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Sales survey of veterinary medicinal products containing antimicrobials in France in 2020

Annual report

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CONNAÎTRE, ÉVALUER, PROTÉGER

Sales Survey of Veterinary Medicinal Products Containing Antimicrobials in France in 2020

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Abstract

The French Agency for Veterinary Medicinal Products (ANSES-ANMV) has been monitoring sales of veterinary antimicrobials in France since 1999. This national monitoring scheme is based on reporting by marketing authorisation holders. Monitoring of sales of antimicrobials is one of the key sources of information, together with the monitoring of bacterial resistance, used to assess and manage the risks associated with antimicrobial resistance.

Background:

The first EcoAntibio plan, covering the 2012-2016 period, aimed to reduce the use of antimicrobials by 25% in five years, with particular attention being paid to the use of antimicrobials of critical importance in veterinary and human medicine. The main objective of the first plan was met, with a 36.5% decrease in animal exposure to antibiotics during this five-year period.

The second EcoAntibio plan, which was launched in 2017, aims to ensure that the decline in animal exposure to antibiotics is sustained. It provides for communication and training measures, access to alternatives to antimicrobials, and improved prevention of animal diseases.

Tonnage of antimicrobials sold

In 2020, the total sales volume for antimicrobials amounted to 415 tonnes, a fall of 2.7% compared with 2019. This tonnage is less than a third of that recorded when monitoring first began in 1999 (1,311 tonnes). A 54.8% reduction can also be observed compared with 2011, the reference year for the first EcoAntibio plan. This trend is largely attributable to lower sales of orally administered antimicrobials.

Exposure to antimicrobials

The sales data are used to estimate the Animal Level of Exposure to Antimicrobials (ALEA) indicator, which corresponds to the ratio between the estimated body weight treated and the biomass of the animal population in France.

Compared with 2011, overall exposure of animals has decreased by 45.4%: by 74.4% for medicated premixes, 54.2% for oral powders and solutions, and 10.7% for injections. Exposure to antimicrobials has declined for all species compared with 2011: -22.5% for cattle, -55.5% for pigs, -64.4% for poultry, -39.9% for rabbits and -11.8% for cats and dogs. The number of intramammary treatments per dairy cow has fallen by 25.4% compared with 2011.

After a sharp fall between 2011 and 2016, the overall exposure of animals in France continued to decline over the period 2017 to 2020. The ALEA fell by 0.6% between 2019 and 2020. Over the last year, the change in exposure has varied according to the species: +2.9% for cattle, -3.2% for pigs, -9.7% for poultry, +2.5% for rabbits and +5.1% for cats and dogs. The increase in exposure of cats and dogs was mainly due to an increase in the use of tablets combining amoxicillin and clavulanic acid. The trend in exposure over one year varies according to the pharmaceutical forms: -6.0% for oral powders and solutions, -0.2% for medicated premixes and +4.2% for injections.

In 2020, animal exposure to antimicrobials reached its lowest level since 1999. After a sharp fall in the ALEA between 2011 and 2016, there has been a relative stabilisation of animal exposure over the last four years for most classes of antimicrobials, with the exception of tetracyclines and polymyxins.

Exposure to fluoroquinolones and newer-generation cephalosporins

The Act on the future of agriculture, food and forestry (LAAF Act No. 2014-1170 of 13 October 2014) set a target of a 25% reduction in three years in the use of antimicrobials belonging to the classes of fluoroquinolones and third- and fourth-generation cephalosporins, taking 2013 as the reference year. This specific target for antimicrobials of critical importance in human medicine was met and far exceeded in 2016.

All animal species combined, exposure to fluoroquinolones and newer-generation cephalosporins has continued to decline, with reductions of 9.3% and 3.9% respectively between 2019 and 2020. Compared with 2013, exposure to fluoroquinolones has fallen by 87.3% and exposure to third- and fourth-generation cephalosporins by 94.3%. The number of intramammary treatments per dairy cow based on newer-generation cephalosporins decreased by 98.8% between 2013 and 2020.

