



RECOMMENDATIONS FOR ANTIBIOTIC STEWARDSHIP IN COMPANION ANIMALS

Prepared by the 2019 Pet Industry Joint Advisory Council
Antimicrobial Resistance Working Group



Introduction

Antimicrobial resistance (AMR) is of increasing concern in the human and veterinary medical health care communities with the continuing discovery of bacteria resistant to common first-line antibiotics. The Centers for Disease Control and Prevention (CDC) estimate that two million people are infected with resistant strains of bacteria and 23,000 deaths result from antibiotic resistance in the U.S. annually.

Antibiotic-resistant genes have been shown to cross between species of bacteria, and bacteria may infect animal species that are not their primary host. Furthermore, resistant strains of bacteria are developing at increasingly rapid rates and outpacing the introduction of new antibiotics, heightening concern among public health officials.



As a result of this concern, the Pet Industry Joint Advisory Council's (PIJAC) AMR Working Group is primarily focused on addressing antibiotic stewardship in companion animals and specifically antibiotic use in the pet industry.

Although the antibiotic resistant [bacteria of greatest concern](#) to human health are not generally associated with companion animals, two relatively common species (*Campylobacter* and *Salmonella*) are common to many pets, and both bacteria have resistant strains. As an example, an outbreak of campylobacteriosis in 2016 was resistant to several antibiotics and was linked to puppies. This outbreak involved 113 patients in 17 states and generated substantial concern about antibiotic stewardship in the pet care community.

The two principal factors involved in the development of antibiotic resistance are overuse and misuse. Overuse is driven by the public's demand for a cure, even when an antibiotic is not the appropriate treatment.

The use of FDA-approved antibiotics to prevent disease is an important tool for veterinarians, and is appropriate under certain conditions, e.g., introduction of wild reptiles into a breeding colony. A veterinarian should also oversee or consult on any prophylactic use of antibiotics in dogs, cats, and small mammals.

Misuse results from incorrectly prescribed antibiotics that have questionable therapeutic benefit or prescribing sub-inhibitory and/or sub-therapeutic antibiotic concentrations to patients. In addition, some antibiotics are available to the public without prescriptions and can easily be misused. Without appropriate veterinary supervision, using such medications may not be effective in treating disease for the reasons above and may lead to antibiotic resistant bacterial strains.

In response to this growing health problem, the CDC and the Food and Drug Administration (FDA) are leading a year-long global initiative, the Antimicrobial Resistance (AMR) Challenge to

inhibit the spread of antibacterial resistance and to promote practices that discourage the development of resistance. Launched in September 2018, the AMR Challenge is an international partnership among governments, private industry and non-governmental organizations, with partners committing to at least one of the following:

- Share data and improve data collection
- Infection prevention and control
- Improve appropriate antibiotic use, including ensuring access to drugs
- Decrease antibiotics and resistance in the environment, improving sanitation
- Invest in development/access to vaccines, therapeutics, and diagnostics

PIJAC has joined the AMR Challenge to help curtail antibiotic resistance associated with the breeding, rearing, transportation, and sale of companion animals and products. As part of our commitment, we will develop and disseminate information to all segments of the pet industry regarding judicious use of antibiotics as part of the larger issue of antimicrobial stewardship: implementation of holistic hygiene practices that minimize the risk and spread of infection.

The PIJAC AMR Working Group

To achieve our goal, we have convened experts from the pet industry, as well as the veterinary and public health communities, to provide working guidelines for maintaining healthy companion animals while striving to deter the threat of resistant bacteria. Working Group members represent different segments of the pet care community, as well as a variety of organizations, many of which have developed best practices and guidelines that support good pet health. During the course of the AMR Challenge, the Working Group has distilled the extensive collection of information on antibiotic use into a broad, but instructive set of recommendations, with extensive links to more specific resources.

The goal of this document is to establish a broad and comprehensive approach to antibiotic stewardship to which everyone in the pet care community should aspire. PIJAC and the members of the AMR Working Group strongly encourage everyone in the pet care community to follow the recommendations to the extent that it is both applicable and feasible within their given operations.

Working Group Members and their areas of expertise can be found in [Appendix A](#). Resources used to develop this document can be found in [Appendix B](#).

Antibiotic Stewardship: Key Elements

Stewardship describes a contemporary adaptation of the well-recognized hierarchy for prevention of disease, in the face of pathogens that continue to develop resistance to critical therapies.

