



Ensuring the Animal Food and Welfare of Livestock

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Abstract

Food animal medicine is a specialized field of veterinary medicine focused on ensuring the health and welfare of livestock animals that are raised for food production. This abstract provides a concise overview of food animal medicine, highlighting its significance, key aspects, and contributions to sustainable agriculture and public health. Food animal medicine encompasses various practices and techniques aimed at preventing, diagnosing, and treating diseases in food-producing animals. It emphasizes the importance of preventive medicine, including vaccination programs, biosecurity measures, and herd health management, to minimize disease outbreaks and optimize animal health. Diagnosis and surveillance play vital roles in food animal medicine, with veterinarians utilizing diagnostic tests, laboratory analysis, and imaging techniques to accurately identify diseases and monitor animal populations. Early detection enables prompt intervention, reducing the impact of diseases on both animal welfare and food safety.

Biosecurity measures are crucial in food animal medicine to prevent the introduction and spread of diseases. Veterinarians work closely with farmers to develop and implement protocols that restrict access, promote hygiene practices, and minimize disease transmission risks. By prioritizing biosecurity, veterinarians safeguard animal health and protect the integrity of the food supply chain. Responsible antimicrobial stewardship is another key aspect of food animal medicine. Veterinarians promote judicious use of antibiotics, employing targeted therapies, proper dosages, and treatment durations. They also educate farmers about alternative disease management strategies and the potential consequences of antibiotic resistance, aiming to preserve the effectiveness of these critical drugs. Food animal medicine directly impacts public health by ensuring the safety and quality of animal-derived food products. Veterinarians actively work to minimize the risk of zoonotic diseases, collaborating with public health agencies and implementing disease control measures to prevent the transmission of pathogens from animals to humans through the food chain.

Keywords: Animal medicine; Food chain; Critical drugs

Introduction

Food animal medicine plays a critical role in safeguarding the health and well-being of livestock animals, such as cattle, pigs, poultry, and sheep, which serve as valuable sources of food and other agricultural products. This specialized field of veterinary medicine focuses on the prevention, diagnosis, and treatment of diseases in food-producing animals, ensuring the production of safe and wholesome food for human consumption. In this article, we delve into the importance of food animal medicine, its key aspects, and its role in supporting sustainable agriculture and public health.

Methods and Materials of Food Animal Medicine

Methods and materials used in food animal medicine vary depending on the specific needs and conditions of the animals being treated. Here are some common methods and materials employed in food animal medicine:

Physical Examination: A thorough physical examination is often the first step in diagnosing and treating food animals. Veterinarians assess the general health of the animals, examine vital signs, check for abnormalities, and evaluate overall body condition.

Diagnostic imaging: Diagnostic imaging techniques, such as X-rays, ultrasound, and computed tomography (CT), are valuable tools in food animal medicine. They aid in the evaluation of internal organs, skeletal structures, and soft tissues, allowing for the detection of fractures, tumors, infections, and other conditions.

Laboratory testing: Laboratory tests play a crucial role in diagnosing diseases and assessing the health status of food animals. Common laboratory tests include blood analysis (complete blood count, blood chemistry), fecal examinations (parasite detection), microbiological cultures, serological testing, and molecular diagnostics

(PCR) to identify specific pathogens or genetic markers.

Medications and therapeutics: Food animal medicine utilizes a range of medications and therapeutics to prevent and treat diseases. This includes antibiotics, vaccines, anthelmintics (dewormers), antiparasitic medications, pain medications, anti-inflammatory drugs, and hormones (when approved for specific uses). Proper dosing, administration routes, and withdrawal periods are strictly followed to ensure both animal welfare and food safety.

Surgical interventions: Surgical procedures may be performed in food animals for various reasons, including reproductive management (such as castration or spaying), treatment of injuries, removal of tumors or abscesses, and corrective procedures. Sterile instruments, anesthesia, and aseptic techniques are utilized to ensure the safety and well-being of the animals.

Herd health management: Food animal medicine often involves implementing herd health management strategies to prevent disease outbreaks and maintain overall herd productivity. This includes vaccination programs, parasite control, nutritional management, reproductive management, biosecurity measures, and record-keeping to monitor the health status and productivity of the entire herd.