Since 2017, the frequency of treatment with critically important antimicrobials has fallen to a very low level. However, despite the large fall in the use of these antimicrobials compared with 2013, continued vigilance is needed, and this trend per species should be monitored over the coming years.

Exposure to colistin

The second EcoAntibio plan set a five-year goal of a 50% reduction in exposure to colistin in the cattle, pig and poultry sectors, taking the average ALEA for 2014-2015 as a reference.

This target was achieved in 2020, with a 66.0% reduction in cumulative exposure to colistin for these three sectors. Exposure has decreased for pigs (-74.8%), poultry (-63.1%) and cattle (-48.1%) compared with the average ALEA for 2014-2015. An increase in exposure of cattle to colistin by the oral route has been observed over the last year.

Conclusion

Results for 2020 indicate that overall exposure of animals to antimicrobials has fallen slightly compared with 2019. After the success of the first EcoAntibio plan, it seems that the reduction in use has reached a limit for some classes of antimicrobials. It is important to monitor antimicrobial uses and assess their consequences on the development of bacterial resistance. The momentum for the prudent and responsible use of antimicrobials in veterinary medicine must be maintained. The EcoAntibio 2 plan aims in particular to consolidate the achievements and pursue the actions previously undertaken during the first national plan.

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1 Introduction

Antimicrobial resistance is a major public health issue concerning both human and veterinary medicine. Monitoring of sales of antimicrobials is one of the key sources of information used to assess and manage the risks associated with antimicrobial resistance.

ANSES-ANMV has been monitoring sales of veterinary antimicrobials in France since 1999. This monitoring is carried out according to the standards defined in Chapter 6.9 of the OIE's Terrestrial Animal Health Code: "Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals".

France also participates in the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) scheme, which was launched by the European Medicines Agency (EMA) at the request of the European Commission, with the aim of collecting harmonised data on antimicrobial sales for all countries in the European Union.

In France, the monitoring of antimicrobial sales is based on reporting by holders of marketing authorisations in accordance with the provisions of Article L. 5141-14-1 of the French Public Health Code, in conjunction with the French Union for the Veterinary Medicinal Product and Reagent Industry (SIMV). All veterinary antimicrobials authorised and sold in France are documented as part of this monitoring, which is based on the annual reporting of antimicrobial sales by the pharmaceutical companies marketing them. The companies also provide an estimated breakdown of the medicines sold by target animal species.

This report describes the veterinary antimicrobial sales for 2020 and includes a comparison with results from previous years.

2 Materials and methods

2.1 Data used in this report

2.1.1 Data on sales of medicinal products containing antimicrobials

Monitoring of sales is based on an annual declaration by each marketing authorisation (MA) holder marketing veterinary medicinal products containing antimicrobials authorised in France. Information on the number of units sold for each presentation of each medicinal product is thus sent to ANSES-ANMV. Since 2009, MA holders have also been required to provide information, for each presentation, on the breakdown of sales by target animal species.

The figures collected cover the period from 1 January to 31 December and constitute an exhaustive compilation of the veterinary antimicrobials marketed in France during the calendar year.

To avoid the risk of any reporting errors, sales volumes are compared with annual turnover reported independently by the MA holders. Any discrepancies are investigated. Significant differences compared with previous years are also subject to a specific audit.

2.1.2 Data on French animal populations

To take account of fluctuations in the animal population when interpreting the data, the information published by Agreste[1] is used for food-producing animals.

For domestic pets, data are provided by statistics from FACCO[2], the French trade federation of food manufacturers for dogs, cats, birds and other pets, which are published every two years.

The data published by the French Horse and Riding Institute[3] (IFCE) are used to determine the numbers of Equidae.

For fish, the national production data come from a report published by the Federation of European Aquaculture Producers[4] (FEAP).

In order to evaluate the biomasses of animals potentially treated with antimicrobials, different weights have been selected: the weights of adult animals for those with a life cycle of more than one year, and the weights at slaughter for the others.

