

Supplementary Table S1. Quantity of each antimicrobial that was used for dairy calves. Antimicrobial usage were expressed in used daily doses (UDD). The mean of the AMU for each antimicrobial was the simple arithmetic mean of the AMU for each antimicrobial (2.5%–97.5% quantile in brackets). There were 1 study in Canada, 2 studies in Ireland and 2 studies in Sweden.

Country (Ref.)		Canada [1]	Ireland [2]	Ireland [3]	Sweden [4]	Sweden [4]
Number of calves		310 (10 farms)	5358 (44 farms)	391 (14 farms)	27 (organic farms)	27 (conventional farms)
Purpose of use		diarrhea	treatment	overall use	treatment	treatment
β -lactam	Penicillins		2.8 (0–14)	0.15	0.58	1.17
	3rd & 4th generation cephalosporins		0.01 (0–0.54)			
	Amoxicillin/clavulanate			16.00		
	Ceftiofur	1.52		1.25		
Sulfonamides	Sulfonamides		18.4 (0–462)			
	Sulfamethazine	15.77 (0.62–37.50)				
	Trimethoprim/sulfonamide	4.10 (0.35–9.93)		1.73	0.08	0.04
Aminoglycosides	Aminoglycosides		1.0 (0–9.3)			
	Dihydrostreptomycin				0.23	0.37
	Gentamycin			7.70		
	Spectinomycin			0.43		
	Framycetin or neomycin			3.01		
Phenicol	Phenicol		2.8 (0–42)			
	Florfenicol			14.13		
Tetracyclines	Tetracyclines		0.8 (0–9.3)	0.26		
	Oxytetracycline				0.04	
Quinolone	Fluoroquinolones		0.5 (0–7.3)	0.67		
	Enrofloxacin				0.01	0.01
Macrolides	Macrolides		1.7 (0–27.8)			

Supplementary Table S2. Antimicrobial resistance of bacteria associated with calf pneumonia. The number of resistant isolates divided by the total number of isolates and the corresponding 2.5%–97.5% quantile were provided in brackets. Study on *Pasteurella* spp. was in Spain and *Mannheimia* spp. in Belgium, respectively. Critically important antimicrobials (according to WHO) with the highest priority were in bold and italic.

Class of Antimicrobial	Antimicrobial	Pasteurella spp.		Mannheimia spp.	
		Ref.	Proportion of Resistant Isolates	Ref.	Proportion of Resistant Isolates
β -lactam	Amoxicillin/Clavulanic acid	[5]	0.00 (0/37; 0.00–0.00)		
	Ampicillin	[5]	0.86 (32/37; 0.88–0.88)		
	<i>Ceftiofur</i>	[5]	0.00 (0/37; 0.00–0.00)		
	Cefoxitin	[5]	0.00 (0/37; 0.00–0.00)		
Sulfonamides	Sulfisoxazole	[5]	0.86 (32/37; 0.88–0.88)		

	Trimethoprim/Sul famethoxazole	[5]	0.00 (0/37; 0.00–0.00)		
	Gentamicin			[6]	0.00(0/16; 0.00–0.00)
Aminoglycosides	Kanamycin	[5]	0.00 (0/37; 0.00–0.00)		
	Streptomycin	[5]	0.38 (14/37; 0.38–0.38)	[6]	0.94(15/16; 0.94–0.94)
Tetracyclines	Tetracycline	[5]	0.86 (32/37; 0.88–0.88)	[6]	0.94(15/16; 0.94–0.94)
Quinolone	Ciprofloxacin			[6]	0.25(4/16; 0.25–0.25)
Macrolides	Erythromycin			[6]	0.94(15/16; 0.94–0.94)

References

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