INTERNATIONAL POULTRY COUNCIL

ANTIMICROBIAL USE AND STEWARDSHIP PRINCIPLES

CONTENTS

POSITION STATEMENT

Mission

The IPC and its members will promote the responsible use and stewardship of antimicrobials; to protect the health and welfare of our birds, to produce safe food, to safeguard the efficacy of antimicrobials, and to build trust with consumers.

The International Poultry Council (IPC)

» Acknowledges that antimicrobial resistance is an issue of global concern;
» Recognizes that the poultry supply chain globally has a responsibility to ensure that it minimizes the sector's potential contribution to the development of antimicrobial resistance;
» Accepts that the poultry sector needs to adopt management practices, and provide education regarding such practices, that reduce the use of those antimicrobials for which resistance could pose the greatest global risk, and;
» Recognizes the ethical obligation of farmers and their veterinarians to protect the health and welfare of the birds in their care, which may include the responsible use of antimicrobials.

IPC principles*

All participants in the poultry industry adopt risk analysis based principles of antimicrobial stewardship to ensure best practices are used throughout all phases of poultry production so as to minimize the use of all antimicrobials while ensuring proper animal care. To achieve stewardship IPC will encourage its members to:

» Understand and control why and when we use antimicrobials;
» Understand and control which antimicrobials we use;
» Understand and control how much antimicrobials we use, and;
» Transparently communicate our actions.

Management practices around biosecurity, housing, nutrition and hygiene, and the use of preventive measures, such as vaccines, should be prioritized to provide the best animal care to reduce the need for antimicrobial use.

Antimicrobials will only be used in compliance with national authorizations.

Those antimicrobials critically important for human medicine should be used for therapeutic purposes only and under a supervising veterinarian's diagnosis and oversight.

IPC and its members will actively engage with intergovernmental organizations, governments and stakeholders to help shape public policy to address antimicrobial resistance. We will work to advance the 'One Health' approach leading to healthy people, healthy animals and a healthy planet.

Definitions

Antimicrobial *broadest term used, refers to any type of product that has activity against a variety of microorganisms, which can include bacteria, viruses, fungi and parasites. This includes products such as antibiotics and anti-protozoals.*

Biosecurity *systems and measures taken to stop the introduction and/or spread of diseases.*

Medically important for humans *antimicrobial classes used in humans are categorized into three groups including critically important, highly important, and important based on their needs in human medicine.*

Risk analysis *includes risk assessment, management and communication. A process which identifies the hazard, determines the appropriate management steps, and then seeks to communicate to key stakeholders.*

Therapeutic use *treatment, control or prevention of a disease.*

INTRODUCTION *

The International Poultry Council acknowledges it has a key leadership role with a responsibility to guide and encourage the global poultry sector to ensure the appropriate use of antimicrobials thereby minimizing the development of antimicrobial resistance and the potential for foodborne transfer to humans through poultry products.

IPC recognizes the need to act promptly in a collaborative effort with all stakeholders throughout the global food animal – protein production – sector to address antimicrobial resistance. We will work to advance a sustainable 'One Health' approach leading to healthy people, healthy animals and a healthy planet.

Recognizing antimicrobial resistance has a broad scope, the primary focus of the IPC stewardship effort is the use in food animals of antimicrobials via injection and orally via water and feed. These antimicrobials are specifically those used for bacterial infections and diseases.

Antimicrobial resistance is a natural biological process of microorganism survival; a microbial defense against substances designed to kill them.

Antimicrobial resistance can be:

» **Intrinsic** resistance that is pre-existing in a microorganism and transferable only to offspring, or;
» **Acquired** resistance developed through chromosomal mutations or DNA and plasmid transfer.

Antimicrobial resistance development and transfer happens in the human health, environmental health and animal health (both food and non-food animal) areas. IPC understands that shared efforts, as well as efforts within each sector, are needed to enact practices to minimize resistance development and transfer, and from a broader public health effort, the focus needs to be on those areas where resistance transfers amongst the various sectors or reservoirs is the greatest.

Thus, from a public health perspective, the sector's focus should be on minimizing development and transfer of antimicrobial resistant organisms or resistance genes via the transfer through foodborne pathogens, with prioritization on minimizing the use of those antimicrobials critically important for human medicine.

