ANTIBACTERIAL AGENT SUSCEPTIBLITY AND RESISTANCE & BACTERIAL ANATOMCIAL SITE ANALYSIS

LOUISIANA VETERINARY MEDICAL DIAGNOSTIC LABORATORY 2004

PRELIMINARY REPORT
Section II
(April 3, 2006)

Prepared by:

Gary A. Balsamo, DVM, MPH & TM,
Infectious Disease Epidemiology Section
Office of Public Health
Louisiana Department of Health and Hospitals
1450 L & A Road
Metairie, LA 70001

II. Susceptibility profiles for specific bacteria or bacterial groups

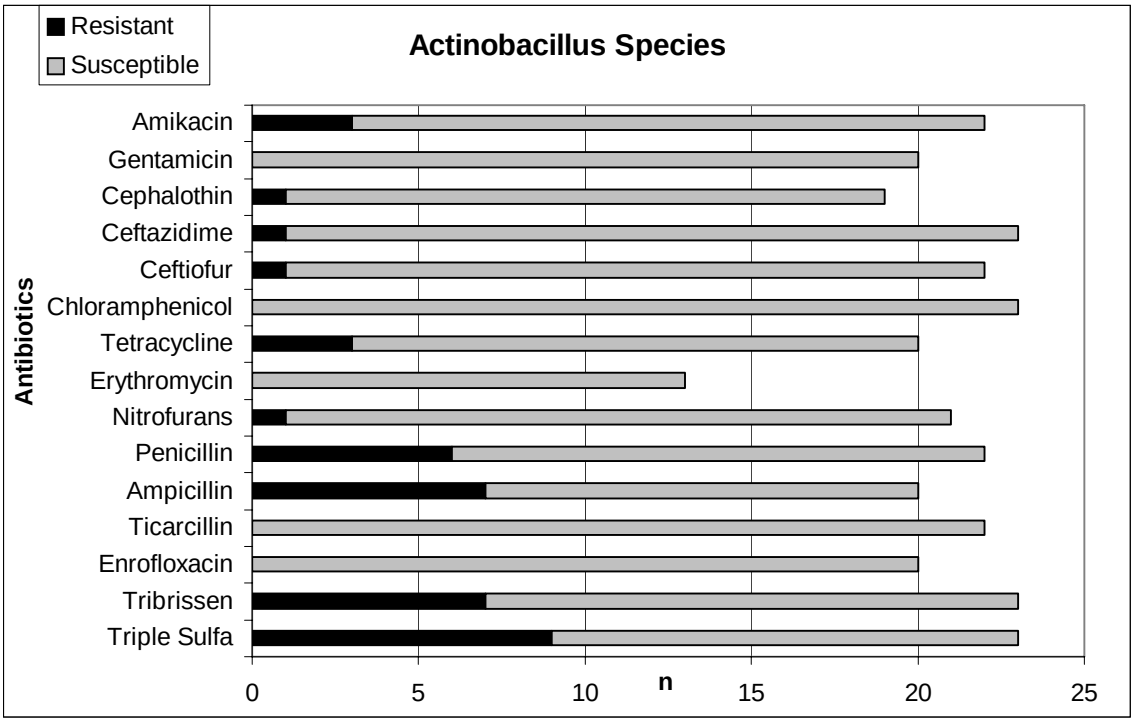
Bacterial species or genera susceptibility/resistance profiles are displayed in this section. If over ten isolates from individual bacterial species were available, antibiotic activity against the individual bacterial species was examined. In many cases if isolates of one bacterial species were numerous but isolates of related genera were less than ten, the smaller number of isolates from related bacterial species was included in the genera group. Genera that featured less than 10 samples submitted to the LVMDL over the 2004 calendar year were excluded. Some of the isolates were not identified to bacterial species, but instead were categorized as non-fermenters, gram-positive rods, or gram-negative rods. These categories were analyzed in the same manner as the specified genera.

There are four sections that comprise the genera profile:

A. A graph illustrating the susceptibility/resistance profiles of selected antimicrobial agents tested on isolates of the organism
B. A table showing percent susceptibility for selected antimicrobial agents on isolates of the organism. Agents effective against 90% or greater of the bacterial samples are illustrated in white boxes; those effective against 80% or greater are illustrated in light grey boxes; and those effective against 70% or greater are illustrated in darker grey boxes. Agents effective against less than 70% of the samples are illustrated in black boxes.
C. The number (n) and percentage of bacterial isolates of the organism from each animal species is shown with a graph illustrating the animal species origin of the samples studied.
D. A graph portraying the anatomical site of sample origin and the animal species of origin. In this graph the following abbreviations or short terms refer to the anatomical sites of origin listed to the right:

ABSCESS	abscess (abscess, draining tract)
AV_GI/REP	avian lower gastrointestinal and reproductive tracts (cloaca, choana, vent)
BLOOD	blood
BONE	bone
CSF	cerebrospinal fluid
EAR	ear
EYE	eye (conjunctiva)
FOOT	foot
GI	gastrointestinal tract
IMPLANT	implant (implant site)
JOINT	joint (joint flush, joint fluid, bursal fluid)
LYMPHNODE	lymph node (lymphatic fluid)
MILK	milk (mammary gland, teat, milk)
MOUTH	mouth abscess
PERFLUID	peritoneal fluid (peritoneal flush, abdominal fluid)
REPD	female reproductive tract (vagina, uterus)
REPD(MALE)	male reproductive tract (penis, prostate flush, prepuce)
RESP	respiratory (lungs, alveolus, bronchial wash)
SKIN	skin (skin biopsy)
SXSITE	surgical site
THRFLUID	thoracic fluid (pleural fluid, chest fluid)
UMBILICUS	umbilicus (navel, umbilical cord)
URINARY	urinary (urine, bladder stone, urine sample)
URT	upper respiratory tract (trans-tracheal wash, tracheal wash, nasal flush)
WOUND	wound

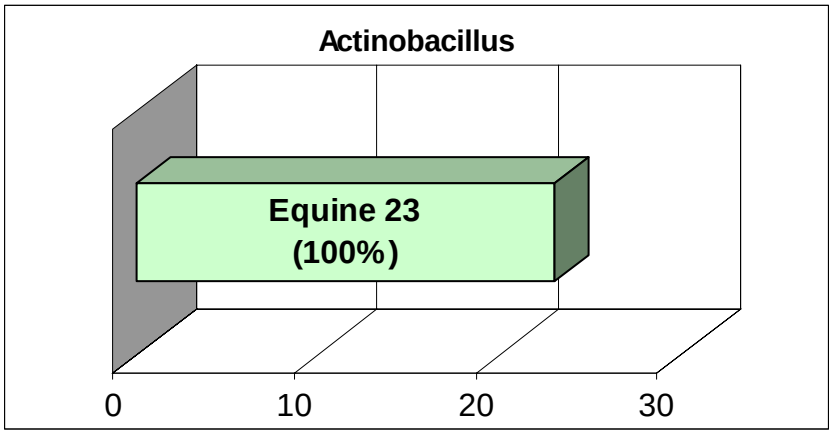
A. *Actinobacillus* species (*Actinobacillus* spp, *Actinobacillus equili*)



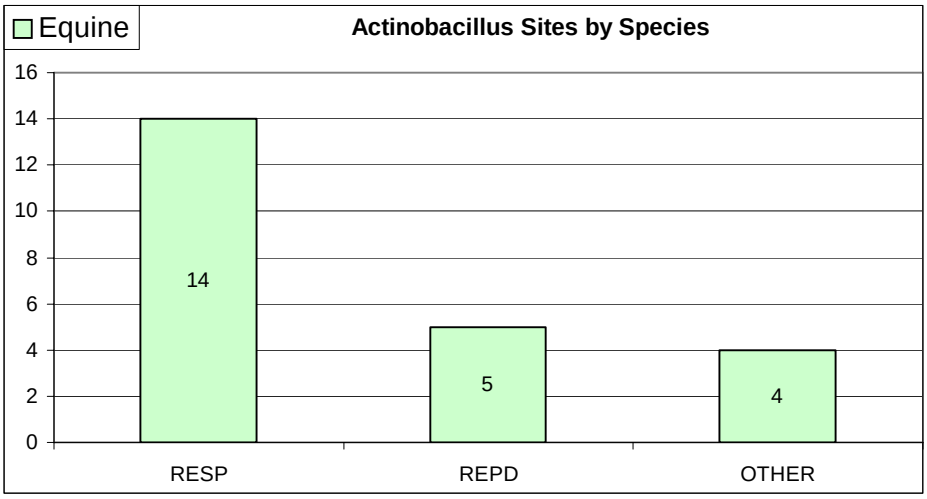
1. Table

Actinobacillus Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	86.4
Gentamicin	100
Cephalothin	94.7
Ceftazidime	95.7
Ceftiofur	95.5
Chloramphenicol	100
Tetracycline	85
Erythromycin	100
Nitrofurans	95.2
Penicillin	72.7
Ampicillin	65
Ticarcillin	100
Enrofloxacin	100
Tribrissen	69.6
Triple Sulfa	60.9

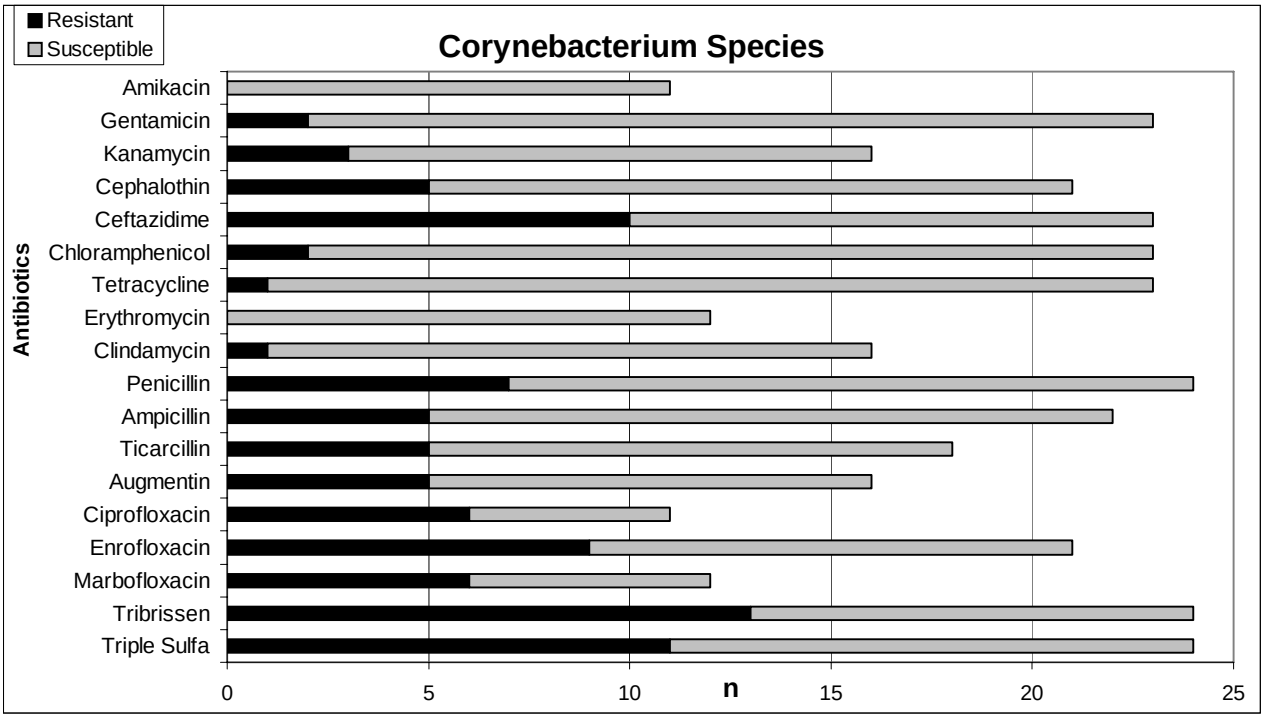
2. Animal Species:



3. Anatomical Sites



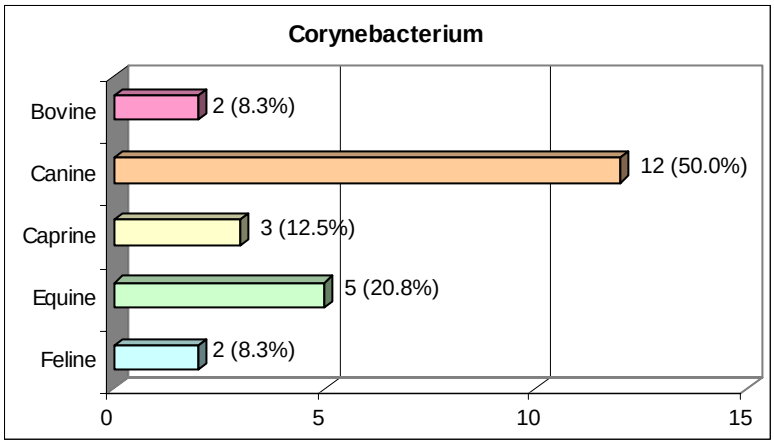
B. *Corynebacterium* spp (*Corynebacterium* spp, *Corynebacterium pseudotuberculosis*)



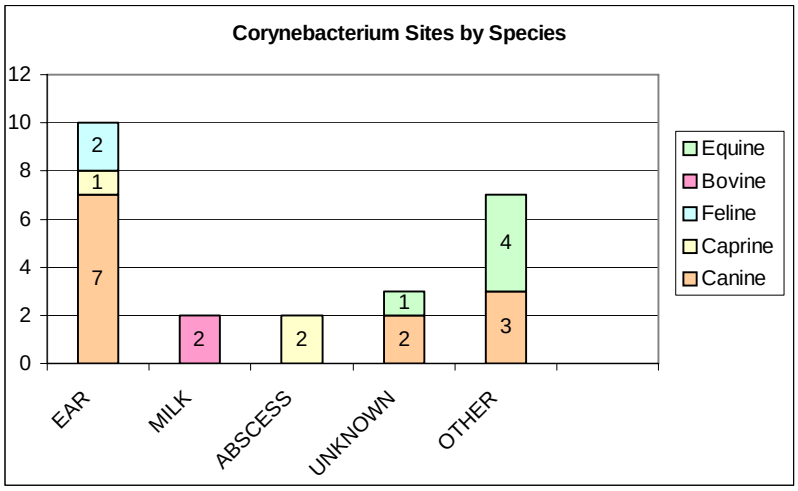
1. Table

Cornyebacterium Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	100
Gentamicin	91.3
Kanamycin	81.3
Cephalothin	76.2
Ceftazidime	56.5
Chloramphenicol	91.3
Tetracycline	95.7
Erythromycin	100
Clindamycin	93.8
Penicillin	70.8
Ampicillin	77.3
Ticarcillin	72.2
Augmentin	68.8
Ciprofloxacin	45.5
Enrofloxacin	57.1
Marbofloxacin	50
Tribrissen	45.8
Triple Sulfa	54.2

