

Evaluation of preventive and curative therapies against infectious diseases in dairy cows



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INTRODUCTION

The majority of diseases in dairy cows are treated by application of antibiotic treatment. Spain is the third country on sales of veterinary antimicrobial agents in Europe.

Mastitis is the most common disease of dairy cows and is the main reason why cows are treated with antibiotics. Nowadays, pressure to reduce their use in livestock is increasing due to problems derived from the treatment with antibiotics and their impact on public health: emergence of pathogenic **organisms resistant to antimicrobials** and the presence of **antibiotic residues**.

Pathogens (Table 1) causing mastitis can be divided into 2 groups: contagious and opportunistic or environmental.

Table 1. Percentage of isolation of most common pathogens

	<i>Staphylococcus aureus</i>	<i>Streptococcus uberis</i>	Coliforms
Catalonia	6,4 % ⁽¹⁾	9,4 % ⁽¹⁾	9,5 % ⁽¹⁾
Germany	10 % ⁽²⁾	8,5 % ⁽²⁾	10,2 % ⁽²⁾
France	15,8 % ⁽²⁾	22,1 % ⁽²⁾	16 % ⁽²⁾
Netherlands	18,9 % ⁽²⁾⁽³⁾	9,6 % ⁽²⁾	28 % ⁽³⁾
Sweden	28,4 % ⁽²⁾	15,2 % ⁽²⁾	21,9 % ⁽²⁾
United Kingdom	3 % ⁽³⁾	25 % ⁽³⁾	21 % ⁽³⁾
Spain	15,5 % ⁽⁴⁾	8 % ⁽⁴⁾	-

⁽¹⁾ ALLIC, 2016 ; ⁽²⁾ Thomas et al., 2015; ⁽³⁾ Ruegg, 2014; ⁽⁴⁾ Marco et al., 2000

OBJECTIVES

- ✓ The aim of this research is to review the use of antibiotics to treat and prevent commonly occurring infections
- ✓ Make recommendations to reduce the use of antimicrobial agents

MATERIAL AND METHODS

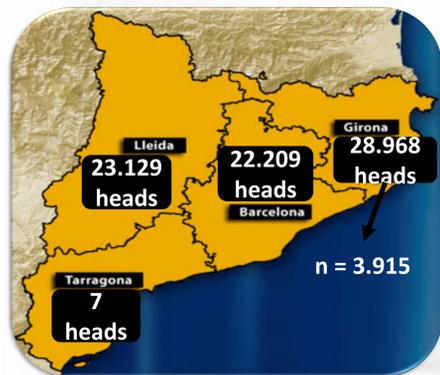


Figure 1. Distribution of dairy cows on Catalonia. Prepared by the author

- ✓ Antibiotic use questionnaire was conducted between February and April 2016 in 10 dairy herds in Girona.
- ✓ Representing 2% of farms in Catalonia and contain 13.5% of cattle in Girona.
- ✓ The sample size does not allow a statistical study with the corresponding statistical tests.

RESULTS AND DISCUSSION

Herd size ranged from 100 to 910 cows, averaging 429 cows. Seven of the herds were housed in freestalls and 3 in bedded housing system. Annual milk production among those herds ranged from 9.647 L to 11.800 L, averaging 10.884 L. Bulk tank milk SCC ranged from 185.000 cells/mL to 371.000 cells/mL, averaging 253.000 cells/mL.

Regarding the different pathologies present in farms, the **predominant disease is mastitis**, followed by lameness (Table 2).

Table 2. Most common pathologies

Farm	Pathologies						
	Size (milking cows)	Mastitis per year (%)	New cases mastitis (%)	Repetitive cases (%)	Metritis (%)	Lameness (%)	Ketosis (%)
1	840	56,7	30,7	46	18,8	34,5	0
2	751	55,1	33,9	38,9	15	68,5	22,2
3	712	29,4	26,2	10,9	-	13,6	1,5
4	209	15	14	6,7	-	7	-
5	123	25	23	8	-	-	-
6	145	-	40	-	1,5	25	-
7	470	65	45	30,7	5	1	1
8	215	12	-	-	2	3,5	1
9	94	34	25,84	24	10,3	14,5	-
10	356	103,5	53,4	48,5	16,8	22,5	-
Average	391,5	47,96	31,51	26,7	13,18	23,09	-
SD	284,09	30,81	15,34	18,74	7,57	20,70	-

Many producers are **treating clinical mastitis with intramuscular or subcutaneous drugs** alone. Supplying last choice treatments (7/10) as fluorquinolones rather than treating with first choice drugs (penicillin or 1st G Cephalosporin) intramammary (Table 3).

