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RESAPATH

French surveillance network for antimicrobial resistance in bacteria from diseased animals

2017 Annual Report

March 2019 Scientific publication

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Contents

INTRODUCTION

Monitoring of Antimicrobial Resistance in bacteria from diseased animals in France in 2017: Summary Report of the RESAPATH network (resapath.anses.fr)

The French surveillance network for antimicrobial resistance (AMR) in bacteria from diseased animals (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. The RESAPATH is a long-term cooperative effort from 71 veterinary diagnostic laboratories throughout France coordinated by the Lyon and Ploufragan-Plouzané-Niort 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 this on-going surveillance system estimating the proportions of susceptibilities to relevant antibiotics of bacteria recovered from diseased animals treated by veterinarians as part of their regular clinical services. The RESAPATH is a key component of the strategic National Action Plans (NAPs) (EcoAntibio 1, 2012-2016; EcoAntibio 2: 2017-2021) adopted by the French Ministry of Agriculture, Food and Forest to combat AMR in animals. The RESAPATH is also part of the recent cross-sectorial "One Health" NAP against AMR in humans, animals and the environment adopted by the French Prime Minister on November 17, 2016. Finally, since AMR monitoring in diseased animals is part of the EU strategy to combat AMR globally, the long-term (> 35 years) expertise of ANSES in running the RESAPATH is at the origin of a proposal to ascertain the opportunity for the most appropriate system to report AMR data from diseased animals at EU level in a coordinated way. It has been recently initiated through the Joint Action on Antimicrobial Resistance and Healthcare-Associated Infections (EU-JAMRAI, 2017-2020) where ANSES co-leads Task 7.4.2 on this issue (see below).
The epidemiology of AMR is increasingly complex and we strongly believe that providing annual data of AMR trends in animal pathogens contributes to a comprehensive overview of AMR in veterinary medicine and is a key indicator to assess NAP efficacy in the non-human sector. 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.

Dr Jean-Yves MADEC, DVM, PhD
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On behalf of the RESAPATH

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ORGANISATION AND KEY FIGURES

The objectives of the RESAPATH are the following:

- To monitor AMR in bacteria isolated from diseased animals in France,
- To collect resistant isolates of particular interest and to characterize their genetic background (including the mechanisms of resistance),
- To provide scientific and technical support on antimicrobial susceptibility testing methods and result interpretation to member laboratories.

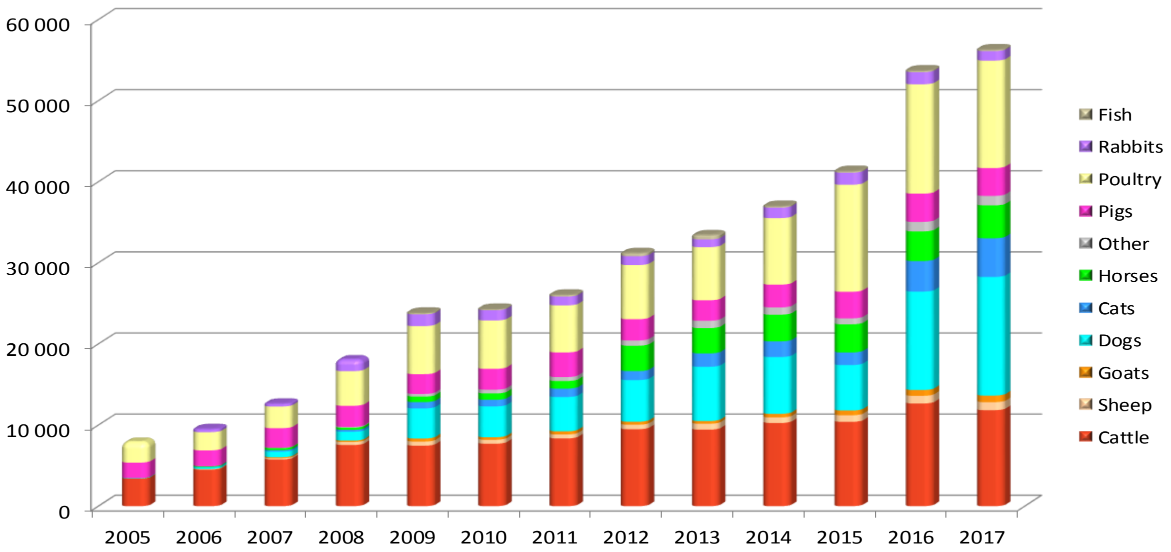
Bacteria recovered from diseased animals and sampled by veterinarians for diagnostic purposes as part of their routine activity are tested for antimicrobial susceptibility by private or public veterinary laboratories throughout France. Antibiograms are performed by disk diffusion according to the guidelines 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 section 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, the RESAPATH also allows the collection of isolates demonstrating AMR profiles of specific interest, which are then subject 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 the RESAPATH. In addition, annual training sessions, technical support, on-site training and other actions are also provided to the RESAPATH laboratories.

The RESAPATH is the unique veterinary member of the French National Observatory for Epidemiology of Bacterial Resistance to Antimicrobials (ONERBA), which encompasses 16 other surveillance networks throughout France, all in private or public medical practices (community or health-care centers). The 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 AMR burden of pathogenic bacteria but stand as a reliable indicator of AMR rates in field conditions. The major impact of the RESAPATH relies on its ability to detect the most resistant and emerging bacteria circulating in animals in France, to measure AMR trends in diseased animals in France (and thus assess NAP efficacy) and to highlight differences or commonalities of resistant bacterial isolates in the animal and human sectors through in-depth molecular and cross-sectorial studies carried out by ANSES in cooperation with National Reference Centers in human medicine.

In 2017, 71 laboratories were members of the RESAPATH and a total of 56,286 antibiograms were transmitted to ANSES, all animal species considered. 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*



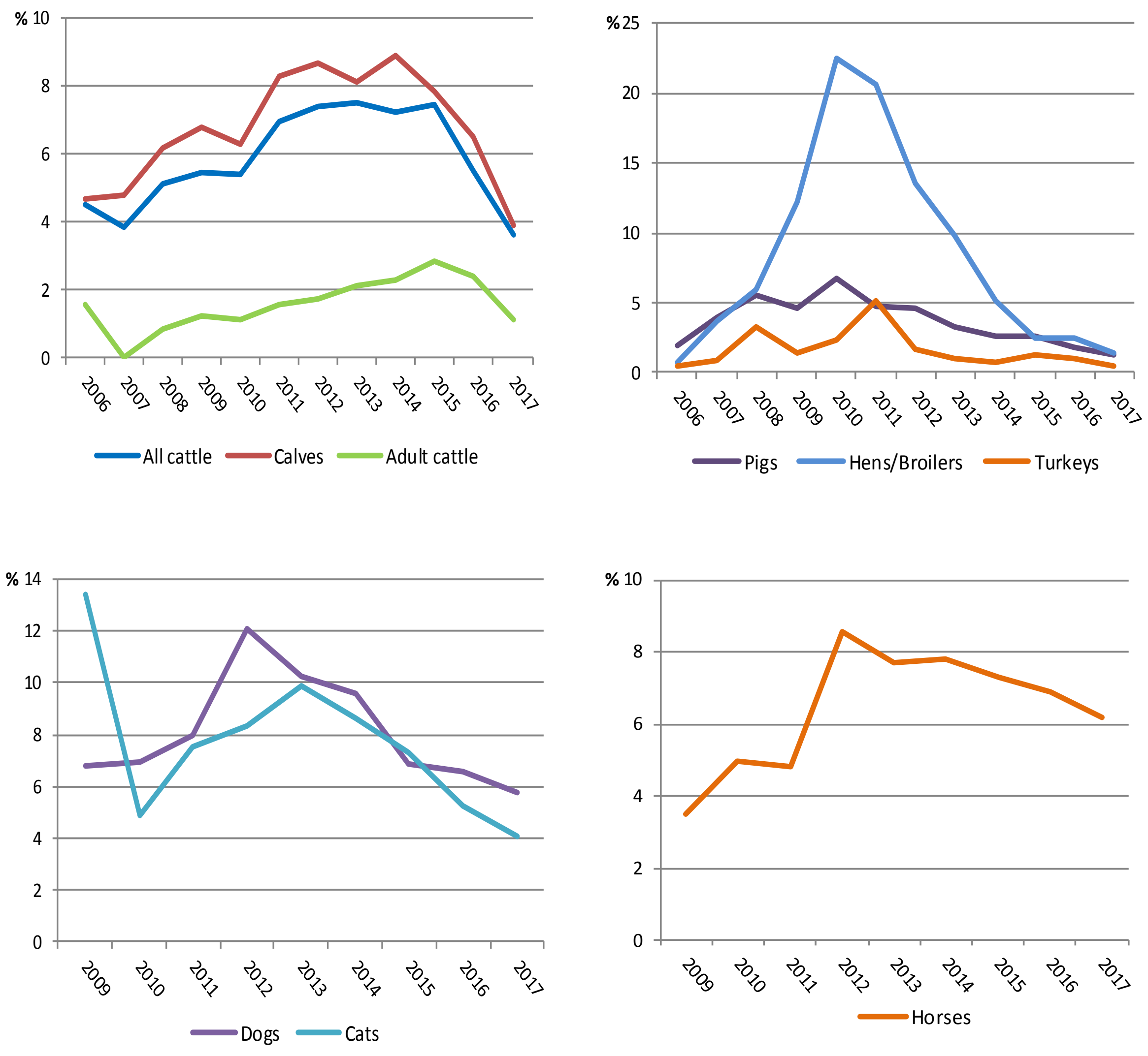
RESISTANCE DATA

This chapter summarizes the key results on AMR trends to the different antimicrobial classes, especially to extended-spectrum cephalosporins (ESCs) and fluoroquinolones (FQs) that are considered of critical importance both in human and veterinary medicines. Other important topics such as resistance trends to other antibiotics or on specific relevant phenotypes are also included. More detailed information on resistance levels per bacterial and animal species are available in annexes at the end of this report.

Resistance to extended-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 has been mainly observed in *Escherichia coli* and to a lesser extent in *Klebsiella pneumoniae* and *Enterobacter* spp. In 2017, the highest rate of resistance to ceftiofur in clinical *E. coli* isolates of animal origin in France was around 5-7%, and was found in dogs (5.8%) and horses (6.2%). Ceftiofur resistance in *E. coli* isolated from other animal species (poultry, pigs, adult cattle, turkeys, small ruminants) was below 2% and almost absent in rabbits.

***Figure 2**: Evolution of proportions of* E. coli *isolates non-susceptible (R+I) to ceftiofur in cattle, pigs, poultry, turkey, horses, cats and dogs (2006-2017)*



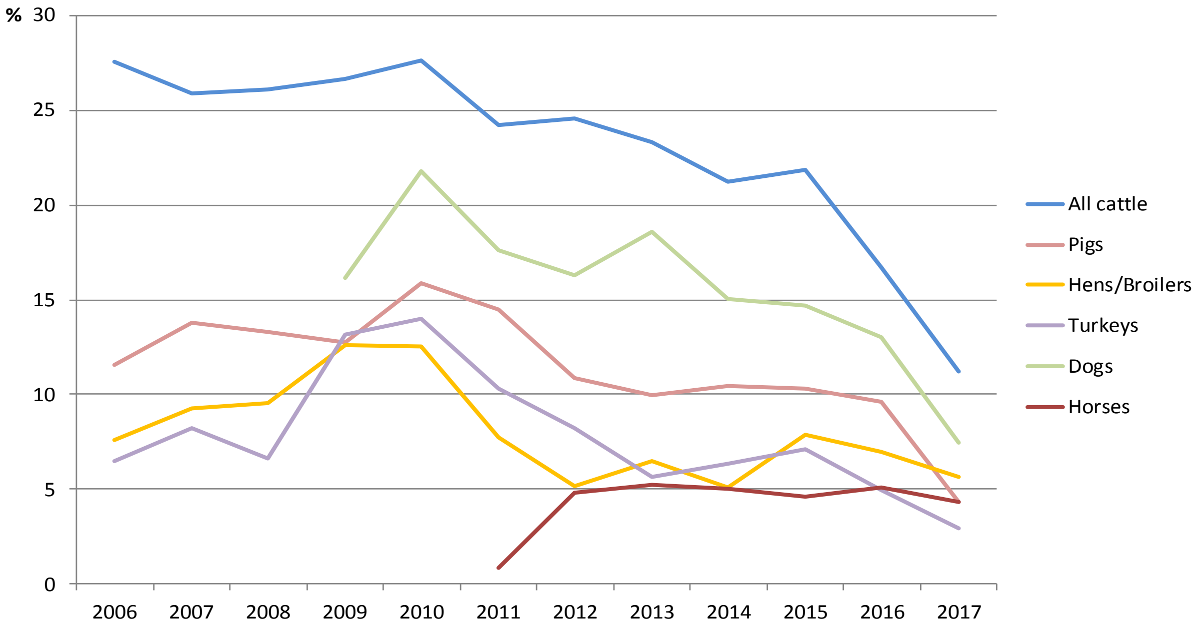
In broilers, resistance to ceftiofur in clinical *E. coli* isolates has been continuously decreasing from 22.5% in 2010 to less than 2% in 2017, and this ten-fold reduction in seven years is a major outcome (*Figure 2*). A similar decrease has been observed in diseased turkeys and pigs suggesting that the strategic NAP EcoAntibio had a positive impact on the ESCs resistance, and thus on limiting the spread of ESBL/AmpC-encoding genes, in those animal species. Also in companion animals (*Figure 2*), a decreasing trend has been observed over the last five years, suggesting that more responsible practices were not only considered in food animals but also in pets. Albeit less evident, a decrease was also observed in horses between 2014 and 2017.

Resistance to fluoroquinolones

Isolates are routinely tested for their susceptibility to enrofloxacin, marbofloxacin or danofloxacin. Other fluoroquinolones (FQs) 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* isolated from diseased animals was used as an indicator of resistance to FQs.

In 2017, cattle displayed the highest rate of FQ resistance in *E. coli* isolates from diseased animals (11.2%). A marked decrease in FQ resistance occurred that year for cattle, pigs and dogs. In broilers and turkeys, FQ resistance had mostly decreased during 2010-2013, and much less but still the following years for turkeys but not for hens/broilers. Overall, a continuous downward trend in FQ resistance has been observed over the last seven years in almost all animal species but horses where constant rates were still noted. Of note, FQ resistance rates in clinical *E. coli* are globally higher than ESCs resistance rates. This highlights that FQ resistance, even though rarely transmitted through mobile genetic elements such as those bearing ESBL/AmpC-encoding genes, should be considered a major issue to be 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 (2006-2017)*



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 ESCs and FQs that have been studied separately). Seven antibiotics (five 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 analyzed over the 2006-2017 period in cattle, pigs, hens/broilers and turkeys.

The global decreasing trend identified in the previous years was still observed in 2017. Despite a slight increase in 2015, resistance levels decreased in 2016 and continued to decrease in 2017 for nearly all animal species and antimicrobials.

In cattle, the decline in resistance levels observed in 2016 continued in 2017 for almost all antibiotics considered except for spectinomycin (or streptomycin) and trimethoprim-sulfonamides which slightly increased (*Figure 4*). In pigs, resistance to amoxicillin and to the combination amoxicillin-clavulanic acid slightly increased since 2015 and resistance to spectinomycin (or streptomycin) increased in 2017 once again after a decline in 2016 and reached a level of resistance close to 2015. Resistances to other antibiotics slightly decreased (gentamicin and trimethoprim-sulfonamides) or significantly decreased (tetracycline and quinolones) (*Figure 5*).

Unlike 2016, resistance rates in poultry decreased in 2017 for all antimicrobials (*Figure 6*). Considering the trend since 2006, the decrease was significant for all antimicrobials studied except for quinolones (stable trend). In turkeys (*Figure 7*), all resistance levels decreased except for spectinomycin (or streptomycin) which showed a slight increase.

***Figure 4**: Evolution of proportions (%) of* E. coli *isolates non-susceptible (R+I) to seven antimicrobials in cattle (2006-2017)*

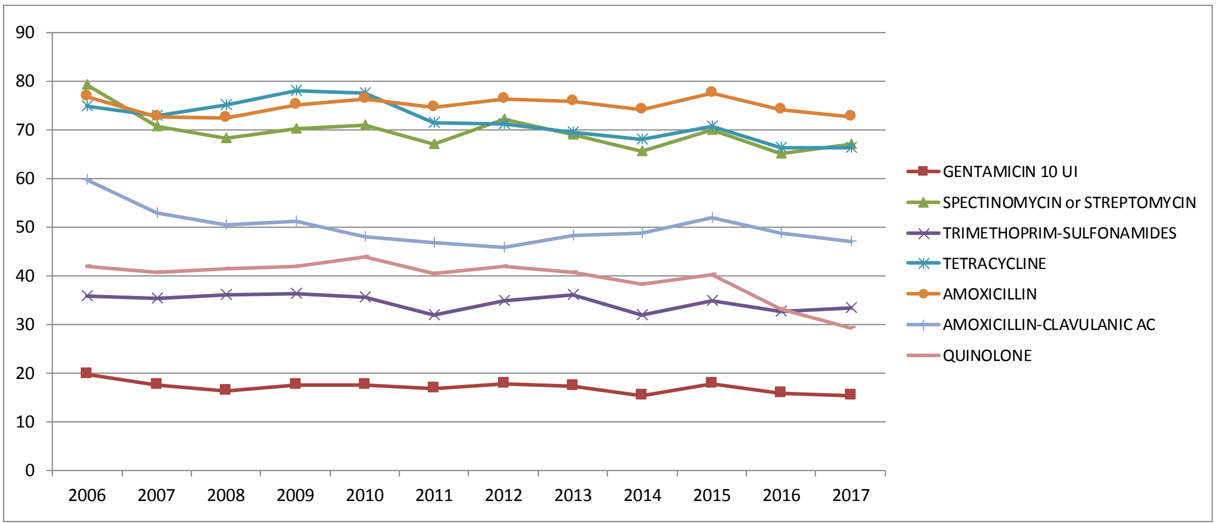


***Figure 5**: Evolution of proportions (%) of* E. coli *isolates non-susceptible (R+I) to seven antimicrobial in pigs (2006-2017)*

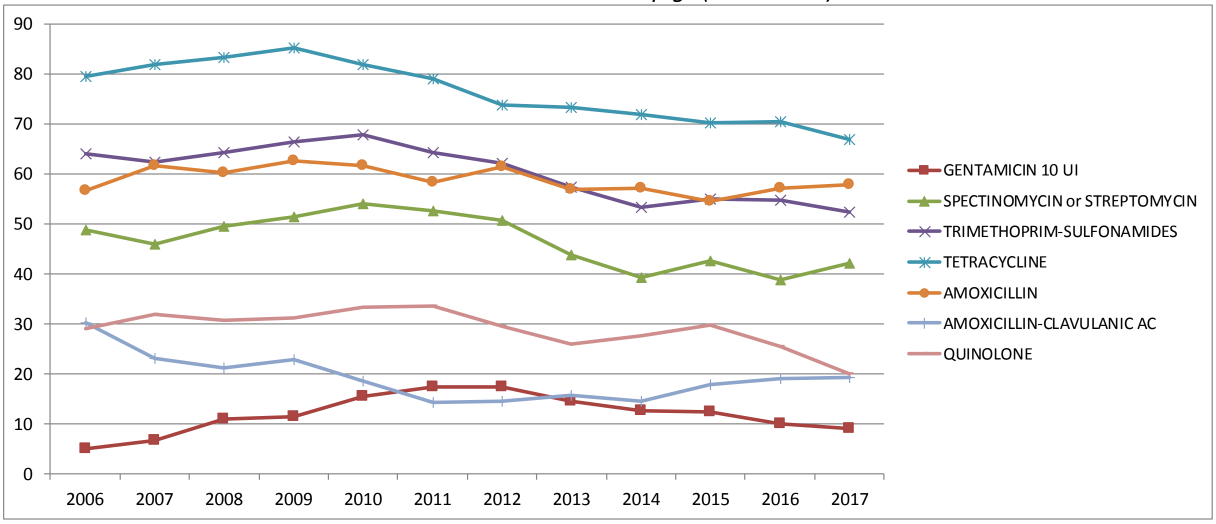


***Figure 6**: Evolution of proportions (%) of* E. coli *isolates non-susceptible (R+I) to seven antimicrobials in hens and broilers (2006-2017)*

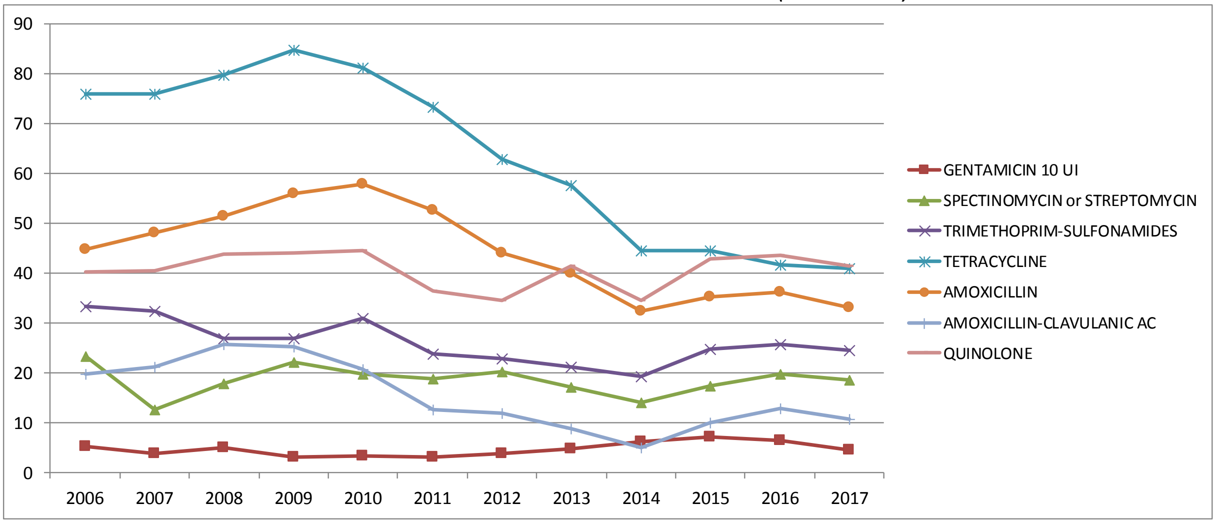
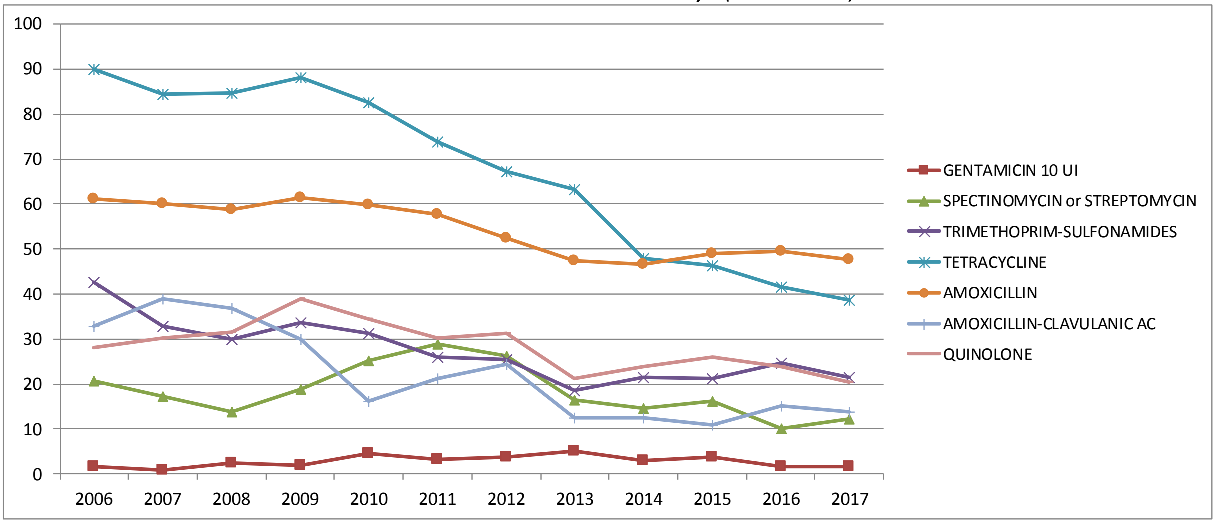


***Figure 7**: Evolution of proportions (%) of* E. coli *isolates non-susceptible (R+I) to seven antimicrobials in turkeys (2006-2017)*



Multidrug resistance

Multidrug resistance (MDR) was investigated in *E. coli*, the most frequent bacterial species isolated in the RESAPATH. MDR is defined as resistance to at least three different classes of antimicrobials out of the five tested. The selective criteria used to select antimicrobials analyzed here were: *i)* relevance in veterinary and human medicine; *ii)* a single antimicrobial per class (as resistance mechanisms within a class, with the exception of aminoglycosides, 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.

Food-producing animals (cattle, pigs, poultry)

The proportion of isolates without resistance to the five antimicrobials is still very variable among production species. The lowest proportion is documented in pigs (22%) and the highest in poultry (46.5% in hens and broilers and 56.6% in turkeys) *(Table 1)***.** Between 2011 and 2017, the proportion of isolates susceptible to the five antimicrobials increased slightly but significantly in cattle and pigs, and doubled in poultry sectors (Chi², p<0.0001) *(Figure 8)*. The proportion of MDR isolates is highest in cattle (17.2%) and to a lesser extent in pigs (8.6%). It is much lower in poultry (4.9% in hens/broilers and 2% in turkeys). Over the 2011-2017 period, the proportion of MDR isolates decreased significantly in all these production species (trend Chi², p <0.0001) *(Figure 9).*

Horses

For horses, the proportion of isolates that is susceptible to all the antimicrobials considered is high (60.6%), but contrary to all other species, this proportion decreased significantly between 2011 and 2017 (Chi², p=0.003) *(Table 1, Figure 8)*. The proportion of isolates with only one or two resistances is less frequent than for food-producing animals. The proportion of *E. coli* MDR has increased very slightly over the past three years (8.6% in 2015 and 9.4% in 2017) *(Figure 9)*.

Dogs

The proportion of susceptible isolates in dogs (72.7% in 2017) significantly increased over the 2013-2017 period. On the contrary, the proportion of MDR isolates (5.4% in 2017) significantly decreased over the same period (Chi², p<0.0001) *(Table 1, Figure 8 and 9).*

Table 1: *Proportions (in %) of resistant* E. coli *isolates (R + I) according to the number of resistances identified among a list of five antimicrobials in 2017*

Number of resistance(s) (R + I)	Proportion of isolates (%)					
	Cattle (n= 5,696)	Pigs (n= 1,220)	Hens/Broilers (n= 3,416)	Turkeys (n= 896)	Horses (n= 541)	Dogs (n= 2,424)
0	27.4	22.0	46.5	56.6	60.6	72.7
1	37.1	32.5	30.5	26.6	19.4	16.1
2	18.2	36.9	18.0	14.8	10.5	5.9
3	12.3	7.6	4.6	1.9	3.7	3.7
4	4.1	1.0	0.4	0.1	4.4	1.2
5	0.9	0.0	0.0	0.0	1.3	0.5
MDR	17.2	8.6	4.9	2.0	9.4	5.4

The results obtained are positive as they show a decrease of MDR over the period 2011-2017 for all animal species. However, the situation remains complex concerning resistance associations such as the joint resistances to critically important antimicrobials. For example, ceftiofur-resistant isolates often have higher proportions of co-resistances than those observed for non-ceftiofur resistant isolates. In cattle, 86% of ceftiofur-resistant isolates were also resistant to tetracyclines and 36% to FQs whereas these proportions are of 67% and 11% for the global sample, respectively. These differences are true for all species and significant for cattle, horses and dogs (Chi2 p<0.001).

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

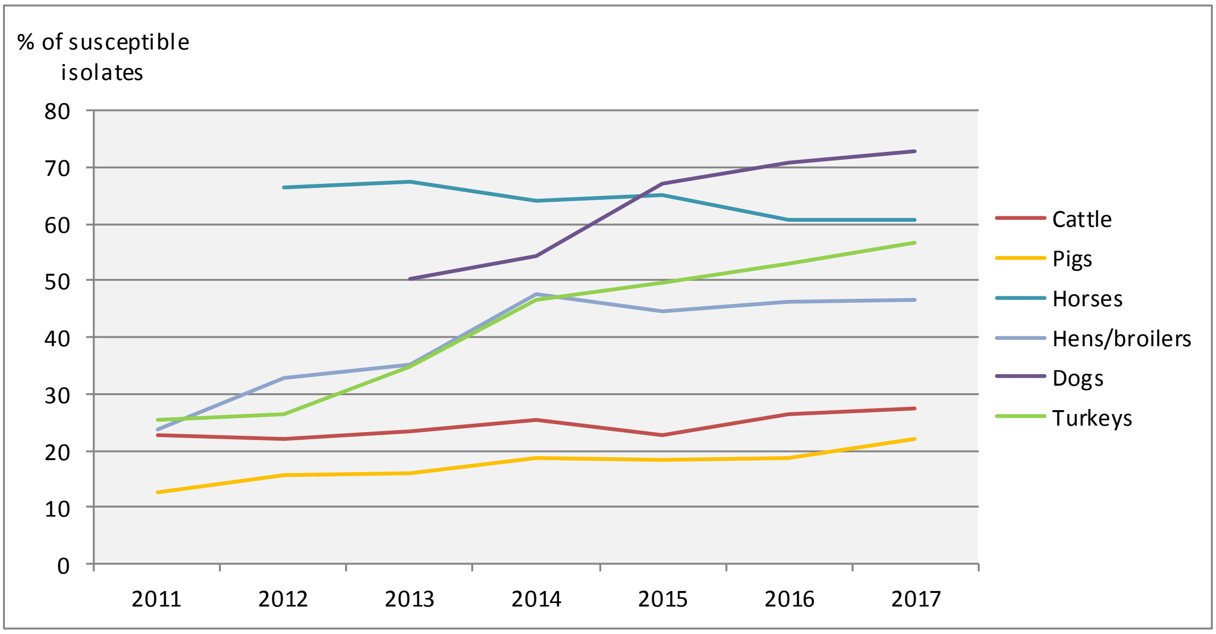
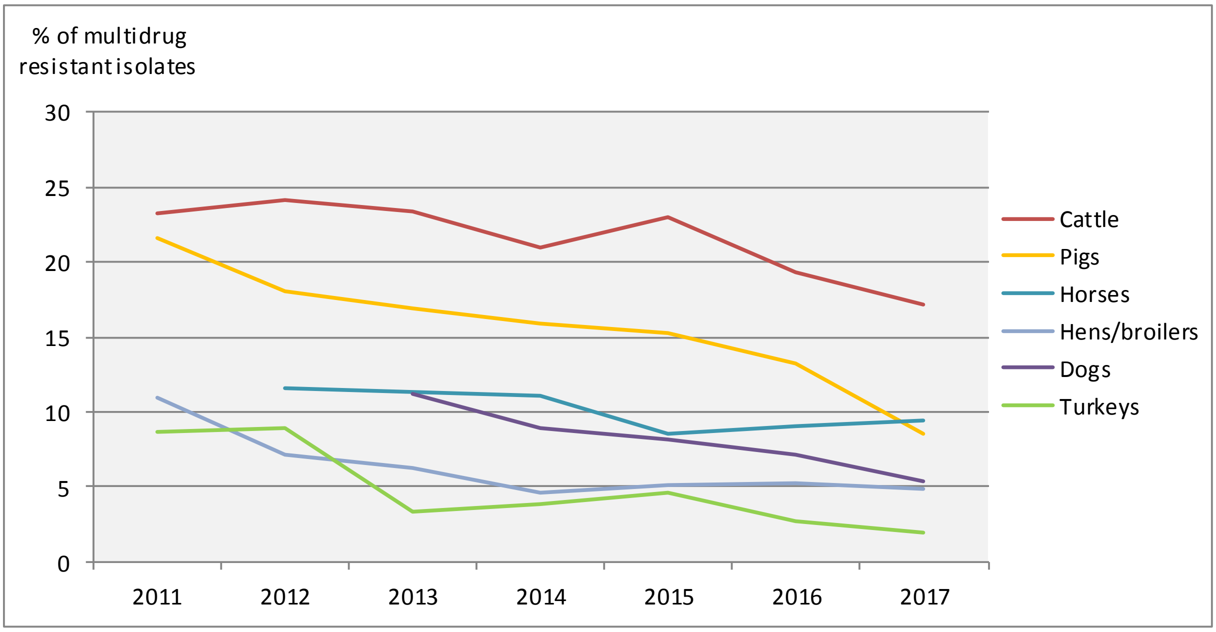


Figure 9**: Evolution of proportions (%) of **multidrug resistant E. coli *isolates (resistant to at least three out of the five antimicrobials considered) in the different animal species*



Colistin resistance in veterinary medicine

Since the renewed interest for colistin in human medicine in case of therapeutic failures, notably to treat carbapenem-resistant Enterobacteriaceae, its use in veterinary medicine has been questioned by different institutions (European Medicine Agency[1,2], ANSES[3], European Commission[4]). However, colistin use in veterinary medicine has only been seriously challenged since the description of the first plasmid-borne colistin-resistance gene *mcr-1* in China, 2015. Today, the *mcr* family has expanded and is now counting eight members, some of which encompassing several variants. In France, only *mcr-3* was identified beside *mcr-1*. This *mcr-3* gene was detected in the bovine sector associated to an epidemic burst and was always co-expressed with the particular CTX-M-55 enzyme. Of note, non-transmissible molecular mechanisms have also been described, such as *mgrB* mutations in *Klebsiella pneumoniae*, and the first veterinary isolate presenting an *mgrB* mutation originated from a French bovine mastitis.[5]

In France, the *mcr-1* gene of animal origin has been described first in *Salmonella*[6], and then in *E. coli* from bovines (21% of ESBL-producing *E. coli* co-carried the *mcr-1* gene) or swines, where 70 *mcr-1* positive *E. coli* were detected among 79 colistin-resistant isolates collected between 2009 and 2013.[7] *E. coli* with *mcr-1* gene were also reported from animals at slaughter (turkeys, broilers and pigs) in 2 to 6% of fecal samples plated on agar without colistin supplementation.[8] Interestingly, while colistin use was decreasing, the proportion of ESBL-producing *E. coli* co-harboring the *mcr-1* gene was increasing, suggesting complex factors for the selection of colistin resistance.[9] In 2017, the Ministry of the Agriculture launched the EcoAntibio 2 plan which includes a specific point (action 12, axis 2) entirely dedicated to colistin, with the objective of reducing its use by half over five years in poultry, swine and cattle.

To determine the MIC to colistin, microdilution assay is the only recommended method.[10] This method is not well-adapted to the routine work of French veterinary laboratories still using disc diffusion, a method which is not entirely reliable for detecting colistin resistance in a clinical perspective. Nevertheless, since biases were *a priori* constant, the evolution of the resistance over the years is considered reliable from an epidemiological perspective. Moreover, according to 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 <15 mm or ≥18 mm 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.

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1 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

2 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.

3 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.

4 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)

5 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. http://www.ncbi.nlm.nih.gov/pubmed/25428921

6 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 Infectious Diseases,* 16**,** 144-145. doi: 10.1016/S1473-3099(15)00538-1.

7 Delannoy S., Le Devendec L., Jouy E., Fach P., Drider D., Kempf I. (2017). Characterization of colistin-resistant *Escherichia coli* isolated from diseased pigs in France. Frontiers in Microbiology, 8, 2278. doi: 10.3389/fmicb.2017.02278.