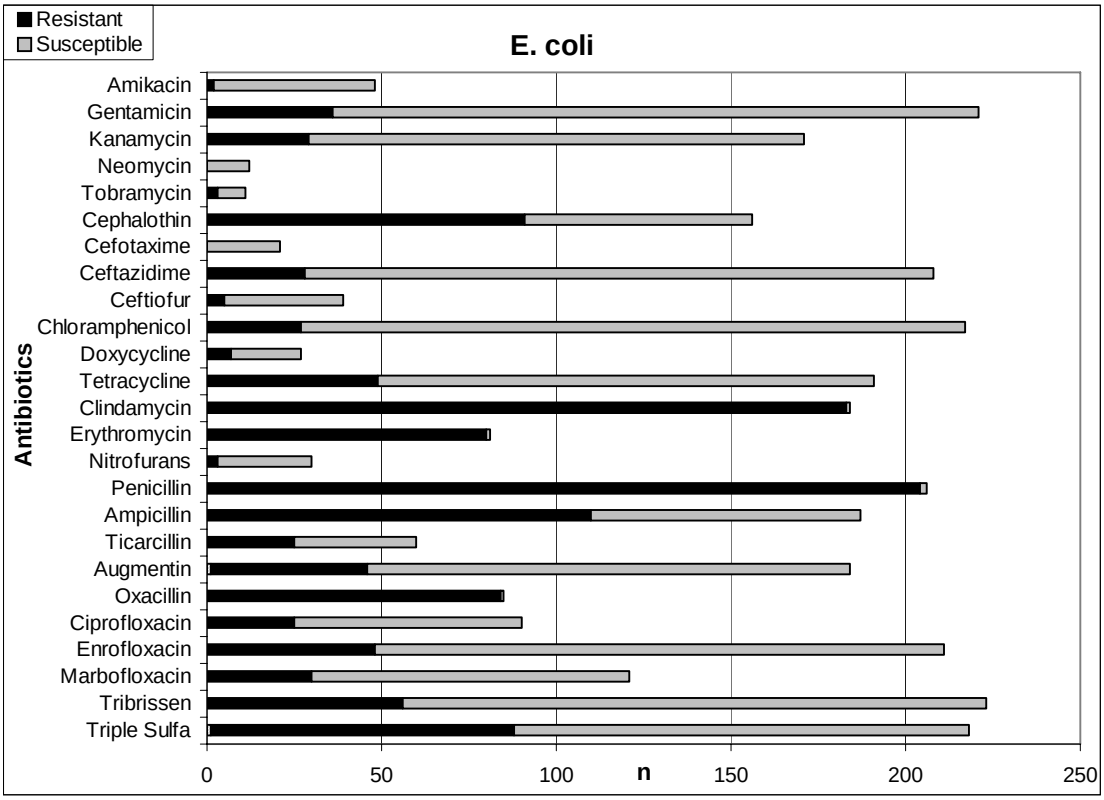
2. Animal Species:



3. Anatomical Sites



C. *E Coli*



1. Table

E. coli Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	96
Gentamicin	84
Kanamycin	83
Neomycin	100
Tobramycin	73
Cephalothin	42
Ceftaxime	100
Ceftazidime	87
Ceftiofur	87
Chloramphenicol	88
Doxycycline	74
Tetracycline	74
Clindamycin	1
Erythromycin	1
Nitrofurans	90
Penicillin	1
Ampicillin	41
Ticarcillin	58
Augmentin	75
Oxacillin	1
Ciprofloxacin	72
Enrofloxacin	77
Marbofloxacin	75
Tribrissen	75
Triple Sulfa	60

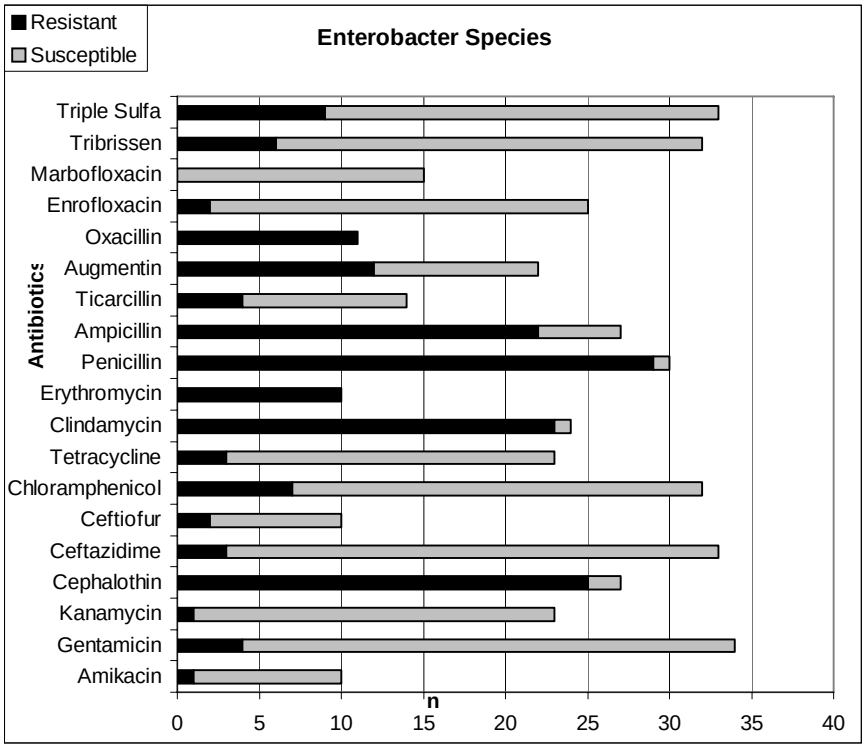
2. Animal Species:

AVIAN	10	4.5%	**CAPRINE**	2	0.9%	**PRIMATE**	2	0.9%
BOVINE	2	0.9%	**EQUINE**	18	8.1%	**REPTILE**	2	0.9%
CANINE	137	62.0%	**FELINE**	41	18.6%	**UNKNOWN**	4	1.8%

3. Anatomical Sites

	AVIAN	BOVINE	CANINE	CAPRINE	EQUINE	FELINE	PRIMATE	REPTILE	RODENT	UNKNOWN	TOTALS
ABSCESS	2		3		2	1			1		9
AV_GI/REP	1		3								4
EAR			8			2					10
IMPLANT			8		1	1					10
PERFLUID			2		2	1					5
REPD			3		6						9
RESP		2	1						1		4
SKIN			2								2
SXSITE			2							1	3
URINARY			86	1	1	26				1	115
URT			2		1	3		1			7
WOUND			3			1					4
OTHER	1	1	4		2	1					9
UNKNOWN	4		13	1	3	5	2	1	1	1	31
TOTALS	8	3	140	2	18	41	2	2	3	3	222

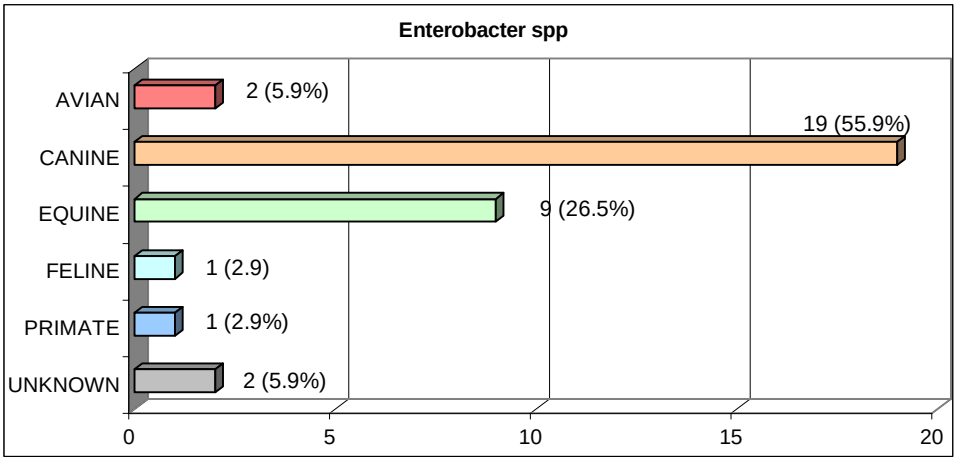
D. *Enterobacter* Species (*Enterobacter* spp, *Enterobacter cloacae*, *Enterobacter aerogenes*)



1. Table

Enterobacter Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	90
Gentamicin	88.2
Kanamycin	95.7
Cephalothin	7.4
Ceftazidime	90.9
Ceftiofur	80
Chloramphenicol	78.1
Tetracycline	87
Erythromycin	0
Clindamycin	4.2
Penicillin	3.3
Ampicillin	18.5
Ticarcillin	71.4
Augmentin	45.5
Oxacillin	0
Enrofloxacin	92
Marbofloxacin	100
Tribrissen	81.3
Triple Sulfa	72.7

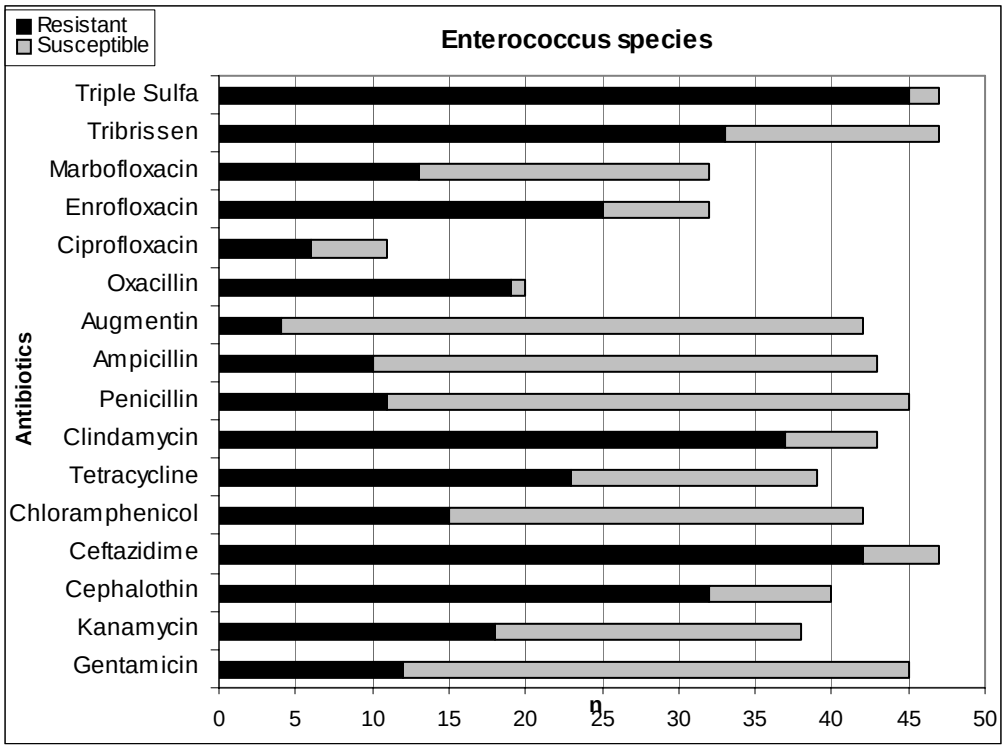
2. Animal Species:



2. Anatomical Sites:

	AVIAN	CANINE	EQUINE	FELINE	PRIMATE	UNKNOWN	TOTALS
BLOOD			4				4
IMPLANT		2	1			1	4
RESPD (MALE)		2					2
URINARY		7		1			8
OTHER		3	3				6
UNKNOWN	2	5	1		1	1	10
TOTALS	2	19	9	1	1	2	34

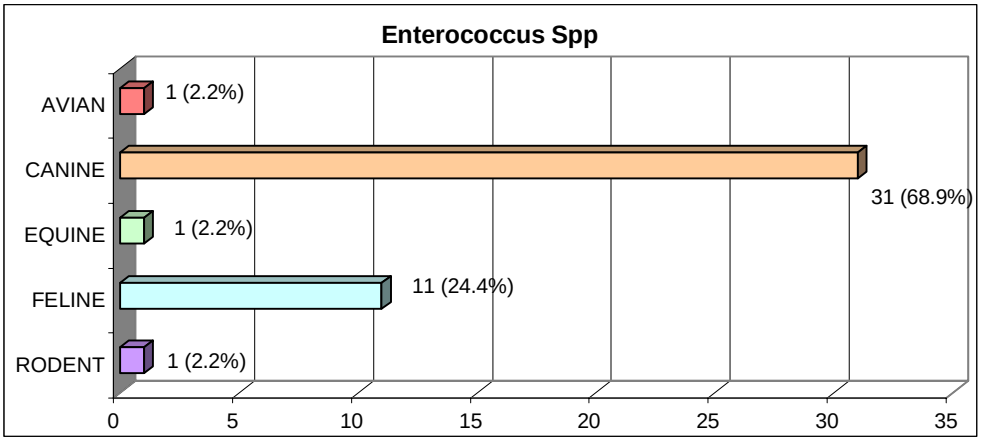
E. *Enterococcus* spp



1. Table

Enterococcus Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Gentamicin	73.3
Kanamycin	52.6
Cephalothin	20
Ceftazidime	10.6
Chloramphenicol	64.3
Tetracycline	41
Clindamycin	14
Penicillin	75.6
Ampicillin	76.7
Augmentin	90.5
Oxacillin	5
Ciprofloxacin	45.5
Enrofloxacin	21.9
Marbofloxacin	59.4
Tribrissen	29.8
Triple Sulfa	4.3

