations related to the environment and the protection of fauna in Mexico and plays a fundamental role in the supervision and promotion of animal welfare (Table 2). However, its primary work is oriented towards wild animals in captivity, zoos, breeders, animal entertainment centers, among others. Therefore, its incidence in the scenario of aquatic animals in experimentation or production is practically null.

Regarding the handling of laboratory animals for experimentation, Mexican Official Standard NOM-062-ZOO-1999 establishes the technical requirements and specifications for the production, care and use of laboratory animals in Mexico (Table 2). This standard regulates facilities and housing conditions for laboratory animals, ensuring adequate standards of ventilation, lighting, temperature and humidity. It also establishes guidelines for care and maintenance, such as feeding, hygiene, disease prevention and requirements for personnel in charge. In terms of welfare, it dictates ethical guidelines for handling animals, reducing their stress and pain, and regulates humane euthanasia when necessary. In addition, it requires detailed documentation of all activities and specifies personnel training, as well as the creation of ethics committees for the evaluation of research protocols.

The main objective of NOM-062-ZOO-1999 is to guarantee the welfare of laboratory animals used in scientific research in Mexico and establishes standards for their care and ethical management (Table 2). This standard seeks to balance the need for research with the protection and welfare of the animals involved. However, it does not include aquatic animals in any of its chapters, so it is only a general document that should be referred to when addressing animal welfare aspects in experimentation and adapting it to the particular requirements of aquaculture research or production.

More related to the issue of aquatic animals for aquaculture production, the General Law on Sustainable Fisheries and Aquaculture is a law in Mexico that regulates fishing and aquaculture activities with a focus on sustainability and conservation of marine and aquatic resources (Table 2). The law establishes principles for the sustainable exploitation of fishery and aquaculture resources, preserving marine biodiversity and species regeneration. It defines access rights, regulating concessions and authorizations, and provides for measures to prevent overexploitation, such as minimum sizes, closed seasons and fishing quotas. It promotes sustainable aquaculture as a complement to fishing production and encourages management through refuge areas and exclusion zones. It also establishes a monitoring system with sanctions, recognizes the importance of conserving marine ecosystems by preventing pollution and waste, and encourages the participation of local and indigenous communities in regulating the sector.

Although this law focuses on conservation and regulation of fishing and aquaculture activities, it also includes provisions related to animal welfare, although not necessarily in detail. It is worth mentioning that, although the law focuses on aquaculture production, the development of this activity requires a great effort of previous research for the development of culture technologies, in this sense the diverse aquatic organisms that are cultivated are,

in the same way, experimental organisms that had to be submitted to bioassays of all kinds. The General Law on Sustainable Fisheries and Aquaculture contributes to animal welfare by maintaining the health and quality of aquatic organisms in aquaculture facilities, regulating management, feeding and disease prevention practices. Although it does not focus specifically on animal welfare, it promotes ethical treatment in captivity, avoiding unnecessary suffering in production systems. It also promotes the conservation of marine and aquatic habitats, benefiting both wild species and captive-bred organisms.

Comparison

European Union

The EU has a comprehensive regulatory framework to regulate animal welfare in areas such as animal husbandry, experimentation, transport and companion animal husbandry, with specific rules for each. With Directive 2010/63/EU, animals used in scientific research are regulated, including aquatic animals. In addition, the “3R” principle (reduction, refinement and replacement) is promoted to minimize their suffering. Furthermore, the EU encourages transparency through annual reports on the use of animals in research, allowing public oversight and promoting accountability in the handling of laboratory animals.

Mexico

Lack of a General Animal Welfare Law: Mexico does not have a general animal welfare law covering a wide range of issues. The initiative to establish a General Animal Welfare Law in 2016 faced resistance from various interest groups. Related regulations are scattered in various laws that make their cohesion and implementation complicated. The constitutional reforms presented by the Executive to Congress this year could remedy this lack of a law that would federally protect animals.

