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RESAPATH

French surveillance network for antimicrobial resistance in pathogenic bacteria of animal origin

2015 Annual Report

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Contents

INTRODUCTION

Monitoring of Antimicrobial Resistance in Pathogenic Bacteria in Animals in France in 2015: Summary Report of the RESAPATH network (www.resapath.anses.fr)

The French surveillance network for antimicrobial resistance in pathogenic bacteria of animal origin (RESAPATH) was set up in 1982 under the name of RESABO (BO for bovines). In 2000, it was expanded to pigs and poultry and in 2007, to other animal species such as small ruminants, companion animals or horses. RESAPATH is a long-term cooperative effort by 74 local routine laboratories throughout France coordinated by the Lyon and Ploufragan-Plouzané Laboratories at the French Agency for Food, Environmental and Occupational Health Safety (ANSES). As mentioned below, the information presented here is based on data from an on-going surveillance system estimating the proportion of resistances to relevant antibiotics in diseased animals treated by veterinarians as part of their regular clinical services. RESAPATH is a key component of the strategic national action plans (EcoAntibio 1, 2011-2016; EcoAntibio 2: 2017-2021) adopted by the French Ministry of Agriculture, Food and Forest to combat antimicrobial resistance in animals. RESAPATH is also part of the recent intersectorial "One Health" national action plan against antimicrobial resistance in humans, animals and the environment adopted by the French Prime Minister on november 2016, 17th. The epidemiology of resistance is increasingly complex and we strongly believe that providing annual data of resistance trends in animal pathogens contributes to a comprehensive overview of antimicrobial resistance in veterinary medicine. We especially thank all laboratories and staff who are contributing to these surveillance efforts and to a better control of this major issue in animals.

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ORGANISATION AND KEY FIGURES

The objectives of the RESAPATH are the following:

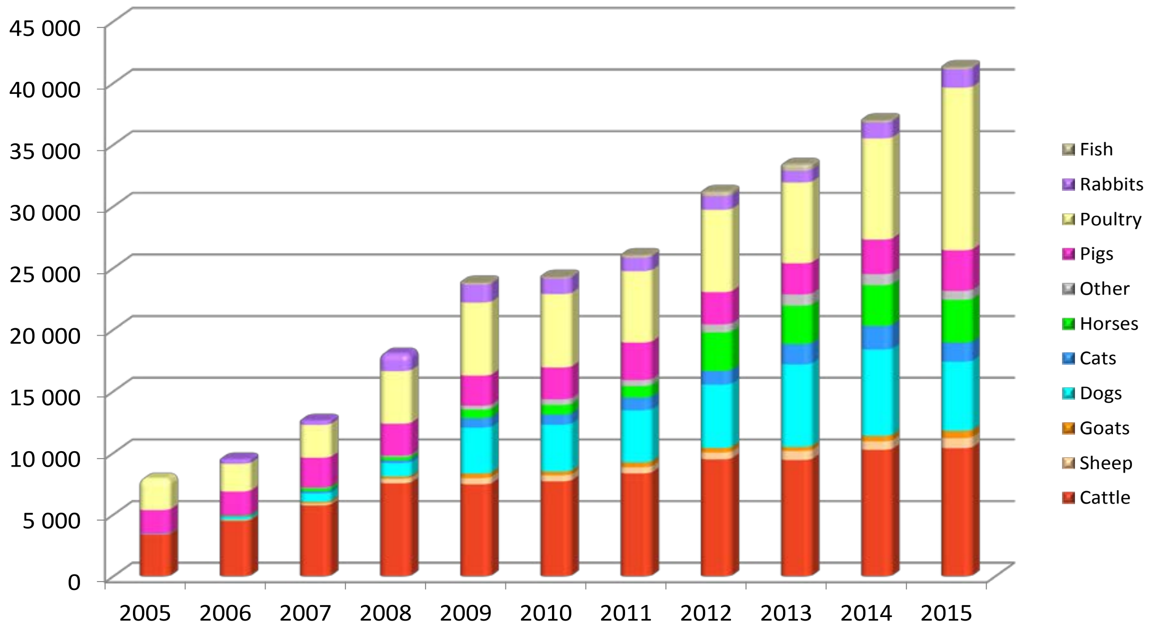
- To monitor antimicrobial resistance in pathogenic bacteria of animal origin in France,
- To collect resistant isolates of particular interest and to characterize their genetic background (including deciphering mechanisms of resistance),
- To provide technical support to local laboratories.

Bacteria recovered from diseased animals and sampled by veterinarians for diagnostic purposes as part of their routine activity are tested for antimicrobial susceptibility by private or public local veterinary laboratories throughout France. Antibiograms are performed by disk diffusion according to the guidelines of the veterinary part of the Antibiogram Committee of the French Society of Microbiology (CA-SFM) and of the AFNOR NF U47-107 standard, and inhibition zone diameters are transmitted to ANSES. Isolates are then categorized as susceptible (S), intermediate (I) or resistant (R) according to the recommendations provided by the veterinary part of the CA-SFM. Should no established breakpoints be available, critical values provided by the manufacturer for the corresponding molecules are used.
In addition to data collection, RESAPATH also allows the collection of isolates harbouring resistance profiles of specific interest, which are then subjected to in-depth molecular studies. Laboratories participate to annual ring trials (External Quality Assurance System), which contribute to the quality control of the data gathered by RESAPATH. In addition, annual training sessions, technical support, on-site training and other actions are also provided.

RESAPATH is the unique veterinary member of the French National Observatory for Epidemiology of Bacterial Resistance to Antimicrobials (ONERBA), which encompasses 17 other surveillance networks throughout France, all in private or public medical practices (community of health-care centres). RESAPATH is a passive or 'event-based' surveillance network. Member laboratories join the RESAPATH on a voluntary basis and data collected depend on the initial decision of veterinary practitioners. Hence, those data cannot be considered as perfectly representative of the global resistance of pathogenic bacteria but are a good indicator of their resistance rates in field conditions. In all, the significance of this monitoring relies on its ability to detect most resistant bacteria and to measure trends over time in antimicrobial resistance in diseased animals in France.

In 2015, 74 laboratories were members of RESAPATH and a total of 41,298 antibiograms were transmitted to ANSES, all animal species included. The evolution of the distribution of antibiograms per animal sector is presented in Figure 1.

Figure 1: *Annual number of antibiograms collected per animal sector*



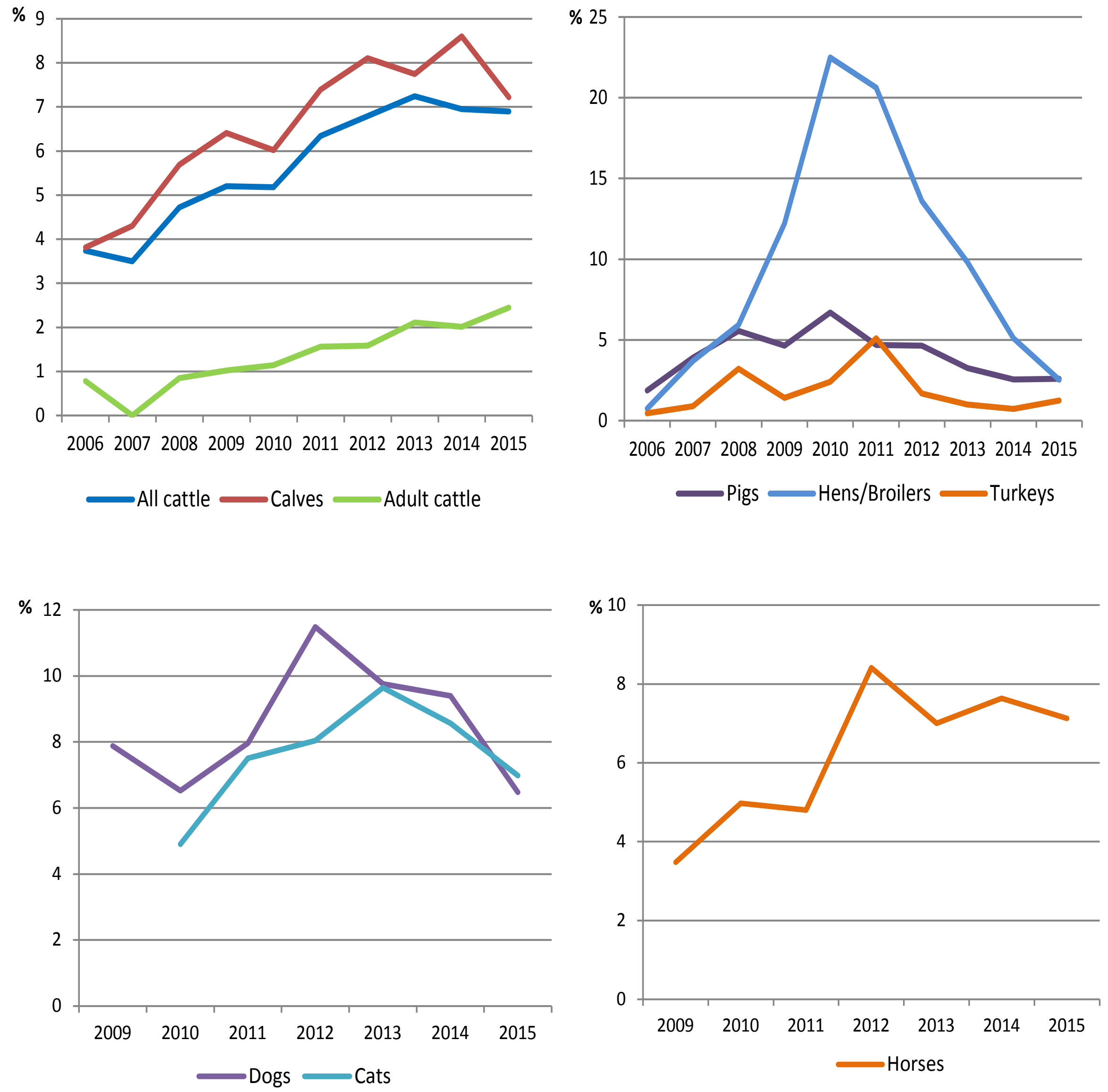
RESISTANCE DATA

This chapter summarizes the key results on resistance trends to the different antimicrobial classes, especially to broad-spectrum cephalosporins and fluroquinolones that are considered of critical importance both in human and veterinary medicine. Other important topics such as resistance trends to other antibiotics or on specific relevant phenotypes are also included. Detailed information on resistances of the clinical isolates is available for each animal species and infection type in the Annex section.

Resistance to broad-spectrum cephalosporins

Isolates are routinely tested for their susceptibility to ceftiofur and cefquinome in food animals and horses, and to ceftiofur and cefovecin in companion animals. Resistance is mainly observed for *Escherichia coli* and to a lesser extent for *Klebsiella pneumoniae* and *Enterobacter* spp. In 2015, the highest rate of resistance to ceftiofur in clinical *E. coli* isolates of animal origin in France was around 6-7%, and was found in veal calves, cats and dogs, and horses. Ceftiofur resistance in *E. coli* in other animal species was less than 3% (poultry: 2.5%, pigs: 2.6%, adult cattle: 2.4%, turkeys: 1.2%).

***Figure 2**: Evolution of proportions of E. coli isolates non-susceptible (R+I) to ceftiofur in cattle, pigs, poultry, turkey, horses, cats and dogs (2006-2015)*



In broilers, resistance to ceftiofur in clinical *E. coli* has been continuously decreasing from 22.5% in 2010 to 2.5% in 2015, and this almost ten-fold reduction in 5 years is a very positive result (Figure 2). A similar decrease has been observed in diseased turkeys and pigs suggesting that the recent strategic actions set up on the use of antimicrobials in food animals in France had a global impact on the ESBL spread in those sectors. Also in cats and dogs (Figure 2), a decreasing trend has been observed over the last three years, suggesting that more responsible practices were not only considered in food but also in companion animals. On the other hand, a steady trend has still been observed in horses over the 2012-2015 period of time.

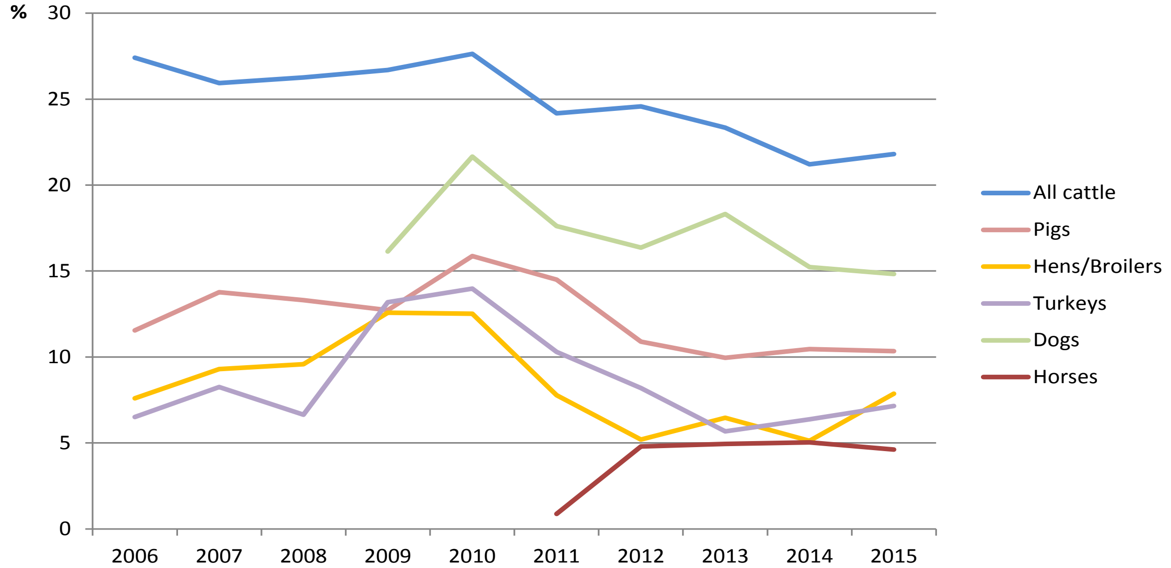
Of note, and as in many European countries, calves are the main contributor to resistance to broad-spectrum cephalosporins in cattle production. These data are in line with a scientific opinion recently issued by EFSA arguing on the risk for the development of antimicrobial resistance due to feeding calves with milk containing residues of antibiotics, which may constitute a strong hypothesis for the selection and spread of ESBL-producing Enterobacteriaceae in those animals. Complementary investigations in calves are in progress in France to clarify this issue.

Resistance to fluoroquinolones

Isolates are routinely tested for their susceptibility to enrofloxacin, marbofloxacin or danofloxacin. Other fluoroquinolones are also tested depending on the animal species, including the recently marketed pradofloxacin in companion animals. In Figure 3, resistance to either enrofloxacin or marbofloxacin in *E. coli* was used as an indicator of resistance to fluoroquinolones.

Data gathered in 2015 show that the highest rate of fluoroquinolone resistance in clinical *E. coli* of animal origin is found in cattle (22%). Overall, a continuous downward trend in fluoroquinolone resistance has been observed over the last 5 years in almost all animal species. Nonetheless, in certain sectors such as pigs, broilers and turkeys, fluoroquinolone resistance has mostly decreased between 2010 and 2013 and not over the last 2 years. Of note, rates of fluoroquinolone resistance in clinical *E. coli* range from 5% to 22% among animal species, to be compared with the much lower range of 1.2% to 6-7% of resistance rates to broad-spectrum cephalosporins. It highlights that fluoroquinolone resistance, while not transmitted through highly mobile genetic elements bearing ESBL/AmpC-encoding genes, should be considered as a major issue which has still not been efficiently counter-acted by national strategic actions.

***Figure 3**: Evolution of proportions of E. coli isolates non-susceptible (R+I) to enrofloxacin or marbofloxacin in cattle, pigs, poultry, turkeys, horses and dogs (2006-2015)*



Resistance to other antibiotics

Trends were investigated for *E. coli*. Antimicrobials that were considered here included those most frequently tested by the RESAPATH laboratories according to relevant classes in veterinary practice (excluding broad-spectrum cephalosporins and fluoroquinolones that have been studied separately). Seven antibiotics (5 classes) were chosen, namely gentamicin, spectinomycin or streptomycin, trimethoprim-sulfonamides in combination, tetracycline, amoxicillin, amoxicillin and clavulanic acid in combination, and a quinolone (nalidixic or oxolinic acid). Trends were analysed over the 2006-2015 period in cattle, pigs and poultry.

The global decreasing trend identified in the previous years should still be considered as such in 2015. However, resistance levels have slightly increased between 2014 and 2015 for nearly all animal species and antimicrobials. It needs to be confirmed in 2016 to be considered as significant. Nevertheless, such a trend observed for all animal species and nearly all antibiotics may also indicate a possible reverse shift towards re-increasing resistance rates.

Resistances in cattle have slightly increased between 2014 and 2015 for all antimicrobials (Figure 4). Over the whole period (2006-2015), resistances have shown a significant but low decrease for tetracycline, aminoglycosides (except for gentamicin), quinolones and trimethoprim-sulfonamides in combination. Resistance to amoxicillin and clavulanic acid in combination has presented an overall decrease since 2006 but has been increasing again since 2013.
In pigs, resistances to trimethoprim-sulfonamides, aminoglycosides (except for gentamicin), quinolones and amoxicillin and clavulanic acid in combination has been increasing between 2014 and 2015 (Figure 5). However, resistances to tetracycline and gentamicin have followed a downward trend since 2009 and 2012, respectively.
Resistance rates in poultry have been less linear over the 2006-2015 period. For hens and broilers (*Gallus gallus*), all resistance rates have increased between 2014 and 2015 except for tetracycline (Figure 6). Obviously, the major drop observed for resistance to amoxicillin (alone or in combination with clavulanic acid) and tetracycline since 2009/2010 might have reached a limit. Resistance to gentamicin is still low but has increased since 2011. For turkeys, increases in resistance rates between 2014 and 2015 are of lower magnitude than for other animal species and an overall decreasing trend over the period 2006-2015 has still been observed (Figure 7).

Figure 4*: Evolution of proportions (%) of E. coli isolates non-susceptible (R+I) to seven antimicrobials in cattle (2006-2015)*

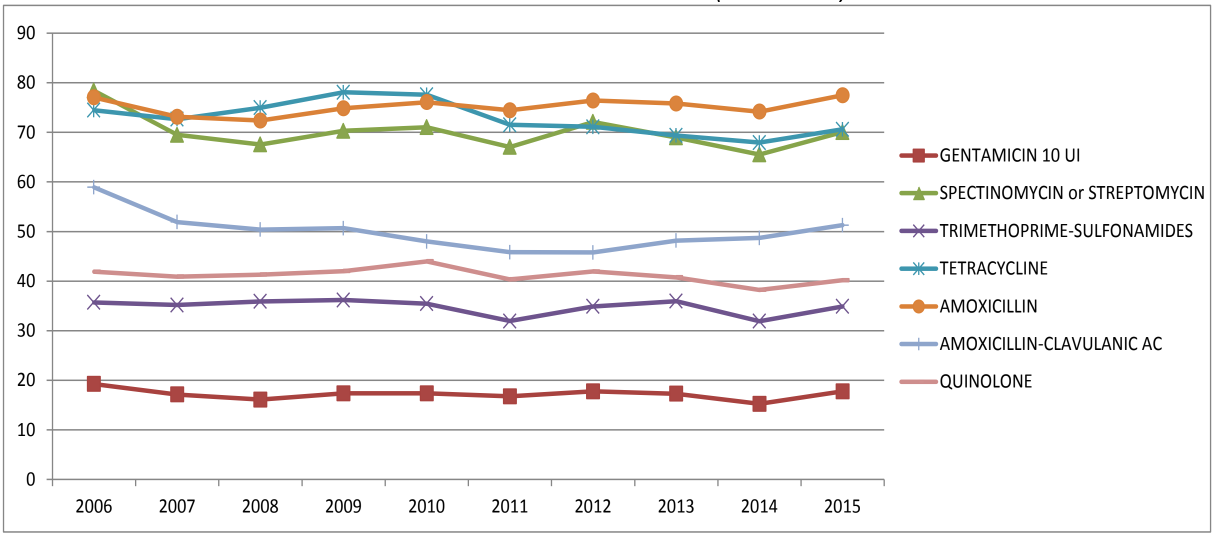


***Figure 5**: Evolution of proportions (%) of E. coli strains non-susceptible (R+I) to seven antimicrobial in pigs (2006-2015)*

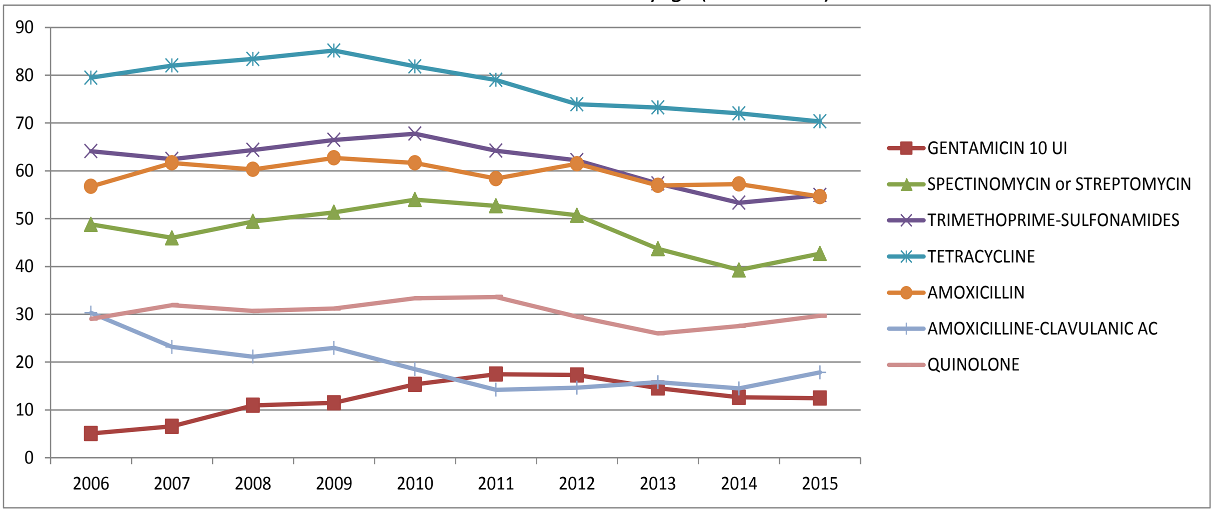


***Figure 6**: Evolution of proportions (%) of E. coli isolates non-susceptible (R+I) to seven antimicrobials in hens and broilers (2006-2015)*

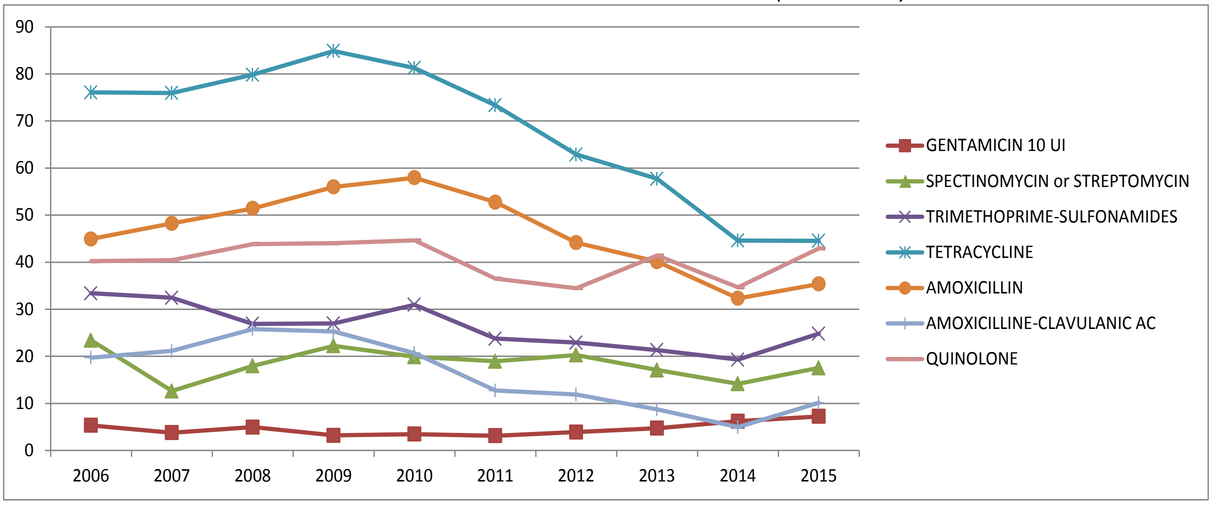
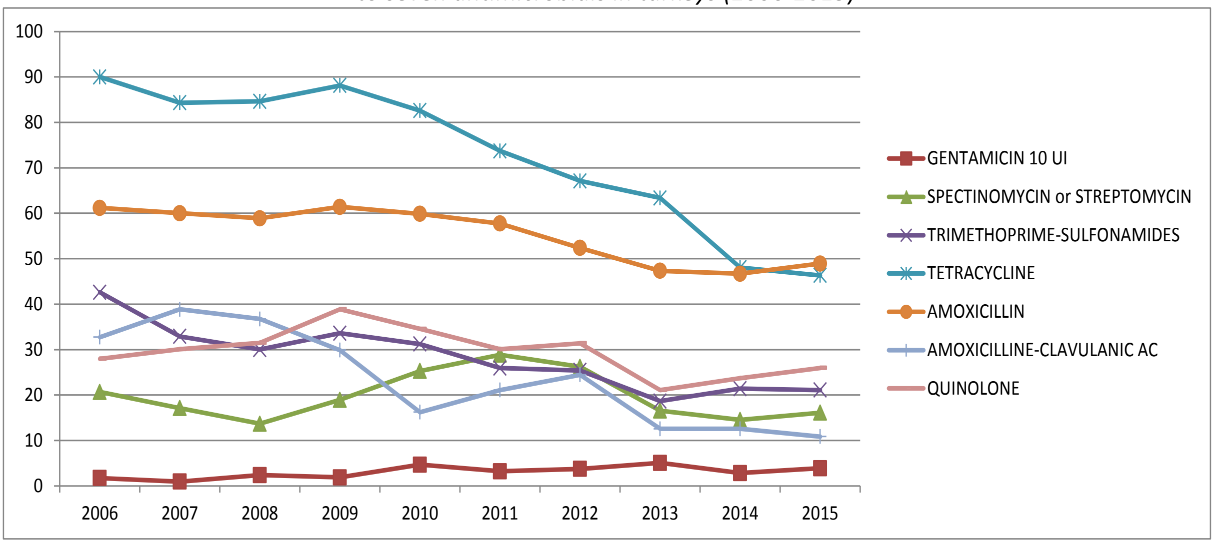


***Figure 7**: Evolution of proportions (%) of E. coli isolates non-susceptible (R+I) to seven antimicrobials in turkeys (2006-2015)*



Multidrug resistance

Multidrug resistance was investigated in *E. coli*, the most frequent bacterial species among the RESAPATH data. The selective criteria used to select antibiotics analyzed here were: i) relevance in veterinary and human medicine, ii) a single antimicrobial per class (as resistance mechanisms within a class often overlap), iii) antimicrobials frequently tested by the RESAPATH laboratories to guarantee a good representativeness of the data. Five antibiotics were selected, namely ceftiofur, gentamicin, tetracycline, trimethoprim-sulfonamide in combination, and either enrofloxacin or marbofloxacin. For dogs, tetracycline was not considered further due to poor usage in companion animals and subsequent limited resistance data available.

In food animals (cattle, pigs, poultry), the proportion of isolates collected by RESAPATH that were susceptible to all antimicrobials considered here ranged from 18.3% (pigs) to nearly 50% (hens/broilers and turkeys) (Table 1). Since 2011, this proportion has been stable in cattle, has regularly increased over time in pigs (Chi² test for trend, $p<0.0001$) and has doubled in poultry (Figure 8).

The proportion of multidrug resistant isolates (resistant to at least 3 classes of antimicrobials among the 5 considered) is the highest in cattle (22.8%, stable since 2011), has decreased to 15.3% in pigs (Chi² test for trend, $p<0.00001$) and was twice lower in 2015 compared to 2011 in poultry (Figure 9). In cattle, contrary to pigs and poultry, ceftiofur resistant isolates harboured numerous co-resistances, such as to tetracycline and fluoroquinolones.

***Table 1**: Number and proportion of resistant isolates (R+I) from a list of five antimicrobials in E. coli in cattle, pigs and poultry*

Resistance number (R+I)	Cattle		Pigs		Hens/broilers		Turkeys	
	n	%	n	%	n	%	N	%
0	1,115	*22.6*	229	*18.3*	1,827	*44.6*	572	*49.7*
1	1,789	*36.3*	381	*30.5*	1,280	*31.3*	337	*29.3*
2	902	*18.3*	449	*35.9*	776	*19.0*	190	*16.5*
3	611	*12.4*	165	*13.2*	196	*4.8*	47	*4.1*
4	410	*8.3*	26	*2.1*	13	*0.3*	4	*0.3*
5	106	*2.1*	0	*0.0*	0	*0.0*	2	*0.2*
Total	4,933	*100*	1,250	*100*	4,092	*100*	1,152	*100*

***Figure 8**: Evolution of proportions (%) of E. coli isolates **susceptible** to all the five antimicrobials considered in the different animal species (only four antimicrobials considered for dogs)*

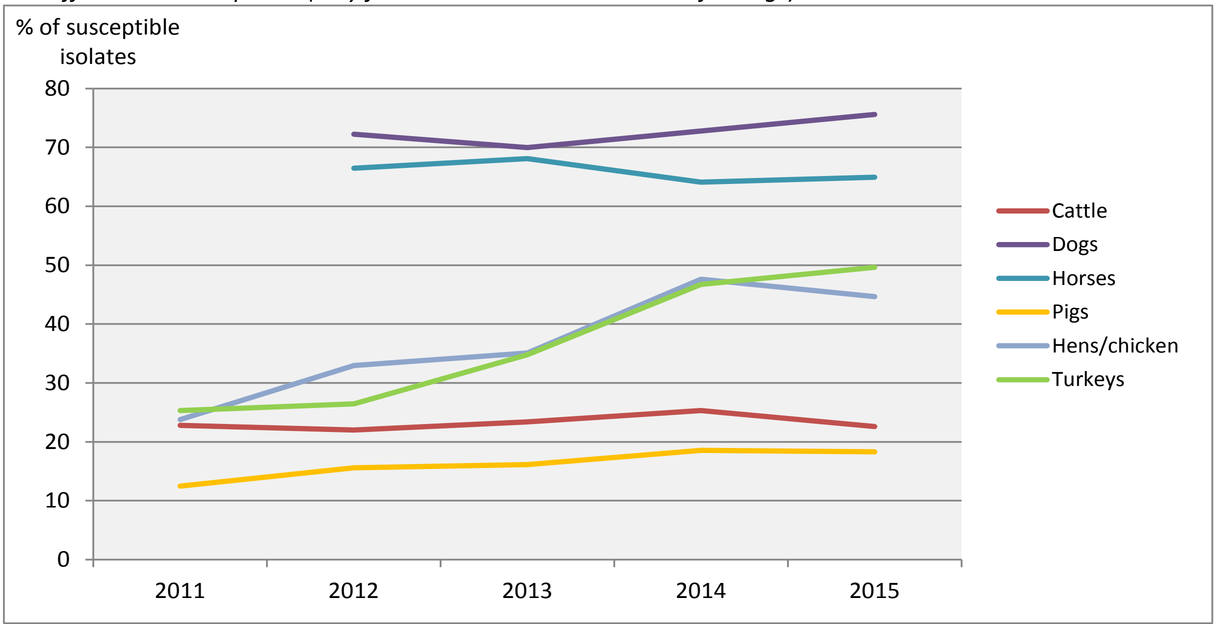
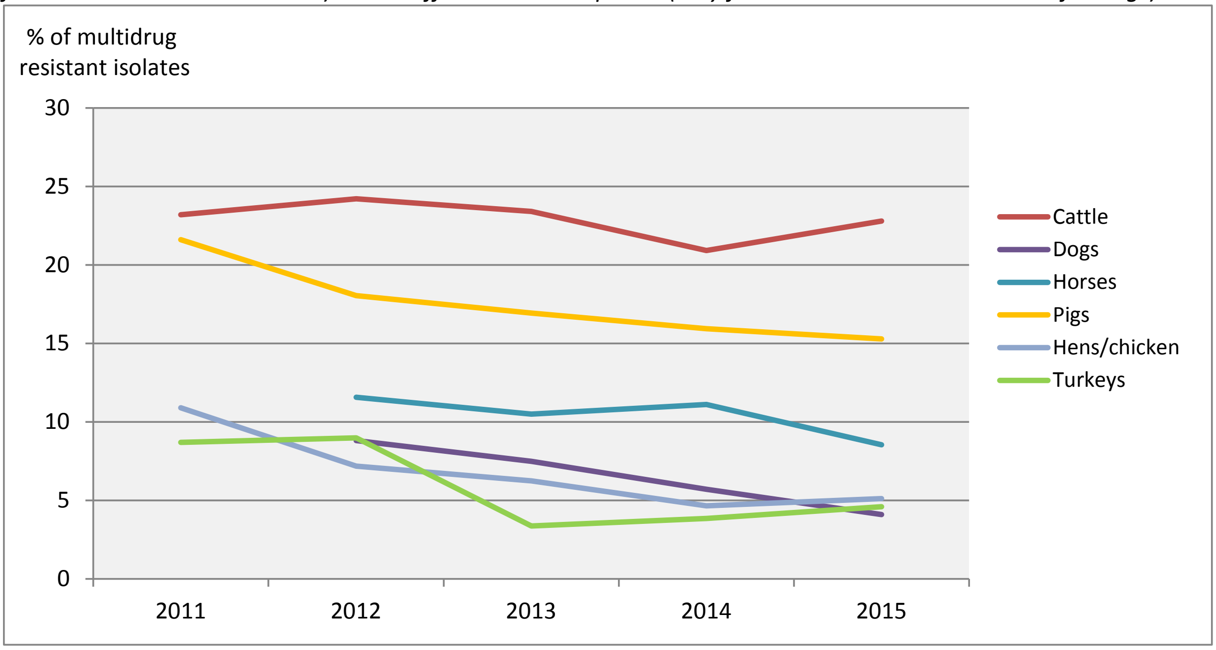


***Figure 9**: Evolution of proportions (%) of **multidrug resistant** E. coli isolates (resistant to at least three out of the five antimicrobials considered) in the different animal species (only four antimicrobials considered for dogs)*



For horses and dogs, the huge majority of the isolates (65% to 76%) were fully susceptible to the antimicrobials considered (Tables 2 and 3). In horses, the proportion of multidrug resistant isolates (resistant to at least 3 antimicrobial classes) (8.5%) is lower than in cattle or pigs. For dogs, the proportion of multidrug resistant isolates has decreased significantly from 8.8% in 2012 to 4.1% in 2015 (Chi² test for trend, $p < 0.0001$), but a direct comparison with the other animal species is hardly relevant as only four antimicrobials were considered for dogs versus five for the other species. As in cattle, ceftiofur-resistant isolates from horses and dogs had numerous co-resistances.