8 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 surveillance,* 21. doi: 10.2807/1560-7917.ES.2016.21.6.30135.

9 Haenni M., Metayer V., Gay E., and Madec J.-Y. (2016). Increasing trends in *mcr-1* prevalence among extended-spectrum-beta-lactamase-producing *Escherichia coli* isolates from French calves despite decreasing exposure to colistin. *Antimicrobial Agents Chemotherapy* 60**,** 6433-6434. doi: 10.1128/AAC.01147-16.

10 CLSI-EUCAST (2016). Polymyxin Breakpoints Working Group. Recommendations for MIC determination of colistin (polymyxin E). URL: http://www.eucast.org/fileadmin/src/media/PDFs/EUCAST_files/General_documents/Recommendations_for_MIC_determination_of_colistin_March_2016.pdf

During 2017, some diagnostic laboratories involved in RESAPATH performed, in parallel to the disk diffusion method, an alternative test called "Colispot".[11] This liquid diffusion method, previously developed in ANSES laboratories, has a perfect agreement with MICs obtained by microdilution method for 197 *E. coli*.[12] The data provided by diagnostic laboratories in routine conditions confirms the very good correlation between an inhibition zone diameter ≥18 mm and the susceptibility to colistin. Indeed, from 2,131 *E. coli* susceptible to colistin using disk diffusion, only three (0.1%) were resistant by liquid diffusion. From 94 *E. coli* not interpretable (inhibition zone diameters of 15, 16 or 17 mm) the liquid diffusion results indicated a susceptibility for 66 strains (70.2%) and a resistance for the 28 others (29.8%). Finally, six *E. coli* with an inhibition zone diameter <15 mm were also classified resistant using liquid diffusion method.

The evolution of the proportions of the different diameters was observed between 2003 and 2017 (*Figures 10 to 14*) and a Chi² test for trend was performed on diameters ≥ 18mm. Susceptible isolates are on a continuous and significant increasing trend in all animal species albeit with various dynamics (*Figure 10 and 14*). Overall, these data suggest that the spread of colistin-resistant *E. coli* that are pathogenic for animals is under control in France.

***Figure 10**: 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 (2,011))*

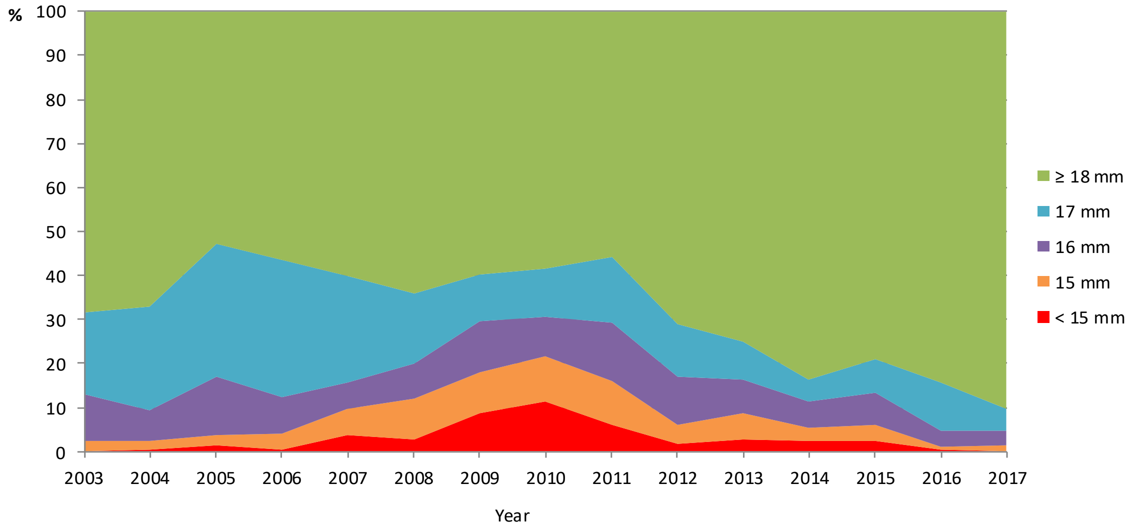
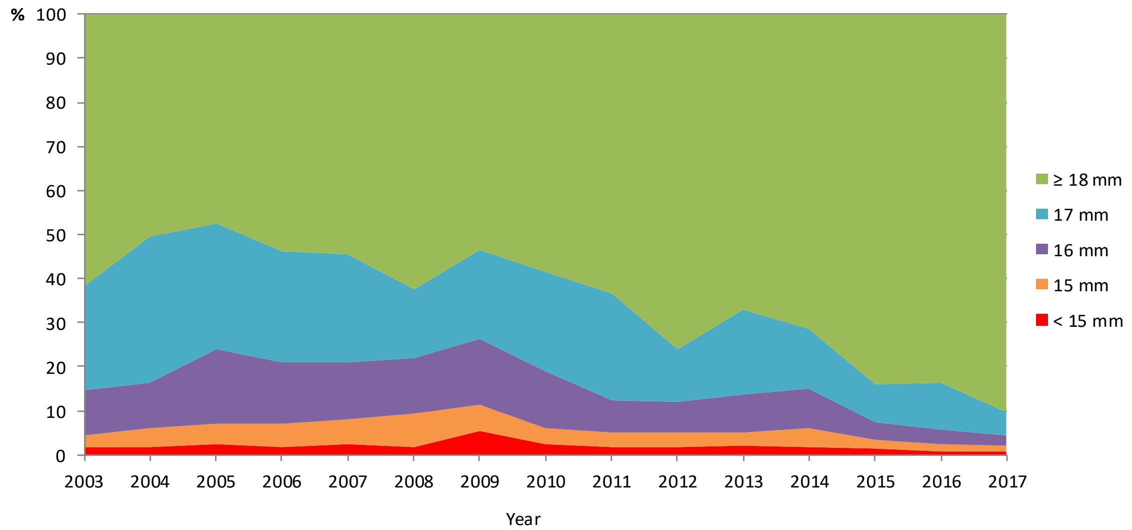


***Figure 11**: Relative proportion of diameters < 15 mm, 15 mm, 16 mm, 17 mm and ≥ 18 mm around the colistin disc (50 µg) for* E. coli *isolated from **digestive pathologies in veal calves** (n min.: 1,139 (2003); n max.: 4,219 (2016))*



11 Jouy E., Haenni M., Le Devendec L., Le Roux A., Châtre P., Madec J.Y., Kempf I. (2017). Improvement in routine detection of colistin resistance in *E. coli* isolated in veterinary diagnostic laboratories. *Journal of Microbiological Methods*, 132:125-127.

12 Anses (2018). French surveillance network for antimicrobial resistance in pathogenic bacteria of animal origin. 2016 Annual Report. (https://resapath.anses.fr/resapath_uploadfiles/files/Documents/2016_RESAPATH%20Rapport%20Annuel_GB.pdf).

***Figure 12**: 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.: 1,193 (2016))*

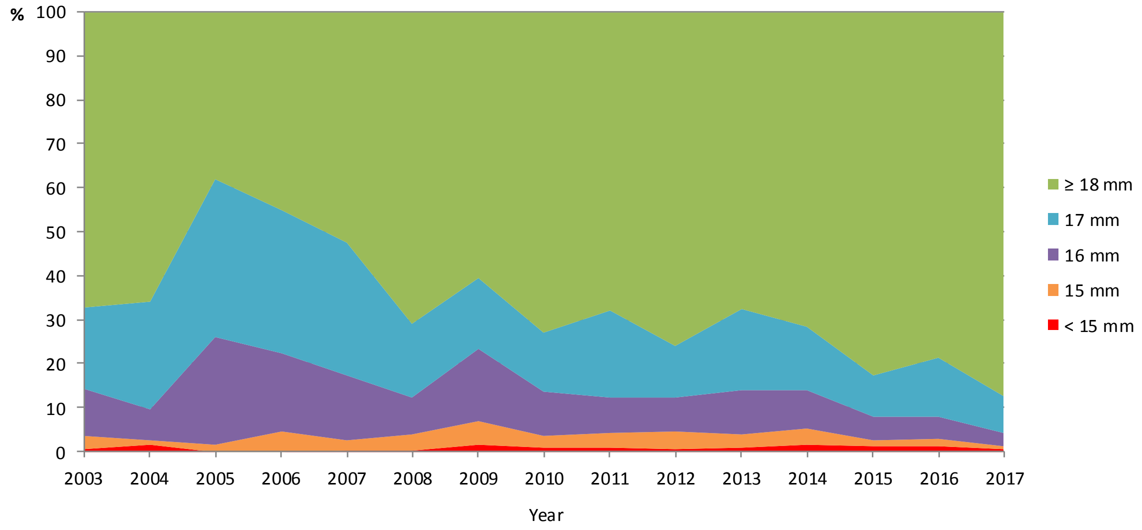


***Figure 13**: Relative proportion of diameters < 15 mm, 15 mm, 16 mm, 17 mm and ≥ 18 mm around the colistin disc (50 µg) for* E. coli *isolated from **turkey** (n min.: 862 (2013); n max.: 2,220 (2015))*

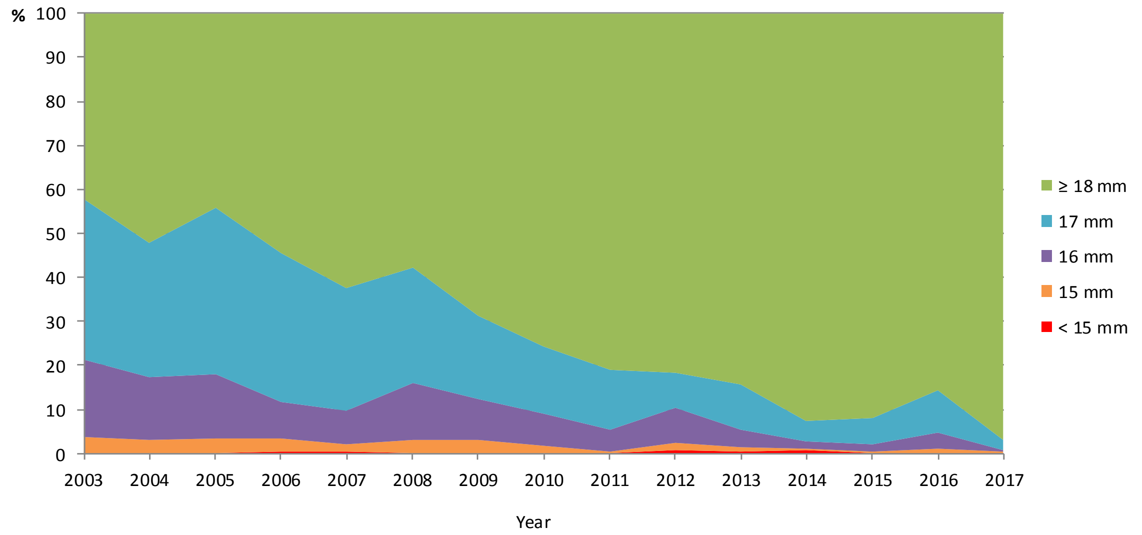
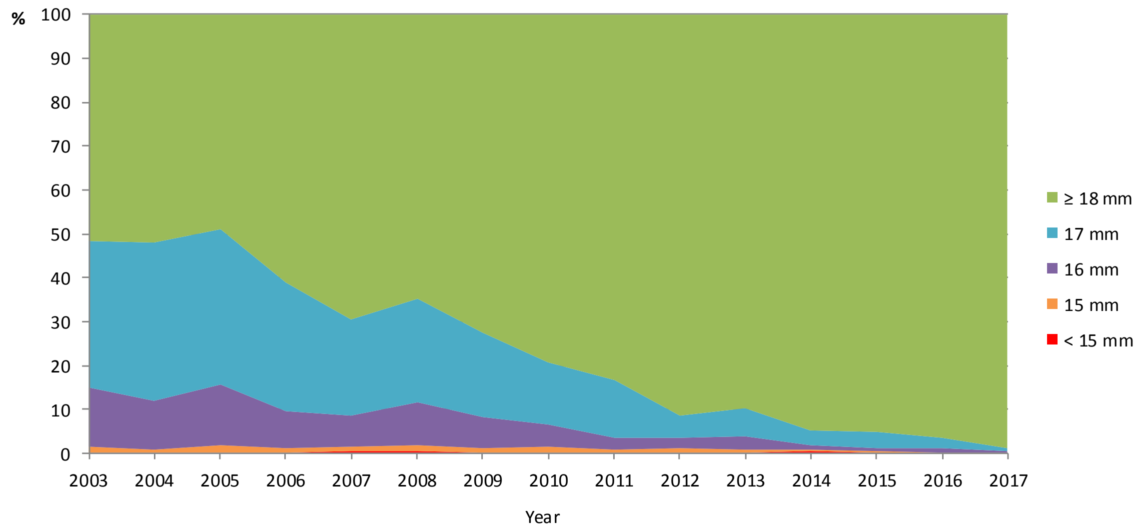


***Figure 14**: Relative proportion of diameters < 15 mm, 15 mm, 16 mm, 17 mm and ≥ 18 mm around the colistin disc (50 µg) for* E. coli *isolated from **hens and broilers** (n min.: 559 (2004); n max.: 7,008 (2017))*



Representativeness and coverage of the Resapath

The quality of a surveillance network raises the question about the representativeness of the surveillance data collected. A study was conducted for the year 2015 in order to appreciate if the RESAPATH covered a sufficient and representative proportion of antimicrobial susceptibility testing (AST) carried out in France in veterinary medicine.[13]

In total, 112 veterinary laboratories carrying out AST were identified in France. Among these laboratories, 74 were members of the RESAPATH and 38 were not. The estimated proportion of AST carried out in veterinary medicine and collected by the RESAPATH in 2015 was very high in pigs (90%), but lower in equids (60%) and poultry (62%) (*Table 2*). The lowest estimate was for dogs and cats (50%).

Table 2. *Number of antimicrobial susceptibility testing performed by the RESAPATH member laboratories and by non-member veterinary laboratories in 2015*

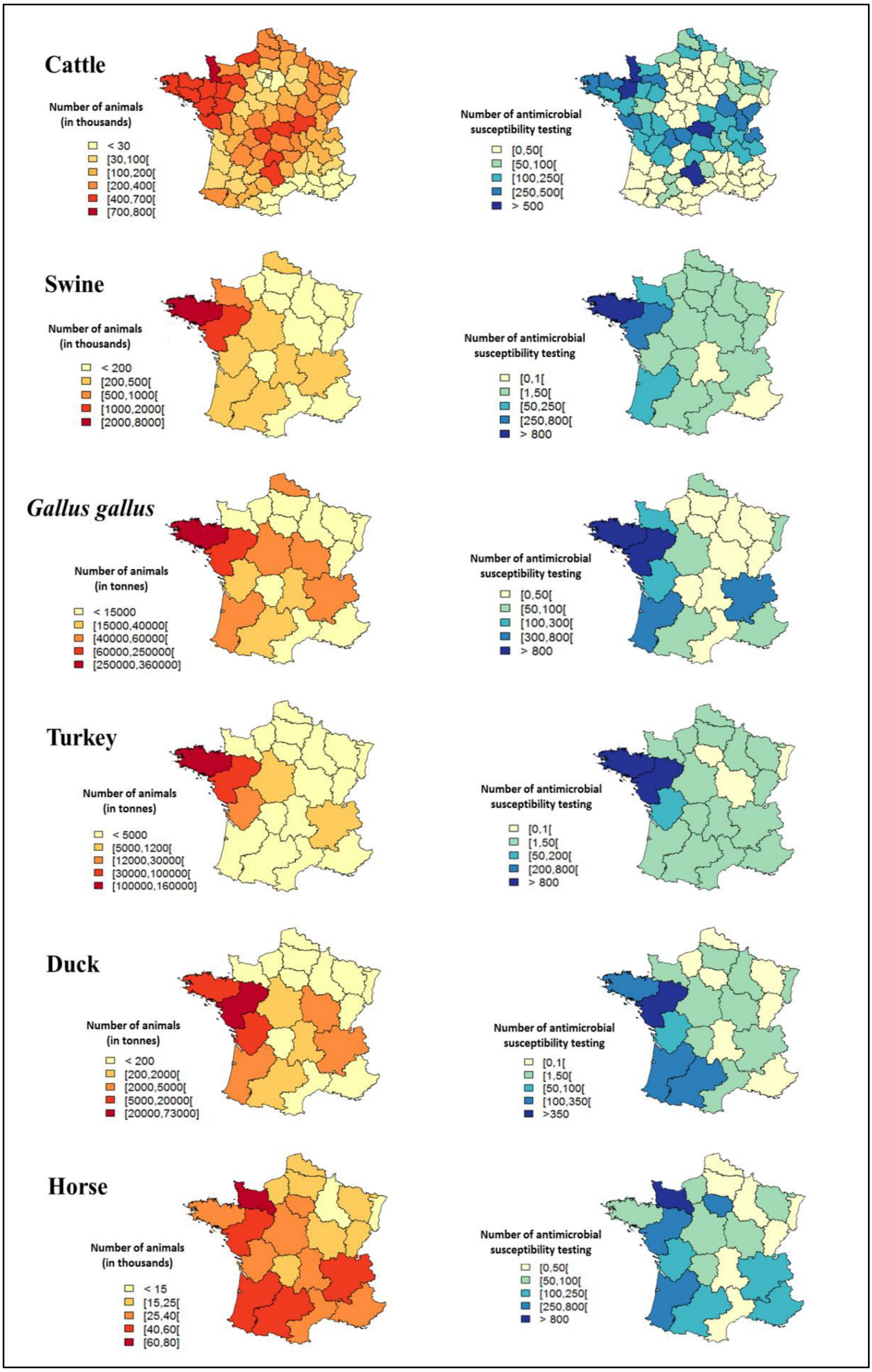
Antimicrobial susceptibility testing	Number of antimicrobial susceptibility testing performed (proportion, in %)							
	Bovine	Swine	Poultry	Equine	Dog-Cat	Ovine-Caprine	Other animals	*Total*
Collected by the Resapath	10,402 (70)	3,309 (90)	13,210 (62)	3,480 (60)	9,733 (50)	1,407 (70)	2,431 (67)	*43,972 (62)*
No collected by the Resapath	4,534 (30)	361 (10)	8,072 (38)	2,291 (40)	9,557 (50)	588 (30)	1,190 (33)	*26,593 (38)*
Total	*14,936*	*3,670*	*21,282*	*5,771*	*19,290*	*1,995*	*3,621*	*70,565*

The geographical coverage of the RESAPATH (geographical distribution of the AST collected by animal species by the network) was compared with the distribution of the animal populations to assess the geographical representativeness of the surveillance network (*Figure 15*). The geographical coverage of the RESAPATH was very satisfactory for cattle and swine. In the equine and poultry sectors, coverage was satisfactory despite an under-representation in some regions. For dogs and cats (map not presented for reasons of confidentiality), representativeness was also good, despite an overrepresentation in the South-East of France and the Paris region.

This is the first study exploring the representativeness and coverage of the RESAPATH. This study based on data from 2015 showed that the RESAPATH collected at least half of the AST performed in France (all sectors considered) and that the surveillance coverage was satisfactory. This study should be reiterated on a regular basis to characterize the coverage of the RESAPATH in a changing social and legal context, which may encourage the development of new laboratories or lead existing laboratories to specialize (segmentation of activities) or to merge activities.

[13] Boireau C., Jarrige N., Cazeau G., Jouy E., Haenni M., Philippon C., Calavas D., Madec J.Y., Leblond A. Gay E. (2018) Représentativité et couverture du Résapath, le réseau d'épidémiosurveillance de l'antibiorésistance des bactéries pathogènes animales. *Bulletin Epidémiologique, santé* animale - alimentation, 82(4).

Figure 15: *Number of animals and number of antimicrobial susceptibility testing collected by the RESAPATH in 2015, by animal sector and by administrative area (department or region)*



Emergence of CTX-M-55: a new Trojan horse?

Plasmid-encoded Extended-Spectrum Beta-Lactamases (ESBLs) of the CTX-M-type emerged in the 2000s and have had a major epidemiological success. Numerous variants have been described, differing in their geographical origin and host range. For example, CTX-M-1 is widespread in animals in France whereas CTX-M-15 are more confined to humans. In Asia, CTX-M-55 was first described in 2007 and is now the most frequently identified ESBL enzyme in human clinical settings. The $bla_{CTX-M-55}$ gene is located on plasmids frequently co-localizing other resistance genes, such as *fosA3* and *rmtB* (coding for fosfomycin and pan-aminoglycosides resistance, respectively).

In France, both fosfomycin and pan-aminoglycosides resistances are very rare in animals, since only two *rmtB*-, one *fosA3*- and one *fosA4*-positive isolates have been collected from bovines through the RESAPATH network, so far.[14] Molecular characterization of these isolates proved the presence of the $bla_{CTX-M-55}$ gene. Interestingly, the colistin-resistance *mcr-3* variant was also systematically associated with the $bla_{CTX-M-55}$ gene.[15] However, no obvious link with Asian countries was evidenced. The proportion of CTX-M-55-producing *E. coli* has been increasing for a few years in France. Even though they are mostly not associated with any uncommon resistance determinants, the recent findings exposed here will prompt us to track this gene and characterize CTX-M-55-producing clones in order to detect any potential emergence of new resistance genes on the French territory.

Stenotrophomonas maltophilia: are animal isolates responsible for human infections?

Stenotrophomonas maltophilia has an environmental reservoir, but is also an opportunistic pathogen for humans and animals, principally horses. *S. maltophilia* presents numerous intrinsic resistances (including beta-lactams, aminoglycosides, tetracyclines and trimethoprim) which complicate any antibiotic treatment.

S. maltophilia is commonly classified in phylogenetic groups, called genogroups, differing according to their virulence patterns. Human isolates mostly belong to the genogroup 6, and more rarely to the genogroup 2. To determine the genogroup of isolates of animal origin, 61 *S. maltophilia* collected through the RESAPATH network from diseased animals (including 57 horses) were studied. Molecular analyses revealed that these isolates mainly belonged to genogroup 2 and 6 (similarly to human isolates), but also to genogroup 5 and 9 which did not comprise human isolates. The identification of isolates from either human or animal origin in the same genogroup may suggest transmission events, regardless of the direction of this transmission. The role of animals in the epidemiology of multi-resistant human *S. maltophilia* remains to be evaluated through larger studies based on whole-genome data of human, animal and environmental isolates.

14 Lupo A., Saras E., Madec J.Y., and Haenni M. (2018). Emergence of *bla*CTX-M-55 associated with f*osA*, *rmtB* and *mcr* gene variants in *Escherichia coli* from various animal species in France. *Journal of Antimicrobial Chemotherapy*, 73: 867-872.

15 Haenni M., Beyrouthy R., Lupo A., Chatre P., Madec J.Y., and Bonnet R. (2018). Epidemic spread of *Escherichia coli* ST744 isolates carrying *mcr-3* and blaCTX-M-55 in cattle in France. *Journal of Antimicrobial Chemotherapy,* 73: 533-536.

Is $\mathit{bla}_{\text{CTX-M-1}}$ riding the same plasmid in France and Sweden?

Extended-Spectrum Beta-Lactamases (ESBLs) in animals are mainly encoded by the $\mathit{bla}_{\text{CTX-M-1}}$ gene, which is often located on widely disseminated plasmids, such as IncI1. A European study showed a divergent epidemiology of plasmids carrying $\mathit{bla}_{\text{CTX-M-1}}$ genes identified in *Escherichia coli* from horses, which mostly consisted in IncHI1 plasmids. To corroborate this specific epidemiology, a study was performed on horses from France and Sweden. Between 2009 and 2014, 74 ESBL-producing *E. coli* were collected from diseased horses, through the RESAPATH network for the French isolates. Clonal dissemination of CTX-M-1-producing *E. coli* was observed in different regions of a country and over several years. Sequence Types (ST)10, ST641 and ST1730 (a close variant of the ST641) were identified in France and Sweden, and these STs have also been reported in the Netherlands suggesting a common source of contamination.
The $\mathit{bla}_{\text{CTX-M-1}}$ gene was identified in 80% of the isolates, predominantly located on IncHI1 plasmids. Molecular sub-typing of these IncHI1 plasmids revealed a divergence between the two countries, with the plasmid sub-type pST2 present in Sweden, whereas the pST9 circulated in France. Interestingly, such wide dissemination of the IncHI1 plasmid may be related to specific digestive processes and metabolic pathways that could favor its circulation and adaptation to horses. However, further large-scale and European-wide studies are needed to explore this hypothesis.

Designing a future European antimicrobial resistance surveillance network in bacteria from diseased animals

In September 2017, a European Union Joint Action on Antimicrobial Resistance and Healthcare Associated Infections (EU-JAMRAI) was launched. Its general objective is to provide concrete recommendations to policy makers to have a European strategy to tackle the threat of AMR and healthcare associated infections, inspired by the One Health approach. ANSES is leading one of its tasks which studies the feasibility of a European surveillance system of AMR in diseased animals. With this purpose, a work team of about 25 epidemiologists, microbiologists, veterinarians, doctors, biostatisticians and data managers from nine European countries (Sweden, Norway, Denmark, Belgium, Czech Republic, Spain, Italy, Greece and France) was composed. Our work steps are to assess existing surveillance systems of AMR in diseased animals (like the Resapath), analyze surveillance needs, identify the best strategies to coordinate national systems and finally design the most feasible and relevant surveillance network for the European region. This project is a real challenge as many countries do not have such surveillance systems at the national level and existing systems are highly diverse regarding their objectives, combinations of animal species / bacterial species / sample types / antimicrobials under surveillance, laboratory standards, sampling schemes, epidemiological data collected, molecular analyses, data management and level of integration with other surveillance programs of AMR and antimicrobial consumption in animals and humans. The project will last until August 2020.

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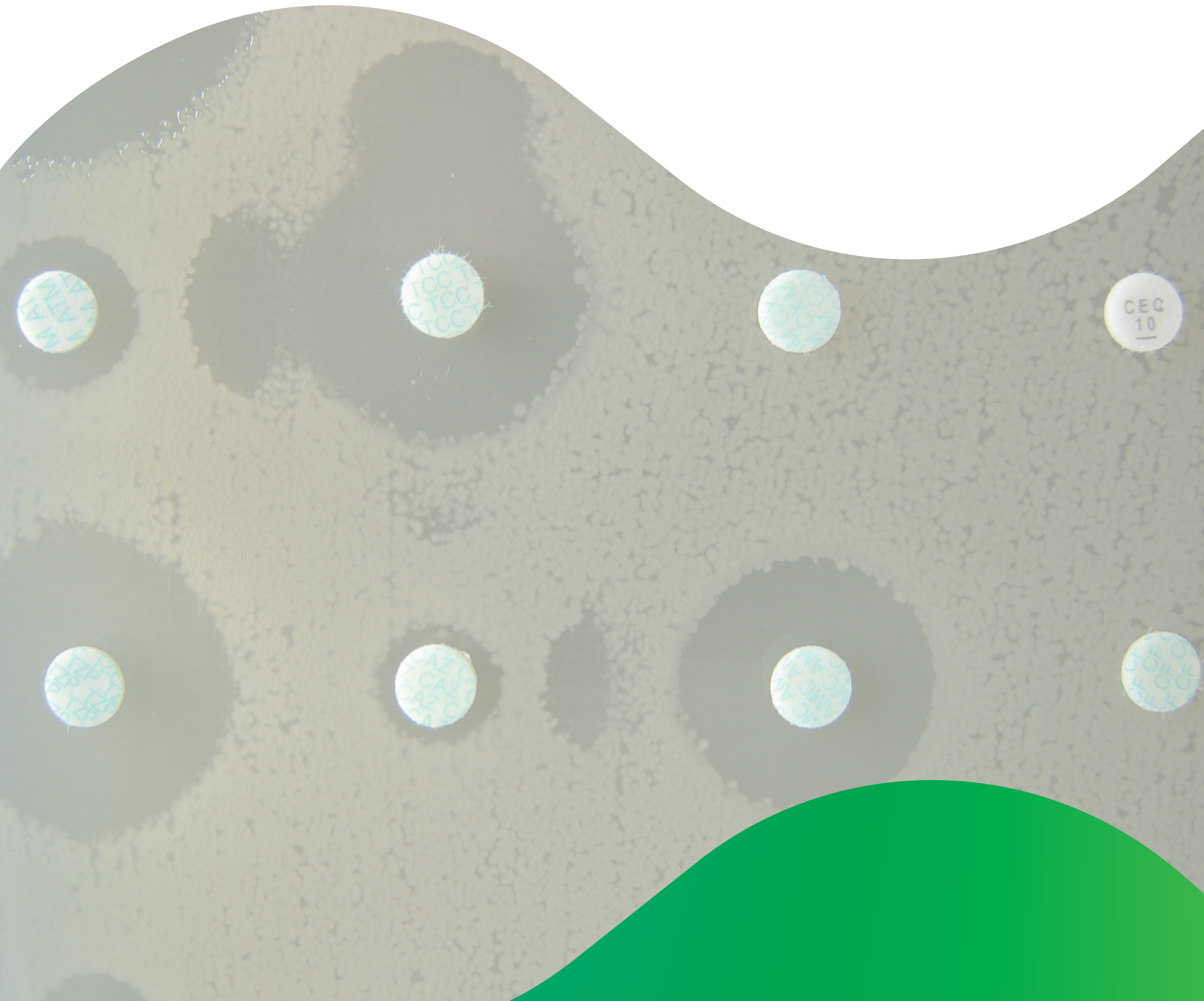
Annex 1

List of the RESAPATH laboratories



Laboratories members

Laboratoire Départemental d'Analyses - BOURG EN BRESSE (01)
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)
Laboratoire Départemental d'Analyses – BOURGES (18)
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)
Laboratoire Vétérinaire Départemental - BESANCON (25)
LBAA - BOURG DE PEAGE (26)
ALCYON - LANDERNEAU (29)
LABOCEA Quimper - QUIMPER (29)
Laboratoire Départemental d'Analyses - NIMES (30)
Laboratoire Guilhem Meynaud - SAINT JEAN (31)
SOCSA Analyse - L'UNION (31)
Laboratoire Départemental Vétérinaire et des Eaux - AUCH (32)
BIOLAB 33 - LE HAILLAN (33)
Laboratoire Départemental Vétérinaire - MONTPELLIER (34)
Bio-Chêne Vert - CHATEAUBOURG (35)
Biovilaine - REDON (35)
LABOCEA- FOUGERES (35)
Laboratoire de Touraine - TOURS (37)
Laboratoire Vétérinaire Départemental - GRENOBLE (38)
Laboratoire Départemental d'Analyses - POLIGNY (39)
Laboratoire des Pyrénées et des Landes - MONT-DE-MARSAN (40)
Laboratoire TERANA LOIRE- MONTBRISON (42)
Bactériologie clinique ONIRIS - NANTES (44)
INOVALYS Nantes - NANTES (44)
Laboratoire Départemental d'Analyses - MENDE (48)
INOVALYS Angers - ANGERS (49)
Laboratoire HGRTS Pays de Loire - MAUGES SUR LOIRE (49)
LABEO Manche - SAINT LO (50)
Laboratoire Départemental d'Analyses - CHAUMONT (52)
Laboratoire Vétérinaire Départemental - LAVAL (53)
Laboratoire Vétérinaire et Alimentaire - MALZEVILLE (54)
Laboratoire Départemental d'Analyses - SAINT AVE (56)
Laboratoire RESALAB-Bretagne - GUENIN (56)
Service du Laboratoire Départemental - NEVERS (58)

Laboratoire Départemental Public - VILLENEUVE D'ASCQ (59)
LABEO Orne - ALENCON (61)
Laboratoire Départemental d'Analyses - ARRAS (62)
AABIOVET - SAINT-OMER (62)
TERANA Puy-de -Dôme- LEMPDES (63)
Laboratoire Départemental d'Analyses - STRASBOURG (67)
Laboratoire Vétérinaire Départemental - COLMAR (68)
ORBIO LABORATOIE - BRON (689
Laboratoire Départemental Vétérinaire - MARCY L'ETOILE (69)
Laboratoire Départemental d'Analyses - MACON (71)
INOVALYS Le Mans - LE MANS (72)
Laboratoire Départemental d'Analyses Vétérinaires - CHAMBERY (73)
Lidal - Laboratoire Vétérinaire Départemental - SEYNOD (74)
Laboratoire Agro Vétérinaire Départemental - ROUEN (76)
LASAT Laboratoire d'Analyses Sèvres Atlantique - CHAMPDENIERS (79)
Laboratoire Vétérinaire Départemental - DURY (80)
Laboratoire Vétérinaire Départemental - MONTAUBAN (82)
Laboratoire Vétérinaire d'Analyses du Var - DRAGUIGNAN (83)
Laboratoire Départemental d'Analyses - AVIGNON (84)
ANI-MEDIC - LA TADIERE (85)
Labovet - LES HERBIERS (85)
Laboratoire de l'Environnement et de l'Alimentation de la Vendée - LA ROCHE SUR YON (85)
Laboratoire Vétérinaire Départemental - LIMOGES (87)
Laboratoire Vétérinaire Départemental - EPINAL (88)
Laboratoire de bactériologie – Biopôle ALFORT - MAISONS-ALFORT (94)
VEBIO - ARCUEIL (94)