However, the sector also has a responsibility to use all antimicrobials prudently to ensure their continued efficacy in treating conditions affecting poultry health and welfare. The poultry sector should focus efforts on the development and implementation of practices that sustainably reduce antimicrobial use.

Antimicrobials are used in the poultry sector to enhance animal health and welfare by reducing suffering and death from preventable and treatable illnesses. Responsible antimicrobial use can have a positive effect on food safety by ensuring that healthy animals enter the food supply, which is an important first step for a safe food supply.

Antimicrobial use can also contribute to improved sustainability through the production of healthy flocks that use resources more efficiently, lessening their environmental footprint.

General guidance for poultry producers and veterinarians on prudent and responsible use of antimicrobials needs to be adapted and adopted into antimicrobial stewardship schemes at the individual farm level and underpinned by management practices emphasizing biosecurity, housing, nutrition and hygiene.

Veterinarians should be involved in overall health management programs as well as in the selection of antimicrobials based upon the diagnosis of an illness or the imminent potential for a disease. Practices focused on minimizing antimicrobial resistance development and transfer are critical elements of stewardship schemes.

This stewardship effort should be supported by stringent governmental regulatory controls based upon sound science-based risk analysis principles to ensure actions that are most likely to achieve the desired outcomes.

The responsible use of all antimicrobials is important. Recognizing consumers desire an array of products produced through various production practices, farm practices can be adapted to meet market segment demands thus delivering marketplace choice for consumers.

IPC notes the Declaration of the 21 September 2016 High-Level meeting of the United Nations General Assembly on antimicrobial resistance.

IPC supports the aims of the actions plans of the World Health Organization (WHO), the Food and Agriculture Organization (FAO) and the World Organization for Animal Health (OIE), for collaborative 'one health' efforts amongst governments, non-governmental organizations and the food animal production sector to advance sound regulatory policy and responsible use practices across all areas of antimicrobial use in human medicine and in food producing animals.

For the food animal sector, the objective of collaborative efforts is to ensure that only regulatory authority approved antimicrobials are used in food animal production systems and that proper controls are in place to ensure responsible use of approved antimicrobials.

This responsible use includes all uses that are authorized under veterinary supervision. Those antimicrobials that are not approved, and those uses not authorized within national governmental laws, regulations or guidelines, are not to be used in food animal production.

To address antimicrobial resistance concerns further, IPC recognizes the need for:

» Professional oversight of antimicrobial use through the development of animal health and veterinary infrastructure to ensure responsible antimicrobial use practices.

» Governmental national antimicrobial resistance surveillance programs that generate local data for utilization in risk assessments.

» Development of commonly defined national programs, including voluntary industry programs, for collection of internationally comparable antimicrobials usage data.

» Scientific research regarding development, transfer and control of antimicrobial resistance in the poultry production chain and on the potential impact for animal health and welfare, food safety, public health and human medicine.

» Scientific research supporting the development of alternative, non-antibiotic approaches to the management of poultry health.

» The development of common terminology around antimicrobial uses and categorization to enhance more effective consumer understanding and communication.

*NOTES

This focus does not include antivirals or disinfectants and it does not include the direct animal to animal, or animal to human, or human to human organism transfer.

Globally various international bodies including the WHO, OIE, FAO and Codex have looked at the categorization and use of antimicrobials. Specific definitions do vary recognizing historical laws, regulations and policies.

The terms 'medically important for humans' and 'not medically important for humans' can vary due to differences amongst medical experts and the medical needs within a country, region or globally.

The terms 'medically important for animals' and 'not medically important for animals' can vary due to differences amongst veterinarian experts and the disease challenges and animal care needs within a country, region or globally.

Those compounds not listed in the World Health Organization "Critically Important Antimicrobials for Human Medicine, 4th Revision 2013" are for this document considered not important for human medicine.

Risk analysis, including risk assessment, risk management and risk communication, is an evolving area of scientific and policy focus and thus definitions are generally consistent but may vary slightly.

RESISTANCE AND RESIDUES

RESISTANCE

Resistance is defined as the loss of susceptibility of a microorganism to the treatment by a specific antimicrobial. It is the microorganism's defense against a substance designed to kill them.