The data on animal populations used for this report are available in Annex 1.

[1] http://agreste.agriculture.gouv.fr/
[2] http://www.facco.fr/
[3] https://www.ifce.fr/
[4] http://feap.info/

2.1.3 Data on veterinary medicinal products containing antimicrobials

A variety of information on medicinal products containing antimicrobials is available in the index of veterinary medicinal products authorised in France[5]. Some data from the Summary of Product Characteristics (SPC) have been used for each veterinary medicine:

- qualitative and quantitative composition in antimicrobials;
- pharmaceutical form;
- dosage and route of administration.

For each medicine and each species, the dosage selected is the one defined in the MA:

- the daily dose, expressed in mg of antimicrobials per kg of body weight treated;
- the duration of treatment, expressed in days.

In the framework of this national monitoring programme, when multiple doses and durations are described in the SPC for the same species, dosing data have been used, according to the following rules:

- When multiple doses are possible, the highest dose was chosen, for the medicine's main indication;
- When multiple treatment durations are possible, the longest treatment duration was chosen.

2.2 Calculations and interpretation of indicators

To correctly interpret the data in this report, it is necessary to understand what information is used as a basis for the calculations of the proposed indicators. Several indicators are provided because the results of this study may be used for different purposes.

Some indicators may be preferred for assessing the correlation between sales of antimicrobials and antimicrobial resistance. Others will be more appropriate for monitoring global changes over time in prescription of veterinary medicinal products and for attempting to measure the impact of measures taken at national level.

In this report, two types of indicators are presented:

- sales indicators, used to monitor the change in the tonnages of antimicrobials sold over time;
- exposure indicators, used to better represent the use of antimicrobials to treat animals.

2.2.1 Tonnages of antimicrobials sold

The quantity of antimicrobials sold by medicine presentation is an exact measurement obtained by multiplying the quantitative composition of active ingredient for each presentation by the number of units sold.

[5] http://www.ircp.anmv.anses.fr/

For some active ingredients expressed in IU (International Units), a conversion coefficient (WHO standard value) has been used to calculate the quantity of antimicrobials in mg by medicine presentation. The coefficients used for the national monitoring scheme are those recommended by the European Medicines Agency (EMA) in the framework of the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) scheme[6].

In this report, the tonnages of antimicrobials sold are presented by pharmaceutical form of the medicines and/or by class of antimicrobials.

Tonnages of antimicrobials sold by species are calculated using the estimates provided by the MA holders of the breakdown of sales by each animal species: the percentage of reported sales for a given species is multiplied by the quantity of antimicrobials for each presentation.

2.2.2 Quantity of antimicrobials sold compared with the animal biomass

In order to take account of fluctuations in medicinal product sales and animal populations over time, the ratio between the quantities of antimicrobials sold and the biomass of the population potentially using antimicrobials can be calculated.

This indicator is expressed in mg of active substance per kg of body weight.

2.2.3 Indicators of exposure of the animal population

For medicines administered by the oral and parenteral routes, three exposure indicators can be calculated: the body weight treated-day, the body weight treated, and the ALEA.

The **body weight treated-day** for a given medicine, also called the "Number of ADDkg", is calculated by dividing the quantity of antimicrobials sold by the daily dose chosen for this medicine.

This daily dose, or ADDkg (Animal Daily Dose) is the dose necessary to treat 1 kg of body weight for one day.

The body weight treated-day for a given species is calculated by adding together the numbers of ADDkg calculated for all the medicine presentations sold for this species.

The **body weight treated** for a given medicine, also called the "Number of ACDkg", is calculated by dividing the quantity of antimicrobials sold by the dose required to treat 1 kg of body weight over the entire duration of treatment.

This dose, known as the ACDkg (Animal Course Dose), is the daily dose multiplied by the duration of treatment.

The body weight treated for a given species is calculated by adding together the numbers of ACDkg calculated for all the medicine presentations sold for this species.