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Annex 2

Cattle

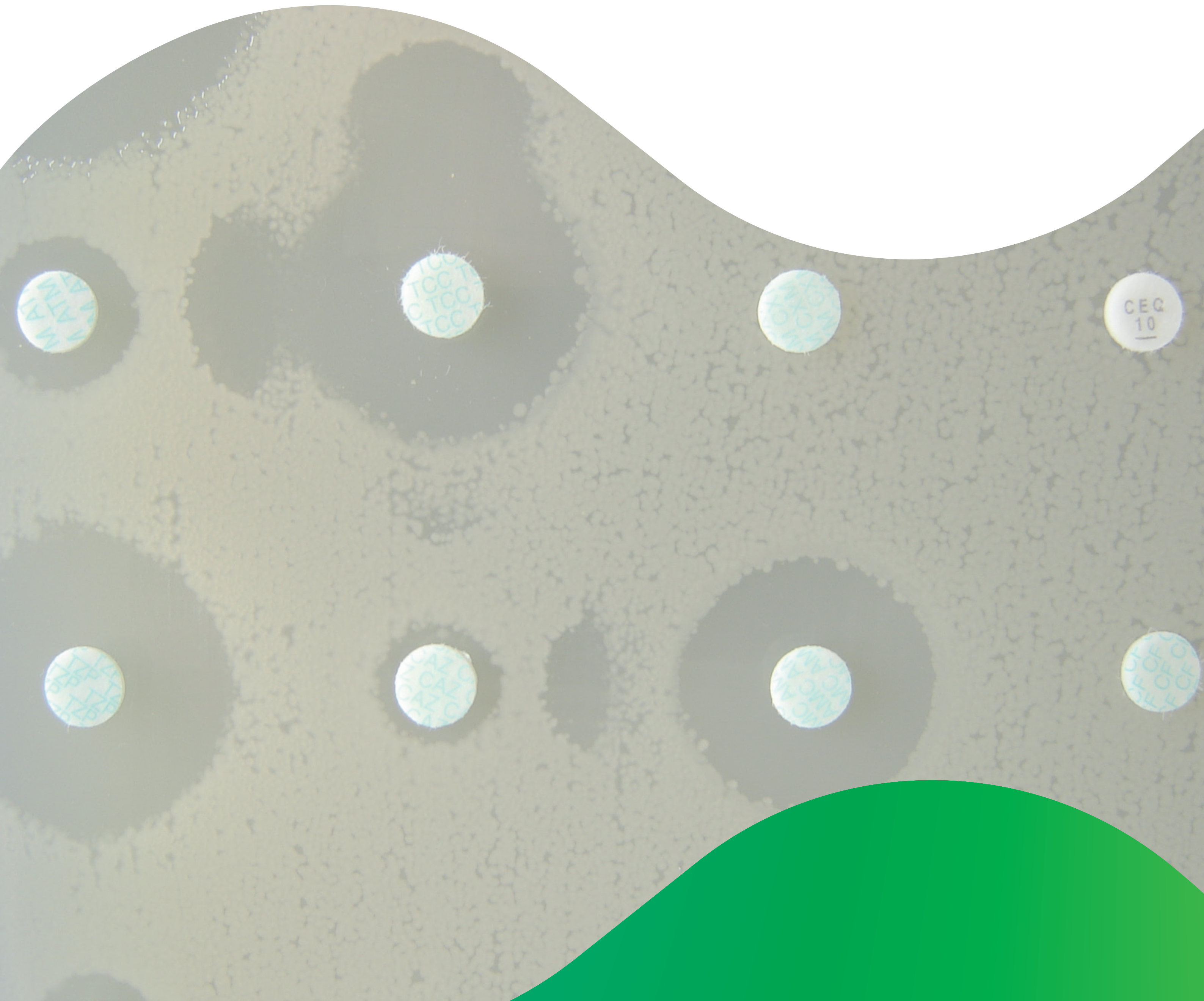
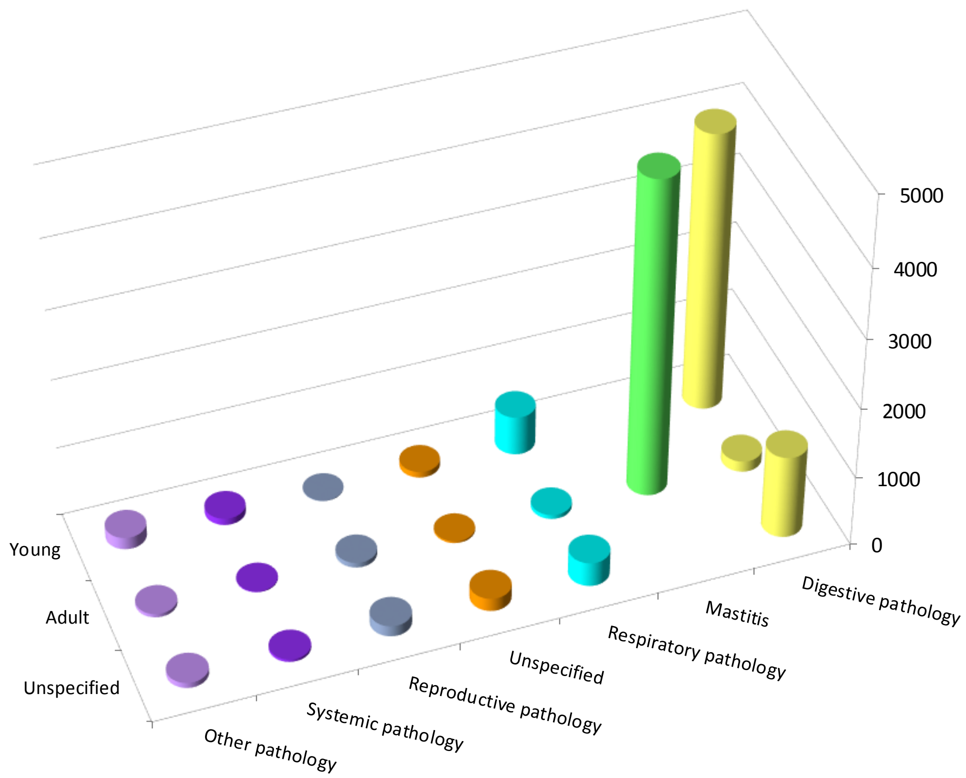


Figure 1 - Cattle 2017 – Number of antibiograms by age group and pathology

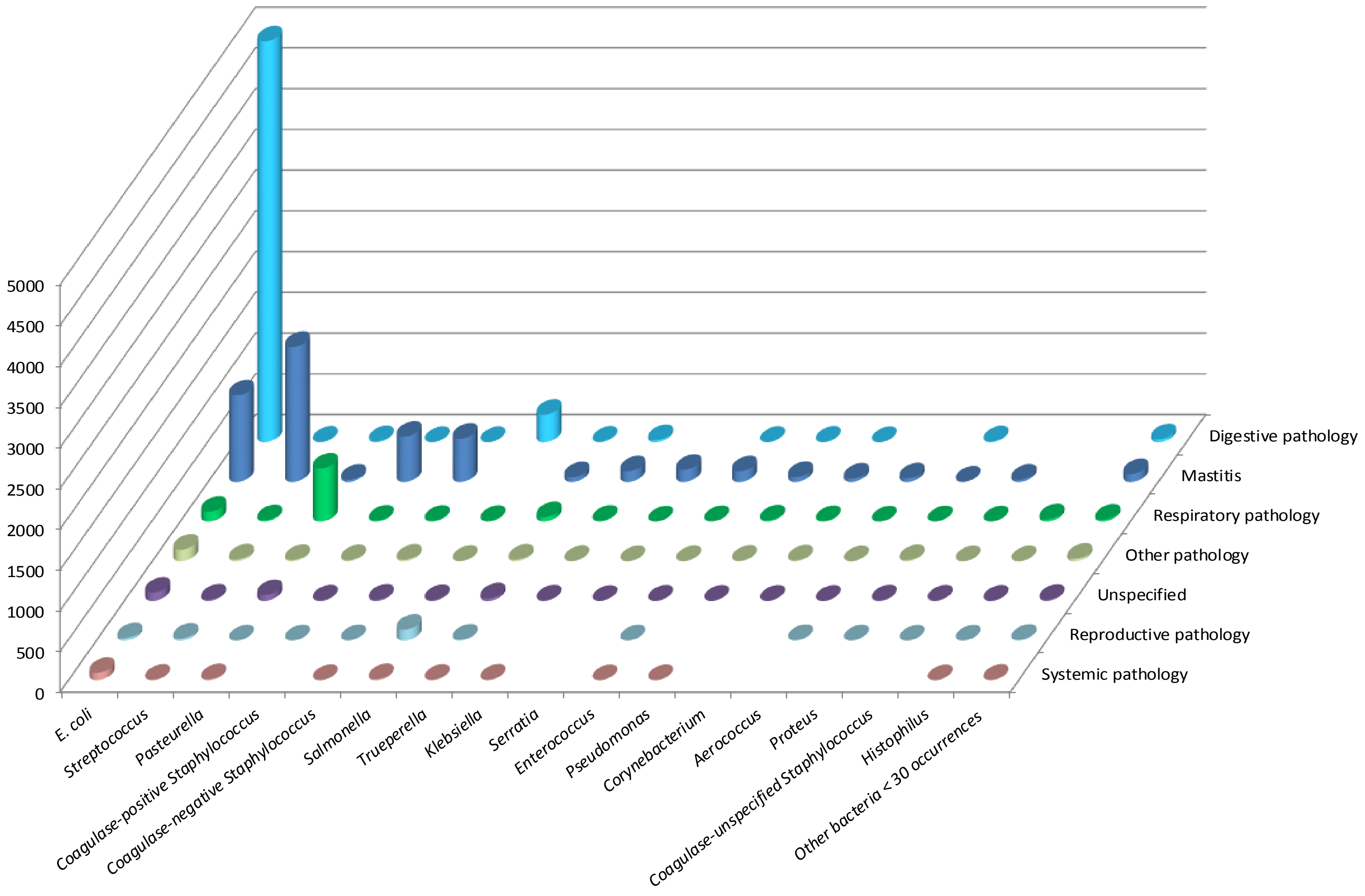


***Note:** all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Cattle 2017 – Number of antibiograms by age group and pathology

Pathology N (%)	Age group N (%)			Total N (%)
	Young	Adult	Unspecified	
Digestive pathology	4,020 *(33.94)*	154 *(1.3)*	1,188 *(10.03)*	**5,362** ***(45.27)***
Mastitis		4,558 *(38.48)*		**4,558** ***(38.48)***
Respiratory pathology	559 *(4.72)*	59 *(0.5)*	344 *(2.9)*	**962** ***(8.12)***
Unspecified	84 *(0.71)*	26 *(0.22)*	184 *(1.55)*	**294** ***(2.48)***
Reproductive pathology	8 *(0.07)*	70 *(0.59)*	151 *(1.27)*	**229** ***(1.93)***
Systemic pathology	96 *(0.81)*	12 *(0.1)*	37 *(0.31)*	**145** ***(1.22)***
Septicemia	63 *(0.53)*	6 *(0.05)*	4 *(0.03)*	**73** ***(0.62)***
Kidney and urinary tract pathology	13 *(0.11)*	11 *(0.09)*	20 *(0.17)*	**44** ***(0.37)***
Omphalitis	40 *(0.34)*			**40** ***(0.34)***
Nervous system pathology	22 *(0.19)*	2 *(0.02)*	12 *(0.1)*	**36** ***(0.3)***
Arthritis	12 *(0.1)*	5 *(0.04)*	13 *(0.11)*	**30** ***(0.25)***
Skin and soft tissue infections	3 *(0.03)*	18 *(0.15)*	5 *(0.04)*	**26** ***(0.22)***
Ocular pathology	4 *(0.03)*		13 *(0.11)*	**17** ***(0.14)***
Otitis	4 *(0.03)*	4 *(0.03)*	5 *(0.04)*	**13** ***(0.11)***
Cardiac pathology	6 *(0.05)*	1 *(0.01)*	3 *(0.03)*	**10** ***(0.08)***
Oral pathology	2 *(0.02)*	1 *(0.01)*		**3** ***(0.03)***
Bone pathology	2 *(0.02)*			**2** ***(0.02)***
Total N ***(%)***	**4,938** ***(41.69)***	**4,927** ***(41.6)***	**1,979** ***(16.71)***	**1,844** ***(100.00)***

Figure 2 - Cattle 2017 – Number of antibiograms by bacteria and pathology (all age groups included)

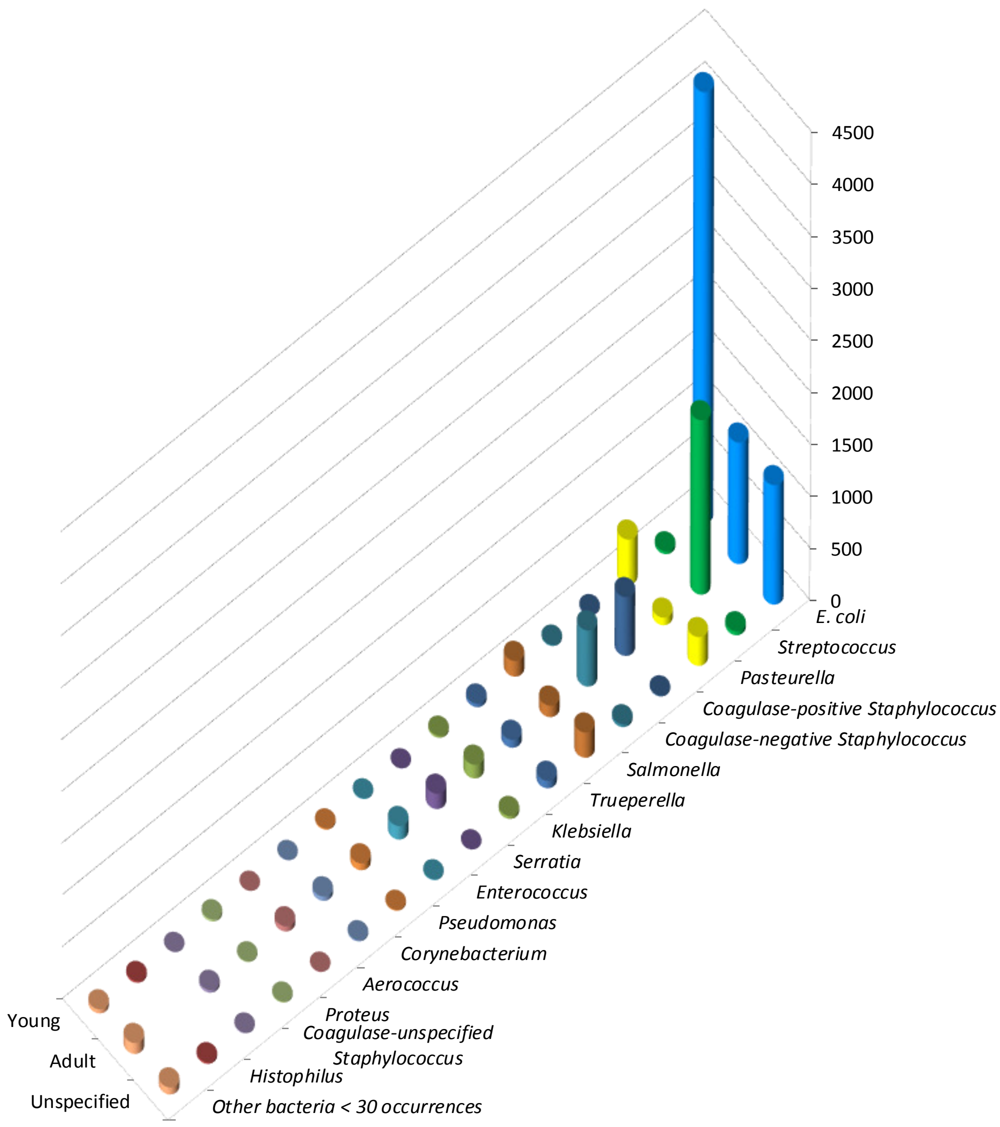


Note: *only values for pathologies >1% and bacterial groups having more than 30 occurrences are represented. Detailed values are presented in table 2 below.*

Table 2 - Cattle 2017 – Number of antibiograms by bacteria and pathology (all age groups included)

	Pathology N (%)																	
Bacteria N (%)	Digestive pathology	Mastitis	Respiratory pathology	Unspecified	Reproductive pathology	Systemic pathology	Septicemia	Kidney and urinary tract pathology	Omphalitis	Nervous system pathology	Arthritis	Skin and soft tissue infections	Ocular pathology	Otitis	Cardiac pathology	Oral pathology	Bone pathology	**Total N *(%)***
E. coli	4,918 *(41.52)*	1,062 *(8.97)*	121 *(1.02)*	101 *(0.85)*	30 *(0.25)*	90 *(0.76)*	61 *(0.52)*	28 *(0.24)*	13 *(0.11)*	18 *(0.15)*	10 *(0.08)*	2 *(0.02)*		3 *(0.03)*	5 *(0.04)*	1 *(0.01)*	1 *(0.01)*	**6,464 *(54.58)***
Streptococcus	6 *(0.05)*	1,655 *(13.97)*	16 *(0.14)*	16 *(0.14)*	25 *(0.21)*	6 *(0.05)*	1 *(0.01)*	2 *(0.02)*	7 *(0.06)*	3 *(0.03)*	5 *(0.04)*	2 *(0.02)*		1 *(0.01)*				**1,745 *(14.73)***
Pasteurella	11 *(0.09)*	26 *(0.22)*	651 *(5.5)*	70 *(0.59)*	2 *(0.02)*	12 *(0.1)*	3 *(0.03)*		1 *(0.01)*	3 *(0.03)*	1 *(0.01)*	1 *(0.01)*	1 *(0.01)*		3 *(0.03)*	1 *(0.01)*		**786 *(6.64)***
Coagulase-positive *Staphylococcus*	2 *(0.02)*	555 *(4.69)*	11 *(0.09)*	7 *(0.06)*	2 *(0.02)*			3 *(0.03)*	1 *(0.01)*		1 *(0.01)*	5 *(0.04)*		1 *(0.01)*	1 *(0.01)*			**589 *(4.97)***
Coagulase-negative *Staphylococcus*	2 *(0.02)*	530 *(4.47)*	9 *(0.08)*	15 *(0.13)*	4 *(0.03)*	2 *(0.02)*	2 *(0.02)*	1 *(0.01)*	3 *(0.03)*	2 *(0.02)*	3 *(0.03)*	6 *(0.05)*	1 *(0.01)*					**580 *(4.9)***
Salmonella	337 *(2.85)*		8 *(0.07)*	10 *(0.08)*	134 *(1.13)*	13 *(0.11)*	3 *(0.03)*											**505 *(4.26)***
Trueperella	5 *(0.04)*	57 *(0.48)*	54 *(0.46)*	32 *(0.27)*	11 *(0.09)*	5 *(0.04)*		3 *(0.03)*	3 *(0.03)*		8 *(0.07)*	4 *(0.03)*			1 *(0.01)*			**183 *(1.55)***
Klebsiella	26 *(0.22)*	129 *(1.09)*	9 *(0.08)*	6 *(0.05)*		7 *(0.06)*			1 *(0.01)*	1 *(0.01)*	1 *(0.01)*							**180 *(1.52)***
Serratia		147 *(1.24)*	1 *(0.01)*	1 *(0.01)*								1 *(0.01)*						**150 *(1.27)***
Enterococcus	3 *(0.03)*	129 *(1.09)*	5 *(0.04)*	4 *(0.03)*	2 *(0.02)*	1 *(0.01)*	1 *(0.01)*							1 *(0.01)*				**146 *(1.23)***
Pseudomonas	5 *(0.04)*	59 *(0.5)*	14 *(0.12)*	2 *(0.02)*		2 *(0.02)*	1 *(0.01)*					1 *(0.01)*	1 *(0.01)*	2 *(0.02)*				**87 *(0.73)***
Corynebacterium	1 *(0.01)*	40 *(0.34)*	5 *(0.04)*	2 *(0.02)*				5 *(0.04)*				1 *(0.01)*		3 *(0.03)*				**57 *(0.48)***
Aerococcus		43 *(0.36)*	1 *(0.01)*	2 *(0.02)*	6 *(0.05)*			1 *(0.01)*										**53 *(0.45)***
Proteus	10 *(0.08)*	4 *(0.03)*	3 *(0.03)*	6 *(0.05)*	2 *(0.02)*			1 *(0.01)*	10 *(0.08)*			1 *(0.01)*		1 *(0.01)*				**38 *(0.32)***
Coagulase-unspecified *Staphylococcus*		27 *(0.23)*	2 *(0.02)*	4 *(0.03)*	1 *(0.01)*				1 *(0.01)*									**35 *(0.3)***
Histophilus			28 *(0.24)*	3 *(0.03)*	1 *(0.01)*	1 *(0.01)*												**33 *(0.28)***
Other bacteria < 30 occurrences	36 *(0.3)*	95 *(0.8)*	24 *(0.2)*	13 *(0.11)*	9 *(0.08)*	6 *(0.05)*	1 *(0.01)*			9 *(0.08)*	1 *(0.01)*	2 *(0.02)*	14 *(0.12)*	1 *(0.01)*		1 *(0.01)*	1 *(0.01)*	**213 *(1.8)***
Total N *(%)*	**5,362 *(45.27)***	**4,558 *(38.48)***	**962 *(8.12)***	**294 *(2.48)***	**229 *(1.93)***	**145 *(1.22)***	**73 *(0.62)***	**44 *(0.37)***	**40 *(0.34)***	**36 *(0.3)***	**30 *(0.25)***	**26 *(0.22)***	**17 *(0.14)***	**13 *(0.11)***	**10 *(0.08)***	**3 *(0.03)***	**2 *(0.02)***	**11,844 (100.00)**

Figure 3 - Cattle 2017 – 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 2017 – Number of antibiograms by bacteria and age group

	Age group N (%)			
Bacteria N (%)	Young	Adult	Unspecified	**Total N (%)**
E. coli	4,143 *(34.98)*	1,170 *(9.88)*	1,151 *(9.72)*	**6,464 *(54.58)***
Streptococcus	27 *(0.23)*	1,680 *(14.18)*	38 *(0.32)*	**1,745 *(14.73)***
Pasteurella	435 *(3.67)*	74 *(0.62)*	277 *(2.34)*	**786 *(6.64)***
Coagulase-positive *Staphylococcus*	12 *(0.10)*	567 *(4.79)*	10 *(0.08)*	**589 *(4.97)***
Coagulase-negative *Staphylococcus*	12 *(0.10)*	541 *(4.57)*	27 *(0.23)*	**580 *(4.90)***
Salmonella	151 *(1.27)*	111 *(0.94)*	243 *(2.05)*	**505 *(4.26)***
Trueperella	35 *(0.3)*	76 *(0.64)*	72 *(0.61)*	**183 *(1.55)***
Klebsiella	20 *(0.17)*	132 *(1.11)*	28 *(0.24)*	**180 *(1.52)***
Serratia	1 *(0.01)*	147 *(1.24)*	2 *(0.02)*	**150 *(1.27)***
Enterococcus	7 *(0.06)*	131 *(1.11)*	8 *(0.07)*	**146 *(1.23)***
Pseudomonas	12 *(0.1)*	66 *(0.56)*	9 *(0.08)*	**87 *(0.73)***
Corynebacterium	3 *(0.03)*	43 *(0.36)*	11 *(0.09)*	**57 *(0.48)***
Aerococcus	1 *(0.01)*	49 *(0.41)*	3 *(0.03)*	**53 *(0.45)***
Proteus	21 *(0.18)*	7 *(0.06)*	10 *(0.08)*	**38 *(0.32)***
Coagulase-unspecified Staphylococcus	2 *(0.02)*	27 *(0.23)*	6 *(0.05)*	**35 *(0.3)***
Histophilus	17 *(0.14)*		16 *(0.14)*	**33 *(0.28)***
Other bacteria < 30 occurrences	39 *(0.33)*	106 *(0.89)*	68 *(0.57)*	**213 *(1.8)***
Total N *(%)*	**4,938 *(41.69)***	**4,927 *(41.6)***	**1,979 *(16.71)***	**11,844 *(100.00)***

Table 4 - Cattle 2017 – Digestive pathology – Young animals – *E. coli*: susceptibility to antibiotics (proportion) (N= 3,842)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*3,670*	**17**
Amoxicillin-Clavulanic ac.	*3,777*	**48**
Cephalexin	*3,265*	**82**
Cephalothin	*770*	**75**
Cefoxitin	*3,237*	**91**
Cefuroxime	*1,652*	**80**
Cefoperazone	*1,048*	**89**
Ceftiofur	*3,833*	**96**
Cefquinome	*3,673*	**93**
Streptomycin 10 UI	*2,216*	**17**
Spectinomycin	*1,321*	**55**
Kanamycin 30 UI	*1,164*	**40**
Gentamicin 10 UI	*3,816*	**81**
Neomycin	*2,820*	**49**
Apramycin	*1,896*	**94**
Tetracycline	*3,634*	**24**
Doxycycline	*93*	**19**
Chloramphenicol	*161*	**55**
Florfenicol	*2,718*	**76**
Nalidixic ac.	*2,296*	**66**
Oxolinic ac.	*686*	**59**
Flumequine	*1,327*	**65**
Enrofloxacin	*3,388*	**87**
Marbofloxacin	*2,864*	**87**
Danofloxacin	*1,090*	**87**
Sulfonamides	*802*	**25**
Trimethoprim	*423*	**65**
Trimethoprim-Sulfonamides	*3,809*	**62**

Table 5 - Cattle 2017 – Mastitis – Adults – *E. coli:* susceptibility to antibiotics (proportion) (N= 1,062)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*1,021*	**71**
Amoxicillin-Clavulanic ac.	*1,058*	**80**
Cephalexin	*977*	**87**
Cephalothin	*294*	**91**
Cefoxitin	*949*	**96**
Cefuroxime	*492*	**91**
Cefoperazone	*699*	**98**
Ceftiofur	*981*	**99**
Cefquinome	*955*	**99**
Streptomycin 10 UI	*624*	**80**
Spectinomycin	*219*	**93**
Kanamycin 30 UI	*477*	**91**
Gentamicin 10 UI	*1,053*	**98**
Neomycin	*697*	**89**
Apramycin	*333*	**100**
Tetracycline	*914*	**81**
Chloramphenicol	*48*	**88**
Florfenicol	*756*	**95**
Nalidixic ac.	*681*	**96**
Oxolinic ac.	*150*	**97**
Flumequine	*278*	**90**
Enrofloxacin	*867*	**98**
Marbofloxacin	*914*	**98**
Danofloxacin	*354*	**98**
Sulfonamides	*208*	**77**
Trimethoprim	*179*	**86**
Trimethoprim-Sulfonamides	*1,034*	**90**

Table 6 - Cattle 2017 – All pathologies and age groups included – *Salmonella* Typhimurium*:* susceptibility to antibiotics (proportion) (N= 164)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*159*	**14**
Amoxicillin-Clavulanic ac.	*163*	**40**
Cephalexin	*147*	**99**
Cephalothin	*37*	**100**
Cefoxitin	*128*	**99**
Cefuroxime	*88*	**98**
Cefoperazone	*70*	**39**
Ceftiofur	*161*	**99**
Cefquinome	*149*	**99**
Streptomycin 10 UI	*86*	**8**
Spectinomycin	*62*	**19**
Kanamycin 30 UI	*42*	**98**
Gentamicin 10 UI	*164*	**96**
Neomycin	*134*	**97**
Apramycin	*82*	**95**
Tetracycline	*153*	**10**
Chloramphenicol	*31*	**26**
Florfenicol	*120*	**48**
Nalidixic ac.	*86*	**84**
Oxolinic ac.	*50*	**98**
Flumequine	*72*	**83**
Enrofloxacin	*158*	**100**
Marbofloxacin	*135*	**99**
Danofloxacin	*61*	**100**
Sulfonamides	*41*	**7**
Trimethoprim-Sulfonamides	*164*	**93**

Table 7 - Cattle 2017 – All pathologies and age groups included – *Salmonella* Mbandaka*:* susceptibility to antibiotics (proportion) (N= 83)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*83*	**98**
Amoxicillin-Clavulanic ac.	*82*	**99**
Cephalexin	*82*	**100**
Cephalothin	*61*	**98**
Cefoxitin	*83*	**99**
Cefuroxime	*67*	**100**
Cefoperazone	*71*	**100**
Ceftiofur	*83*	**100**
Cefquinome	*79*	**100**
Streptomycin 10 UI	*66*	**94**
Kanamycin 30 UI	*66*	**100**
Gentamicin 10 UI	*83*	**100**
Neomycin	*82*	**100**
Tetracycline	*83*	**100**
Florfenicol	*82*	**100**
Nalidixic ac.	*63*	**100**
Enrofloxacin	*83*	**100**
Marbofloxacin	*82*	**100**
Danofloxacin	*71*	**100**
Sulfonamides	*64*	**94**
Trimethoprim	*60*	**100**
Trimethoprim-Sulfonamides	*83*	**100**

Table 8 - Cattle 2017 – All pathologies and age groups included – *Salmonella* Montevideo*:* susceptibility to antibiotics (proportion) (N= 121)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*112*	**100**
Amoxicillin-Clavulanic ac.	*121*	**100**
Cephalexin	*110*	**100**
Cephalothin	*80*	**100**
Cefoxitin	*121*	**100**
Cefuroxime	*80*	**99**
Cefoperazone	*103*	**100**
Ceftiofur	*121*	**100**
Cefquinome	*120*	**100**
Streptomycin 10 UI	*98*	**95**
Kanamycin 30 UI	*101*	**100**
Gentamicin 10 UI	*121*	**100**
Neomycin	*119*	**100**
Apramycin	*38*	**100**
Tetracycline	*121*	**98**
Florfenicol	*120*	**98**
Nalidixic ac.	*87*	**100**
Flumequine	*33*	**100**
Enrofloxacin	*121*	**100**
Marbofloxacin	*119*	**100**
Danofloxacin	*98*	**100**
Sulfonamides	*78*	**100**
Trimethoprim	*68*	**100**
Trimethoprim-Sulfonamides	*121*	**100**

Table 9 - Cattle 2017 – Respiratory pathology – Young animals – *Pasteurella multocida:* susceptibility to antibiotics (proportion) (N= 220)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*210*	**100**
Amoxicillin-Clavulanic ac.	*207*	**99**
Cephalexin	*62*	**98**
Ceftiofur	*214*	**99**
Cefquinome	*195*	**97**
Streptomycin 10 UI	*157*	**37**
Kanamycin 30 UI	*30*	**80**
Gentamicin 10 UI	*190*	**96**
Neomycin	*35*	**49**
Tetracycline	*214*	**66**
Doxycycline	*139*	**69**
Florfenicol	*218*	**100**
Nalidixic ac.	*70*	**83**
Oxolinic ac.	*124*	**73**
Flumequine	*148*	**76**
Enrofloxacin	*217*	**94**
Marbofloxacin	*189*	**100**
Trimethoprim-Sulfonamides	*220*	**93**

Table 10 - Cattle 2017 – Respiratory pathology – Young animals – *Mannheimia haemolytica:* susceptibility to antibiotics (proportion) (N= 143)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*136*	**96**
Amoxicillin-Clavulanic ac.	*136*	**99**
Cephalexin	*55*	**100**
Ceftiofur	*137*	**100**
Cefquinome	*118*	**100**
Streptomycin 10 UI	*90*	**12**
Gentamicin 10 UI	*117*	**94**
Neomycin	*37*	**49**
Tetracycline	*139*	**78**
Doxycycline	*71*	**70**
Florfenicol	*139*	**99**
Nalidixic ac.	*62*	**90**
Oxolinic ac.	*64*	**88**
Flumequine	*89*	**87**
Enrofloxacin	*140*	**96**
Marbofloxacin	*114*	**100**
Trimethoprim-Sulfonamides	*142*	**96**

Table 11 - Cattle 2017 – Mastitis – Adults – *Serratia Marcescens:* susceptibility to antibiotics (proportion) (N= 116)

Antibiotic	*Total (N)*	**% S**
Amoxicillin-Clavulanic ac.	*112*	**11**
Cephalothin	*31*	**0**
Cefoxitin	*97*	**30**
Cefuroxime	*38*	**3**
Cefoperazone	*81*	**99**
Ceftiofur	*109*	**100**
Cefquinome	*111*	**99**
Streptomycin 10 UI	*77*	**51**
Kanamycin 30 UI	*44*	**100**
Gentamicin 10 UI	*115*	**100**
Neomycin	*82*	**99**
Apramycin	*34*	**100**
Tetracycline	*100*	**9**
Florfenicol	*63*	**92**
Nalidixic ac.	*75*	**100**
Flumequine	*34*	**97**
Enrofloxacin	*89*	**100**
Marbofloxacin	*102*	**100**
Danofloxacin	*33*	**100**
Trimethoprim-Sulfonamides	*110*	**100**

Table 12 - Cattle 2017 – Mastitis – Adults – *Klebsiella pneumoniae:* susceptibility to antibiotics (proportion) (N= 76)

Antibiotic	*Total (N)*	**% S**
Amoxicillin-Clavulanic ac.	*76*	**83**
Cefoxitin	*58*	**100**
Cefoperazone	*51*	**98**
Ceftiofur	*64*	**100**
Cefquinome	*69*	**100**
Streptomycin 10 UI	*50*	**80**
Kanamycin 30 UI	*32*	**97**
Gentamicin 10 UI	*74*	**99**
Neomycin	*49*	**98**
Tetracycline	*67*	**81**
Florfenicol	*34*	**94**
Nalidixic ac.	*43*	**93**
Enrofloxacin	*53*	**100**
Marbofloxacin	*69*	**100**
Trimethoprim-Sulfonamides	*72*	**92**

Table 13 - Cattle 2017 – Mastitis – Adults – Coagulase-positive *Staphylococcus*: susceptibility to antibiotics (proportion) (N= 550)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*533*	**74**
Cefoxitin	*507*	**85**
Oxacillin	*72*	**97**
Cefovecin	*91*	**99**
Erythromycine	*451*	**93**
Tylosin	*356*	**97**
Spiramycin	*520*	**96**
Lincomycin	*517*	**96**
Pirlimycin	*65*	**97**
Streptomycin 10 UI	*400*	**90**
Kanamycin 30 UI	*318*	**98**
Gentamicin 10 UI	*514*	**99**
Neomycin	*297*	**98**
Tetracycline	*511*	**93**
Florfenicol	*223*	**99**
Enrofloxacin	*441*	**99**
Marbofloxacin	*491*	**99**
Trimethoprim-Sulfonamides	*455*	**98**
Rifampicin	*149*	**99**

Table 14 - Cattle 2017 – Mastitis – Adults – Coagulase-negative *Staphycoccus*: susceptibility to antibiotics (proportion) (N= 530)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*526*	**75**
Cefoxitin	*471*	**93**
Oxacillin	*91*	**96**
Cefovecin	*83*	**95**
Erythromycine	*467*	**87**
Tylosin	*318*	**93**
Spiramycin	*520*	**92**
Lincomycin	*516*	**83**
Pirlimycin	*47*	**94**
Streptomycin 10 UI	*366*	**88**
Kanamycin 30 UI	*334*	**97**
Gentamicin 10 UI	*516*	**98**
Neomycin	*342*	**98**
Tetracycline	*499*	**87**
Florfenicol	*234*	**98**
Enrofloxacin	*431*	**99**
Marbofloxacin	*442*	**99**
Trimethoprim-Sulfonamides	*439*	**97**
Rifampicin	*173*	**97**

Table 15 - Cattle 2017 – Mastitis – Adults – *Streptococcus uberis*: susceptibility to antibiotics (proportion) (N= 1,321)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*1,085*	**85**
Erythromycine	*1,212*	**82**
Tylosin	*754*	**77**
Spiramycin	*1,246*	**80**
Lincomycin	*1,238*	**81**
Streptomycin 500 µg	*1,092*	**85**
Kanamycin 1000 µg	*915*	**94**
Gentamicin 500 µg	*1,150*	**97**
Tetracycline	*1,210*	**80**
Doxycycline	*64*	**78**
Chloramphenicol	*55*	**82**
Florfenicol	*574*	**95**
Enrofloxacin	*1,151*	**62**
Marbofloxacin	*1,079*	**86**
Trimethoprim-Sulfonamides	*1,237*	**82**
Rifampicin	*370*	**57**

Table 16 - Cattle 2017 – Mastitis – Adults – *Streptococcus dysgalactiae:* susceptibility to antibiotics (proportion) (N= 229)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*195*	**99**
Erythromycine	*204*	**84**
Tylosin	*132*	**83**
Spiramycin	*223*	**90**
Lincomycin	*215*	**91**
Streptomycin 500 µg	*195*	**93**
Kanamycin 1000 µg	*156*	**94**
Gentamicin 500 µg	*203*	**100**
Tetracycline	*211*	**20**
Florfenicol	*84*	**94**
Enrofloxacin	*189*	**53**
Marbofloxacin	*184*	**93**
Trimethoprim-Sulfonamides	*206*	**84**
Rifampicin	*55*	**60**

