

Table S1. Number and percentage of antimicrobial resistant E. coli isolates stratified by year and antimicrobial. Data from IDEXX 2012-2018 Alberta and British Columbia from 7522 urine samples and 8084 bacterial isolates.

	2012	2013	2014	2015	2016	2017	2018	P Value
Amikacin	0/552 0%	0/684 0%	0/647 0%	0/781 0.00%	2/740 0.3%	1/750 0.1 %	1/688 0.1%	0.21 ^c
Amoxicillin	120/552 21.7%	132/684 19.3%	163/647 25.2%	208/781 26.6%	196/740 26.5%	167/752 22.2%	147/690 21.3%	0.02
AMC	42/552 7.6%	51/684 7.5%	59/647 9.1%	65/781 8.3%	73/740 9.9%	58/752 7.7%	44/690 6.4%	0.20
Cefalexin	55/552 10.0%	61/684 8.9%	80/647 12.4%	83/781 10.6%	95/740 12.8%	66/752 8.8%	49/690 7.1%	0.007
Cefovecin	40/552 7.2%	50/684 7.3%	58/647 9.0%	62/781 7.9%	65/740 8.8%	47/752 6.3%	35/690 5.0%	0.07
Clindamycin	IR	IR	IR	IR	IR	IR	IR	-
Doxycycline	44/551 8.0%	60/684 8.8%	56/645 8.7%	73/781 9.3%	62/740 8.4%	52/752 6.9%	49/690 7.1%	0.58
Enrofloxacin	14/552 2.5%	18/684 2.6%	26/647 4.0%	44/781 5.6%	28/740 3.8%	15/752 2.0%	18/690 2.6%	0.002
Gentamicin	10/552 1.8%	11/684 1.6%	10/647 1.5%	25/781 3.2%	18/740 2.4%	21/750 2.8%	8/689 1.2%	0.07
Marbofloxacin	14/552 2.5%	17/684 2.5%	25/647 3.9%	42/781 5.4%	28/740 3.8%	14/752 1.9%	14/690 2.0%	0.0008
Nitrofurantoin	4/552 0.7%	7/684 1.0%	5/647 0.8%	5/781 0.6%	2/740 0.3%	2/752 0.3%	3/690 0.4%	0.44 ^c
TMS	14/552 2.5%	20/684 2.9%	23/647 3.6%	43/781 5.5%	44/740 5.9%	23/752 3.1%	21/690 3.0%	0.001

AMC = Amoxicillin with clavulanic acid, TMS = trimethoprim-sulfamethoxazole IR = Intrinsic

resistance

^c Fisher-exact

Table S2. Number and percentage of bacterial isolates stratified by province and species.
 Data from IDEXX 2012-2018 Alberta and British Columbia from 7522 urine samples and 8084 bacterial isolates

Bacteria	Alberta (n = 2630 samples)	British Columbia (n = 5 454 samples)	Both (n = 8084 samples)	P Value
<i>E coli</i>	1564 59.4%	3284 60.2%	4847 60.0%	0.52
<i>Enterococcus spp</i>	597 22.7%	1236 22.7%	1833 22.7%	0.97
<i>Staphylococcus spp</i>	322 12.2%	630 11.6%	952 11.8%	0.39
<i>Streptococcus spp</i>	35 1.3%	66 1.2%	101 1.2%	0.73
<i>Proteus spp</i>	31 1.2%	65 1.2%	96 1.2%	1
<i>Klebsiella spp</i>	14 0.5%	53 1.0%	67 0.8%	0.06
<i>Enterobacter spp</i>	20 0.8%	32 0.6%	52 0.6%	0.44
All Bacteria	2630 100%	5450 100%	8084 100%	

Numbers of individual isolates in each column do not add up to 100% as only most common seven isolates shown

Table S3. Number and percentage of antimicrobial resistant Enterococcus isolates stratified by year and antimicrobial.

