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Regional authorities regulate antibiotic use

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By Victoria Alday de Graindorge, Ph.D.

Overview of European, U.S. legislative systems

The regulation of antibiotic use has the objectives of guaranteeing the safety and efficacy of the drugs for the animals treated and protecting the health of consumers. As with other drugs, antibiotic use assumes the existence of some potential undesirable effects.

These can include the promotion of resistance to antimicrobial agents, interference with the normal microflora of the treated animals, residues in animal tissues destined for human consumption, potential toxic effects on the cells and tissues of animals, adverse effects due to interactions with other drugs or diseases, and allergic phenomena. Because of such effects, antibiotics are regulated by sanitary authorities.

In some countries, various aquaculture drugs and treatments are available from “shrimp pharmacies.”

European union legislation on antibiotics

In the European Union, the entity responsible for the evaluation of medical drugs is the Committee for Medicinal Veterinary Products (CVMP) of the European Agency for the Evaluation of Medicinal Products. Current legislation is based on Regulation no. 2377/90 of the council, dated June 26, 1990, and its later modifications.

Table 1 (right) lists the antibiotics that are authorized by the E.U. for use in aquaculture. Some are specifically authorized for fish species, while most are approved for use in all species destined for human consumption. Also included are prohibited antibiotics whose use is not authorized in any species destined for human consumption.

Table 1. Antibiotics authorized and prohibited by the European Union.

Antibiotic	Species	MRL	Target Tissues
	Sulfamides and Diaminopyrimidines		
Sulfamides	All	100 ug/kg	Muscle
Trimethoprim	All	50 ug/kg	Muscle and skin in natural proportions
	Penicillins		
Amoxicillin	All	50 ug/kg	Muscle, liver, kidney, and fat
Ampicillin	All	50 ug/kg	Muscle, liver, kidney, and fat
Benzylpenicillin	All	50 ug/kg	Muscle, liver, kidney, and fat
Cloxacillin	All	300 ug/kg	Muscle, liver, kidney, and fat
Dicloxacillin	All	300 ug/kg	Muscle, liver, kidney, and fat
Oxacillin	All	300 ug/kg	Muscle, liver, kidney, and fat
	Tetracyclines		
Chlortetracycline	All	100 ug/kg	Muscle and skin in natural proportions
		300 ug/kg	Liver
		600 ug/kg	Kidney
Oxytetracycline	All	100 ug/kg	Muscle and skin in natural proportions
		300 ug/kg	Liver
		600 ug/kg	Kidney
Tetracyclines	All	100 ug/kg	Muscle and skin in natural proportions
		300 ug/kg	Liver
		600 ug/kg	Kidney
	Aminoglucosides		
Neomicine	All	500 ug/kg	Muscle and skin in natural proportions, liver, and fat
		5,000 ug/kg	Kidney
Paromomicine	All	500 ug/kg	Muscle and skin in natural proportions
		1,500 ug/kg	Liver and kidney
Espectinomycin	All	300 ug/kg	Muscle and skin in natural proportions
		500 ug/kg	Fat
		1,000 ug/kg	Liver
		5,000 ug/kg	Kidney
	Chloramphenicol and Derivatives		
Florfenicol	Fishes	1,000 ug/kg	Muscle and skin in natural proportions
Chloramphenicol	Prohibited		
	Macrolides, Lincosamides, Streptogramins, and Pleuromutilines		
Erythromycin	All	200 ug/kg	Muscle and skin in natural proportions, liver, kidney, and fat
Tilmicosin	All	50 ug/kg	Muscle and skin in natural proportions, fat
		1,000 ug/kg	Liver and kidney
Tylosin	All	100 ug/kg	Muscle, skin in natural proportions, liver, kidney, and fat
Lincomycin	All	100 ug/kg	Muscle and skin in natural proportions
		50 ug/kg	Fat
		500 ug/kg	Liver
		1,500 ug/kg	Kidney
	Quinolones and Fluoroquinolones		
Danofloxacin	All	100 ug/kg	Muscle and skin in natural proportions
		50 ug/kg	Fat
		200 ug/kg	Liver and kidney
Difloxacin	All	300 ug/kg	Muscle and skin in natural proportions
		100 ug/kg	Fat
		800 ug/kg	Liver
		600 ug/kg	Kidney
Enrofloxacin	All	100 ug/kg	Muscle and skin in natural proportions, fat
		200 ug/kg	Liver and kidney
Flumequine	Fishes	600 ug/kg	Muscle and skin in natural proportions
Oxalinic acid	Fishes	1,300 ug/kg	Muscle and skin in natural proportions
Sarafloxacin	Salmonids	30 ug/kg	Muscle and skin in natural proportions
	Nitrofurans		
Furazolidone	Prohibited		
All	Prohibited		
	Nitroimidazoles		
Dimetridazole	Prohibited		
Metronidazole	Prohibited		
	Other Compounds		
Colistin	All	150 ug/kg	Muscle and skin in natural proportions,
(Polymyxin)			kidney, and fat
		200 ug/kg	Kidney