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Annex 3

Sheep

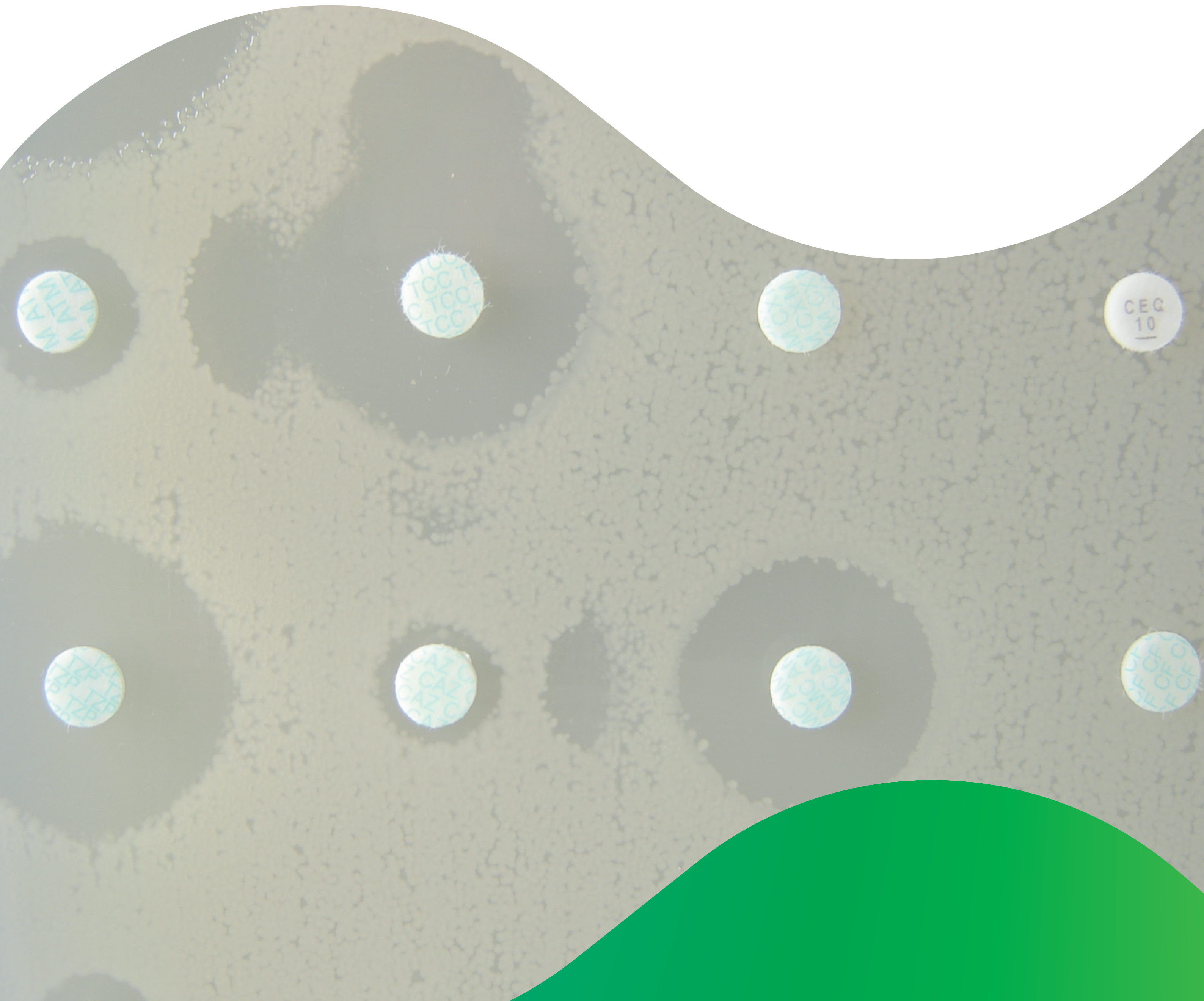
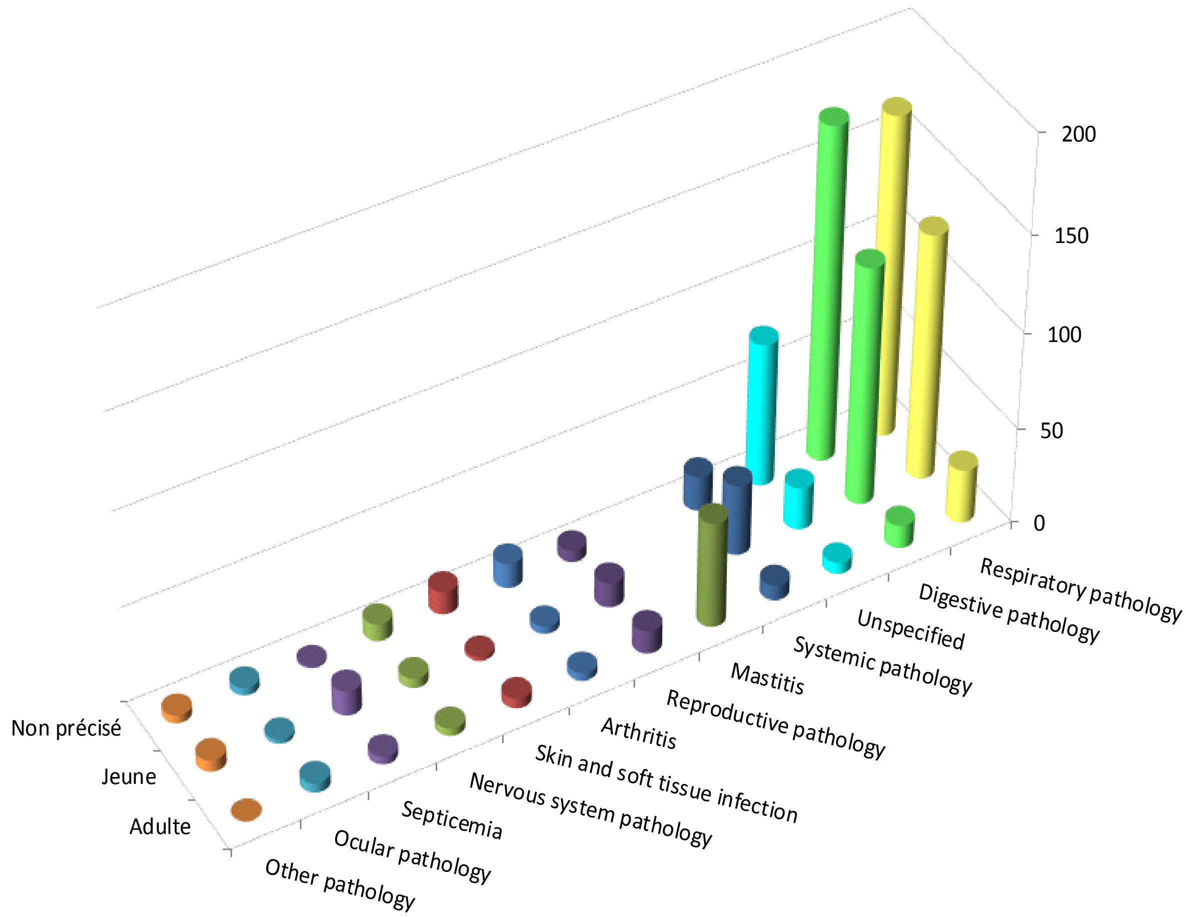


Figure 1 - Sheep 2017 – Number of antibiograms by age group and pathology

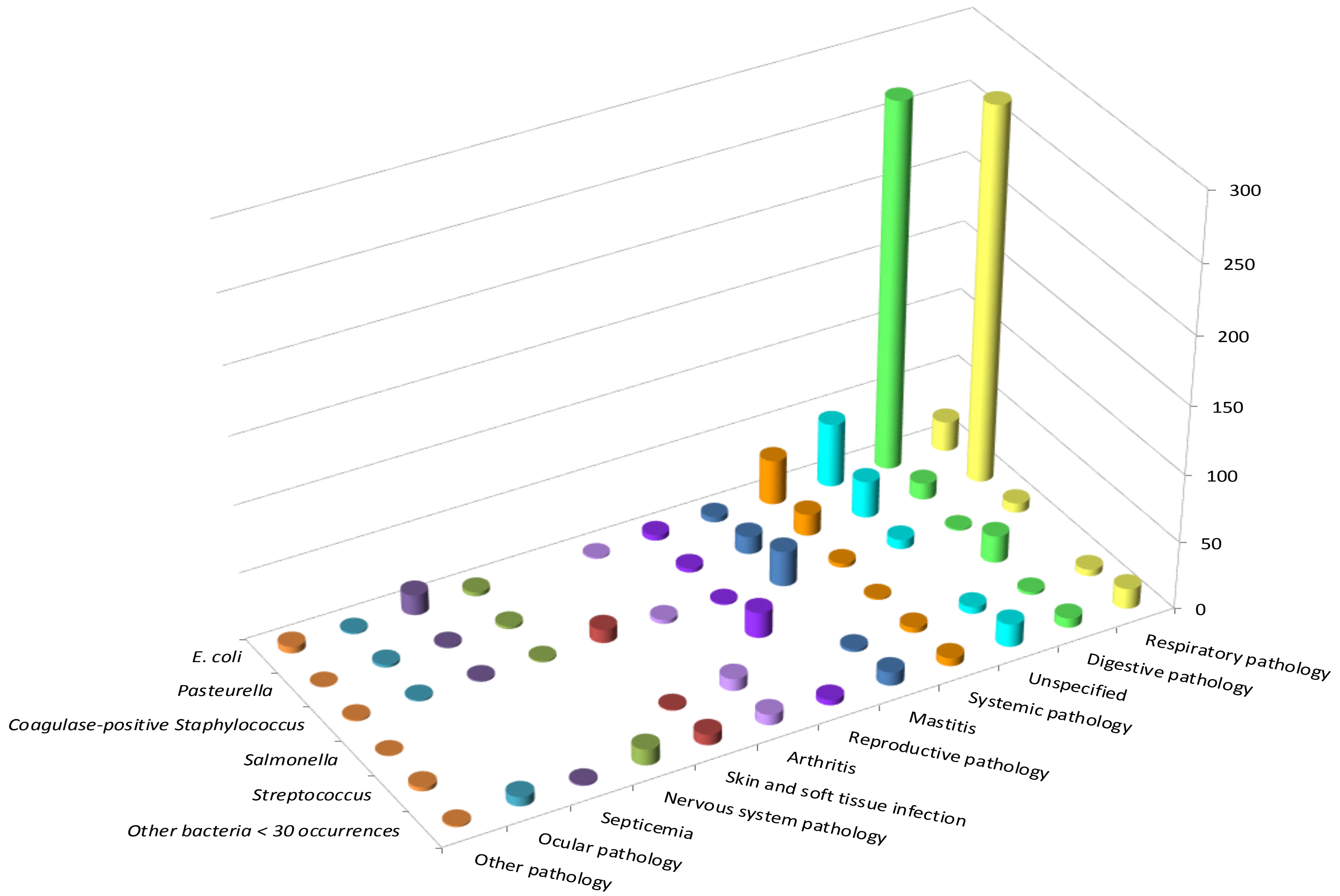


Note: *all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Sheep 2017 – Number of antibiograms by age group and pathology

	Age group N (%)			
Pathology N (%)	Unspecified	Young	Adult	**Total N *(%)***
Respiratory pathology	167 *(17.0)*	128 *(13.0)*	28 *(2.9)*	**323 *(32.9)***
Digestive pathology	174 *(17.7)*	124 *(12.6)*	12 *(1.2)*	**310 *(31.6)***
Unspecified	75 *(7.6)*	22 *(2.2)*	6 *(0.6)*	**103 *(10.5)***
Systemic pathology	18 *(1.8)*	37 *(3.8)*	8 *(0.8)*	**63 *(6.4)***
Mastitis			55 *(5.6)*	**55 *(5.6)***
Reproductive pathology	6 *(0.6)*	13 *(1.3)*	12 *(1.2)*	**31 *(3.2)***
Arthritis	13 *(1.3)*	4 *(0.4)*	4 *(0.4)*	**21 *(2.1)***
Skin and soft tissue infections	12 *(1.2)*	2 *(0.2)*	5 *(0.5)*	**19 *(1.9)***
Nervous system pathology	9 *(0.9)*	5 *(0.5)*	4 *(0.4)*	**18 *(1.8)***
Septicemia	1 *(0.1)*	13 *(1.3)*	4 *(0.4)*	**18 *(1.8)***
Ocular pathology	4 *(0.4)*	2 *(0.2)*	5 *(0.5)*	**11 *(1.1)***
Kidney and urinary tract pathology	2 *(0.2)*	3 *(0.3)*		**5 *(0.5)***
Otitis	1 *(0.1)*	2 *(0.2)*		**3 *(0.3)***
Cardiac pathology	1 *(0.1)*	1 *(0.1)*		**2 *(0.2)***
Total N *(%)*	**483 *(49.2)***	**356 *(36.3)***	**143 *(14.6)***	**982 *(100.0)***

Figure 2 - Sheep 2017 – 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 2017 – Number of antibiograms by bacterial group and pathology

Bacteria N (%)	Pathology N (%)														
	Respiratory pathology	Digestive pathology	Unspecified	Systemic pathology	Mastitis	Reproductive pathology	Arthritis	Skin and soft tissue infections	Nervous system pathology	Septicemia	Ocular pathology	Kidney and urinary tract pathology	Otitis	Cardiac pathology	**Total N *(%)***
E. coli	22 *(2.2)*	268 *(27.3)*	47 *(4.8)*	33 *(3.4)*	4 *(0.4)*	4 *(0.4)*	1 *(0.1)*		3 *(0.3)*	15 *(1.5)*	1 *(0.1)*	4 *(0.4)*		1 *(0.1)*	**403 *(41)***
Pasteurella	274 *(27.9)*	12 *(1.2)*	27 *(2.7)*	16 *(1.6)*	13 *(1.3)*	3 *(0.3)*			2 *(0.2)*	1 *(0.1)*	2 *(0.2)*				**350 *(35.6)***
Coagulase-positive *Staphylococcus*	7 *(0.7)*	1 *(0.1)*	7 *(0.7)*	3 *(0.3)*	26 *(2.6)*	1 *(0.1)*	3 *(0.3)*	10 *(1.0)*	1 *(0.1)*	1 *(0.1)*	1 *(0.1)*		1 *(0.1)*		**62 *(6.3)***
Salmonella		20 *(2)*		1 *(0.1)*		19 *(1.9)*									**40 *(4.1)***
Streptococcus	5 *(0.5)*	2 *(0.2)*	5 *(0.5)*	4 *(0.4)*	2 *(0.2)*		9 *(0.9)*	1 *(0.1)*				1 *(0.1)*	1 *(0.1)*	1 *(0.1)*	**31 *(3.2)***
Other bacteria < 30 occurrences	15 *(1.5)*	7 *(0.7)*	17 *(1.7)*	6 *(0.6)*	10 *(1.0)*	4 *(0.4)*	8 *(0.8)*	8 *(0.8)*	12 *(1.2)*	1 *(0.1)*	7 *(0.7)*		1 *(0.1)*		**96 *(9.8)***
Total N *(%)*	**323 *(32.9)***	**310 *(31.6)***	**103 *(10.5)***	**63 *(6.4)***	**55 *(5.6)***	**31 *(3.2)***	**21 *(2.1)***	**19 *(1.9)***	**18 *(1.8)***	**18 *(1.8)***	**11 *(1.1)***	**5 *(0.5)***	**3 *(0.3)***	**2 *(0.2)***	**982 *(100.0)***

Table 3 - Sheep 2017 – Digestive pathology – *E. coli:* susceptibility to antibiotics (proportion) (N= 268)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*265*	**45**
Amoxicillin-Clavulanic ac.	*267*	**63**
Cephalexin	*254*	**85**
Cephalothin	*32*	**91**
Cefoxitin	*239*	**95**
Cefuroxime	*54*	**89**
Cefoperazone	*39*	**97**
Ceftiofur	*267*	**98**
Cefquinome	*252*	**98**
Streptomycin 10 UI	*185*	**38**
Spectinomycin	*49*	**94**
Kanamycin 30 UI	*38*	**92**
Gentamicin 10 UI	*264*	**94**
Neomycin	*120*	**87**
Apramycin	*46*	**100**
Tetracycline	*240*	**39**
Florfenicol	*225*	**88**
Nalidixic ac.	*232*	**94**
Enrofloxacin	*249*	**96**
Marbofloxacin	*123*	**96**
Danofloxacin	*44*	**93**
Sulfonamides	*57*	**46**
Trimethoprim-Sulfonamides	*268*	**65**

Table 4 - Sheep 2017 – Respiratory pathology – All age groups – *Mannheimia haemolytica:* susceptibility to antibiotics (proportion) (N= 165)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*160*	**98**
Amoxicillin-Clavulanic ac.	*145*	**99**
Cephalexin	*139*	**99**
Cefoxitin	*95*	**99**
Ceftiofur	*165*	**100**
Cefquinome	*130*	**98**
Streptomycin 10 UI	*121*	**48**
Gentamicin 10 UI	*146*	**90**
Neomycin	*48*	**48**
Tetracycline	*163*	**91**
Florfenicol	*158*	**100**
Nalidixic ac.	*146*	**95**
Enrofloxacin	*160*	**93**
Marbofloxacin	*65*	**100**
Trimethoprim-Sulfonamides	*164*	**98**

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Annex 4

Goats

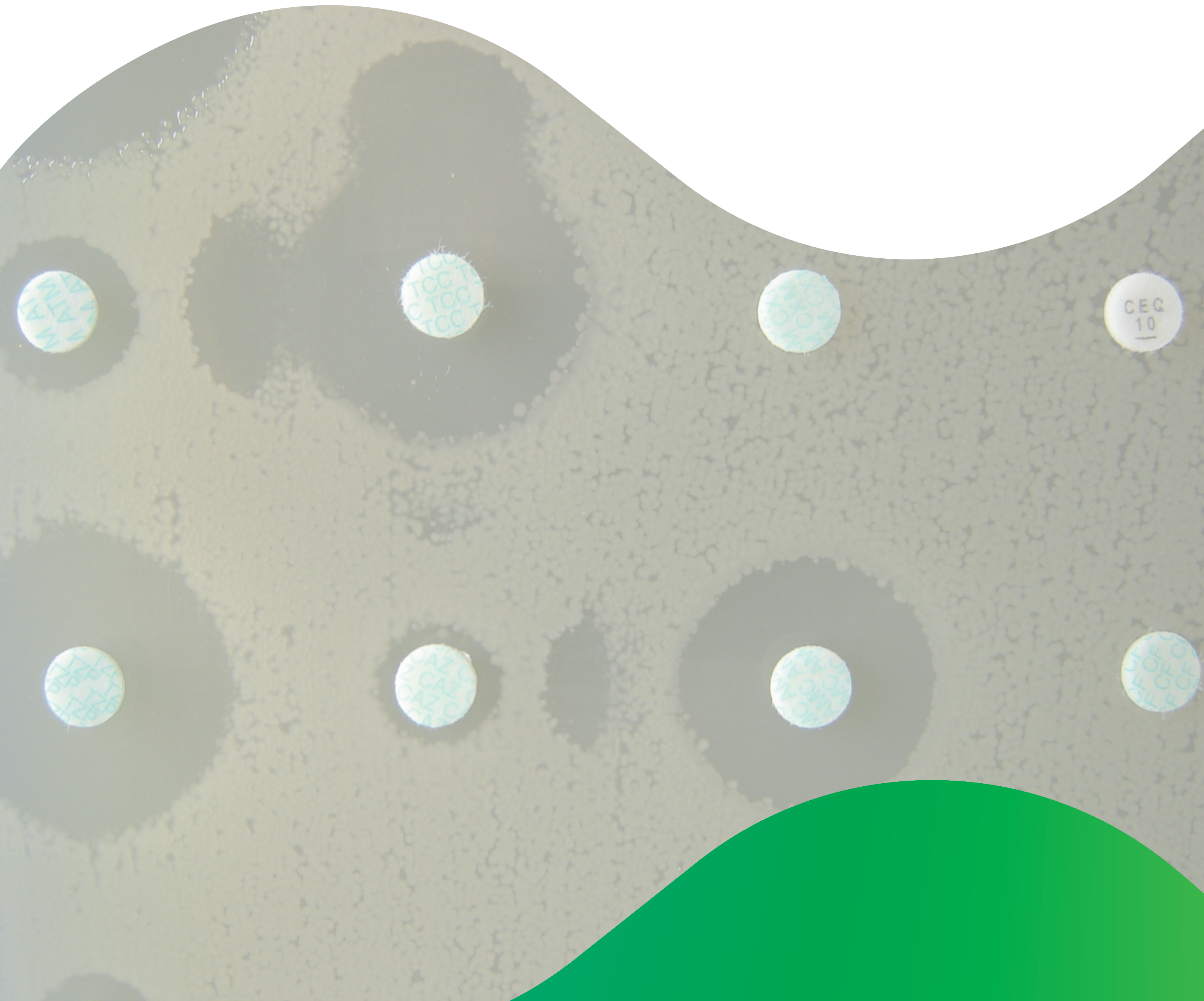
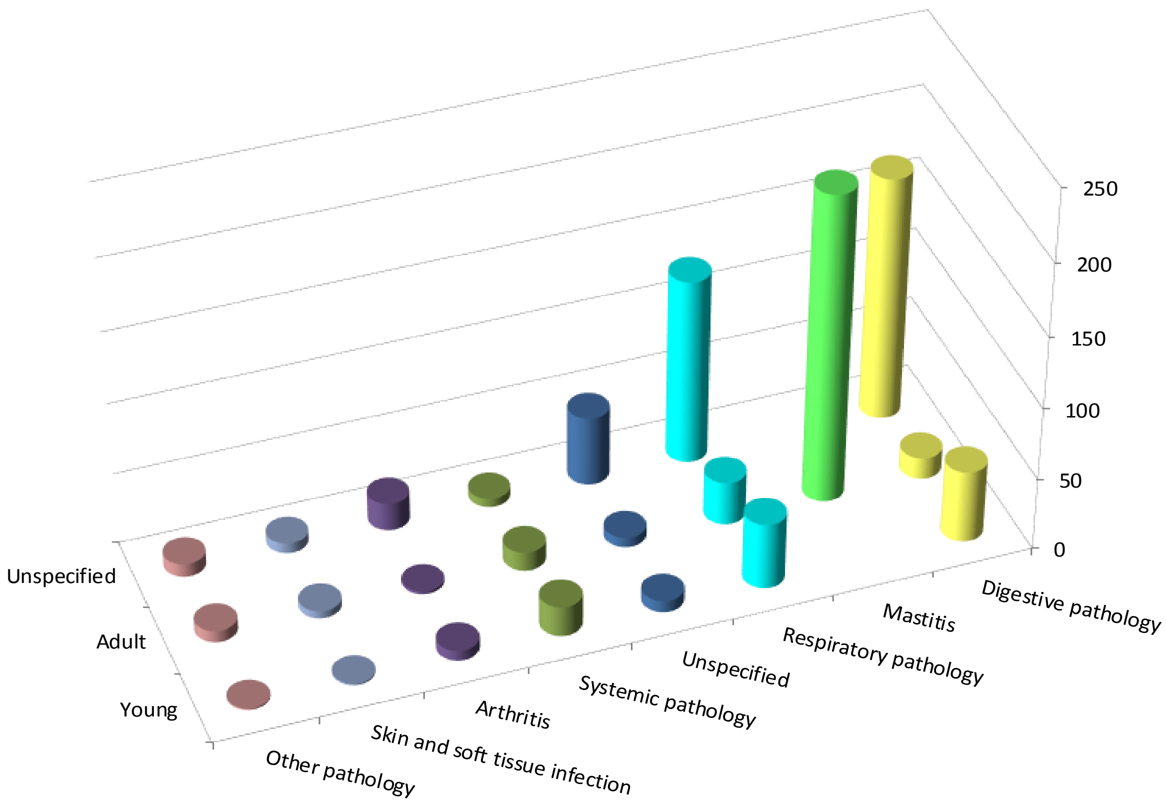


Figure 1 - Goats 2017 – Number of antibiograms by age group and pathology

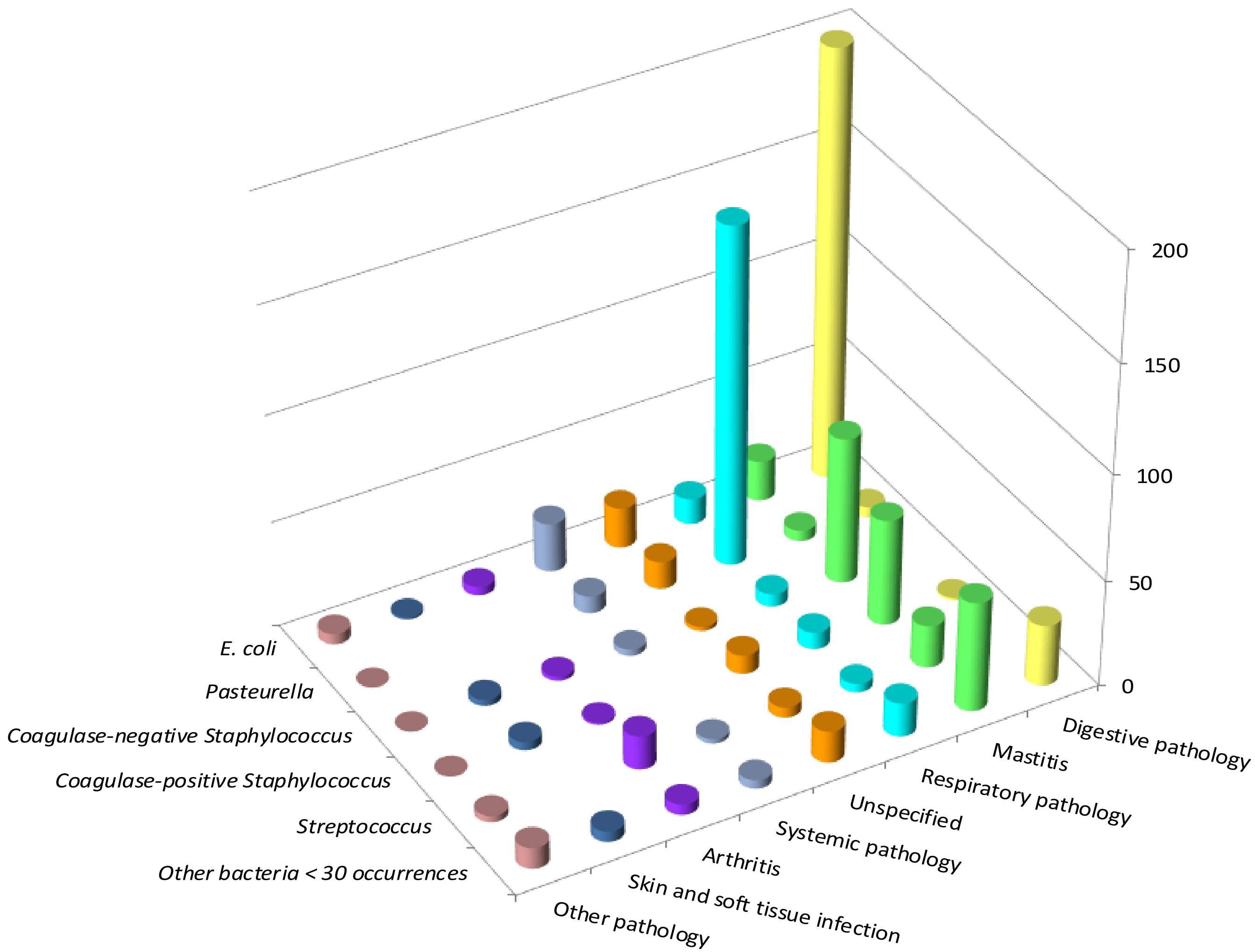


Note: *all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Goats 2017 – Number of antibiograms by age group and pathology

Pathology N (%)	Age group N (%)			Total N (%)
	Unspecified	Adult	Young	
Digestive pathology	170 *(20.8)*	15 *(1.8)*	50 *(6.1)*	**235** ***(28.8)***
Mastitis		215 *(26.3)*		**215** ***(26.3)***
Respiratory pathology	129 *(15.8)*	30 *(3.7)*	46 *(5.6)*	**205** ***(25.1)***
Unspecified	48 *(5.9)*	7 *(0.9)*	8 *(1.0)*	**63** ***(7.7)***
Systemic pathology	6 *(0.7)*	13 *(1.6)*	21 *(2.6)*	**40** ***(4.9)***
Arthritis	19 *(2.3)*	2 *(0.2)*	7 *(0.9)*	**28** ***(3.4)***
Skin and soft tissue infections	7 *(0.9)*	5 *(0.6)*	1 *(0.1)*	**13** ***(1.6)***
Nervous system pathology	4 *(0.5)*	2 *(0.2)*	1 *(0.1)*	**7** ***(0.9)***
Kidney and urinary tract pathology	3 *(0.4)*	2 *(0.2)*		**5** ***(0.6)***
Reproductive pathology	1 *(0.1)*	4 *(0.5)*		**5** ***(0.6)***
Septicemia	1 *(0.1)*			**1** ***(0.1)***
Total N ***(%)***	**388** ***(47.5)***	**295** ***(36.1)***	**134** ***(16.4)***	**817** ***(100.0)***

Figure 2 - Goats 2017 – 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 2017 – Number of antibiograms by bacterial group and pathology

	Pathology N (%)											
Bacteria N (%)	Digestive pathology	Mastitis	Respiratory pathology	Unspecified	Systemic pathology	Arthritis	Skin and soft tissue infections	Nervous system pathology	Kidney and urinary tract pathology	Reproductive pathology	Septicemia	**Total N *(%)***
E. coli	200 *(24.5)*	19 *(2.3)*	12 *(1.5)*	19 *(2.3)*	23 *(2.8)*	4 *(0.5)*	1 *(0.1)*	1 *(0.1)*	2 *(0.2)*	1 *(0.1)*	1 *(0.1)*	**283** ***(34.6)***
Pasteurella	5 *(0.6)*	5 *(0.6)*	159 *(19.5)*	13 *(1.6)*	8 *(1.0)*							**190** ***(23.3)***
Coagulase-negative Staphylococcus		69 *(8.4)*	6 *(0.7)*	2 *(0.2)*	3 *(0.4)*	2 *(0.2)*	3 *(0.4)*					**85** ***(10.4)***
Coagulase-positive Staphylococcus	1 *(0.1)*	50 *(6.1)*	8 *(1.0)*	9 *(1.1)*		1 *(0.1)*	4 *(0.5)*					**73** ***(8.9)***
Streptococcus		20 *(2.4)*	4 *(0.5)*	5 *(0.6)*	2 *(0.2)*	16 *(2.0)*		1 *(0.1)*		2 *(0.2)*		**50** ***(6.1)***
Other bacteria < 30 occurrences	29 *(3.5)*	52 *(6.4)*	16 *(2)*	15 *(1.8)*	4 *(0.5)*	5 *(0.6)*	5 *(0.6)*	5 *(0.6)*	3 *(0.4)*	2 *(0.2)*		**136** ***(16.6)***
Total N *(%)*	**235** ***(28.8)***	**215** ***(26.3)***	**205** ***(25.1)***	**63** ***(7.7)***	**40** ***(4.9)***	**28** ***(3.4)***	**13** ***(1.6)***	**7** ***(0.9)***	**5** ***(0.6)***	**5** ***(0.6)***	**1** ***(0.1)***	**817** ***(100.0)***

Table 3 - Goats 2017 – All pathologies and age groups included – *E. coli:* susceptibility to antibiotics (proportion) (N= 283)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*277*	**43**
Amoxicillin-Clavulanic ac.	*276*	**67**
Cephalexin	*265*	**88**
Cephalothin	*137*	**91**
Cefoxitin	*248*	**96**
Cefuroxime	*167*	**95**
Cefoperazone	*145*	**97**
Ceftiofur	*282*	**98**
Cefquinome	*273*	**98**
Streptomycin 10 UI	*218*	**43**
Spectinomycin	*138*	**83**
Kanamycin 30 UI	*154*	**75**
Gentamicin 10 UI	*272*	**90**
Neomycin	*221*	**80**
Apramycin	*54*	**98**
Tetracycline	*265*	**42**
Florfenicol	*235*	**92**
Nalidixic ac.	*244*	**80**
Oxolinic ac.	*30*	**70**
Flumequine	*36*	**81**
Enrofloxacin	*275*	**87**
Marbofloxacin	*214*	**88**
Danofloxacin	*156*	**89**
Trimethoprim-Sulfonamides	*281*	**58**

Table 4 - Goats 2017 – All pathologies and age groups included – *Pasteurella*: susceptibility to antibiotics (proportion) (N= 190)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*173*	**83**
Amoxicillin-Clavulanic ac.	*172*	**91**
Cephalexin	*147*	**93**
Cephalothin	*81*	**99**
Cefoxitin	*102*	**94**
Cefuroxime	*73*	**95**
Cefoperazone	*73*	**79**
Ceftiofur	*188*	**95**
Cefquinome	*175*	**90**
Streptomycin 10 UI	*149*	**35**
Spectinomycin	*77*	**25**
Kanamycin 30 UI	*81*	**36**
Gentamicin 10 UI	*176*	**84**
Neomycin	*117*	**43**
Tetracycline	*182*	**80**
Florfenicol	*185*	**98**
Nalidixic ac.	*144*	**88**
Flumequine	*38*	**89**
Enrofloxacin	*185*	**91**
Marbofloxacin	*151*	**96**
Danofloxacin	*102*	**76**
Trimethoprim-Sulfonamides	*189*	**71**