***Table 2**: Number and proportion of resistant isolates (R+I) from a list of five antimicrobials in E. coli in horses*

Resistance number (R+I)	Horses n	Horses %
0	365	*64.9*
1	92	*16.4*
2	57	*10.1*
3	12	*2.1*
4	29	*5.2*
5	7	*1.2*
Total	562	*100*

***Table 3**: Number and proportion of resistant isolates (R+I) from a list of four antimicrobials in E. coli in dogs*

Resistance number (R+I)	Dogs n	Dogs %
0	711	*75.6*
1	112	*11.9*
2	80	*8.5*
3	28	*3.0*
4	10	*1.1*
Total	941	*100*

Altogether, these data highlight to what extent diseased animals have become a major reservoir of multiple resistance genes. The abundance of multidrug resistant isolates confirms that not only critically important antibiotics such as broad-spectrum cephalosporins and fluoroquinolones may drive the selection of antimicrobial resistance but also ancient molecules, such as tetracyclines. Of note, rates of multidrug resistance in *E. coli* dramatically vary among animal sectors, which may reflect the diversity of usages or production systems.

Colistin resistance in veterinary medicine

Colistin has been used for a long time in veterinary medicine and reports of resistant isolates were scarce until 2015. For example, the first colistin-resistant *Klebsiella pneumoniae* of animal origin was described recently[1]. However, colistin use is now seriously challenged by the discovery of the plasmidic resistance gene *mcr-1*. One year after its discovery, more than one hundred publications reported its worldwide dissemination, mainly in *E. coli*. In France, the *mcr-1* gene was described in *E. coli* isolated from livestock (with a prevalence of 21 % in ESBL-producing *E. coli* from diarrheic veal calves[2], versus 2-6 % in other healthy animal species[3]) and in *Salmonella* isolates[4]. In Europe, the *mcr-1* prevalence in the digestive flora of healthy animals is also considered as low (1 à 2 %)[5]. Interestingly, colistin use is continuously decreasing in France but the prevalence of *E. coli* isolates presenting both the ESBL and *mcr-1* genes follows a reverse trend, suggesting other selecting factors than colistin usage.

Colistin use had been recurrently questioned over the last years because of the renewed interest of this molecule in human medicine to treat pan-resistant Enterobacteriaceae. Several official opinions had thus been released (European Medicine Agency[6,7], ANSES[8], European Commission[9])' which considered colistin as an important antibiotic for veterinary medicine and did not restrict its use. These opinions were of course revised in 2016, after the discovery of the *mcr-1* plasmidic (and transferable) gene[10].

The Resapath network collects antibiograms performed by disc diffusion, a method which is not entirely reliable for the monitoring of colistin resistance. Consequently, the low levels of colistin-resistance (<2 %) observed for several years had always been considered as a probable under-estimation of the true prevalence. Nevertheless, since biases were *a priori* constant, the evolution of the resistance over the years is reliable. Moreover, according to the experimental data accumulated by the veterinary laboratories as well as the ANSES laboratories, interpretation rules for diameters zones around the colistin disc (50 µg) were defined. Indeed, for *E. coli*, diameters of < 15mm or ≥ 18mm correspond to MICs of > 2 mg/L (resistant) or <2 mg/L (susceptible), respectively. Intermediate diameters (15, 16 and 17 mm) are non-informative and require the determination of the MIC. However, the probability for the MIC to be > 2 mg/L (resistant) is decreasing in parallel with the increase in diameters.

1 Kieffer N., Poirel L., Nordmann P., Madec J.-Y., Haenni M. (2015) Emergence of colistin resistance in *Klebsiella pneumoniae* from veterinary medicine. *Journal of Antimicrobial Chemotherapy*, 70 (4): 1265-1267.

2 Haenni M., Poirel L., Kieffer N., Chatre P., Saras E., Metayer V., Dumoulin R., Nordmann P., and Madec J.Y. (2016). Co-occurrence of extended spectrum beta lactamase and MCR-1 encoding genes on plasmids. *Lancet Infect Dis* 16**,** 281-282. doi: 10.1016/S1473-3099(16)00007-4

3 Perrin-Guyomard A., Bruneau M., Houee P., Deleurme K., Legrandois P., Poirier C., Soumet C., and Sanders P. (2016). Prevalence of mcr-1 in commensal Escherichia coli from French livestock, 2007 to 2014. Euro Surveill 21. doi: 10.2807/1560-7917.ES.2016.21.6.30135

4 Webb H.E., Granier S.A., Marault M., Millemann Y., Den Bakker H.C., Nightingale K.K., Bugarel M., Ison S.A., Scott H.M. and Loneragan G.H. (2016). Dissemination of the *mcr-1* colistin resistance gene. *Lancet Infect Dis* 16**,** 144-145. doi: 10.1016/S1473-3099(15)00538-1

5 Kempf I., Fleury M.-A., Drider D., Bruneau M., Sanders P., Chauvin C., Madec J.-Y., Jouy E. (2013). What do we know about resistance to colistin in Enterobacteriaceae in avian and pig production in Europe? *International Journal of Antimicrobial Agents*, 42: 379-383.

6 European Medicines Agency. (2013). Use of colistin products in animals within the European Union : Development of resistance and possible impact on human and animal health. EMA/755938/2012, 19 July 2013.
URL : http://www.ema.europa.eu/docs/en_GB/document_library/Report/2013/07/WC500146813.pdf

7 European Medicines Agency. (2014). Answers to the requests for scientific advice on the impact on public health and animal health of the use of antibiotics in animals. EMA/381884/2014, 18 December 2014.

8 Avis de l'Anses relatif à l'évaluation des risques d'émergence d'antibiorésistance liés aux modes d'utilisation des antibiotiques dans le domaine de la santé animale. (2014). URL https://www.anses.fr/fr/system/files/SANT2011sa0071Ra.pdf.

9 Décision adoptée le 16 mars 2015, suite à un référé pris au titre de l'article 35 de la directive 2001/82/CE relative aux médicaments vétérinaires et concernant toutes les AMM de formes orales de colistine (EMA/EC/2015)

10 European Medicines Agency. (2016). Updated advice on the use of colistin products in animals within the European Union: development of resistance and possible impact on human and animal health. EMA/231573/2016, 26 May 2016.

The evolution of the proportions of the different diameters was observed between 2003 and 2015 (*Figures 15 to 19*), and a Chi² test for trend was performed on diameters ≥ 18mm.

A significant increase in the proportion of susceptible strains was observed in all animal species, even though with specific dynamics. These data suggest that the diffusion of colistin-resistant *E. coli* that are pathogenic for animals is under control.

Figure 15 *: Relative proportion of diameters < 15 mm, 15 mm, 16 mm, 17 mm and ≥ 18 mm around the colistin disc (50 µg) for E. coli isolated from digestive pathologies in piglets (n min.: 296 (2005); n max.: 776 (2011))*

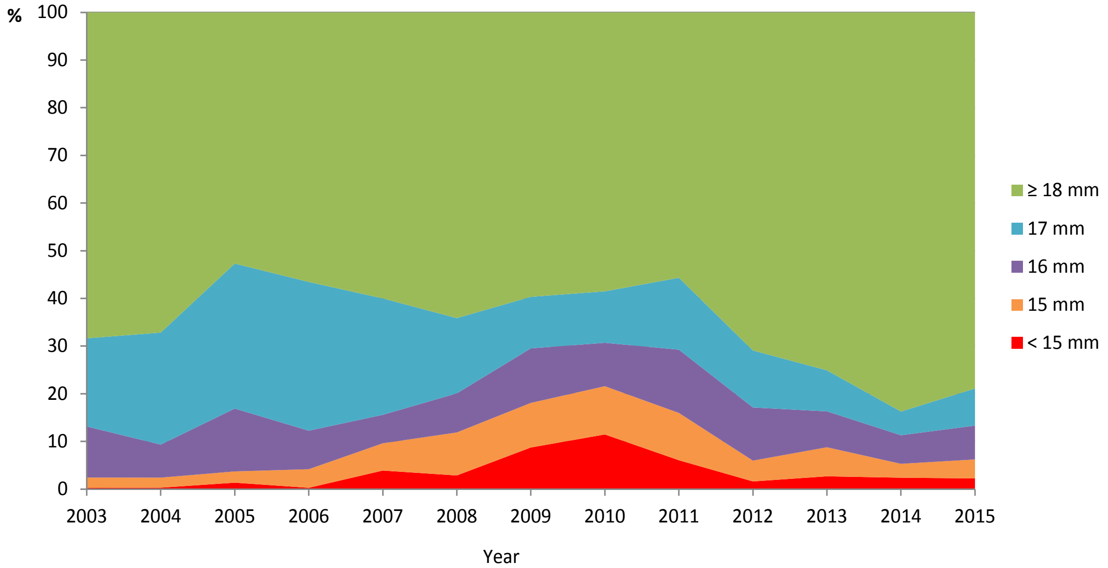


Figure 16 *: Relative proportion of diameters < 15 mm, 15 mm, 16 mm, 17 mm and ≥ 18 mm around the colistin disc (50 µg) for E. coli isolated from digestive pathologies in veal calves (n min.: 1139 (2003); n max.: 3412 (2015))*

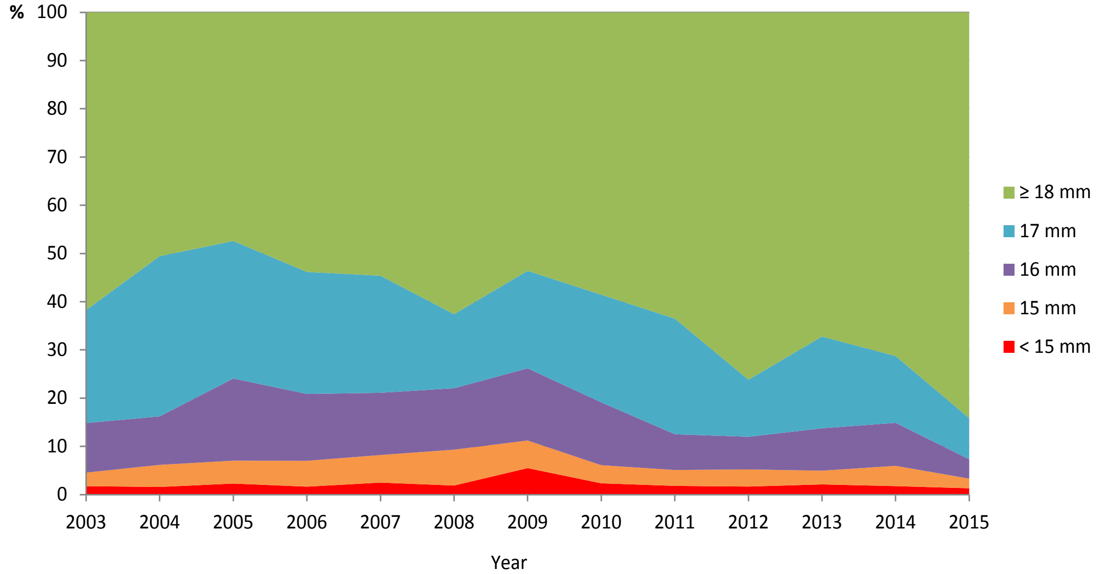


Figure 17 *: Relative proportion of diameters < 15 mm, 15 mm, 16 mm, 17 mm and ≥ 18 mm around the colistin disc (50 µg) for E. coli isolated from bovine mastitis(n min.: 188 (2004); n max.: 785 (2014))*

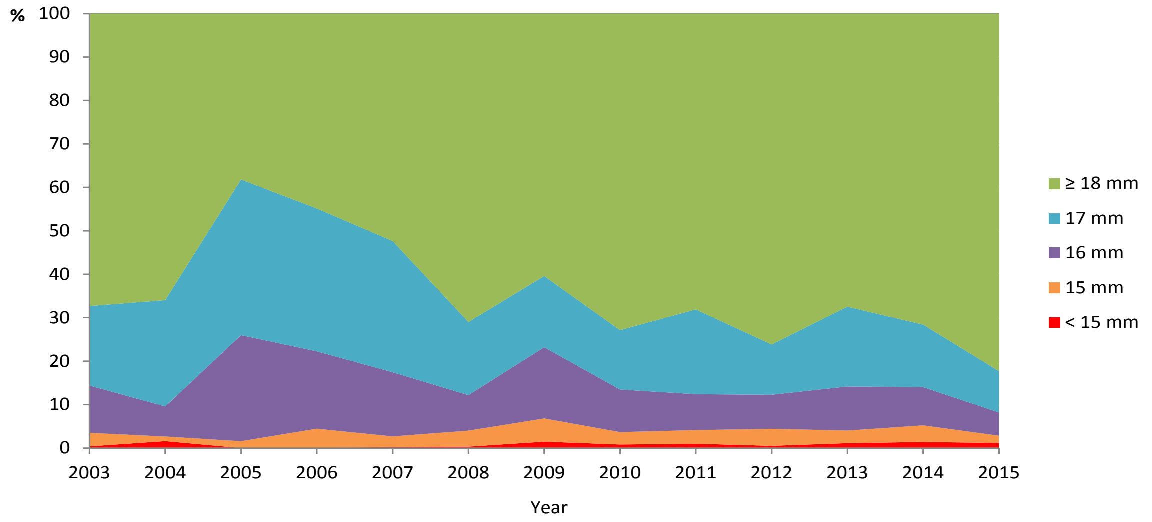


Figure 18 *: Relative proportion of diameters < 15 mm, 15 mm, 16 mm, 17 mm and ≥ 18 mm around the colistin disc (50 µg) for E. coli isolated from turkey (n min.: 862 (2013); n max.: 2220 (2015))*

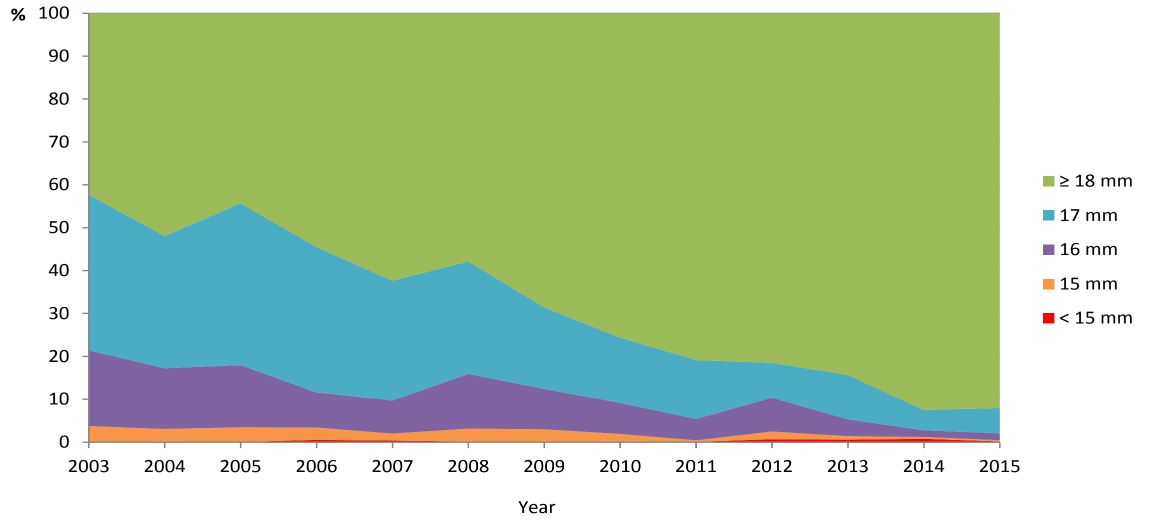
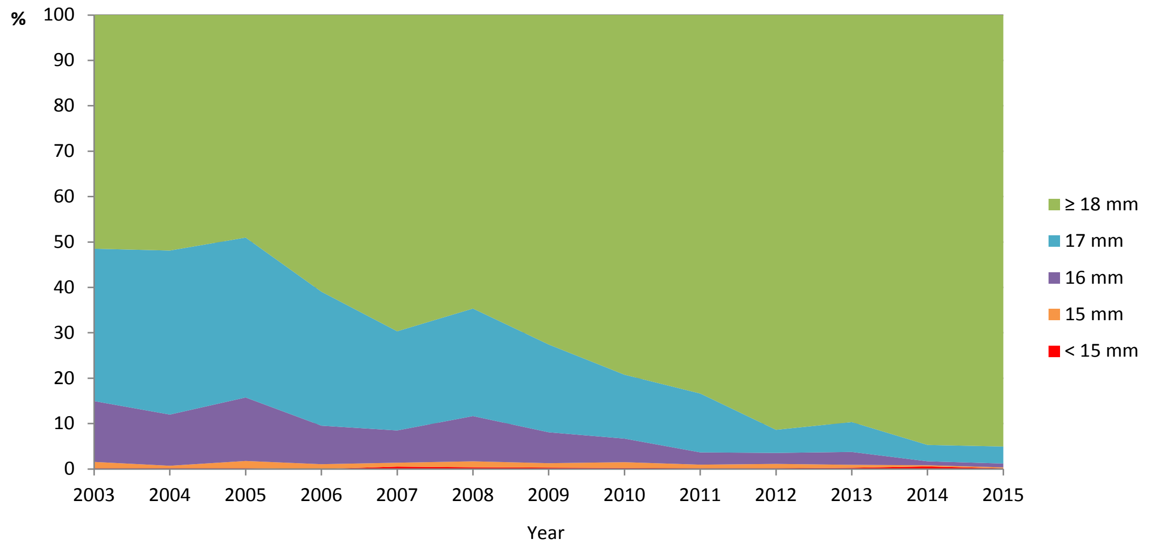


Figure 19 *: Relative proportion of diameters < 15 mm, 15 mm, 16 mm, 17 mm and ≥ 18 mm around the colistin disc (50 µg) for E. coli isolated from hens and chickens (n min.: 559 (2004); n max.: 6379 (2015))*



Carbapenem-resistant *Acinetobacter baumannii* in French companion animals

Acinetobacter baumannii is responsible for infections in animals involving the urinary and respiratory tracts, the skin and mucous membranes, with elevated mortality. The development of the infection is favored by the presence of a foreign body and occurs more frequently in horses, dogs and cats[11]. *A. baumannii* is infamous as an opportunistic pathogen in critically ill humans as well, and carbapenems are considered as a therapeutic reference. Unfortunately, clones producing enzymes hydrolyzing carbapenems, especially OXA-23, have spread globally. This situation, together with the propensity of *A. baumannii* to develop multidrug-resistance, raises a serious threat for public health.

A. baumannii producing OXA-23 have been recovered also in animals. These isolates belonged to Sequence Type (ST) 2, the most prevalent ST among multidrug-resistant isolates of human origin, suggesting a contamination of animals by humans. During 2011-2015 in the framework of the RESAPATH, seven isolates found in the urines of cats (n=5) and dogs (n=2), which were resident in different households and five different municipalities, demonstrated high-level resistance to carbapenems and all produced an OXA-23. Surprisingly, the genotyping demonstrated that the isolates were highly similar (>98.8%) and all belonged to ST25. These observations suggest that *A. baumannii* ST25 resistant to carbapenems has clonally disseminated and that ST25 isolates are more prevalent among animals than ST2 isolates, which, on the other hand, are the most prevalent among isolates of human origin in France.

In conclusion, companion animals might constitute a further reservoir of carbapenem-resistant *A. baumannii* and not only be subject of contamination by humans. Considering the difficulties for treatment of *A. baumannii* infections, monitoring the reservoir of carbapenem-resistant isolates and preventing the contamination of companion animals are a priority to preserve public health.

Detection of high risk human *Enterobacter cloacae* clones in animal strains

Enterobacter cloacae is a nosocomial pathogen that is intrinsically expressing its chromosomal *ampC* gene but can also acquire plasmidic resistances such as ESBL genes. An MLST scheme was recently developed to characterize human strains and highlighted the presence of high risk clones for humans, most of which are associated with ESBLs. In animals, *E. cloacae* is a minor pathogen. Nevertheless, between 2010 and 2013, antibiograms of 635 clinical isolates collected in horses, cats and dogs were reported through the RESAPATH network. A total of 36 (5.7%; 36/635) isolates were resistant to ceftiofur and all presented an ESBL phenotype. The $bla_{\text{CTX-M-15}}$ was detected in 66.6% of the isolates and was mostly carried by IncHI2/ST1 plasmids. PFGE and MLST analysis allowed to group isolates in 23 PFGE profiles and 13 different STs. A total of 25/36 of the animal isolates (69.4%) corresponded to high risk clones for humans, and the CTX-M-15-producing ST114 was highly prevalent (44 %, 16/36). These results raise questions on the transfer of such resistant strains between the animal and human reservoirs. Finally, further studies should also determine whether these high risk clones are strictly associated to ESBL-presenting *E. cloacae* or are also prevalent in susceptible isolates.

11 Francey T., Gaschen F., Nicolet J., Burnens AP. (2000). The role of *Acinetobacter baumannii* as a nosocomial pathogen for dogs and cats in an intensive care unit. *J Vet Intern Med.*, **14**:177-183.

Proteus mirabilis isolates collecting resistance phenotypes

Proteus mirabilis is an opportunistic pathogen, causing mostly urinary tract infections in humans. It is rarely found in veterinary medicine, unless in cats and dogs in which it is responsible for urinary tract infections as well. While veterinary isolates are usually considered as fully susceptible, human strains of *P. mirabilis* presenting the *Salmonella* Genomic Island 1 (SGI1) or acquired resistance to extended-spectrum cephalosporins (ESBL, AmpC) are increasingly reported. Two studies were thus conducted in the frame of the RESAPATH to assess whether such resistant isolates were already spreading in animals.

The first study revealed the presence of the PGI1 (*Proteus* Genomic Island 1) element and the SGI1-V variant – which additionally produced the VEB-6 ESBL enzyme – in *P. mirabilis* from dogs. The second study aimed at estimating the prevalence of such resistances in 468 clinical *Proteus* spp. collected between 2008 and 2015. A total of 17 *P. mirabilis* (3.6%) harboring the SGI1 (n=11) or PGI1 (n=6) elements were identified. Resistance to extended-spectrum cephalosporins was detected in 18 isolates (3.8%), including 10 ESBL (among which six are the SGI1 encoded VEB-6) and 8 AmpC enzymes. Interestingly, all AmpCs and 8/10 ESBLs were chromosomally-encoded. All isolates were non-clonal and originated from dogs, cats and horses. These results are breaking the myth of the susceptible *P. mirabilis* and are prompting us to survey these phenotypes in order to detect a potential rapid emergence.

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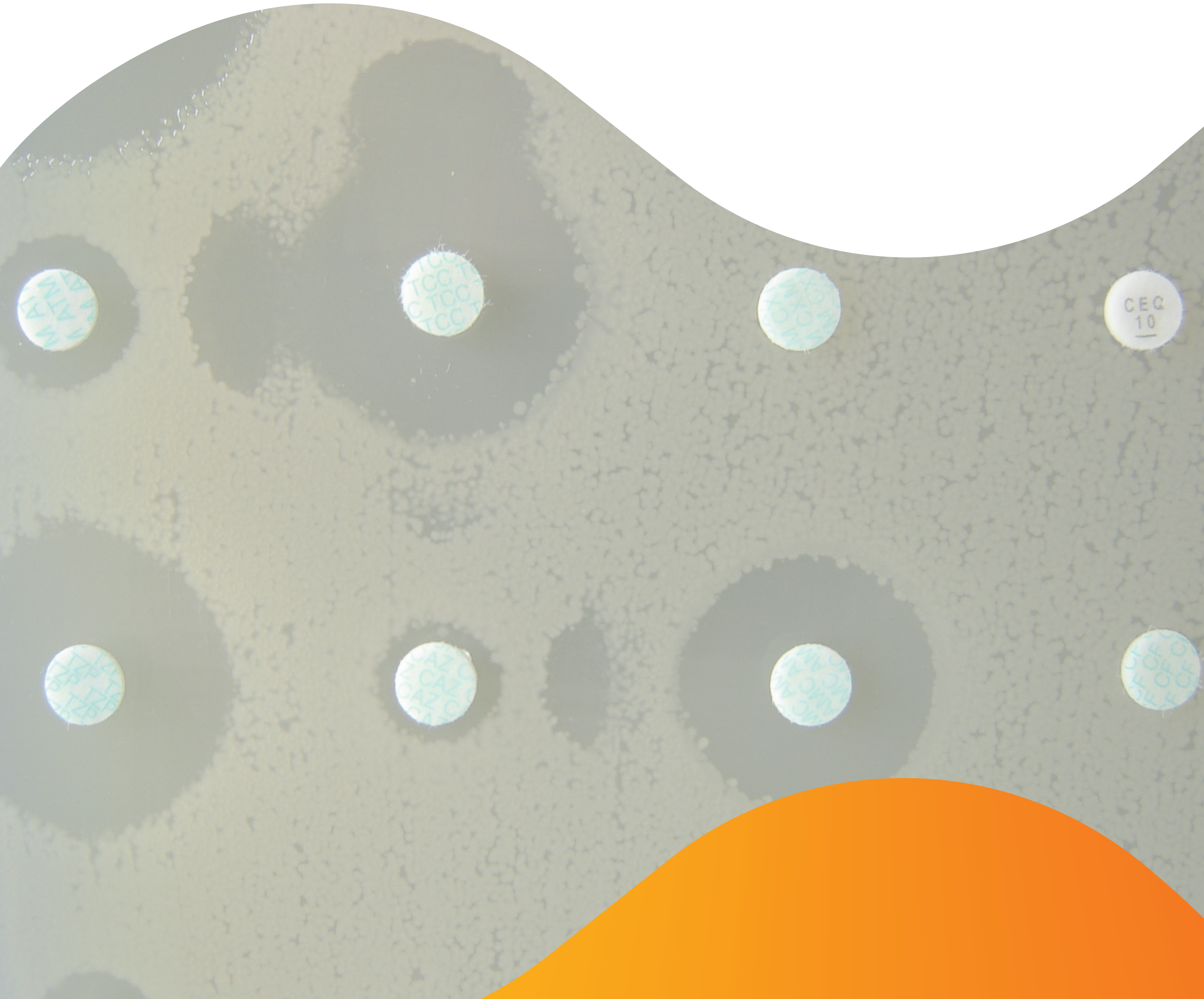
Annex 1

List of RESAPATH laboratories



Laboratories members

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Eurofins Laboratoire Cœur de France - MOULINS (03)
Laboratoire Départemental Vétérinaire et Hygiène Alimentaire - GAP (05)
Laboratoire Vétérinaire Départemental - SOPHIA ANTIPOLIS (06)
Laboratoire Départemental d'Analyses - HAGNICOURT (08)
Laboratoire Départemental d'Analyses - TROYES (10)
Aveyron Labo - RODEZ (12)
Laboratoire Départemental d'Analyses - MARSEILLE (13)
ANSES Laboratoire de pathologie équine de Dozulé – GOUSTRANVILLE (14)
LABEO Frank Duncombe - CAEN (14)
Laboratoire Départemental d'Analyses et de Recherches - AURILLAC (15)
Laboratoire Départemental d'Analyses de la Charente - ANGOULEME (16)
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Laboratoire Départemental de la Côte d'Or- DIJON (21)
LABOCEA Ploufragan - PLOUFRAGAN (22)
LABOFARM - LOUDEAC (22)
Laboratoire Départemental d'Analyse - (23) AJAIN
Laboratoire Départemental d'Analyse et de Recherche - COULOUNIEIX CHAMIERS (24)
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LABOCEA Quimper - QUIMPER (29)
Laboratoire Départemental d'Analyses - NIMES (30)
Laboratoire Départemental Vétérinaire et des Eaux - AUCH (32)
BIOLAB 33 - LE HAILLAN (33)
Laboratoire Départemental Vétérinaire - MONTPELLIER (34)
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Laboratoire RESALAB-Bretagne - GUENIN (56)
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VEBIO - ARCUEIL (94)

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Annex 2

Cattle

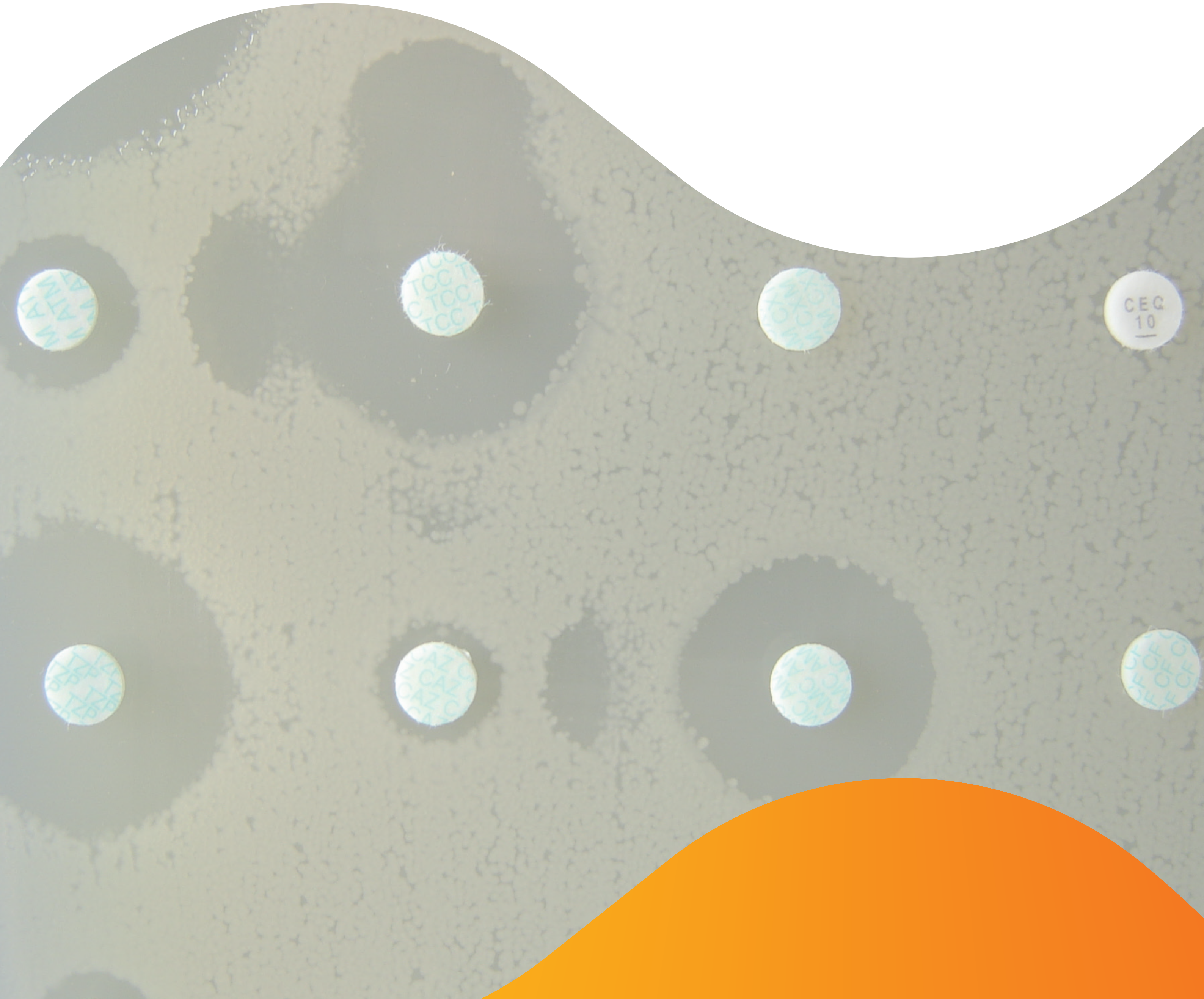
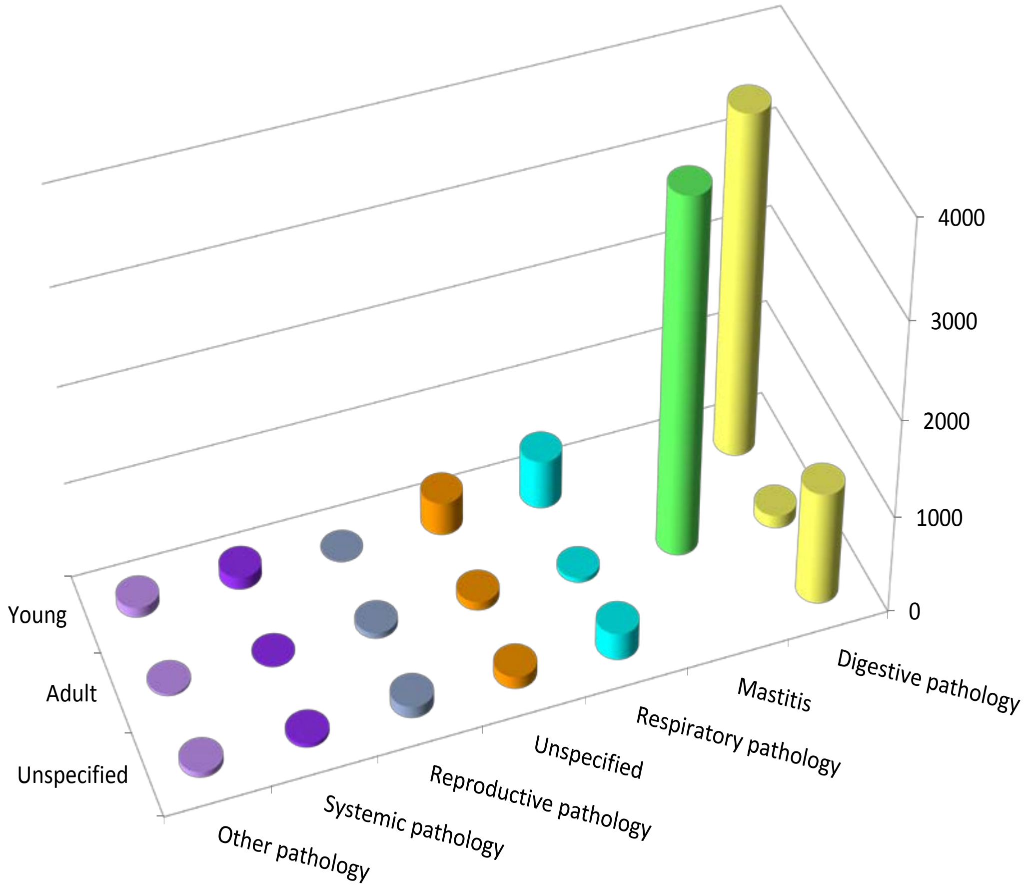