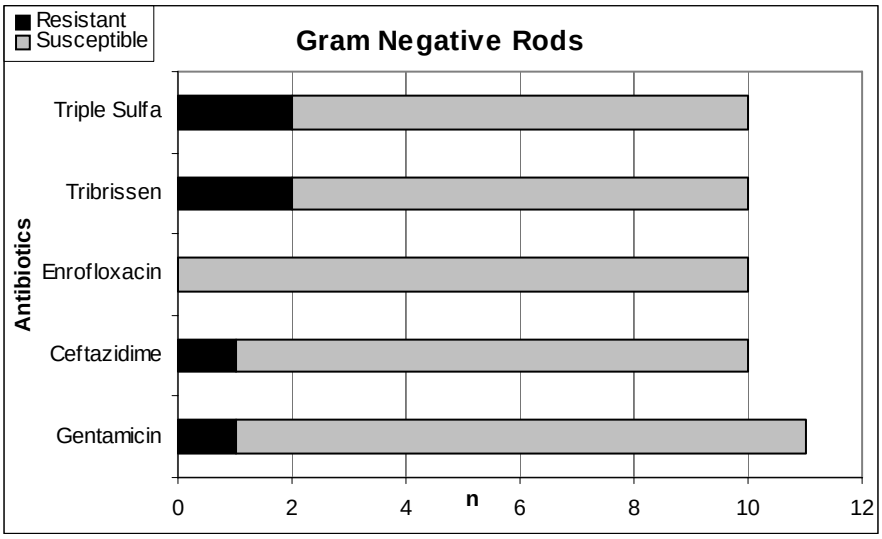
2. Animal Species:



3. Anatomical Sites:

	AVIAN	CANINE	EQUINE	FELINE	RODENT	TOTALS
ABSCESS		2				2
EAR		4				4
IMPLANT		2				2
URINARY		18		7		25
WOUND				2		2
OTHER	1	3	1	2	1	8
UNKNOWN		2				2
TOTALS	1	31	1	11	1	45

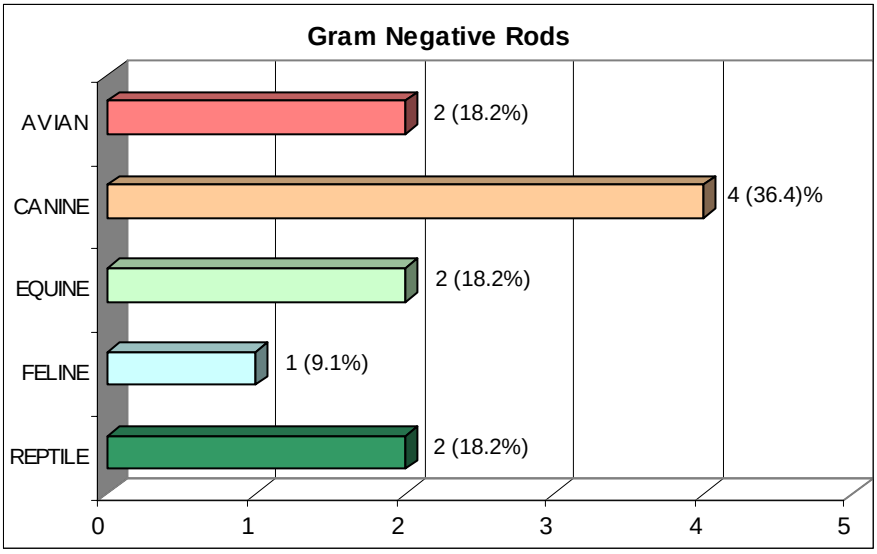
F. Gram Negative Rods



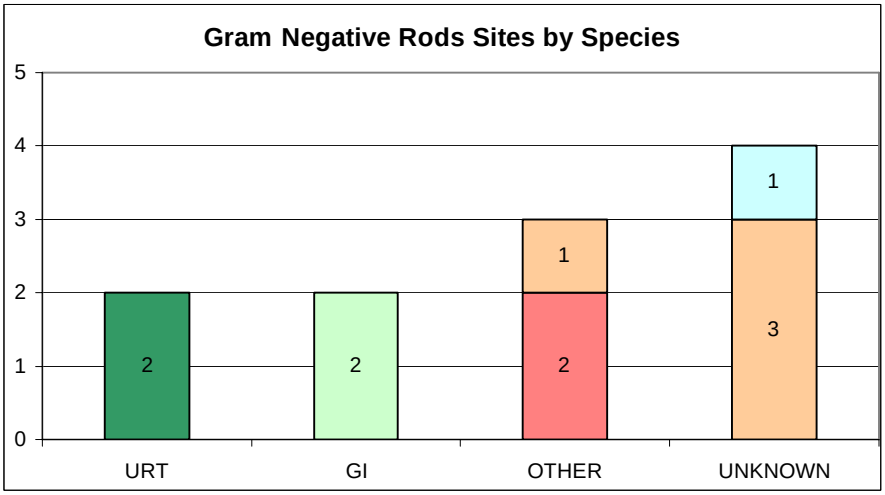
1. Table

Gram Negative Rods Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Gentamicin	90.9
Ceftazidime	90
Enrofloxacin	100
Tribrissen	80
Triple Sulfa	80

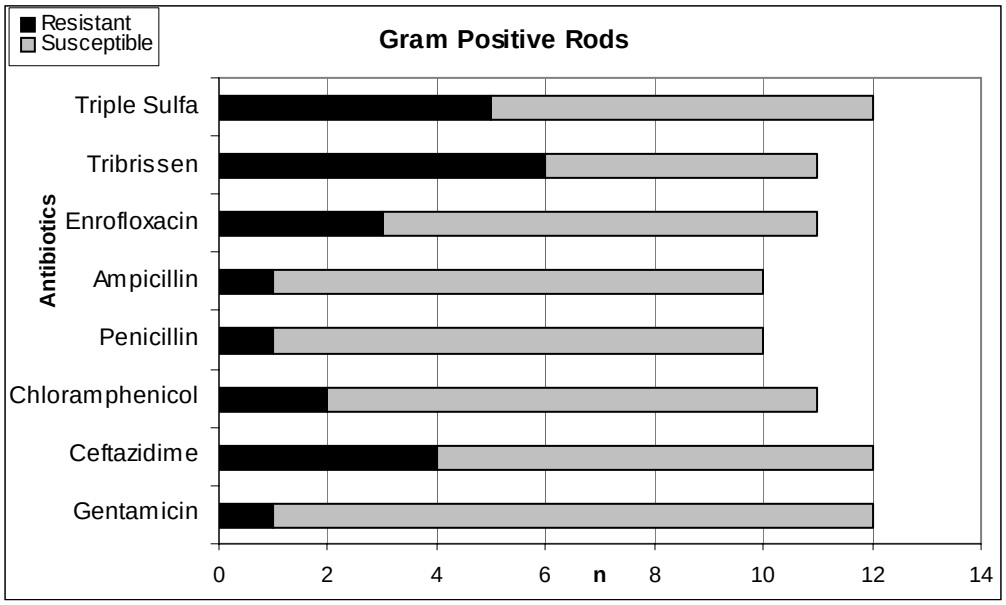
2. Animal Species:



3. Anatomical Site:



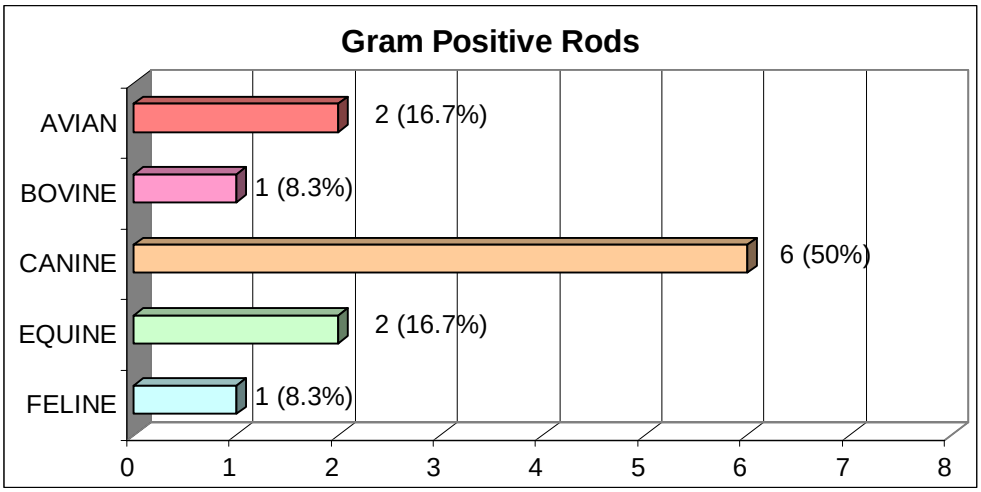
G Gram Positive Rods



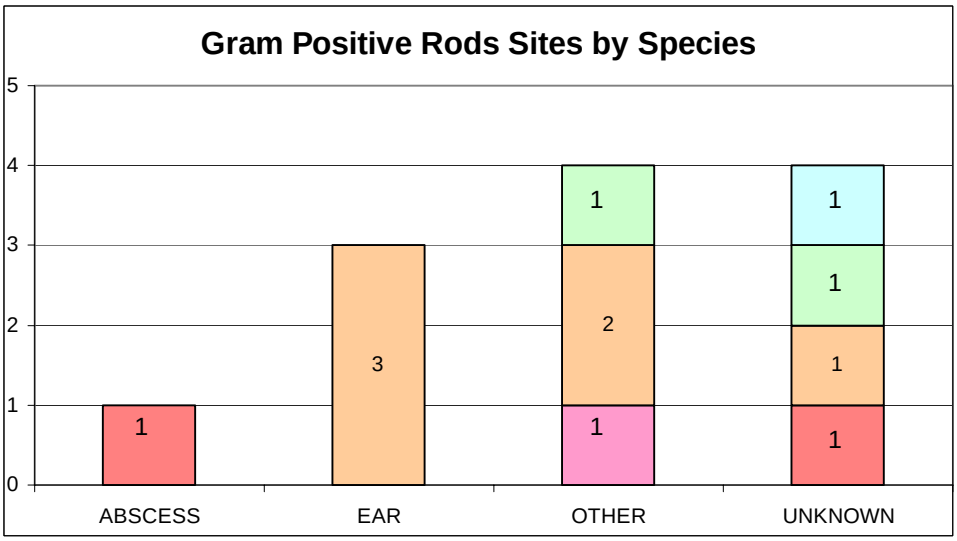
1. Table

Gram Positive Rods Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Gentamicin	91.7
Ceftazidime	66.7
Chloramphenicol	81.8
Penicillin	90
Ampicillin	90
Enrofloxacin	72.7
Tribrissen	45.5
Triple Sulfa	58.3

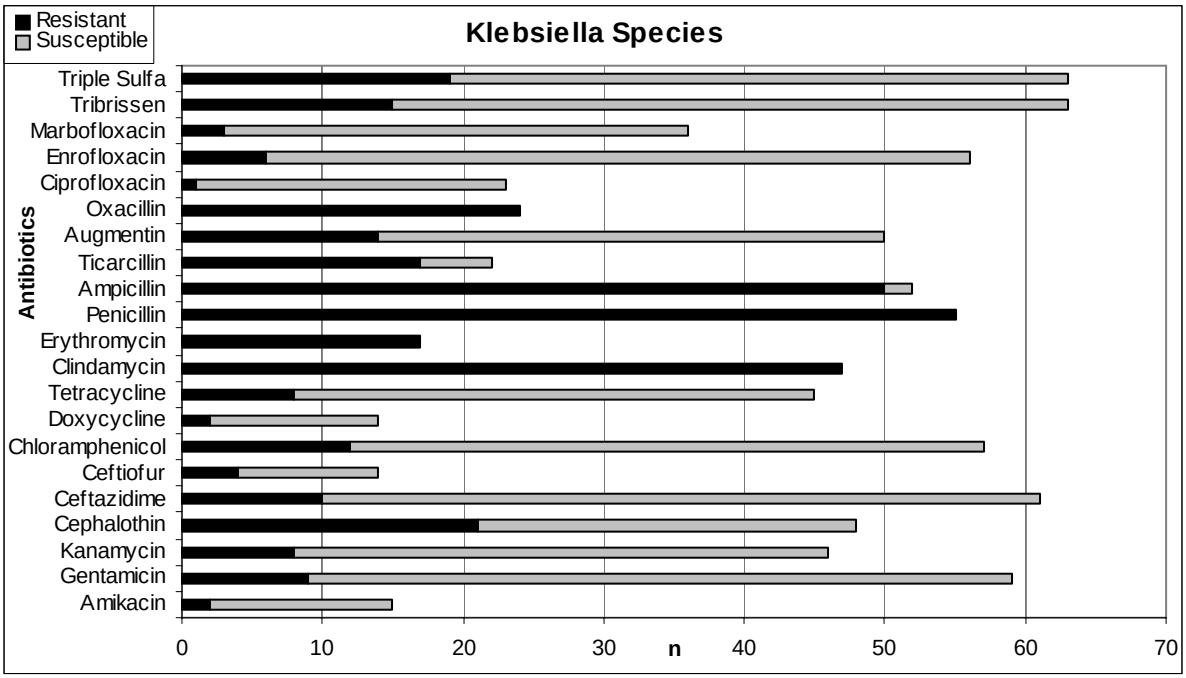
2. Animal Species:



3. Anatomical Sites:



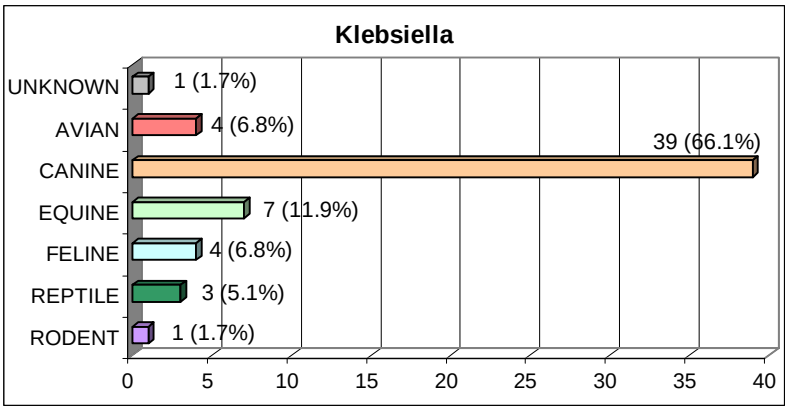
H. *Klebsiella* spp (*Klebsiella pneumoniae*, *Klebsiella* spp)



1. Table

Klebsiella Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	86.7
Gentamicin	84.2
Kanamycin	82.6
Cephalothin	56.3
Ceftazidime	83.6
Ceftiofur	71.4
Chloramphenicol	78.9
Doxycycline	85.7
Tetracycline	82.2
Erythromycin	0
Clindamycin	0
Penicillin	0
Ampicillin	3.8
Ticarcillin	22.7
Augmentin	72
Oxacillin	0
Ciprofloxacin	95.7
Enrofloxacin	89.3
Marbofloxacin	91.7
Tribrissen	76.2
Triple Sulfa	69.8