	2012	2013	2014	2015	2016	2017	2018	P Value
Amikacin	IR	IR	IR	IR	IR	IR	IR	NA
Amoxicillin	8/206 3.9%	11/248 4.4%	8/265 3.0%	10/274 3.6%	9/300 3.0%	5/256 2.0%	15/265 5.7%	0.41
AMC	8/206 3.9%	11/248 4.4%	8/265 3.0%	10/274 3.6%	9/300 3.0%	5/256 2.0%	15/265 5.7%	0.41
Cefalexin	IR	IR	IR	IR	IR	IR	IR	NA
Cefovecin	IR	IR	IR	IR	IR	IR	IR	NA
Clindamycin	IR	IR	IR	IR	IR	IR	IR	NA
Doxycycline	90/200 45.0%	118/240 49.2%	120/261 46.0%	121/270 44.8%	156/297 52.5%	106/253 41.9%	129/264 48.9%	0.70
Enrofloxacin	9/206 4.4%	13/248 5.2%	16/265 6.0%	9/274 3.3%	15/300 5.0%	5/255 2.0%	18/265 6.8%	0.16
Gentamicin	IR	IR	IR	IR	IR	IR	IR	NA
Marbofloxacin	35/206 17.0%	41/248 16.5%	48/265 18.1%	41/274 15.0%	49/300 16.3%	39/256 15.2%	47/265 17.7%	0.97
Nitrofurantoin	2/206 1%	9/248 3.6%	8/265 3.0%	8/274 2.9%	6/300 2.0%	4/256 1.6%	5/263 1.9%	0.11
TMS	IR	IR	IR	IR	IR	IR	IR	NA

AMC = Amoxicillin with clavulanic acid, TMS = trimethoprim-sulfamethoxazole IR = Intrinsic

resistance

Table S4. Number and percentage of antimicrobial resistant Streptococcus species stratified by year and antimicrobial. Data from IDEXX 2012-2018 Alberta and British Columbia from 7522 urine samples and 8084 bacterial isolates.

	2012	2013	2014	2015	2016	2017	2018	P Value
Amikacin	0/9 0%	0/8 0%	1/11 9.1%	0/10 0%	0/15 0%	0/14 0%	8/93 8.6%	0.83 ^C
Amoxicillin	30/105 28.6%	49/127 38.6%	46/146 31.5%	45/154 29.2%	54/137 39.4%	41/158 25.9%	36/117 30.8%	0.13
AMC	10/105 9.5%	7/127 5.5%	11/146 7.5%	11/154 7.1%	14/137 10.2%	14/158 8.9%	4/117 3.4%	0.42
Cefalexin	10/105 9.5%	7/127 5.5%	11/146 7.5%	11/154 7.1%	14/137 10.2%	14/158 8.9%	4/117 3.4%	0.42
Cefovecin	10/105 9.5%	7/127 5.5%	11/146 7.5%	11/154 7.1%	14/137 10.2%	14/158 8.9%	6/117 5.1%	0.68
Clindamycin	8/105 7.6%	14/127 11.0%	13/146 8.9%	17/154 11.0%	28/137 20.4%	26/158 16.5%	30/117 25.6%	0.0002
Doxycycline	3/105 2.9%	2/126 1.6%	4/146 2.7%	0/154 0%	3/137 2.2%	10/158 6.3%	2/117 1.7%	0.03
Enrofloxacin	9/105 8.6%	7/127 5.5%	4/146 2.7%	5/154 3.2%	10/137 7.3%	8/158 5.1%	5/117 4.3%	0.32
Gentamicin	6/105 5.7%	5/127 3.9%	2/146 1.4%	3/154 1.9%	5/137 3.6%	1/158 0.6%	1/117 0.9%	0.09 ^C
Marbofloxacin	11/105 10.5%	8/127 6.3%	6/146 4.1%	8/154 5.2%	12/137 8.8%	9/158 1.9%	3/117 2.6%	0.17
Nitrofurantoin	0/105 0%	0/127 0%	0/146 0%	0/154 0%	0/137 0%	0/158 0%	1/117 0.9%	0.24
TMS	2/105 1.9%	5/127 3.9%	4/146 2.7%	3/154 1.9%	10/137 7.3%	3/158 1.9%	4/117 3.4%	0.22

AMC = Amoxicillin with clavulanic acid, TMS = trimethoprim-sulfamethoxazole IR = Intrinsic

resistance

C= fischer exact