Figure 1 - Cattle 2015 – Number of antibiograms by age group and pathology

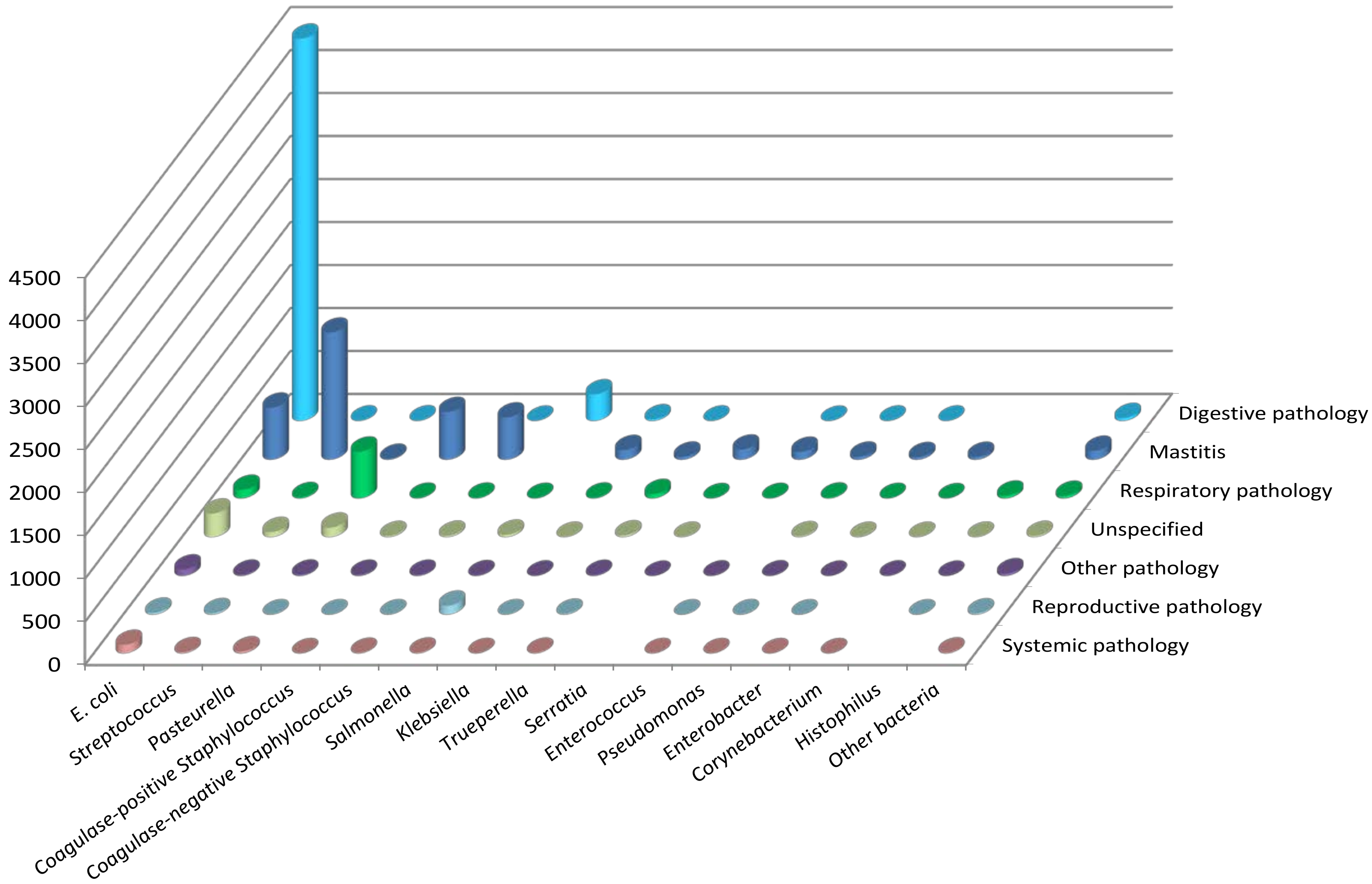


***Note:** all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Cattle 2015 – Number of antibiograms by age group and pathology

Pathology N (%)	Age group N (%)			Total N (%)
	Young	Adult	Unspecified	
Digestive pathology	3,539 *(34.03)*	130 *(1.25)*	1,156 *(11.12)*	**4,825** ***(46.40)***
Mastitis		3,681 *(35.40)*		**3,681** ***(35.40)***
Respiratory pathology	496 *(4.77)*	46 *(0.44)*	275 *(2.64)*	**817** ***(7.86)***
Unspecified	338 *(3.25)*	89 *(0.86)*	123 *(1.18)*	**550** ***(5.29)***
Reproductive pathology	4 *(0.04)*	58 *(0.56)*	115 *(1.11)*	**177** ***(1.70)***
Systemic pathology	125 *(1.20)*	7 *(0.07)*	37 *(0.36)*	**169** ***(1.63)***
Nervous system pathology	23 *(0.22)*	2 *(0.02)*	8 *(0.08)*	**33** ***(0.32)***
Kidney and urinary tract pathology	4 *(0.04)*	11 *(0.11)*	14 *(0.13)*	**29** ***(0.28)***
Omphalitis	29 *(0.28)*			**29** ***(0.28)***
Septicemia	25 *(0.24)*	1 *(0.01)*	2 *(0.02)*	**28** ***(0.27)***
Arthritis	9 *(0.09)*	4 *(0.04)*	5 *(0.05)*	**18** ***(0.17)***
Skin and soft tissue infections	4 *(0.04)*	2 *(0.02)*	11 *(0.11)*	**17** ***(0.16)***
Otitis	2 *(0.02)*		5 *(0.05)*	**7** ***(0.07)***
Ocular pathology	1 *(0.01)*		5 *(0.05)*	**6** ***(0.06)***
Cardiac pathology	2 *(0.02)*		4 *(0.04)*	**6** ***(0.06)***
Cardiovascular disease	2 *(0.02)*		2 *(0.02)*	**4** ***(0.04)***
Oral pathology		2 *(0.02)*	1 *(0.01)*	**3** ***(0.03)***
Total N *(%)*	**4,603** ***(44.26)***	**4,033** ***(38.78)***	**1,763** ***(16.95)***	**10,399** ***(100.00)***

Figure 2 - Cattle 2015 – Number of antibiograms by bacteria and pathology (all age groups included)

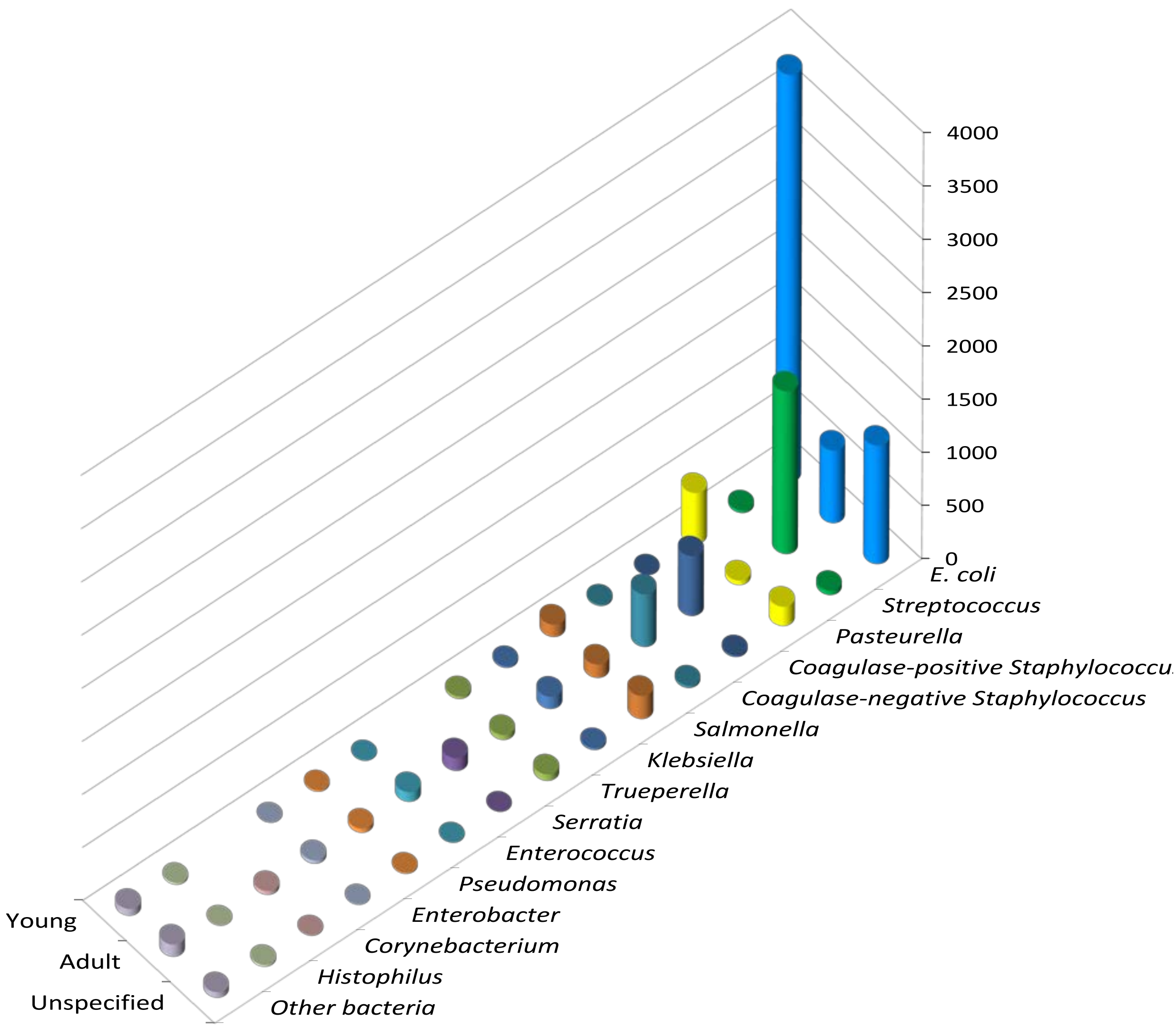


Note: *only values for pathologies >1% and bacterial groups having more than 30 occurrences are represented. Detailed values are presented in table 2 below.*

Table 2 - Cattle 2015 – Number of antibiograms by bacteria and pathology (all age groups included)

Bacteria N (%)	**Pathology N (%)**																	**Total N *(%)***
	Digestive pathology	Mastitis	Respiratory pathology	Unspecified	Reproductive pathology	Systemic pathology	Nervous system pathology	Kidney and urinary tract pathology	Omphalitis	Septicemia	Arthritis	Skin and soft tissue infections	Otitis	Ocular pathology	Cardiac pathology	Cardiovascular disease	Oral pathology	
E. coli	4,445 *(42.74)*	604 *(5.81)*	99 *(0.95)*	273 *(2.63)*	21 *(0.20)*	98 *(0.94)*	15 *(0.14)*	15 *(0.14)*	14 *(0.13)*	20 *(0.19)*	3 *(0.03)*	1 *(0.01)*			**3** *(0.03)*	3 *(0.03)*		**5,614** ***(53.99)***
Streptococcus	4 *(0.04)*	1,477 *(14.20)*	14 *(0.13)*	59 *(0.57)*	16 *(0.15)*	13 *(0.13)*	4 *(0.04)*	1 *(0.01)*	2 *(0.02)*	1 *(0.01)*	2 *(0.02)*	2 *(0.02)*						**1,595** ***(15.34)***
Pasteurella	5 *(0.05)*	9 *(0.09)*	543 *(5.22)*	109 *(1.05)*	2 *(0.02)*	22 *(0.21)*	1 *(0.01)*		1 *(0.01)*	4 *(0.04)*	1 *(0.01)*	2 *(0.02)*	2 *(0.02)*		**1** *(0.01)*		1 *(0.01)*	**703** ***(6.76)***
Coagulase-positive Staphylococcus		553 *(5.32)*	7 *(0.07)*	12 *(0.12)*	2 *(0.02)*	1 *(0.01)*	2 *(0.02)*	1 *(0.01)*			1 *(0.01)*	5 *(0.05)*	1 *(0.01)*		**1** *(0.01)*			**586** ***(5.64)***
Coagulase-negative Staphylococcus	2 *(0.02)*	490 *(4.71)*	8 *(0.08)*	15 *(0.14)*	2 *(0.02)*	5 *(0.05)*	1 *(0.01)*	4 *(0.04)*	2 *(0.02)*		1 *(0.01)*		2 *(0.02)*				1 *(0.01)*	**533** ***(5.13)***
Salmonella	308 *(2.96)*		5 *(0.05)*	27 *(0.26)*	103 *(0.99)*	8 *(0.08)*	7 *(0.07)*											**458** ***(4.40)***
Klebsiella	18 *(0.17)*	111 *(1.07)*	9 *(0.09)*	3 *(0.03)*	3 *(0.03)*	2 *(0.02)*			1 *(0.01)*	1 *(0.01)*	1 *(0.01)*							**149** ***(1.43)***
Trueperella	3 *(0.03)*	34 *(0.33)*	50 *(0.48)*	19 *(0.18)*	9 *(0.09)*	6 *(0.06)*			3 *(0.03)*		4 *(0.04)*	1 *(0.01)*			**1** *(0.01)*	1 *(0.01)*		**131** ***(1.26)***
Serratia		116 *(1.12)*	2 *(0.02)*	3 *(0.03)*														**121** ***(1.16)***
Enterococcus	1 *(0.01)*	90 *(0.87)*	4 *(0.04)*		1 *(0.01)*	2 *(0.02)*		2 *(0.02)*				1 *(0.01)*						**101** ***(0.97)***
Pseudomonas	3 *(0.03)*	34 *(0.33)*	9 *(0.09)*	9 *(0.09)*	3 *(0.03)*	1 *(0.01)*			1 *(0.01)*		1 *(0.01)*	2 *(0.02)*						**63** ***(0.61)***
Enterobacter	3 *(0.03)*	29 *(0.28)*	4 *(0.04)*	2 *(0.02)*	1 *(0.01)*	1 *(0.01)*												**40** ***(0.38)***
Corynebacterium		32 *(0.31)*	1 *(0.01)*	2 *(0.02)*		1 *(0.01)*		1 *(0.01)*				1 *(0.01)*					1 *(0.01)*	**39** ***(0.38)***
Histophilus			32 *(0.31)*	4 *(0.04)*	1 *(0.01)*													**37** ***(0.36)***
Other bacteria < 30 occurrences	33 *(0.32)*	102 *(0.98)*	30 *(0.29)*	13 *(0.13)*	13 *(0.13)*	9 *(0.09)*	3 *(0.03)*	5 *(0.05)*	5 *(0.05)*	2 *(0.02)*	4 *(0.04)*	2 *(0.02)*	2 *(0.02)*	6 *(0.06)*				**229** ***(2.20)***
Total N *(%)*	**4,825** ***(46.40)***	**3,681** ***(35.40)***	**817** ***(7.86)***	**550** ***(5.29)***	**177** ***(1.70)***	**169** ***(1.63)***	**33** ***(0.32)***	**29** ***(0.28)***	**29** ***(0.28)***	**28** ***(0.27)***	**18** ***(0.17)***	**17** ***(0.16)***	**7** ***(0.07)***	**6** ***(0.06)***	**6** ***(0.06)***	**4** ***(0.04)***	**3** ***(0.03)***	**10,399** ***(100.00)***

Figure 3 - Cattle 2015 – Number of antibiograms by bacteria and age group



Note: *only bacterial groups having more than 30 occurrences are represented. Detailed values are presented in table 3 below.*

Table 3 - Cattle 2015 – Number of antibiograms by bacteria and age group

Bacteria N (%)	Age group N (%) Young	Adult	Unspecified	Total N (%)
E. coli	3,819 *(36.72)*	682 *(6.56)*	1,113 *(10.70)*	**5,614** ***(53.99)***
Streptococcus	25 *(0.24)*	1,530 *(14.71)*	40 *(0.38)*	**1,595** ***(15.34)***
Pasteurella	479 *(4.61)*	42 *(0.40)*	182 *(1.75)*	**703** ***(6.76)***
Coagulase-positive Staphylococcus	6 *(0.06)*	564 *(5.42)*	16 *(0.15)*	**586** ***(5.64)***
Coagulase negative Staphylococcus	14 *(0.13)*	496 *(4.77)*	23 *(0.22)*	**533** ***(5.13)***
Salmonella	116 *(1.12)*	125 *(1.20)*	217 *(2.09)*	**458** ***(4.40)***
Klebsiella	17 *(0.16)*	115 *(1.11)*	17 *(0.16)*	**149** ***(1.43)***
Trueperella	24 *(0.23)*	46 *(0.44)*	61 *(0.59)*	**131** ***(1.26)***
Serratia		118 *(1.13)*	3 *(0.03)*	**121** ***(1.16)***
Enterococcus	6 *(0.06)*	91 *(0.88)*	4 *(0.04)*	**101** ***(0.97)***
Pseudomonas	14 *(0.13)*	39 *(0.38)*	10 *(0.10)*	**63** ***(0.61)***
Enterobacter	2 *(0.02)*	33 *(0.32)*	5 *(0.05)*	**40** ***(0.38)***
Corynebacterium		35 *(0.34)*	4 *(0.04)*	**39** ***(0.38)***
Histophilus	17 *(0.16)*	3 *(0.03)*	17 *(0.16)*	**37** ***(0.36)***
Other bacteria < 30 occurrences	64 *(0.62)*	114 *(1.10)*	51 *(0.49)*	**229** ***(2.20)***
Total N *(%)*	**4,603 *(44.26)***	**4,033 *(38.78)***	**1,763 *(16.95)***	**10,399 *(100.00)***

Table 4 - Cattle 2015 – Digestive pathology – Young animals – *E. coli*: susceptibility to antibiotics (proportion) (N= 3,420)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*2,983*	**15**
Amoxicillin-Clavulanic ac.	*3,319*	**43**
Cephalexin	*2,677*	**77**
Cephalothin	*808*	**61**
Cefoxitin	*2,568*	**90**
Cefuroxime	*1,756*	**70**
Cefoperazone	*1,176*	**87**
Ceftiofur	*3,409*	**93**
Cefquinome 30 µg	*3,345*	**87**
Streptomycin 10 UI	*2,094*	**15**
Spectinomycin	*851*	**52**
Kanamycin 30 UI	*1,283*	**44**
Tobramycin	*51*	**67**
Gentamicin 10 UI	*3,415*	**80**
Neomycin	*2,311*	**52**
Netilmicin	*51*	**82**
Amikacin	*51*	**100**
Apramycin	*1,347*	**86**
Tetracycline	*3,169*	**22**
Chloramphenicol	*142*	**44**
Florfenicol	*2,440*	**77**
Nalidixic ac.	*2,099*	**58**
Oxolinic ac.	*853*	**58**
Flumequine	*1,329*	**58**
Enrofloxacin	*3,206*	**77**
Marbofloxacin	*3,200*	**80**
Danofloxacin	*1,545*	**76**
Sulfonamides	*854*	**18**
Trimethoprim	*393*	**66**
Trimethoprim-Sulfonamides	*3,395*	**63**

Table 5 - Cattle 2015 – Mastitis – Adults – *E. coli:* susceptibility to antibiotics (proportion) (N= 604)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*530*	**72**
Amoxicillin-Clavulanic ac.	*603*	**81**
Cephalexin	*499*	**87**
Cephalothin	*217*	**88**
Cefoxitin	*450*	**99**
Cefuroxime	*321*	**92**
Cefoperazone	*443*	**98**
Ceftiofur	*504*	**98**
Cefquinome 30 µg	*554*	**98**
Streptomycin 10 UI	*363*	**82**
Spectinomycin	*151*	**95**
Kanamycin 30 UI	*259*	**92**
Gentamicin 10 UI	*596*	**98**
Neomycin	*431*	**90**
Apramycin	*138*	**97**
Tetracycline	*549*	**81**
Chloramphenicol	*32*	**78**
Florfenicol	*408*	**97**
Nalidixic ac.	*374*	**95**
Oxolinic ac.	*98*	**94**
Flumequine	*153*	**97**
Enrofloxacin	*533*	**98**
Marbofloxacin	*537*	**98**
Danofloxacin	*232*	**99**
Sulfonamides	*93*	**80**
Trimethoprim	*78*	**88**
Trimethoprim-Sulfonamides	*574*	**91**

Table 6 - Cattle 2015 – All pathologies and age groups included – *Salmonella* Typhimurium*:* susceptibility to antibiotics (proportion) (N= 162)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*128*	**16**
Amoxicillin-Clavulanic ac.	*162*	**36**
Cephalexin	*119*	**97**
Cephalothin	*56*	**96**
Cefoxitin	*132*	**99**
Cefuroxime	*65*	**95**
Cefoperazone	*68*	**62**
Ceftiofur	*162*	**99**
Cefquinome 30 µg	*152*	**97**
Streptomycin 10 UI	*99*	**17**
Spectinomycin	*63*	**33**
Kanamycin 30 UI	*56*	**98**
Gentamicin 10 UI	*162*	**95**
Neomycin	*140*	**98**
Apramycin	*80*	**99**
Tetracycline	*145*	**14**
Chloramphenicol	*31*	**55**
Florfenicol	*120*	**47**
Nalidixic ac.	*108*	**70**
Oxolinic ac.	*44*	**82**
Flumequine	*48*	**81**
Enrofloxacin	*162*	**94**
Marbofloxacin	*154*	**99**
Danofloxacin	*88*	**93**
Sulfonamides	*38*	**11**
Trimethoprim-Sulfonamides	*162*	**96**

Table 7 - Cattle 2015 – All pathologies and age groups included – *Salmonella* Mbandaka*:* susceptibility to antibiotics (proportion) (N= 66)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*65*	**100**
Amoxicillin-Clavulanic ac.	*63*	**100**
Cephalexin	*64*	**98**
Cephalothin	*48*	**100**
Cefoxitin	*66*	**100**
Cefuroxime	*51*	**100**
Cefoperazone	*55*	**100**
Ceftiofur	*66*	**100**
Cefquinome 30 µg	*65*	**97**
Streptomycin 10 UI	*51*	**98**
Kanamycin 30 UI	*51*	**100**
Gentamicin 10 UI	*66*	**100**
Neomycin	*65*	**98**
Tetracycline	*66*	**95**
Florfenicol	*66*	**100**
Nalidixic ac.	*48*	**96**
Enrofloxacin	*66*	**100**
Marbofloxacin	*65*	**100**
Danofloxacin	*62*	**100**
Sulfonamides	*49*	**88**
Trimethoprim	*46*	**100**
Trimethoprim-Sulfonamides	*66*	**98**

Table 8 - Cattle 2015 – All pathologies and age groups included – *Salmonella* Montevideo*:* susceptibility to antibiotics (proportion) (N= 76)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*72*	**99**
Amoxicillin-Clavulanic ac.	*73*	**99**
Cephalexin	*66*	**97**
Cephalothin	*42*	**95**
Cefoxitin	*73*	**97**
Cefuroxime	*47*	**100**
Cefoperazone	*55*	**100**
Ceftiofur	*76*	**100**
Cefquinome 30 µg	*74*	**95**
Streptomycin 10 UI	*50*	**94**
Kanamycin 30 UI	*50*	**100**
Gentamicin 10 UI	*76*	**99**
Neomycin	*70*	**100**
Apramycin	*33*	**85**
Tetracycline	*74*	**99**
Florfenicol	*74*	**100**
Nalidixic ac.	*47*	**100**
Enrofloxacin	*76*	**100**
Marbofloxacin	*71*	**100**
Danofloxacin	*64*	**100**
Sulfonamides	*40*	**100**
Trimethoprim	*33*	**100**
Trimethoprim-Sulfonamides	*76*	**100**

Table 9 - Cattle 2015 – Respiratory pathology – Young animals – *Pasteurella multocida:* susceptibility to antibiotics (proportion) (N= 198)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*179*	**96**
Amoxicillin-Clavulanic ac.	*181*	**96**
Cephalexin	*150*	**99**
Cefoperazone	*39*	**100**
Ceftiofur	*196*	**98**
Cefquinome 30 µg	*184*	**94**
Streptomycin 10 UI	*71*	**55**
Spectinomycin	*110*	**78**
Kanamycin 30 UI	*48*	**92**
Gentamicin 10 UI	*175*	**92**
Neomycin	*119*	**87**
Tetracycline	*193*	**81**
Doxycycline	*79*	**72**
Florfenicol	*191*	**99**
Nalidixic ac.	*77*	**95**
Oxolinic ac.	*89*	**85**
Flumequine	*112*	**89**
Enrofloxacin	*184*	**95**
Marbofloxacin	*186*	**98**
Danofloxacin	*137*	**96**
Sulfonamides	*32*	**9**
Trimethoprim-Sulfonamides	*193*	**90**

Table 10 - Cattle 2015 – Respiratory pathology – Young animals – *Mannheimia haemolytica:* susceptibility to antibiotics (proportion) (N= 134)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*114*	**96**
Amoxicillin-Clavulanic ac.	*121*	**98**
Cephalexin	*91*	**99**
Ceftiofur	*134*	**99**
Cefquinome 30 µg	*119*	**97**
Streptomycin 10 UI	*50*	**40**
Spectinomycin	*58*	**74**
Kanamycin 30 UI	*38*	**76**
Gentamicin 10 UI	*114*	**84**
Neomycin	*70*	**79**
Tetracycline	*131*	**84**
Doxycycline	*45*	**69**
Florfenicol	*130*	**98**
Nalidixic ac.	*57*	**93**
Oxolinic ac.	*41*	**83**
Flumequine	*59*	**85**
Enrofloxacin	*120*	**95**
Marbofloxacin	*131*	**99**
Danofloxacin	*92*	**91**
Trimethoprim-Sulfonamides	*131*	**100**

Table 11 - Cattle 2015 – Mastitis – Adults – *Serratia Marcescens:* susceptibility to antibiotics (proportion) (N= 93)

Antibiotic	*Total (N)*	**% S**
Amoxicillin-Clavulanic ac.	*90*	**22**
Cefoxitin	*66*	**77**
Cefuroxime	*47*	**13**
Cefoperazone	*64*	**100**
Ceftiofur	*81*	**99**
Cefquinome 30 µg	*83*	**100**
Streptomycin 10 UI	*56*	**61**
Gentamicin 10 UI	*91*	**99**
Neomycin	*64*	**98**
Tetracycline	*86*	**5**
Florfenicol	*50*	**90**
Nalidixic ac.	*52*	**100**
Enrofloxacin	*79*	**100**
Marbofloxacin	*88*	**100**
Trimethoprim-Sulfonamides	*79*	**99**

Table 12 - Cattle 2015 – Mastitis – Adults – *Klebsiella pneumoniae:* susceptibility to antibiotics (proportion) (N= 71)

Antibiotic	*Total (N)*	**% S**
Amoxicillin-Clavulanic ac.	*71*	**89**
Cephalothin	*31*	**100**
Cefoxitin	*55*	**96**
Cefuroxime	*34*	**97**
Cefoperazone	*46*	**98**
Ceftiofur	*61*	**100**
Cefquinome 30 µg	*66*	**100**
Streptomycin 10 UI	*48*	**94**
Kanamycin 30 UI	*36*	**100**
Gentamicin 10 UI	*71*	**99**
Neomycin	*44*	**93**
Tetracycline	*66*	**82**
Florfenicol	*48*	**98**
Nalidixic ac.	*44*	**89**
Enrofloxacin	*63*	**98**
Marbofloxacin	*65*	**98**
Trimethoprim-Sulfonamides	*67*	**97**

Table 13 - Cattle 2015 – Mastitis – Adults – Coagulase-positive *Staphylococcus*: susceptibility to antibiotics (proportion) (N= 553).