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Annex 5

Pigs

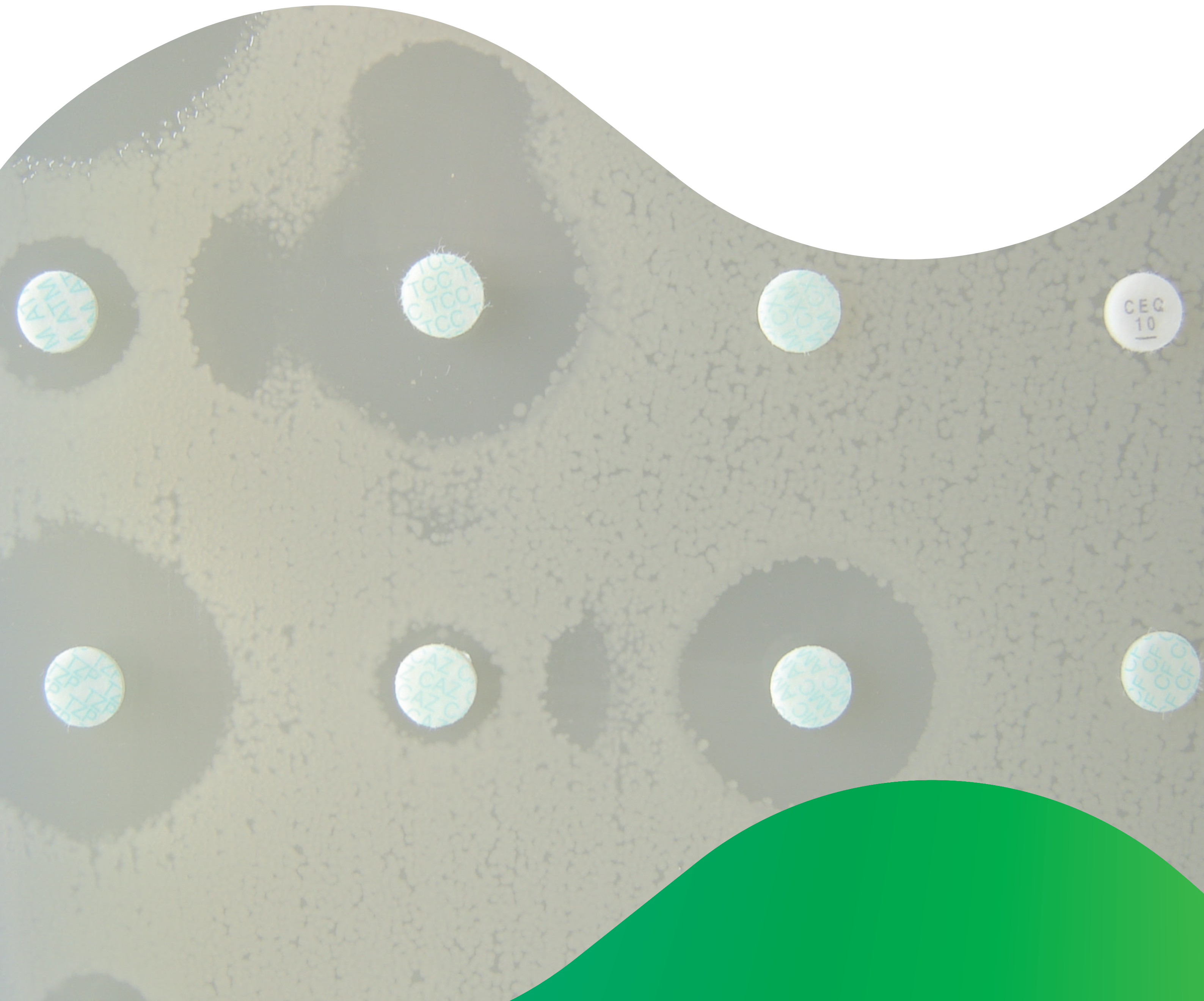


Figure 1 - Pigs 2017 – Antibiogram proportions by animal category

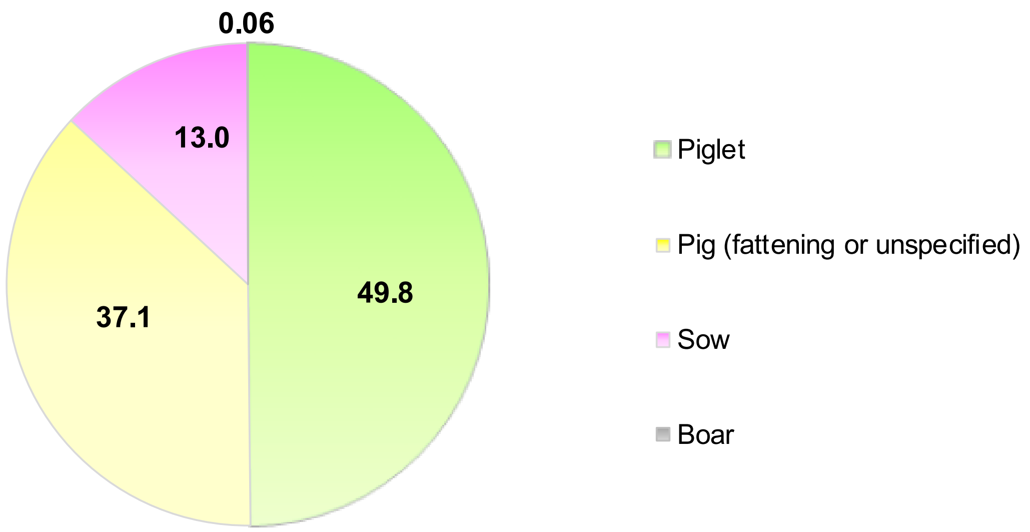
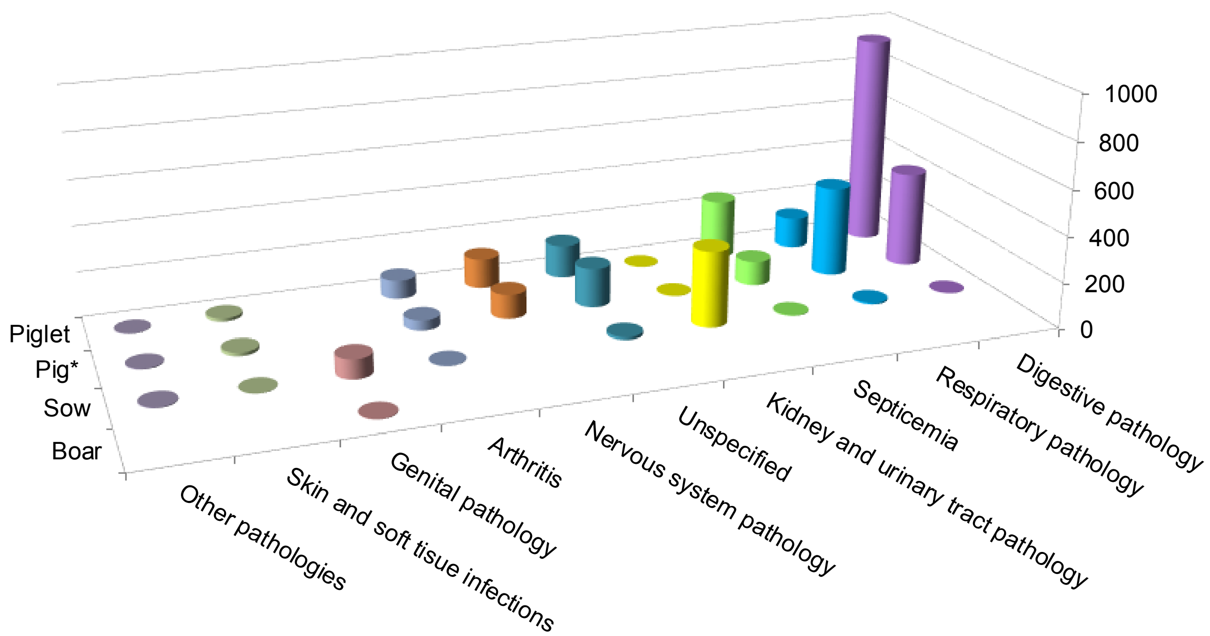


Figure 2 - Pigs 2017 – Number of antibiograms by pathology and animal category

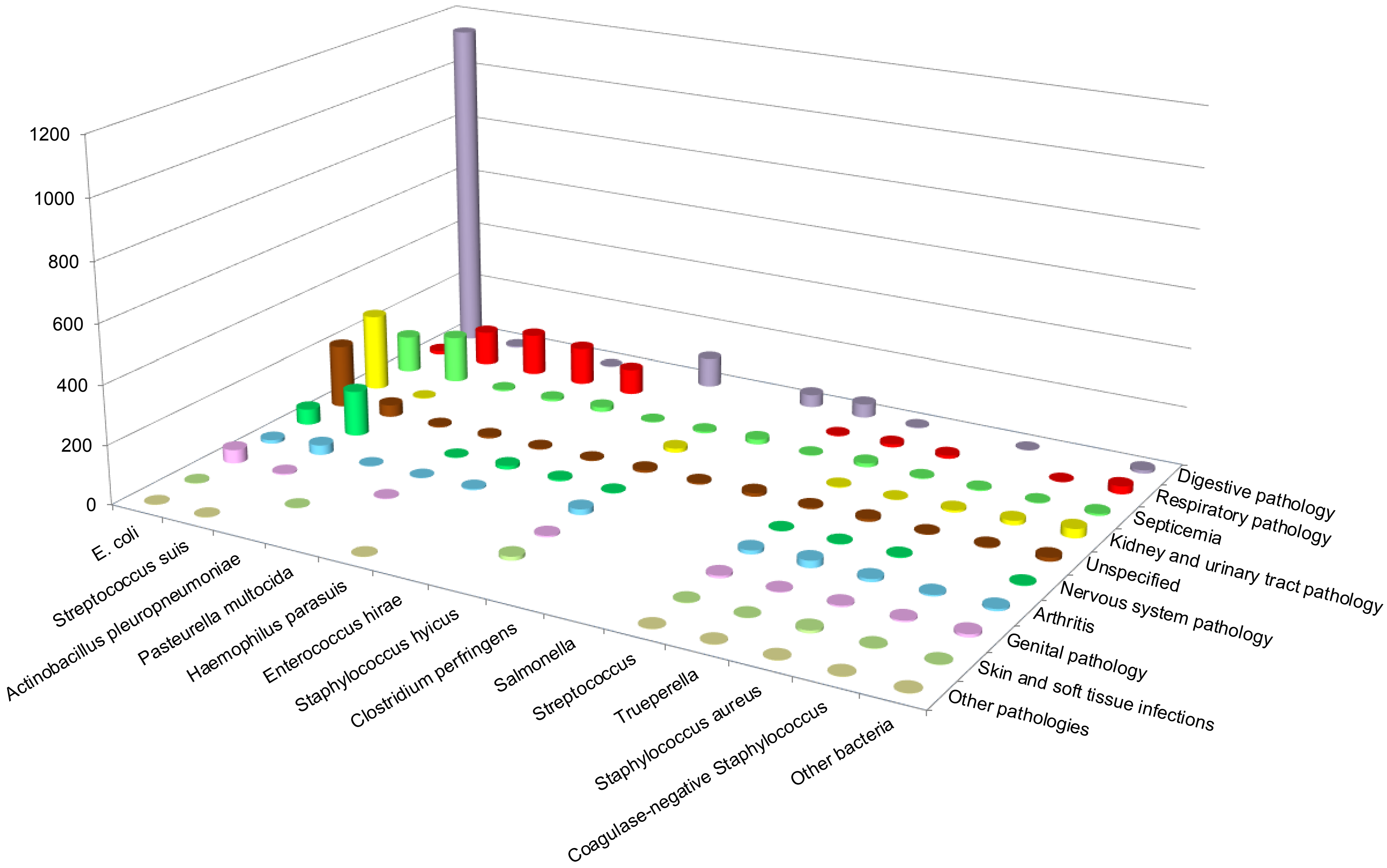


* fattening or unspecified

Table 1 - Pigs 2017 – 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	Arthritis	Genital pathology	Skin and soft tissue infections	Other	**Total N** *(%)*
Piglet	934 *(27.25)*	137 *(4.00)*	260 *(7.59)*	1 *(0.03)*	145 *(4.23)*	131 *(3.82)*	83 *(2.42)*		15 *(0.44)*	2 *(0.06)*	**1,708** ***(49.84)***
Pig (fattening or unspecified)	421 *(12.28)*	397 *(11.58)*	108 *(3.15)*	1 *(0.03)*	173 *(5.05)*	107 *(3.12)*	45 *(1.31)*		15 *(0.44)*	3 *(0.09)*	**1,270** ***(37.06)***
Sow	1 *(0.03)*	7 *(0.20)*	2 *(0.06)*	333 *(9.72)*	14 *(0.41)*		1 *(0.03)*	85 *(2.48)*	1 *(0.03)*	3 *(0.09)*	**447** ***(13.04)***
Boar								2 *(0.06)*			**2** ***(0.06)***
Total N ***(%)***	**1,356** ***(39.57)***	**541** ***(15.79)***	**370** ***(10.80)***	**335** ***(9.78)***	**332** ***(9.69)***	**238** ***(6.94)***	**129** ***(3.76)***	**87** ***(2.54)***	**31** ***(0.90)***	**8** ***(0.23)***	**3,427** ***(100.00)***

Figure 3 - Pigs 2017 – Number of antibiograms by bacteria and pathology



Note: *only values for pathologies and bacteria having more than 30 occurrences are represented. Detailed values are presented in table 2 below.*

Table 2 - Pigs 2017 – 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	Arthritis	Genital pathology	Skin and soft tissue infections	Other	**Total N *(%)***
E. coli	1,144 *(33.38)*	13 *(0.38)*	126 *(3.68)*	262 *(7.65)*	214 *(6.24)*	54 *(1.58)*	12 *(0.35)*	46 *(1.34)*	2 *(0.06)*	1 *(0.03)*	**1,874** ***(54.68)***
Streptococcus suis	5 *(0.15)*	118 *(3.44)*	159 *(4.64)*	2 *(0.06)*	41 *(1.20)*	155 *(4.52)*	33 *(0.96)*	4 *(0.12)*		1 *(0.03)*	**518** ***(15.12)***
Actinobacillus pleuropneumoniae		142 *(4.14)*	5 *(0.15)*		5 *(0.15)*		1 *(0.03)*		1 *(0.03)*		**154** ***(4.49)***
Pasteurella multocida	1 *(0.03)*	128 *(3.74)*	8 *(0.23)*		7 *(0.20)*	2 *(0.06)*	1 *(0.03)*	2 *(0.06)*			**149** ***(4.35)***
Haemophilus parasuis		87 *(2.54)*	16 *(0.47)*		4 *(0.12)*	12 *(0.35)*	4 *(0.12)*			1 *(0.03)*	**124** ***(3.62)***
Enterococcus hirae	101 *(2.95)*		2 *(0.06)*		3 *(0.09)*	5 *(0.15)*					**111** ***(3.24)***
Staphylococcus hyicus			6 *(0.18)*	14 *(0.41)*	8 *(0.23)*	2 *(0.06)*	19 *(0.55)*	5 *(0.15)*	13 *(0.38)*		**67** ***(1.96)***
Clostridium perfringens	43 *(1.25)*		17 *(0.50)*		5 *(0.15)*						**65** ***(1.90)***
Salmonella	47 *(1.37)*	3 *(0.09)*	2 *(0.06)*		12 *(0.35)*						**64** ***(1.87)***
Streptococcus	3 *(0.09)*	11 *(0.32)*	13 *(0.38)*	3 *(0.09)*	5 *(0.15)*	1 *(0.03)*	13 *(0.38)*	8 *(0.23)*	2 *(0.06)*	1 *(0.03)*	**60** ***(1.75)***
Trueperella		11 *(0.32)*	3 *(0.09)*	1 *(0.03)*	9 *(0.26)*	2 *(0.06)*	24 *(0.70)*	2 *(0.06)*	1 *(0.03)*	1 *(0.03)*	**54** ***(1.58)***
Staphylococcus aureus	1 *(0.03)*		4 *(0.12)*	7 *(0.20)*	2 *(0.06)*	3 *(0.09)*	10 *(0.29)*	5 *(0.15)*	9 *(0.26)*	1 *(0.03)*	**42** ***(1.23)***
Coagulase-negative *Staphylococcus*		1 *(0.03)*	2 *(0.06)*	15 *(0.44)*	4 *(0.12)*		5 *(0.15)*	5 *(0.15)*	2 *(0.06)*	1 *(0.03)*	**35** ***(1.02)***
Other bacteria *< 30 occurrences*	11 *(0.32)*	27 *(0.79)*	7 *(0.20)*	31 *(0.90)*	13 *(0.38)*	2 *(0.06)*	7 *(0.20)*	10 *(0.29)*	1 *(0.03)*	1 *(0.03)*	**110** ***(3.21)***
Total N **(%)**	**1,356** ***(39.57)***	**541** ***(15.79)***	**370** ***(10.80)***	**335** ***(9.78)***	**332** ***(9.69)***	**238** ***(6.94)***	**129** ***(3.76)***	**87** ***(2.54)***	**31** ***(0.90)***	**8** ***(0.23)***	**3,427** ***(100.00)***

Table 3 - Pigs 2017 – All pathologies and age groups included – *E. coli*: susceptibility to antibiotics (proportion) (N= 1,874)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*1,847*	**42**
Amoxicillin-Clavulanic ac.	*1,768*	**81**
Cephalexin	*1,030*	**93**
Cephalothin	*412*	**86**
Cefoxitin	*1,433*	**96**
Cefuroxime	*297*	**94**
Cefoperazone	*272*	**97**
Ceftiofur	*1,850*	**99**
Cefquinome	*590*	**98**
Streptomycin 10 UI	*403*	**45**
Spectinomycin	*1,425*	**64**
Gentamicin 10 UI	*1,718*	**91**
Neomycin	*1,746*	**83**
Apramycin	*1,692*	**93**
Tetracycline	*1,507*	**33**
Florfenicol	*1,748*	**88**
Nalidixic ac.	*923*	**81**
Oxolinic ac.	*977*	**81**
Flumequine	*876*	**81**
Enrofloxacin	*1,532*	**96**
Marbofloxacin	*1,491*	**96**
Danofloxacin	*307*	**93**
Trimethoprim	*389*	**54**
Trimethoprim-Sulfonamides	*1,853*	**48**

Table 4 - Pigs 2017 – Digestive pathology – Piglets (post-weaning included) – *E. coli*: susceptibility to antibiotics (proportion) (N= 780)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*764*	**41**
Amoxicillin-Clavulanic ac.	*765*	**84**
Cephalexin	*465*	**95**
Cephalothin	*152*	**92**
Cefoxitin	*619*	**97**
Ceftiofur	*770*	**99**
Cefquinome	*160*	**98**
Streptomycin 10 UI	*172*	**49**
Spectinomycin	*681*	**65**
Gentamicin 10 UI	*761*	**91**
Neomycin	*772*	**81**
Apramycin	*762*	**93**
Tetracycline	*603*	**34**
Florfenicol	*747*	**86**
Nalidixic ac.	*338*	**81**
Oxolinic ac.	*436*	**80**
Flumequine	*258*	**79**
Enrofloxacin	*684*	**96**
Marbofloxacin	*638*	**96**
Trimethoprim	*137*	**60**
Trimethoprim-Sulfonamides	*766*	**49**

Table 5 - Pigs 2017 – Kidney and urinary tract pathology – Sows – *E. coli*: susceptibility to antibiotics (proportion) (N= 260)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*259*	**42**
Amoxicillin-Clavulanic ac.	*186*	**74**
Cephalexin	*128*	**85**
Cefoxitin	*143*	**90**
Ceftiofur	*252*	**100**
Spectinomycin	*111*	**68**
Gentamicin 10 UI	*176*	**94**
Neomycin	*166*	**96**
Apramycin	*160*	**98**
Tetracycline	*245*	**32**
Florfenicol	*248*	**85**
Oxolinic ac.	*193*	**79**
Flumequine	*107*	**75**
Enrofloxacin	*170*	**91**
Marbofloxacin	*254*	**92**
Trimethoprim-Sulfonamides	*259*	**49**

Table 6 - Pigs 2017 – All pathologies included – *Actinobacillus pleuropneumoniae*: susceptibility to antibiotics (proportion) (N= 154)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*150*	**95**
Ceftiofur	*152*	**100**
Tilmicosin	*154*	**95**
Doxycycline	*131*	**94**
Florfenicol	*149*	**100**
Marbofloxacin	*127*	**100**
Trimethoprim-Sulfonamides	*154*	**95**

Table 7 - Pigs 2017 – All pathologies included – *Pasteurella multocida*: susceptibility to antibiotics (proportion) (N= 160)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*137*	**100**
Amoxicillin-Clavulanic ac.	*108*	**97**
Ceftiofur	*146*	**99**
Tilmicosin	*138*	**96**
Tetracycline	*123*	**92**
Doxycycline	*113*	**92**
Florfenicol	*143*	**100**
Enrofloxacin	*109*	**99**
Marbofloxacin	*108*	**99**
Trimethoprim-Sulfonamides	*148*	**83**

Table 8 - Pigs 2017 – All pathologies included – *Streptococcus suis*: susceptibility to antibiotics (proportion) (N= 518)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*484*	**100**
Oxacillin	*506*	**98**
Erythromycine	*399*	**34**
Tylosin	*282*	**31**
Spiramycin	*293*	**35**
Lincomycin	*380*	**32**
Streptomycin 500 µg	*259*	**98**
Kanamycin 1000 µg	*190*	**97**
Gentamicin 500 µg	*400*	**99**
Tetracycline	*296*	**18**
Doxycycline	*142*	**33**
Trimethoprim-Sulfonamides	*514*	**79**

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Annex 6

Poultry

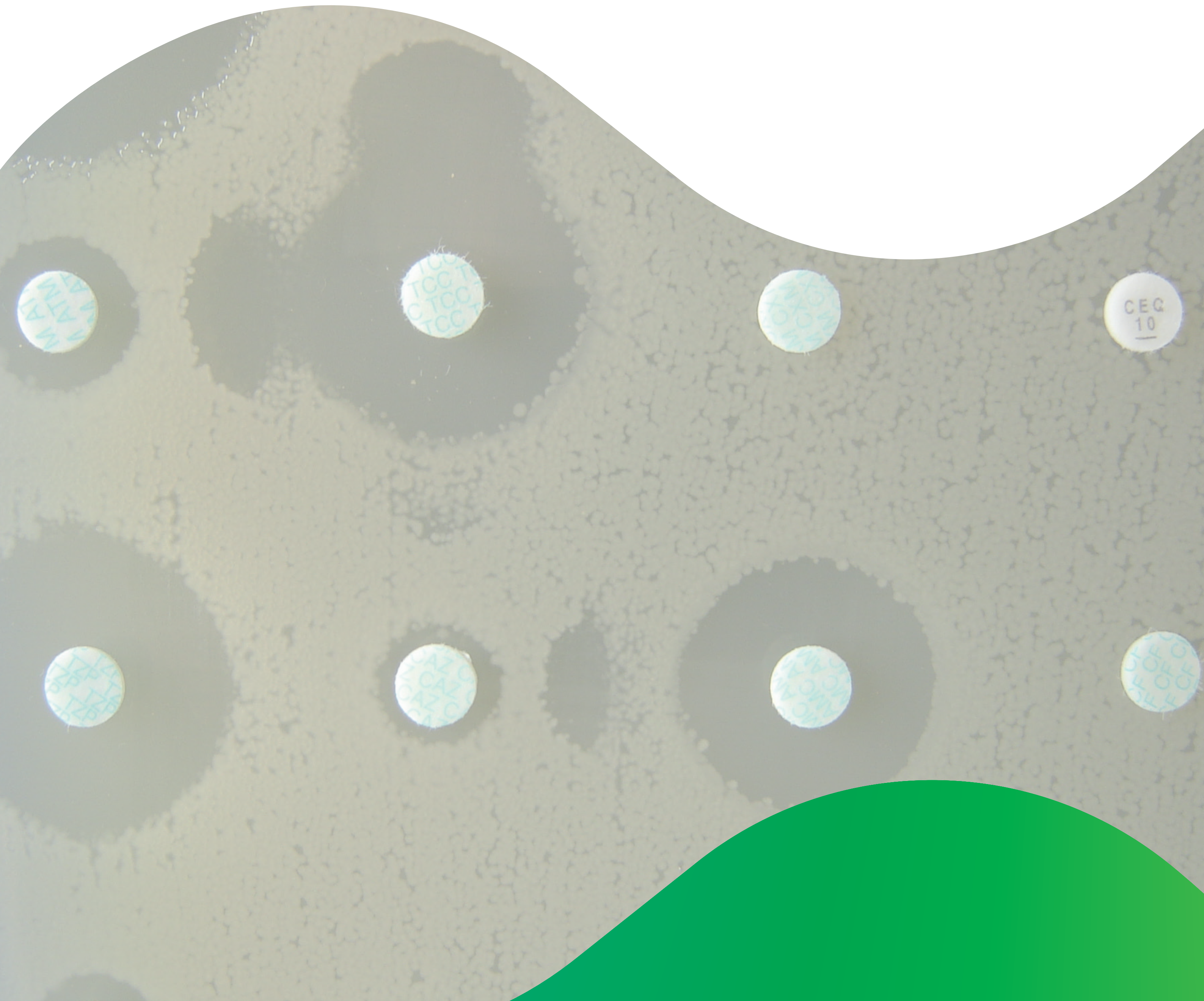
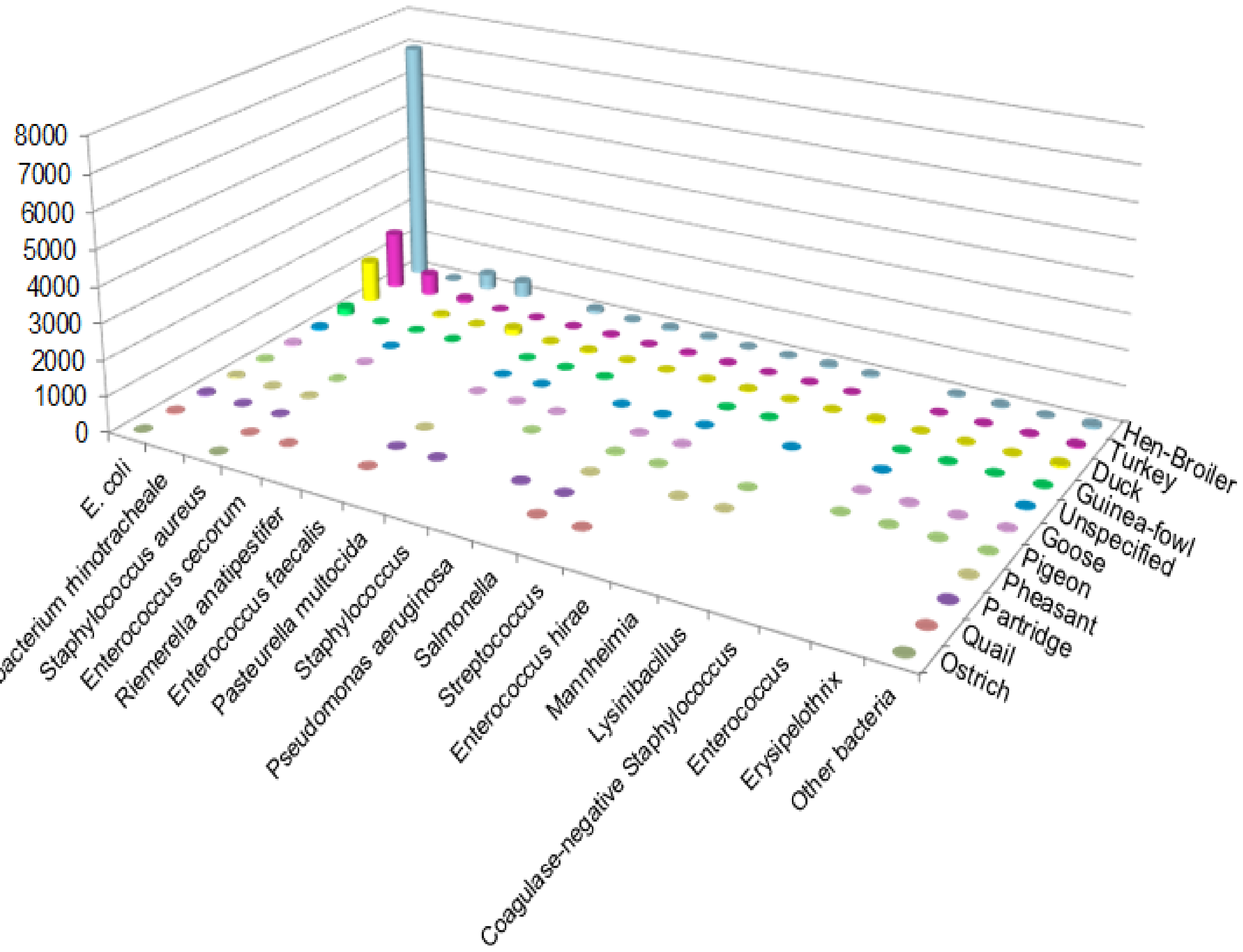


Figure 1 - Poultry 2017 – Number of antibiograms by bacteria and animal



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

Table 1, part 1 - Poultry 2017 – Number of antibiograms by bacteria and animal

Bacteria N ***(%)***	Hen-broiler	Turkey	Duck	Guinea-fowl	Poultry (unspecified)	Goose	Pigeon	Pheasant	Partridge	Quail	Ostrich	**Total N** ***(%)***
	Animal species N *(%)*											
E. coli	7,017 *(52.98)*	1,640 *(12.38)*	1,184 *(8.94)*	216 *(1.63)*	58 *(0.44)*	42 *(0.32)*	26 *(0.20)*	37 *(0.28)*	44 *(0.33)*	25 *(0.19)*	4 *(0.03)*	**10,293** ***(77.71)***
Ornithobacterium rhinotracheale	16 *(0.12)*	613 *(4.63)*		4 *(0.03)*				3 *(0.02)*	1 *(0.01)*			**637** ***(4.81)***
Staphylococcus aureus	437 *(3.30)*	96 *(0.72)*	44 *(0.33)*	15 *(0.11)*	6 *(0.05)*	3 *(0.02)*	2 *(0.02)*	1 *(0.01)*	1 *(0.01)*	2 *(0.02)*	1 *(0.01)*	**608** ***(4.59)***
Enterococcus cecorum	448 *(3.38)*	8 *(0.06)*	7 *(0.05)*	6 *(0.05)*						1 *(0.01)*		**470** ***(3.55)***
Riemerella anatipestifer		3 *(0.02)*	180 *(1.36)*									**183** ***(1.38)***
Enterococcus faecalis	111 *(0.84)*	13 *(0.10)*	20 *(0.15)*	2 *(0.02)*	1 *(0.01)*	1 *(0.01)*		1 *(0.01)*	1 *(0.01)*	1 *(0.01)*		**151** ***(1.14)***
Pasteurella multocida	28 *(0.21)*	31 *(0.23)*	43 *(0.32)*	1 *(0.01)*	2 *(0.02)*	4 *(0.03)*			1 *(0.01)*			**110** ***(0.83)***
Coagulase-unspecified *Staphylococcus*	65 *(0.49)*	3 *(0.02)*	9 *(0.07)*	7 *(0.05)*		2 *(0.02)*	2 *(0.02)*					**88** ***(0.66)***
Pseudomonas aeruginosa	43 *(0.32)*	27 *(0.20)*	4 *(0.03)*		2 *(0.02)*				1 *(0.01)*			**77** ***(0.58)***
Salmonella	9 *(0.07)*	13 *(0.10)*	10 *(0.08)*		5 *(0.04)*	7 *(0.05)*	20 *(0.15)*	8 *(0.06)*	1 *(0.01)*	2 *(0.02)*		**75** ***(0.57)***
Streptococcus	21 *(0.16)*	2 *(0.02)*	26 *(0.20)*	1 *(0.01)*	1 *(0.01)*	4 *(0.03)*	1 *(0.01)*			1 *(0.01)*		**57** ***(0.43)***
Enterococcus hirae	52 *(0.39)*	2 *(0.02)*	1 *(0.01)*	1 *(0.01)*				1 *(0.01)*				**57** ***(0.43)***
Mannheimia	41 *(0.31)*	1 *(0.01)*	6 *(0.05)*		4 *(0.03)*		1 *(0.01)*	1 *(0.01)*				**54** ***(0.41)***
Lysinibacillus			51 *(0.39)*									**51** ***(0.39)***
Coagulase-negative *Staphylococcus*	29 *(0.22)*	4 *(0.03)*	3 *(0.02)*	5 *(0.04)*	1 *(0.01)*	3 *(0.02)*	1 *(0.01)*					**46** ***(0.35)***

Table 1, part 2 - Poultry 2017 – Number of antibiograms by bacteria and animal

	Animal species N *(%)*											
Bacteria N ***(%)***	Hen-broiler	Turkey	Duck	Guinea-fowl	Poultry	Goose	Pigeon	Pheasant	Partridge	Quail	Ostrich	**Total N** ***(%)***
Enterococcus	31 *(0.23)*	5 *(0.04)*	4 *(0.03)*	1 *(0.01)*		2 *(0.02)*	2 *(0.02)*					**45** ***(0.34)***
Erysipelothrix	7 *(0.05)*	11 *(0.08)*	7 *(0.05)*	3 *(0.02)*		1 *(0.01)*	1 *(0.01)*					**30** ***(0.23)***
Other bacteria *< 30 occurrences*	81 *(0.61)*	36 *(0.27)*	63 *(0.48)*	6 *(0.05)*	9 *(0.07)*	4 *(0.03)*	3 *(0.02)*	3 *(0.02)*	2 *(0.02)*	5 *(0.04)*	1 *(0.01)*	**213** ***(1.61)***
Total N **(%)**	**8,436** ***(63.69)***	**2,508** ***(18.94)***	**1,662** ***(12.55)***	**268** ***(2.02)***	**89** ***(0.67)***	**73** ***(0.55)***	**59** ***(0.45)***	**55** ***(0.42)***	**52** ***(0.39)***	**37** ***(0.28)***	**6** ***(0.05)***	**13,245** ***(100.00)***

Table 2 - Hens and broilers 2017 – All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N=6,975)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*6,969*	**67**
Amoxicillin-Clavulanic ac.	*5,536*	**89**
Cephalexin	*2,379*	**93**
Cephalothin	*3,005*	**93**
Cefoxitin	*5,363*	**98**
Cefuroxime	*519*	**96**
Cefoperazone	*357*	**97**
Ceftiofur	*6,634*	**99**
Cefquinome	*2,209*	**98**
Spectinomycin	*2,418*	**82**
Gentamicin 10 UI	*6,840*	**96**
Neomycin	*3,747*	**98**
Apramycin	*3,623*	**100**
Tetracycline	*5,648*	**59**
Doxycycline	*614*	**62**
Florfenicol	*5,349*	**100**
Nalidixic ac.	*5,897*	**59**
Oxolinic ac.	*2,550*	**57**
Flumequine	*5,618*	**59**
Enrofloxacin	*5,203*	**94**
Marbofloxacin	*566*	**93**
Danofloxacin	*368*	**91**
Sulfonamides	*225*	**69**
Trimethoprim	*3,212*	**78**
Trimethoprim-Sulfonamides	*6,975*	**75**

Table 3 – Laying hens (table eggs and hatching eggs) 2017 – All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N= 2,319)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*2,286*	**78**
Amoxicillin-Clavulanic ac.	*1,899*	**93**
Cephalexin	*468*	**90**
Cephalothin	*1,389*	**93**
Cefoxitin	*1,856*	**98**
Ceftiofur	*2,207*	**99**
Cefquinome	*419*	**98**
Spectinomycin	*480*	**85**
Gentamicin 10 UI	*2,261*	**95**
Neomycin	*1,481*	**98**
Apramycin	*1,433*	**99**
Tetracycline	*1,823*	**69**
Doxycycline	*147*	**68**
Florfenicol	*1,826*	**99**
Nalidixic ac.	*2,135*	**66**
Oxolinic ac.	*468*	**65**
Flumequine	*1,927*	**67**
Enrofloxacin	*1,546*	**97**
Trimethoprim	*1,421*	**88**
Trimethoprim-Sulfonamides	*2,285*	**89**

Table 4 – Broilers 2017 – All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N= 4,270)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*4,256*	**61**
Amoxicillin-Clavulanic ac.	*3,232*	**87**
Cephalexin	*1,540*	**94**
Cephalothin	*1,580*	**92**
Cefoxitin	*3,123*	**98**
Cefuroxime	*263*	**95**
Cefoperazone	*139*	**96**
Ceftiofur	*4,002*	**98**
Cefquinome	*1,510*	**98**
Spectinomycin	*1,634*	**81**
Gentamicin 10 UI	*4,151*	**96**
Neomycin	*1,881*	**98**
Apramycin	*1,837*	**99**
Tetracycline	*3,448*	**54**
Doxycycline	*457*	**60**
Florfenicol	*3,151*	**99**
Nalidixic ac.	*3,648*	**55**
Oxolinic ac.	*1,776*	**57**
Flumequine	*3,442*	**56**
Enrofloxacin	*3,233*	**93**
Marbofloxacin	*173*	**91**
Danofloxacin	*140*	**91**
Trimethoprim	*1,764*	**70**
Trimethoprim-Sulfonamides	*4,262*	**69**

Table 5 - Turkeys 2017 – All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N= 1,640)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*1,637*	**52**
Amoxicillin-Clavulanic ac.	*1,164*	**86**
Cephalexin	*722*	**94**
Cephalothin	*382*	**95**
Cefoxitin	*1,105*	**99**
Ceftiofur	*1,573*	**99**
Cefquinome	*569*	**99**
Spectinomycin	*639*	**88**
Gentamicin 10 UI	*1,552*	**98**
Neomycin	*503*	**99**
Apramycin	*495*	**99**
Tetracycline	*1,219*	**61**
Doxycycline	*203*	**64**
Florfenicol	*1,085*	**99**
Nalidixic ac.	*1,401*	**80**
Oxolinic ac.	*658*	**81**
Flumequine	*1,202*	**83**
Enrofloxacin	*1,409*	**97**
Trimethoprim	*507*	**80**
Trimethoprim-Sulfonamides	*1,638*	**79**