The concern is that foodborne bacteria becomes a human health issue due to the transfer of the resistant microorganism or its determinants. Resistance is addressed via the risk analysis process which includes risk assessment, risk management and risk communication.

RESIDUES

A residue is defined as a small amount of the antimicrobial that remains in the animal tissues. Residues are a potential route for the antimicrobials themselves to enter the food chain through the consumption of tissues containing them. Residues limits are assessed with the establishment of an acceptable daily intake (ADI) that considers both toxicological and microbiological data.

The maximum residue limits (MRLs) are established based upon food consumption factors and residue profiles to ensure safe use. MRLs are set for muscle, fat, liver and kidney, and when residues are within the MRLs, they are within safe tolerances. If needed, withdrawal periods are set so the antimicrobial sufficiently clears from the animal prior to slaughter. Importantly, residue testing programs are used by government authorities to validate that no unsafe residues remain in the tissues consumed as food.

GLOBAL REGULATORY STRUCTURE AND REFERENCES

Recognizing that antimicrobial resistance is a global public health concern, IPC supports global best practices to ensure that robust national regulatory structures incorporate sound risk analysis and responsible use practices. In collaborating with regulatory authorities, IPC encourages governments to build their regulatory framework upon established international references published and updated by the WHO, OIE, and Codex which are based solely on scientific evidence*. In the absence of regulatory framework at market level, IPC strongly supports proactive practices that ensure the proper use of antimicrobials and the sustainability of the global poultry industry for the future.

*INTERNATIONAL REFERENCES

The "Environmental Health Criteria 240, Principles and Methods for the Risk Assessment of Chemicals in Food" that can serve as the overall risk assessment process

The World Organization for Animal Health (OIE) "Terrestrial Animal Health Code Risk Analysis for Antimicrobial Resistance Arising from the Use of Antimicrobial Agents in Animals", Chapter 6.10, that can serve as the basis of the risk analysis process specific to antimicrobial resistance

The Guidelines for Risk Analysis of Foodborne Antimicrobial Resistance, CAC/GL 77- 2011 that provides guidance on processes and methodology for risk analysis

The World Health Organization "Critically Important Antimicrobials for Human Medicine, 4th Revision 2013" that provides reference to those antimicrobials most important for human medicine

The "OIE List of Antimicrobial Agents of Veterinary Importance – May 2015" that provides reference to those antimicrobials most important for animal medicine

ANTIMICROBIAL CATEGORIZATION AND USES

The principles and guidance issued by the international organizations referred to above generally categorize classes of antimicrobials as either 'medically important for humans' or 'not medically important for humans'. Further, the OIE identifies antimicrobials of importance to animal medicine. WHO and OIE both differentiate amongst antimicrobial classes as 'critically important', 'highly important' and 'important' based upon criteria of needs for either human or animal medicine respectively.

The WHO also lists antimicrobials which are essential for the treatment of specific infections in humans as 'highest priority critically important antimicrobials (HPCIAs)'. These categorizations can provide regulatory authorities guidance into risk management decisions relative to approval and controls on uses.

Individual antimicrobial compounds are scientifically defined within a class. The compounds and their class can then be categorized based upon use.

Medically important for humans

» **Human-only use antimicrobials** Compounds or class of compounds used only in human medicine and not used in animal medicine;

» **Shared class use antimicrobials** Compounds or class of compounds used in human medicine and animal medicine.

Not medically important for humans

» **Animal-only use antimicrobials** Compounds or class of compounds used only in animal medicine and not used in human medicine.

Importantly, when considering an individual shared class antimicrobial – one from a class used in human and animal medicine – a specific compound and a specific use in animal medicine may not present a potential adverse human health risk based upon a risk assessment and thus an appropriate risk management decision may be to approve that use in food animal medicine. The uses of antimicrobials are generally defined as:

Therapeutic use, which includes:

» **Disease treatment (curative) use** any specific procedure used for the cure or the amelioration of a disease;

» **Disease control (metaphylaxis) use** practices aimed at reducing the spread of, or incidence of, a disease, and;

» **Disease prevention (prophylaxis) use** reducing the likelihood of a disease where there is a high probability of the occurrence of a disease in a susceptible population.