Antibiotic	*Total (N)*	**% S**
Penicillin	*546*	**76**
Cefoxitin	*501*	**97**
Oxacillin	*83*	**98**
Erythromycin	*440*	**95**
Tylosin	*362*	**96**
Spiramycin	*550*	**96**
Lincomycin	*511*	**96**
Pirlimycin	*63*	**100**
Streptomycin 10 UI	*404*	**92**
Kanamycin 30 UI	*331*	**97**
Gentamicin 10 UI	*527*	**98**
Neomycin	*265*	**98**
Tetracycline	*526*	**95**
Chloramphenicol	*36*	**89**
Florfenicol	*191*	**99**
Enrofloxacin	*484*	**98**
Marbofloxacin	*518*	**99**
Danofloxacin	*107*	**97**
Trimethoprim-Sulfonamides	*443*	**99**
Rifampicin	*175*	**99**

Table 14 - Cattle 2015 – Mastitis – Adults – Coagulase-negative *Staphycoccus*: susceptibility to antibiotics (proportion) (N= 490)

Antibiotic	*Total (N)*	**% S**
Penicillin	*489*	**69**
Cefoxitin	*443*	**95**
Oxacillin	*104*	**93**
Erythromycin	*413*	**86**
Tylosin	*304*	**89**
Spiramycin	*489*	**91**
Lincomycin	*464*	**82**
Pirlimycin	*54*	**89**
Streptomycin 10 UI	*324*	**84**
Kanamycin 30 UI	*278*	**97**
Gentamicin 10 UI	*467*	**99**
Neomycin	*316*	**100**
Tetracycline	*476*	**86**
Chloramphenicol	*31*	**87**
Florfenicol	*163*	**98**
Enrofloxacin	*380*	**98**
Marbofloxacin	*408*	**99**
Danofloxacin	*151*	**98**
Trimethoprim-Sulfonamides	*366*	**99**
Rifampicin	*173*	**98**

Table 15 - Cattle 2015 – Mastitis – Adults – *Streptococcus uberis*: susceptibility to antibiotics (proportion) (N= 1,195)

Antibiotic	*Total (N)*	**% S**
Ampicillin	*103*	**99**
Oxacillin	*940*	**80**
Erythromycin	*996*	**78**
Tylosin	*736*	**72**
Spiramycin	*1,180*	**76**
Lincomycin	*1,058*	**77**
Pristinamycin	*32*	**97**
Streptomycin 500 µg	*1,021*	**84**
Kanamycin 1000 µg	*822*	**95**
Gentamicin 500 µg	*1,020*	**97**
Tetracycline	*1,033*	**80**
Doxycycline	*78*	**90**
Chloramphenicol	*83*	**87**
Florfenicol	*532*	**89**
Enrofloxacin	*1,040*	**59**
Marbofloxacin	*982*	**78**
Danofloxacin	*182*	**47**
Trimethoprim-Sulfonamides	*1,100*	**83**
Rifampicin	*401*	**42**

Table 16 - Cattle 2015 – Mastitis – Adults – *Streptococcus dysgalactiae:* susceptibility to antibiotics (proportion) (N= 187)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*166*	**97**
Erythromycin	*147*	**76**
Tylosin	*124*	**82**
Spiramycin	*184*	**86**
Lincomycin	*168*	**86**
Streptomycin 500 µg	*167*	**94**
Kanamycin 1000 µg	*142*	**94**
Gentamicin 500 µg	*163*	**99**
Tetracycline	*169*	**14**
Florfenicol	*48*	**96**
Enrofloxacin	*156*	**56**
Marbofloxacin	*150*	**91**
Trimethoprim-Sulfonamides	*164*	**88**
Rifampicin	*45*	**67**

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Annex 3

Sheep

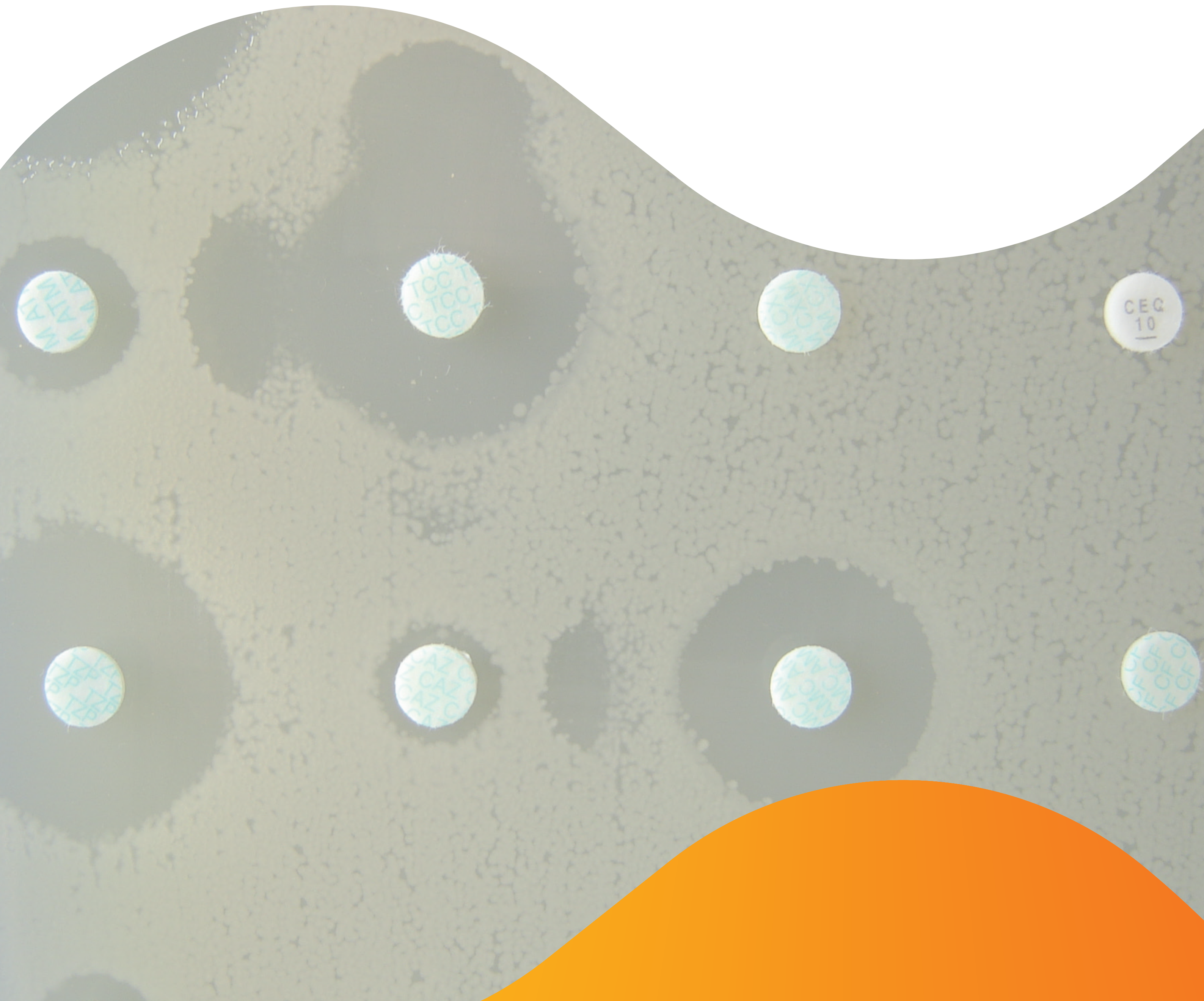
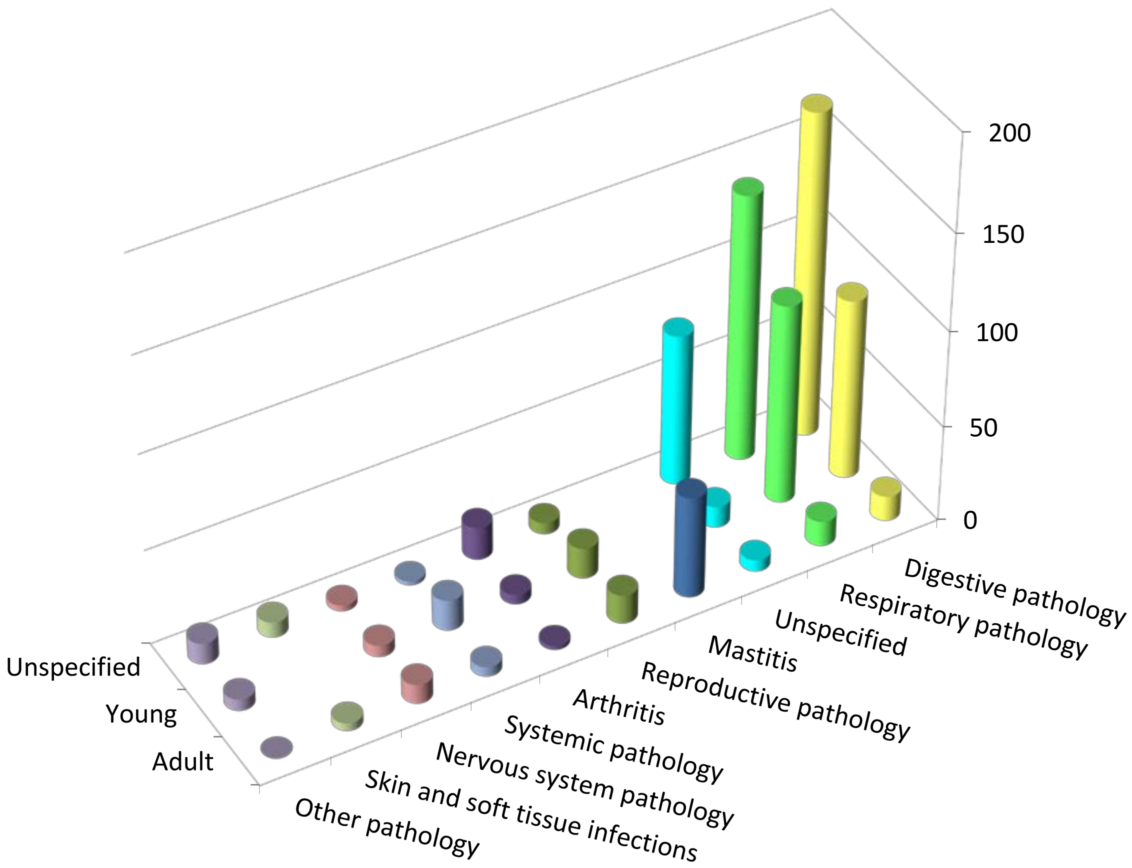


Figure 1 - Sheep 2015 – Number of antibiograms by age group and pathology

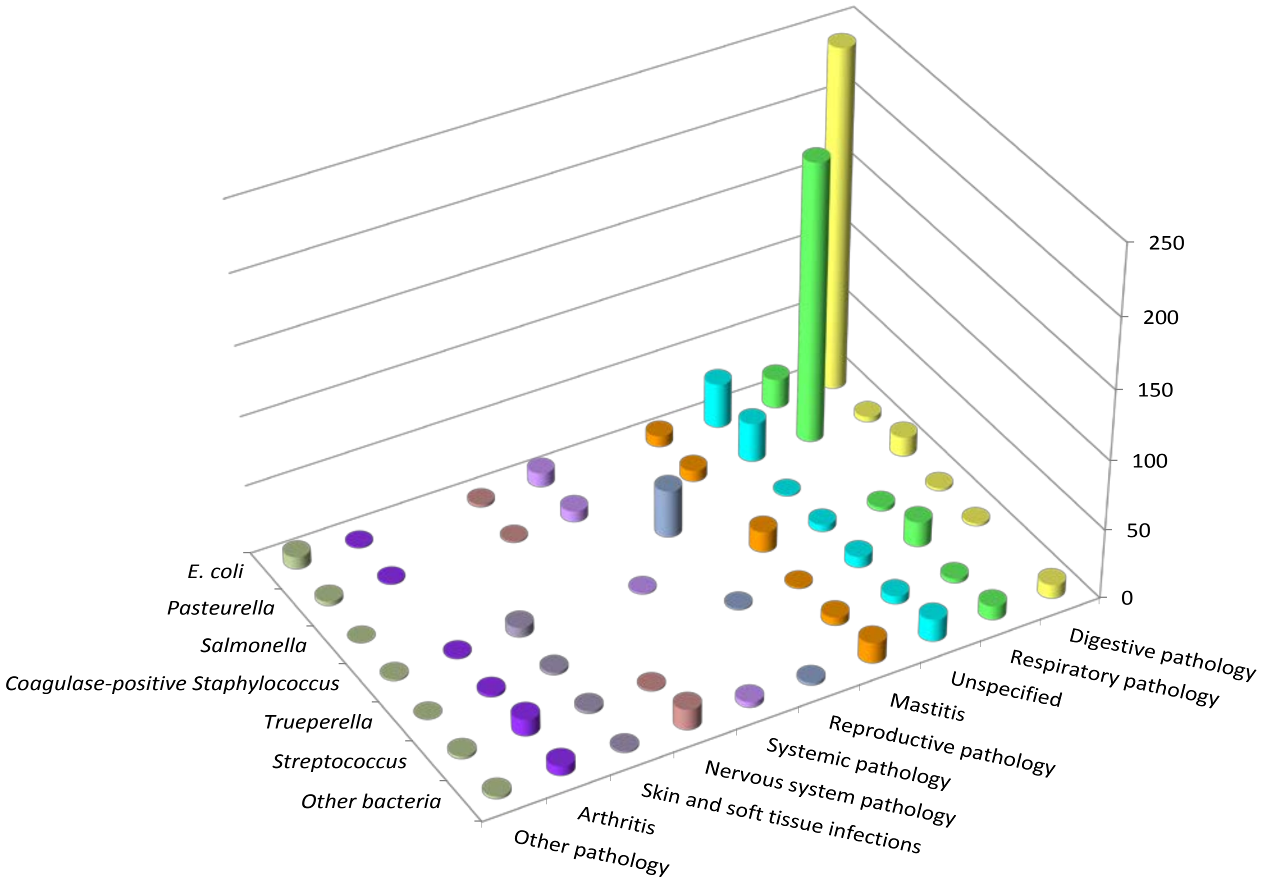


***Note:** all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Sheep 2015 – Number of antibiograms by age group and pathology

	Age group N (%)			
Pathology N (%)	Unspecified	Young	Adult	**Total N *(%)***
Digestive pathology	169 *(20.8)*	94 *(11.6)*	13 *(1.6)*	**276 *(33.9)***
Respiratory pathology	139 *(17.1)*	104 *(12.8)*	13 *(1.6)*	**256 *(31.5)***
Unspecified	79 *(9.7)*	11 *(1.4)*	6 *(0.7)*	**96 *(11.8)***
Mastitis			53 *(6.5)*	**53 *(6.5)***
Reproductive pathology	6 *(0.7)*	16 *(2.0)*	15 *(1.8)*	**37 *(4.6)***
Arthritis	17 *(2.1)*	5 *(0.6)*	2 *(0.2)*	**24 *(3.0)***
Systemic pathology	2 *(0.2)*	16 *(2.0)*	5 *(0.6)*	**23 *(2.8)***
Nervous system pathology	3 *(0.4)*	6 *(0.7)*	10 *(1.2)*	**19 *(2.3)***
Skin and soft tissue infections	8 *(1.0)*		4 *(0.5)*	**12 *(1.5)***
Septicemia	5 *(0.6)*	2 *(0.2)*		**7 *(0.9)***
Kidney and urinary tract pathology	4 *(0.5)*	1 *(0.1)*		**5 *(0.6)***
Ocular pathology	2 *(0.2)*	2 *(0.2)*		**4 *(0.5)***
Cardiac pathology		1 *(0.1)*		**1 *(0.1)***
Total N *(%)*	**434 *(53.4)***	**258 *(31.7)***	**121 *(14.9)***	**813 *(100.0)***

Figure 2 - Sheep 2015 – Number of antibiograms by bacterial group and pathology



Note: *only values for pathologies >1% and bacterial groups having more than 30 occurrences are represented. Detailed values are presented in table 2 below.*

Table 2 - Sheep 2015 – Number of antibiograms by bacterial group and pathology

Bacteria N (%)	Pathology N (%)													
	Digestive pathology	Respiratory pathology	Unspecified	Mastitis	Reproductive pathology	Arthritis	Systemic pathology	Nervous system pathology	Skin and soft tissue infections	Septicemia	Kidney and urinary tract pathology	Ocular pathology	Cardiac pathology	**Total N *(%)***
E. coli	244 *(30.0)*	21 *(2.6)*	32 *(3.9)*	8 *(1.0)*		1 *(0.1)*	10 *(1.2)*	2 *(0.2)*		2 *(0.2)*	5 *(0.6)*	1 *(0.1)*	1 *(0.1)*	**327 *(40.2)***
Pasteurella	4 *(0.5)*	201 *(24.7)*	28 *(3.4)*	8 *(1.0)*		1 *(0.1)*	8 *(1.0)*	1 *(0.1)*		3 *(0.4)*				**254 *(31.2)***
Salmonella	14 *(1.7)*		1 *(0.1)*		34 *(4.2)*									**49 *(6.0)***
Coagulase-positive Staphylococcus	2 *(0.2)*	3 *(0.4)*	5 *(0.6)*	15 *(1.8)*		1 *(0.1)*	1 *(0.1)*		7 *(0.9)*			1 *(0.1)*		**35 *(4.3)***
Trueperella	2 *(0.2)*	18 *(2.2)*	8 *(1.0)*	1 *(0.1)*	1 *(0.1)*	2 *(0.2)*			2 *(0.2)*					**34 *(4.2)***
Streptococcus		3 *(0.4)*	6 *(0.7)*	6 *(0.7)*		12 *(1.5)*		1 *(0.1)*	2 *(0.2)*	1 *(0.1)*		1 *(0.1)*		**32 *(3.9)***
Other bacteria < 30 occurrences	10 *(1.2)*	10 *(1.2)*	16 *(2.0)*	15 *(1.8)*	2 *(0.2)*	7 *(0.9)*	4 *(0.5)*	15 *(1.8)*	1 *(0.1)*	1 *(0.1)*		1 *(0.1)*		**82 *(10.1)***
Total N *(%)*	**276 *(33.9)***	**256 *(31.5)***	**96 *(11.8)***	**53 *(6.5)***	**37 *(4.6)***	**24 *(3.0)***	**23 *(2.8)***	**19 *(2.3)***	**12 *(1.5)***	**7 *(0.9)***	**5 *(0.6)***	**4 *(0.5)***	**1 *(0.1)***	**813 *(100.0)***

Table 3 - Sheep 2015 – Digestive pathology – *E. coli:* susceptibility to antibiotics (proportion) (N= 244)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*220*	**41**
Amoxicillin-Clavulanic ac.	*244*	**68**
Cephalexin	*216*	**91**
Cefoxitin	*185*	**99**
Cefuroxime	*42*	**98**
Cefoperazone	*59*	**98**
Ceftiofur	*243*	**98**
Cefquinome 30 µg	*239*	**98**
Streptomycin 10 UI	*190*	**32**
Spectinomycin	*159*	**78**
Kanamycin 30 UI	*63*	**89**
Gentamicin 10 UI	*243*	**93**
Neomycin	*217*	**78**
Tetracycline	*233*	**37**
Florfenicol	*223*	**90**
Nalidixic ac.	*216*	**82**
Oxolinic ac.	*42*	**93**
Flumequine	*108*	**84**
Enrofloxacin	*198*	**90**
Marbofloxacin	*111*	**94**
Danofloxacin	*74*	**88**
Sulfonamides	*48*	**65**
Trimethoprim-Sulfonamides	*243*	**56**

Table 4 - Sheep 2015 – Respiratory pathology – All age groups – *Mannheimia haemolytica:* susceptibility to antibiotics (proportion) (N= 137)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*131*	**95**
Amoxicillin-Clavulanic ac.	*119*	**98**
Cephalexin	*110*	**100**
Cefoxitin	*75*	**100**
Ceftiofur	*137*	**99**
Cefquinome 30 µg	*115*	**99**
Streptomycin 10 UI	*100*	**74**
Spectinomycin	*82*	**88**
Gentamicin 10 UI	*120*	**82**
Neomycin	*107*	**79**
Tetracycline	*135*	**87**
Florfenicol	*128*	**99**
Nalidixic ac.	*120*	**93**
Flumequine	*64*	**94**
Enrofloxacin	*90*	**92**
Marbofloxacin	*66*	**97**
Danofloxacin	*34*	**91**
Trimethoprim-Sulfonamides	*136*	**96**

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Goats

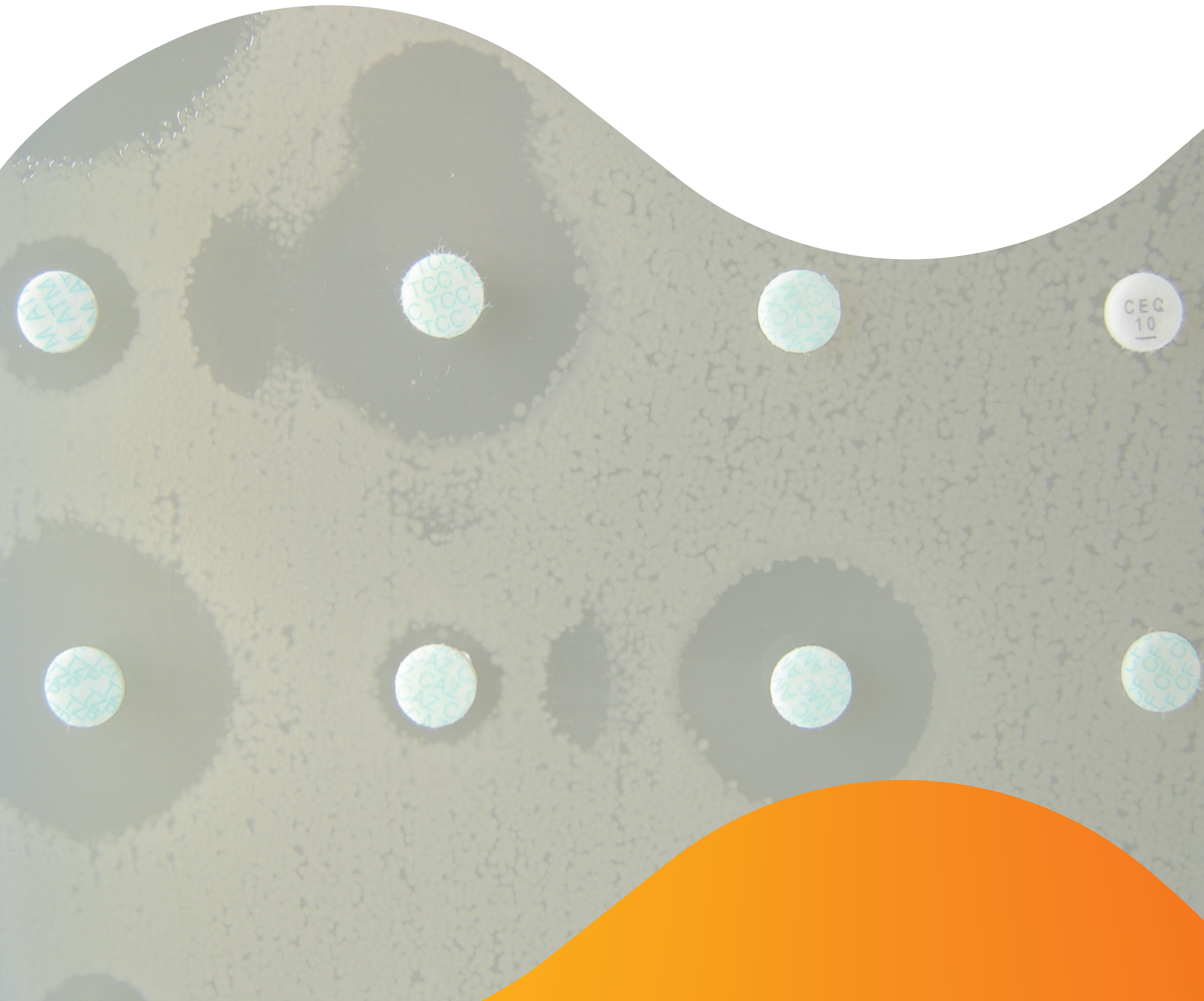
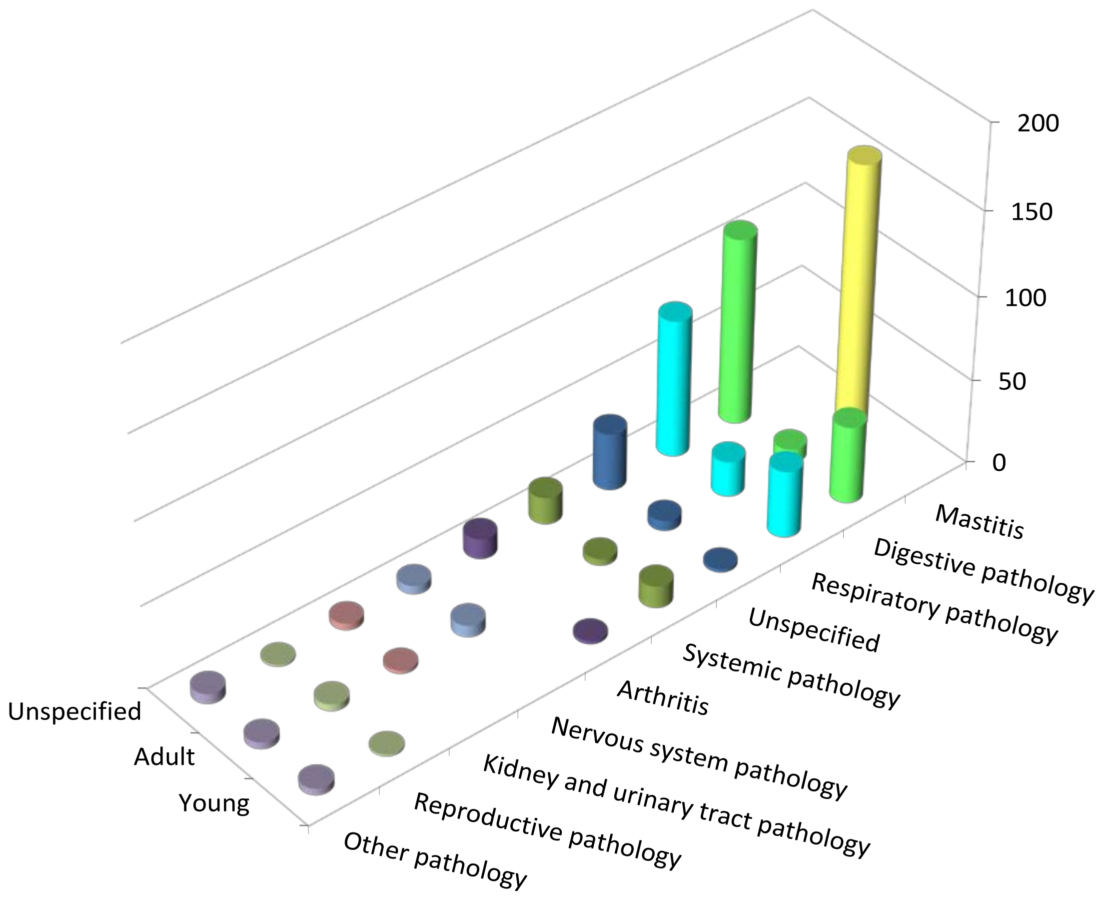


Figure 1 - Goats 2015 – Number of antibiograms by age group and pathology

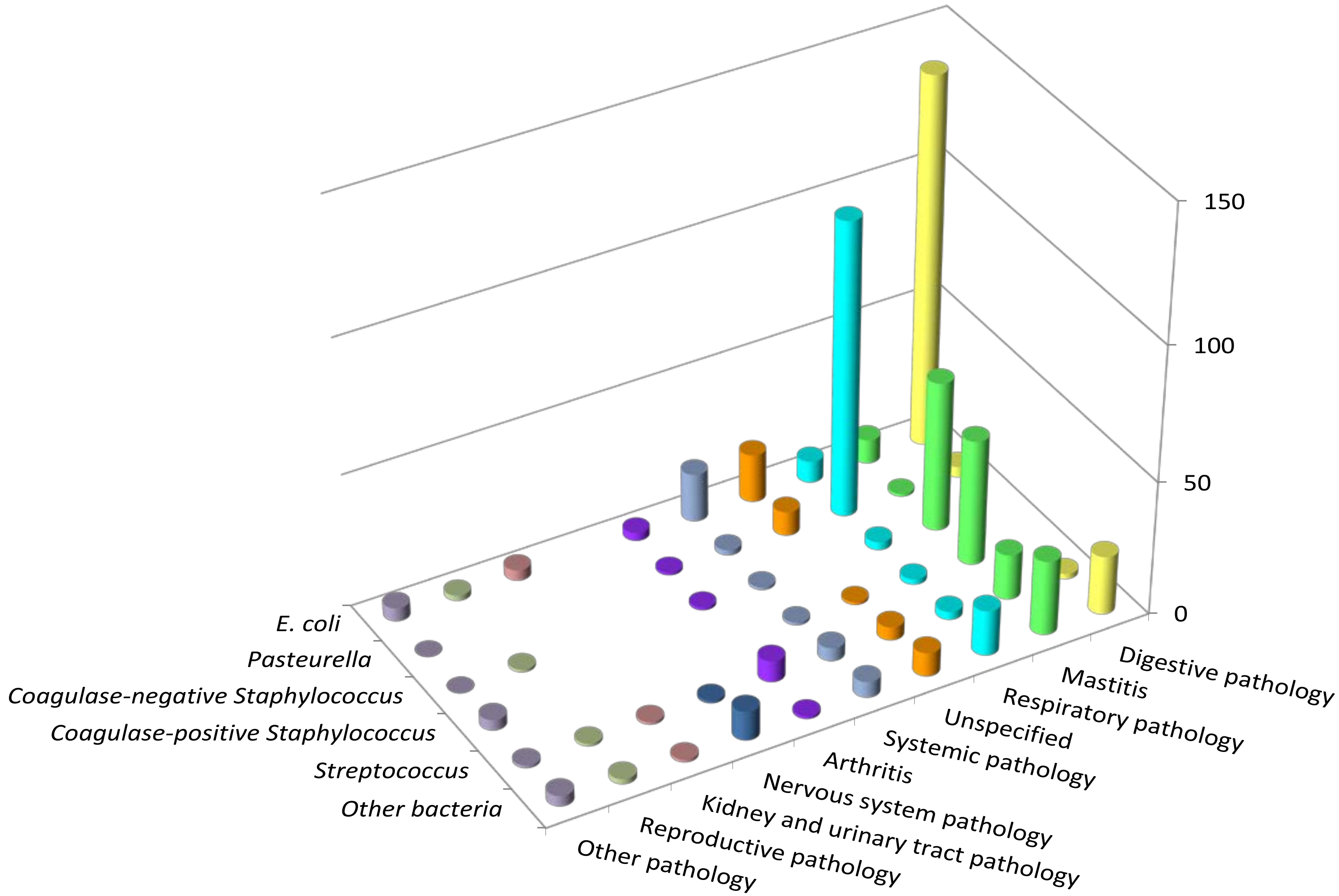


Note: *all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Goats 2015 – Number of antibiograms by age group and pathology

	Age group N (%)			
Pathology N (%)	Unspecified	Adult	Young	**Total N (%)**
Digestive pathology	111 *(18.7)*	8 *(1.3)*	46 *(7.8)*	**165 *(27.8)***
Mastitis		158 *(26.6)*		**158 *(26.6)***
Respiratory pathology	82 *(13.8)*	21 *(3.5)*	40 *(6.7)*	**143 *(24.1)***
Unspecified	34 *(5.7)*	6 *(1.0)*	2 *(0.3)*	**42 *(7.1)***
Systemic pathology	16 *(2.7)*	4 *(0.7)*	13 *(2.2)*	**33 *(5.6)***
Arthritis	12 *(2.0)*		2 *(0.3)*	**14 *(2.4)***
Nervous system pathology	5 *(0.8)*	7 *(1.2)*		**12 *(2.0)***
Kidney and urinary tract pathology	4 *(0.7)*	2 *(0.3)*		**6 *(1.0)***
Reproductive pathology	1 *(0.2)*	4 *(0.7)*	1 *(0.2)*	**6 *(1.0)***
Septicemia		1 *(0.2)*	3 *(0.5)*	**4 *(0.7)***
Skin and soft tissue infections	1 *(0.2)*	3 *(0.5)*		**4 *(0.7)***
Otitis	2 *(0.3)*			**2 *(0.3)***
Ocular pathology	2 *(0.3)*			**2 *(0.3)***
Cardiac pathology	1 *(0.2)*		1 *(0.2)*	**2 *(0.3)***
Total N *(%)*	**271 *(45.7)***	**214 *(36.1)***	**108 *(18.2)***	**593 *(100.0)***

Figure 2 - Goats 2015 – Number of antibiograms by bacterial group and pathology



***Note:** only values for pathologies >1% and bacterial groups having more than 30 occurrences are represented. Detailed values are presented in table 2 below.*

Table 2 - Goats 2015 – Number of antibiograms by bacterial group and pathology

	Pathology N (%)														
Bacteria N (%)	Digestive pathology	Mastitis	Respiratory pathology	Unspecified	Systemic pathology	Arthritis	Nervous system pathology	Kidney and urinary tract pathology	Reproductive pathology	Septicemia	Skin and soft tissue infections	Otitis	Ocular pathology	Cardiac pathology	**Total N *(%)***
E. coli	137 *(23.1)*	9 *(1.5)*	8 *(1.3)*	18 *(3.0)*	18 *(3.0)*	3 *(0.5)*		4 *(0.7)*	2 *(0.3)*	3 *(0.5)*				**2** *(0.3)*	**204** ***(34.4)***
Pasteurella	4 *(0.7)*	1 *(0.2)*	110 *(18.5)*	9 *(1.5)*	2 *(0.3)*	1 *(0.2)*									**127** ***(21.4)***
Coagulase-negative Staphylococcus		56 *(9.4)*	3 *(0.5)*		1 *(0.2)*	1 *(0.2)*			1 *(0.2)*						**62** ***(10.5)***
Coagulase-positive Staphylococcus		47 *(7.9)*	2 *(0.3)*	1 *(0.2)*	1 *(0.2)*						3 *(0.5)*		1 *(0.2)*		**55** ***(9.3)***
Streptococcus	2 *(0.3)*	17 *(2.9)*	3 *(0.5)*	5 *(0.8)*	5 *(0.8)*	8 *(1.3)*	1 *(0.2)*	1 *(0.2)*	1 *(0.2)*		1 *(0.2)*				**44** ***(7.4)***
Other bacteria < 30 occurrences	22 *(3.7)*	28 *(4.7)*	17 *(2.9)*	9 *(1.5)*	6 *(1.0)*	1 *(0.2)*	11 *(1.8)*	1 *(0.2)*	2 *(0.3)*	1 *(0.2)*		2 *(0.3)*	1 *(0.2)*		**101** ***(17.0)***
Total N *(%)*	**165** ***(27.8)***	**158** ***(26.6)***	**143** ***(24.1)***	**42** ***(7.1)***	**33** ***(5.6)***	**14** ***(2.4)***	**12** ***(2.0)***	**6** ***(1.0)***	**6** ***(1.0)***	**4** ***(0.7)***	**4** ***(0.7)***	**2** ***(0.3)***	**2** ***(0.3)***	**2** ***(0.3)***	**593** ***(100.0)***

Table 3 - Goats 2015 – All pathologies and age groups included – *E. coli:* susceptibility to antibiotics (proportion) (N= 204)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*196*	**49**
Amoxicillin-Clavulanic ac.	*181*	**81**
Cephalexin	*168*	**89**
Cephalothin	*82*	**95**
Cefoxitin	*151*	**99**
Cefuroxime	*107*	**94**
Cefoperazone	*86*	**95**
Ceftiofur	*202*	**98**
Cefquinome 30 µg	*198*	**96**
Streptomycin 10 UI	*148*	**48**
Spectinomycin	*125*	**78**
Kanamycin 30 UI	*105*	**83**
Gentamicin 10 UI	*199*	**94**
Neomycin	*181*	**84**
Apramycin	*48*	**96**
Tetracycline	*189*	**43**
Florfenicol	*176*	**90**
Nalidixic ac.	*159*	**79**
Flumequine	*60*	**75**
Enrofloxacin	*190*	**87**
Marbofloxacin	*176*	**89**
Danofloxacin	*125*	**86**
Sulfonamides	*32*	**59**
Trimethoprim	*38*	**74**
Trimethoprim-Sulfonamides	*203*	**67**

Table 4 - Goats 2015 – All pathologies and age groups included – *Pasteurella*: susceptibility to antibiotics (proportion) (N= 127)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*119*	**89**
Amoxicillin-Clavulanic ac.	*97*	**93**
Cephalexin	*89*	**97**
Cephalothin	*58*	**98**
Cefoxitin	*59*	**98**
Cefuroxime	*45*	**100**
Cefoperazone	*47*	**94**
Ceftiofur	*127*	**100**
Cefquinome 30 µg	*112*	**94**
Streptomycin 10 UI	*93*	**44**
Spectinomycin	*67*	**76**
Kanamycin 30 UI	*53*	**55**
Gentamicin 10 UI	*109*	**93**
Neomycin	*79*	**76**
Tetracycline	*126*	**80**
Florfenicol	*120*	**98**
Nalidixic ac.	*83*	**77**
Flumequine	*44*	**91**
Enrofloxacin	*102*	**91**
Marbofloxacin	*110*	**97**
Danofloxacin	*73*	**90**
Trimethoprim-Sulfonamides	*126*	**82**