Table 6 - Ducks 2017 – All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N= 1,184)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*1,181*	**57**
Amoxicillin-Clavulanic ac.	*998*	**77**
Cephalexin	*592*	**88**
Cephalothin	*415*	**78**
Cefoxitin	*984*	**98**
Ceftiofur	*1,079*	**97**
Cefquinome	*580*	**97**
Spectinomycin	*635*	**94**
Gentamicin 10 UI	*1,076*	**97**
Neomycin	*498*	**98**
Apramycin	*511*	**99**
Tetracycline	*1,127*	**41**
Doxycycline	*108*	**55**
Florfenicol	*1,013*	**99**
Nalidixic ac.	*964*	**72**
Oxolinic ac.	*590*	**77**
Flumequine	*1,109*	**71**
Enrofloxacin	*920*	**98**
Trimethoprim	*496*	**61**
Trimethoprim-Sulfonamides	*1,182*	**61**

Table 7 - Hens and broilers 2017 – All pathologies included - *Staphylococcus aureus*: susceptibility to antibiotics (proportion) (N= 437)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*319*	**88**
Cefoxitin	*417*	**86**
Erythromycine	*356*	**93**
Tylosin	*395*	**95**
Spiramycin	*256*	**96**
Lincomycin	*424*	**92**
Gentamicin 10 UI	*280*	**99**
Neomycin	*202*	**100**
Tetracycline	*357*	**87**
Doxycycline	*185*	**85**
Enrofloxacin	*320*	**99**
Trimethoprim-Sulfonamides	*433*	**99**

Table 8 - Hens and broilers 2017 – All pathologies included – *Enterococcus cecorum*: susceptibility to antibiotics (proportion) (N= 448)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*445*	**98**
Erythromycine	*324*	**43**
Tylosin	*312*	**40**
Spiramycin	*278*	**24**
Lincomycin	*435*	**48**
Gentamicin 500 µg	*245*	**97**
Tetracycline	*325*	**8**
Doxycycline	*103*	**12**
Trimethoprim-Sulfonamides	*445*	**37**

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Annex 7

Rabbits

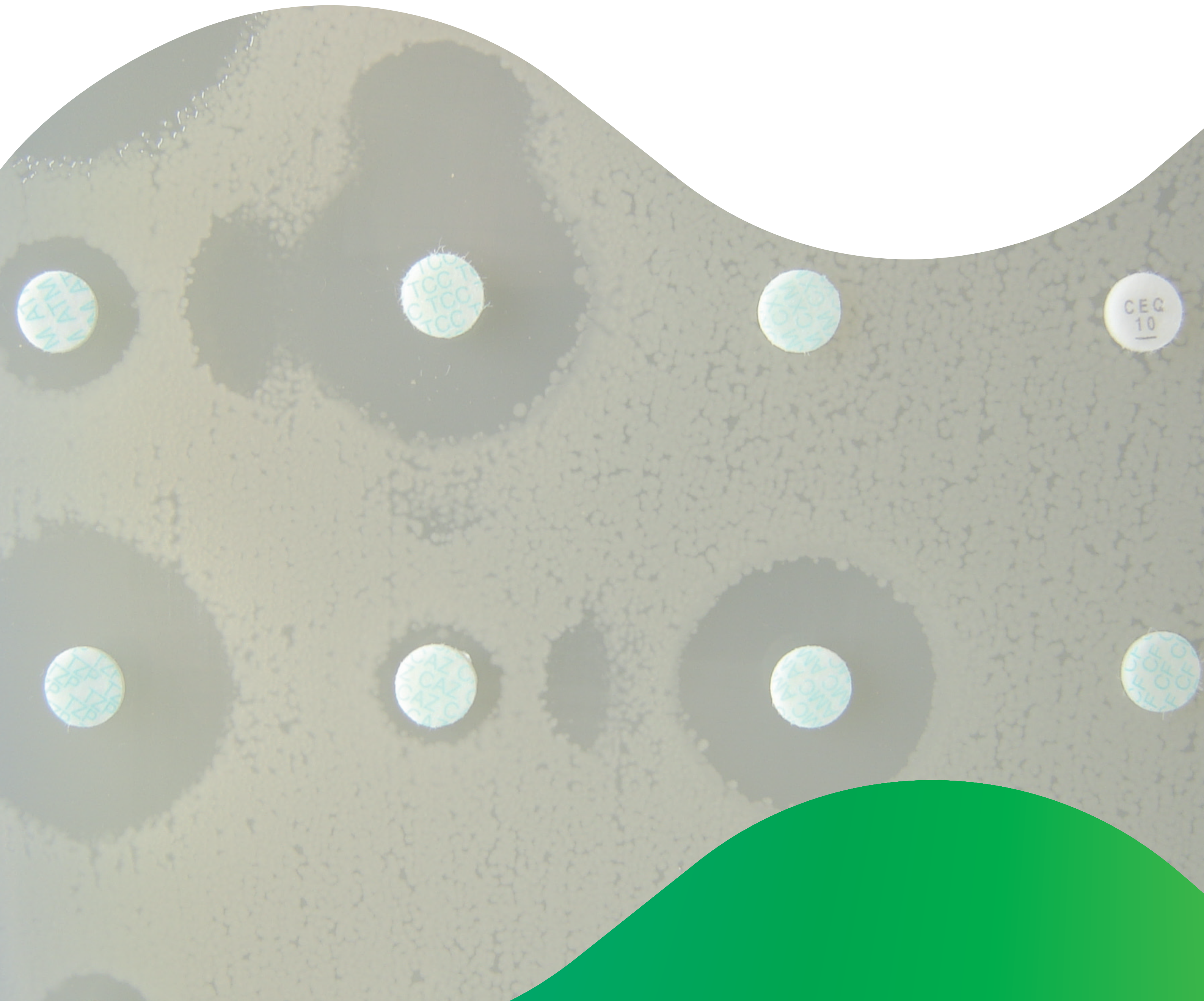
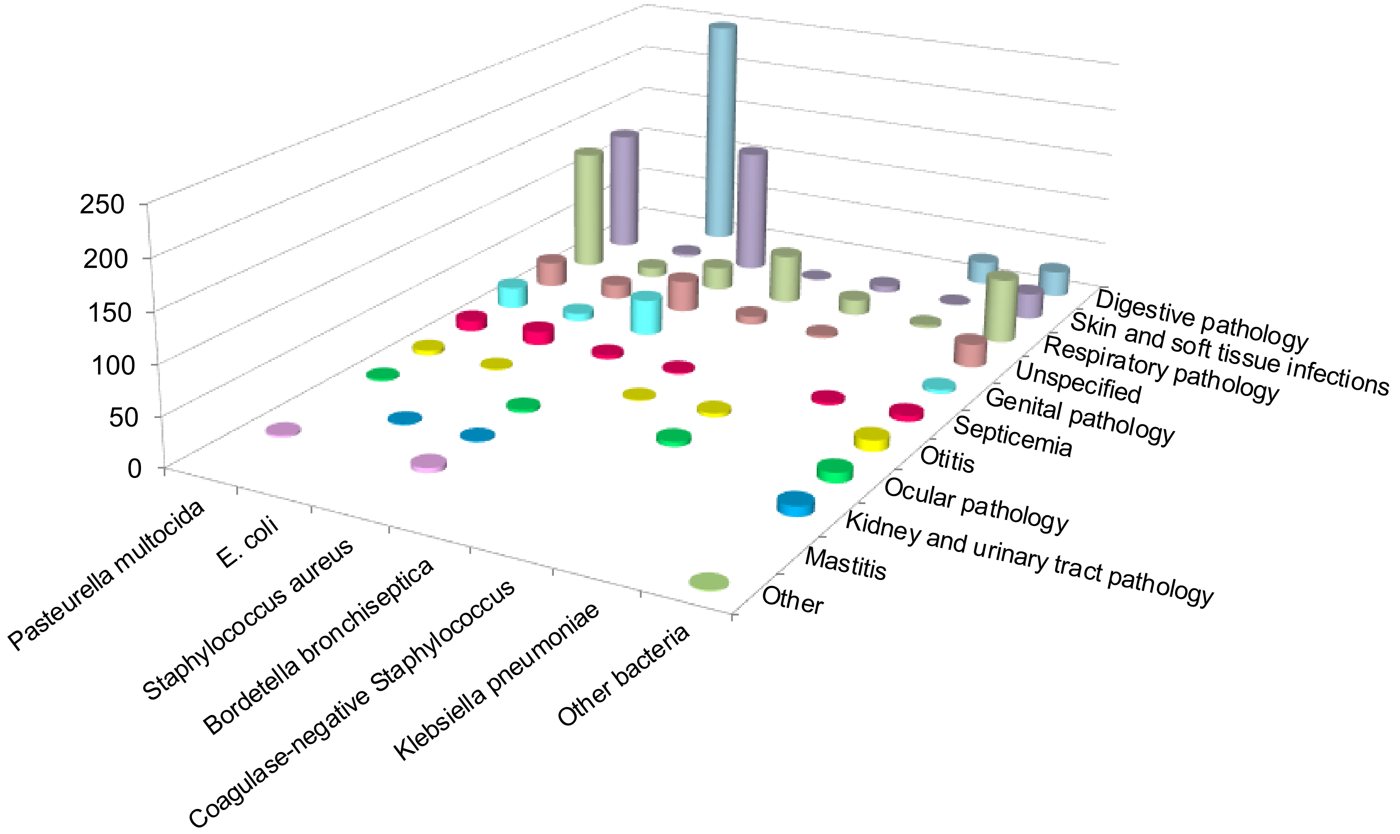


Figure 1 - Rabbits 2017 – Number of antibiograms by bacteria and pathology



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

Table 1 - Rabbits 2017 – Number of antibiograms by bacteria and pathology

	Pathology N *(%)*											
Bacteria N ***(%)***	Skin and soft tissue infections	Digestive pathology	Respiratory pathology	Unspecified	Genital pathology	Septicemia	Otitis	Ocular pathology	Kidney and urinary tract pathology	Mastitis	Other	**Total N** ***(%)***
Pasteurella multocida	129 *(10.92)*		128 *(10.84)*	26 *(2.20)*	22 *(1.86)*	11 *(0.93)*	5 *(0.42)*	2 *(0.17)*		2 *(0.17)*		**325** ***(27.52)***
E. coli	3 *(0.25)*	248 *(21.00)*	10 *(0.85)*	15 *(1.27)*	8 *(0.68)*	14 *(1.19)*	1 *(0.08)*		1 *(0.08)*			**300** ***(25.40)***
Staphylococcus aureus	132 *(11.18)*		24 *(2.03)*	33 *(2.79)*	37 *(3.13)*	4 *(0.34)*		3 *(0.25)*	1 *(0.08)*	5 *(0.42)*		**239** ***(20.24)***
Bordetella bronchiseptica	1 *(0.08)*		51 *(4.32)*	9 *(0.76)*		2 *(0.17)*	1 *(0.08)*					**64** ***(5.42)***
Coagulase-negative *Staphylococcus*	7 *(0.59)*		16 *(1.35)*	3 *(0.25)*			4 *(0.34)*	5 *(0.42)*				**35** ***(2.96)***
Klebsiella pneumoniae	1 *(0.08)*	24 *(2.03)*	3 *(0.25)*			3 *(0.25)*						**31** ***(2.62)***
Other bacteria < 30 occurrences	27 *(2.29)*	27 *(2.29)*	67 *(5.67)*	24 *(2.03)*	4 *(0.34)*	6 *(0.51)*	11 *(0.93)*	10 *(0.85)*	10 *(0.85)*		1 *(0.08)*	**187** ***15.83)***
Total N **(%)**	**300** ***(25.40)***	**299** ***(25.32)***	**299** ***(25.32)***	**110** ***(9.31)***	**71** ***(6.01)***	**40** ***(3.39)***	**22** ***(1.86)***	**20** ***(1.69)***	**12** ***(1.02)***	**7** ***(0.59)***	**1** ***(0.08)***	**1,181** ***(100.00)***

Table 2 - Rabbits 2017 - All pathologies included - *E. coli*: susceptibility to antibiotics (proportion) (N = 300)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*220*	**70**
Amoxicillin-Clavulanic ac.	*224*	**80**
Cephalexin	*192*	**82**
Cefoxitin	*201*	**96**
Ceftiofur	*264*	**100**
Cefquinome	*159*	**99**
Streptomycin 10 UI	*134*	**34**
Spectinomycin	*229*	**92**
Gentamicin 10 UI	*297*	**87**
Neomycin	*286*	**78**
Apramycin	*283*	**85**
Tetracycline	*292*	**17**
Florfenicol	*136*	**95**
Nalidixic ac.	*181*	**75**
Flumequine	*156*	**83**
Enrofloxacin	*286*	**97**
Marbofloxacin	*141*	**96**
Danofloxacin	*105*	**98**
Trimethoprim-Sulfonamides	*295*	**28**

Table 3 - Rabbits 2017 – All pathologies included - *Pasteurella multocida*: susceptibility to antibiotics (proportion) (N= 325)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*110*	**99**
Ceftiofur	*157*	**100**
Tilmicosin	*293*	**92**
Spectinomycin	*174*	**100**
Gentamicin 10 UI	*293*	**99**
Neomycin	*104*	**95**
Tetracycline	*310*	**96**
Doxycycline	*283*	**95**
Florfenicol	*129*	**100**
Nalidixic ac.	*213*	**77**
Flumequine	*194*	**94**
Enrofloxacin	*259*	**99**
Marbofloxacin	*146*	**100**
Danofloxacin	*181*	**99**
Trimethoprim-Sulfonamides	*324*	**94**

Table 4 - Rabbits 2017 – All pathologies included - *Staphylococcus aureus*: susceptibility to antibiotics (proportion) (N= 239)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*137*	**82**
Cefoxitin	*203*	**93**
Erythromycine	*193*	**38**
Spiramycin	*183*	**36**
Lincomycin	*139*	**41**
Gentamicin 10 UI	*226*	**59**
Tetracycline	*231*	**39**
Doxycycline	*209*	**57**
Enrofloxacin	*183*	**95**
Danofloxacin	*127*	**72**
Trimethoprim-Sulfonamides	*238*	**57**

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Annex 8

Fish

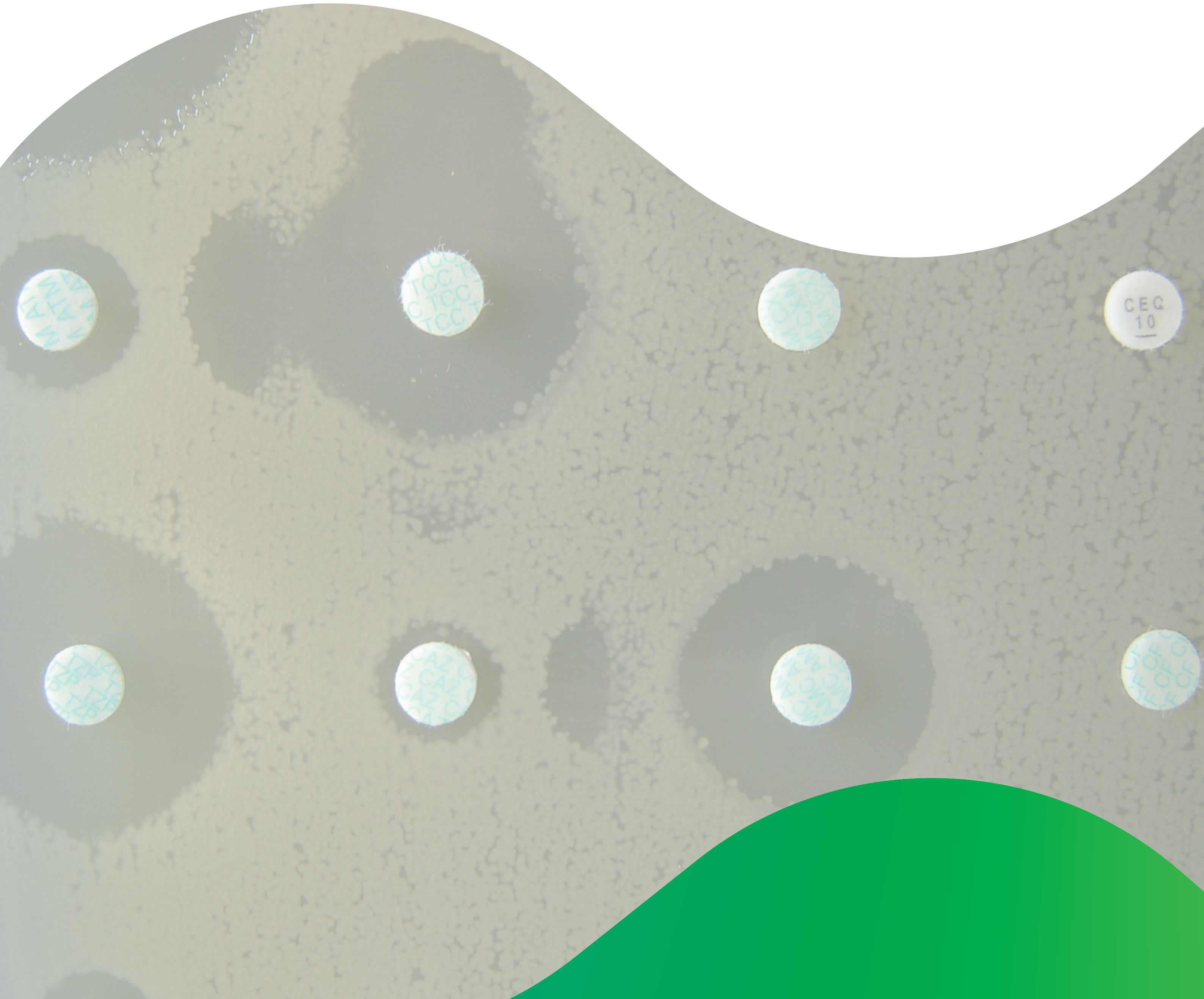

Figure 1 - Fish 2017 – Antibiogram proportions by animal species

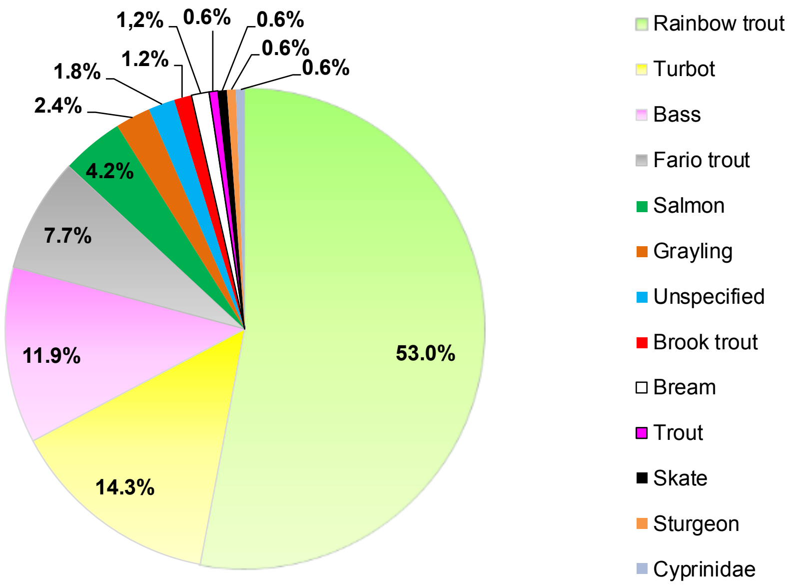

Table 1 - Fish 2017 – Number of antibiograms by bacteria and pathology

	Pathology N *(%)*		
Bacteria N *(%)*	Unspecified	Septicemia	**Total N *(%)***
Aeromonas salmonicida	77 *(45.8)*	38 *(22.6)*	**115 *(68.4)***
Vibrio	7 *(4.2)*	6 *(3.6)*	**13 *(7.7)***
Aeromonas	10 *(5.9)*	2 *(1.2)*	**12 *(7.1)***
Yersinia ruckeri	9 *(5.4)*	1 *(0.6)*	**10 *(5.9)***
Carnobacterium	7 *(4.2)*	2 *(1.2)*	**9 *(5.4)***
Edwardsiella tarda	4 *(2.4)*	1 *(0.6)*	**5 *(3.0)***
Photobacterium		2 *(1.2)*	**2 *(1.2)***
Streptococcus	1 *(0.6)*		**1 *(0.6)***
Lactococcus	1 *(0.6)*		**1 *(0.6)***
Total N (%)	**116 *(69.1)***	**52 *(30.9)***	**168 *(100.0)***

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Annex 9

Horses

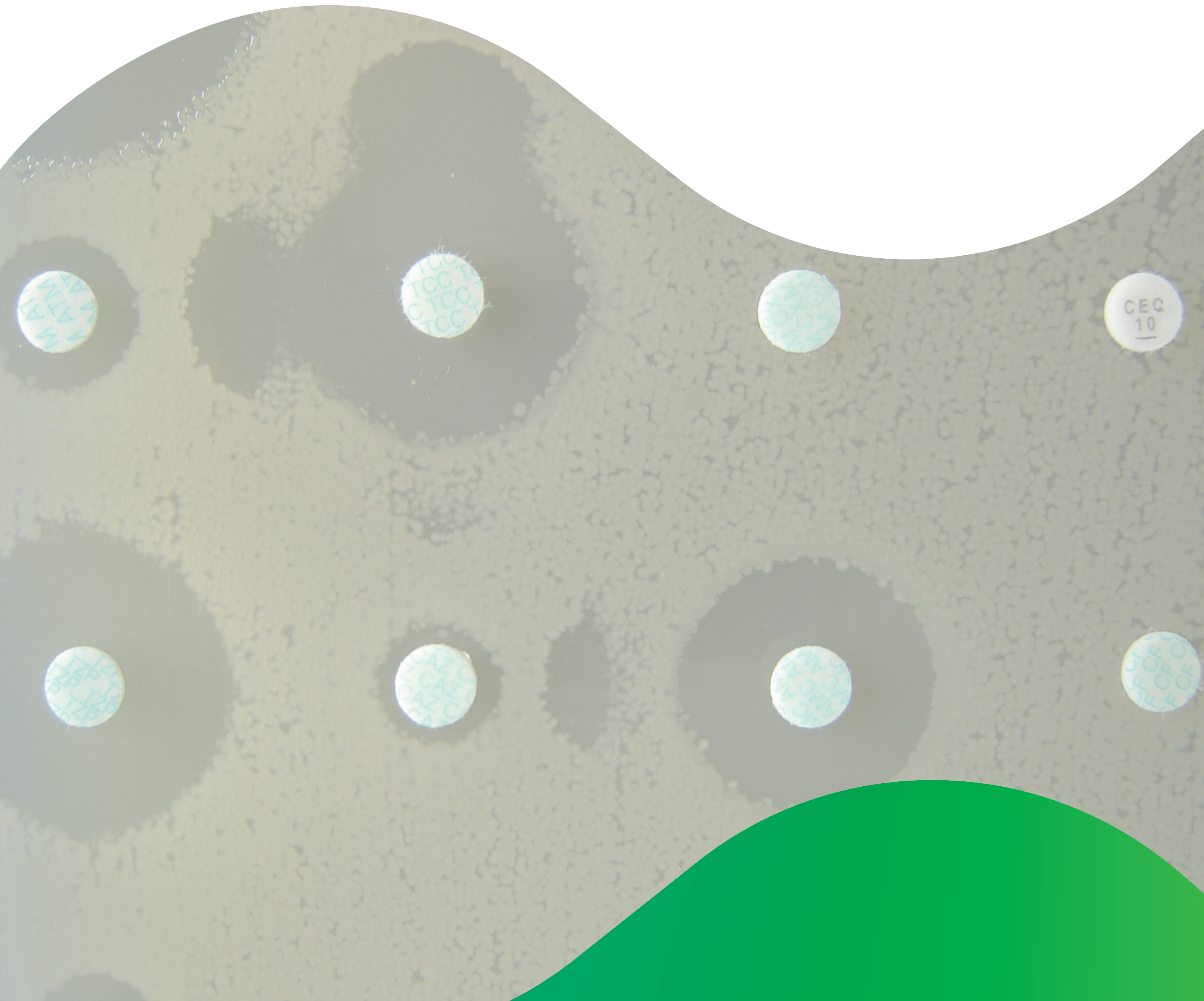
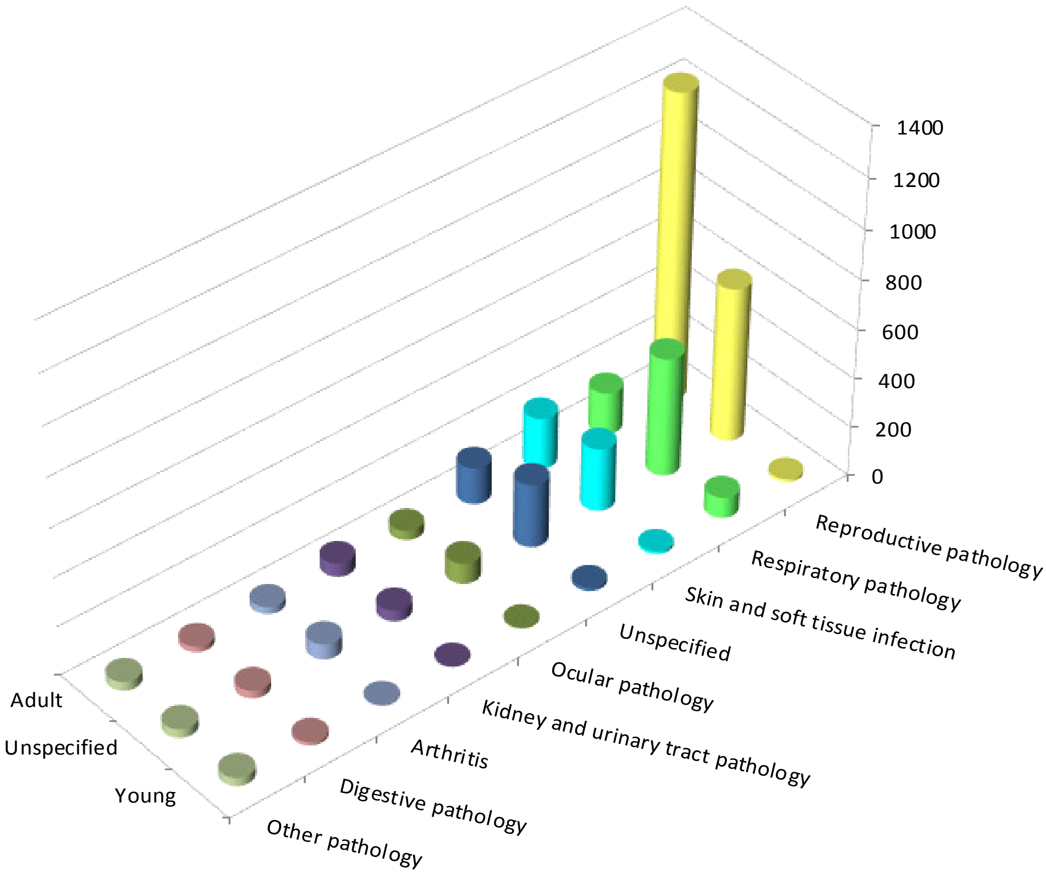


Figure 1 - Horses 2017 – Number of antibiograms by age group and pathology

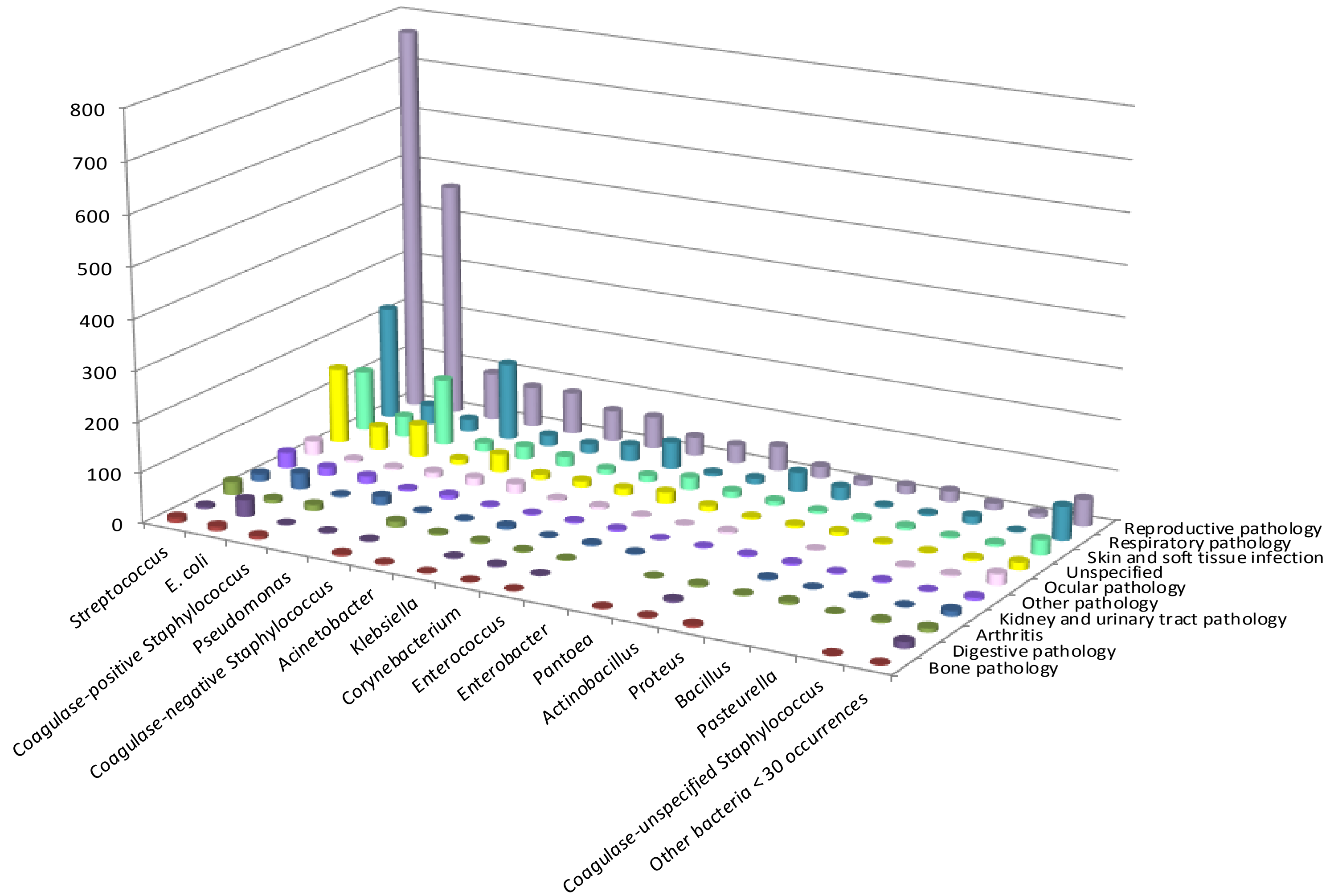


Note: *all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Horses 2017 – Number of antibiograms by age group and pathology

	Age group N (%)			
Pathology N (%)	Adult	Unspecified	Young	**Total N (%)**
Reproductive pathology	1,245 *(30.71)*	626 *(15.44)*	12 *(0.30)*	**1,883 *(46.45)***
Respiratory pathology	170 *(4.19)*	482 *(11.89)*	84 *(2.07)*	**736 *(18.15)***
Skin and soft tissue infections	209 *(5.16)*	257 *(6.34)*	11 *(0.27)*	**477 *(11.77)***
Unspecified	149 *(3.68)*	258 *(6.36)*	13 *(0.32)*	**420 *(10.36)***
Ocular pathology	38 *(0.94)*	84 *(2.07)*	4 *(0.10)*	**126 *(3.11)***
Kidney and urinary tract pathology	55 *(1.36)*	45 *(1.11)*	2 *(0.05)*	**102 *(2.52)***
Arthritis	29 *(0.72)*	62 *(1.53)*	3 *(0.07)*	**94 *(2.32)***
Digestive pathology	23 *(0.57)*	31 *(0.76)*	13 *(0.32)*	**67 *(1.65)***
Bone pathology	15 *(0.37)*	25 *(0.62)*	4 *(0.10)*	**44 *(1.09)***
Omphalitis			27 *(0.67)*	**27 *(0.67)***
Otitis	13 *(0.32)*	11 *(0.27)*	2 *(0.05)*	**26 *(0.64)***
Mastitis	22 *(0.54)*			**22 *(0.54)***
Systemic pathology	1 *(0.02)*	12 *(0.3)*		**13 *(0.32)***
Cardiovascular disease		11 *(0.27)*		**11 *(0.27)***
Septicemia			3 *(0.07)*	**3 *(0.07)***
Oral pathology	1 *(0.02)*	1 *(0.02)*		**2 *(0.05)***
Nervous system pathology			1 *(0.02)*	**1 *(0.02)***
Total N *(%)*	**1,970 *(48.59)***	**1,905 *(46.99)***	**179 *(4.42)***	**4,054 *(100.00)***

Figure 2 - Horses 2017 – 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 2017 – Number of antibiograms by bacterial group and pathology