[6] http://www.ema.europa.eu/docs/en_GB/document_library/Other/2015/06/WC500188365.pdf

The **indicator of exposure** of animals to antimicrobials or **ALEA** (Animal Level of Exposure to Antimicrobials) is calculated by dividing the body weight treated by the biomass of the animal population potentially using antimicrobials.

If the ALEA is equal to 1, it means that, for a given species, the estimated body weight treated is exactly the same as the total body weight (produced) of the animal population.

The ALEA indicator has no unit and is based on the assumption that all the antimicrobials sold during the year were administered to animals in France during this same year.

The total per year in body weight treated is lower than the sum of body weight treated per class of antimicrobials, due to combinations of antimicrobials in some veterinary medicines. The same is true for the total body weight treated-day and the total ALEA, when the results are presented by class of antimicrobials.

2.3 Important points concerning the 2020 annual report

National monitoring of antimicrobial sales has been subject to Quality Assurance standards (ISO 9001 Standard) since March 2021 to ensure compliance with data quality requirements.

Changes to the SPC were introduced in 2020 for certain veterinary medicinal products authorised in France. These changes have been incorporated in the analysis of sales for 2020 but do not affect the results of previous years.

The biomass data have been updated from the Agreste website for the different animal populations.

Some conversion factors (IU to mg) were modified in the protocol published by ESVAC in March 2021[7]. These coefficients were updated in the national monitoring for 2020.

Some errors in the data on intramammary treatments were identified in the previous report. These errors have been corrected in this report.

Data on the cat and dog populations were reworked throughout the monitoring period in order to smooth the population sizes, which are published every two years by the FACCO.

The tonnage for topical medicines was calculated for 2020. A specific analysis was performed on the use of these topical medicines in cats and dogs.

For each medicine presentation, MA holders provided an estimate of the breakdown of sales for calves and other cattle, as well as for chickens and turkeys. For the first time under the national monitoring scheme, these data were analysed to obtain usage patterns by antimicrobial class for these different animal categories.

[7] http://www.ema.europa.eu/docs/en_GB/document_library/Other/2015/06/WC500188365.pdf

3 Sales and exposure indicators in 2020

3.1 Tonnages of antimicrobials sold

In 2020, the total volume of sales amounted to 414.58 tonnes of antimicrobials. Five antimicrobial classes (tetracyclines, sulfonamides, penicillins, aminoglycosides and macrolides) accounted for 89% of the tonnage (Table 1). Antimicrobials of critical importance (newer-generation cephalosporins and fluoroquinolones) accounted for 0.2% of the tonnage.

Table 1: Breakdown of the tonnage in 2020 presented by antimicrobial class and route of administration

	MEDICATED PREMIXES	ORAL FORMS EXCLUDING PREMIXES	INJECTIONS	INTRAMAMMARY & INTRAUTERINE	TOPICAL MEDICINES	TOTAL	SHARE OF THE CLASS (%)
AMINOGLYCOSIDES	10.05	12.10	26.12	1.64	0.20	50.11	12.09%
OTHER CLASSES *	-	1.66	-	0.04	0.02	1.72	0.42%
CEPHALOSPORINS 1&2G	-	4.05	0.05	1.26	-	5.35	1.29%
CEPHALOSPORINS 3&4G	-	-	0.10	0.00	-	0.11	0.03%
FLUOROQUINOLONES	-	0.51	0.28	-	0.00	0.78	0.19%
LINCOSAMIDES	0.31	2.28	0.68	0.02	-	3.28	0.79%
MACROLIDES	5.66	17.08	7.29	-	-	30.03	7.24%
PENICILLINS	9.58	29.00	27.80	2.05	-	68.43	16.51%
PHENICOLS	-	0.21	5.71	-	0.12	6.03	1.46%
PLEUROMUTILINS	1.41	1.99	0.02	-	-	3.42	0.82%
POLYMYXINS	0.85	8.89	0.44	0.14	0.00	10.32	2.49%
QUINOLONES	0.02	1.74	-	-	-	1.76	0.43%
SULFONAMIDES	40.46	41.18	5.72	-	0.40	87.77	21.17%
TETRACYCLINES	52.32	65.49	9.55	1.56	2.44	131.37	31.69%
TRIMETHOPRIM	5.80	7.18	1.11	-	-	14.08	3.40%
TOTAL	126.47	193.35	84.84	6.72	3.19	414.58	100.00%
PERCENTAGE	30.51%	46.64%	20.47%	1.62%	0.77%	100.00%	