In particular, increased resistance among common bacteria has elevated the importance of the veterinary relationship at all points of the pet supply chain. Veterinarians understand when antibiotics are needed and what drug, dose, duration, and approach are more likely to resolve the infection. Resistant bacteria have rendered some routine therapies ineffective. Culture and sensitivity testing under the direction of a veterinarian has become a staple of infectious disease management, both to identify the organism and determine the correct antibiotic, which reduces the opportunity for resistance to develop and helps ensure antibiotics remain effective.

A key element of stewardship is a well-established [Veterinarian-Client-Patient Relationship](#) (VCPR) between the supervising veterinarian and the pet industry partner so that a course of effective antibiotic use can be determined:

- Customizing antibiotic therapies for
 - Client, e.g., breeder, distributor, retailer
 - Location/environment, e.g., breeding facility, transportation vehicle, retail store habitat (dry, semi-aquatic or aquatic)
- Determining the correct antibiotic: bacteria identification and sensitivity to the antibiotic
- Prescribing appropriate concentrations, time intervals, route of administration and duration

In addition, several elements fall within the responsibilities of the primary animal care giver:

- Reducing the susceptibility of the host animal to disease
 - Vaccination
 - Proper nutrition
 - Environment: space, configuration, and enrichment
- Creating less hospitable conditions for the bacteria through appropriate sanitation and hygiene
- Isolation/quarantine of animals showing clinical signs of disease and/or animals undergoing treatment
- Bio-security measures to reduce risk of introducing pathogens into a population of animals.

Best Practices for Prevention and Management of Disease: Key Considerations

Recommendations have been developed for disease prevention and management that encompass different companion animal categories and different environments.

Although these standards vary depending on the animal and the environment, there are common elements critical to disease management and minimizing the likelihood for developing resistance.

- As previously mentioned, a well-established [Veterinarian-Client-Patient Relationship \(VCPR\)](#) is essential for all pet categories in all settings.
- Antibiotic use:
 - Narrow spectrum, if appropriate
 - Effective for the bacterial disease – may require culture and sensitivity testing
 - Based on clinical indications/signs
 - Appropriate dosage, route of administration, and duration of treatment
 - Limited to ill or at-risk animals
 - Record keeping: antibiotics used, dose, route (e.g., by mouth, in feed), administration frequency, duration, animal condition, diagnosis, treatment outcomes (keep records for two years)
- Prevention of disease
 - Enclosures (including transport): sturdy, correct size, can be sanitized
 - Regular monitoring of health status of all animals
 - Vaccinations
 - Nutrition
 - Bio-security: pest control, animal containment
- Zoonotic disease prevention
 - Staff training
 - Proper handling
 - Bio-security: hand washing stations, foot baths, personal protective equipment

These elements are found with appropriate specifics throughout the animal care and husbandry best practices recommendations that follow.

Recommendations for Antibiotic Stewardship

Disease Prevention and Management

The most critical aspect of any animal health management program to promote animal health, zoonotic disease prevention and antibiotic stewardship is the [Veterinarian-Client-Patient Relationship](#) (VCPR). The following are the minimum requirements for an effective program:

- Consult with a veterinarian familiar with animal health, pathologic diseases, zoonotic diseases, and nutritional requirements associated with your animal species.
- Maintain an ongoing pest control program to prevent or minimize wild rodents in small mammal/reptile/bird rooms, and in areas where feed is stored. An ongoing pest control program should also be utilized to prevent or minimize other potential disease vectors (such as flies, mosquitoes, or ticks) on the animals and in the housing and transport environment.
- Staff must be trained to identify signs and symptoms of disease.
- Keep records for at least two years (e.g., location, date, number of animals affected) for animals exhibiting signs or symptoms of disease or death. Isolate or quarantine animals with symptoms of disease.
- New animals should be isolated in a quarantine area until their health is evaluated, unless the animals have been confirmed to be in good health prior to transfer.
- Distributors should avoid combining animals from different shipments to prevent pathogen transmission.
- Feed, water containers, equipment for handling cages, and bedding should not be moved among facility units (depending on the configuration of the facility; e.g., racks, rooms, buildings) to prevent cross-contamination.
- All food should be stored in sealed containers to protect it from deterioration, mold, and contamination by vermin. Containers should be labeled with their contents.
- Waste (including bedding and animal waste) should be disposed of properly¹.
- Clean cages, floors, and feed storage areas regularly using disinfectants or sanitizers, surfactants, and hot water.
- Facilities should have a biosecurity plan created with veterinary input to minimize cross-contamination between areas.
- Hand washing stations, or at minimum hand sanitizer, must be available to employees.
- Staff should be informed regarding zoonotic pathogens and methods of transmission.
- Drinking, eating, or smoking should not take place in rooms housing animals.
- Shipments should have a permanently affixed or indelible lot identification label to include:
 - Package date, shipment date, supplier information
- Records of animals leaving the facility should be maintained for at least two years (in the event of zoonotic pathogen detection) including:
 - Date of shipment, species, type/age, and number of animals shipped

