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Veterinary Pathology, Production Animals Medicine, and Food Inspection: One Health in Practice in Slaughterhouse

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Abstract: Veterinary Pathology is crucial in understanding the diseases affecting animals, their causes, development, and changes in tissues and organs. Veterinarians who work with production animals are responsible for maintaining their health and productivity. Pathology is used to comprehend the nature of diseases, which leads to the implementation of treatment protocols and preventive measures. Slaughterhouse food inspection is crucial for ensuring that meat is safe for consumption. This process involves ante-mortem and post-mortem inspections to detect any signs of disease or abnormalities that could render the meat unsafe. This integrated approach within slaughterhouses practically demonstrates the One Health concept. The importance of considering animal health, human health, and environmental impacts together is underscored. Veterinary practices directly impact the safety and quality of food products, which has implications for public health.

Keywords: One Health, One Pathology, Meat Inspection, Food production.

Review Paper

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INTRODUCTION

One Health is a concept that incorporates a range of disciplines to recognize and address the connection between human, animal, and environmental health. It is established that the health and well-being of these three elements are interdependent, and health issues in one sector can affect those in another. The comprehension of One Health encompasses more than just diseases. Understanding One Health is reinventing the comprehension of disease and its consequences, i.e., to reinvent Pathology [1, 2].

One Health – One Pathology

Disease transmission between species, which extends beyond the classic concept of zoonosis and has effects or consequences in the shared environment, has now been recognized. Thus, only One health and “one pathology” exist. Veterinary pathology is a fundamental branch of veterinary science that focuses on understanding the nature of animal diseases. Pathology studies diseases, their causes, pathogeny, evolution, and consequences. This involves examining the structural modifications in tissues and organs and uncovering the mechanisms behind those modifications. It's no coincidence that the German pathologist Rudolf Virchow introduced the idea of One Health in the 19th Century, proposing that human and animal health are interlinked. He was known for his work in modern pathology, and he developed the term 'zoonosis' to describe diseases that can be transmitted from animals to humans. However, ancient civilizations recognized the importance of the environment in understanding diseases, even before Christ's birth. Others followed, but despite the "warnings" we received from the planet, such as outbreaks of diseases like avian influenza, mad cow disease (BSE), AIDS, and other ancient diseases that are still part of the reality of the world, such as tuberculosis, brucellosis, and rabies, it was only in the 21st century that the formalization of the One Health concept is often attributed to the work of organizations like the World Health Organization (WHO), the Food and Agriculture Organization (FAO), and the World Organisation for Animal Health (OIE). More than just recognizing the importance of zoonosis, it is now known that environmental changes, such as habitat destruction, can affect human and animal health, promoting the emergence of new diseases. Climate changes can alter the relationship between etiological agents and hosts, and there are unpredictable consequences when crossing the interspecies barrier. Only a holistic approach can overcome the challenges of a constantly evolving planet [1-4].

In a world of globalization, the concept of One Health has become increasingly important because diseases can spread quickly outside geographical boundaries, and human activities profoundly impact the environment and animals. This framework is crucial for holistic and practical health challenges in the 21st century [4].

One Health – One Medicine

One Health - One Medicine is a concept that emphasizes the interconnection between human, animal, and environmental health. It's based on the understanding that health issues (such as diseases) often transcend species and that human health is closely linked to the health of animals and the environment we share. Giving a specific medication to a production animal is challenging in this setting. The responsible therapeutic decision sustained in the One Health concept is the day-to-day of a production animal veterinary. Their decision-making process involves considering other animals, the environment, and the man who will consume the animal's meat. The development of antibiotic-resistant bacteria is caused by the excessive and improper use of antibiotics in human and veterinary medicine. The inappropriate use of antibiotics in the production of animals can lead to the development of bacterial resistance that can be transmitted to humans through food consumption, direct contact with animals, or the environment. In the medicine of production animals, preventing and controlling diseases, such as brucellosis and tuberculosis, are fundamental to ensure the herd's health. The veterinarian has an essential role in the identification of diseases, as well as in the realization of sanitary campaigns for their control. The surveillance, prevention, and control of zoonotic diseases in animals are essential to protect public health [5–7].