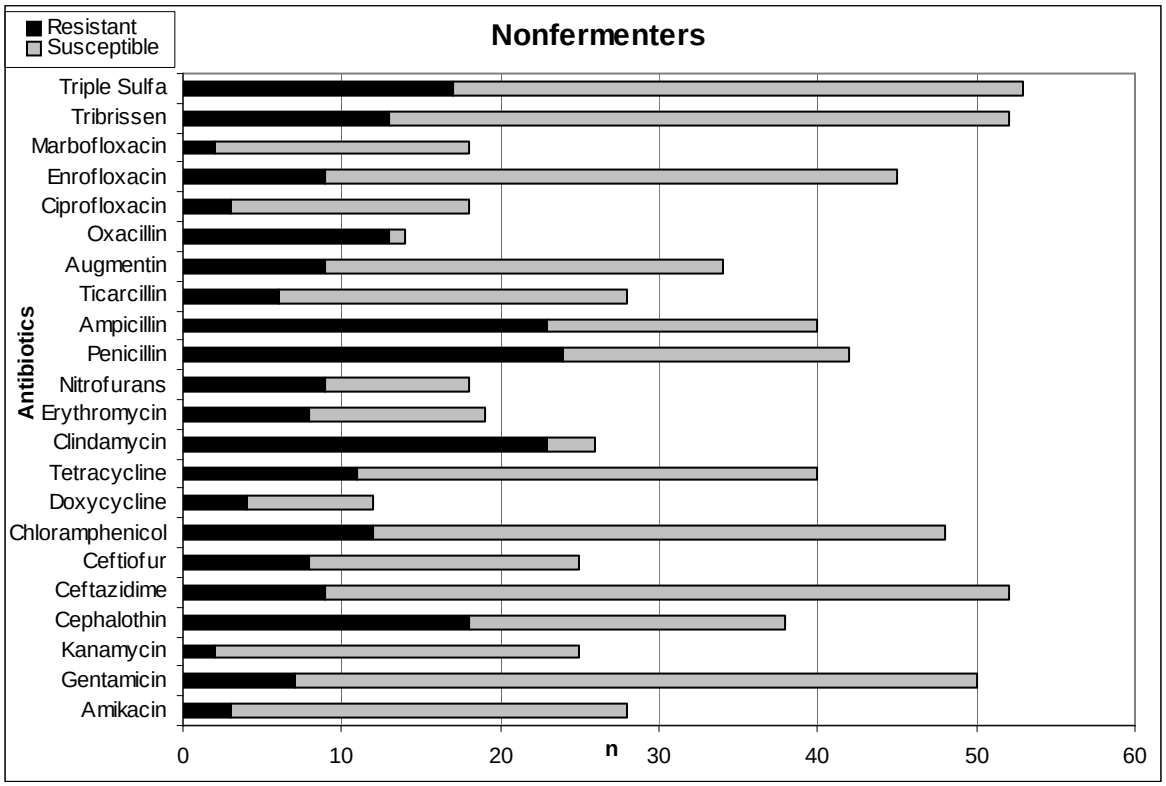
2. Animal Species:



3. Anatomical Site:

	AVIAN	CANINE	EQUINE	FELINE	REPTILE	RODENT	UNKNOWN	TOTALS
ABSCESS	1		1					2
AV_GI/REP	2							2
EAR		2						2
IMPLANT		2	1					3
REPD		1	1				1	3
SXSITE		1		1				2
URINARY		23	1	1				25
URT		2	2		1			5
WOUND	1	1						2
OTHER		3	1			1		5
UNKNOWN		4		2	2			8
TOTALS	4	39	7	4	3	1	1	59

I. Nonfermenters



1. Table

Nonfermenters Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	89.3
Gentamicin	86
Kanamycin	92
Cephalothin	52.6
Ceftazidime	82.7
Ceftiofur	68
Chloramphenicol	75
Doxycycline	66.7
Tetracycline	72.5
Erythromycin	57.9
Clindamycin	11.5
Nitrofurans	50
Penicillin	42.9
Ampicillin	42.5
Ticarcillin	78.6
Augmentin	73.5
Oxacillin	7.1
Ciprofloxacin	83.3
Enrofloxacin	80
Marbofloxacin	88.9
Tribrissen	75
Triple Sulfa	67.9

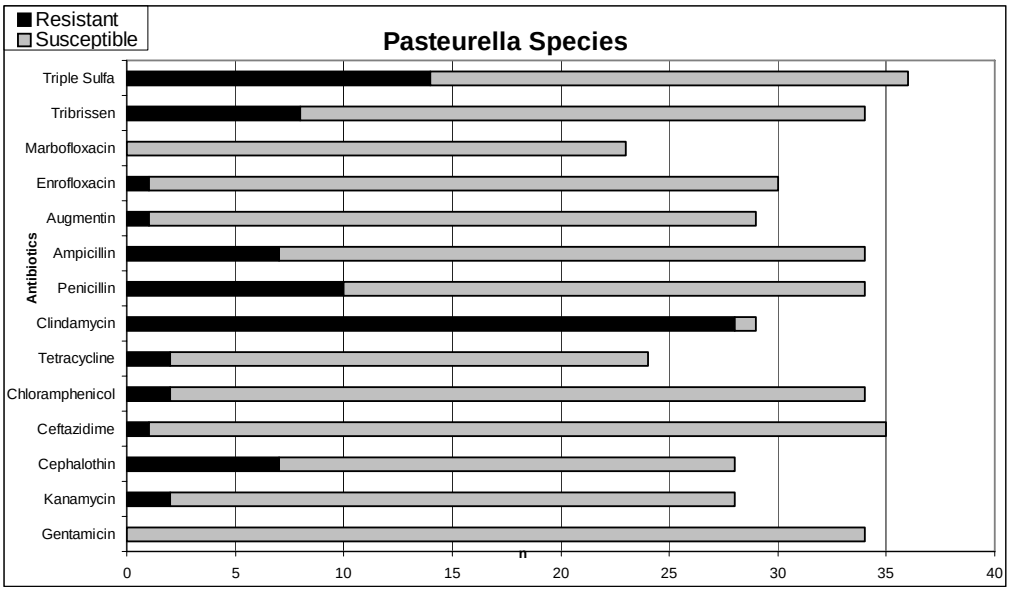
2. Animal Species:

AVIAN	5	10.0%	**CANINE**	17	34.0%	**MARSUP**	1	2.0%
BOVINE	1	2.0%	**EQUINE**	13	26.0%	**PORCINE**	1	2.0%
CAMELID	2	4.0%	**FELINE**	6	12.0%	**REPTILE**	3	6.0%
						RODENT	1	2.0%

3. Anatomical Sites:

	AVIAN	**BOVINE**	**CAMELID**	**CANINE**	**EQUINE**	**FELINE**	**MARSUP**	**PORCINE**	**REPTILE**	**RODENT**	**TOTALS**
ABSCESS							1			1	2
AV_GI/REP	2										2
EYE				1	1						2
IMPLANT				3							3
REPD					2						2
RESP		1		3		1					5
THRFLUID				2							2
URINARY				4		1					5
URT	1		1	1	6			1	1		11
OTHER	1				3	1			2		7
UNKNOWN	1		1	3	1	3					9
TOTALS	5	1	2	17	13	6	1	1	3	1	50

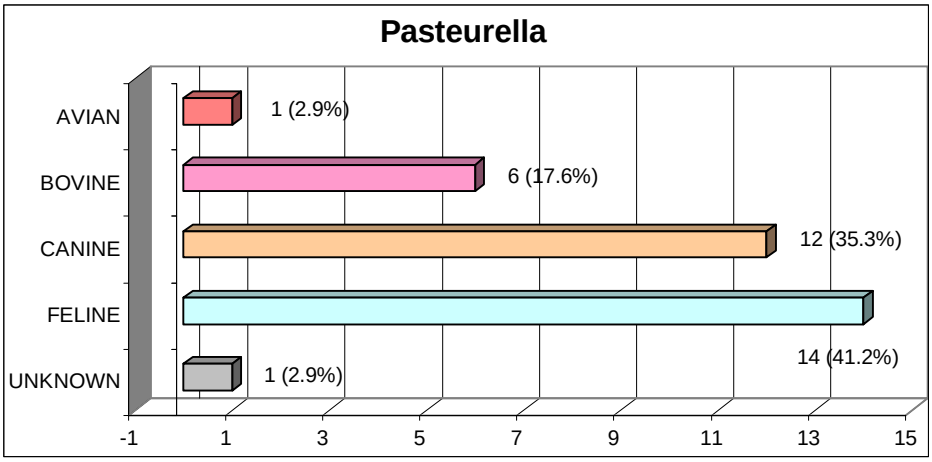
J. *Pasteurella* spp (*Pasteurella multocida, Pasteurella spp*)



1. Table

Pasteurella Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Gentamicin	100
Kanamycin	92.9
Cephalothin	75
Ceftazidime	97.1
Chloramphenicol	94.1
Tetracycline	91.7
Clindamycin	3.4
Penicillin	70.6
Ampicillin	79.4
Augmentin	96.6
Enrofloxacin	96.7
Marbofloxacin	100
Tribrissen	76.5
Triple Sulfa	61.1

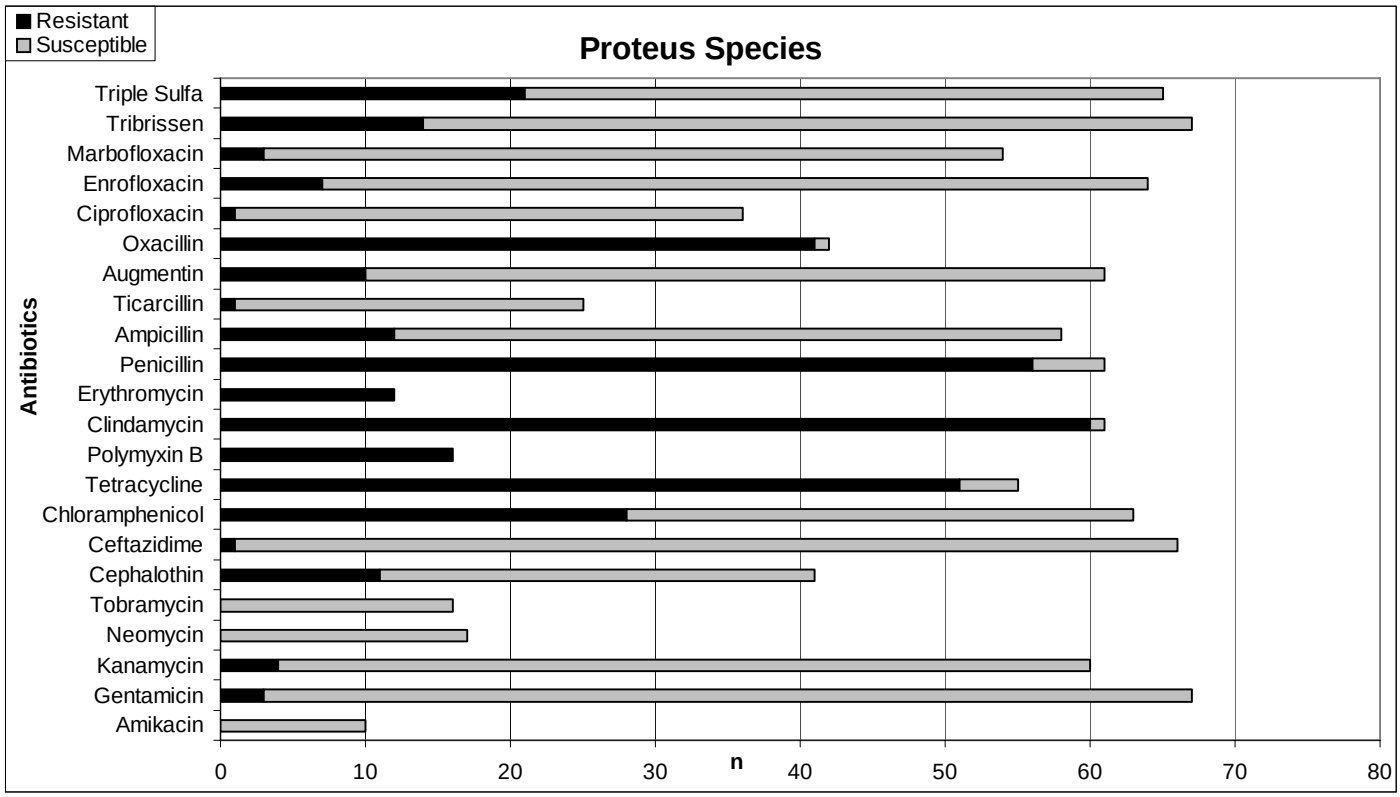
2. Animal Species



3. Anatomical Site:

	AVIAN	BOVINE	CANINE	FELINE	UNKNOWN	TOTALS
ABSCESS			1	2		3
EAR				2		2
LYMPHNODE				1		1
RESP		2	1			3
THRFLUID			1	1		2
URT		1	3	3		7
WOUND			1	1	1	3
OTHER		1	1	1		3
UNKNOWN	1	2	4	3		10
TOTALS	1	6	12	14	1	34

K. *Proteus* spp (*Proteus mirabilis*, *Proteus* spp)



1. Table

Proteus Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	100
Gentamicin	95.5
Kanamycin	93.3
Neomycin	100
Tobramycin	100
Cephalothin	73.2
Ceftazidime	98.5
Chloramphenicol	55.6
Tetracycline	7.3
Polymyxin B	0
Erythromycin	0
Clindamycin	1.6
Penicillin	8.2
Ampicillin	79.3
Ticarcillin	96
Augmentin	83.6
Oxacillin	2.4
Ciprofloxacin	97.2
Enrofloxacin	89.1
Marbofloxacin	94.4
Tribrissen	79.1
Triple Sulfa	67.7