¹ Additional guidance can be found in PIJAC's Small Animal Care Standards: <http://pijac.org/sites/default/files/pdfs/SmallAnimalCareStandards2017.pdf> and PIJAC's Pet Retail Store Best Management Practices: <https://pijac.org/sites/default/files/PIJACRetailPetStoreBMP8816.docx>

- Specific location within facility where shipped animals were housed (if applicable)
- Carrier Trip logs are recommended for the animal transportation carrier, e.g., destination of animals, vehicle identification, time of departure and arrival, other stops made, and other cargo.

Remediation in the Event of a Zoonotic Outbreak

- Movement of animals, cages and equipment within the areas of the facility without prior sanitation and disinfection should be avoided.
- Staff working with infected (or potentially infected) animals should have access to appropriate personal protective equipment (dust mask, gloves, washable coveralls and footwear).
- Breeders, distributors, and retailers should cooperate fully with the Centers for Disease Control and Prevention, local or state health departments, and departments of agriculture or animal health.
- All recent records of shipments should be made available to inspectors.
- Customers that have received animals should be notified immediately using materials created in collaboration with appropriate zoonotic disease experts.
 - Customers receiving animals that were shipped after the pathogen was documented should be notified. This includes animals potentially exposed to the pathogen prior to its discovery.
- Transporters of animals in transit should be notified immediately.
- Animals in the facility (or that part of the facility) should be isolated until the extent of the outbreak has been determined



Manufacturers

Veterinary Oversight

Animal health companies and manufacturers of antibiotics should continue to provide training and encourage policies that promote judicious use of antibiotics, while increasing veterinarian oversight.

Product Formulation and Labeling of Indications (FDA Oversight)

The pet care community favors a collaborative, stakeholder approach similar to the one used by FDA and the food animal industry with regard to antibiotics. In particular, the model of voluntary phase-out of subtherapeutic uses of medically important antibiotics, while maintaining the important therapeutic uses of disease treatment, disease control, and disease prevention, was an important step in protecting animal health.

Antibiotic Alternatives and New Antibiotics

We recognize that animal health companies continue to work to develop new tools to help address animal diseases. These include a focus on therapies like vaccines aimed at reducing the need for antibiotics, antibiotic alternatives, and animal-only antibiotics. Investment in the research and development of innovative solutions remains an important aspect.



General Animal Group Recommendations: Breeders, Distributors, Transporters and Retailers²

Health Management

The most critical aspect of all animal health management programs to promote antibiotic stewardship is the [Veterinarian-Client-Patient Relationship](#) (VCPR). The following are the minimum requirements for an effective program:

- The facility should have a valid veterinarian-client-patient relationship (VCPR) with a licensed veterinarian(s) responsible for providing direction on prevention and control of diseases.
- The veterinarian should be licensed in the state in which the facility is located.
- The veterinarian should be a USDA Accredited Veterinarian if they will be providing health certificates for animals traveling interstate and/or internationally.
- The veterinarian should supervise the use of **all** antibiotics.
- The veterinarian should follow [AVMA Judicious Use Principles](#).
- Provisions should be made for access to 24-hour emergency veterinary care.
- There should be regular, scheduled consultation with the veterinarian to evaluate infectious disease controls within the facility (bacterial, parasitic, fungal and viral).
- The veterinarian should work in cooperation with the facility to determine the most effective preventive and treatment programs to successfully manage parasites and infectious diseases.
- Sick, injured, or diseased animals should receive prompt veterinary diagnosis and treatment and nursing care.
- Adequate and timely veterinary care should be provided for all animals.
- Animals that are not responding to treatment(s) should receive additional veterinary care without delay.
- Ill or injured animals should be separated and placed in a specific quarantine area or habitat for monitoring and treatment; habitats used should be labeled and dated with of the injury or illness and its treatment details.
- Deceased animals must be removed as quickly as possible. Cause of death should be determined and documented, with records retained for a minimum of two years for tracking purposes. Disposal of deceased animals should consider disease containment, prevention of environmental contamination and follow local ordinances.
- Retailers should source animals from suppliers and/or breeders with established procedures to monitor and manage disease.