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Pigs

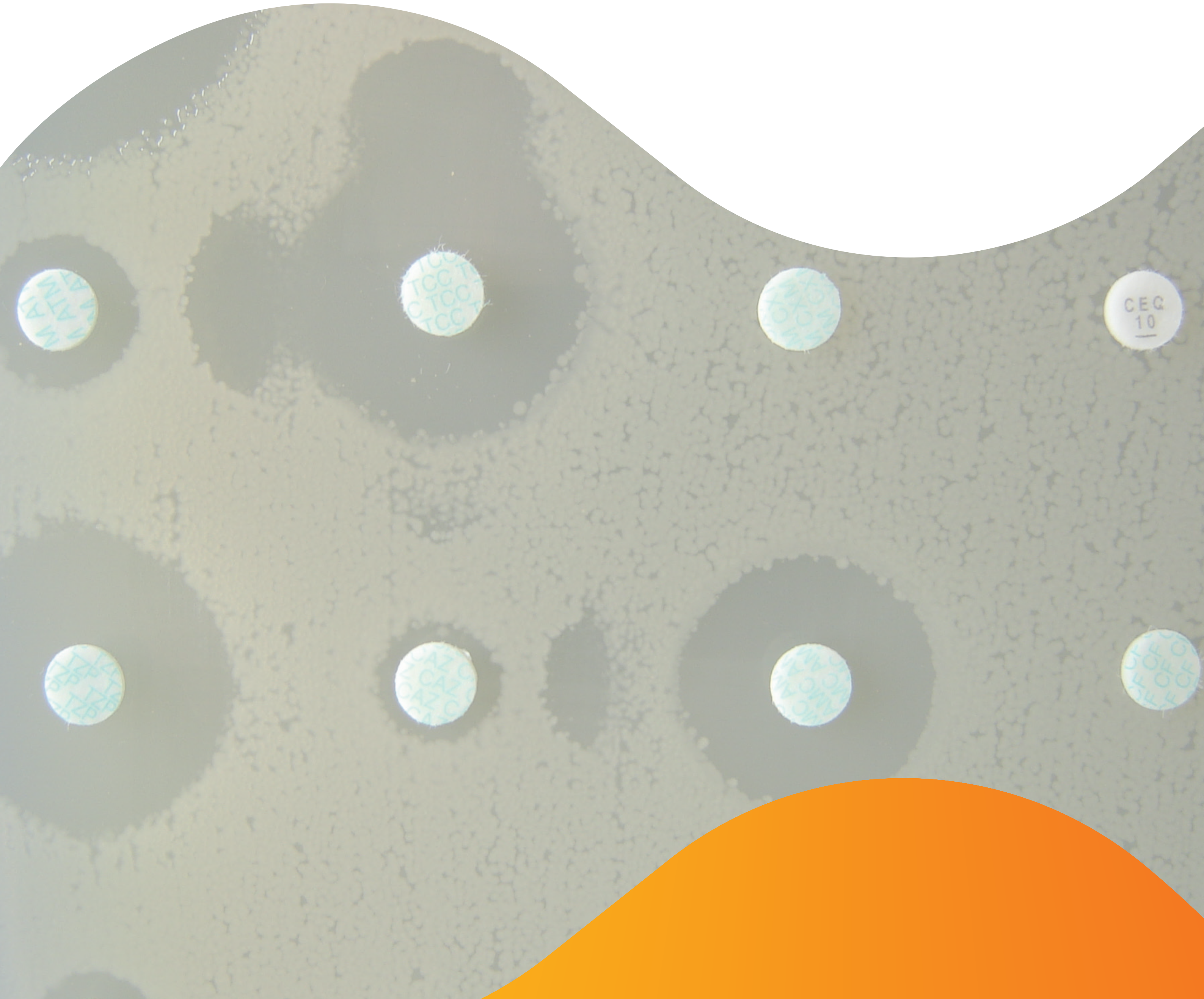

Figure 1 - Pigs 2015 – Antibiogram proportions by animal category

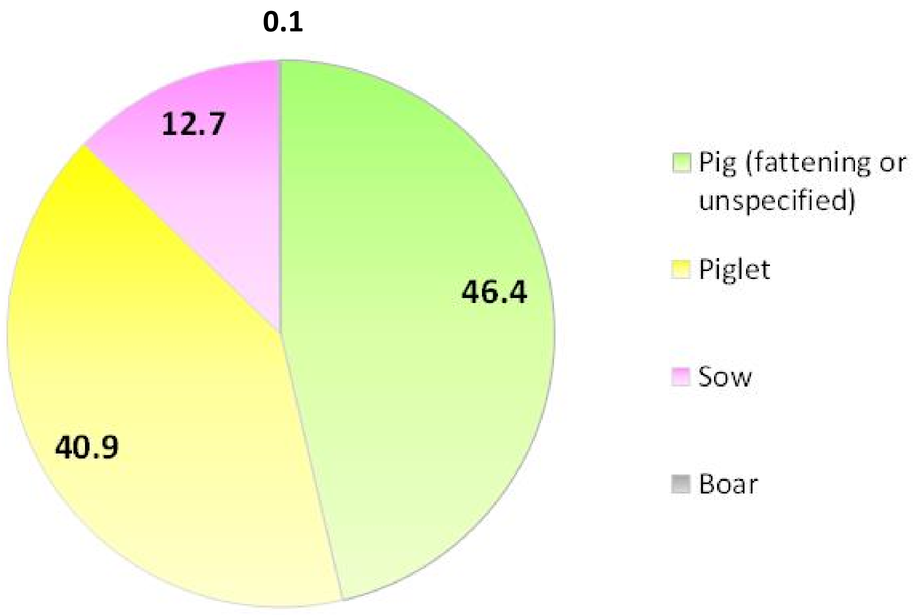

Figure 2 - Pigs 2015 – Number of antibiograms by pathology and animal category

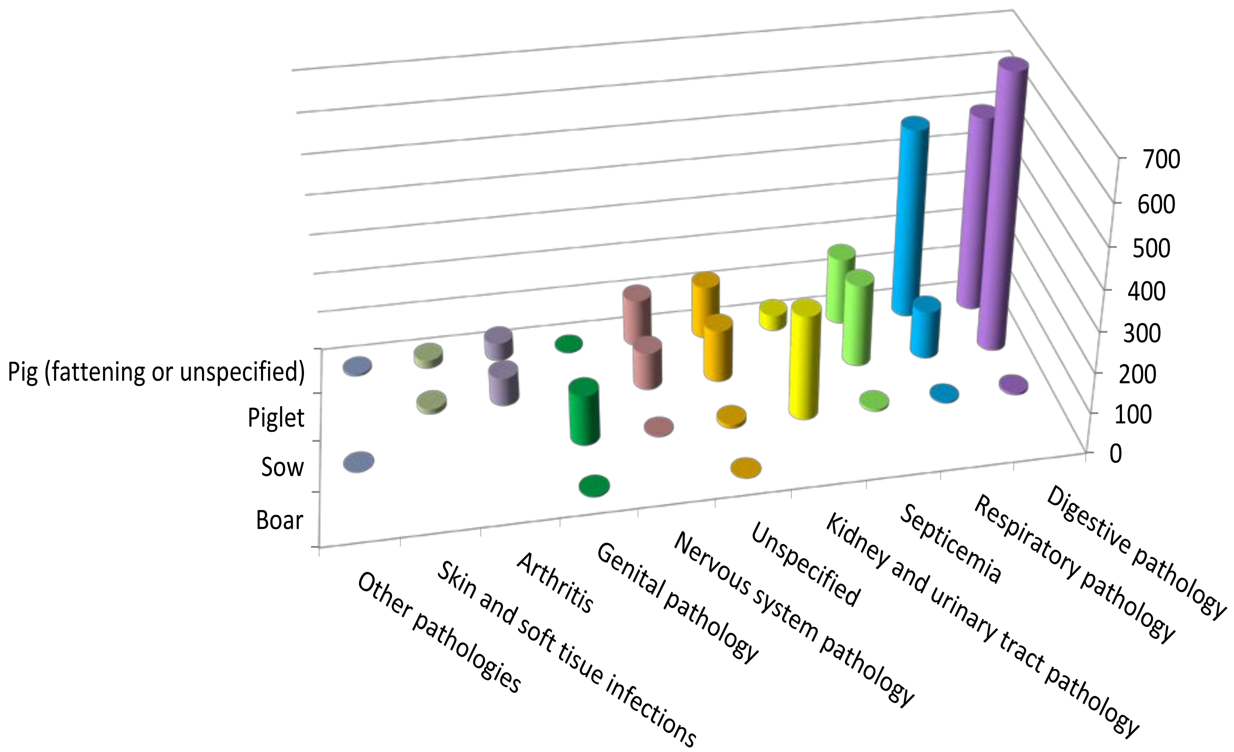

Table 1 - Pigs 2015 – Number of antibiograms by pathology and animal category

	Pathology N *(%)*										
Age group or physiological stage N (%)	Digestive pathology	Respiratory pathology	Septicemia	Kidney and urinary tract pathology	Unspecified	Nervous system pathology	Genital pathology	Arthritis	Skin and soft tissue infections	Others	**Total N** *(%)*
Piglet	499 *(15.22)*	485 *(14.79)*	170 *(5.18)*	40 *(1.22)*	134 *(4.09)*	118 *(3.60)*	3 *(0.09)*	45 *(1.37)*	21 *(0.64)*	5 *(0.15)*	**1,520** *(46.36)*
Pig (fattening or unspecified)	700 *(21.35)*	121 *(3.69)*	209 *(6.37)*		132 *(4.03)*	94 *(2.87)*		71 *(2.17)*	13 *(0.40)*		**1,340** *(40.87)*
Sow	6 *(0.18)*	3 *(0.09)*	6 *(0.18)*	262 *(7.99)*	10 *(0.30)*	2 *(0.06)*	125 *(3.81)*			1 *(0.03)*	**415** *(12.66)*
Boar					1 *(0.03)*		3 *(0.09)*				**4** *(0.12)*
Total N ***(%)***	**1,205** *(36.75)*	**609** *(18.57)*	**385** *(11.74)*	**302** *(9.21)*	**277** *(8.45)*	**214** *(6.53)*	**131** *(4.00)*	**116** *(3.54)*	**34** *(1.04)*	**6** *(0.18)*	**3,279** *(100.00)*

Figure 3 - Pigs 2015 – Number of antibiograms by bacteria and pathology

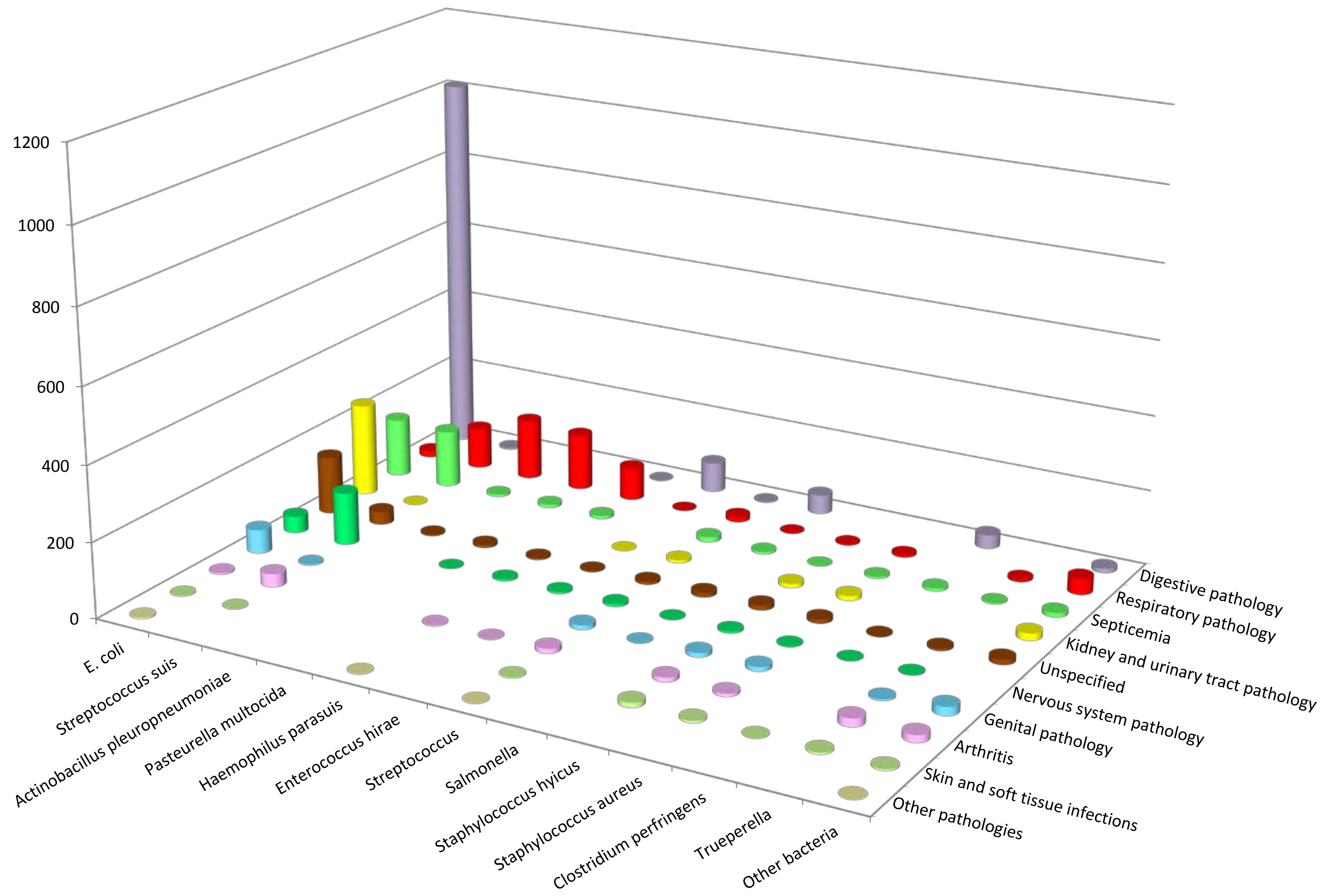

Table 2 - Pigs 2015 – Number of antibiograms by bacteria and pathology

	Pathology N *(%)*										
Bacteria N ***(%)***	Digestive pathology	Respiratory pathology	Septicemia	Kidney and urinary tract pathology	Unspecified	Nervous system pathology	Genital pathology	Arthritis	Skin and soft tissue infections	Other pathologies	**Total N** ***(%)***
E. coli	1,016 *(30.99)*	17 *(0.52)*	158 *(4.82)*	249 *(7.59)*	156 *(4.76)*	45 *(1.37)*	64 *(1.95)*	4 *(0.12)*	2 *(0.06)*	3 *(0.09)*	**1,714** *(52.27)*
Streptococcus suis	4 *(0.12)*	111 *(3.39)*	154 *(4.70)*	1 *(0.03)*	35 *(1.07)*	141 *(4.30)*	3 *(0.09)*	34 *(1.04)*	1 *(0.03)*		**484** *(14.76)*
Actinobacillus pleuropneumoniae		163 *(4.97)*	6 *(0.18)*		4 *(0.12)*						**173** *(5.28)*
Pasteurella multocida		152 *(4.64)*	9 *(0.27)*		8 *(0.24)*	1 *(0.03)*					**170** *(5.18)*
Haemophilus parasuis	1 *(0.03)*	89 *(2.71)*	9 *(0.27)*		5 *(0.15)*	5 *(0.15)*		2 *(0.06)*		1 *(0.03)*	**112** *(3.42)*
Enterococcus hirae	81 *(2.47)*	1 *(0.03)*		1 *(0.03)*	3 *(0.09)*	5 *(0.15)*		1 *(0.03)*			**92** *(2.81)*
Streptococcus	2 *(0.06)*	15 *(0.46)*	14 *(0.43)*	8 *(0.24)*	8 *(0.24)*	7 *(0.21)*	12 *(0.37)*	14 *(0.43)*	2 *(0.06)*	1 *(0.03)*	**83** *(2.53)*
Salmonella	52 *(1.59)*	1 *(0.03)*	6 *(0.18)*		12 *(0.37)*	1 *(0.03)*	1 *(0.03)*				**73** *(2.23)*
Staphylococcus hyicus		3 *(0.09)*	1 *(0.03)*	11 *(0.34)*	13 *(0.40)*	5 *(0.15)*	12 *(0.37)*	12 *(0.37)*	13 *(0.40)*		**70** *(2.13)*
Staphylococcus aureus		6 *(0.18)*	5 *(0.15)*	13 *(0.40)*	11 *(0.34)*	2 *(0.06)*	12 *(0.37)*	8 *(0.24)*	6 *(0.18)*		**63** *(1.92)*
Clostridium perfringens	37 *(1.13)*		8 *(0.24)*		2 *(0.06)*	1 *(0.03)*			1 *(0.03)*		**49** *(1.49)*
Trueperella		7 *(0.21)*	3 *(0.09)*		6 *(0.18)*	1 *(0.03)*	4 *(0.12)*	22 *(0.67)*	5 *(0.15)*		**48** *(1.46)*
Other bacteria < 30 occurrences	12 *(0.37)*	44 *(1.34)*	12 *(0.37)*	19 *(0.58)*	14 *(0.43)*		23 *(0.70)*	19 *(0.58)*	4 *(0.12)*	1 *(0.03)*	**148** *(4.51)*
Total N (%)	**1,205** *(36.75)*	**609** *(18.57)*	**385** *(11.74)*	**302** *(9.21)*	**277** *(8.45)*	**214** *(6.53)*	**131** *(4.00)*	**116** *(3.54)*	**34** *(1.04)*	**6** *(0.18)*	**3,279** *(100.00)*

Table 3 - Pigs 2015 – All pathologies and age groups included – *E. coli*: susceptibility to antibiotics (proportion) (N= 1,714)

Antibiotic	*Total (N)*	% S
Amoxicillin	*1,677*	**45**
Amoxicillin-Clavulanic ac.	*1,552*	**82**
Cephalexin	*942*	**89**
Cephalothin	*333*	**93**
Cefoxitin	*1,098*	**98**
Cefuroxime	*184*	**94**
Cefoperazone	*202*	**97**
Ceftiofur	*1,712*	**97**
Cefquinome 30 µg	*368*	**98**
Streptomycin 10 UI	*237*	**39**
Spectinomycin	*1,421*	**60**
Gentamicin 10 UI	*1,601*	**88**
Neomycin	*1,551*	**84**
Apramycin	*1,503*	**89**
Tetracycline	*1,326*	**30**
Florfenicol	*1,600*	**90**
Nalidixic ac.	*634*	**69**
Oxolinic ac.	*1,327*	**71**
Flumequine	*1,031*	**73**
Enrofloxacin	*1,661*	**90**
Marbofloxacin	*1,450*	**92**
Danofloxacin	*350*	**90**
Sulfonamides	*167*	**32**
Trimethoprim	*528*	**44**
Trimethoprim-Sulfonamides	*1,680*	**45**

Table 4 - Pigs 2015 – Digestive pathology – Piglets (post-weaning included) – *E. coli*: susceptibility to antibiotics (proportion) (N= 600)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*583*	**41**
Amoxicillin-Clavulanic ac.	*547*	**80**
Cephalexin	*403*	**90**
Cefoxitin	*353*	**97**
Ceftiofur	*595*	**97**
Cefquinome 30 µg	*100*	**97**
Spectinomycin	*561*	**55**
Gentamicin 10 UI	*581*	**82**
Neomycin	*595*	**79**
Apramycin	*590*	**86**
Tetracycline	*407*	**23**
Florfenicol	*544*	**88**
Nalidixic ac.	*117*	**65**
Oxolinic ac.	*540*	**68**
Flumequine	*294*	**67**
Enrofloxacin	*598*	**87**
Marbofloxacin	*567*	**90**
Trimethoprim	*121*	**35**
Trimethoprim-Sulfonamides	*567*	**38**

Table 5 - Pigs 2015 – Kidney and urinary tract pathology – Sows – *E. coli*: susceptibility to antibiotics (proportion) (N= 214)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*208*	**42**
Amoxicillin-Clavulanic ac.	*155*	**68**
Ceftiofur	*208*	**99**
Gentamicin 10 UI	*156*	**98**
Tetracycline	*200*	**37**
Florfenicol	*203*	**88**
Nalidixic ac.	*104*	**60**
Oxolinic ac.	*205*	**63**
Enrofloxacin	*160*	**84**
Marbofloxacin	*210*	**89**
Trimethoprim-Sulfonamides	*214*	**49**

Table 6 - Pigs 2015 – All pathologies included – *Actinobacillus pleuropneumoniae*: susceptibility to antibiotics (proportion) (N= 173)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*171*	**98**
Amoxicillin-Clavulanic ac.	*129*	**100**
Ceftiofur	*172*	**100**
Tilmicosin	*169*	**98**
Tetracycline	*170*	**84**
Florfenicol	*170*	**99**
Enrofloxacin	*173*	**99**
Marbofloxacin	*153*	**99**
Trimethoprim-Sulfonamides	*173*	**96**

Table 7 - Pigs 2015 – All pathologies included – *Pasteurella multocida*: susceptibility to antibiotics (proportion) (N= 170)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*165*	**100**
Amoxicillin-Clavulanic ac.	*143*	**100**
Ceftiofur	*169*	**100**
Tilmicosin	*158*	**97**
Tetracycline	*167*	**90**
Florfenicol	*167*	**99**
Flumequine	*115*	**94**
Enrofloxacin	*169*	**98**
Marbofloxacin	*139*	**100**
Trimethoprim-Sulfonamides	*170*	**88**

Table 8 - Pigs 2015 – All pathologies included – *Streptococcus suis*: susceptibility to antibiotics (proportion) (N= 484)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*465*	**99**
Oxacillin	*227*	**94**
Erythromycin	*379*	**31**
Tylosin	*473*	**25**
Spiramycin	*477*	**29**
Lincomycin	*476*	**27**
Streptomycin 500 µg	*297*	**94**
Kanamycin 1000 µg	*201*	**98**
Gentamicin 500 µg	*376*	**99**
Tetracycline	*347*	**13**
Trimethoprim-Sulfonamides	*483*	**85**

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Annex 6

Poultry

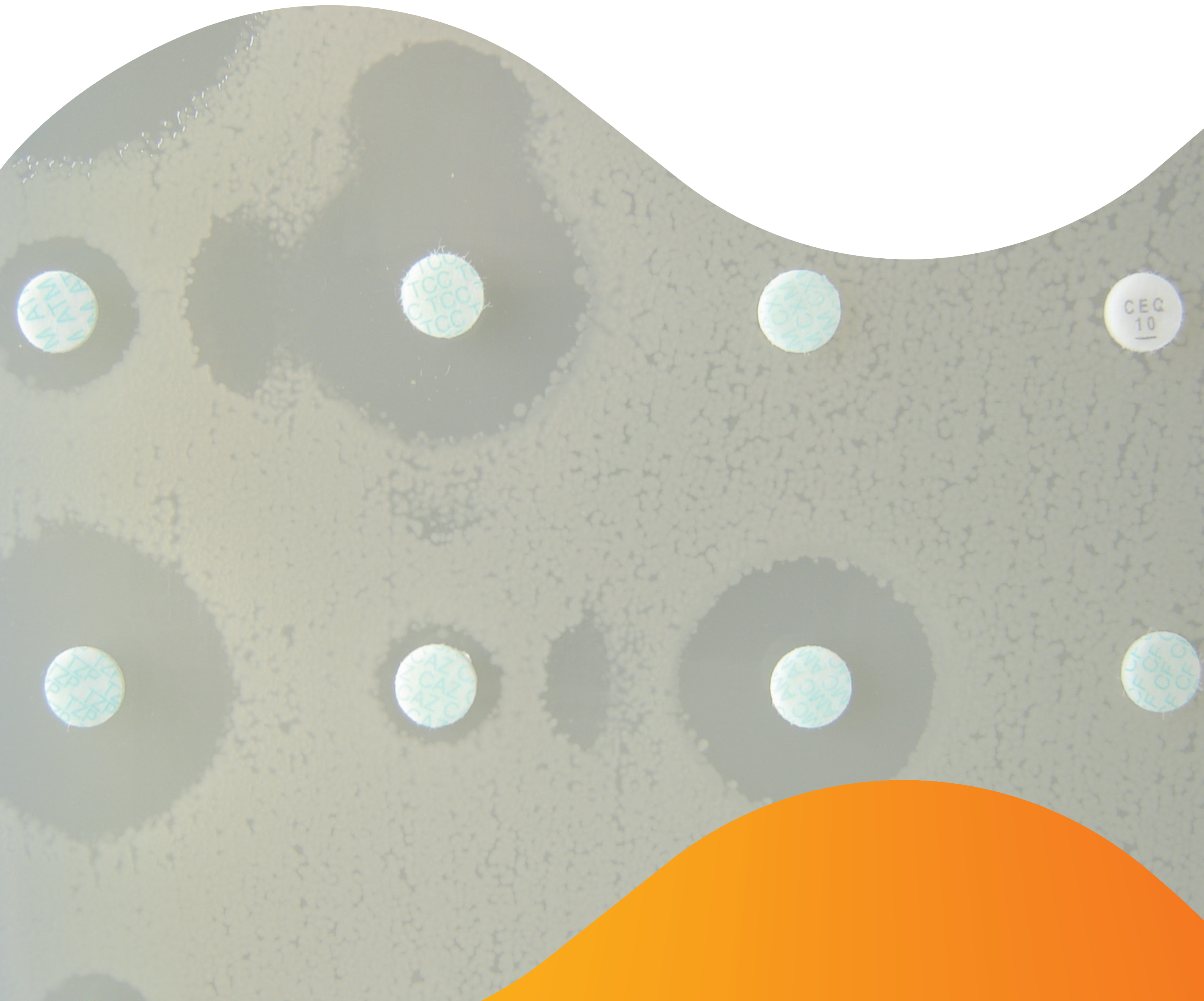

Figure 1 - Poultry 2015 – Number of antibiograms by pathology and animal

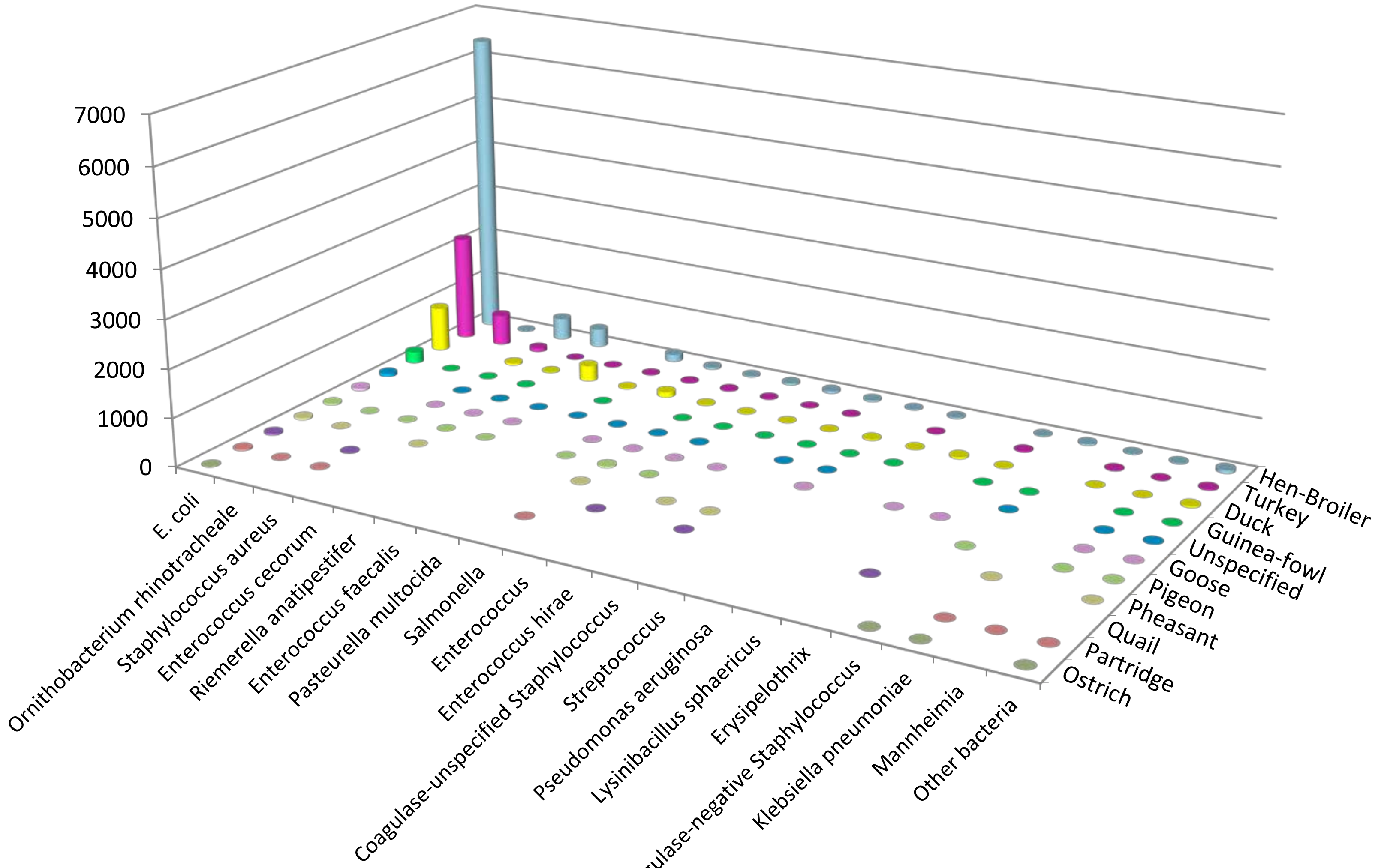

Table 1 - Poultry 2015 – Number of antibiograms by bacteria and animal

Bacteria N *(%)*	**Animal species N** ***(%)***											**Total N** ***(%)***
	Hen-chicken	Turkey	Duck	Guinea-fowl	Poultry	Goose	Pigeon	Pheasant	Quail	Partridge	Ostrich	
E. coli	6,397 *(48.50)*	2,226 *(16.88)*	937 *(7.10)*	241 *(1.83)*	69 *(0.52)*	48 *(0.36)*	31 *(0.24)*	38 *(0.29)*	34 *(0.26)*	29 *(0.22)*	7 *(0.05)*	**10,057** ***(76.25)***
Ornithobacterium rhinotracheale	14 *(0.11)*	654 *(4.96)*		3 *(0.02)*			1 *(0.01)*	1 *(0.01)*		2 *(0.02)*		**675** ***(5.12)***
Staphylococcus aureus	459 *(3.48)*	80 *(0.61)*	42 *(0.32)*	7 *(0.05)*	3 *(0.02)*	2 *(0.02)*	3 *(0.02)*		8 *(0.06)*	3 *(0.02)*		**607** ***(4.60)***
Enterococcus cecorum	383 *(2.90)*	2 *(0.02)*	18 *(0.14)*	7 *(0.05)*	2 *(0.02)*	5 *(0.04)*	1 *(0.01)*	1 *(0.01)*				**419** ***(3.18)***
Riemerella anatipestifer		4 *(0.03)*	329 *(2.49)*		1 *(0.01)*	3 *(0.02)*	1 *(0.01)*					**338** ***(2.56)***
Enterococcus faecalis	153 *(1.16)*	17 *(0.13)*	17 *(0.13)*	2 *(0.02)*	1 *(0.01)*							**190** ***(1.44)***
Pasteurella multocida	41 *(0.31)*	15 *(0.11)*	111 *(0.84)*		2 *(0.02)*	1 *(0.01)*	1 *(0.01)*					**171** ***(1.30)***
Salmonella	25 *(0.19)*	19 *(0.14)*	18 *(0.14)*	1 *(0.01)*	3 *(0.02)*	3 *(0.02)*	26 *(0.20)*	8 *(0.06)*		3 *(0.02)*		**106** ***(0.80)***
Enterococcus	45 *(0.34)*	13 *(0.10)*	6 *(0.05)*	2 *(0.02)*	3 *(0.02)*	1 *(0.01)*	1 *(0.01)*		3 *(0.02)*			**74** ***(0.56)***
Enterococcus hirae	55 *(0.42)*	3 *(0.02)*	1 *(0.01)*	1 *(0.01)*		1 *(0.01)*		1 *(0.01)*				**62** ***(0.47)***
Coagulase-unspecified Staphylococcus	34 *(0.26)*	7 *(0.05)*	5 *(0.04)*	3 *(0.02)*	2 *(0.02)*			2 *(0.02)*	1 *(0.01)*			**54** ***(0.41)***
Streptococcus	15 *(0.11)*		27 *(0.20)*	1 *(0.01)*	1 *(0.01)*	7 *(0.05)*						**51** ***(0.39)***
Pseudomonas aeruginosa	27 *(0.20)*	5 *(0.04)*	11 *(0.08)*	2 *(0.02)*								**45** ***(0.34)***
Lysinibacillus sphaericus			40 *(0.30)*			1 *(0.01)*						**41** ***(0.31)***
Erysipelothrix	11 *(0.08)*	19 *(0.14)*	4 *(0.03)*	3 *(0.02)*		3 *(0.02)*			1 *(0.01)*			**41** ***(0.31)***
Coagulase-negative Staphylococcus	30 *(0.23)*			3 *(0.02)*	1 *(0.01)*		2 *(0.02)*				1 *(0.01)*	**37** ***(0.28)***
Klebsiella pneumoniae	13 *(0.10)*	16 *(0.12)*	1 *(0.01)*					1 *(0.01)*		1 *(0.01)*	1 *(0.01)*	**33** ***(0.25)***
Manheimia	18 *(0.14)*	2 *(0.02)*	3 *(0.02)*	1 *(0.01)*	4 *(0.03)*	1 *(0.01)*	1 *(0.01)*			1 *(0.01)*		**31** ***(0.24)***
Other bacteria < 30 occurrences	73 *(0.55)*	23 *(0.17)*	31 *(0.24)*	4 *(0.03)*	12 *(0.09)*	2 *(0.02)*	5 *(0.04)*	1 *(0.01)*		4 *(0.03)*	3 *(0.02)*	**158** ***(1.20)***
Total N **(%)**	**7,793** ***(59.08)***	**3,105** ***(23.54)***	**1,601** ***(12.14)***	**281** ***(2.13)***	**104** ***(0.79)***	**78** ***(0.59)***	**73** ***(0.55)***	**53** ***(0.40)***	**47** ***(0.36)***	**43** ***(0.33)***	**12** ***(0.09)***	**13,190** ***(100.00)***