MRL = Maximum residue limit, All = All species consumed

The CVMP document “Note for Guidance on the Risk Analysis Approach for Residues of Veterinary Medicinal Products in Food of Animal Origin” states that it could be possible to extrapolate the maximum residue limits for salmonids to all fish species.

U.S. use of antibiotics

The United States establishes norms, ensures they are followed and punishes infractions through the Food and Drug Administration (FDA). Through the Center for Veterinary Medicine, FDA is in charge of regulating the studies that pharmaceutical companies must present to obtain approval for drugs to be used in food animals.

This system contemplates the establishment of maximum levels for residues that are innocuous to consum-ers and the necessary requisites to establish the withdrawal period or waiting time between the administration of a drug to animals and its clearance from their systems.

The Food Safety and Inspection Service, under the U.S. Department of Agriculture, has the mission of national control of residue incidence through random sampling of tissues in slaughterhouses and their chemical analysis.

Table 2 lists the antibiotics prohibited by FDA for use in animals destined for human consumption. Table 3 lists the tolerated residue levels established by FDA for aquatic organisms.

Table 2. Antimicrobials prohibited by the U.S. Food and Drug Administration for use in animals destined for human consumption.

Antibiotic
Chloramphenicol
Dimetridazole
Ipronidazole
Other nitroimidazoles
Furazolidone
Nitrofurazone
Fluoroquinolones
Glucopeptides

Table 3. Residues tolerated by the U.S. Food and Drug Administration for aquatic organisms.

Antibiotic	Species	Withdrawal Period (days)	Maximum Residue Limit in Flesh (ppm)
Sulfamerazine	Trout	21	0
Sulfadimethoxine + Ormetroprim	Salmonids Catfish	42 3	0.1 0.1
Oxytetracycline	Pacific salmon Salmonids Catfish Lobster	7 21 21 30	2 2 2 2

FDA’s title 21, chapter I, parts 500-600 code establishes the conditions under which specific antibiotics can be used in species for which they are not registered, with special emphasis on limitations for their applications in animals destined for human consumption.

For further information on antibiotic regulations:

Antibióticos para animales: Una perspectiva sobre antibióticos, salud animal y el debate sobre la resistencia. (1999) Federación Europea de la Industria de Sanidad Animal.
http://www.veterindustria.com/veter/temasdeinteres/docs/dossier1.pdf

EMEA/CVMP/342/99 Final Report: Antibiotic Resistance in the European Union Associated With Therapeutic Use of Veterinary Medicines. (1999) Report, qualitative risk assessment by Committee for Veterinary Medicinal Products.

European Agency for the Evaluation of Medicinal Products.
http://www.emea.eu.int/pdfs/vet/regaffair/034299ENC.pdf

Title 21: Food and Drugs. Chapter I. (April 2003) U.S. Food and Drug Administration, Department of Health and Human Services.
http://www.access.gpo.gov/nara/cfr/waisidx_03/21cfrv6_03.html

Versión consolidada de los Anexos I a IV del Reglamento no. 2377/90 delConsejo. (Julio 2003) Límites máximos de residuos de medicamentos veterinarios que pue-den aceptarse en alimentos de origen animal.
http://pharmacos.eudra.org/F2/mrl/conspdf/MRL%20consol%202003-07-22%20ES.pdf

Veterinary Medicines. (2003) European Agency for the Evaluation of Medicinal Products.
http://www.emea.eu.int/index/

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Author

VICTORIA ALDAY DE GRAINDORGE, PH.D.

INVE Technologies NV
Oeverstraat 7
B-9200 Baasrode, Belgium

v.alday-sanz@inve.be (mailto:v.alday-sanz@inve.be)