Bacteria N (%)	Pathology N (%)																	Total N (%)
	Reproductive pathology	Respiratory pathology	Skin and soft tissue infections	Unspecified	Ocular pathology	Kidney and urinary tract pathology	Arthritis	Digestive pathology	Bone pathology	Omphalitis	Otitis	Mastitis	Systemic pathology	Cardio-vascular disease	Septicemia	Oral pathology	Nervous system pathology	
Streptococcus	767 *(18.92)*	225 *(5.55)*	119 *(2.94)*	150 *(3.7)*	28 *(0.69)*	15 *(0.37)*	26 *(0.64)*	5 *(0.12)*	10 *(0.25)*	11 *(0.27)*	4 *(0.1)*	10 *(0.25)*	4 *(0.1)*	1 *(0.02)*	1 *(0.02)*			**1,376 *(33.94)***
E. coli	466 *(11.49)*	38 *(0.94)*	41 *(1.01)*	46 *(1.13)*	5 *(0.12)*	32 *(0.79)*	7 *(0.17)*	34 *(0.84)*	9 *(0.22)*	5 *(0.12)*	3 *(0.07)*	1 *(0.02)*	5 *(0.12)*		2 *(0.05)*			**694 *(17.12)***
Coagulase-positive *Staphylococcus*	94 *(2.32)*	24 *(0.59)*	132 *(3.26)*	65 *(1.6)*	4 *(0.1)*	3 *(0.07)*	12 *(0.3)*	1 *(0.02)*	6 *(0.15)*	2 *(0.05)*	5 *(0.12)*	3 *(0.07)*	2 *(0.05)*	2 *(0.05)*				**355 *(8.76)***
Pseudomonas	80 *(1.97)*	153 *(3.77)*	17 *(0.42)*	10 *(0.25)*	11 *(0.27)*	17 *(0.42)*		2 *(0.05)*			3 *(0.07)*	1 *(0.02)*						**294 *(7.25)***
Coagulase-negative *Staphylococcus*	83 *(2.05)*	21 *(0.52)*	25 *(0.62)*	36 *(0.89)*	15 *(0.37)*	2 *(0.05)*	11 *(0.27)*	2 *(0.05)*	4 *(0.1)*	1 *(0.02)*	1 *(0.02)*	3 *(0.07)*		3 *(0.07)*				**207 *(5.11)***
Acinetobacter	61 *(1.5)*	19 *(0.47)*	20 *(0.49)*	11 *(0.27)*	19 *(0.47)*	2 *(0.05)*	4 *(0.1)*		2 *(0.05)*		2 *(0.05)*							**140 *(3.45)***
Klebsiella	63 *(1.55)*	32 *(0.79)*	10 *(0.25)*	13 *(0.32)*	4 *(0.1)*	6 *(0.15)*	4 *(0.1)*	2 *(0.05)*	1 *(0.02)*			1 *(0.02)*		1 *(0.02)*				**137 *(3.38)***
Corynebacterium	37 *(0.91)*	53 *(1.31)*	12 *(0.3)*	14 *(0.35)*	5 *(0.12)*	1 *(0.02)*	2 *(0.05)*	3 *(0.07)*	1 *(0.02)*		1 *(0.02)*		1 *(0.02)*			1 *(0.02)*		**131 *(3.23)***
Enterococcus	36 *(0.89)*	6 *(0.15)*	24 *(0.59)*	22 *(0.54)*	2 *(0.05)*	4 *(0.1)*	2 *(0.05)*	1 *(0.02)*	1 *(0.02)*	3 *(0.07)*		1 *(0.02)*						**102 *(2.52)***
Enterobacter	49 *(1.21)*	11 *(0.27)*	12 *(0.3)*	11 *(0.27)*	1 *(0.02)*	2 *(0.05)*												**86 *(2.12)***
Pantoea	23 *(0.57)*	39 *(0.96)*	9 *(0.22)*	4 *(0.1)*	4 *(0.1)*		1 *(0.02)*		2 *(0.05)*					2 *(0.05)*				**84 *(2.07)***
Actinobacillus	12 *(0.3)*	25 *(0.62)*	5 *(0.12)*	5 *(0.12)*			4 *(0.1)*	4 *(0.1)*	2 *(0.05)*		2 *(0.05)*		1 *(0.02)*					**60 *(1.48)***
Proteus	16 *(0.39)*	3 *(0.07)*	6 *(0.15)*	8 *(0.2)*	1 *(0.02)*	4 *(0.1)*	2 *(0.05)*		4 *(0.1)*	3 *(0.07)*	1 *(0.02)*							**48 *(1.18)***
Bacillus	21 *(0.52)*	4 *(0.1)*	6 *(0.15)*	3 *(0.07)*		1 *(0.02)*	6 *(0.15)*					1 *(0.02)*		1 *(0.02)*				**43 *(1.06)***
Pasteurella	13 *(0.32)*	15 *(0.37)*	3 *(0.07)*	1 *(0.02)*	2 *(0.05)*	1 *(0.02)*	1 *(0.02)*				2 *(0.05)*					1 *(0.02)*		**39 *(0.96)***
Coagulase-unspecified *Staphylococcus*	9 *(0.22)*	1 *(0.02)*	6 *(0.15)*	6 *(0.15)*	3 *(0.07)*	1 *(0.02)*	4 *(0.1)*		1 *(0.02)*			1 *(0.02)*						**32 *(0.79)***
Other bacteria < 30 occurrences	53 *(1.31)*	67 *(1.65)*	30 *(0.74)*	15 *(0.37)*	22 *(0.54)*	11 *(0.27)*	8 *(0.2)*	13 *(0.32)*	1 *(0.02)*	2 *(0.05)*	2 *(0.05)*			1 *(0.02)*			1 *(0.02)*	**226 *(5.57)***
Total N *(%)*	**1,883 *(46.45)***	**736 *(18.15)***	**477 *(11.77)***	**420 *(10.36)***	**126 *(3.11)***	**102 *(2.52)***	**94 *(2.32)***	**67 *(1.65)***	**44 *(1.09)***	**27 *(0.67)***	**26 *(0.64)***	**22 *(0.54)***	**13 *(0.32)***	**11 *(0.27)***	**3 *(0.07)***	**2 *(0.05)***	**1 *(0.02)***	**4,054 *(100.00)***

Table 3 - Horses 2017 – Reproductive pathology – All ages groups included – *E. coli*: susceptibility to antibiotics (proportion) (N= 466)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*466*	**70**
Amoxicillin-Clavulanic ac.	*466*	**79**
Cephalexin	*330*	**87**
Cefoxitin	*328*	**98**
Cefuroxime	*51*	**100**
Cefoperazone	*81*	**96**
Ceftiofur	*465*	**96**
Cefquinome	*464*	**96**
Streptomycin 10 UI	*316*	**74**
Spectinomycin	*55*	**60**
Kanamycin 30 UI	*451*	**92**
Gentamicin 10 UI	*466*	**95**
Neomycin	*239*	**91**
Amikacine	*135*	**100**
Apramycin	*64*	**100**
Tetracycline	*330*	**75**
Florfenicol	*314*	**98**
Nalidixic ac.	*271*	**97**
Oxolinic ac.	*137*	**97**
Flumequine	*192*	**96**
Enrofloxacin	*465*	**97**
Marbofloxacin	*459*	**97**
Danofloxacin	*92*	**99**
Sulfonamides	*34*	**76**
Trimethoprim-Sulfonamides	*466*	**72**

Table 4 - Horses 2017 – Respiratory pathology – All ages groups included – *E. coli*: susceptibility to antibiotics (proportion) (N= 38)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*38*	**50**
Amoxicillin-Clavulanic ac.	*38*	**66**
Cephalexin	*31*	**81**
Cefoxitin	*38*	**92**
Ceftiofur	*38*	**84**
Cefquinome	*37*	**84**
Streptomycin 10 UI	*30*	**60**
Kanamycin 30 UI	*30*	**83**
Gentamicin 10 UI	*38*	**79**
Tetracycline	*33*	**82**
Florfenicol	*31*	**100**
Nalidixic ac.	*37*	**89**
Enrofloxacin	*38*	**92**
Marbofloxacin	*32*	**100**
Trimethoprim-Sulfonamides	*38*	**45**

Table 5 - Horses 2017 – Skin and soft tissue infections – All ages groups included – *E. coli*: susceptibility to antibiotics (proportion) (N= 41)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*41*	**76**
Amoxicillin-Clavulanic ac.	*41*	**88**
Cephalexin	*41*	**76**
Cefoxitin	*39*	**95**
Ceftiofur	*41*	**85**
Cefquinome	*38*	**87**
Streptomycin 10 UI	*38*	**63**
Kanamycin 30 UI	*38*	**89**
Gentamicin 10 UI	*41*	**83**
Tetracycline	*40*	**73**
Florfenicol	*37*	**97**
Nalidixic ac.	*41*	**98**
Enrofloxacin	*41*	**98**
Marbofloxacin	*41*	**98**
Trimethoprim-Sulfonamides	*41*	**66**

Table 6 - Horses 2017 – All pathologies and ages groups included – *Klebsiella*: susceptibility to antibiotics (proportion) (N= 137)

Antibiotic	*Total (N)*	**% S**
Amoxicillin-Clavulanic ac.	*136*	**76**
Cefoxitin	*111*	**92**
Cefuroxime	*32*	**100**
Cefoperazone	*35*	**97**
Ceftiofur	*136*	**87**
Cefquinome	*131*	**88**
Streptomycin 10 UI	*101*	**71**
Kanamycin 30 UI	*117*	**86**
Gentamicin 10 UI	*137*	**84**
Neomycin	*69*	**87**
Tetracycline	*107*	**76**
Florfenicol	*100*	**95**
Nalidixic ac.	*92*	**87**
Flumequine	*43*	**67**
Enrofloxacin	*135*	**89**
Marbofloxacin	*128*	**95**
Danofloxacin	*33*	**100**
Trimethoprim-Sulfonamides	*136*	**70**

Table 7 - Horses 2017 – All pathologies and ages groups included – *Enterobacter:* susceptibility to antibiotics (proportion) (N= 86)

Antibiotic	*Total (N)*	**% S**
Amoxicillin-Clavulanic ac.	*86*	**15**
Cephalexin	*67*	**13**
Cefoxitin	*73*	**15**
Ceftiofur	*86*	**73**
Cefquinome	*84*	**83**
Streptomycin 10 UI	*62*	**56**
Kanamycin 30 UI	*76*	**64**
Gentamicin 10 UI	*86*	**65**
Tetracycline	*69*	**74**
Florfenicol	*63*	**90**
Nalidixic ac.	*65*	**80**
Enrofloxacin	*86*	**94**
Marbofloxacin	*83*	**96**
Trimethoprim-Sulfonamides	*85*	**64**

Table 8 - Horses 2017 – Skin and soft tissue infections – All age groups included – *Staphylococcus aureus*: susceptibility to antibiotics (proportion) (N= 100)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*100*	**57**
Cefoxitin	*92*	**78**
Oxacillin	*72*	**86**
Erythromycine	*100*	**95**
Lincomycin	*32*	**94**
Streptomycin 10 UI	*92*	**90**
Kanamycin 30 UI	*96*	**80**
Gentamicin 10 UI	*100*	**82**
Tetracycline	*93*	**75**
Enrofloxacin	*87*	**98**
Marbofloxacin	*99*	**98**
Trimethoprim-Sulfonamides	*99*	**97**
Rifampicin	*70*	**94**

Table 9 - Horses 2017 – Reproductive pathology – All age groups included – *Streptococcus groupe C and Streptococcus zooepidemicus:* susceptibility to antibiotics (proportion) (N= 579)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*525*	**99**
Erythromycine	*575*	**91**
Tulathromycin	*48*	**96**
Tylosin	*85*	**94**
Spiramycin	*257*	**96**
Lincomycin	*167*	**89**
Streptomycin 500 µg	*478*	**96**
Kanamycin 1000 µg	*465*	**96**
Gentamicin 500 µg	*481*	**99**
Tetracycline	*477*	**22**
Florfenicol	*69*	**99**
Enrofloxacin	*579*	**27**
Marbofloxacin	*554*	**67**
Trimethoprim-Sulfonamides	*530*	**64**
Rifampicin	*491*	**59**

Table 10 - Horses 2017 – Respiratory pathology – All age groups included – *Streptococcus:* susceptibility to antibiotics (proportion) (N= 225)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*222*	**95**
Erythromycine	*225*	**94**
Spiramycin	*73*	**99**
Lincomycin	*74*	**85**
Streptomycin 500 µg	*199*	**97**
Kanamycin 1000 µg	*189*	**98**
Gentamicin 500 µg	*203*	**99**
Tetracycline	*191*	**46**
Florfenicol	*36*	**92**
Enrofloxacin	*224*	**22**
Marbofloxacin	*202*	**56**
Trimethoprim-Sulfonamides	*220*	**67**
Rifampicin	*168*	**64**

Table 11 - Horses 2017 – Skin and soft tissue infections – All age groups included – *Streptococcus:* susceptibility to antibiotics (proportion) (N= 119)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*119*	**97**
Erythromycine	*119*	**92**
Lincomycin	*33*	**94**
Streptomycin 500 µg	*116*	**99**
Kanamycin 1000 µg	*115*	**100**
Gentamicin 500 µg	*115*	**100**
Tetracycline	*116*	**40**
Enrofloxacin	*115*	**17**
Marbofloxacin	*110*	**61**
Trimethoprim-Sulfonamides	*118*	**82**
Rifampicin	*97*	**59**

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Annex 10

Dogs

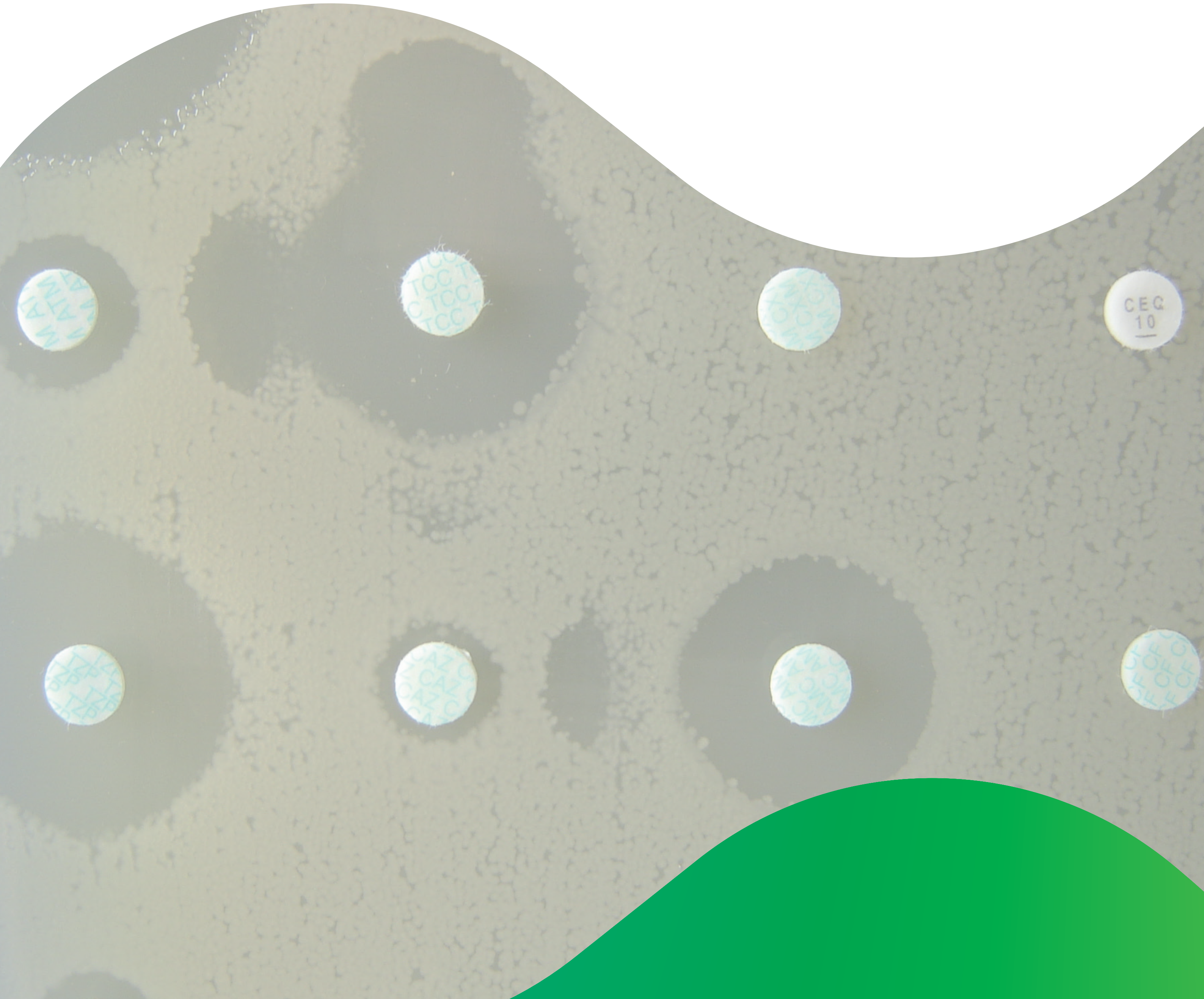
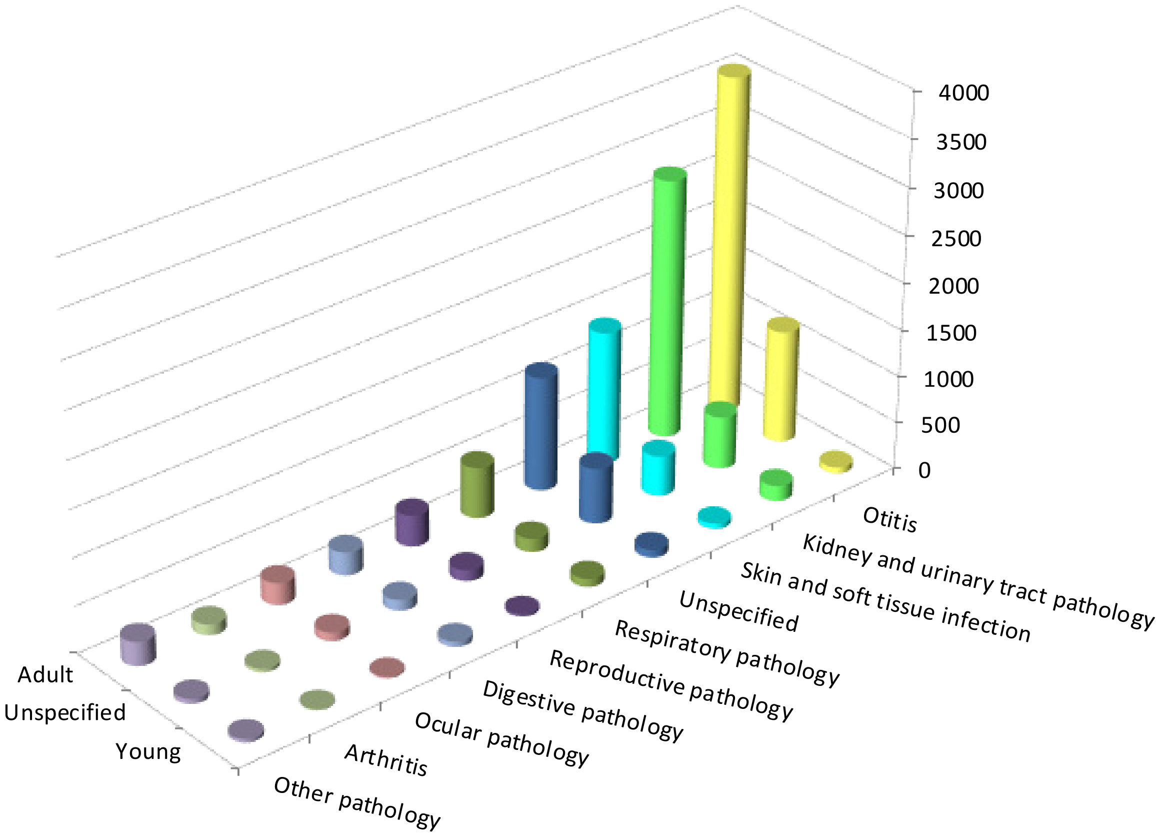


Figure 1 - Dogs 2017 – Number of antibiograms by age group and pathology

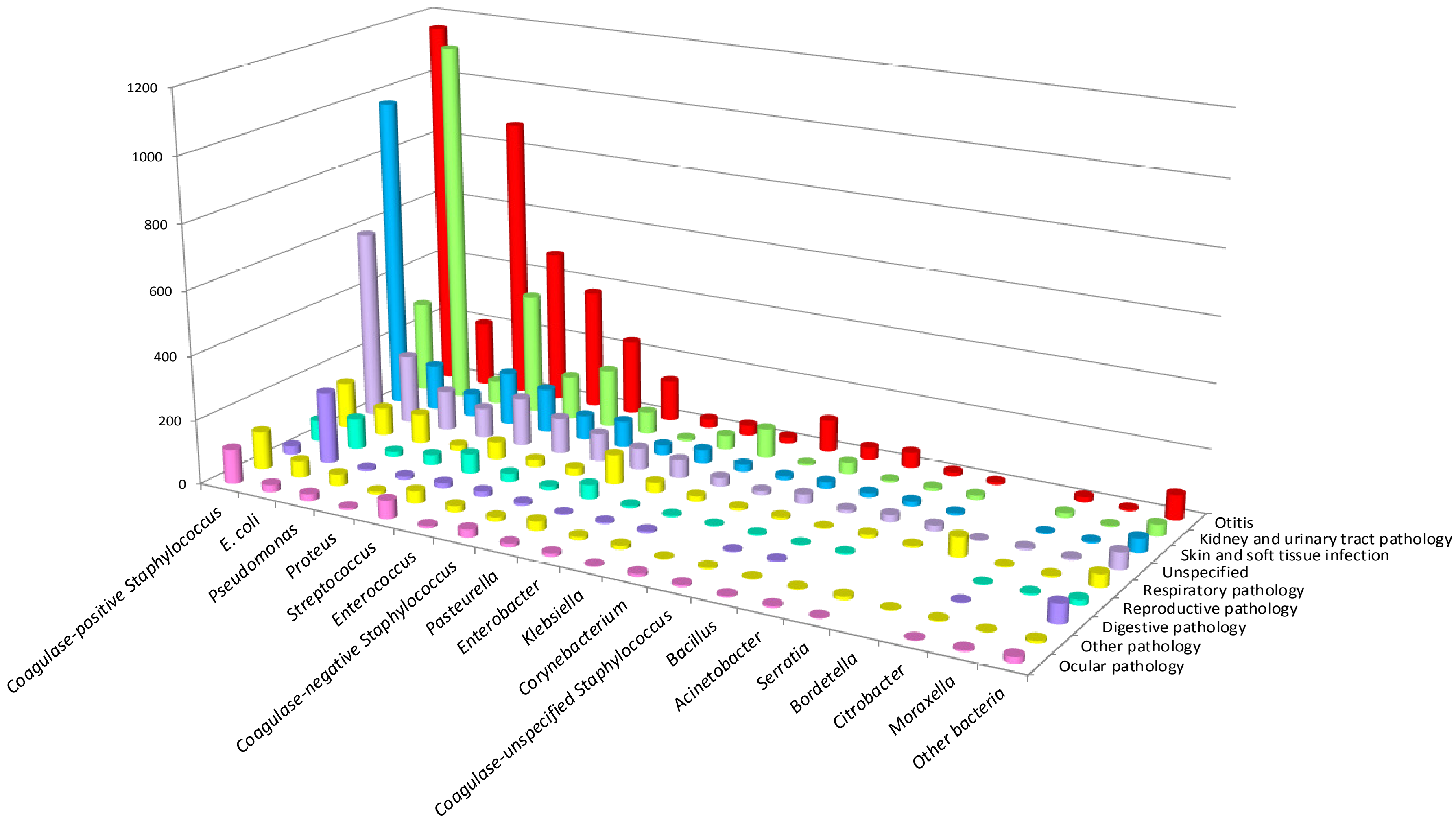


***Note:** all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Dogs 2017 – Number of antibiograms by age group and pathology

	Age group N (%)			
Pathology N (%)	Adult	Unspecified	Young	**Total N (%)**
Otitis	3,588 *(24.54)*	1,199 *(8.2)*	67 *(0.46)*	**4,854** ***(33.2)***
Kidney and urinary tract pathology	2,761 *(18.89)*	557 *(3.81)*	163 *(1.11)*	**3 481** ***(23.81)***
Skin and soft tissue infections	1,415 *(9.68)*	427 *(2.92)*	55 *(0.38)*	**1 897** ***(12.98)***
Unspecified	1,217 *(8.32)*	590 *(4.04)*	83 *(0.57)*	**1,890** ***(12.93)***
Respiratory pathology	544 *(3.72)*	142 *(0.97)*	85 *(0.58)*	**771** ***(5.27)***
Reproductive pathology	332 *(2.27)*	116 *(0.79)*	26 *(0.18)*	**474** ***(3.24)***
Digestive pathology	245 *(1.68)*	114 *(0.78)*	56 *(0.38)*	**415** ***(2.84)***
Ocular pathology	233 *(1.59)*	90 *(0.62)*	15 *(0.1)*	**338** ***(2.31)***
Arthritis	115 *(0.79)*	34 *(0.23)*	8 *(0.05)*	**157** ***(1.07)***
Bone pathology	98 *(0.67)*	26 *(0.18)*	9 *(0.06)*	**133** ***(0.91)***
Oral pathology	96 *(0.66)*	15 *(0.1)*	7 *(0.05)*	**118** ***(0.81)***
Systemic pathology	17 *(0.12)*	7 *(0.05)*	16 *(0.11)*	**40** ***(0.27)***
Mastitis	32 *(0.22)*			**32** ***(0.22)***
Muscle pathology	8 *(0.05)*	1 *(0.01)*		**9** ***(0.06)***
Nervous system pathology	4 *(0.03)*		1 *(0.01)*	**5** ***(0.03)***
Septicemia		2 *(0.01)*	1 *(0.01)*	**3** ***(0.02)***
Cardiac pathology			2 *(0.01)*	**2** ***(0.01)***
Total N ***(%)***	**10,705** ***(73.23)***	**3,320** ***(22.71)***	**594** ***(4.06)***	**14,619** ***(100.00)***

Figure 2 - Dogs 2017 – 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, part 1 - Dogs 2017 – Number of antibiograms by bacteria and pathology

Bacteria N (%)	Otitis	Kidney and urinary tract pathology	Skin and soft tissue infections	Unspecified	Respiratory pathology	Reproductive pathology	Digestive pathology	Ocular pathology	Arthritis	Bone pathology	Oral pathology	Systemic pathology	Mastitis	Muscle pathology	Nervous system pathology	Septicemia	Cardiac pathology	**Total N (%)**
	Pathology N (%)																	
Coagulase-positive *Staphylococcus*	1,468 *(10.04)*	459 *(3.14)*	963 *(6.59)*	646 *(4.42)*	165 *(1.13)*	82 *(0.56)*	22 *(0.15)*	123 *(0.84)*	58 *(0.4)*	60 *(0.41)*	18 *(0.12)*	4 *(0.03)*	9 *(0.06)*	1 *(0.01)*		1 *(0.01)*		**4,079** ***(27.9)***
E. coli	277 *(1.89)*	1,541 *(10.54)*	126 *(0.86)*	253 *(1.73)*	104 *(0.71)*	120 *(0.82)*	253 *(1.73)*	17 *(0.12)*	3 *(0.02)*	7 *(0.05)*	11 *(0.08)*	18 *(0.12)*	7 *(0.05)*	1 *(0.01)*				**2,738** ***(18.73)***
Pseudomonas	1 126 *(7.7)*	82 *(0.56)*	101 *(0.69)*	158 *(1.08)*	112 *(0.77)*	25 *(0.17)*	5 *(0.03)*	24 *(0.16)*	12 *(0.08)*	3 *(0.02)*	4 *(0.03)*	2 *(0.01)*	1 *(0.01)*	1 *(0.01)*	1 *(0.01)*			**1,657** ***(11.33)***
Proteus	614 *(4.2)*	503 *(3.44)*	175 *(1.2)*	136 *(0.93)*	22 *(0.15)*	35 *(0.24)*	9 *(0.06)*	7 *(0.05)*	6 *(0.04)*	8 *(0.05)*	12 *(0.08)*	1 *(0.01)*	1 *(0.01)*				1 *(0.01)*	**1,530** ***(10.47)***
Streptococcus	468 *(3.2)*	149 *(1.02)*	115 *(0.79)*	149 *(1.02)*	32 *(0.22)*	80 *(0.55)*	24 *(0.16)*	66 *(0.45)*	22 *(0.15)*	7 *(0.05)*	18 *(0.12)*	2 *(0.01)*	3 *(0.02)*	1 *(0.01)*	1 *(0.01)*	1 *(0.01)*		**1,138** ***(7.78)***
Enterococcus	283 *(1.94)*	262 *(1.79)*	92 *(0.63)*	91 *(0.62)*	20 *(0.14)*	24 *(0.16)*	24 *(0.16)*	5 *(0.03)*	2 *(0.01)*	2 *(0.01)*	4 *(0.03)*	3 *(0.02)*	1 *(0.01)*	1 *(0.01)*		1 *(0.01)*	1 *(0.01)*	**816** ***(5.58)***
Coagulase-negative *Staphylococcus*	158 *(1.08)*	115 *(0.79)*	93 *(0.64)*	90 *(0.62)*	28 *(0.19)*	11 *(0.08)*	5 *(0.03)*	24 *(0.16)*	16 *(0.11)*	9 *(0.06)*	6 *(0.04)*	1 *(0.01)*	5 *(0.03)*		3 *(0.02)*			**564** ***(3.86)***
Pasteurella	42 *(0.29)*	6 *(0.04)*	41 *(0.28)*	100 *(0.68)*	108 *(0.74)*	65 *(0.44)*	2 *(0.01)*	10 *(0.07)*	13 *(0.09)*	6 *(0.04)*	31 *(0.21)*	1 *(0.01)*	1 *(0.01)*					**426** ***(2.91)***
Klebsiella	34 *(0.23)*	120 *(0.82)*	15 *(0.1)*	41 *(0.28)*	21 *(0.14)*	6 *(0.04)*	17 *(0.12)*	4 *(0.03)*	1 *(0.01)*	7 *(0.05)*	2 *(0.01)*	4 *(0.03)*						**272** ***(1.86)***
Enterobacter	39 *(0.27)*	70 *(0.48)*	40 *(0.27)*	49 *(0.34)*	23 *(0.16)*	3 *(0.02)*	12 *(0.08)*	4 *(0.03)*	6 *(0.04)*	8 *(0.05)*	4 *(0.03)*	3 *(0.02)*	2 *(0.01)*	2 *(0.01)*				**265** ***(1.81)***
Corynebacterium	93 *(0.64)*	8 *(0.05)*	31 *(0.21)*	20 *(0.14)*	8 *(0.05)*	2 *(0.01)*	1 *(0.01)*	8 *(0.05)*		1 *(0.01)*	2 *(0.01)*							**174** ***(1.19)***
Bacillus	60 *(0.41)*	10 *(0.07)*	21 *(0.14)*	16 *(0.11)*	8 *(0.05)*	3 *(0.02)*	1 *(0.01)*	8 *(0.05)*	2 *(0.01)*	3 *(0.02)*	1 *(0.01)*							**133** ***(0.91)***
Coagulase-unspecified *Staphylococcus*	40 *(0.27)*	19 *(0.13)*	12 *(0.08)*	20 *(0.14)*	4 *(0.03)*	2 *(0.01)*		6 *(0.04)*	1 *(0.01)*	1 *(0.01)*				1 *(0.01)*				**106** ***(0.73)***

Table 2, part 2 - Dogs 2017 – 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	Arthritis	Bone pathology	Oral pathology	Systemic pathology	Mastitis	Muscle pathology	Nervous system pathology	Septicemia	Cardiac pathology	**Total N *(%)***
Acinetobacter	13 *(0.09)*	18 *(0.12)*	21 *(0.14)*	17 *(0.12)*	6 *(0.04)*	3 *(0.02)*		7 *(0.05)*		1 *(0.01)*	1 *(0.01)*		1 *(0.01)*					**88 *(0.6)***
Citrobacter	24 *(0.16)*	21 *(0.14)*	10 *(0.07)*	12 *(0.08)*	4 *(0.03)*	3 *(0.02)*	3 *(0.02)*	2 *(0.01)*		1 *(0.01)*								**80 *(0.55)***
Serratia	9 *(0.06)*	13 *(0.09)*	5 *(0.03)*	26 *(0.18)*	6 *(0.04)*		3 *(0.02)*	6 *(0.04)*	4 *(0.03)*	5 *(0.03)*				1 *(0.01)*				**78 *(0.53)***
Bordetella				1 *(0.01)*	58 *(0.4)*						1 *(0.01)*	1 *(0.01)*						**61 *(0.42)***
Pantoea	9 *(0.06)*	18 *(0.12)*	9 *(0.06)*	12 *(0.08)*	4 *(0.03)*		2 *(0.01)*	2 *(0.01)*		1 *(0.01)*								**57 *(0.39)***
Moraxella	5 *(0.03)*	3 *(0.02)*	4 *(0.03)*	4 *(0.03)*	4 *(0.03)*	2 *(0.01)*	1 *(0.01)*	6 *(0.04)*	1 *(0.01)*									**30 *(0.21)***
Other bacteria < 30 occurrences	92 *(0.63)*	64 *(0.44)*	23 *(0.16)*	49 *(0.34)*	34 *(0.23)*	8 *(0.05)*	31 *(0.21)*	9 *(0.06)*	10 *(0.07)*	3 *(0.02)*	3 *(0.02)*		1 *(0.01)*					**327 *(2.24)***
Total N *(%)*	**4,854 *(33.2)***	**3,481 *(23.81)***	**1,897 *(12.98)***	**1,890 *(12.93)***	**771 *(5.27)***	**474 *(3.24)***	**415 *(2.84)***	**338 *(2.31)***	**157 *(1.07)***	**133 *(0.91)***	**118 *(0.81)***	**40 *(0.27)***	**32 *(0.22)***	**9 *(0.06)***	**5 *(0.03)***	**3 *(0.02)***	**2 *(0.01)***	**14,619 *(100.00)***

Table 3 - Dogs 2017 – Kidney and urinary tract pathology – All age groups included – *E. coli:* susceptibility to antibiotics (proportion) (N= 1,541)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*1,527*	**67**
Amoxicillin-Clavulanic ac.	*1,538*	**69**
Cephalexin	*1,508*	**75**
Cephalothin	*79*	**63**
Cefoxitin	*574*	**91**
Cefuroxime	*95*	**77**
Cefoperazone	*153*	**80**
Cefovecin	*250*	**86**
Ceftiofur	*1,533*	**94**
Cefquinome	*607*	**96**
Streptomycin 10 UI	*650*	**71**
Kanamycin 30 UI	*426*	**90**
Tobramycin	*755*	**97**
Gentamicin 10 UI	*1,529*	**96**
Neomycin	*338*	**92**
Apramycin	*48*	**92**
Tetracycline	*1,377*	**82**
Doxycycline	*225*	**48**
Chloramphenicol	*942*	**90**
Florfenicol	*443*	**93**
Nalidixic ac.	*1,258*	**88**
Oxolinic ac.	*64*	**81**
Flumequine	*200*	**86**
Enrofloxacin	*1,460*	**93**
Marbofloxacin	*1,416*	**93**
Danofloxacin	*79*	**94**
Sulfonamides	*67*	**84**
Trimethoprim-Sulfonamides	*1,534*	**87**

Table 4 - Dogs 2017 – Skin and soft tissue infections – All age groups included – *E. coli:* susceptibility to antibiotics (proportion) (N= 126)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*124*	**57**
Amoxicillin-Clavulanic ac.	*126*	**66**
Cephalexin	*125*	**69**
Cefoxitin	*58*	**91**
Ceftiofur	*126*	**94**
Cefquinome	*59*	**93**
Streptomycin 10 UI	*53*	**60**
Kanamycin 30 UI	*35*	**86**
Tobramycin	*53*	**96**
Gentamicin 10 UI	*125*	**97**
Neomycin	*33*	**85**
Tetracycline	*111*	**78**
Chloramphenicol	*68*	**84**
Florfenicol	*55*	**96**
Nalidixic ac.	*109*	**86**
Enrofloxacin	*120*	**91**
Marbofloxacin	*117*	**91**
Trimethoprim-Sulfonamides	*125*	**80**

Table 5 - Dogs 2017 – Otitis – All age groups included – *E. coli*: susceptibility to antibiotics (proportion) (N= 277)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*275*	**73**
Amoxicillin-Clavulanic ac.	*277*	**77**
Cephalexin	*268*	**78**
Cefoxitin	*151*	**89**
Cefovecin	*38*	**82**
Ceftiofur	*275*	**95**
Cefquinome	*140*	**98**
Streptomycin 10 UI	*138*	**77**
Kanamycin 30 UI	*91*	**91**
Tobramycin	*108*	**99**
Gentamicin 10 UI	*275*	**98**
Neomycin	*80*	**86**
Tetracycline	*260*	**83**
Doxycycline	*37*	**46**
Chloramphenicol	*140*	**85**
Florfenicol	*124*	**92**
Nalidixic ac.	*256*	**88**
Enrofloxacin	*274*	**96**
Marbofloxacin	*247*	**95**
Trimethoprim-Sulfonamides	*274*	**90**