Mexico’s General Law of Ecological Balance and Environmental Protection (LGEEPA) establishes that the Federal Government must create standards for the dignified and respectful treatment of animals in activities that include capture, captivity, commercialization, quarantine, training, exhibition, exploitation, transport and slaughter. Despite this, the law does not specify clear protocols to guarantee animal welfare nor does it designate entities responsible for compliance. NOM-062-ZOO-1999 regulates the use of laboratory animals, but focuses on terrestrial animals, without including aquatic animals. The General Law on Sustainable Fisheries and Aquaculture regulates fishing and aquaculture activities with a focus on the conservation and health of marine resources, which indirectly contributes to animal welfare, but does not specifically address animal handling or slaughter.

In general, the European Union has implemented a broader and more specific regulatory framework for animal welfare, including aquatic animals used in research. In contrast, Mexico lacks a general animal welfare law and focuses on specific regulations for laboratory animals and conservation issues in aquaculture. The lack of specific regulations for aquatic animals may be an important gap in the protection of their welfare in Mexico.

Improving Mexican regulations based on European standards

To improve animal welfare conditions for aquatic animals in experimentation and culture in Mexico, taking the European Union regulations as a model, the following measures could be considered:

- i) Develop a Comprehensive Animal Welfare Law covering specific aspects for aquatic animals in research and aquaculture production, already existing in European directives.
- ii) Establish specific regulations for aquatic animal experimentation, promoting the “3R” principles and guaranteeing ethical and animal welfare standards.
- iii) A modification to NOM-062-ZOO-1999 to include specific provisions for aquatic animals in experimentation, ensuring a level of protection similar to that of terrestrial animals.
- iv) Implement transparency and annual reporting on the use of aquatic animals in research and production, following the EU model.
- v) Promote public education and awareness of aquatic animal welfare.
- vi) Include the participation of experts and local communities in decision-making related to aquaculture production and research.
- vii) Encourage research into alternative methods that reduce the need to use animals in experimentation.
- viii) Improve the General Law on Sustainable Fisheries and Aquaculture with specific provisions to guarantee the welfare of aquatic animals in aquaculture facilities, regulating aspects such as space, living conditions and ethical management.
- ix) Consider implementing specific regulations for the slaughter or euthanasia of aquatic animals, ensuring humane methods and training of personnel.

Taken together, these improvements could contribute significantly to strengthening animal welfare conditions for aquatic animals in Mexico, bringing them in line with the standards and practices adopted in the European Union. By adopting measures inspired by EU regulations and customizing them to the Mexican context, animal welfare conditions for aquatic animals in experimentation and culture could be significantly improved. This would contribute to balancing the need for research and production with the protection and welfare of these animals.

CONCLUSIONS

The EU has a comprehensive and specific regulatory framework for animal welfare, addressing various areas such as animal husbandry, experimentation, transport and companion animal husbandry. Directive 2010/63/EU stands out for establishing clear rules for the protection of animals used in scientific research, including aquatic animals, and promoting the “3R” principles (reduction, refinement and replacement). In addition, transparency and accountability are emphasized through annual reporting on the use of animals in research, and aquatic animal experimentation is specifically regulated.

Mexico lacks a general animal welfare law, and related regulations are scattered in different laws, making their cohesion and implementation difficult. Although the LGEEPA includes provisions related to animal welfare, it does not specify the mechanisms or protocols to guarantee it, and supervision falls to the Federal Attorney General's Office for Environmental Protection (PROFEPA), whose incidence on aquatic animals in experimentation is limited. The Mexican Official Standard for Laboratory Animals (NOM-062-ZOO-1999) does not include specific provisions for aquatic animals, and the General Law on Sustainable Fisheries and Aquaculture focuses more on sustainability and conservation than on animal welfare.

ACKNOWLEDGEMENTS

During the evaluation of this manuscript, the Executive Branch of Mexico presented to the Chamber of Deputies the initiative for the General Animal Welfare Law, which was approved in December 2024. Although this law has not yet come into effect, Congress has complied with the constitutional mandate by presenting the initiative for its creation. However, uncertainty remains as to whether the secondary laws will include farmed aquatic animals under their scope of protection.

We would like to thank the PROHUMAN BIOLAW program of the European Union and the University of Guadalajara for the resources received to carry out the stay at the Faculty of Law of the University of Murcia, Spain.

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