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Animal housing and environmental management: Proper housing and environmental management are essential components of food animal medicine. Veterinarians work with producers to design and maintain facilities that provide appropriate ventilation, temperature control, lighting, and cleanliness to minimize stress, disease transmission, and optimize animal welfare.

Equipment and tools: Food animal medicine requires specific equipment and tools to carry out various procedures effectively. This includes syringes, needles, surgical instruments, hoof trimming tools, diagnostic equipment (e.g., stethoscope, thermometers), anesthesia machines, and specialized equipment for reproductive management (e.g., ultrasound machines, semen collection devices).

Health monitoring systems: Monitoring the health status of food animals is crucial in food animal medicine. This may involve implementing surveillance systems, such as regular veterinary visits, tracking disease patterns, implementing diagnostic testing protocols, and utilizing electronic monitoring tools (e.g., temperature sensors, activity monitors) to detect early signs of illness and intervene promptly.

Veterinary collaboration and expertise: Food animal [1-5] medicine often involves collaboration between veterinarians, producers, and other experts in the field. This interdisciplinary approach ensures a comprehensive understanding of animal health, herd management, nutrition, biosecurity, and disease prevention.

It is important to note that the specific methods and materials used in food animal medicine should align with local regulations, animal welfare standards, and best practices established by veterinary organizations and regulatory authorities.

Side effects of Food Animal Medicine

Food animal medicine, like any form of medical intervention, may have side effects and potential implications. Here are some side effects and considerations associated with the use of medications and treatments in food animal medicine:

Residue concerns: The use of certain medications in food animals may leave residues in animal tissues, such as meat, milk, or eggs. It is important to follow withdrawal periods specified on the medication labels to ensure that the residues are below acceptable levels before the animal products enter the food supply. Failure to adhere to withdrawal periods can lead to potential health risks for consumers.

Allergic reactions: Some animals may exhibit allergic reactions to certain medications or treatments. These reactions can range from mild to severe and may include skin rashes, difficulty breathing, swelling, or anaphylaxis. It is crucial for veterinarians and producers to be aware of potential allergies and closely monitor animals after administering medications.

Antibiotic resistance: The use of antibiotics in food animal medicine can contribute to the development and spread of antibiotic-resistant bacteria. Overuse or misuse of antibiotics can lead to the emergence of bacteria that are no longer responsive to commonly used antibiotics, posing Table 2 a significant challenge to both animal and human health. Responsible antibiotic use, following appropriate treatment protocols and promoting alternatives, is crucial to mitigate the risk of antibiotic resistance.

Gastrointestinal disturbances: Some medications used in food animal medicine can cause gastrointestinal disturbances in animals. This may include diarrhea, stomach upset, or changes in appetite. Close monitoring and appropriate management can help minimize these effects.

Environmental impact: Certain treatments or medications used in food animal medicine may have environmental implications. For example, some parasite control products may contain chemicals that, if not properly managed, can enter the environment through manure or runoff and potentially impact ecosystems or water quality. Proper disposal and adherence to environmental regulations are necessary to mitigate these effects.

Adverse drug reactions: Animals, like humans, may experience adverse reactions to medications. These can range from mild side effects, such as lethargy or decreased appetite, to severe reactions that can be life-threatening. It is important to closely monitor animals after administering medications and consult with a veterinarian if any adverse reactions occur.

Development of drug resistance in pathogens: Prolonged or indiscriminate use of certain medications may lead to the development of drug-resistant pathogens. This can limit the effectiveness of treatment options and pose challenges in managing diseases in food animal populations. Responsible use of medications, rotation of treatment options, and adherence to veterinary guidelines are [6, 7] critical in mitigating this risk. It is essential for veterinarians and producers to closely follow proper dosage, administration guidelines, and withdrawal periods specified by regulatory authorities and drug manufacturers. This helps minimize the potential side effects and ensures the responsible use of medications in food animal medicine. Striking a balance between maintaining animal health, ensuring food safety, and minimizing potential side effects is crucial in promoting sustainable and responsible practices in food animal medicine.