Table 2 - Hens and broilers 2015 – All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N=6,397)

Antibiotic	*Total (N)*	**% S**
Ampicillin	*649*	**69**
Amoxicillin	*6,358*	**65**
Amoxicillin-Clavulanic ac.	*4,352*	**90**
Cephalexin	*1,904*	**91**
Cephalothin	*2,229*	**95**
Cefoxitin	*3,789*	**98**
Cefuroxime	*228*	**94**
Cefoperazone	*198*	**97**
Ceftiofur	*5,878*	**97**
Cefquinome 30 µg	*1,144*	**98**
Spectinomycin	*2,066*	**83**
Gentamicin 10 UI	*4,596*	**93**
Neomycin	*2,967*	**97**
Apramycin	*2,557*	**99**
Tetracycline	*4,820*	**55**
Florfenicol	*3,759*	**99**
Nalidixic ac.	*3,717*	**61**
Oxolinic ac.	*2,401*	**57**
Flumequine	*6,053*	**57**
Enrofloxacin	*6,359*	**92**
Marbofloxacin	*639*	**95**
Danofloxacin	*198*	**84**
Sulfonamides	*501*	**63**
Trimethoprim	*2,720*	**77**
Trimethoprim-Sulfonamides	*6,367*	**75**

Table 3 – Laying hens (table eggs and hatching eggs) 2015 – All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N= 2,416)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*2,388*	**71**
Amoxicillin-Clavulanic ac.	*1,791*	**91**
Cephalexin	*444*	**87**
Cephalothin	*1,303*	**95**
Cefoxitin	*1,727*	**97**
Ceftiofur	*2,313*	**97**
Cefquinome 30 µg	*280*	**97**
Spectinomycin	*618*	**82**
Gentamicin 10 UI	*1,863*	**91**
Neomycin	*1,376*	**98**
Apramycin	*1,314*	**99**
Tetracycline	*1,865*	**58**
Florfenicol	*1,616*	**99**
Nalidixic ac.	*1,706*	**63**
Oxolinic ac.	*494*	**60**
Flumequine	*2,347*	**61**
Enrofloxacin	*2,392*	**95**
Trimethoprim	*1,369*	**82**
Trimethoprim-Sulfonamides	*2,393*	**82**

Table 4 – Broilers 2015 – All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N= 3,577)

Antibiotic	*Total (N)*	**% S**
Ampicillin	*519*	**67**
Amoxicillin	*3,569*	**61**
Amoxicillin-Clavulanic ac.	*2,242*	**89**
Cephalexin	*1,168*	**92**
Cephalothin	*895*	**97**
Cefoxitin	*1,779*	**99**
Cefuroxime	*110*	**95**
Ceftiofur	*3,161*	**98**
Cefquinome 30 µg	*739*	**98**
Spectinomycin	*1,198*	**83**
Gentamicin 10 UI	*2,405*	**94**
Neomycin	*1,292*	**97**
Apramycin	*989*	**99**
Tetracycline	*2,637*	**55**
Florfenicol	*1,846*	**99**
Nalidixic ac.	*1,962*	**58**
Oxolinic ac.	*1,652*	**56**
Flumequine	*3,545*	**56**
Enrofloxacin	*3,567*	**90**
Marbofloxacin	*283*	**95**
Danofloxacin	*101*	**79**
Sulfonamides	*458*	**62**
Trimethoprim	*1,340*	**72**
Trimethoprim-Sulfonamides	*3,571*	**70**

Table 5 - Turkeys 2015 – All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N= 2,226)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*2,221*	**51**
Amoxicillin-Clavulanic ac.	*1,282*	**89**
Cephalexin	*871*	**89**
Cephalothin	*294*	**98**
Cefoxitin	*1,063*	**99**
Ceftiofur	*2,096*	**99**
Cefquinome 30 µg	*295*	**98**
Spectinomycin	*758*	**84**
Gentamicin 10 UI	*1,188*	**96**
Neomycin	*486*	**97**
Apramycin	*366*	**99**
Tetracycline	*1,401*	**54**
Florfenicol	*804*	**98**
Nalidixic ac.	*1,097*	**81**
Oxolinic ac.	*988*	**79**
Flumequine	*2,155*	**75**
Enrofloxacin	*2,225*	**93**
Marbofloxacin	*169*	**91**
Sulfonamides	*212*	**68**
Trimethoprim	*749*	**83**
Trimethoprim-Sulfonamides	*2,225*	**79**

Table 6 - Ducks 2015 – All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N= 937)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*936*	**45**
Amoxicillin-Clavulanic ac.	*741*	**80**
Cephalexin	*452*	**90**
Cephalothin	*288*	**92**
Cefoxitin	*694*	**99**
Ceftiofur	*834*	**98**
Cefquinome 30 µg	*400*	**99**
Spectinomycin	*654*	**91**
Gentamicin 10 UI	*799*	**96**
Neomycin	*340*	**97**
Apramycin	*349*	**97**
Tetracycline	*899*	**30**
Florfenicol	*750*	**99**
Nalidixic ac.	*720*	**74**
Oxolinic ac.	*513*	**73**
Flumequine	*921*	**72**
Enrofloxacin	*935*	**92**
Sulfonamides	*106*	**48**
Trimethoprim	*381*	**57**
Trimethoprim-Sulfonamides	*937*	**60**

Table 7 - Hens and broilers 2015 – All pathologies included - *Staphylococcus aureus*: susceptibility to antibiotics (proportion) (N= 459)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*280*	**87**
Cefoxitin	*299*	**89**
Erythromycin	*321*	**89**
Tylosin	*351*	**92**
Spiramycin	*228*	**93**
Lincomycin	*359*	**90**
Gentamicin 10 UI	*239*	**97**
Neomycin	*165*	**98**
Tetracycline	*364*	**80**
Enrofloxacin	*457*	**96**
Trimethoprim-Sulfonamides	*456*	**97**

Table 8 - Hens and broilers 2015 – All pathologies included – *Enterococcus cecorum*: susceptibility to antibiotics (proportion) (N= 383)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*381*	**98**
Erythromycin	*244*	**51**
Tylosin	*255*	**48**
Spiramycin	*188*	**53**
Lincomycin	*257*	**49**
Gentamicin 500 µg	*126*	**98**
Tetracycline	*269*	**4**
Trimethoprim-Sulfonamides	*382*	**40**

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Annex 7

Rabbits

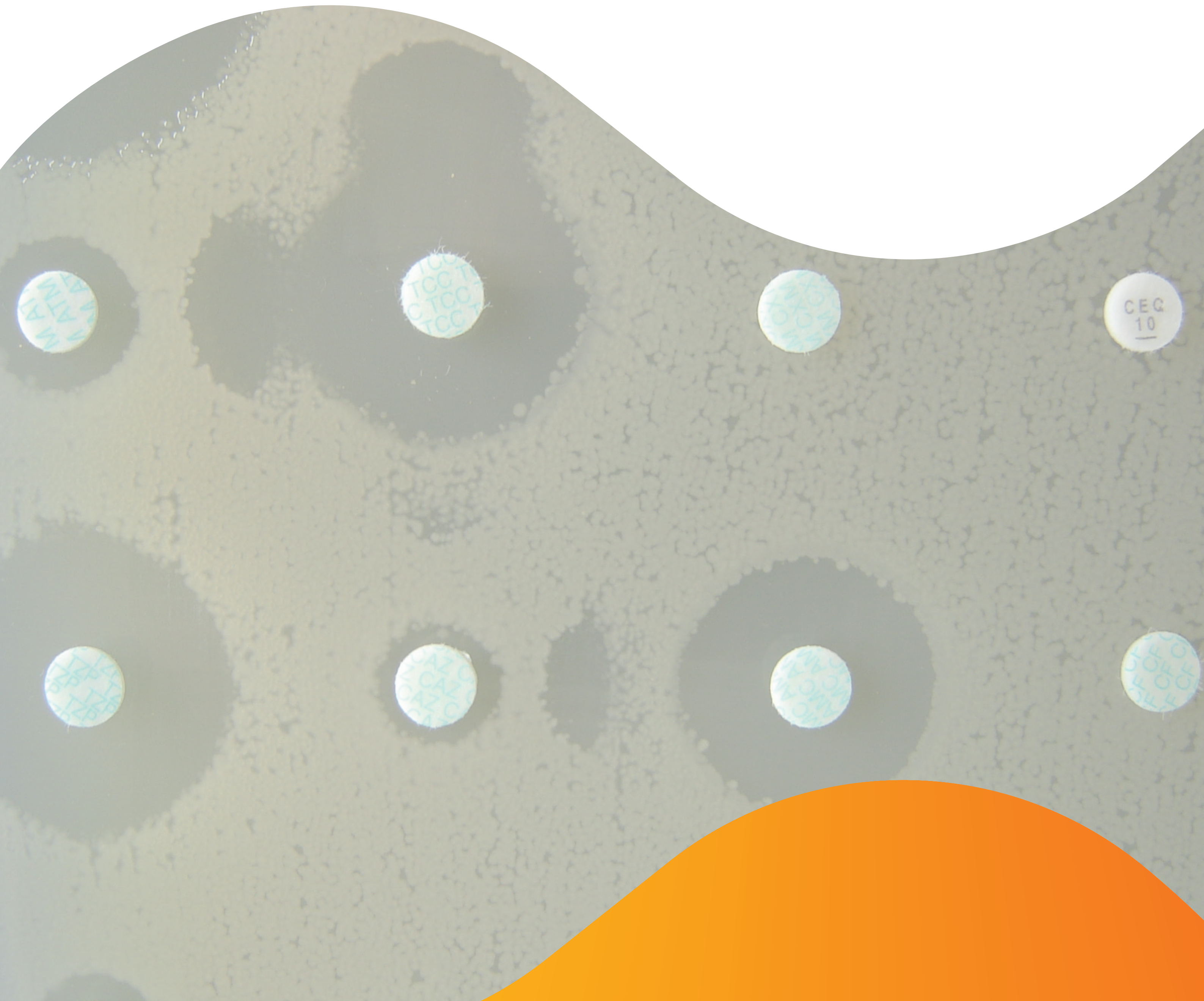
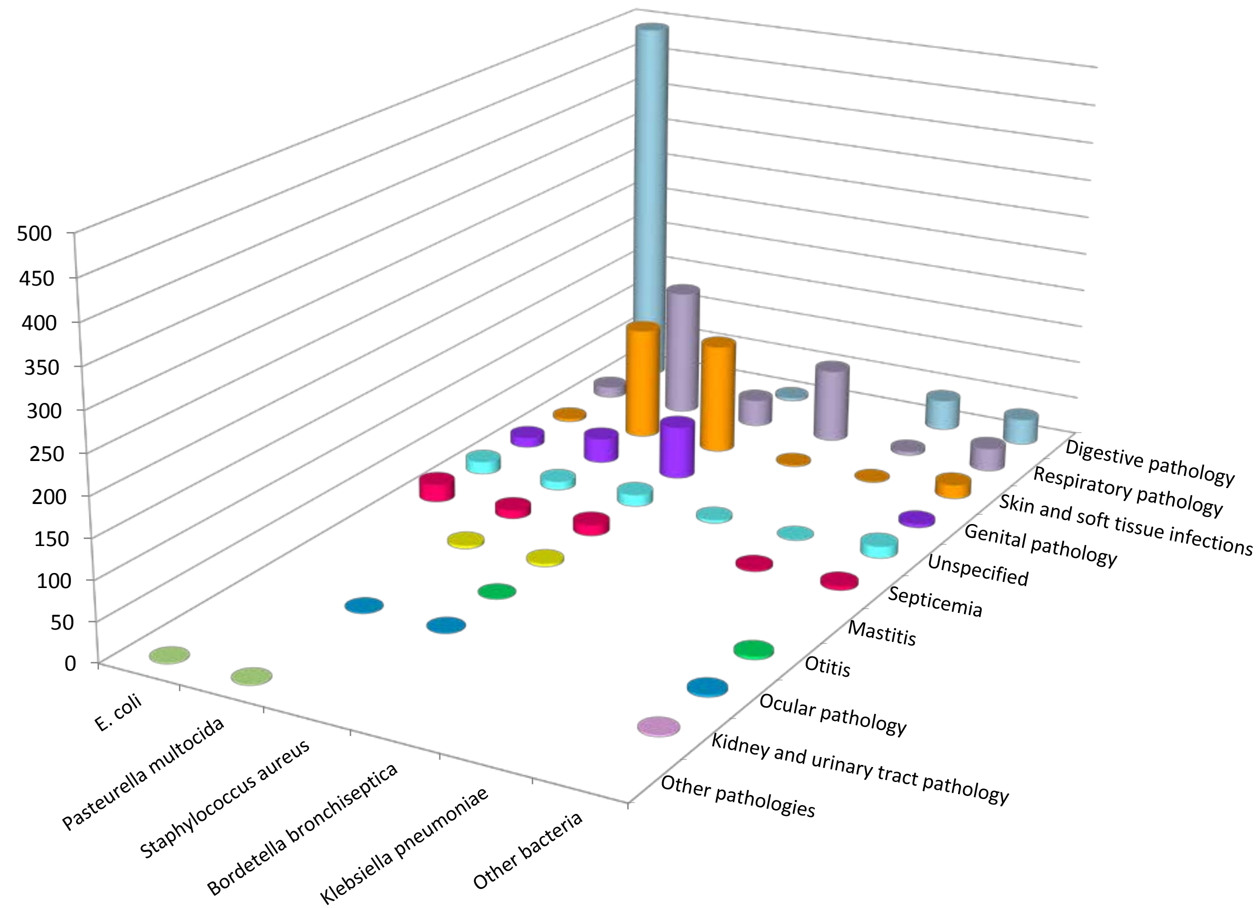


Figure 1 - Rabbits 2015 – Number of antibiograms by bacteria and pathology



Note: *only values for bacterial groups having more than 30 occurrences are represented. Detailed values are presented in table 1 below.*

Table 1 - Rabbits 2015 – Number of antibiograms by bacteria and pathology

Bacteria N *(%)*	**Pathology N** *(%)*											**Total N** *(%)*
	Digestive pathology	Respiratory pathology	Skin and soft tissue infections	Genital pathology	Unspecified	Septicemia	Mastitis	Ocular pathology	Otitis	Kidney and urinary tract pathology	Others	
E. coli	493	14	4	13	16	23					1	**564**
	(33.02)	*(0.94)*	*(0.27)*	*(0.87)*	*(1.07)*	*(1.54)*					*(0.07)*	***(37.78)***
Pasteurella multocida		167	147	32	11	11	4	1			1	**374**
		(11.19)	*(9.85)*	*(2.14)*	*(0.74)*	*(0.74)*	*(0.27)*	*(0.07)*			*(0.07)*	***(25.05)***
Staphylococcus aureus	4	35	144	69	15	14	4	1	1			**287**
	(0.27)	*(2.34)*	*(9.65)*	*(4.62)*	*(1.00)*	*(0.94)*	*(0.27)*	*(0.07)*	*(0.07)*			***(19.22)***
Bordetella bronchiseptica		96	2		4							**102**
		(6.43)	*(0.13)*		*(0.27)*							***(6.83)***
Klebsiella pneumoniae	40	5	1		1	3						**50**
	(2.68)	*(0.33)*	*(0.07)*		*(0.07)*	*(0.20)*						***(3.35)***
Other bacteria	34	30	18	5	15	5		3	4	2		**116**
< 30 occurrences	*(2.28)*	*(2.01)*	*(1.21)*	*(0.33)*	*(1.00)*	*(0.33)*		*(0.20)*	*(0.27)*	*(0.13)*		***(7.77)***
Total N	**571**	**347**	**316**	**119**	**62**	**56**	**8**	**5**	**5**	**2**	**2**	**1,493**
(%)	***(38.25)***	***(23.24)***	***(21.17)***	***(7.97)***	***(4.15)***	***(3.75)***	***(0.54)***	***(0.33)***	***(0.33)***	***(0.13)***	***(0.13)***	***(100.00)***

Table 2 - Rabbits 2015 - All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N = 564)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*316*	**43**
Amoxicillin-Clavulanic ac.	*321*	**62**
Cephalexin	*327*	**81**
Cephalothin	*110*	**85**
Cefoxitin	*345*	**98**
Ceftiofur	*505*	**99**
Cefquinome 30 µg	*268*	**99**
Streptomycin 10 UI	*136*	**44**
Spectinomycin	*452*	**83**
Gentamicin 10 UI	*560*	**86**
Neomycin	*550*	**77**
Apramycin	*533*	**85**
Tetracycline	*556*	**14**
Nalidixic ac.	*389*	**66**
Flumequine	*333*	**69**
Enrofloxacin	*560*	**89**
Marbofloxacin	*137*	**94**
Danofloxacin	*278*	**87**
Trimethoprim	*178*	**28**
Trimethoprim-Sulfonamides	*564*	**27**

Table 3 - Rabbits 2015 – All pathologies included - *Pasteurella multocida*: susceptibility to antibiotics (proportion) (N= 374)

Antibiotic	*Total (N)*	**% S**
Ceftiofur	*149*	**98**
Tilmicosin	*345*	**96**
Spectinomycin	*245*	**98**
Gentamicin 10 UI	*332*	**99**
Tetracycline	*370*	**97**
Flumequine	*243*	**96**
Enrofloxacin	*374*	**99**
Danofloxacin	*245*	**99**
Trimethoprim-Sulfonamides	*374*	**97**

Table 4 - Rabbits 2015 – All pathologies included - *Staphylococcus aureus*: susceptibility to antibiotics (proportion) (N= 287)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*189*	**78**
Cefoxitin	*188*	**99**
Erythromycin	*236*	**36**
Spiramycin	*283*	**36**
Gentamicin 10 UI	*287*	**50**
Tetracycline	*287*	**32**
Enrofloxacin	*286*	**90**
Trimethoprim-Sulfonamides	*287*	**51**

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Annex 8

Fish

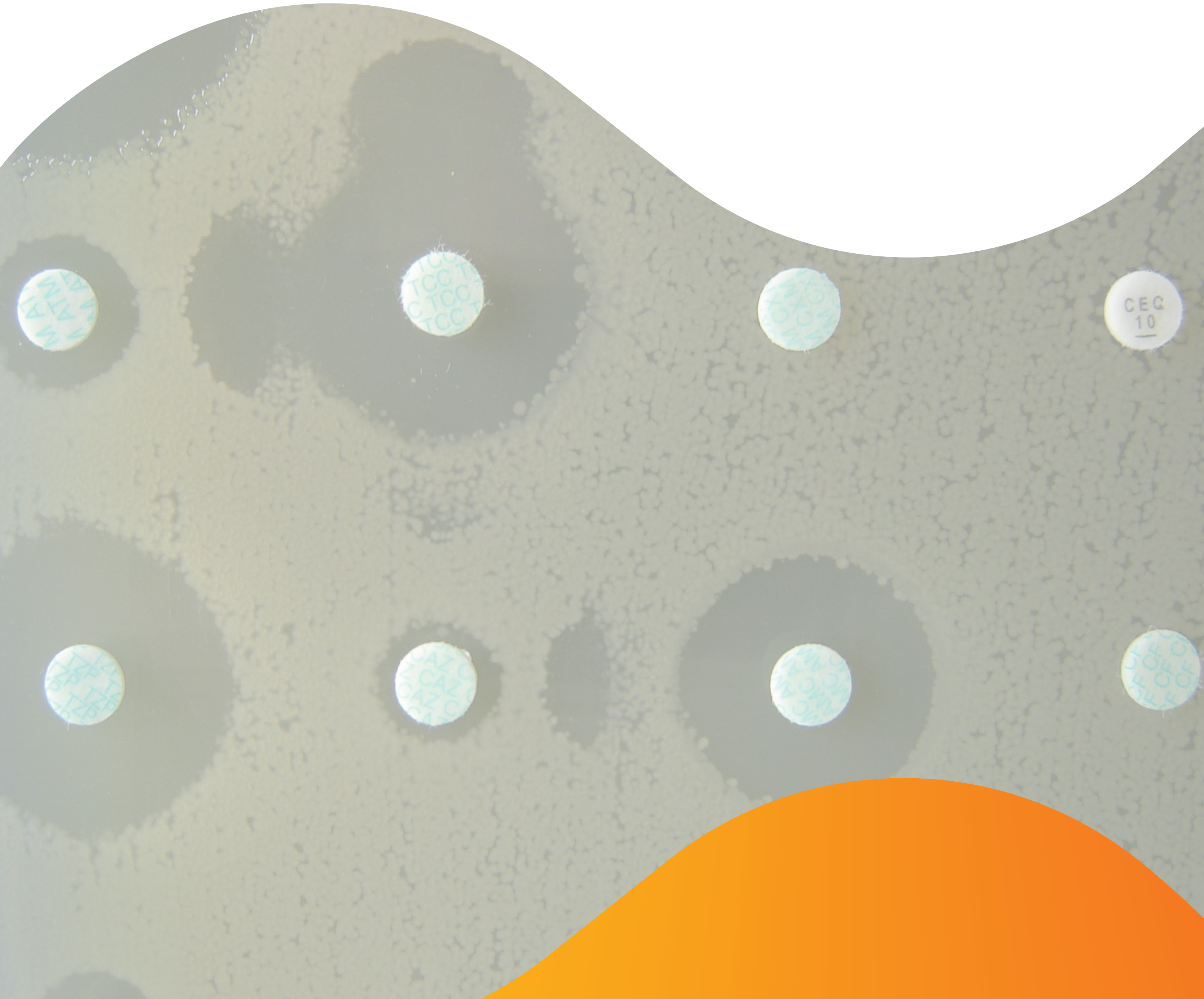

Figure 1 - Fish 2015 – Antibiogram proportions by animal species

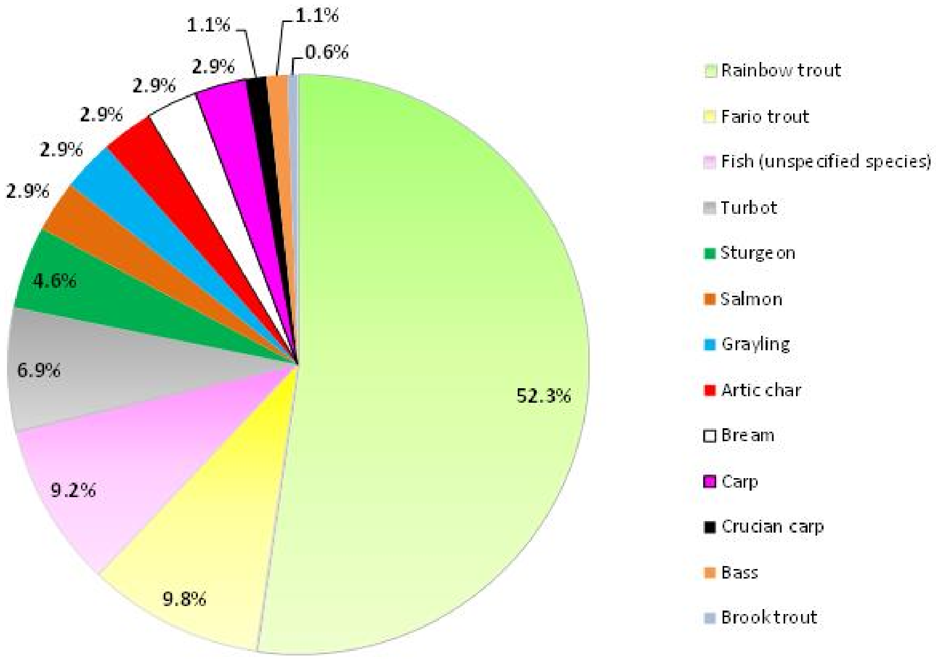

Table 1 - Fish 2015 – Number of antibiograms by bacteria and pathology

	Pathology N *(%)*			
Bacteria N ***(%)***	Unspecified	Septicemia	Skin and soft tissue infections	**Total N** ***(%)***
Aeromonas salmonicida	73 *(41.95)*	17 *(9.77)*	2 *(1.15)*	**92** ***(52.87)***
Aeromonas	11 *(6.32)*	7 *(4.02)*	5 *(2.87)*	**23** ***(13.22)***
Yersinia ruckeri	14 *(8.05)*	3 *(1.72)*		**17** ***(9.77)***
Carnobacterium	11 *(6.32)*	4 *(2.30)*		**15** ***(8.62)***
Edwardsiella tarda	7 *(4.02)*		1 *(0.57)*	**8** ***(4.60)***
Vibrio	4 *(2.30)*			**4** ***(2.30)***
Lactococcus	3 *(1.72)*			**3** ***(1.72)***
Photobacterium	1 *(0.57)*	2 *(1.15)*		**3** ***(1.72)***
Streptococcus			3 *(1.72)*	**3** ***(1.72)***
Pseudomonas	2 *(1.15)*			**2** ***(1.15)***
Acinetobacter			1 *(0.57)*	**1** ***(0.57)***
Shewanella putrefaciens			1 *(0.57)*	**1** ***(0.57)***
Cedecea	1 *(0.57)*			**1** ***(0.57)***
Chromobacterium	1 *(0.57)*			**1** ***(0.57)***
Total N (%)	**128** ***(73.56)***	**33** ***(18.97)***	**13** ***(7.47)***	**174** ***(100.00)***

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Horses

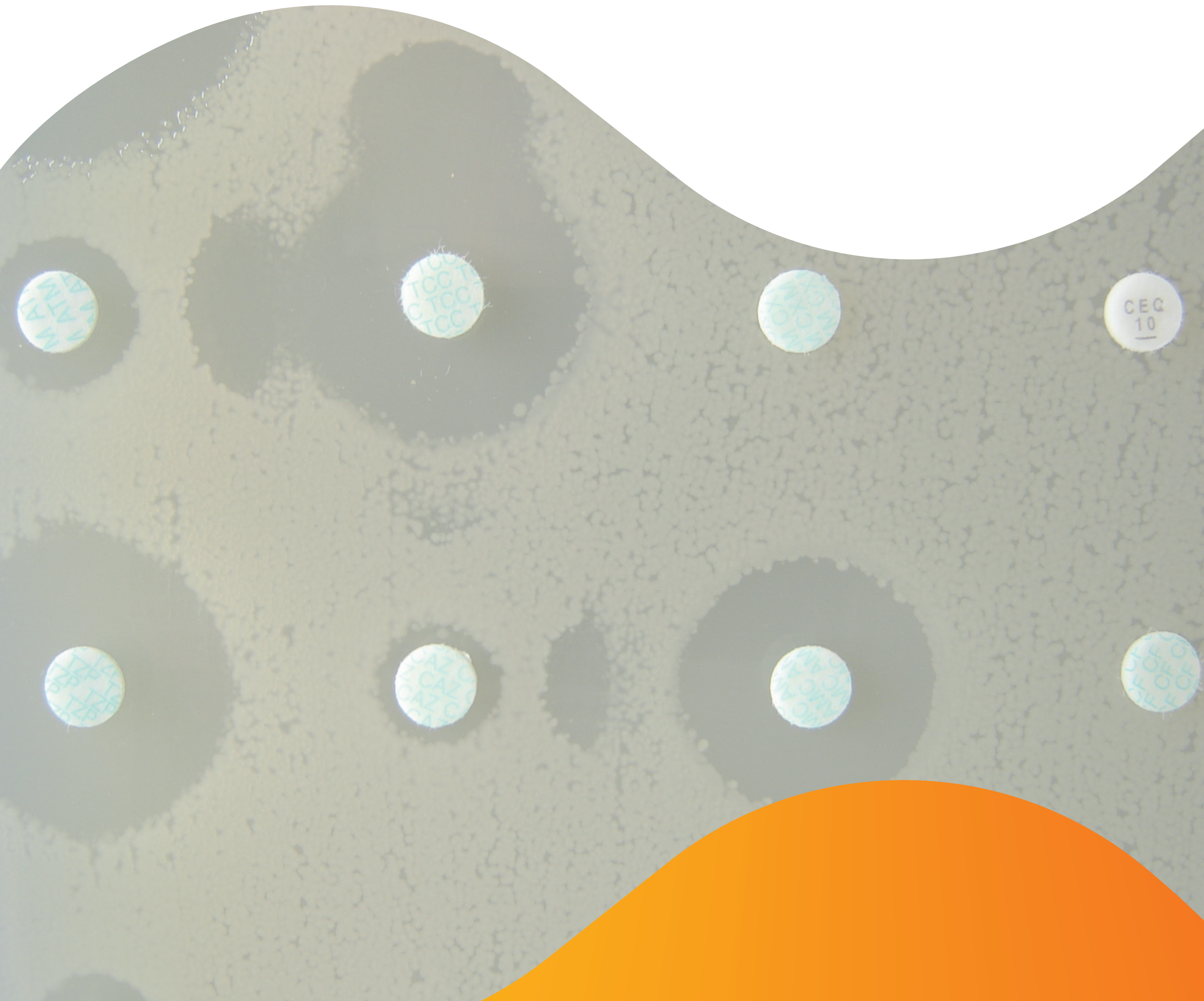
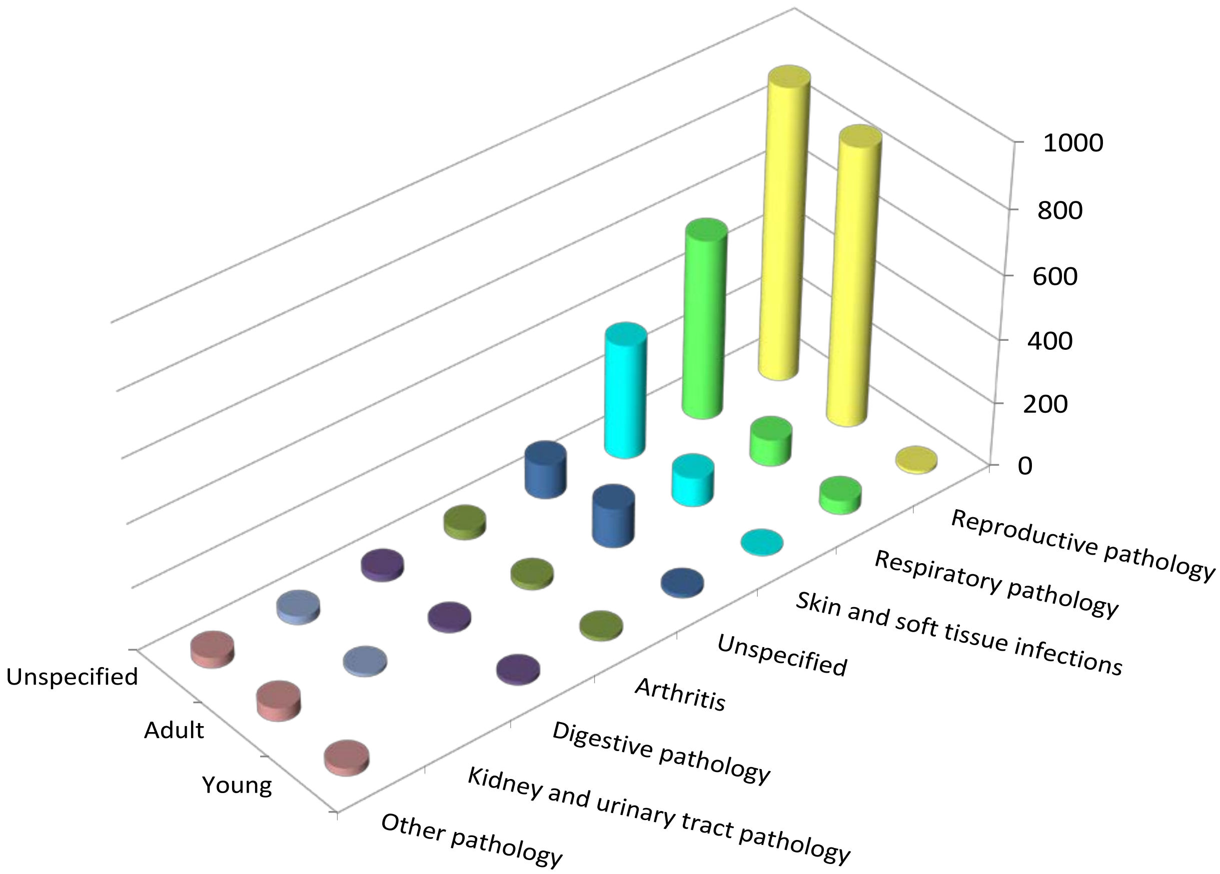