Growth promotion / production use

» Shifting the microflora in the gastrointestinal tract for better balance of beneficial and harmful bacteria, thus improving nutrient utilization to support healthy growth and improved performance. Nutritional efficiency, feed efficiency and average daily gain are indicators of response.

Anticoccidials, including ionophores, have a unique mode of action and are used to control the common protozoan parasite which causes the disease coccidiosis in poultry and thus can be categorized differently by various regulatory authorities. This class of compounds is not used in human medicine and thus not considered as medically important for humans. Due to their uniqueness some authorities do not categorize anticoccidials as antibiotics, although they are generally captured by the term antimicrobials.

SCIENCE-BASED REGULATORY PROCESSES

Stringent science-based regulatory processes can be built upon leveraging global best practices. Sound regulatory frameworks and processes serve to ensure the appropriate approval of compounds and uses while also helping to build consumer confidence in a safe food supply. Regulatory criteria include ensuring human safety, animal safety and environmental safety. The process also addresses quality as it relates to manufacturing and efficacy as it relates to effectiveness. Within the human safety assessment antimicrobial resistance is addressed via the risk analysis process which includes risk assessment, risk management and risk communication *(see appendix A for a detailed risk analysis approach)*.

STEWARDSHIP PRINCIPLES AND PROGRAMS

The principles of antimicrobial stewardship are based on ensuring quality use and future efficacy of antimicrobials, including antibiotics. These stewardship principles are a key part of ethical livestock management. They serve to ensure appropriate animal care that minimizes animal disease and suffering while also ensuring proper antimicrobial use that minimizes antimicrobial resistance development.

Principles need to be adaptable to national and species-specific production practices so the measures can best serve to enhance responsible use of all antimicrobials throughout all phases of poultry production. The farmer, professional and veterinarian in cooperation with all food chain stakeholders can collaborate in the development of responsible use guidelines that can become part of stewardship programs to meet prioritized needs within a country.

To achieve stewardship IPC will encourage its members to:

» Understand and control why and when we use antimicrobials;
» Understand and control which antimicrobials we use;
» Understand and control how much antimicrobials we use, and;
» Transparently communicate our actions.

As part of stewardship efforts, alternative practices to manage bird health should be considered and adopted, where they are efficacious and practical solutions that achieve the desired animal health objective. In this respect, management practices around biosecurity, housing, nutrition and hygiene should be prioritized to provide the best animal care, and then when needed other preventive tools, such as vaccines, should be considered.

Furthermore, new innovations that can reduce the need for antimicrobial use should be monitored and considered for adoption. Antimicrobials are one of the tools that can be considered to meet a specific animal care need.

SUMMARY

IPC recognizes that antimicrobial use can contribute to antimicrobial resistance development and transfer, while also supporting the right of poultry farmers to have access throughout all phases of poultry production to antimicrobials as a tool for use as a part of an appropriate animal care program.

IPC notes the ethical obligation of farmers and their veterinarians to protect the health and welfare of the birds in their care. Further, the poultry sector shares the responsibility for antimicrobial use stewardship to help achieve public health, food safety, animal health and environmental health common objectives.

Building regulatory structures globally with stringent regulatory controls based upon sound science-based risk analysis principles and sound stewardship principles and practices are essential to minimizing antimicrobial resistance development and transfer.

Collaborative efforts amongst intergovernmental organizations, governments, non-governmental organizations, the human medicine sector and the food animal production sector can minimize the development and transfer of antimicrobial resistance with a focus on foodborne pathogens.

Antimicrobials should be used to enhance animal health and welfare through proper animal care to reduce suffering and death from preventable and treatable illnesses.

For the poultry sector, from a public health perspective, the focus should be ensuring a safe, healthy and affordable food supply while minimizing the development and transfer of antimicrobial resistance organisms or genes via their transfer through foodborne pathogens, with prioritization on minimizing the use of those antimicrobials in animals that are critically important for human medicine.

APPENDIX – RISK ANALYSIS APPROACH

RISK ANALYSIS

Risk analysis includes risk assessment, management and communication. It is a process that identifies the hazard, determines the appropriate management steps and then seeks to communicate to key stakeholders.

Noting there are various reservoirs of resistance, the overall risk analysis should be focused on the foodborne pathogen(s) for which there is a human medicine treatment need due to a foodborne illness.

