

Workshop

Control of Antibiotics Use and

Surveillance of Clinical Pathogens in Veterinary in Europe

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Choice of antimicrobials under field conditions Is it possible in daily practice?

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Outline

- Prudent and practical use of antimicrobials (PPUA).
- A proposal to apply PPUA under field conditions.
 - Back to the basics...
 - Practical proposal
- Conclusions.

- Prudent use of antimicrobials is an integral part of good veterinary practices.
- It is an attitude to maximize therapeutic efficacy and minimize selection of resistant micro-organims.
- Prudent use principles is a guide for optimal use of antimicrobials.

• There are specific European legislation about prudent use of antimicrobials.

11.9.2015	EN	Official Journal of the European Union	C 299/7

COMMISSION NOTICE

Guidelines for the prudent use of antimicrobials in veterinary medicine

(2015/C 299/04)

 There are recommendations from many organizations like the one published by the Federation of veterinarians of Europe (FVE)





A proposal to apply prudent use under field conditions



CRITERIA TO ESTABLISH AN ANTIMICROBIAL THERAPY

- 1. Diagnosis: Pathogen identification and pharmacodynamic parameters (minimun inhibitory concentration MIC).
- 2. Antimicrobial pharmacokinetics: absorption, distribution, metabolism and excretion.
- 3. Side-effects
- 4. Withdrawal period
- 5. Return on investment (ROI)

Antimicrobial sensitivity Pharmacodynamics- MIC



 MIC-Minimum inhibitory concentration - Lowest concentration of antimicrobial that inhibits completely the bacterial growth after 24-48 hours-Determined in vitro by means of a dilution method in culture media or agar (CLSI document M31).

The clinical CO (CO_{CL})

The **COCL** is based upon the collection of isolates obtained during the clinical effectiveness studies.

COCL reflects the upper limit of the MIC values associated with a high likelihood of clinical success [probability of cure (POC)].

There is no set method for establishing the **COCL**, and no hard target for POC.

Practical proposal

CRITERIA TO ESTABLISH A THERAPY WITH ANTIBIOTICS



Practical proposal

- To have isolates of clinical cases before applying the treatments
 - MIC (quantitative)
 - Antibiogram (qualitative)
- This information allows changing the antimicrobial treatment if it were necessary.
- In livestock production, it is very interesting to link pharmacodynamic data with the origin of the animals (cow and sow farm for example). Epidemiological information.

General workflow



Fattening farm



Sow unit

Epidemiological link Validity of the information: 6 months

Workflow (microbiology)



Clinical samples

GRUP DE

PORCÍ

GSP

SANEJAMENT

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Microbiological isolation

Vitek system Cherry !

Bacteria identification

Workflow (Antimicrobial sensitivity) MIC





Customized plates

Respiratory pathogens

		PAQUETE MIC RESPIRATORIOS										
	1	<u>ر</u>	2 7	3 4	4 5	<u>ј</u> Е	s 7	/ 8	5 5	3 10	ر د	.1 12
Α	Enrofloxacina	Marbofloxacina	Tildipirosina	Tulatromicina	Tilmicosina	Tiamulina	Amoxiciclina	Florfenicol	Doxiciclina	Oxitetraciclina	Sulfamethoxazol/trimetoprim	Ceftiofur
в	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2
С	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3
D	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4
Ε	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5
F	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6
G	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7
н	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	CONTROL	CONTROL	CONTROL

Digestive pathogens

	PAQUETE MIC DIGESTIVOS											
	1	. 2	3	4	5	6	7	8	9	10	11	1 12
A	Enrofloxacina	Marbofloxacina	Neomicina	Apramicina	Gentamicina	Amoxiciclina	Ceftiofur	Cefquinome	Florfenicol	Espectinomicina	Sulfamethoxazol/trimetoprim	Sulfato de Colistina
В	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2
С	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3
D	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4
E	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5
F	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6
G	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	CONTROL
н	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	CONTROL	CONTROL	CONTROL
										_		

Systemic pathogens

		PAQUETE MIC SISTÉMICOS										
	1	. 2	3	4	5	6	7	8	9	10	11	. 12
А	Enrofloxacina	Marbofloxacina	Tilmicosina	Tiamulina	Amoxiciclina	Florfenicol	Doxiciclina	Penicilina G	Ampicilina	Cefquinome	Sulfamethoxazol/trimetoprim	Ceftiofur
В	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2	Dil 2
С	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3	Dil 3
D	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4	Dil 4
Ε	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5	Dil 5
F	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6	Dil 6
G	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7	Dil 7
Н	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	Dil 8	CONTROL	CONTROL	CONTROL

Propietat GSP: G25340589

Workflow (Antimicrobial sensitivity) MIC



Workflow (Pharmacological interpretation)

- Actinobacillus pleuropneumoniae isolation
 - MIC value
 - Amoxicillin --- 3 μg/mL
 - Enrofloxacin ---- 0.005 μg/mL
 - Ceftiofur ---- 3 μg/mL
 - Tetracycline --- 0.1 μg/mL
 - Florfenicol --- 0.25 μg/mL
- It is quite simple to discard drugs: Amoxicillin and ceftiofur
- It is possible to select the most suitable taking into account recommedations about antimicrobial categories:
 - Florfenicol = Tetracycline (category I) and enrofloxacin (category II)



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Conclusions

Conclusions

- We need to monitorize he sensitivity of microorganisms to be treated with antimicrobials
 - Diagnosis and isolation
 - Pharmacodynamic determination.
- It is possible to carry out a prudent use of antimicrobials under practical conditions.
- We need support to explain correctly the epidemiological link of antimicrobial susceptibility for livestock. It must be known and agreed by:
 - National authorities
 - Veterinarians
 - Stakeholders

Thank you very much for your attention