On the other hand, veterinarians develop strategies to manage and control disease outbreaks effectively, considering all the factors involved and considering sustainability and environmental health. In their daily activity, they recognize the importance of maintaining healthy ecosystems to prevent the emergence of diseases and promote, in the farms they assist, the need for sustainable practices to preserve the planet's health. The veterinarian in this area is responsible for educating and raising awareness among producers about the importance of integrated health because of the proximity to the populations. The role of the veterinarian also extends to sustainability and animal welfare. Sustainable animal production practices, including respect for animal welfare and minimizing environmental impact, are essential to the One Health concept. This involves proper waste management, efficient use of resources, and reducing the ecological footprint of animal production [5–8].

One Health – One Security

Meat inspection is a critical process in the food industry, designed to ensure that meat products are safe, wholesome, and properly labelled. It is a crucial aspect of public health—disease detection.

Sanitary inspection is crucial to the One Health approach, especially regarding animal-origin food production. Sanitary inspection in slaughterhouses and food processing facilities prevents zoonotic diseases. These procedures ensure that sick animals or those exhibiting signs of infectious diseases cannot enter the food chain. Additionally, a sanitary inspection ensures that animals are not contaminated with harmful residues, antibiotics, hormones, other growth promoters, and environmental contaminants. This is crucial for the health of humans and animals and the preservation of the environment [9, 10].

An important part of sanitary inspection involves monitoring the use of antibiotics in animal production and the surveillance of antimicrobial resistance. This aspect is directly aligned with the principles of One Health as antibiotic resistance is a global concern affecting humans, animals, and the environment. Sanitary inspection significantly contributes to food safety, ensuring that animal-origin products are processed hygienically and safely, reducing the risk of foodborne disease outbreaks [11–13].

One Health in Action in Slaughterhouses: Veterinary Pathology, Veterinary Medicine, and Food Inspection

Applying the One Health concept to sanitary inspection in slaughterhouses is a clear example of how human, animal, and environmental health are interconnected, especially in food safety and detecting and controlling zoonotic diseases. Pathology is the protagonist, and the clinic is an essential player in this context. Indeed, veterinary pathologists play a crucial role in understanding animal diseases, which can affect human health through zoonotic diseases, influence livestock health, and impact food safety [4].

During slaughter, sanitary inspectors examine animals and their tissues for signs of diseases. The results of these examinations may result in disposing of carcasses or portions thereof to prevent diseases or contaminants from entering the food chain.

Veterinary clinicians work with production animals (such as cattle, pigs, poultry, and fish) to ensure the health and productivity of herds. Using their knowledge of disease pathology, they establish vaccination programs, management practices, and nutritional strategies to prevent diseases [14].

By intersecting these areas, health problems can be detected and managed early, minimizing the impact on production and ensuring the safety of animal-origin products for consumption.

In sanitary inspection of food animals, "red flag" lesions should be considered, indicating severe

conditions that may pose a significant risk to the herd's health or the consumer of animal-origin products or well-being problems. These' red flags' lesions include neoplastic lesions, parasitoses such as cysticercosis, hydatidosis/echinococcosis, suppurative, caseous, and foot lesions [15].

When these lesions are identified during sanitary inspection, there is an immediate need for communication with the clinical veterinarians responsible for the herd. Veterinarians must investigate the root cause of these lesions, assess the risk of contamination or spread of diseases, and implement control measures to protect animal health and food safety. Additionally, actions such as quarantine could be implemented. This integrated approach faces challenges like the need for constant surveillance to detect emerging diseases, adapting to changing regulations, and managing the logistics of keeping a slaughterhouse running efficiently and safely. However, it also presents opportunities to improve public health, enhance animal welfare, and maintain sustainable food production practices [15–17].

CONCLUSION

In conclusion, Vet Pathology, Medicine and Sanitary Inspection: in the Slaughterhouse underscore a critical area where interdisciplinary collaboration is beneficial and essential for ensuring the health and safety of both animals and humans, reflecting the core principles of the One Health approach.