RISK ASSESSMENT

The risk assessment should consider the release assessment (presence in target animal because of drug use), exposure assessment (human to ingest the resistant bacteria from food), consequences assessment (human exposure resulting in adverse human health consequence) and risk estimation.

Surveillance and monitoring data provide information that can be utilized for the risk assessment. Information is always limited, however with the consideration of global, regional and to the extent available national data, risk assessors are able to best estimate risk.

With limited resources, surveillance efforts should be focused on the pathogenic foodborne bacteria of campylobacter and salmonella and indicator bacteria E. coli and enterococcus.

RISK MANAGEMENT

Risk management actions should be based upon the risk related to a specific antimicrobial and its use in food animals. The risk management process incorporates consideration of information relative to the class regarding importance for human medicine and animal medicine.

The various classification ranks as 'critically important', 'very important' and 'important' for human medicine and animal medicine should be considered by the risk manager. Based upon the risk the appropriate risk management controls and requirements for, or restrictions on, use should be selected to minimize the potential risks.

National farm structure, product distribution and professional and veterinary infrastructure and practices need to be factored into the decision for appropriate and effective controls. The range of risk management options to consider includes those in the chart below.

RISK MANAGEMENT OPTIONS

most restrictive	⟷		*least restrictive*
Non approval			Approval
Veterinary use only	Veterinary oversight	Professional oversight	On-farm use
Prescription			No prescription
Available only for veterinary use			Available over the counter for farmer use
Single animal use			Group of animals use
Commercial feed mill mixing only	(Extent of Current Good Manufacturing Practices)		On-farm feed mixing

Disease treatment	Disease control	Disease prevention
Via injection*	Orally via water* (medicated water)	Orally via feed* (medicated feed

Restrictions for use defined on the label

** Bioavailability may determine the appropriate route of administration to be effective*

For general guidance to regulatory authorities on which uses should be approved based upon class of compounds and overall risk profiles, the following risk management approaches are encouraged, recognizing that the specific risk assessment for a compound should be the primary determinant for a specific use:

Medically important for humans

Antimicrobials important for human medicine should be approved for therapeutic uses (disease treatment, disease control and disease prevention) only and can be used in feed, water or via injection.

» These antimicrobials should be used under veterinary or professional oversight.
» The use of those antimicrobials of critical importance for human medicine should be minimized.

Not medically important for humans

Antimicrobials not important for human medicine can be approved for therapeutic uses (disease treatment, disease control and disease prevention), and based upon a risk assessment, for other uses, and can be used in feed, water or via injection.

Importantly, when considering an individual shared class antimicrobial – one from a class used in human and animal medicine – a specific compound and a specific use in animal medicine may not present a potential adverse human health risk based upon a risk assessment and thus an appropriate risk management decision may be to approve that use in food animal medicine.

RISK COMMUNICATION

Risk communication should be focused on ensuring proper communication of the science-based regulatory authority risk assessment and risk management decisions. This communication should seek to ensure the farmer, professionals and veterinarians fully understand the regulatory approved uses, and controls needed, to ensure safe use thereby minimizing antimicrobial resistance development and its transfer via pathogenic foodborne bacteria.

Risk communication should also include awareness of antimicrobial resistance, causes of antimicrobial resistance, appropriate disease diagnosis and antimicrobial stewardship principles and programs.

DEFINITIONS

Not all the terms below are used in this document, however common terminology is considered important for global consistency and clarity.

Acceptable daily intake (ADI) measure of a veterinary drug that can be ingested by a person on a daily basis over a lifetime without an appreciable health risk.

Antibiotic type of antimicrobial, specifically antibiotics are compounds produced naturally by a fungus or another microorganism, or synthetic analogues of these, which kill or inhibit the growth of bacteria that cause disease in humans or animals.

Anticoccidials compounds with a unique mode of action that are used to control the common protozoan parasite which causes coccidiosis in poultry and thus can be categorized differently by various regulatory authorities. This class of compounds is currently not used in human medicine and thus not considered as medically important for humans. Ionophores and chemicals are used as anticoccidials. Due to their uniqueness and use some authorities do not categorize anticoccidials as antibiotics, although they are generally captured by the term antimicrobials.