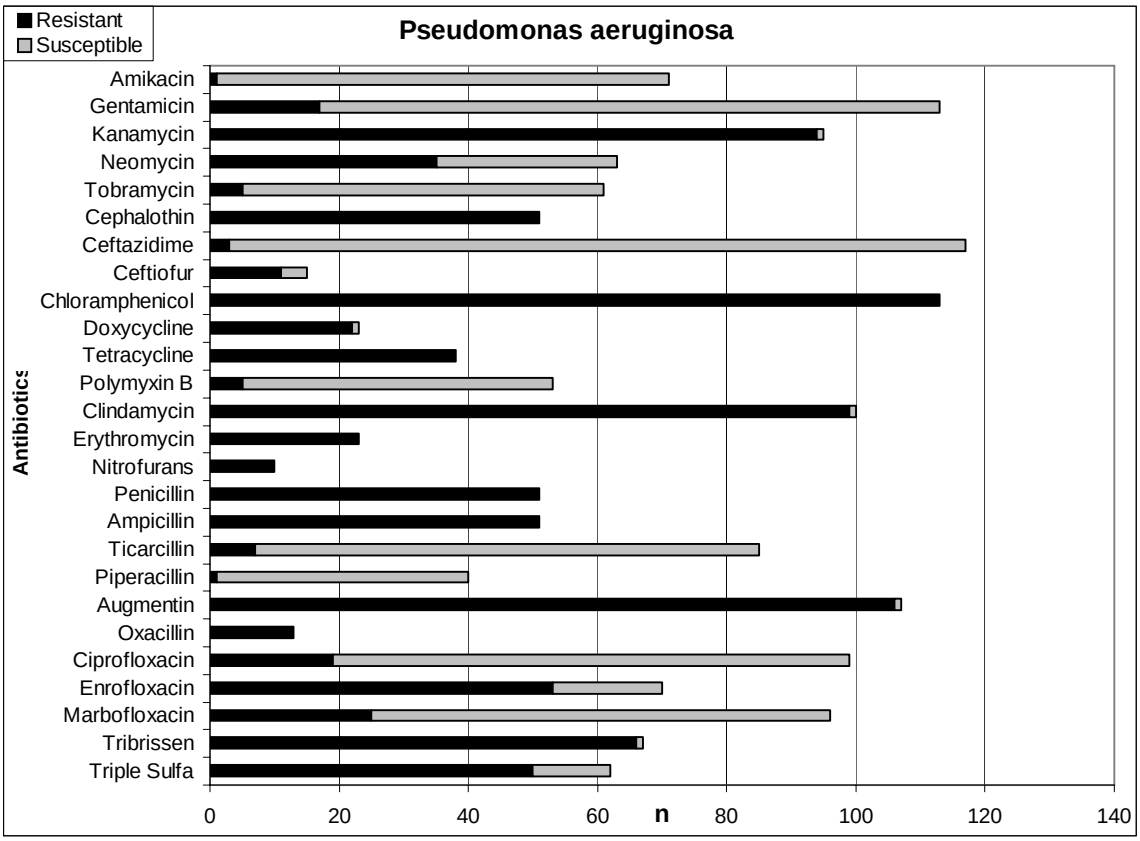
2. Animal Species:

AVIAN	2	3.0%	**FELINE**	5	7.5%	**RODENT**	1	1.5%
CANINE	57	85.1%	**MUSTELID**	1	1.5%	**UNKNOWN**	1	1.5%

3. Anatomical Site:

	AVIAN	**CANINE**	**FELINE**	**MUSTELID**	**RODENT**	**UNKNOWN**	**TOTALS**
EAR		24					24
URINARY		18	2				20
URT		2					2
WOUND		1	1				2
OTHER	1	4	2	1		1	8
UNKNOWN	1	8			1		10
TOTALS	2	57	5	1	1	1	66

L. *Pseudomonas aeruginosa*



1. Table

Pseudomonas aeruginosa Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	98.6
Gentamicin	85
Kanamycin	1.1
Neomycin	44.4
Tobramycin	91.8
Cephalothin	0
Ceftazidime	97.4
Ceftiofur	26.7
Chloramphenicol	0
Doxycycline	4.3
Tetracycline	0
Polymyxin B	90.6
Erythromycin	0
Clindamycin	1
Nitrofurans	0
Penicillin	0
Ampicillin	0
Ticarcillin	91.8
Piperacillin	97.5
Augmentin	0.9
Oxacillin	0
Ciprofloxacin	80.8
Enrofloxacin	24.3
Marbofloxacin	74
Tribrissen	1.5
Triple Sulfa	19.4

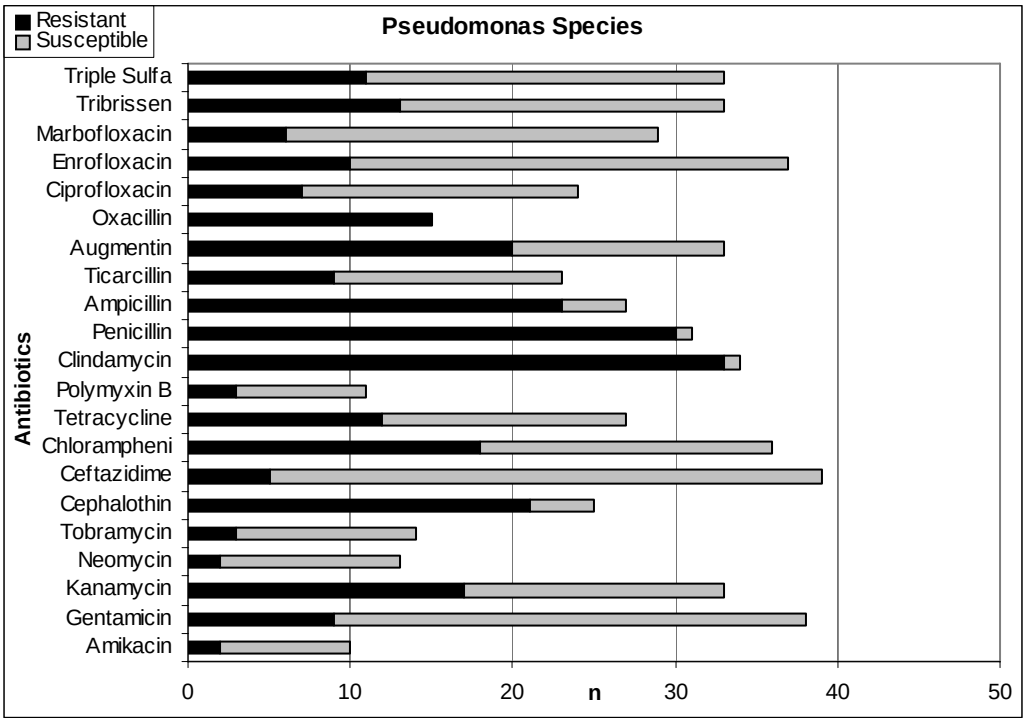
2. Animal Species:

AVIAN	7	6.0%	**CERVINE**	2	1.7%	**FELINE**	8	6.8%
CANINE	85	72.6%	**EQUINE**	8	6.8%	**REPTILE**	6	5.1%
						UNKNOWN	1	0.9%

3. Anatomical Site:

	AVIAN	**CANINE**	**CERVINE**	**EQUINE**	**FELINE**	**REPTILE**	**UNKNOWN**	**TOTALS**
ABSCESS			2			1		3
EAR		42			3			45
FOOT		2			1	1		4
IMPLANT		6		1				7
MOUTH	1						1	2
SKIN		1		1				2
SXSITE		1		2	1			4
URINARY		7			1			8
URT	3	2		2				7
WOUND		4				2		6
OTHER	1	1		1				3
UNKNOWN	2	19		1	2	2		26
TOTALS	7	85	2	8	8	6	1	117

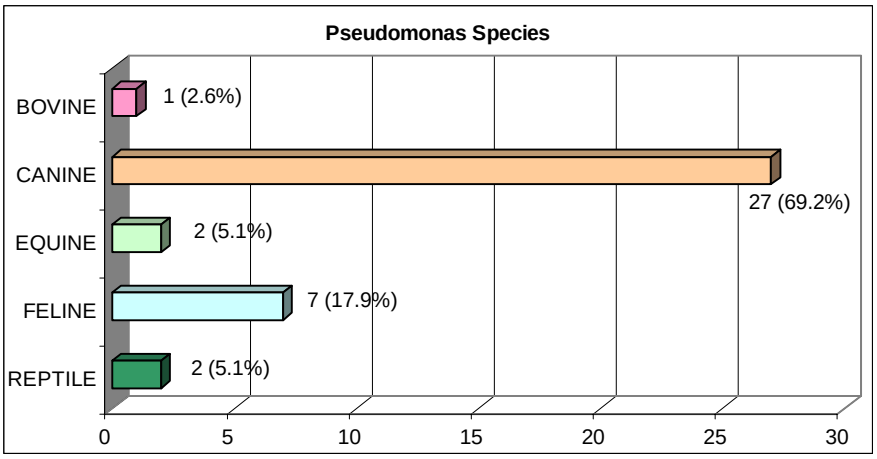
M. *Pseudomonas* species (*Pseudomonas malei*, *Pseudomonas maltophilia*, *Pseudomonas* spp)



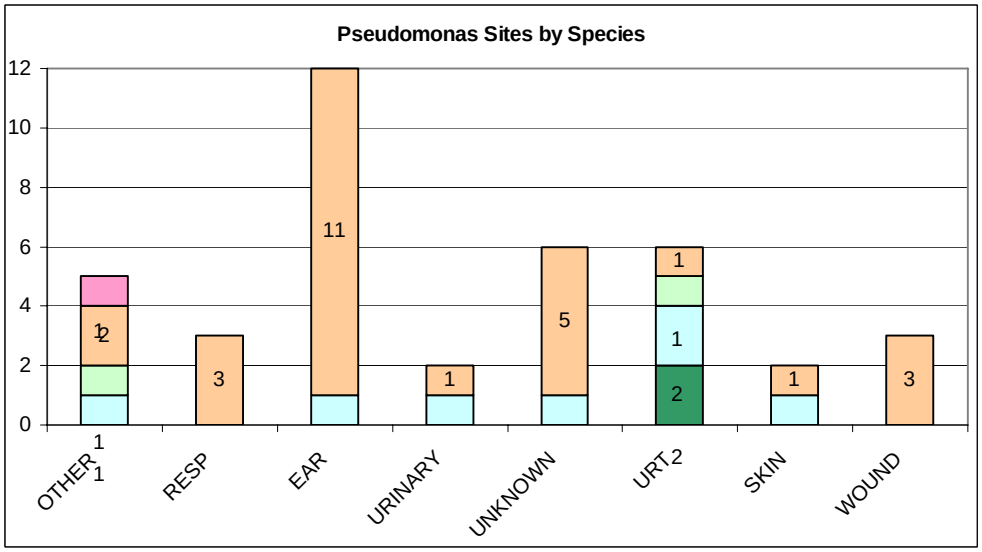
1. Table

Pseudomonas species Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	80
Gentamicin	76.3
Kanamycin	48.5
Neomycin	84.6
Tobramycin	78.6
Cephalothin	16
Ceftazidime	87.2
Chloramphenicol	50
Tetracycline	55.6
Polymyxin B	72.7
Clindamycin	2.9
Penicillin	3.2
Ampicillin	14.8
Ticarcillin	60.9
Augmentin	39.4
Oxacillin	0
Ciprofloxacin	70.8
Enrofloxacin	73
Marbofloxacin	79.3
Tribrissen	60.6
Triple Sulfa	66.7

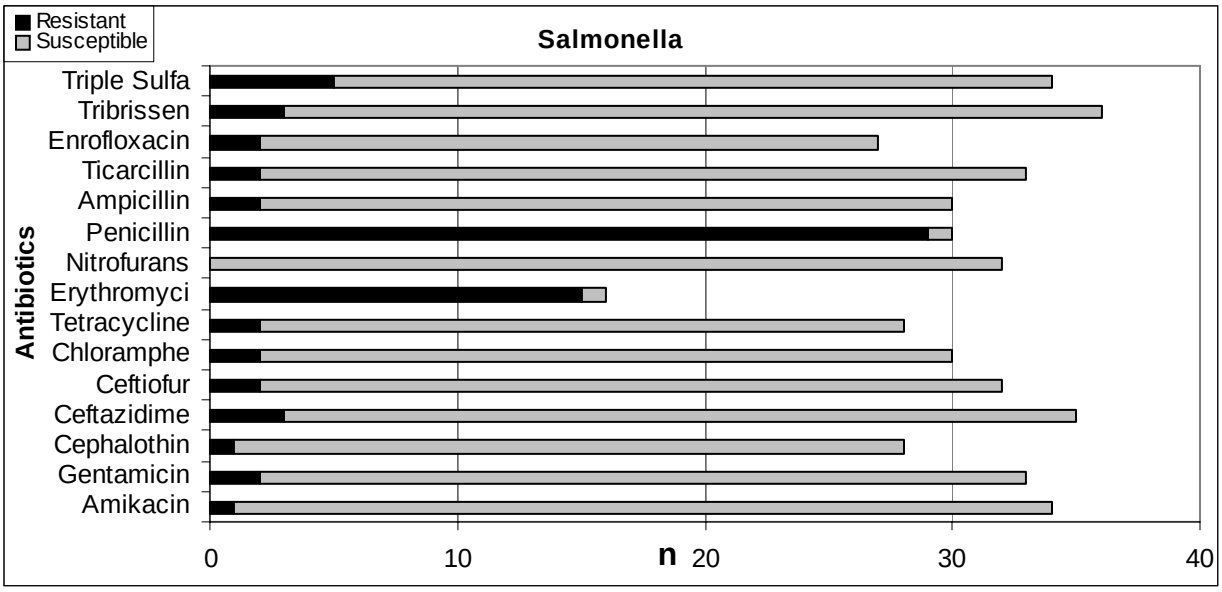
2. Animal Species:



3. Anatomical Site:



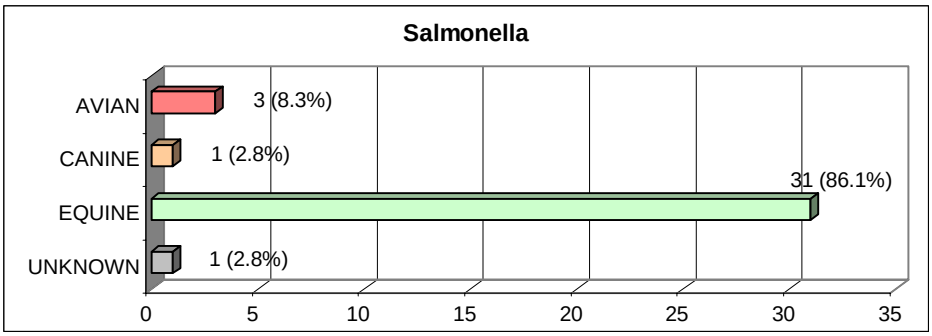
N. *Salmonella*



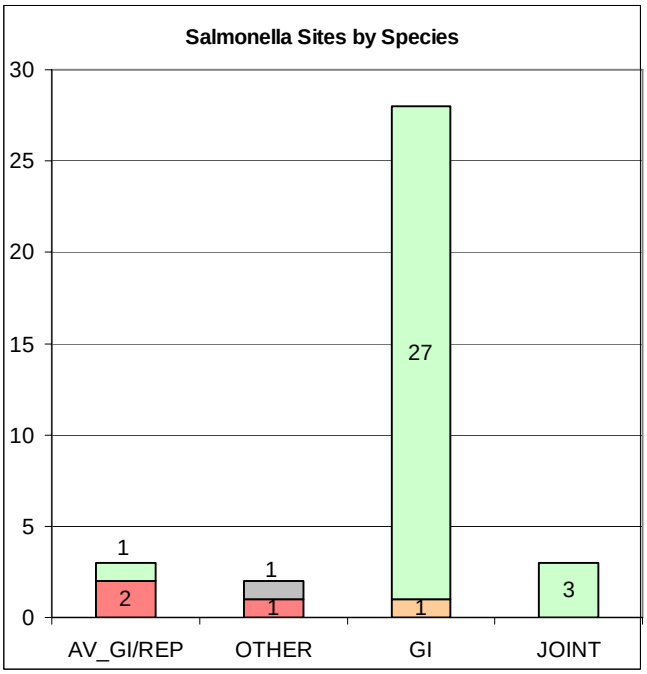
1. Table

Salmonella Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	97.1
Gentamicin	93.9
Cephalothin	96.4
Ceftazidime	91.4
Ceftiofur	93.8
Chloramphenicol	93.3
Tetracycline	92.9
Erythromycin	6.3
Nitrofurans	100
Penicillin	3.3
Ampicillin	93.3
Ticarcillin	93.9
Enrofloxacin	73
Tribrissen	60.6
Triple Sulfa	66.7

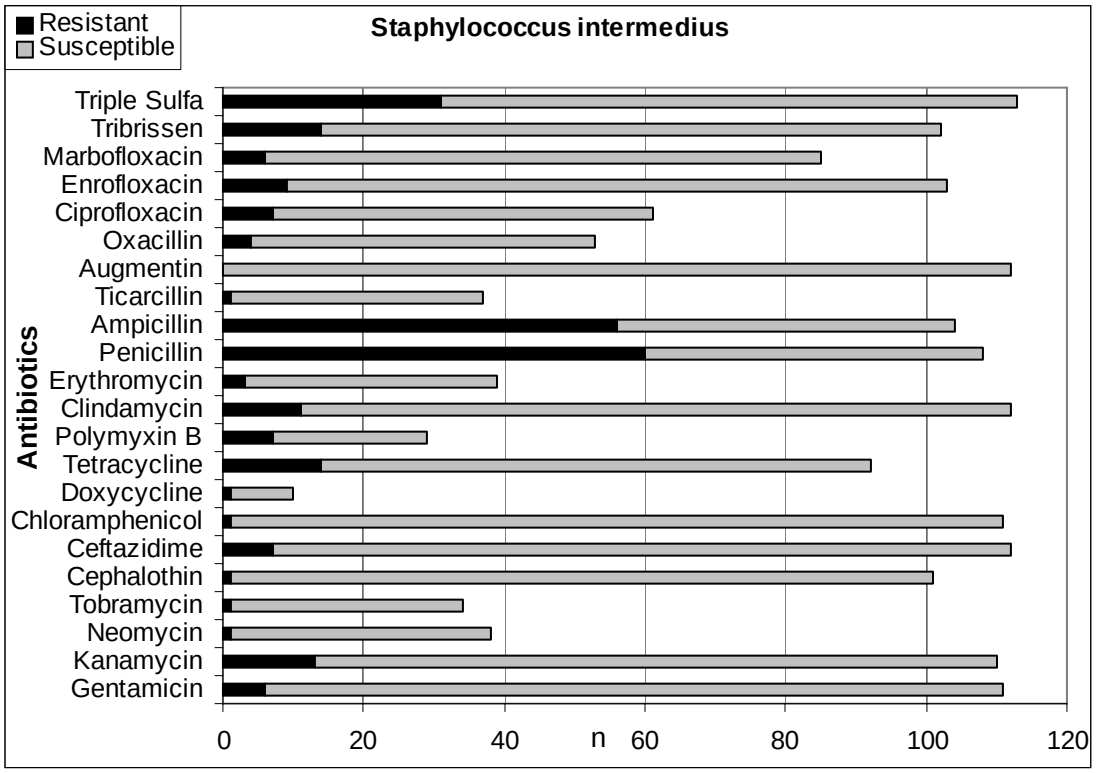
2. Animal Species:



3. Anatomical Site:



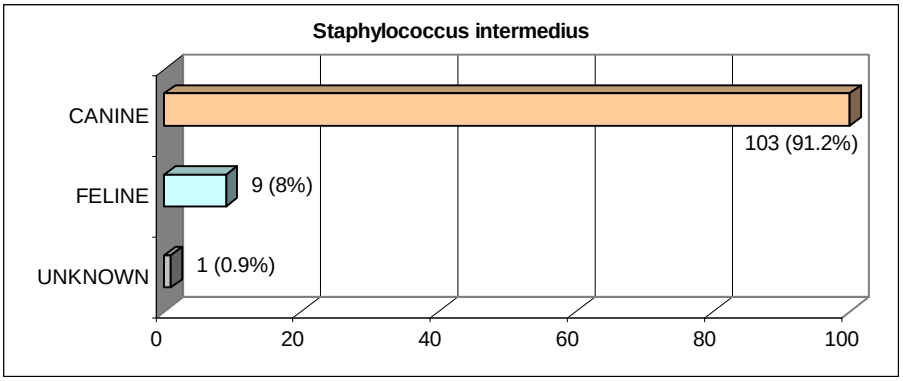
O. *Staphylococcus intermedius*



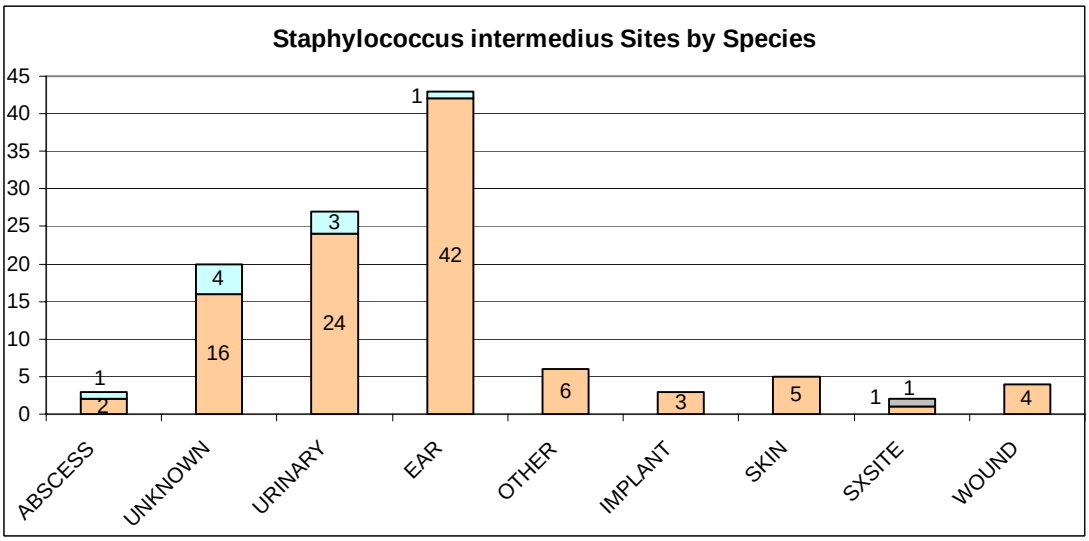
1. Table

Staphylococcus intermedius Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Gentamicin	94.6
Kanamycin	88.2
Neomycin	97.4
Tobramycin	97.1
Cephalothin	99
Ceftazidime	93.8
Chloramphenicol	99.1
Tetracycline	84.8
Polymyxin B	75.9
Doxycycline	90
Clindamycin	90.2
Erythromycin	92.3
Penicillin	44.4
Ampicillin	46.2
Ticarcillin	97.3
Augmentin	100
Oxacillin	92.5
Ciprofloxacin	88.5
Enrofloxacin	91.3
Marbofloxacin	92.9
Tribrissen	86.3
Triple Sulfa	72.6

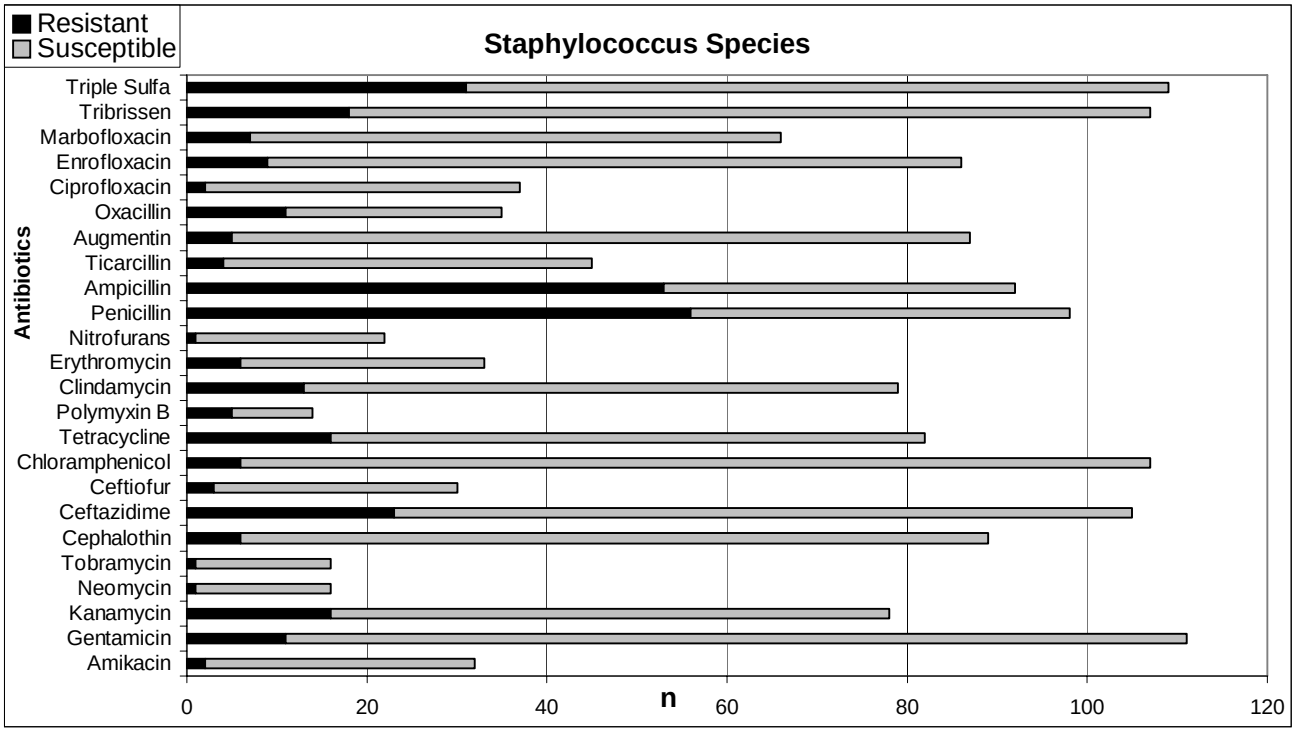
2. Animal Species:



3. Anatomical Site:



P. *Staphylococcus species (Staphylococcus coagulase positive, Staphylococcus coagulase negative, Staphylococcus aureus, Staphylococcus epidermidis, Staphylococcus spp)*



1. Table

Staphylococcus species Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	93.8
Gentamicin	90.1
Kanamycin	79.5
Neomycin	93.8
Tobramycin	93.8
Cephalothin	93.3
Ceftazidime	78.1
Ceftiofur	90
Chloramphenicol	94.4
Tetracycline	80.5
Polymyxin B	64.3
Clindamycin	83.5
Erythromycin	81.8
Nitrofurans	95.5
Penicillin	42.9
Ampicillin	42.4
Ticarcillin	91.1
Augmentin	94.3
Oxacillin	68.6
Ciprofloxacin	94.6
Enrofloxacin	89.5
Marbofloxacin	89.4
Tribrissen	83.3
Triple Sulfa	71.6

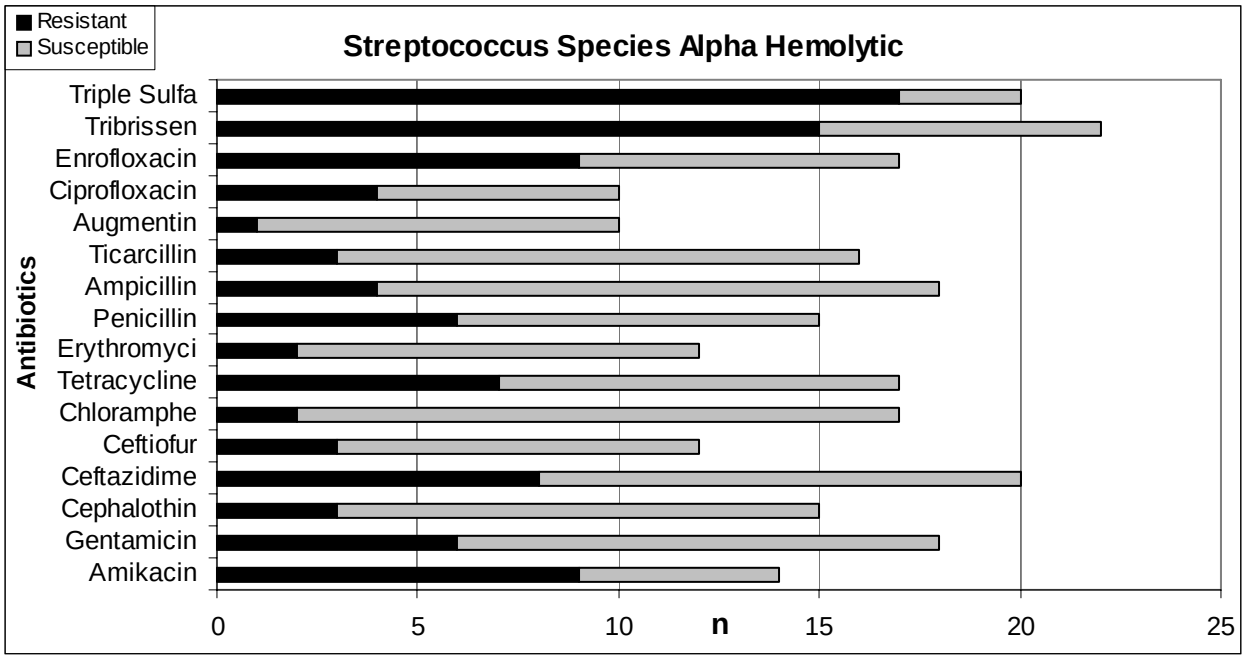
2. Animal Species:

AVIAN	6	5.4%	**CAPRINE**	1	0.9%	**LAGOMORPH**	1	0.9%	**PORCINE**	1	0.9%
BOVINE	3	2.7%	**EQUINE**	17	15.3%	**MARSUP**	1	0.9%	**REPTILE**	1	0.9%
CANINE	54	48.6%	**FELINE**	20	18.0%	**MUSTELID**	1	0.9%	**RODENT**	1	0.9%
									UNKNOWN	4	3.6%

3. Anatomical Site:

	AVIAN	BOVINE	CANINE	CAPRINE	EQUINE	FELINE	LAGOMORPH	MARSUP	MUSTELID	PORCINE	REPTILE	RODENT	UNKNOWN	TOTALS
ABSCESS			2			2				1				5
AV_GI/REP	2													2
BONE			2											2
CSF		1			1									2
EAR			11			3								14
EYE	1				2									3
FOOT			3				1							4
IMPLANT			3		1									4
JOINT	1		2		4									7
MILK		2		1									2	5
REPD					2									2
SKIN			3										1	4
URINARY			9			7			1				1	18
URT			1		2									3
WOUND			2		1	1								4
OTHER			3		3							1		7
UNKNOWN	2		13		1	7		1			1			25
TOTALS	6	3	54	1	17	20	1	1	1	1	1	1	4	111

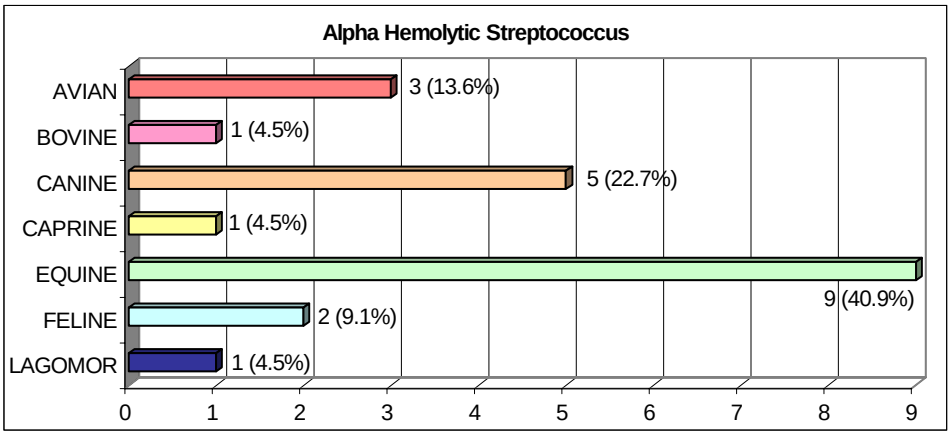
Q. *Streptococcus* Species Alpha Hemolytic



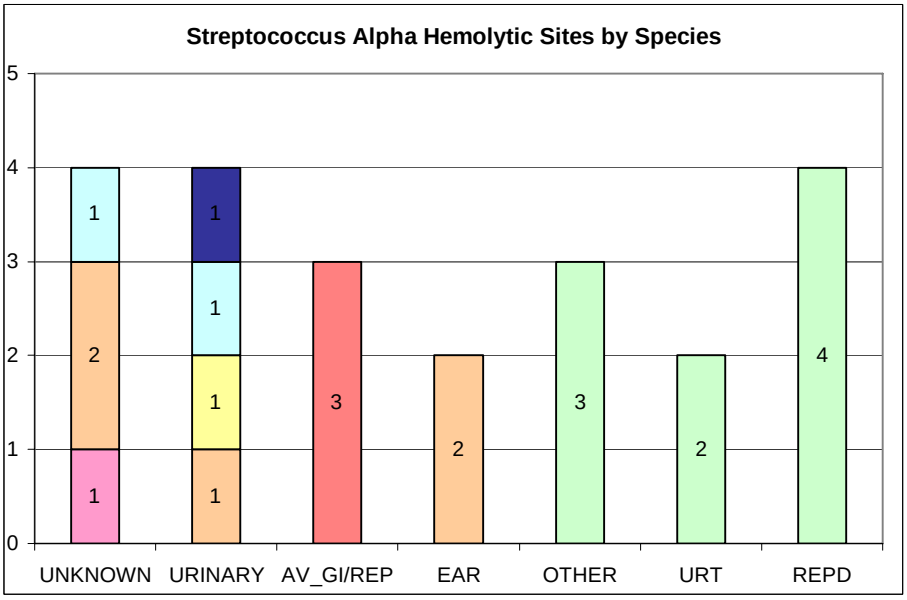
1. Table

Streptococcus Species Alpha Hemolytic Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	35.7
Gentamicin	66.7
Cephalothin	80
Ceftazidime	60
Ceftiofur	75
Chloramphenicol	88.2
Tetracycline	58.8
Erythromycin	83.3
Penicillin	60
Ampicillin	77.8
Ticarcillin	81.3
Augmentin	90
Ciprofloxacin	60
Enrofloxacin	47.1
Tribrissen	31.8
Triple Sulfa	15

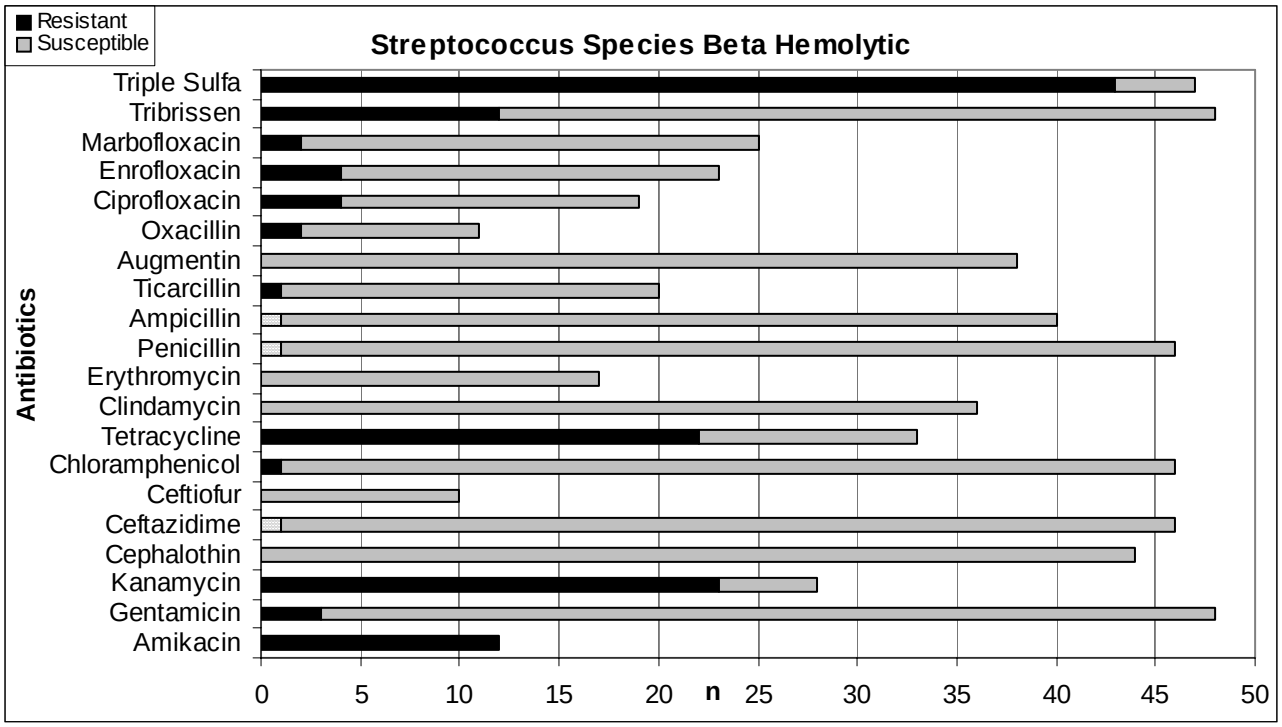
2. Animal Species:



3. Anatomical Site:



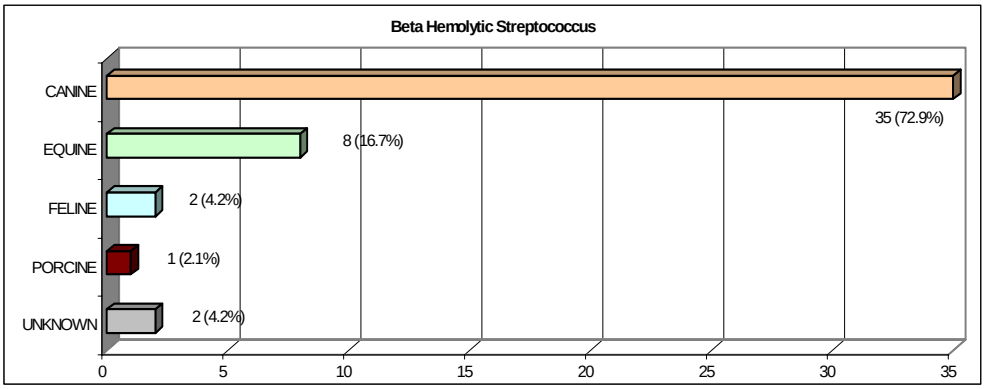
R. *Streptococcus* Species Beta Hemolytic



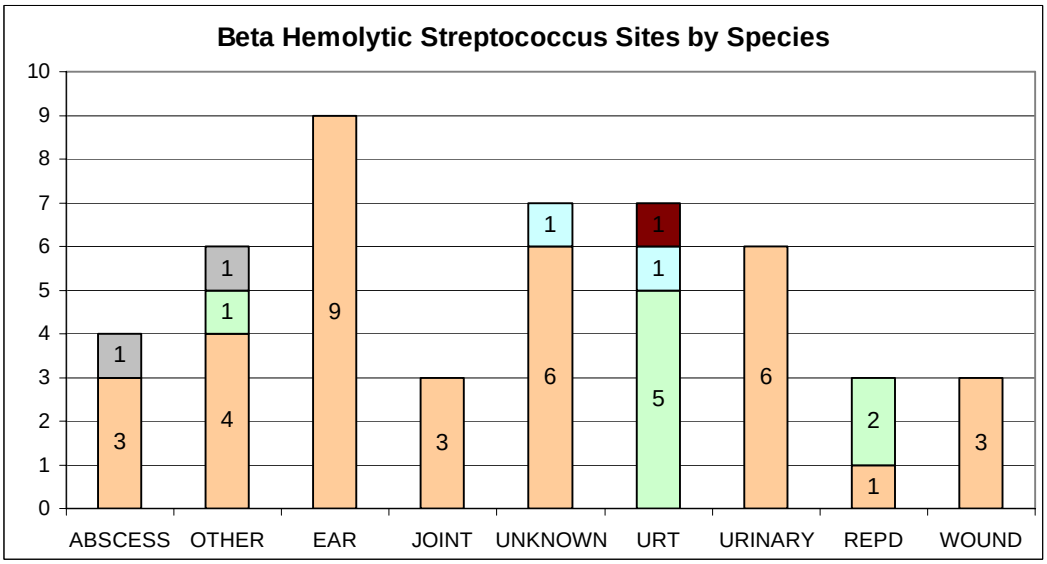
1. Table

Streptococcus Species Beta Hemolytic Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	0
Gentamicin	93.8
Kanamycin	17.9
Cephalothin	100
Ceftazidime	100
Ceftiofur	100
Chloramphenicol	97.8
Tetracycline	33.3
Clindamycin	100
Erythromycin	100
Penicillin	100
Ampicillin	100
Ticarcillin	95
Augmentin	100
Oxacillin	81.8
Ciprofloxacin	78.9
Enrofloxacin	82.6
Marbofloxacin	92
Tribrissen	75
Triple Sulfa	8.5

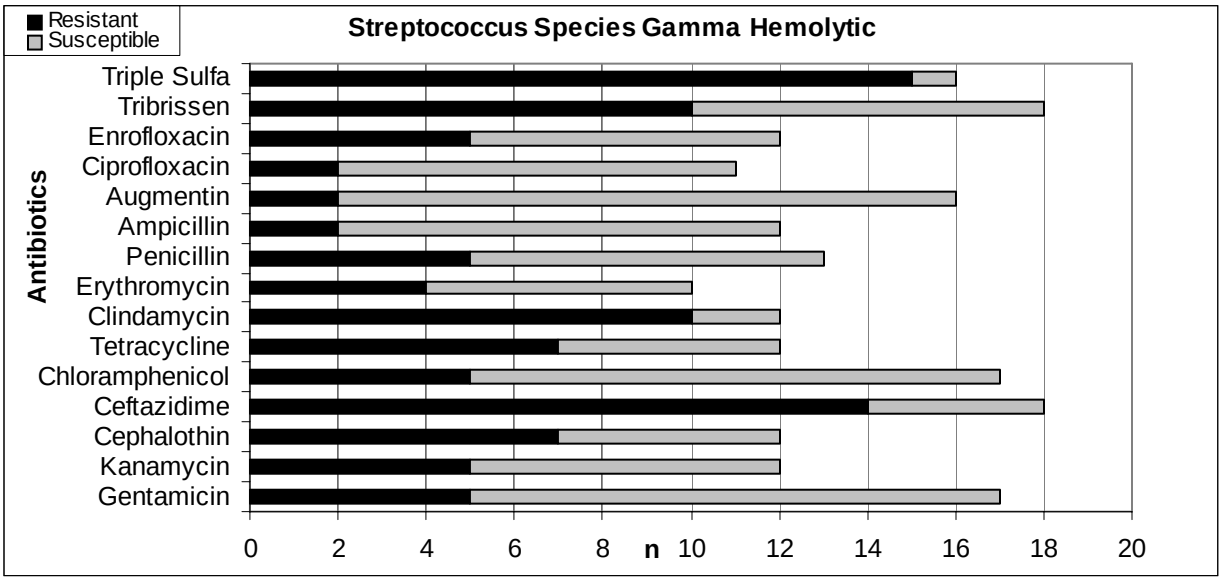
2. Animal Species:



