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Prologue: Veterinary Pharmaceuticals

Samuel Oppong Bekoe

1. Introduction

Pharmaceuticals in general have contributed significantly to improvements in the quality of life of both humans and animals. Pharmaceuticals used for either human or veterinary purposes have the ability to delay the onset of disease, relieve symptoms, and cure and prevent complications. In all, the quality of life gets improved with the use and application of pharmaceuticals.

Veterinary pharmaceuticals are needed not only for the ultimate economic benefits they provide but for ensuring that animals are healthy. Quite a significant number of veterinary drugs are available for different purposes and application. These include antibiotics used to fight and destroy bacteria; anthelmintics used to destroy internal parasites; insecticides used to destroy ticks, lice, fleas, and mites; and hormones used for growth and fertility promotion [1].

Broadly, four main categories of veterinary pharmaceuticals have been identified, and these are (i) prophylaxis agents used to prevent diseases, (ii) metaphylaxis agents used to control the spread of illness, (iii) therapeutic agents for the treatment of various forms of diseases, and (iv) growth promoters used to stimulate growth rate [1].

The development, formulation, preparation at point of use, quality assessment, dosage forms, distribution, stability, use and storage, occurrence, and persistence in the environment as well as their disposal and regulatory control require skilled knowledge and expertise to ensure their effective handling.

There is therefore the need to ensure that animal food for human consumption contain very minimal level and if possible devoid of any potential hazardous veterinary drug residues.

This would help ensure the successful achievement of human health needs.

The transfer of potentially hazardous veterinary pharmaceutical residues from animal food (in residual levels) to humans through the food chain could pose detrimental health issues to humans.

Public health-related issues and potential risks to humans (intrinsic toxicity, residual levels, and antimicrobial resistance especially and environmental contamination from waste of animals) from un-guarded and routine administration of veterinary pharmaceuticals have necessitated the need for stringent global, international, and national regulations as well as safety standards for veterinary pharmaceuticals.

Veterinary pharmaceuticals are usually formulated considering certain key factors such as the anatomy of the animal, bioavailability of the drug molecule, and other pharmacodynamic and pharmacokinetic parameters. For example, one cannot lay hands easily on an injectable or powder form of oxytetracycline employed for human purposes. Oxytetracycline is presented in the form of

capsules and tablets for humans. However, feed premixes, injectables, soluble powders, and tablet dosage forms of oxytetracycline have been formulated for animals.

The active ingredients (in veterinary medicines) may also differ in kind and amount compared to human medicines [2]. For instance, doses as low as 50 mg for oxytetracycline may be administered to animals, which is far below the recommended daily dosage for humans.

The approval processes for veterinary pharmaceuticals and human drugs are separate in most cases, though similar [2].

It is increasingly becoming evident that data on the quantities of veterinary pharmaceuticals employed from national levels are lacking. Such data are obtained or provided on voluntary basis and very little transparency is involved [3–5].

Furthermore, political, commercial, and economic interests of veterinary pharmaceutical manufacturers do not always commensurate with the required public health interests.

Thus, a well-coordinated strategy needed to identify reliable scientific data with the right correlated research designs and methods from relevant stakeholders is needed to address such pertinent issues. With this background, holistic contributions from researchers, scientists, and well-meaning stakeholders would be required in addressing the myriad of issues arising from the use of veterinary pharmaceuticals. Such agenda must, thus, include contributions from experts in clinical sciences (e.g., veterinary medicine and human medicine), basic sciences (e.g., genetics and microbiology), social sciences (e.g., anthropology and sociology), economics (e.g., health and agriculture), public health (e.g., epidemiology and nursing), and policy makers (e.g., legislative and regulatory) to achieve desired goals.

The in-depth information, data, and some policy directions needed to address such issues are what this book provides. For example, the challenge of finding new bioactive compounds from plant sources, needed to treat infectious diseases, hitherto, not responding to already available antimicrobial agents, is covered in this book.

The use of various plant extracts in the management of foot and mouth disease virus is well discussed in this book.

Moreover, lots of exposure on current trends in analytical techniques needed for the determination of residual levels of veterinary pharmaceuticals in animal food products is also well expounded.

The contents of this book, together with ongoing and future research, would in the long term help provide and address well-structured scientific agenda and objectives related to veterinary pharmaceuticals. This would ultimately help surmount challenges associated with the manufacture, use, and collection of data associated with veterinary pharmaceuticals.

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