Antibiotic free product for which no antibiotics were used at any time in the life of the animal in the production of the meat.

Antibiotic free of those medically important for humans product for which there is no use of antimicrobials determined as medically important for humans.

Antimicrobial broadest term used, refers to any type of product that has activity against a variety of microorganisms, which can include bacteria, viruses, fungi and parasites. This includes products such as antibiotics and anti-protozoals.

Antimicrobial (antibiotic) residue status

Antimicrobial (antibiotic) residue free product for which there is no detectable antimicrobial residue in the edible tissues.

Free of unacceptable antimicrobial (antibiotic) residue product for which there is no residue above the established safe tolerance, or above the maximum residue limit (MRL).

Antimicrobial resistance (AMR) the ability of a microorganism (like bacteria) to stop an antimicrobial (such as antibiotics) from working against it.

Bacteria single-celled microorganisms that can exist either as independent (free-living) organisms or as parasites (dependent on another organism for life) - the plural of bacterium.

Breakpoint breakpoint is a chosen concentration (mg/L) of an antibiotic which defines whether a species of bacteria is susceptible or resistant to the antibiotic, if the minimum inhibitory concentration (MIC) is less than or equal to the susceptibility breakpoint the bacteria is considered susceptible to the antibiotic. Clinical and Laboratory Standards Institute (CLSI) establishes breakpoints for food animal antimicrobials.

Chromosome DNA molecule with all of the genetic material of an organism.

Co-resistance the presence of resistance to more than one class of antibiotics in the same bacterial strain as might occur on a plasmid.

Cross resistance tolerance to a usually toxic substance that is acquired not as a result of direct exposure but by exposure to a related substance.

Foodborne pathogen a microbe that can cause disease in humans which is carried by food.

Growth promotion / production use shifting the microflora in the gastrointestinal tract for better balance of bacteria, improving nutrient utilization to support healthy growth and improved performance. Nutritional efficiency, feed efficiency and average daily gain are indicators of response.

Ionophores a substance that is able to transport particular ions across a lipid membrane in a cell and disrupt the ion concentration gradient (Ca2+, K+, H+, Na+) across microorganisms.

Limit of detection (LOD) the lowest analyte (a substance whose chemical constituents are being identified and measured) concentration likely to be reliably distinguished and for which detection is feasible.

Limit of quantification (LOQ) lowest concentration at which the analyte (a substance whose chemical constituents are being identified and measured) can not only be reliably detected but at which some predefined goals can be quantified. The LOQ may be equivalent to the LOD or it could be at a much higher concentration.

Maximum residue limit (MRL) the maximum concentration of a residue resulting from the use of a veterinary drug that is permitted as acceptable in a tissue.

Metaphylaxis timely mass medication of a group of animals to eliminate or minimize an expected spread of disease - when antimicrobials are administered to a flock that contains animals with clinical signs and animals without clinical signs.

Minimum inhibitory concentrations (MICs) zones of inhibition at which an organism is considered to be susceptible, intermediate, or resistant based on obtainable serum concentrations of the drug and clinical trials.

Plasmid small extra-chromosomal DNA molecule within a cell that is distinct from a cell's chromosomal DNA and that can replicate independently. Plasmids confer growth benefits in bacterial cells. Plasmids are capable of replicating independently of the chromosomal DNA and they can confer resistance to antibiotics.

Prophylaxis the administration of preventive medicine to an at risk group of animals to prevent the outbreak of disease - when antimicrobials are administered to a herd or flock of animals at risk of a disease outbreak.

Raised without antibiotics product for which no antibiotics were used at any time in the life of the animal in the production of the meat.

Residue small amount of antimicrobial that remains after the main part has gone or been taken or used.

Resistance - acquired

Multidrug-resistant (MDR) defined as acquired non-susceptibility to at least one agent in three or more antimicrobial classes

Extensively drug-resistant (XDR) defined as non-susceptibility to at least one agent in all but two or fewer antimicrobial classes (i.e. bacterial isolates remain susceptible to only one or two classes)

Pandrug-resistant (PDR) defined as non-susceptibility to all agents in all antimicrobial classes

Susceptibility vulnerability of a specific microorganism to inhibition or destruction by an antibiotic.

Therapeutic treatment, control or prevention of a disease.

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