3. Anatomical Site:



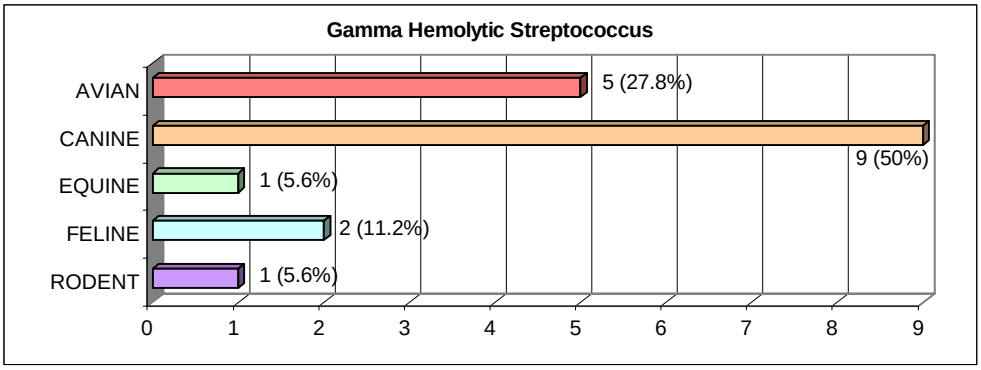
S. *Streptococcus* Species Gamma Hemolytic



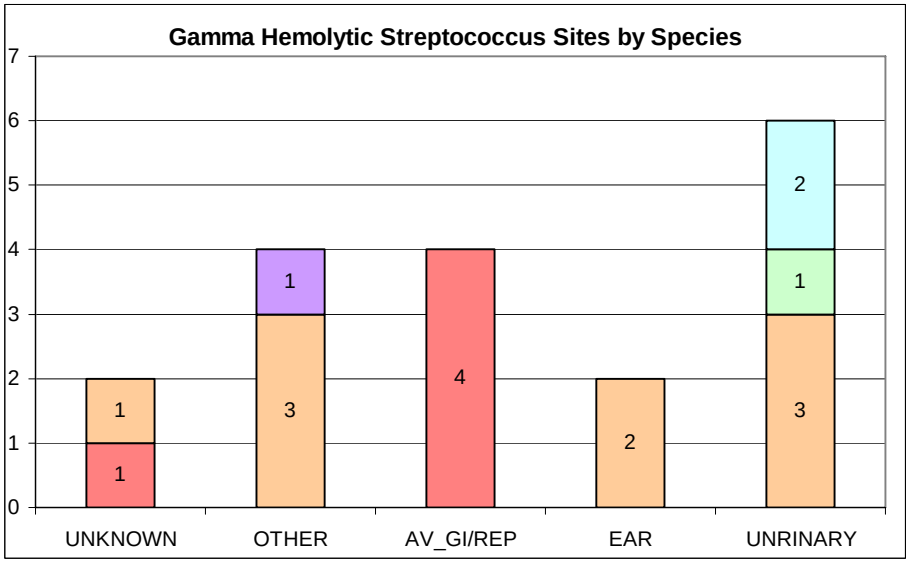
1. Table

Streptococcus Species Gamma Hemolytic Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Gentamicin	70.6
Kanamycin	58.3
Cephalothin	41.7
Ceftazidime	22.2
Chloramphenicol	70.6
Tetracycline	41.7
Clindamycin	16.7
Erythromycin	60
Penicillin	61.5
Ampicillin	83.3
Augmentin	87.5
Ciprofloxacin	81.8
Enrofloxacin	58.3
Tribrissen	44.4
Triple Sulfa	6.3

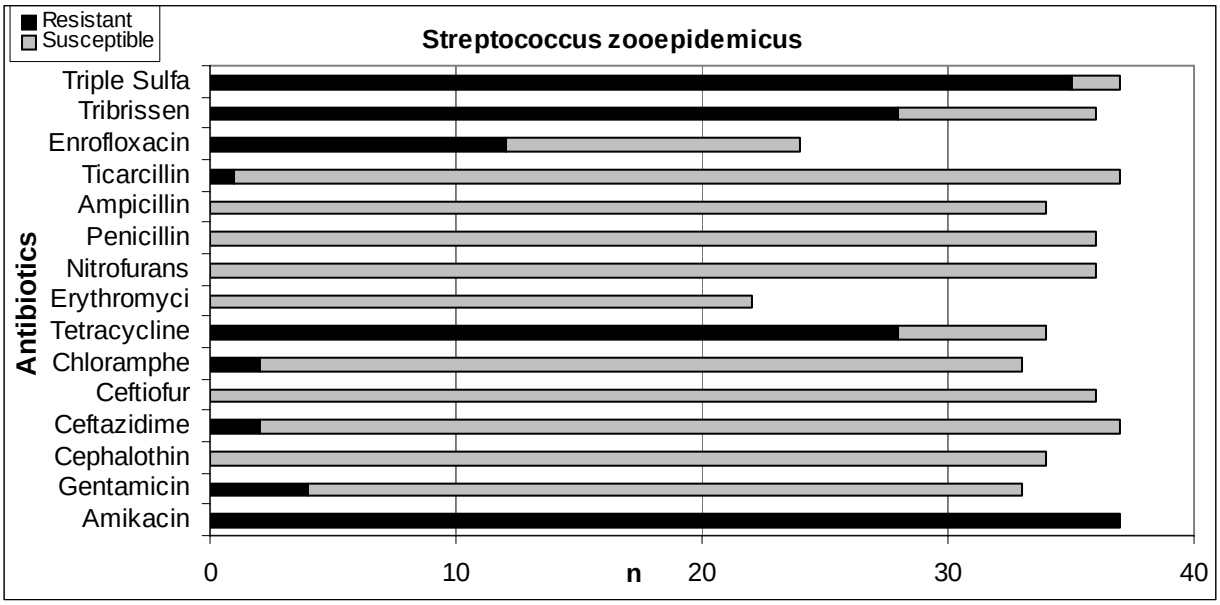
2. Animal Species:



3. Anatomical Site:



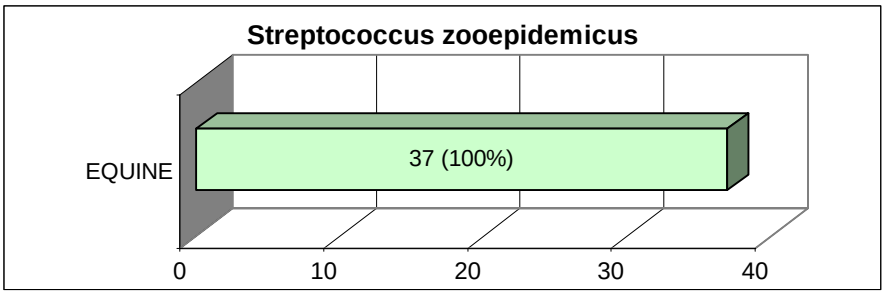
T. *Streptococcus zooepidemicus*



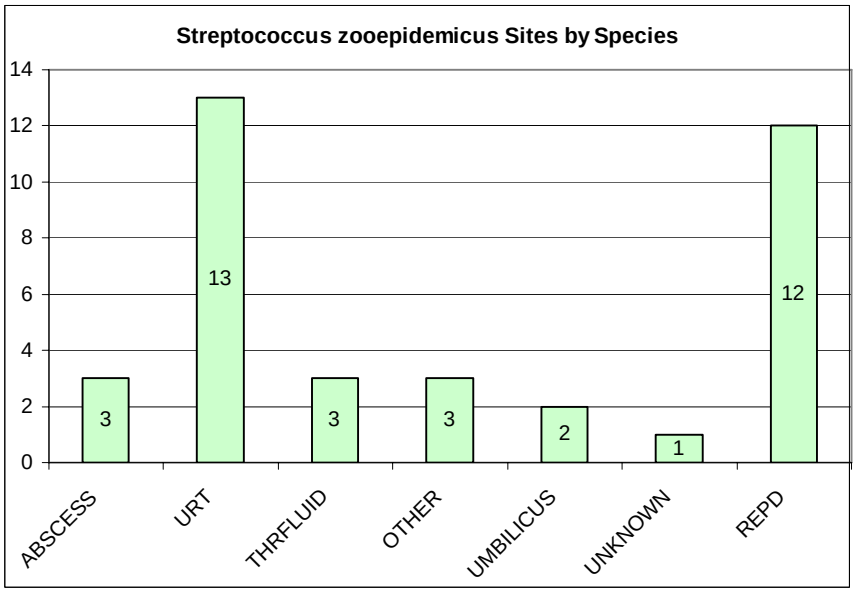
1. Table

Streptococcus zooepidemicus Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	0
Gentamicin	87.9
Cephalothin	100
Ceftazidime	94.6
Ceftiofur	100
Chloramphenicol	93.9
Tetracycline	17.6
Erythromycin	100
Nitrofurans	100
Penicillin	100
Ampicillin	100
Ticarcillin	97.3
Enrofloxacin	50
Tribrissen	22.2
Triple Sulfa	5.4

2. Animal Species:



3. Anatomical Site:



U. *Streptococcus* spp (*Streptococcus* spp, *Streptococcus dysgalactiae*, *Streptococcus equi equi*, *Streptococcus equisimilis*, *Streptococcus* species non-hemolytic, *Streptococcus* species group L)

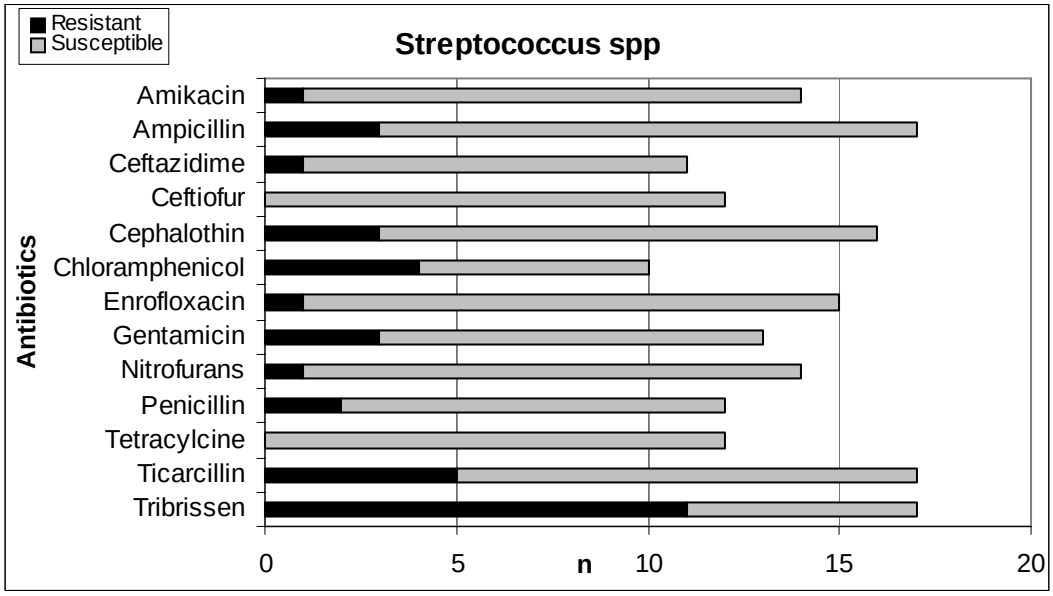
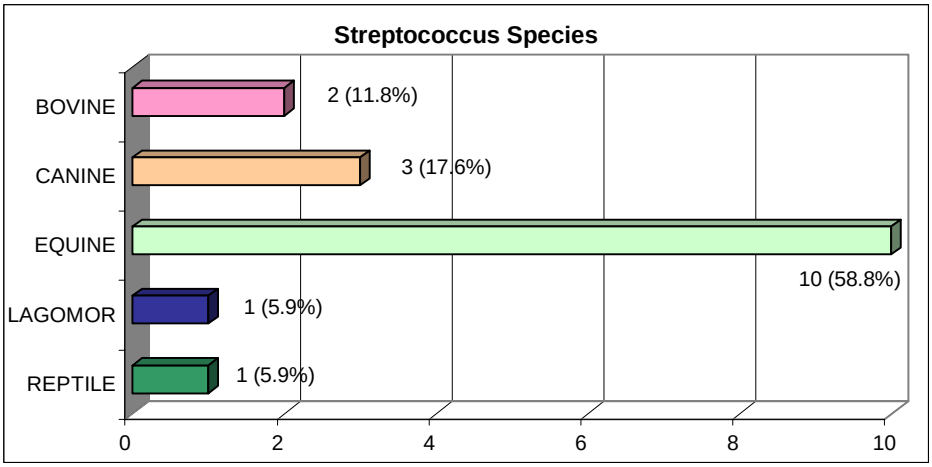
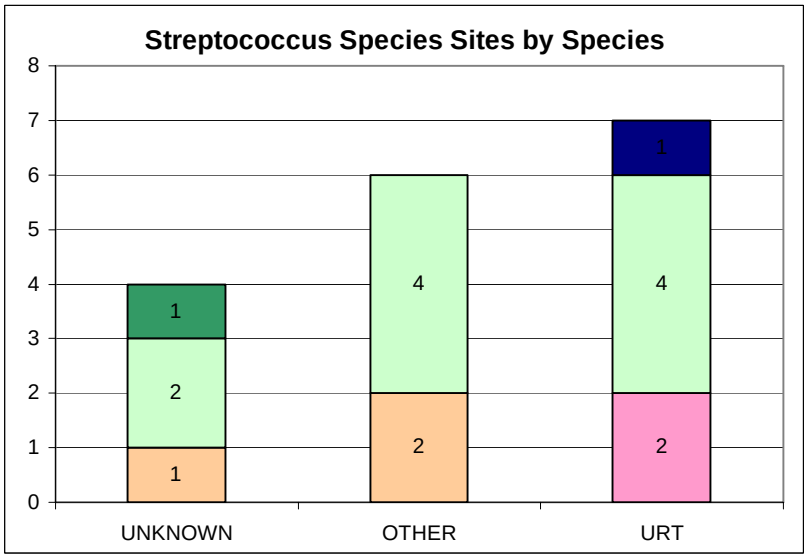


Table 2. Animal Species:

Streptococcus spp Percent Susceptible to Antibiotics	
Antibiotics	***Percent***
Amikacin	0
Ampicillin	92.9
Ceftazidime	82.4
Ceftiofur	90.9
Cephalothin	100
Chloramphenicol	81.3
Tetracycline	83.3
Gentamicin	93.3
Nitrofurans	76.9
Penicillin	92.9
Ticarcillin	100
Enrofloxacin	60
Tribrissen	70.6
Triple Sulfa	35.3



3. Anatomical Site: