USE OF ANTIBIOTICS IN POULTRY AND SWINE HEALTH

Their administration is currently being questioned by several countries and reviewed by organizations such as the WHO, FAO, and OIE. In this sense, it is important to distinguish the benefits of rational and responsible use.

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Based on the FARM TO FORK principle, as members of the productive sector, we are part of a chain in which all the links are fundamental. Therefore, we face the challenge of Multidisciplinary Work, respecting Animal Welfare, to achieve quality and safe food. In this sense, there is a worldwide debate on the use of antibiotics in animal production, based on the resistance of resistant bacterial isolates in human medicine, for which we intend to review the issue to try to clarify positions.

Antimicrobials, known as antibiotics, are substances obtained naturally from microorganisms or by synthesis. By modifying the chemical structure of a naturally occurring agent, it is also possible to produce semi-synthetic agents.

The first natural antibiotic was penicillin, giving rise to a large group of highly active and widely used drugs and the beginning of a new stage in human history.

Bacteria resistance to antibiotics is not a new issue, as it has been known since the first antimicrobial was developed, although it is generating increasing international concern. In this sense, both the FAO (Food and Agriculture Organization of the United Nations), the OIE (World Organization for Animal Health, *Organización Internacional de Epizootias*, as per its acronym in Spanish), and the WHO (World Health Organization) have shown their interest in the subject and produced documents providing recommendations for the appropriate use of this type of drugs.

The "Rational and Responsible Use of Antibiotics" mainly requires:

- A prophylactic use of antimicrobials when necessary, supported by correct diagnosis.

- Education and training, also for those who will administer it.
- A correct dosage administration, including dosing intervals and the duration of treatment.
- The administration of quality, controlled products manufactured under GMP standards and supported by research.
- The storage of products according to the supplier's instructions.

Assuming that, in our field, we are faced with the diagnosis, prognosis, and treatment of animal populations, when confronted with pathological manifestations in farms, we should, first of all, have a complete anamnesis of the batch in question in which we determine, among other things, the degree of immunocompetence of the affected batch, including the description of necropsy findings and the presumptive diagnosis given by the Doctor of Veterinary Medicine in the field.

It is important to have the support of Pathology Laboratories to perform complementary analyses/tests such as:

- Diagnosis of etiological agents involved
- Isolation of bacteria

- Classification of them
- Antibiotic sensitivity tests

With results in hand:

- Determine whether the agent/s isolated is/are PRIMARY or SECONDARY,
- Select the antibiotic to be used: spectrum of action; pharmacokinetics and pharmacodynamics; time-dependent or concentration-dependent; mechanisms of action.
- Routes of administration.
- Supplier/s: They should comply with the Good Manufacturing Practices (GMP) of medicines, which include their development, research, and control.
- The cure will be achieved by the bacterial death of a large part of the population. The elimination of surviving microorganisms is obtained by the active participation of the organism. Therefore, it is essential to know the immunocompetence status of the animals. Immuno-deprived batches need special care, as chemotherapeutic drugs will have to act without the help of the organism´s defences.
- Deprivation or withdrawal time for each formulation to avoid the presence of undesirable residues.

Going back to the concept of from FARM TO FORK, in production, we must ensure the absence of xenobiotic residues, among other things. To this end, we must respect the deprivation or withdrawal period, during which the animals do not consume antibiotics, thus avoiding them or their metabolites in edible products. In this respect, I share some of the research work (Bibliography) carried out in Argentina through Public-Private coordination at the *Universidad Nacional del Centro de la Provincia de Buenos Aires* [National University of the Centre of the Province of Buenos Aires]. At this University, specifically at the School of Veterinary Sciences, bioavailability and residues studies have been conducted using HPLC-MS method in different biological matrices:

FOSBAC WITHDRAWAL PERIOD IN POULTRY

Withdrawal Time – MRL 0.5 µg/ml

	MUSCLE	LIVER	KIDNEY
ORAL	1.12	1.27	2.55
F/INJECTION	1.72	0.42	0.92

Although in poultry, there are no residues left in kidneys after less than 3 days, in BEDSON S.A., we keep the withdrawal period at 7 days, thus providing greater security in the safety of the food product.

FOSBAC WITHDRAWAL PERIOD IN SWINE

In muscle, liver, kidney, and fat, after oral and intramuscular administration routes

Withdrawal Time – MRL 0.5 µg/ml

	MUSCLE	LIVER	KIDNEY	FATTY SKIN
PO assay	2.78	2.69	2.95	0.90
IM assay	1.48	1.73	1.38	1.27

If we consider swine, the kidney is the biological matrix where antibiotic remains most although, after 3 days, there are no residues either. Nevertheless, the 7-day withdrawal period is still maintained to ensure the safety of the food product.

Antibiotics are a valuable tool in the treatment of certain pathologies, and the "Rational and Responsible Use of Antibiotics" depends on us.

More information at:
https://bedson.com/

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