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Summary

Veterinary medicine represents an applied science with a significant impact on multiple professionals sectors. Its exercise is not only limited to the treatment of domestic animals, but extends to critical functions such as the control of transmissible diseases between species, health management in the food industry and the improvement of animal productivity.

Likewise, the veterinary professional intervenes in areas such as public health, environmental control and research in biological sciences. These functions make it strategic dicipline to guarantee animal welfare, consumer protection and the sustainability of ecosystems.

Introduction

Veterinary medicine is a scientific discipline with a wide field of action, whose importance transcends the traditional clinical field. Its intervention is fundamental in strategic sectors such as public health, agricultural production, food security, biomedical research and enviromental conservation.

Veterinary professionals are actively involved in the prevention and control of zoonotic diseases, in the health inspection of products of animals origin, in the desing of animal welfare policies and in epidemiological surveillance systems. Recognises the interdependence between human, animal and enviromental health, veterinary medicine takes on a central role in promoting sustainable and resilient enviroments. This paper aims to analyze the impact of veterinary medicine in various professionals field, highlighting its multidisiplinary nature and its contribution to the integral development of modern societies.

The importance of veterinary medicine in different professional fields

The veterinary in human health

Veterinary medicine is component of public health activities dedicated to applying techniques, knowledge, and resources to the protection and improvement of human health. These activities include surveillance, prevention, control, and eradication of zoonoses, directly protecting humans from the more than 100 animal diseases that can affect them thereby having direct implications and influence on public health. Other veterinary duties include preventing occupational hazards and diseases related to live animals and their products; as well as controlling animal populations that can become sources of disease of humans.
Veterinarians are experts in a variety of animals species; from insects to mammals. Under this concep, veterinary medicine protects humans health and contributes to ensuring public health by preventing diseases that effect the world's population at their source. In addition to the above, veterinarians ensure food safety through food safety, improve animal health by preventing and eradicating diseases, and assist in ecosystem management by avoiding imbalances due to climate change or invasive species.
There are various animal-derived diseases to which humans are susceptible, such as avian influenza, rabies, brucellasis, and Covid-19 itself, these pathogens represents global risks to public health, for which the starting point of prevention is animal health care. (1)

Biotechology in veterinary medicine

Animal biotecnology is a branch of biotechnology in which molecular biology techniques are used to genetically modify animals in order to improve their suitability for agricultural, industrial, or pharmaceutical applications. Animal biotechnology has bee used to produce genetically modified animals that synthesize

therapeutic proteins, have improved growth rates, or are resistant to diseases. Advances in animal biotechnology have been facilitated by recent advances in animal genome sequencing, gene expression, and metabolic profiling of animal cells. More recently, genome editing technology (zinc finger nucleases, talens, and crispr-cas systems) have opened up new opportunities to easily create genetic variations in animals that can improve their health and well-being, agricultural production, and protection against diseases.

The development of animal biotechnology has led to the emergence of three highly interesting and constantly growing sectors: animal genomics, animal cloning, and the generation of transgenic animal and knockouts. It is not a new discipline if we consider that animal production through the selection of different breeds began with the domestication of animal species around twelve thousand years ago. Biotechnology can help produce environmentally friendly animals and conserve endangered species. Another example of biotechnology's impact on ecology is the production of infertile fish. Some farmed fish species are not native and can pose a threat to natural ecosystems. (2)

Administration in veterinary medicine

Administration in veterinary medicine has evolved significantly in recent decades, moving from empirical management based on the professional's personal experience to management grounded in quantifiable data. In this context, management indicators are presented as key tools for ensuring the efficiency, sustainability, and quality of veterinary services, both in private clinics and in public veterinary health units. The use of indicators allows for the measurement, evaluation, and optimization of administrative, clinical, and operational processes. In private veterinary clinics, for example, indicators such as the client retention rate, profitability per species served, average time per consultation, and the compliance rate with health protocols provide critical information for strategic decision-making. These data not only improve operational efficiency but also contribute to improving the quality of service,

promoting greater client loyalty and improving animal health outcomes.
One of the main challenges in implementing indicator-based management in the veterinary field is the lack of standardization in data recordings systems and the resistance to change among some professionals. Overcoming these obstacles requires ongoing training in administration, information technology, and quality management, as well as the development of digital platforms tailored to the specific needs of the veterinary sector. Finally, indicator-based management in veterinary not only contributes to strengthening internal management capabilities but also improves social responsibility, as it allows for the evidentiary demostration of the positive impact of veterinary services on animal welfare, public health and environmental sustainability. (3)