REFERENCES

1. Sundberg, J. P., & Schofield, P. N. (2009). One medicine, one pathology, and the one health concept. *Journal of the American Veterinary Medical Association*, *234*(12), 1530-1531. doi:10.2460/javma.234.12.1530.
2. Nielsen, N. O., Waltner-Toews, D., Nishi, J. S., & Hunter, D. B. (2012). Whither ecosystem health and ecological medicine in veterinary medicine and education. *The Canadian Veterinary Journal*, *53*(7), 747.
3. Kahn, L. H., Kaplan, B., Monath, T. P., & Steele, J. H. (2008). Teaching "one medicine, one health". *The American journal of medicine*, *121*(3), 169-170. doi: 10.1016/j.amjmed.2007.09.023.
4. Guarner, J., & Jean, S. (2023). One Health: The Role of Pathology as it pertains to Diagnosis of Zoonoses and Discovery of Emerging Infections. *Modern Pathology*, 100236. doi: 10.1016/j.modpat.2023.100236.
5. Qian, J., Wu, Z., Zhu, Y., & Liu, C. (2023). One Health: a holistic approach for food safety in livestock. *Science in One Health*, 100015. doi: 10.1016/j.soh.2023.100015.
6. Falzon, L. C., Alumasa, L., Amanya, F., Kang'Ethe, E., Kariuki, S., Momanyi, K., ... & Fèvre, E. M. (2019). One Health in action: Operational aspects of an integrated surveillance system for zoonoses in western Kenya. *Frontiers in veterinary science*, *6*, 252. doi:10.3389/fvets.2019.00252.
7. Gortazar, C., Diez-Delgado, I., Barasona, J. A., Vicente, J., De La Fuente, J., & Boadella, M. (2015). The wild side of disease control at the wildlife-livestock-human interface: a review. *Frontiers in veterinary science*, *1*, 27.
8. de Melo, R. T., Rossi, D. A., Monteiro, G. P., & Fernandez, H. (2020). Veterinarians and one health in the fight against zoonoses such as COVID-19. *Frontiers in Veterinary Science*, *7*, 756.
9. Kniel, K. E., Kumar, D., & Thakur, S. (2018). Understanding the complexities of food safety using a One Health approach. *Preharvest Food Safety*, 401-411. doi: 10.1128/microbiolspec.pfs-0021-2017.
10. CGIAR One Health Initiative Seeks to Improve Meat Hygiene in Slaughterhouses in Western Kenya. CGIAR.
11. Garcia, S. N., Osburn, B. I., & Jay-Russell, M. T. (2020). One health for food safety, food security, and sustainable food production. *Frontiers in Sustainable Food Systems*, *4*, 1.
12. Angelos, J., Arens, A., Johnson, H., Cadriel, J., & Osburn, B. (2016). One Health in food safety and security education: A curricular framework. *Comparative Immunology, Microbiology and Infectious Diseases*, *44*, 29-33. doi: 10.1016/j.cimid.2015.11.005.
13. King, L. J. (2012). One Health and Food Safety. In Improving Food Safety Through a One Health Approach: Workshop Summary; *National Academies Press* (US).
14. CVPM, S.W., RVT One World, One Medicine, One Health Available online: https://todaysveterinarypractice.com/public-health/one-world-one-medicine-one-health/ (accessed on 12 December 2023).
15. van Staaveren, N., Doyle, B., Hanlon, A., & Boyle, L. A. (2019). Multi-stakeholder focus groups on potential for meat inspection data to inform management of pig health and welfare on farm. *Agriculture*, *9*(2), 40. doi:10.3390/agriculture9020040.
16. Nitzan, D., Andreuzza, B. N., & Chattopadhyay, D. (2023). The Food Systems, One Health, and Resilience (FOR) Approach—Led by the FOR-Runners. *Sustainability*, *15*(18), 13889. doi:10.3390/su151813889.
17. One Health and Food Safety – From Farm to Table Available online: https://www.cfs.gov.hk/english/multimedia/multimedia_pub/multimedia_pub_fsf_126_02.html (accessed on 20 December 2023).