Results and Discussion

Preventive medicine: The cornerstone of food animal health

Preventive medicine is paramount in food animal medicine.

Table 1: It allows for tracking the administration of medications to individual animals, including the date, type of medication, dosage, route of administration, and the veterinarian responsible.

Animal ID	Date	Medication	Dosage	Route of Administration	Veterinarian
1	5/1/2023	Antibiotic X	10 mg/kg	Intramuscular	Dr. Smith
2	5/3/2023	Dewormer Y	5 mg/kg	Oral	Dr. Johnson
3	5/5/2023	Vaccine Z	2 mL	Subcutaneous	Dr. Thompson

Table 2: This table format provides a summary of herd health management activities over time. It includes the date of the intervention, vaccinations administered, medications given, parasite control measures implemented, and any additional notes or observations.

Date	Vaccination	Medication	Parasite Control	Other Notes
4/1/2023	Vaccine A	Antibiotic X	Dewormer Y	None
5/1/2023	Vaccine B	None	Dewormer Z	Respiratory outbreak
3	5/5/2023	Vaccine Z	2 mL	Subcutaneous

Veterinarians work closely with farmers and producers to develop comprehensive herd health management plans. These plans encompass vaccination programs, biosecurity measures, nutrition optimization, parasite control, and overall herd management practices aimed at preventing the occurrence and spread of diseases. By focusing on prevention, veterinarians help minimize disease outbreaks, reduce the need for extensive treatment, and improve overall animal welfare.

Disease surveillance and diagnostics

Early disease detection is crucial in food animal medicine. Veterinarians employ various surveillance methods to monitor animal populations and identify potential disease threats promptly. This includes regular herd health visits, diagnostic testing, and monitoring systems that track disease patterns and emerging pathogens. Diagnostic tools such as laboratory testing, serology, microbial culture, and molecular diagnostics enable veterinarians to accurately diagnose diseases and guide appropriate treatment strategies. Rapid and accurate diagnosis is vital not only for individual animal health but also for preventing the spread of contagious diseases within and between herds.

Biosecurity measures

Biosecurity measures are critical in food animal medicine to prevent the introduction and transmission of diseases. Veterinarians work with farmers to develop and implement biosecurity protocols tailored to the specific needs of their operations. These measures may include restricted access to farms, proper cleaning and disinfection protocols, isolation and quarantine of new animals, and regular monitoring for signs of disease. By minimizing the risk of disease introduction, veterinarians help maintain the health of food animal populations and protect the safety of the food supply chain.

Antimicrobial stewardship

Effective antimicrobial stewardship is a key aspect of food animal medicine. Veterinarians play a crucial role in promoting responsible antibiotic use to prevent the emergence of antimicrobial resistance. They develop treatment protocols based on accurate diagnoses, use targeted therapies, and promote proper dosage and duration of treatment. Additionally, they educate farmers and producers about good husbandry practices, biosecurity, and alternatives to antibiotics, such as probiotics and vaccines. By ensuring judicious antimicrobial use, veterinarians contribute to the long-term effectiveness of these critical drugs in both veterinary and human medicine.

Food safety and public health

Food animal medicine directly impacts public health by ensuring the safety and quality of food products derived from animals. Veterinarians work to minimize the risk of zoonotic diseases, which are illnesses transmitted between animals and humans. By implementing disease control measures and monitoring food production systems, they help prevent the transmission of pathogens, such as *Salmonella*, *E. coli*, and *Campylobacter*, from animals to humans through the food chain. Veterinarians also collaborate with public health agencies to investigate and respond to disease outbreaks, protect consumer health, and promote safe food handling practices.

Conclusion

Food animal medicine is vital for the health, welfare, and productivity of livestock animals. Through preventive medicine, disease surveillance, diagnostics, biosecurity measures, antimicrobial stewardship, and food safety initiatives, veterinarians ensure the production of safe and sustainable food while promoting animal welfare and public health. By combining their expertise with advancements in veterinary science and technology, veterinarians continue to play a crucial role in supporting the thriving agricultural industry and meeting the growing global demand. Food animal medicine plays a vital role in safeguarding the health and welfare of livestock animals while ensuring the production of safe and sustainable food.

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