Figure 1 - Horses 2015 – Number of antibiograms by age group and pathology

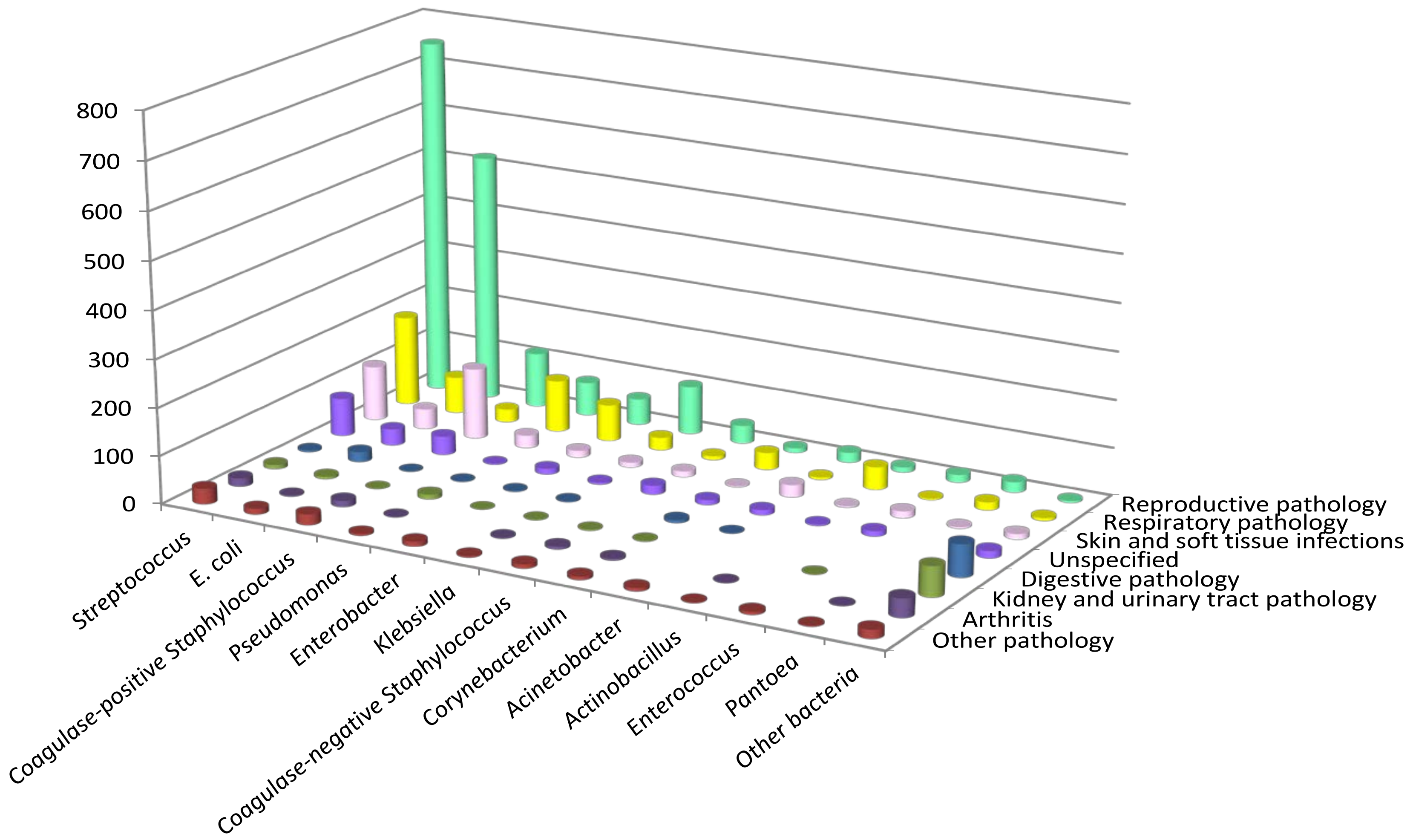


Note: *all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Horses 2015 – Number of antibiograms by age group and pathology

	Age group N (%)			
Pathology N (%)	Unspecified	Adult	Young	**Total N *(%)***
Reproductive pathology	915 *(26.38)*	871 *(25.12)*	10 *(0.29)*	**1,796 *(51.79)***
Respiratory pathology	565 *(16.29)*	83 *(2.39)*	43 *(1.24)*	**691 *(19.93)***
Skin and soft tissue infections	360 *(10.38)*	91 *(2.62)*	4 *(0.12)*	**455 *(13.12)***
Unspecified	108 *(3.11)*	124 *(3.58)*	13 *(0.37)*	**245 *(7.06)***
Arthritis	31 *(0.89)*	19 *(0.55)*	12 *(0.35)*	**62 *(1.79)***
Digestive pathology	23 *(0.66)*	14 *(0.40)*	12 *(0.35)*	**49 *(1.41)***
Kidney and urinary tract pathology	26 *(0.75)*	11 *(0.32)*		**37 *(1.07)***
Bone pathology	21 *(0.61)*	5 *(0.14)*	8 *(0.23)*	**34 *(0.98)***
Mastitis		22 *(0.63)*		**22 *(0.63)***
Systemic pathology	16 *(0.46)*	4 *(0.12)*	1 *(0.03)*	**21 *(0.61)***
Omphalitis			19 *(0.55)*	**19 *(0.55)***
Otitis	10 *(0.29)*	3 *(0.09)*		**13 *(0.37)***
Ocular pathology	1 *(0.03)*	8 *(0.23)*	1 *(0.03)*	**10 *(0.29)***
Cardiac pathology	3 *(0.09)*	3 *(0.09)*		**6 *(0.17)***
Oral pathology	3 *(0.09)*	1 *(0.03)*		**4 *(0.12)***
Nervous system pathology		1 *(0.03)*	2 *(0.06)*	**3 *(0.09)***
Septicemia			1 *(0.03)*	**1 *(0.03)***
Total N *(%)*	**2,082 *(60.03)***	**1,260 *(36.33)***	**126 *(3.63)***	**3,468 *(100.00)***

Figure 2 - Horses 2015 – Number of antibiograms by bacterial group and pathology



Note: *only values for pathologies >1% and bacterial groups having more than 30 occurrences are represented. Detailed values are presented in table 2 below.*

Table 2 - Horses 2015 – Number of antibiograms by bacterial group and pathology

Bacteria N (%)	Pathology N (%)																	
	Reproductive pathology	Respiratory pathology	Skin and soft tissue infections	Unspecified	Arthritis	Digestive pathology	Kidney and urinary tract pathology	Bone pathology	Mastitis	Systemic pathology	Omphalitis	Otitis	Ocular pathology	Cardiac pathology	Oral pathology	Nervous system pathology	Septicemia	**Total N *(%)***
Streptococcus	750 *(21.63)*	189 *(5.45)*	115 *(3.32)*	80 *(2.31)*	17 *(0.49)*	4 *(0.12)*	9 *(0.26)*	10 *(0.29)*	8 *(0.23)*	3 *(0.09)*	4 *(0.12)*	2 *(0.06)*	2 *(0.06)*	2 *(0.06)*	1 *(0.03)*			**1,196 *(34.49)***
E. coli	522 *(15.05)*	77 *(2.22)*	42 *(1.21)*	34 *(0.98)*	2 *(0.06)*	21 *(0.61)*	5 *(0.14)*	4 *(0.12)*	2 *(0.06)*	2 *(0.06)*	3 *(0.09)*	1 *(0.03)*						**715 *(20.62)***
Coagulase-positive Staphylococcus	115 *(3.32)*	27 *(0.78)*	149 *(4.30)*	39 *(1.12)*	13 *(0.37)*	1 *(0.03)*	1 *(0.03)*	4 *(0.12)*	4 *(0.12)*	4 *(0.12)*	4 *(0.12)*		2 *(0.06)*	2 *(0.06)*	1 *(0.03)*	1 *(0.03)*		**367 *(10.58)***
Pseudomonas	71 *(2.05)*	109 *(3.14)*	26 *(0.75)*	2 *(0.06)*	1 *(0.03)*	1 *(0.03)*	10 *(0.29)*			1 *(0.03)*	1 *(0.03)*	1 *(0.03)*	1 *(0.03)*					**224 *(6.46)***
Enterobacter	55 *(1.59)*	77 *(2.22)*	14 *(0.40)*	12 *(0.35)*		2 *(0.06)*	1 *(0.03)*	2 *(0.06)*		1 *(0.03)*	1 *(0.03)*	3 *(0.09)*	1 *(0.03)*		1 *(0.03)*	1 *(0.03)*		**171 *(4.93)***
Klebsiella	102 *(2.94)*	27 *(0.78)*	10 *(0.29)*	4 *(0.12)*	2 *(0.06)*	2 *(0.06)*	1 *(0.03)*		2 *(0.06)*		1 *(0.03)*							**151 *(4.35)***
Coagulase-negative Staphylococcus	38 *(1.10)*	8 *(0.23)*	12 *(0.35)*	19 *(0.55)*	6 *(0.17)*		2 *(0.06)*	5 *(0.14)*	1 *(0.03)*			1 *(0.03)*	2 *(0.06)*					**94 *(2.71)***
Corynebacterium	10 *(0.29)*	36 *(1.04)*	2 *(0.06)*	10 *(0.29)*	4 *(0.12)*	6 *(0.17)*	1 *(0.03)*	3 *(0.09)*	1 *(0.03)*	1 *(0.03)*		1 *(0.03)*					1 *(0.03)*	**76 *(2.19)***
Acinetobacter	21 *(0.61)*	5 *(0.14)*	26 *(0.75)*	11 *(0.32)*		1 *(0.03)*		1 *(0.03)*		3 *(0.09)*		1 *(0.03)*	1 *(0.03)*		1 *(0.03)*			**71 *(2.05)***
Actinobacillus	11 *(0.32)*	48 *(1.38)*	3 *(0.09)*	3 *(0.09)*	1 *(0.03)*									1 *(0.03)*				**67 *(1.93)***
Enterococcus	16 *(0.46)*	3 *(0.09)*	14 *(0.40)*	11 *(0.32)*			1 *(0.03)*		1 *(0.03)*	1 *(0.03)*	4 *(0.12)*							**51 *(1.47)***
Pantoea	22 *(0.63)*	17 *(0.49)*	3 *(0.09)*		1 *(0.03)*			1 *(0.03)*				1 *(0.03)*						**45 *(1.30)***
Other bacteria < 30 occurrences	63 *(1.82)*	68 *(1.96)*	39 *(1.12)*	20 *(0.58)*	15 *(0.43)*	11 *(0.32)*	6 *(0.17)*	4 *(0.12)*	3 *(0.09)*	5 *(0.14)*	1 *(0.03)*	2 *(0.06)*	1 *(0.03)*	1 *(0.03)*		1 *(0.03)*		**240 *(6.92)***
Total N (%)	**1,796 *(51.79)***	**691 *(19.93)***	**455 *(13.12)***	**245 *(7.06)***	**62 *(1.79)***	**49 *(1.41)***	**37 *(1.07)***	**34 *(0.98)***	**22 *(0.63)***	**21 *(0.61)***	**19 *(0.55)***	**13 *(0.37)***	**10 *(0.29)***	**6 *(0.17)***	**4 *(0.12)***	**3 *(0.09)***	**1 *(0.03)***	**3,468 *(100.00)***

Table 3 - Horses 2015 – Reproductive pathology – All ages groups included –*E. coli*: susceptibility to antibiotics (proportion) (N= 522)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*520*	**66**
Amoxicillin-Clavulanic ac.	*519*	**69**
Cephalexin	*47*	**89**
Cefoxitin	*48*	**94**
Cefuroxime	*41*	**95**
Ceftiofur	*522*	**96**
Cefquinome 30 µg	*520*	**98**
Streptomycin 10 UI	*384*	**71**
Kanamycin 30 UI	*513*	**93**
Gentamicin 10 UI	*522*	**95**
Neomycin	*179*	**93**
Amikacin	*472*	**99**
Tetracycline	*387*	**80**
Florfenicol	*31*	**100**
Nalidixic ac.	*383*	**97**
Oxolinic ac.	*136*	**99**
Flumequine	*477*	**97**
Enrofloxacin	*522*	**98**
Marbofloxacin	*518*	**98**
Danofloxacin	*41*	**95**
Trimethoprim-Sulfonamides	*521*	**79**

Table 4 - Horses 2015 – Respiratory pathology – All ages groups included –*E. coli*: susceptibility to antibiotics (proportion) (N= 77)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*76*	**61**
Amoxicillin-Clavulanic ac.	*76*	**71**
Ceftiofur	*77*	**90**
Cefquinome 30 µg	*77*	**88**
Streptomycin 10 UI	*74*	**59**
Kanamycin 30 UI	*73*	**86**
Gentamicin 10 UI	*77*	**87**
Amikacin	*71*	**100**
Tetracycline	*74*	**73**
Nalidixic ac.	*76*	**91**
Flumequine	*72*	**93**
Enrofloxacin	*77*	**92**
Marbofloxacin	*74*	**93**
Trimethoprim-Sulfonamides	*77*	**62**

Table 5 - Horses 2015 – Skin and soft tissue infections – All ages groups included – Tous *E. coli*: susceptibility to antibiotics (proportion) (N= 42)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*42*	**55**
Amoxicillin-Clavulanic ac.	*42*	**62**
Ceftiofur	*42*	**88**
Cefquinome 30 µg	*42*	**88**
Streptomycin 10 UI	*42*	**52**
Kanamycin 30 UI	*42*	**88**
Gentamicin 10 UI	*42*	**83**
Amikacin	*42*	**100**
Tetracycline	*42*	**67**
Nalidixic ac.	*42*	**79**
Flumequine	*42*	**81**
Enrofloxacin	*42*	**83**
Marbofloxacin	*42*	**86**
Trimethoprim-Sulfonamides	*42*	**60**

Table 6 - Horses 2015 – All pathologies and ages groups included – *Klebsiella* spp: susceptibility to antibiotics (proportion) (N= 151)

Antibiotic	*Total (N)*	**% S**
Amoxicillin-Clavulanic ac.	*150*	**91**
Cephalothin	*48*	**96**
Cefoxitin	*75*	**97**
Cefuroxime	*54*	**96**
Cefoperazone	*43*	**100**
Ceftiofur	*151*	**93**
Cefquinome 30 µg	*150*	**95**
Streptomycin 10 UI	*112*	**83**
Kanamycin 30 UI	*136*	**96**
Gentamicin 10 UI	*151*	**94**
Neomycin	*80*	**96**
Amikacin	*90*	**100**
Tetracycline	*118*	**89**
Florfenicol	*50*	**96**
Nalidixic ac.	*110*	**93**
Flumequine	*106*	**93**
Enrofloxacin	*150*	**95**
Marbofloxacin	*142*	**100**
Danofloxacin	*44*	**100**
Sulfonamides	*32*	**94**
Trimethoprim-Sulfonamides	*151*	**83**

Table 7 - Horses 2015 – All pathologies and ages groups included – *Enterobacter* spp*:* susceptibility to antibiotics (proportion) (N= 171)

Antibiotic	*Total (N)*	**% S**
Amoxicillin-Clavulanic ac.	*171*	**51**
Cefoxitin	*46*	**24**
Cefuroxime	*34*	**56**
Ceftiofur	*171*	**88**
Cefquinome 30 µg	*170*	**94**
Streptomycin 10 UI	*144*	**84**
Kanamycin 30 UI	*153*	**89**
Gentamicin 10 UI	*170*	**90**
Neomycin	*35*	**94**
Amikacin	*147*	**97**
Tetracycline	*151*	**89**
Nalidixic ac.	*149*	**91**
Flumequine	*145*	**88**
Enrofloxacin	*171*	**90**
Marbofloxacin	*162*	**98**
Trimethoprim-Sulfonamides	*171*	**87**

Table 8 - Horses 2015 – Skin and soft tissue infections – All age groups included –*Staphylococcus aureus*: susceptibility to antibiotics (proportion) (N= 107)

Antibiotic	*Total (N)*	**% S**
Penicillin	*107*	**62**
Cefoxitin	*100*	**81**
Oxacillin	*96*	**91**
Erythromycin	*107*	**93**
Spiramycin	*34*	**94**
Lincomycin	*30*	**93**
Streptomycin 10 UI	*100*	**90**
Kanamycin 30 UI	*101*	**84**
Gentamicin 10 UI	*107*	**82**
Tetracycline	*103*	**83**
Enrofloxacin	*107*	**93**
Marbofloxacin	*106*	**95**
Trimethoprim-Sulfonamides	*107*	**99**
Rifampicin	*99*	**93**

Table 9 - Horses 2015 – Reproductive pathology – All age groups included – *Streptococcus groupe C and Streptococcus zooepidemicus:* susceptibility to antibiotics (proportion) (N= 617)

Antibiotic	*Total (N)*	**% S**
Ampicillin	*72*	**100**
Oxacillin	*587*	**99**
Erythromycin	*617*	**89**
Tylosin	*43*	**93**
Spiramycin	*158*	**97**
Lincomycin	*88*	**86**
Streptomycin 500 µg	*542*	**92**
Kanamycin 1000 µg	*533*	**91**
Gentamicin 500 µg	*545*	**99**
Tetracycline	*536*	**34**
Florfenicol	*44*	**100**
Enrofloxacin	*617*	**24**
Marbofloxacin	*601*	**79**
Trimethoprim-Sulfonamides	*614*	**96**
Rifampicin	*572*	**56**

Table 10 - Horses 2015 – Respiratory pathology – All age groups included – *Streptococcus* spp.*:* susceptibility to antibiotics (proportion) (N= 189)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*188*	**98**
Erythromycin	*189*	**93**
Spiramycin	*32*	**100**
Lincomycin	*30*	**90**
Streptomycin 500 µg	*179*	**98**
Kanamycin 1000 µg	*172*	**99**
Gentamicin 500 µg	*182*	**99**
Tetracycline	*180*	**43**
Enrofloxacin	*188*	**32**
Marbofloxacin	*175*	**78**
Trimethoprim-Sulfonamides	*183*	**95**
Rifampicin	*173*	**61**

Table 11 - Horses 2015 – Skin and soft tissue infections – All age groups included – *Streptococcus* spp.*:* susceptibility to antibiotics (proportion) (N= 115)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*112*	**98**
Erythromycin	*114*	**96**
Streptomycin 500 µg	*114*	**97**
Kanamycin 1000 µg	*110*	**98**
Gentamicin 500 µg	*114*	**99**
Tetracycline	*115*	**31**
Enrofloxacin	*112*	**36**
Marbofloxacin	*113*	**76**
Trimethoprim-Sulfonamides	*113*	**96**
Rifampicin	*103*	**52**

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Annex 10

Dogs

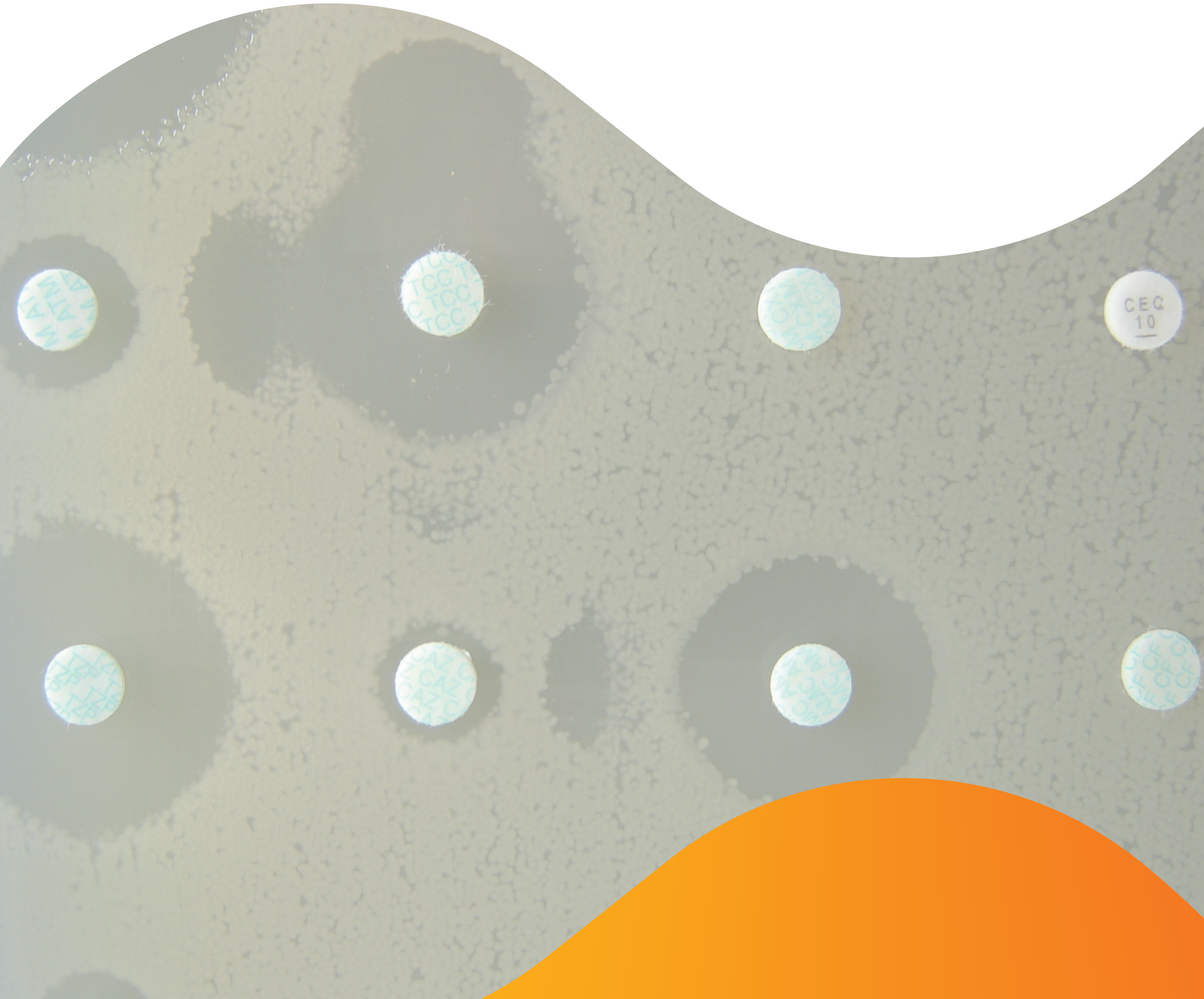
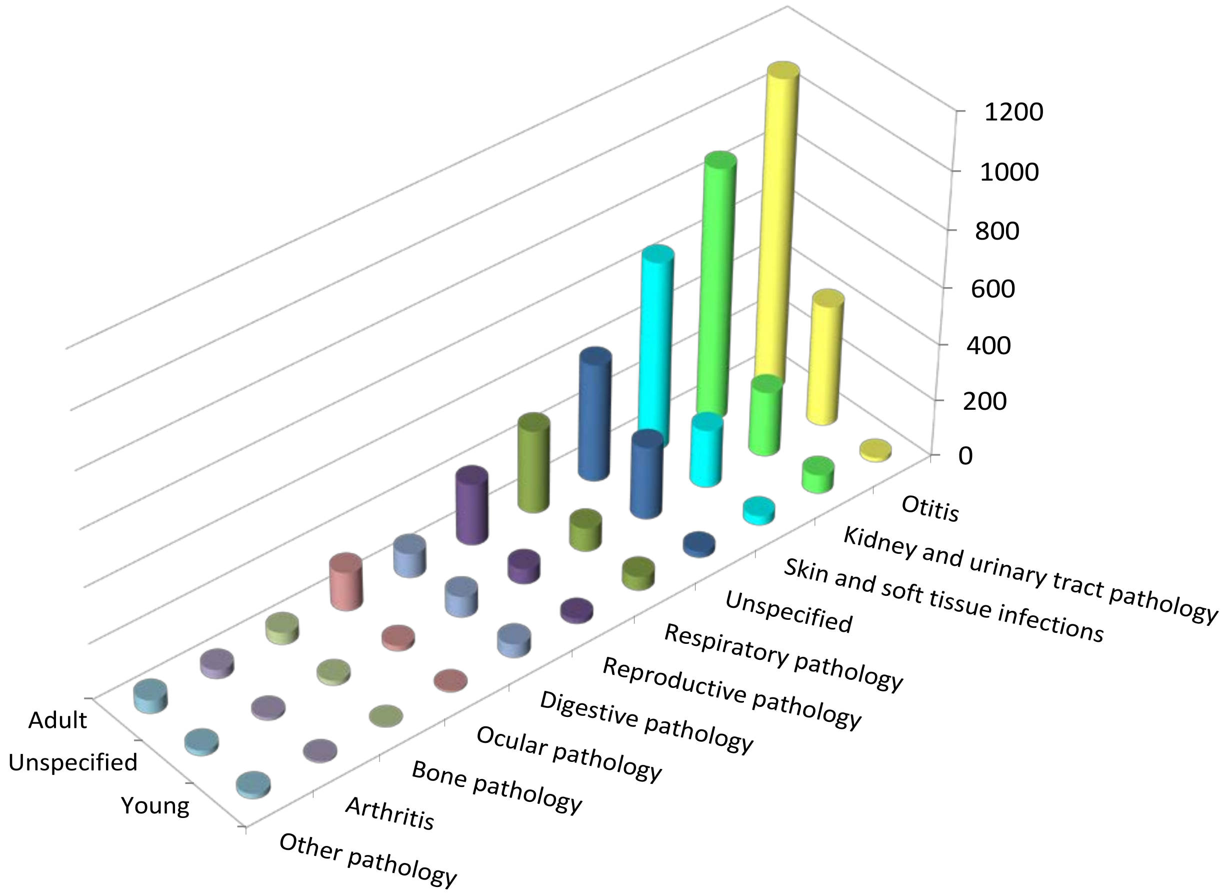


Figure 1 - Dogs 2015 – Number of antibiograms by age group and pathology

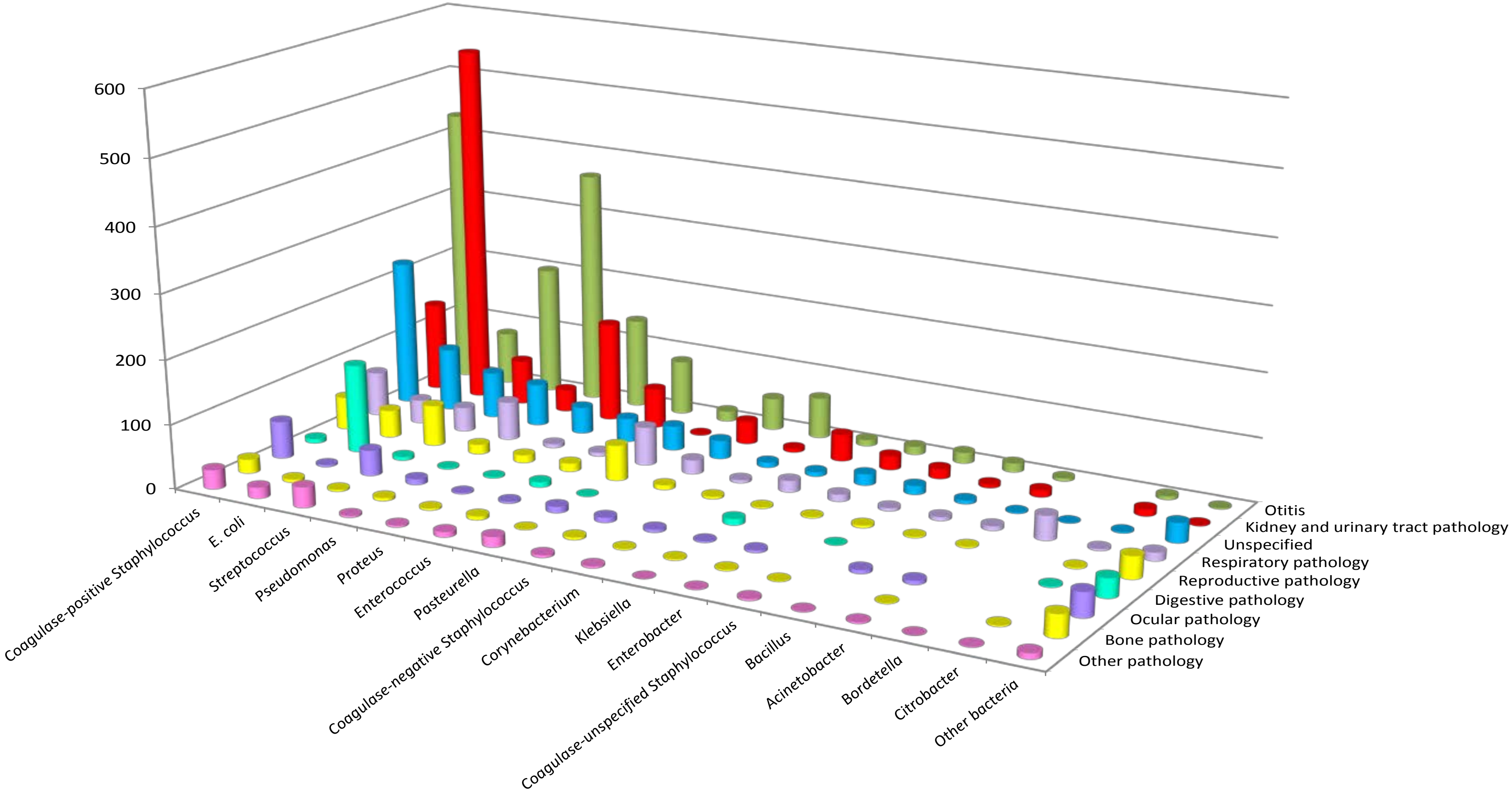


Note: *all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Dogs 2015 – Number of antibiograms by age group and pathology

	Age group N (%)			
Pathology N (%)	Adult	Unspecified	Young	**Total N (%)**
Otitis	1,092 *(19.49)*	427 *(7.62)*	15 *(0.27)*	**1,534 *(27.38)***
Kidney and urinary tract pathology	888 *(15.85)*	230 *(4.11)*	66 *(1.18)*	**1,184 *(21.14)***
Skin and soft tissue infections	669 *(11.94)*	205 *(3.66)*	33 *(0.59)*	**907 *(16.19)***
Unspecified	418 *(7.46)*	257 *(4.59)*	22 *(0.39)*	**697 *(12.44)***
Respiratory pathology	294 *(5.25)*	83 *(1.48)*	49 *(0.87)*	**426 *(7.60)***
Reproductive pathology	218 *(3.89)*	54 *(0.96)*	19 *(0.34)*	**291 *(5.19)***
Digestive pathology	86 *(1.54)*	74 *(1.32)*	48 *(0.86)*	**208 *(3.71)***
Ocular pathology	137 *(2.45)*	19 *(0.34)*	5 *(0.09)*	**161 *(2.87)***
Bone pathology	42 *(0.75)*	18 *(0.32)*	1 *(0.02)*	**61 *(1.09)***
Arthritis	32 *(0.57)*	11 *(0.20)*	5 *(0.09)*	**48 *(0.86)***
Oral pathology	25 *(0.45)*	13 *(0.23)*		**38 *(0.68)***
Systemic pathology	8 *(0.14)*	4 *(0.07)*	13 *(0.23)*	**25 *(0.45)***
Mastitis	8 *(0.14)*			**8 *(0.14)***
Nervous system pathology	5 *(0.09)*	1 *(0.02)*		**6 *(0.11)***
Septicemia			4 *(0.07)*	**4 *(0.07)***
Muscle pathology	2 *(0.04)*			**2 *(0.04)***
Cardiac pathology		1 *(0.02)*	1 *(0.02)*	**2 *(0.04)***
Total N *(%)*	**3,924 *(70.05)***	**1,397 *(24.94)***	**281 *(5.02)***	**5,602 *(100.00)***

Figure 2 - Dogs 2015 – Number of antibiograms by bacteria and pathology



Note: *only values for pathologies >1% and bacterial groups having more than 30 occurrences are represented. Detailed values are presented in table 2 below.*

Table 2 - Dogs 2015 – Number of antibiograms by bacteria and pathology

	Pathology N (%)																	
Bacteria N (%)	Otitis	Kidney and urinary tract pathology	Skin and soft tissue infections	Unspecified	Respiratory pathology	Reproductive pathology	Digestive pathology	Ocular pathology	Bone pathology	Arthritis	Oral pathology	Systemic pathology	Mastitis	Nervous system pathology	Septicemia	Muscle pathology	Cardiac pathology	**Total N *(%)***
Coagulase-positive Staphylococcus	433 *(7.73)*	139 *(2.48)*	486 *(8.68)*	227 *(4.05)*	69 *(1.23)*	51 *(0.91)*	7 *(0.12)*	58 *(1.04)*	22 *(0.39)*	17 *(0.30)*	7 *(0.12)*	3 *(0.05)*	3 *(0.05)*					**1,522 *(27.17)***
E. coli	82 *(1.46)*	558 *(9.96)*	51 *(0.91)*	98 *(1.75)*	37 *(0.66)*	43 *(0.77)*	138 *(2.46)*	3 *(0.05)*	5 *(0.09)*	1 *(0.02)*	1 *(0.02)*	13 *(0.23)*			**2** *(0.04)*			**1 032 *(18.42)***
Streptococcus	200 *(3.57)*	70 *(1.25)*	87 *(1.55)*	72 *(1.29)*	38 *(0.68)*	64 *(1.14)*	6 *(0.11)*	40 *(0.71)*	3 *(0.05)*	19 *(0.34)*	6 *(0.11)*	3 *(0.05)*		**1** *(0.02)*	**1** *(0.02)*		2 *(0.04)*	**612 *(10.92)***
Pseudomonas	364 *(6.50)*	35 *(0.62)*	38 *(0.68)*	66 *(1.18)*	60 *(1.07)*	15 *(0.27)*	2 *(0.04)*	9 *(0.16)*	5 *(0.09)*	3 *(0.05)*								**597 *(10.66)***
Proteus	140 *(2.50)*	155 *(2.77)*	46 *(0.82)*	42 *(0.75)*	6 *(0.11)*	12 *(0.21)*	2 *(0.04)*	2 *(0.04)*	3 *(0.05)*		2 *(0.04)*		1 *(0.02)*					**411 *(7.34)***
Enterococcus	85 *(1.52)*	62 *(1.11)*	35 *(0.62)*	37 *(0.66)*	6 *(0.11)*	13 *(0.23)*	8 *(0.14)*	3 *(0.05)*	6 *(0.11)*	2 *(0.04)*	2 *(0.04)*	3 *(0.05)*				1 *(0.02)*		**263 *(4.69)***
Pasteurella	16 *(0.29)*	2 *(0.04)*	13 *(0.23)*	38 *(0.68)*	60 *(1.07)*	55 *(0.98)*	1 *(0.02)*	10 *(0.18)*	1 *(0.02)*	1 *(0.02)*	12 *(0.21)*	2 *(0.04)*		**1** *(0.02)*				**212 *(3.78)***
Coagulase-negative Staphylococcus	50 *(0.89)*	36 *(0.64)*	44 *(0.79)*	29 *(0.52)*	22 *(0.39)*	7 *(0.12)*		8 *(0.14)*	4 *(0.07)*	2 *(0.04)*			1 *(0.02)*	**1** *(0.02)*				**204 *(3.64)***
Corynebacterium	64 *(1.14)*	6 *(0.11)*	14 *(0.25)*	8 *(0.14)*	5 *(0.09)*	4 *(0.07)*		5 *(0.09)*	2 *(0.04)*		2 *(0.04)*			**1** *(0.02)*				**111 *(1.98)***
Klebsiella	10 *(0.18)*	42 *(0.75)*	10 *(0.18)*	7 *(0.12)*	18 *(0.32)*	2 *(0.04)*	10 *(0.18)*	2 *(0.04)*	2 *(0.04)*									**103 *(1.84)***
Enterobacter	13 *(0.23)*	22 *(0.39)*	23 *(0.41)*	18 *(0.32)*	11 *(0.20)*	2 *(0.04)*		4 *(0.07)*	2 *(0.04)*		1 *(0.02)*							**96 *(1.71)***
Coagulase-unspecified Staphylococcus	17 *(0.30)*	16 *(0.29)*	7 *(0.12)*	14 *(0.25)*	5 *(0.09)*	4 *(0.07)*	1 *(0.02)*		1 *(0.02)*				2 *(0.04)*	**1** *(0.02)*				**68 *(1.21)***
Bacillus	14 *(0.25)*	6 *(0.11)*	7 *(0.12)*	6 *(0.11)*	6 *(0.11)*	2 *(0.04)*		6 *(0.11)*					1 *(0.02)*					**48 *(0.86)***