² Additional guidance for retailers can be found on PIJAC's Animal Care Resources website: <https://pijac.org/animal-welfare-and-programs/animal-care#Retailers>

- In breeding and distribution facilities, new animals should be isolated in a quarantine area until disease-free status is confirmed.
- Each species of breeding animal should be maintained in a separate room and if possible, use a separate heating and ventilation system for biosecurity.
- Animals that are not ill, but are known to harbor rare zoonotic microbes (e.g. Seoul virus, resistant strains of salmonella or campylobacter) should be removed from the breeding animals and no longer used for breeding.

Health Monitoring

Daily monitoring of animal health and behavior allows for prompt identification and treatment of animal disease, illness, and injury and promotes good health of all animals in a facility. A designated employee or employees should conduct visual health checks of animals at least once a day.

Testing Standards for Birds

- Bird health testing should be done as appropriate with the understanding that testing protocols will differ between breeder and distributor requirements.
- Psittacosis protocols should follow the National Association of State Public Health Veterinarians (NASPHV), [Compendium of Measures to Control Chlamydia psittaci Infection Among Humans \(Psittacosis\), and Pet Birds \(Avian Chlamydiosis\), 2017](#).



Record Keeping and Identification

- Records tracking the purchase and sale (all movement) of all animals into and out of the facility with dates of movement and address of parties involved should be maintained for a minimum of two years.
- Records of births and deaths for all animal should be maintained for a minimum of two years.
- All animals (as feasible e.g. animals that can be identified with normally acceptable means) should have an individual form of identification to allow differentiation from other animals in the facility and to track their travel history. If individual identification is not feasible, records should be kept to identify which supplier or breeder animals were purchased from for traceback purposes.
- Complete animal health records of all animals should be kept and maintained for a minimum of two years after the animal leaves the premises or dies on premises.
- When antibiotics are administered, the animal health records should include the following:
 - Antibiotic name, concentration, amount, time interval (how many times given per day, etc.) route of administration, duration of treatment, condition being treated, and effectiveness of treatment (patient outcome), veterinarian name.

Facilities, Facility Maintenance and Sanitation

- The facilities' interior walls and floors where animals are maintained should be constructed in a manner that permits them to be readily cleaned and maintained.
- Controlling vermin, insects and other pests
 - Adopt protocols and barriers to minimize the entry of pests and disease vectors.
- Primary and temporary enclosures (cages, flight cages, aquariums, containers, or other housing units) should be structurally sound and maintained in good repair.
- Enclosures must provide adequate space for the animal or animals.
- Animals should be separated by species, unless comingling is a professionally accepted practice or directed by a veterinarian.
- Enclosures should be designed to contain animals, keep other animals out, and be appropriate for the species to promote the health and well-being of the animals.
- Enclosures should be cleaned and disinfected as needed, and as species appropriate.

Nutrition

- Provide food that is nutritious, palatable and uncontaminated and in sufficient quantities to maintain the animal in good health.
 - All food should be stored in sealed containers to protect it from deterioration, mold, and contamination by vermin.
 - Provide all animals, other than aquatic organisms, with potable drinking water at least once daily or more frequently as appropriate for the species, except as dictated by hibernation, veterinary treatment, or other professionally accepted practices.

Transportation

- Transport activities must be compliant with local, state, and federal regulations, including but not limited to regulations of the United States Department of Agriculture (USDA), Department of Transportation (DOT), and guidance from the International Air Transport Association (IATA).
- An emergency veterinary care plan should be in place.
- Transport containers should be manufactured to protect animals from physical injury and exposure to extreme temperatures by using materials with appropriate strength and insulation.
- Animals should be put in internal containers to avoid injury during handling and transport.
- Heat/cold packs should be used as needed to protect animals from temperature fluctuations.
- Animals in the same primary enclosure must be in compatible groups.
- Animal cargo space must meet temperature guidelines that are species appropriate.
- Vehicles should have a temperature gauge in the animal holding area that is visible to the driver. The temperature in the vehicle must be monitored to ensure it is maintained at the appropriate temperature for the species of animals being transported.