Table 3. Drugs most commonly used in farms

Antimicrobial classes	Drug	Nº farms
Fluoroquinolones	Enrofloxacin	7
Lincosamins	Lincomycin	1
β-lactam	Penicillin	7
	Cephalosporin 1 st G	1
	Cephalosporin 3 rd - 4 th G	1
Aminoglycosides	Neomycin	1
	Kanamycin	1
	Streptomycin	1
	Framicetin	1

The **use of fluorquinolones and 3rd generation cephalosporin** increases the risk of emergence of resistant pathogens and should not be used as 1st option. Following Prudent Use Guidelines fluorquinolones should be reserved for the treatment of clinical conditions that have responded poorly, or are expected to respond poorly, to other classes of antimicrobials and should only be used where **susceptibility testing has first been carried out**.

Table 4. Use of antibiotics on farm

Farm	Selection criteria	Evaluation of effectivity	Regular rotation?	Prescription
1	withdrawal period	Subjective	No	Herd veterinarian
2	withdrawal period	Subjective	No	Vet com.
3	Price	Subjective	No	Vet com.
4	Price	Subjective	No	Vet com.
5	Price	Not evaluated	No	Vet com.
6	Price	Not evaluated	No	Vet com.
7	Price	Subjective	No	Vet com.
8	effectivity	Subjective	No	Vet com.
9	withdrawal period	Subjective	No	Vet com.
10	withdrawal period	Subjective	No	Herd veterinarian

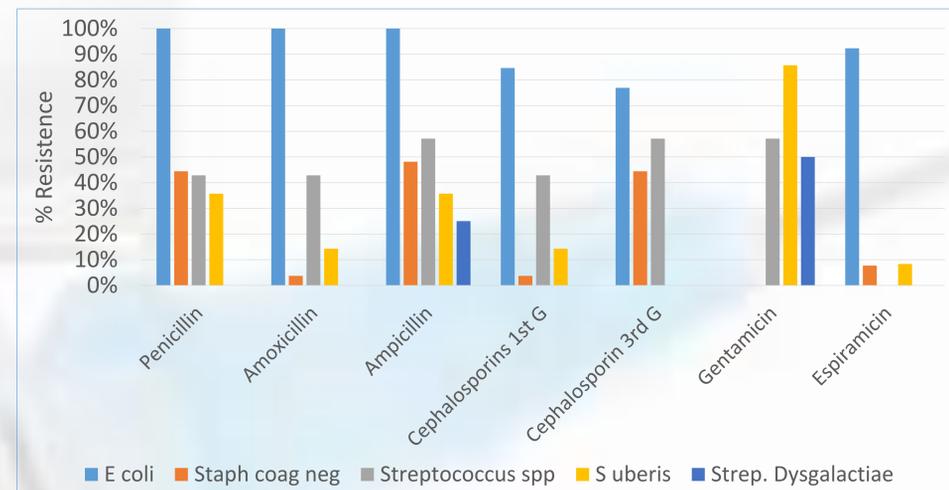


Figure 2. Percentage of resistance to most common drugs used on farms. Data shows there is a big presence of resistance to most common drugs used on farms, mainly to Penicillin and Ampicillin. E coli shows resistance, and has the biggest percentage of resistance, to a wider range of drugs. Data from antibiogram results realized by ALLIC during 2015 (n=67).

CONCLUSIONS

- ❖ Mastitis is the **most prevalent disease** on farms studied, as is shown by the results obtained.
- ❖ Farmers has an **easy way to buy antimicrobials**, but this will change with the new legislation.
- ❖ Some **questionable treatments** are routinely carried out on farms studied as treatments with last choice drugs.
- ❖ **Measures** to reduce antimicrobial use can be adopted:
 - Administering **intramammary infusions** instead of systemic treatments
 - Implementation of a **selective drying treatment** and applying **non-antibiotic sealants** may be another alternative
- ❖ Reduce the use of antibiotics causes a **decrease in resistance** and a **lower risk of transferring to people**.

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