Bacteria N (%)	Pathology N (%)																	
	Otitis	Kidney and urinary tract pathology	Skin and soft tissue infections	Unspecified	Respiratory pathology	Reproductive pathology	Digestive pathology	Ocular pathology	Bone pathology	Arthritis	Oral pathology	Systemic pathology	Mastitis	Nervous system pathology	Septicemia	Muscle pathology	Cardiac pathology	**Total N** ***(%)***
Acinetobacter	5 *(0.09)*	11 *(0.20)*	7 *(0.12)*	2 *(0.04)*	7 *(0.12)*	2 *(0.04)*		6 *(0.11)*	1 *(0.02)*	1 *(0.02)*	1 *(0.02)*							**43** ***(0.77)***
Bordetella				1 *(0.02)*	38 *(0.68)*													**39** ***(0.70)***
Citrobacter	6 *(0.11)*	11 *(0.20)*	1 *(0.02)*	2 *(0.04)*	3 *(0.05)*	2 *(0.04)*	2 *(0.04)*		2 *(0.04)*						**1** *(0.02)*			**30** ***(0.54)***
Other bacteria < 30 occurrences	35 *(0.62)*	13 *(0.23)*	38 *(0.68)*	30 *(0.54)*	35 *(0.62)*	13 *(0.23)*	31 *(0.55)*	5 *(0.09)*	2 *(0.04)*	2 *(0.04)*	4 *(0.07)*	1 *(0.02)*		1 *(0.02)*		1 *(0.02)*		**211** ***(3.77)***
Total N ***(%)***	**1,534** ***(27.38)***	**1,184** ***(21.14)***	**907** ***(16.19)***	**697** ***(12.44)***	**426** ***(7.60)***	**291** ***(5.19)***	**208** ***(3.71)***	**161** ***(2.87)***	**61** ***(1.09)***	**48** ***(0.86)***	**38** ***(0.68)***	**25** ***(0.45)***	**8** ***(0.14)***	**6** ***(0.11)***	**4** ***(0.07)***	**2** ***(0.04)***	**2** ***(0.04)***	**5,602** ***(100.00)***

Table 3 - Dogs 2015 – Kidney and urinary tract pathology – All age groups included – *E. coli:* susceptibility to antibiotics (proportion) (N= 558)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*488*	**61**
Amoxicillin-Clavulanic ac.	*558*	**77**
Cephalexin	*526*	**84**
Cephalothin	*75*	**57**
Cefoxitin	*336*	**90**
Cefuroxime	*60*	**62**
Cefoperazone	*67*	**96**
Cefovecin	*302*	**90**
Ceftiofur	*525*	**94**
Cefquinome 30 µg	*165*	**94**
Streptomycin 10 UI	*273*	**78**
Kanamycin 30 UI	*152*	**90**
Tobramycin	*67*	**97**
Gentamicin 10 UI	*551*	**96**
Neomycin	*208*	**92**
Tetracycline	*246*	**79**
Doxycycline	*321*	**59**
Chloramphenicol	*181*	**79**
Florfenicol	*126*	**94**
Nalidixic ac.	*301*	**78**
Oxolinic ac.	*41*	**95**
Flumequine	*130*	**81**
Enrofloxacin	*553*	**86**
Marbofloxacin	*441*	**91**
Danofloxacin	*44*	**100**
Pradofloxacin	*134*	**83**
Sulfonamides	*30*	**53**
Trimethoprim-Sulfonamides	*553*	**87**

Table 4 - Dogs 2015 – Skin and soft tissue infections – All age groups included – *E. coli:* susceptibility to antibiotics (proportion) (N= 51)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*41*	**29**
Amoxicillin-Clavulanic ac.	*50*	**54**
Cephalexin	*49*	**71**
Ceftiofur	*46*	**85**
Gentamicin 10 UI	*50*	**98**
Nalidixic ac.	*33*	**67**
Enrofloxacin	*51*	**76**
Marbofloxacin	*41*	**80**
Trimethoprim-Sulfonamides	*51*	**73**

Table 5 - Dogs 2015 – Otitis – All age groups included – *E. coli*: susceptibility to antibiotics (proportion) (N= 82)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*78*	**55**
Amoxicillin-Clavulanic ac.	*82*	**72**
Cephalexin	*80*	**76**
Cefoxitin	*55*	**85**
Cefovecin	*37*	**86**
Ceftiofur	*73*	**89**
Cefquinome 30 µg	*36*	**92**
Streptomycin 10 UI	*35*	**80**
Kanamycin 30 UI	*30*	**93**
Gentamicin 10 UI	*82*	**93**
Neomycin	*35*	**89**
Tetracycline	*41*	**71**
Doxycycline	*33*	**70**
Florfenicol	*35*	**86**
Nalidixic ac.	*62*	**69**
Enrofloxacin	*81*	**80**
Marbofloxacin	*57*	**84**
Trimethoprim-Sulfonamides	*73*	**84**

Table 6 - Dogs 2015 – All pathologies and age groups included –*Pasteurella*: susceptibility to antibiotics (proportion) (N= 212)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*150*	**91**
Amoxicillin-Clavulanic ac.	*209*	**96**
Cephalexin	*207*	**89**
Cefoxitin	*41*	**88**
Cefovecin	*98*	**90**
Ceftiofur	*189*	**95**
Cefquinome 30 µg	*47*	**89**
Streptomycin 10 UI	*106*	**71**
Kanamycin 30 UI	*89*	**83**
Tobramycin	*63*	**79**
Gentamicin 10 UI	*212*	**95**
Neomycin	*56*	**73**
Tetracycline	*121*	**93**
Doxycycline	*94*	**91**
Chloramphenicol	*83*	**95**
Florfenicol	*53*	**100**
Nalidixic ac.	*67*	**82**
Flumequine	*42*	**62**
Enrofloxacin	*208*	**94**
Marbofloxacin	*191*	**97**
Trimethoprim	*51*	**90**
Trimethoprim-Sulfonamides	*198*	**91**

Table 7 - Dogs 2015 – Otitis – All age groups included – Coagulase-positive *Staphylococcus:* susceptibility to antibiotics (proportion) (N= 433)

Antibiotic	*Total (N)*	**% S**
Penicillin	*396*	**30**
Cefoxitin	*354*	**96**
Oxacillin	*122*	**95**
Cefovecin	*168*	**86**
Erythromycin	*394*	**73**
Tylosin	*96*	**78**
Spiramycin	*315*	**76**
Lincomycin	*384*	**73**
Pristinamycin	*33*	**100**
Streptomycin 10 UI	*252*	**71**
Kanamycin 30 UI	*206*	**68**
Tobramycin	*49*	**49**
Gentamicin 10 UI	*432*	**87**
Neomycin	*221*	**82**
Tetracycline	*335*	**65**
Doxycycline	*66*	**82**
Chloramphenicol	*175*	**75**
Florfenicol	*105*	**97**
Enrofloxacin	*411*	**86**
Marbofloxacin	*362*	**90**
Danofloxacin	*93*	**95**
Pradofloxacin	*55*	**89**
Trimethoprim-Sulfonamides	*389*	**89**
Fusidic ac.	*215*	**94**
Rifampicin	*130*	**99**

Table 8 - Dogs 2015 – Skin and soft tissue infections – All age groups included – Coagulase-positive *Staphylococcus:* susceptibility to antibiotics (proportion) (N= 486)

Antibiotic	*Total (N)*	**% S**
Penicillin	*454*	**19**
Cefoxitin	*436*	**92**
Oxacillin	*119*	**94**
Cefovecin	*225*	**74**
Erythromycin	*455*	**58**
Tylosin	*117*	**62**
Spiramycin	*329*	**60**
Lincomycin	*453*	**59**
Pristinamycin	*32*	**100**
Streptomycin 10 UI	*254*	**56**
Kanamycin 30 UI	*266*	**55**
Tobramycin	*100*	**61**
Gentamicin 10 UI	*486*	**84**
Neomycin	*224*	**74**
Tetracycline	*355*	**56**
Doxycycline	*122*	**82**
Chloramphenicol	*208*	**69**
Florfenicol	*130*	**99**
Enrofloxacin	*471*	**81**
Marbofloxacin	*412*	**86**
Danofloxacin	*90*	**89**
Pradofloxacin	*56*	**84**
Trimethoprim-Sulfonamides	*436*	**81**
Fusidic ac.	*253*	**97**
Rifampicin	*105*	**95**

Table 9 - Dogs 2015 – Kidney and urinary tract pathology – All age groups included – Coagulase-positive *Staphylococcus:* susceptibility to antibiotics (proportion) (N= 139)

Antibiotic	*Total (N)*	**% S**
Penicillin	*134*	**14**
Cefoxitin	*128*	**88**
Cefovecin	*59*	**76**
Erythromycin	*134*	**64**
Spiramycin	*87*	**68**
Lincomycin	*131*	**67**
Streptomycin 10 UI	*73*	**66**
Kanamycin 30 UI	*67*	**57**
Gentamicin 10 UI	*138*	**83**
Neomycin	*51*	**67**
Tetracycline	*93*	**56**
Doxycycline	*45*	**89**
Chloramphenicol	*47*	**81**
Enrofloxacin	*121*	**79**
Marbofloxacin	*113*	**85**
Trimethoprim-Sulfonamides	*134*	**82**
Fusidic ac.	*72*	**96**
Rifampicin	*40*	**100**

Table 10 - Dogs 2015 – Otitis – All age groups included – *Streptococcus* spp.: susceptibility to antibiotics (proportion) (N= 200)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*169*	**85**
Cefovecin	*55*	**82**
Erythromycin	*171*	**74**
Tylosin	*52*	**83**
Spiramycin	*126*	**82**
Lincomycin	*150*	**79**
Streptomycin 500 µg	*127*	**90**
Kanamycin 1000 µg	*122*	**97**
Gentamicin 500 µg	*173*	**95**
Tetracycline	*150*	**25**
Chloramphenicol	*90*	**66**
Florfenicol	*45*	**89**
Enrofloxacin	*182*	**29**
Marbofloxacin	*166*	**67**
Trimethoprim-Sulfonamides	*174*	**83**
Rifampicin	*36*	**44**

Table 11 - Dogs 2015 – Skin and soft tissue infections – All age groups included – *Streptococcus* spp.: susceptibility to antibiotics (proportion) (N= 87)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*75*	**91**
Erythromycin	*80*	**74**
Spiramycin	*37*	**73**
Lincomycin	*64*	**81**
Streptomycin 500 µg	*49*	**86**
Kanamycin 1000 µg	*41*	**95**
Gentamicin 500 µg	*73*	**93**
Tetracycline	*56*	**34**
Chloramphenicol	*36*	**75**
Enrofloxacin	*83*	**33**
Marbofloxacin	*75*	**73**
Trimethoprim-Sulfonamides	*73*	**86**

Table 12 - Dogs 2015 – All pathologies and age groups included – *Proteus mirabilis*: susceptibility to antibiotics (proportion) (N= 390)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*277*	**70**
Amoxicillin -Ac. clavulanique	*384*	**92**
Cephalexin	*370*	**83**
Cephalothin	*93*	**91**
Cefoxitin	*182*	**96**
Cefuroxime	*103*	**96**
Cefoperazone	*55*	**98**
Cefovecin	*218*	**95**
Ceftiofur	*366*	**97**
Cefquinome 30 µg	*110*	**99**
Streptomycin 10 UI	*160*	**64**
Kanamycin 30 UI	*91*	**81**
Tobramycin	*123*	**90**
Gentamicin 10 UI	*385*	**91**
Neomycin	*150*	**88**
Chloramphenicol	*194*	**58**
Florfenicol	*80*	**98**
Nalidixic ac.	*164*	**71**
Oxolinic ac.	*44*	**84**
Flumequine	*82*	**78**
Enrofloxacin	*383*	**84**
Marbofloxacin	*338*	**97**
Danofloxacin	*50*	**86**
Pradofloxacin	*58*	**83**
Trimethoprim-Sulfonamides	*372*	**77**

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Annex 11

Cats

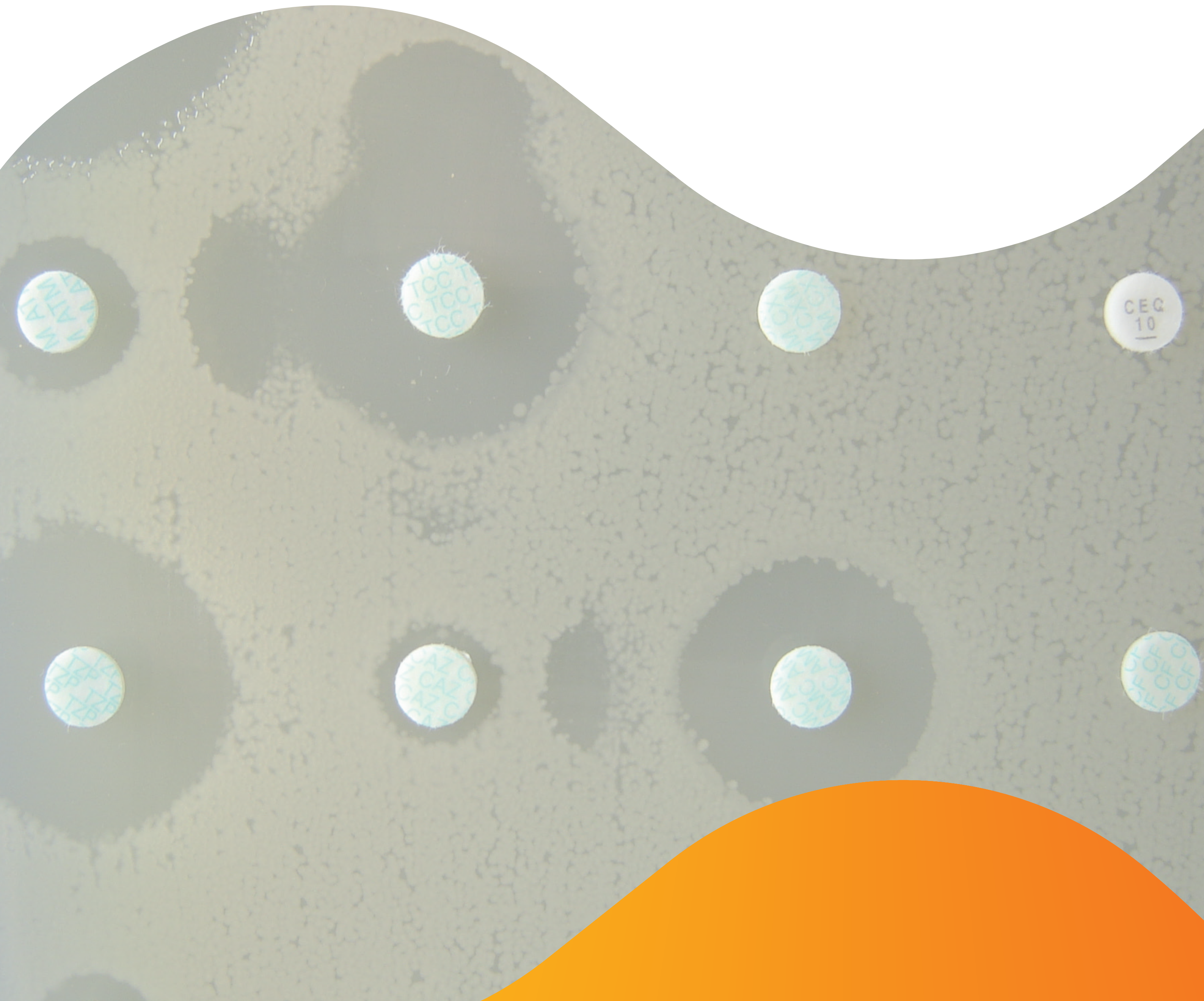
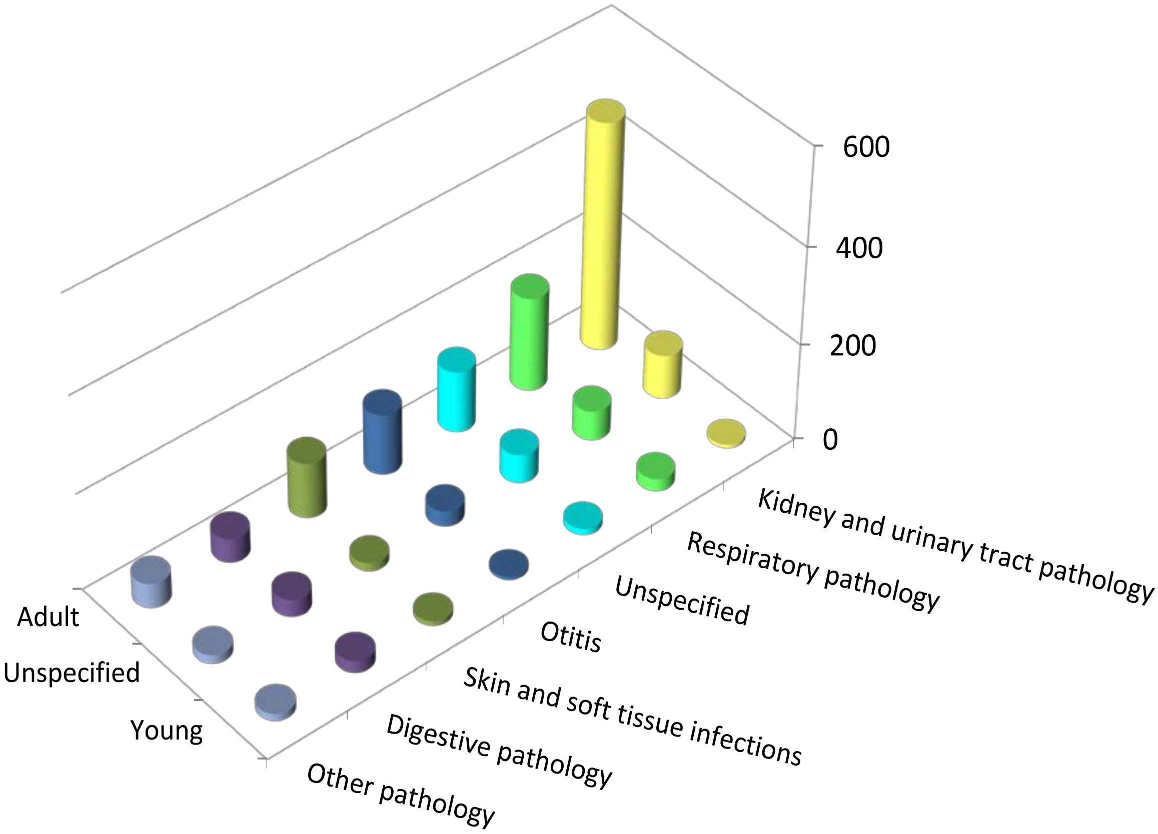


Figure 1 - Cats 2015 – Number of antibiograms by age group and pathology

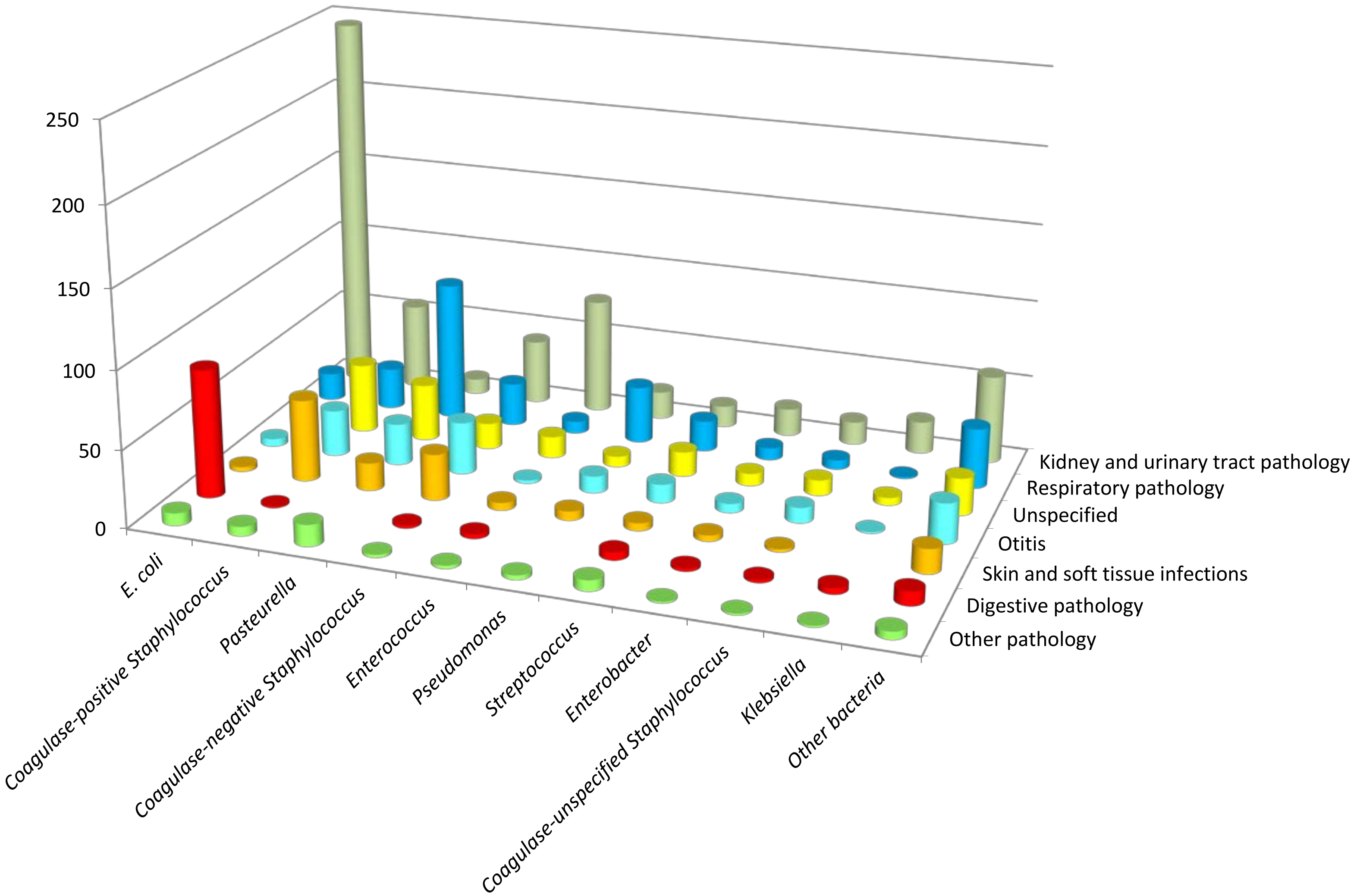


Note: *all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Cats 2015 – Number of antibiograms by age group and pathology

Pathology N (%)	Age group N (%) Adult	Unspecified	Young	Total N (%)
Kidney and urinary tract pathology	473 *(30.46)*	91 *(5.86)*	7 *(0.45)*	**571** ***(36.77)***
Respiratory pathology	195 *(12.56)*	61 *(3.93)*	26 *(1.67)*	**282** ***(18.16)***
Unspecified	127 *(8.18)*	59 *(3.8)*	13 *(0.84)*	**199** ***(12.81)***
Otitis	126 *(8.11)*	32 *(2.06)*	6 *(0.39)*	**164** ***(10.56)***
Skin and soft tissue infections	115 *(7.41)*	17 *(1.09)*	10 *(0.64)*	**142** ***(9.14)***
Digestive pathology	50 *(3.22)*	36 *(2.32)*	25 *(1.61)*	**111** ***(7.15)***
Ocular pathology	22 *(1.42)*	6 *(0.39)*	6 *(0.39)*	**34** ***(2.19)***
Bone pathology	9 *(0.58)*	3 *(0.19)*	1 *(0.06)*	**13** ***(0.84)***
Arthritis	6 *(0.39)*	3 *(0.19)*	2 *(0.13)*	**11** ***(0.71)***
Systemic pathology	3 *(0.19)*		5 *(0.32)*	**8** ***(0.52)***
Oral pathology	5 *(0.32)*	2 *(0.13)*		**7** ***(0.45)***
Reproductive pathology	5 *(0.32)*	1 *(0.06)*	1 *(0.06)*	**7** ***(0.45)***
Nervous system pathology	1 *(0.06)*	3 *(0.19)*		**4** ***(0.26)***
Total N ***(%)***	**1,137** ***(73.21)***	**314** ***(20.22)***	**102** ***(6.57)***	**1,553** ***(100.00)***

Figure 2 - Cats 2015 – Number of antibiograms by bacteria and pathology



Note: *only values for pathologies >1% and bacterial groups having more than 30 occurrences are represented. Detailed values are presented in table 2 below.*

Table 2 - Cats 2015 – Number of antibiograms by bacteria and pathology

	Pathology N (%)													
Bacteria N (%)	Kidney and urinary tract pathology	Respiratory pathology	Unspecified	Otitis	Skin and soft tissue infections	Digestive pathology	Ocular pathology	Bone pathology	Arthritis	Systemic pathology	Oral pathology	Reproductive pathology	Nervous system pathology	**Total N *(%)***
E. coli	245 *(15.78)*	18 *(1.16)*	16 *(1.03)*	5 *(0.32)*	3 *(0.19)*	83 *(5.34)*	1 *(0.06)*	1 *(0.06)*		3 *(0.19)*		3 *(0.19)*	1 *(0.06)*	**379** ***(24.40)***
Coagulase-positive Staphylococcus	56 *(3.61)*	27 *(1.74)*	45 *(2.90)*	30 *(1.93)*	53 *(3.41)*	1 *(0.06)*	1 *(0.06)*	2 *(0.13)*		1 *(0.06)*	2 *(0.13)*		1 *(0.06)*	**219** ***(14.10)***
Pasteurella	10 *(0.64)*	90 *(5.80)*	37 *(2.38)*	27 *(1.74)*	18 *(1.16)*		10 *(0.64)*	2 *(0.13)*	5 *(0.32)*	2 *(0.13)*	5 *(0.32)*			**206** ***(13.26)***
Coagulase-negative Staphylococcus	42 *(2.70)*	28 *(1.80)*	17 *(1.09)*	34 *(2.19)*	30 *(1.93)*	2 *(0.13)*	10 *(0.64)*					1 *(0.06)*	1 *(0.06)*	**165** ***(10.62)***
Enterococcus	75 *(4.83)*	8 *(0.52)*	14 *(0.90)*	2 *(0.13)*	5 *(0.32)*	3 *(0.19)*		1 *(0.06)*				1 *(0.06)*		**109** ***(7.02)***
Pseudomonas	18 *(1.16)*	37 *(2.38)*	7 *(0.45)*	11 *(0.71)*	6 *(0.39)*			1 *(0.06)*	2 *(0.13)*					**82** ***(5.28)***
Streptococcus	14 *(0.90)*	20 *(1.29)*	16 *(1.03)*	12 *(0.77)*	5 *(0.32)*	5 *(0.32)*	2 *(0.13)*	3 *(0.19)*		2 *(0.13)*		2 *(0.13)*		**81** ***(5.22)***
Enterobacter	18 *(1.16)*	8 *(0.52)*	8 *(0.52)*	6 *(0.39)*	4 *(0.26)*	2 *(0.13)*	1 *(0.06)*	1 *(0.06)*						**48** ***(3.09)***
Coagulase-unspecified Staphylococcus	15 *(0.97)*	6 *(0.39)*	10 *(0.64)*	10 *(0.64)*	2 *(0.13)*	2 *(0.13)*	1 *(0.06)*						1 *(0.06)*	**47** ***(3.03)***
Klebsiella	21 *(1.35)*	1 *(0.06)*	5 *(0.32)*	1 *(0.06)*		4 *(0.26)*			1 *(0.06)*					**33** ***(2.12)***
Other bacteria < 30 occurrences	57 *(3.67)*	39 *(2.51)*	24 *(1.55)*	26 *(1.67)*	16 *(1.03)*	9 *(0.58)*	8 *(0.52)*	2 *(0.13)*	3 *(0.19)*				0	**184** ***(11.85)***
Total N *(%)*	**571** ***(36.77)***	**282** ***(18.16)***	**199** ***(12.81)***	**164** ***(10.56)***	**142** ***(9.14)***	**111** ***(7.15)***	**34** ***(2.19)***	**13** ***(0.84)***	**11** ***(0.71)***	**8** ***(0.52)***	**7** ***(0.45)***	**7** ***(0.45)***	**4** ***(0.26)***	**1,553** ***(100.00)***

Table 3 - Cats 2015 – All pathologies and age groups included – *E. coli:* susceptibility to antibiotics (proportion) (N= 379)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*322*	**60**
Amoxicillin-Clavulanic ac.	*372*	**73**
Cephalexin	*348*	**84**
Cephalothin	*52*	**60**
Cefoxitin	*224*	**91**
Cefuroxime	*63*	**75**
Cefoperazone	*57*	**93**
Cefovecin	*156*	**88**
Ceftiofur	*358*	**93**
Cefquinome 30 µg	*156*	**94**
Streptomycin 10 UI	*223*	**71**
Kanamycin 30 UI	*140*	**89**
Tobramycin	*44*	**100**
Gentamicin 10 UI	*372*	**95**
Neomycin	*168*	**90**
Tetracycline	*222*	**70**
Doxycycline	*159*	**57**
Chloramphenicol	*111*	**83**
Florfenicol	*120*	**93**
Nalidixic ac.	*198*	**87**
Flumequine	*91*	**84**
Enrofloxacin	*371*	**88**
Marbofloxacin	*319*	**90**
Danofloxacin	*50*	**98**
Pradofloxacin	*59*	**90**
Trimethoprim-Sulfonamides	*376*	**86**

Table 4 - Cats 2015 – Kidney and urinary tract pathology – All age groups included – *E. coli:* susceptibility to antibiotics (proportion) (N= 245)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*208*	**61**
Amoxicillin-Clavulanic ac.	*245*	**75**
Cephalexin	*227*	**83**
Cephalothin	*38*	**55**
Cefoxitin	*136*	**90**
Cefoperazone	*34*	**91**
Cefovecin	*119*	**88**
Ceftiofur	*235*	**91**
Cefquinome 30 µg	*77*	**88**
Streptomycin 10 UI	*140*	**71**
Kanamycin 30 UI	*81*	**91**
Tobramycin	*35*	**100**
Gentamicin 10 UI	*243*	**95**
Neomycin	*98*	**93**
Tetracycline	*130*	**69**
Doxycycline	*123*	**55**
Chloramphenicol	*87*	**84**
Florfenicol	*61*	**95**
Nalidixic ac.	*125*	**88**
Flumequine	*49*	**88**
Enrofloxacin	*243*	**88**
Marbofloxacin	*208*	**89**
Pradofloxacin	*42*	**90**
Trimethoprim-Sulfonamides	*243*	**86**

Table 5 - Cats 2015 – Respiratory pathology – All age groups included – *Pasteurella:* susceptibility to antibiotics (proportion) (N= 90)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*60*	**97**
Amoxicillin-Clavulanic ac.	*90*	**97**
Cephalexin	*89*	**97**
Cefovecin	*64*	**95**
Ceftiofur	*78*	**100**
Gentamicin 10 UI	*90*	**89**
Tetracycline	*59*	**98**
Doxycycline	*37*	**100**
Chloramphenicol	*40*	**100**
Nalidixic ac.	*50*	**94**
Enrofloxacin	*89*	**99**
Marbofloxacin	*75*	**99**
Trimethoprim-Sulfonamides	*89*	**91**

Table 6 - Cats 2015 – All pathologies and age groups included – Coagulase-positive *Staphylococcus:* susceptibility to antibiotics (proportion) (N= 219)

Antibiotic	*Total (N)*	**% S**
Penicillin	*211*	**31**
Cefoxitin	*189*	**80**
Oxacillin	*38*	**82**
Cefovecin	*112*	**62**
Erythromycin	*211*	**62**
Tylosin	*32*	**88**
Spiramycin	*162*	**68**
Lincomycin	*209*	**69**
Streptomycin 10 UI	*126*	**67**
Kanamycin 30 UI	*123*	**63**
Tobramycin	*66*	**55**
Gentamicin 10 UI	*219*	**79**
Neomycin	*107*	**80**
Tetracycline	*172*	**74**
Doxycycline	*52*	**88**
Chloramphenicol	*112*	**85**
Florfenicol	*72*	**99**
Enrofloxacin	*210*	**72**
Marbofloxacin	*178*	**79**
Danofloxacin	*38*	**92**
Trimethoprim-Sulfonamides	*193*	**82**
Fusidic ac.	*125*	**89**
Rifampicin	*46*	**98**

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