Veterinary medicine in the environment

The environment plays a crucial role in veterinary medicine, it affects the health of both domestic and farm animals as well as the transmission of diseases. Veterinary science not only focuses on animal health but also on protecting the environments to prevent health risks.
Veterinarians work to prevent zoonotic diseases (those that can be transmitted from animals to humans), control environmental pollution caused by animal waste or medications, and promote sustainable practices in livestock and animal production. Moreover, the relationship between animals, humans and the environments is key to the one health concept, which aims to protect global health through collaboration between human medicine, veterinary medicine, and environmental science.
Veterinary are involved in the conservation of endangered species and in the development of projects for the conservation of wildlife and natural habitats. They are also engaged in environmental education and scientific research for biodiversity conservation. Is also concerned environmental pollution and its impact on human health and nature itself, this includes waste management and reducing the ecological footprint of veterinary clinics, are responsible for the health and well-being of animals, which also translates into

the management of natural resources and the prevention of diseases that can affect human health. In addition veterinary medicine has been integrated into the concept of "One Health," which encompasses human, animal, and environmental health promoting a unified health approach for all. (4)

Teaching and education in Veterinary medicine

Are fundamental pillars for the development of the profession and for ensuring animal welfare, public health, and environmental sustainability. Veterinary education is not limited to transmitting theoretical knowledge; it also aims to train professionals skills, ethical values, and social responsibility. Through teaching, future veterinarians are prepared to face challenges such as disease control, responsible animal production, biodiversity protection, and food safety. In addition, continuing education is essential for practicing professionals to stay updated with scientific and technological advances. In this sense, Veterinary teaching has a dual purpose: to train new generations of veterinarians and to provide ongoing education for professionals, thereby strengthening the link between science, society, and environmental care. Teaching and education in veterinary medicine are essential for training professionals capable of ensuring animal welfare, public health, and environmental sustainability. In México, institutions such as the Faculty of Veterinary Medicine and Animal Science at UNAM offer undergraduate master's, and doctoral programs that combine theory and practice in a strong academic environment with facilities for clinical training and research. The National School of Veterinary Medicine and Animal Science, founded in 1853, represents the first school of its kind in Mexico and Latin America, and throughout its history it has adapted to the evolving needs of the profession. (5)

The role of veterinary medicine in food health

"From farm to table" is phrase that reflects a reality that most of the public is unaware of. This reality is that veterinarians are responsible for the health of animals destined for consumption, such as chikens, turkeys, pigs, cattle, sheep, and goats, among other species, from the moment of conception and birth until they are consumed. And it is the veterinarians specialized in food safety who guarantee the safety of the food consumed every day by the population, as explained in Royal Decrees 1430/1992, of November 27, and 2022/1993, of november 19.

Also with products of plant origin, this is maintained with equal depth and dedication for the production of food of plant origin. It is veterinarian who supervises the raw materials in the field in order to locate insects, bacteria or chemical remains that can reach the food chain. In addition to taking care of the traceability and safety of food throughout the process of handling, processing and marketing. Of course, are they same ones who review all the manufacture of animal feed for both cattle and pets, to guarantee the health of the animals and, therefore, of the people. (6)

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conclusion

We can see that the role of veterinary medicine in society is very important because they fulfill a surveillance function against diseases that can cause great economic and human losses; in addition to improving the quality of life of our pets, whose importance as family members has been growing over time and ensuring the health of the environment. That is why, working hand in hand with other specialties and professions, we seek to prevent diseases and ecological disasters that affect society.

Recognizing the multidimensional importance of veterinary medicine is therefore essential to foster cross-sectoral policies, promote interdisciplinary research and ensure balanced development between health, production and the environment.

Links

1) https://www.mspbs.gov.py
2) https://www.nifa.usda.gov
3) https://www.racve.es
4) https://ve.scielo.org
5) https://www.aa.vmc.org
6) https://www.inesalud.com