Table 6 - Dogs 2017 – All pathologies and age groups included – *Pasteurella*: susceptibility to antibiotics (proportion) (N= 426)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*418*	**98**
Amoxicillin-Clavulanic ac.	*422*	**99**
Cephalexin	*414*	**95**
Cefoxitin	*50*	**88**
Cefovecin	*40*	**95**
Ceftiofur	*401*	**99**
Cefquinome	*208*	**98**
Streptomycin 10 UI	*199*	**69**
Kanamycin 30 UI	*144*	**88**
Tobramycin	*175*	**98**
Gentamicin 10 UI	*422*	**98**
Neomycin	*104*	**75**
Tetracycline	*358*	**97**
Doxycycline	*101*	**97**
Chloramphenicol	*213*	**99**
Florfenicol	*158*	**99**
Nalidixic ac.	*314*	**93**
Flumequine	*47*	**87**
Enrofloxacin	*422*	**97**
Marbofloxacin	*397*	**99**
Danofloxacin	*55*	**98**
Trimethoprim	*55*	**82**
Trimethoprim-Sulfonamides	*366*	**95**

Table 7 - Dogs 2017 – Otitis – All age groups included – *Staphylococcus pseudintermedius:* susceptibility to antibiotics (proportion) (N= 1,148)

Antibiotic	Total (N)	% S
Penicillin G	*1,127*	**23**
Oxacillin	*819*	**95**
Cefovecin	*603*	**92**
Erythromycine	*1,122*	**73**
Tylosin	*152*	**76**
Spiramycin	*526*	**75**
Lincomycin	*1,003*	**76**
Streptomycin 10 UI	*672*	**74**
Kanamycin 30 UI	*489*	**74**
Gentamicin 10 UI	*1,123*	**89**
Neomycin	*366*	**82**
Tetracycline	*1,105*	**62**
Doxycycline	*61*	**89**
Chloramphenicol	*528*	**78**
Florfenicol	*434*	**100**
Enrofloxacin	*814*	**92**
Marbofloxacin	*1,052*	**93**
Pradofloxacin	*54*	**96**
Sulfonamides	*70*	**37**
Trimethoprim-Sulfonamides	*1,124*	**90**
Fusidic ac.	*823*	**97**
Rifampicin	*103*	**98**

Table 8 - Dogs 2017 – Skin and soft tissue infections – All age groups included – *Staphylococcus pseudintermedius:* susceptibility to antibiotics (proportion) (N= 791)

Antibiotic	Total (N)	% S
Penicillin G	*790*	**15**
Oxacillin	*541*	**89**
Cefovecin	*553*	**88**
Erythromycine	*786*	**66**
Tylosin	*120*	**79**
Spiramycin	*326*	**74**
Lincomycin	*674*	**70**
Streptomycin 10 UI	*365*	**68**
Kanamycin 30 UI	*261*	**70**
Tobramycin	*30*	**83**
Gentamicin 10 UI	*790*	**88**
Neomycin	*242*	**79**
Tetracycline	*744*	**59**
Doxycycline	*58*	**90**
Chloramphenicol	*451*	**78**
Florfenicol	*174*	**100**
Enrofloxacin	*664*	**90**
Marbofloxacin	*742*	**89**
Pradofloxacin	*35*	**89**
Sulfonamides	*53*	**49**
Trimethoprim-Sulfonamides	*763*	**81**
Fusidic ac.	*550*	**96**
Rifampicin	*46*	**98**

Table 9 - Dogs 2017 – Kidney and urinary tract pathology – All age groups included – *Staphylococcus pseudintermedius:* susceptibility to antibiotics (proportion) (N= 459)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*312*	**15**
Oxacillin	*219*	**94**
Cefovecin	*128*	**91**
Erythromycine	*305*	**71**
Spiramycin	*121*	**73**
Lincomycin	*289*	**75**
Streptomycin 10 UI	*185*	**72**
Kanamycin 30 UI	*162*	**69**
Tobramycin	*32*	**81**
Gentamicin 10 UI	*311*	**91**
Neomycin	*86*	**80**
Tetracycline	*271*	**59**
Doxycycline	*43*	**79**
Chloramphenicol	*124*	**81**
Florfenicol	*117*	**100**
Enrofloxacin	*206*	**88**
Marbofloxacin	*305*	**90**
Trimethoprim-Sulfonamides	*311*	**86**
Fusidic ac.	*199*	**98**
Rifampicin	*30*	**93**

Table 10 - Dogs 2017 – All pathologies and age groups included – All age groups included – *Staphylococcus aureus:* susceptibility to antibiotics (proportion) (N= 478)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*467*	**22**
Cefoxitin	*459*	**80**
Oxacillin	*255*	**87**
Erythromycine	*455*	**70**
Tylosin	*40*	**88**
Spiramycin	*202*	**72**
Lincomycin	*414*	**78**
Streptomycin 10 UI	*233*	**66**
Kanamycin 30 UI	*127*	**87**
Gentamicin 10 UI	*471*	**91**
Neomycin	*150*	**71**
Tetracycline	*466*	**73**
Chloramphenicol	*318*	**81**
Florfenicol	*106*	**100**
Enrofloxacin	*418*	**89**
Marbofloxacin	*421*	**87**
Pradofloxacin	*43*	**84**
Sulfonamides	*56*	**36**
Trimethoprim-Sulfonamides	*475*	**90**
Fusidic ac.	*365*	**96**

Table 11 - Dogs 2017 – Otitis – All age groups included – *Staphylococcus aureus:* susceptibility to antibiotics (proportion) (N= 135)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*130*	**32**
Cefoxitin	*128*	**93**
Oxacillin	*71*	**99**
Erythromycine	*127*	**72**
Spiramycin	*64*	**69**
Lincomycin	*112*	**79**
Streptomycin 10 UI	*67*	**58**
Kanamycin 30 UI	*31*	**71**
Gentamicin 10 UI	*134*	**92**
Neomycin	*52*	**75**
Tetracycline	*132*	**69**
Chloramphenicol	*90*	**86**
Enrofloxacin	*124*	**92**
Marbofloxacin	*114*	**90**
Trimethoprim-Sulfonamides	*134*	**93**
Fusidic ac.	*103*	**97**

Table 12 - Dogs 2017 – Skin and soft tissue infections – All age groups included – *Staphylococcus aureus:* susceptibility to antibiotics (proportion) (N= 75)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*75*	**17**
Cefoxitin	*68*	**78**
Oxacillin	*34*	**88**
Erythromycine	*73*	**73**
Spiramycin	*50*	**74**
Lincomycin	*71*	**77**
Streptomycin 10 UI	*50*	**62**
Gentamicin 10 UI	*74*	**93**
Neomycin	*36*	**72**
Tetracycline	*73*	**68**
Chloramphenicol	*51*	**76**
Enrofloxacin	*71*	**96**
Marbofloxacin	*61*	**89**
Trimethoprim-Sulfonamides	*75*	**87**
Fusidic ac.	*48*	**94**

Table 13 - Dogs 2017 – Kidney and urinary tract pathology – All age groups included – *Staphylococcus aureus:* susceptibility to antibiotics (proportion) (N= 74)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*75*	**17**
Cefoxitin	*68*	**78**
Oxacillin	*34*	**88**
Erythromycine	*73*	**73**
Spiramycin	*50*	**74**
Lincomycin	*71*	**77**
Streptomycin 10 UI	*50*	**62**
Gentamicin 10 UI	*74*	**93**
Neomycin	*36*	**72**
Tetracycline	*73*	**68**
Chloramphenicol	*51*	**76**
Enrofloxacin	*71*	**96**
Marbofloxacin	*61*	**89**
Trimethoprim-Sulfonamides	*75*	**87**
Fusidic ac.	*48*	**94**

Table 14 - Dogs 2017 – Otitis – All age groups included – *Streptococcus*: susceptibility to antibiotics (proportion) (N= 468)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*425*	**90**
Cefovecin	*90*	**90**
Erythromycine	*448*	**79**
Tylosin	*87*	**86**
Spiramycin	*266*	**87**
Lincomycin	*432*	**80**
Streptomycin 500 µg	*366*	**92**
Kanamycin 1000 µg	*345*	**98**
Gentamicin 500 µg	*434*	**98**
Tetracycline	*436*	**35**
Doxycycline	*38*	**53**
Chloramphenicol	*116*	**64**
Florfenicol	*236*	**98**
Enrofloxacin	*449*	**56**
Marbofloxacin	*436*	**83**
Trimethoprim-Sulfonamides	*450*	**79**
Rifampicin	*52*	**40**

Table 15 - Dogs 2017 – Skin and soft tissue infections – All age groups included – *Streptococcus*: susceptibility to antibiotics (proportion) (N= 115)

Antibiotic	*Total (N)*	**% S**
Oxacillin	*106*	**90**
Erythromycine	*110*	**77**
Spiramycin	*54*	**83**
Lincomycin	*101*	**75**
Streptomycin 500 µg	*81*	**83**
Kanamycin 1000 µg	*71*	**97**
Gentamicin 500 µg	*107*	**93**
Tetracycline	*100*	**42**
Chloramphenicol	*48*	**81**
Florfenicol	*30*	**97**
Enrofloxacin	*114*	**57**
Marbofloxacin	*112*	**79**
Trimethoprim-Sulfonamides	*104*	**83**

Table 16 - Dogs 2017 – All pathologies and age groups included – *Proteus mirabilis*: susceptibility to antibiotics (proportion) (N= 1,469)

Antibiotic	*Total (N)*	**% S**
Amoxicillin-Clavulanic ac.	*1,468*	**90**
Cephalexin	*1,436*	**79**
Cephalothin	*79*	**91**
Cefoxitin	*517*	**91**
Cefuroxime	*123*	**96**
Cefovecin	*138*	**98**
Ceftiofur	*1,459*	**98**
Cefquinome	*539*	**98**
Streptomycin 10 UI	*522*	**74**
Spectinomycin	*31*	**71**
Kanamycin 30 UI	*392*	**85**
Tobramycin	*838*	**93**
Gentamicin 10 UI	*1,466*	**91**
Neomycin	*259*	**88**
Apramycin	*57*	**89**
Chloramphenicol	*950*	**65**
Florfenicol	*432*	**97**
Nalidixic ac.	*1,317*	**85**
Oxolinic ac.	*40*	**95**
Flumequine	*137*	**91**
Enrofloxacin	*1,421*	**90**
Marbofloxacin	*1,394*	**96**
Danofloxacin	*99*	**96**
Sulfonamides	*41*	**88**
Trimethoprim-Sulfonamides	*1,463*	**78**

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Annex 11

Cats

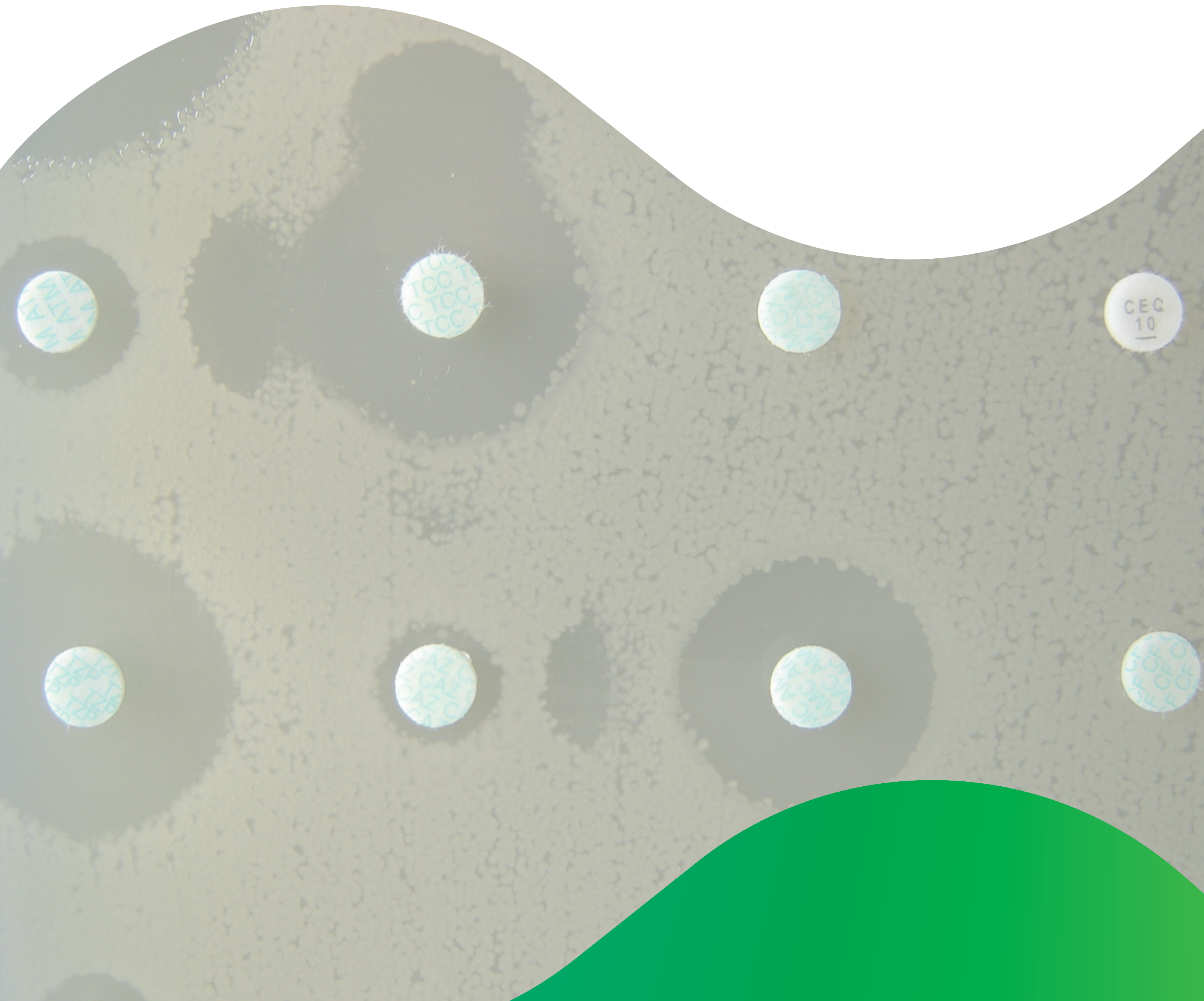
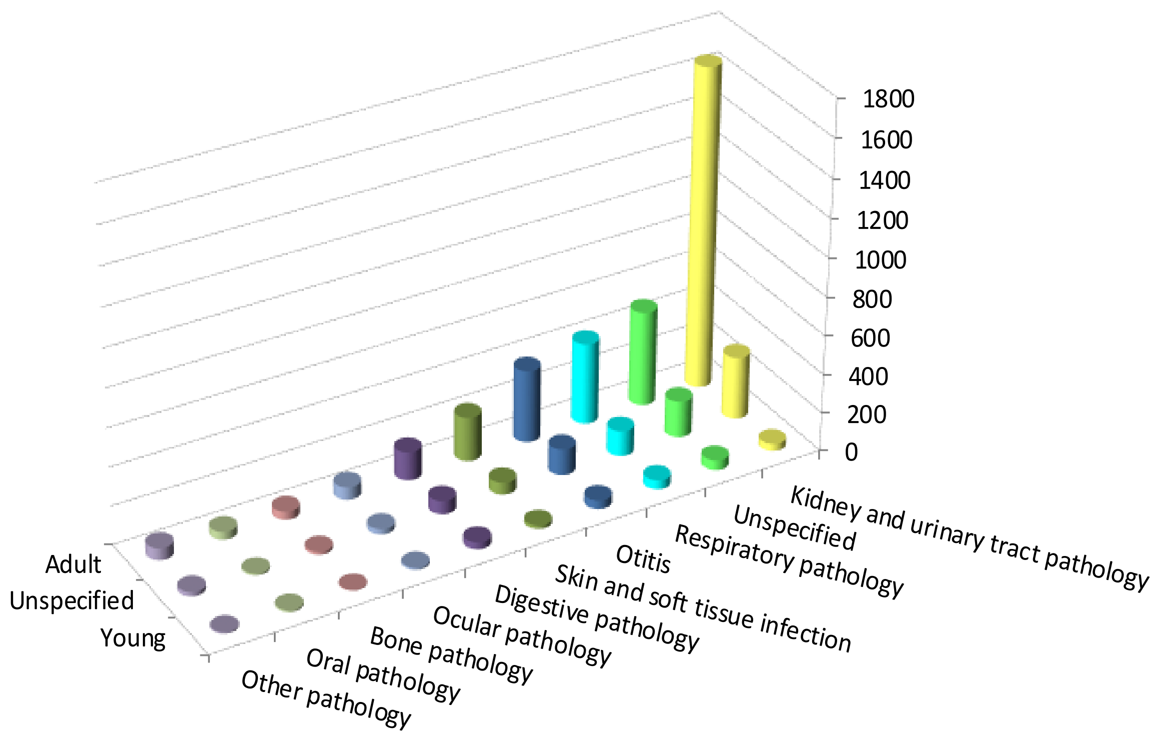


Figure 1 - Cats 2017 – Number of antibiograms by age group and pathology

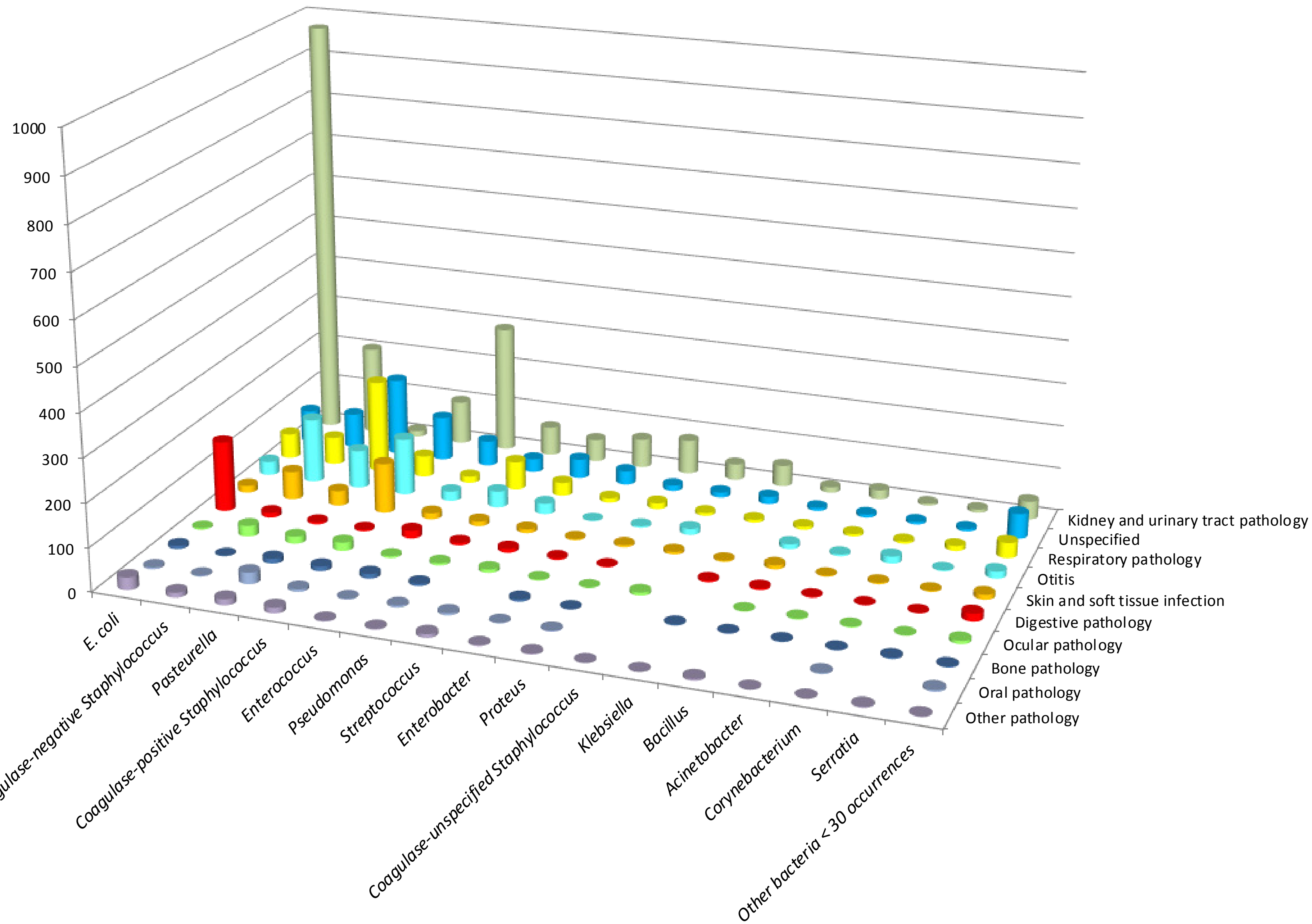


Note: *all values are detailed in table 1 (including other pathologies, representing less than 1%, grouped together)*

Table 1 - Cats 2017 – Number of antibiograms by age group and pathology

Pathology N (%)	Age group N (%)			Total N (%)
	Adult	Unspecified	Young	
Kidney and urinary tract pathology	1,666 *(34.85)*	323 *(6.76)*	37 *(0.77)*	**2,026** ***(42.38)***
Unspecified	492 *(10.29)*	188 *(3.93)*	50 *(1.05)*	**730** ***(15.27)***
Respiratory pathology	421 *(8.81)*	131 *(2.74)*	47 *(0.98)*	**599** ***(12.53)***
Otitis	376 *(7.86)*	135 *(2.82)*	44 *(0.92)*	**555** ***(11.61)***
Skin and soft tissue infections	229 *(4.79)*	62 *(1.3)*	18 *(0.38)*	**309** ***(6.46)***
Digestive pathology	147 *(3.07)*	69 *(1.44)*	35 *(0.73)*	**251** ***(5.25)***
Ocular pathology	66 *(1.38)*	27 *(0.56)*	10 *(0.21)*	**103** ***(2.15)***
Bone pathology	42 *(0.88)*	15 *(0.31)*	3 *(0.06)*	**60** ***(1.25)***
Oral pathology	41 *(0.86)*	9 *(0.19)*	8 *(0.17)*	**58** ***(1.21)***
Reproductive pathology	26 *(0.54)*	9 *(0.19)*	1 *(0.02)*	**36** ***(0.75)***
Arthritis	23 *(0.48)*	11 *(0.23)*	1 *(0.02)*	**35** ***(0.73)***
Systemic pathology	9 *(0.19)*	1 *(0.02)*	1 *(0.02)*	**11** ***(0.23)***
Septicemia			3 *(0.06)*	**3** ***(0.06)***
Cardiac pathology	1 *(0.02)*	1 *(0.02)*		**2** ***(0.04)***
Nervous system pathology	2 *(0.04)*			**2** ***(0.04)***
Mastitis	1 *(0.02)*			**1** ***(0.02)***
Total N *(%)*	**3,542 *(74.08)***	**981 *(20.52)***	**258 *(5.4)***	**4,781 *(100.00)***

Figure 2 - Cats 2017 – 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 2017 – Number of antibiograms by bacteria and pathology

Bacteria N **(%)**	Kidney and urinary tract pathology	Unspecified	Respiratory pathology	Otitis	Skin and soft tissue infections	Digestive pathology	Ocular pathology	Bone pathology	Oral pathology	Reproductive pathology	Arthritis	Systemic pathology	Septicemia	Cardiac pathology	Nervous system pathology	Mastitis	**Total N** ***(%)***
	Pathology N (%)																
E. coli	971 *(20.31)*	75 *(1.57)*	58 *(1.21)*	32 *(0.67)*	16 *(0.33)*	163 *(3.41)*	3 *(0.06)*	7 *(0.15)*	4 *(0.08)*	18 *(0.38)*		6 *(0.13)*	1 *(0.02)*	2 *(0.04)*		1 *(0.02)*	**1,357** ***(28.38)***
Coagulase-negative *Staphylococcus*	205 *(4.29)*	81 *(1.69)*	64 *(1.34)*	149 *(3.12)*	65 *(1.36)*	11 *(0.23)*	25 *(0.52)*	1 *(0.02)*	2 *(0.04)*	6 *(0.13)*	3 *(0.06)*	1 *(0.02)*			1 *(0.02)*		**614** ***(12.84)***
Pasteurella	14 *(0.29)*	180 *(3.76)*	214 *(4.48)*	89 *(1.86)*	35 *(0.73)*	5 *(0.1)*	16 *(0.33)*	11 *(0.23)*	26 *(0.54)*		12 *(0.25)*	1 *(0.02)*	1 *(0.02)*				**604** ***(12.63)***
Coagulase-positive *Staphylococcus*	101 *(2.11)*	102 *(2.13)*	49 *(1.02)*	132 *(2.76)*	115 *(2.41)*	4 *(0.08)*	19 *(0.4)*	10 *(0.21)*	6 *(0.13)*	4 *(0.08)*	8 *(0.17)*	1 *(0.02)*					**551** ***(11.52)***
Enterococcus	295 *(6.17)*	59 *(1.23)*	15 *(0.31)*	22 *(0.46)*	14 *(0.29)*	18 *(0.38)*	4 *(0.08)*	10 *(0.21)*	2 *(0.04)*	1 *(0.02)*		1 *(0.02)*					**441** ***(9.22)***
Pseudomonas	67 *(1.4)*	31 *(0.65)*	66 *(1.38)*	38 *(0.79)*	11 *(0.23)*	6 *(0.13)*	5 *(0.1)*	5 *(0.1)*	4 *(0.08)*		2 *(0.04)*						**235** ***(4.92)***
Streptococcus	52 *(1.09)*	45 *(0.94)*	31 *(0.65)*	25 *(0.52)*	9 *(0.19)*	9 *(0.19)*	8 *(0.17)*		5 *(0.1)*	4 *(0.08)*	3 *(0.06)*		1 *(0.02)*				**192** ***(4.02)***
Enterobacter	68 *(1.42)*	32 *(0.67)*	10 *(0.21)*	1 *(0.02)*	3 *(0.06)*	4 *(0.08)*	2 *(0.04)*	5 *(0.1)*	1 *(0.02)*		2 *(0.04)*						**128** ***(2.68)***
Proteus	80 *(1.67)*	13 *(0.27)*	14 *(0.29)*	4 *(0.08)*	5 *(0.1)*	2 *(0.04)*	1 *(0.02)*	1 *(0.02)*	2 *(0.04)*	2 *(0.04)*							**124** ***(2.59)***
Coagulase-unspecified *Staphylococcus*	37 *(0.77)*	12 *(0.25)*	7 *(0.15)*	14 *(0.29)*	6 *(0.13)*		7 *(0.15)*			1 *(0.02)*							**84** ***(1.76)***
Klebsiella	49 *(1.02)*	17 *(0.36)*	7 *(0.15)*		3 *(0.06)*	4 *(0.08)*		2 *(0.04)*									**82** ***(1.72)***
Bacillus	12 *(0.25)*	7 *(0.15)*	7 *(0.15)*	11 *(0.23)*	9 *(0.19)*	4 *(0.08)*	1 *(0.02)*	1 *(0.02)*			3 *(0.06)*				**1** *(0.02)*		**56** ***(1.17)***
Acinetobacter	21 *(0.44)*	7 *(0.15)*	6 *(0.13)*	4 *(0.08)*	2 *(0.04)*	2 *(0.04)*	2 *(0.04)*	1 *(0.02)*									**45** ***(0.94)***
Corynebacterium	5 *(0.1)*	6 *(0.13)*	5 *(0.1)*	16 *(0.33)*	3 *(0.06)*	1 *(0.02)*	2 *(0.04)*	1 *(0.02)*	2 *(0.04)*								**41** ***(0.86)***
Serratia	7 *(0.15)*	6 *(0.13)*	11 *(0.23)*	2 *(0.04)*	2 *(0.04)*	1 *(0.02)*	1 *(0.02)*	3 *(0.06)*			1 *(0.02)*	1 *(0.02)*					**35** ***(0.73)***
Other bacteria *< 30 occurrences*	42 *(0.88)*	57 *(1.19)*	35 *(0.73)*	16 *(0.33)*	11 *(0.23)*	17 *(0.36)*	7 *(0.15)*	2 *(0.04)*	4 *(0.08)*		1 *(0.02)*						**192** ***(4.02)***
Total N ***(%)***	**2,026** ***(42.38)***	**730** ***(15.27)***	**599** ***(12.53)***	**555** ***(11.61)***	**309** ***(6.46)***	**251** ***(5.25)***	**103** ***(2.15)***	**60** ***(1.25)***	**58** ***(1.21)***	**36** ***(0.75)***	**35** ***(0.73)***	**11** ***(0.23)***	**3** ***(0.06)***	**2** ***(0.04)***	**2** ***(0.04)***	**1** ***(0.02)***	**4,781** ***(100.00)***

Table 3 - Cats 2017 – All pathologies and age groups included – *E. coli:* susceptibility to antibiotics (proportion) (N= 1,357)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*1,351*	**69**
Amoxicillin-Clavulanic ac.	*1,351*	**74**
Cephalexin	*1,329*	**81**
Cephalothin	*57*	**74**
Cefoxitin	*560*	**93**
Cefuroxime	*112*	**88**
Cefoperazone	*142*	**89**
Cefovecin	*207*	**92**
Ceftiofur	*1,347*	**96**
Cefquinome	*595*	**99**
Streptomycin 10 UI	*595*	**74**
Kanamycin 30 UI	*393*	**92**
Tobramycin	*621*	**98**
Gentamicin 10 UI	*1,349*	**98**
Neomycin	*340*	**94**
Apramycin	*80*	**100**
Tetracycline	*1,230*	**81**
Doxycycline	*188*	**56**
Chloramphenicol	*752*	**90**
Florfenicol	*429*	**95**
Nalidixic ac.	*1,111*	**90**
Oxolinic ac.	*43*	**86**
Flumequine	*183*	**84**
Enrofloxacin	*1,294*	**94**
Marbofloxacin	*1,226*	**94**
Danofloxacin	*88*	**93**
Sulfonamides	*45*	**84**
Trimethoprim-Sulfonamides	*1,349*	**89**

Table 4 - Cats 2017 – Kidney and urinary tract pathology – All age groups included – *E. coli:* susceptibility to antibiotics (proportion) (N= 971)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*969*	**72**
Amoxicillin-Clavulanic ac.	*967*	**74**
Cephalexin	*962*	**81**
Cephalothin	*31*	**68**
Cefoxitin	*353*	**92**
Cefuroxime	*46*	**83**
Cefoperazone	*85*	**87**
Cefovecin	*151*	**91**
Ceftiofur	*964*	**95**
Cefquinome	*361*	**99**
Streptomycin 10 UI	*410*	**75**
Kanamycin 30 UI	*272*	**94**
Tobramycin	*497*	**98**
Gentamicin 10 UI	*968*	**98**
Neomycin	*193*	**93**
Apramycin	*30*	**100**
Tetracycline	*874*	**82**
Doxycycline	*142*	**56**
Chloramphenicol	*598*	**90**
Florfenicol	*268*	**97**
Nalidixic ac.	*801*	**91**
Flumequine	*110*	**86**
Enrofloxacin	*926*	**94**
Marbofloxacin	*900*	**94**
Danofloxacin	*40*	**88**
Trimethoprim-Sulfonamides	*964*	**90**

Table 5 - Cats 2017 – Respiratory pathology – All age groups included – *Pasteurella:* susceptibility to antibiotics (proportion) (N= 214)

Antibiotic	*Total (N)*	**% S**
Amoxicillin	*206*	**96**
Amoxicillin-Clavulanic ac.	*211*	**97**
Cephalexin	*206*	**95**
Ceftiofur	*193*	**98**
Cefquinome	*86*	**93**
Streptomycin 10 UI	*91*	**38**
Kanamycin 30 UI	*59*	**73**
Tobramycin	*99*	**91**
Gentamicin 10 UI	*207*	**92**
Neomycin	*51*	**63**
Tetracycline	*202*	**95**
Doxycycline	*33*	**91**
Chloramphenicol	*128*	**100**
Florfenicol	*87*	**99**
Nalidixic ac.	*181*	**97**
Enrofloxacin	*211*	**98**
Marbofloxacin	*201*	**100**
Trimethoprim-Sulfonamides	*209*	**85**

Table 6 - Cats 2017 – All pathologies and age groups included – Coagulase-positive *Staphylococcus*: susceptibility to antibiotics (proportion) (N= 551)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*547*	**41**
Cefoxitin	*426*	**82**
Oxacillin	*325*	**90**
Cefovecin	*247*	**82**
Erythromycine	*539*	**72**
Tylosin	*75*	**84**
Spiramycin	*256*	**79**
Lincomycin	*505*	**81**
Streptomycin 10 UI	*342*	**80**
Kanamycin 30 UI	*259*	**90**
Gentamicin 10 UI	*549*	**91**
Neomycin	*159*	**82**
Tetracycline	*516*	**79**
Doxycycline	*31*	**100**
Chloramphenicol	*239*	**87**
Florfenicol	*183*	**99**
Enrofloxacin	*391*	**87**
Marbofloxacin	*518*	**89**
Trimethoprim-Sulfonamides	*539*	**89**
Fusidic ac.	*363*	**95**
Rifampicin	*55*	**100**

Tableau 7 - Cats 2017 – Otitis – All pathologies and age groups included – Coagulase-positive *Staphylococcus*: susceptibility to antibiotics (proportion) (N= 132)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*131*	**53**
Cefoxitin	*101*	**92**
Oxacillin	*80*	**99**
Cefovecin	*49*	**92**
Erythromycine	*130*	**82**
Spiramycin	*67*	**91**
Lincomycin	*125*	**90**
Streptomycin 10 UI	*91*	**87**
Kanamycin 30 UI	*73*	**88**
Gentamicin 10 UI	*132*	**98**
Neomycin	*35*	**89**
Tetracycline	*128*	**88**
Chloramphenicol	*46*	**89**
Florfenicol	*49*	**98**
Enrofloxacin	*84*	**93**
Marbofloxacin	*125*	**95**
Trimethoprim-Sulfonamides	*130*	**96**
Fusidic ac.	*80*	**96**

Tableau 8 - Cats 2017 – Skin and soft tissue infections – All pathologies and age groups included – Coagulase-positive *Staphylococcus*: susceptibility to antibiotics (proportion) (N= 115)

Antibiotic	*Total (N)*	**% S**
Penicillin G	*114*	**35**
Cefoxitin	*100*	**80**
Oxacillin	*63*	**97**
Cefovecin	*69*	**87**
Erythromycine	*113*	**75**
Spiramycin	*49*	**84**
Lincomycin	*107*	**85**
Streptomycin 10 UI	*58*	**84**
Kanamycin 30 UI	*42*	**93**
Gentamicin 10 UI	*115*	**97**
Neomycin	*38*	**89**
Tetracycline	*107*	**86**
Chloramphenicol	*64*	**89**
Enrofloxacin	*97*	**97**
Marbofloxacin	*107*	**95**
Trimethoprim-Sulfonamides	*109*	**97**
Fusidic ac.	*78*	**91**

Tableau 9 - Cats 2017 – Kidney and urinary tract pathology – All pathologies and age groups included – Coagulase-positive *Staphylococcus*: susceptibility to antibiotics (proportion) (N= 100)

Antibiotic	*Total (N)*	**% S**
Penicillin	*96*	**29**
Cefoxitin	*86*	**66**
Oxacillin	*58*	**74**
Cefovecin	*35*	**57**
Erythromycin	*95*	**66**
Spiramycin	*52*	**75**
Lincomycin	*63*	**75**
Streptomycin 10 UI	*48*	**75**
Kanamycin 30 UI	*45*	**60**
Gentamicin 10 UI	*94*	**76**
Tetracycline	*89*	**71**
Chloramphenicol	*47*	**89**
Enrofloxacin	*72*	**56**
Marbofloxacin	*99*	**63**
Trimethoprim-Sulfonamides	*98*	**76**
Fusidic ac.	*59*	**97**

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