- Drivers should be trained in basic biosecurity (e.g. use of gloves and hand sanitizing process), as well as appropriate animal handling and transport for the species they are transporting.

Other Considerations

- Animals for sale to the public should be eating independently before being sold, unless otherwise directed by a veterinarian.
- Aquatic life for sale should be independently eating prepared food before being sold to their new owner, unless using other professionally accepted practices or directed by a veterinarian.
- Birds for sale should be fully weaned and eating independently before being sold to their new owner, unless otherwise directed by a veterinarian. Birds still hand feeding may be sold if allowed by state law and the new owner has been properly trained by staff to provide appropriate and adequate hand feeding.
- Before change of ownership, animals should be up-to-date on vaccinations and parasite treatments as needed and as directed by the veterinarian.
- Documentation of the health care and medical history of the animal should be provided to the new owner as appropriate and directed by the veterinarian.



Appendix A

Antimicrobial Resistance Working Group Members

Michael Abernathy, Pinnacle Pets
Michael Costin, DVM, MBA, American Veterinary Medical Association
Janet Donnelly, Breeder Leadership Council
Dave Dzanis, DVM, American Pet Products Association
Tom Edling, DVM, Edling Consulting
Debora Eisen, American Pet Products Association
Chris Fleming, Pinnacle Pets
Amanda Fredal, Pet Supplies Plus
Gail Golab, PhD, DVM, American Veterinary Medical Association
Scott Hardin, PIJAC Science Advisor
Jerry Klein, DVM, American Kennel Club
Rob Mellace, Pet Express
Whitney Miller, DVM, Petco
Andrew Nelson, Petland
Ron Phillips, Animal Health Institute
Jim Seidewand, Pet World
Nick Saint-Erne, DVM
Brandon Sinn, DVM, Main Street Animal Clinic
Debra Spaulding, World Pet Association
Jay Springer, Pet Supplies Plus
Lindsay Wright, DVM, American Animal Hospital Association

Appendix B

Resources

The following organizations have published recommendations, guidelines and best management practices for animal care that include disease management. Certain general husbandry standards address animal health and the prevention of disease and are applicable to all pet classes. Insofar as some diseases are specific to certain classes of animals, more detailed recommendations are available in the resources that follow.

American Animal Hospital Association

<https://www.aaha.org/professional/resources/antimicrobials.aspx>

American Veterinary Medical Association

<https://www.avma.org/KB/Policies/Pages/Antimicrobial-Stewardship-Definition-and-Core-Principles.aspx>

<https://www.avma.org/KB/Policies/Pages/Judicious-Therapeutic-Use-of-Antimicrobials.aspx>

https://www.avma.org/KB/Resources/Reports/Documents/TFASCAP_Report.pdf

https://www.avma.org/KB/Resources/Documents/AntibioticDoDonts_DOGpdf.pdf

https://www.avma.org/KB/Resources/Documents/AntibioticDoDonts_CAT.pdf

American Association of Feline Practitioners

https://www.catvets.com/public/PDFs/PracticeGuidelines/Guidelines/2014AntimicrobialsGuidelines%20AAHA_AAFP.pdf

Centers for Disease Control and Prevention

<https://www.cdc.gov/drugresistance/intl-activities/amr-challenge.html>

<https://www.cdc.gov/healthypets/index.html>

U.S. Food and Drug Administration

<https://www.fda.gov/AnimalVeterinary/SafetyHealth/AntimicrobialResistance/default.htm>

<https://www.fda.gov/downloads/AnimalVeterinary/SafetyHealth/AntimicrobialResistance/UCM620420.pdf>

National Association of State Public Health Veterinarians

<http://www.nasphv.org/Documents/VeterinaryStandardPrecautions.pdf>

<http://www.nasphv.org/Documents/ModelInfectionControlPlan.docx>

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<https://www.pijac.org/animal-welfare-and-programs/animal-care#small>

<https://pijac.org/sites/default/files/pdfs/PIJACAquaticWholesalerBMP10-6-2016.pdf>

https://pijac.org/sites/default/files/pdfs/guide_finalco.pdf

<https://pijac.org/animal-welfare-and-programs/animal-care#Retailers>



pijac.org

202.452.1525 | info@pijac.org