* Other classes: fusidic acid, dimetridazole, metronidazole and rifaximin

In 2020, 27.47 mg of antimicrobials were sold per kilogram of body weight, with differences depending on the species (Table 2).

Table 2: Tonnages by species in 2020 and quantities of antimicrobials per kilogram of body weight

	Cattle	Pigs	Poultry	Rabbits	Cats & Dogs	Sheep & Goats	Horses	Fish	Other	Total
Tonnage sold	117.47	133.06	69.44	30.24	20.40	32.74	9.90	1.00	0.34	414.58
% of total tonnage	28.33%	32.10%	16.75%	7.29%	4.92%	7.90%	2.39%	0.24%	0.08%	100.00%
Sales in mg/kg	13.42	47.10	33.11	390.02	114.15	58.21	19.22	21.56	9.66	27.47

3.2 Indicators of exposure of the animal population

Given the differences in potency and dose between different medicines, the sales in weight of antimicrobials do not accurately reflect their use. The most recent antimicrobials are generally more potent and require the administration of a smaller dose of active ingredient. To calculate the body weight treated, it is therefore necessary to take into account the dosage and duration of administration of each medicine.

Medicated premixes are generally medicinal products containing older compounds and are administered over a long period. Although they accounted for nearly 31% of the tonnage, they represented 10% of body weight treated (Table 3). In 2020, oral treatments represented 53% of the body weight treated, compared with 47% for parenteral treatments. Fluoroquinolones and newer-generation cephalosporins were used to treat around 1% of the body weight treated.

Table 3: Body weight treated in 2020 by class of antimicrobials and route of administration (in tonnes)

	MEDICATED PREMIXES	ORAL POWDERS & SOLUTIONS	OTHER ORAL FORMS*	INJECTIONS	TOTAL	PERCENTAGE
AMINOGLYCOSIDES	37,096	79,795	5,460	606,338	728,689	11.82%
OTHER CLASSES	0	0	6,367	0	6,367	0.10%
CEPHALOSPORINS 1&2G	0	0	11,048	538	11,586	0.19%
CEPHALOSPORINS 3&4G	0	0	0	16,337	16,337	0.27%
FLUOROQUINOLONES	0	8,765	1,262	31,481	41,508	0.67%
LINCOSAMIDES	1,478	34,342	867	24,505	61,192	0.99%
MACROLIDES	38,070	125,765	2,513	514,607	680,955	11.05%
PENICILLINS	79,178	333,930	60,062	919,216	1,392,386	22.59%
PHENICOLS	0	4,178	0	151,671	155,849	2.53%
PLEUROMUTILINS	17,868	15,322	0	499	33,689	0.55%
POLYMYXINS	24,853	450,616	4,602	60,175	540,246	8.77%
QUINOLONES	286	22,899	169	0	23,354	0.38%
SULFONAMIDES	154,623	240,073	10,913	141,825	547,434	8.88%
TETRACYCLINES	160,615	780,657	10,329	494,571	1,446,172	23.47%
TRIMETHOPRIM	121,135	210,066	5,345	140,279	476,825	7.74%
TOTAL (in tonnes)	483,852	2,063,394	105,709	2,309,148	4,962,103	100.00%
PERCENTAGE	9.75%	41.58%	2.13%	46.54%	100.00%	

* Other oral forms: tablets, oral pastes, boluses, etc.

In 2020, rabbits, cats, dogs and pigs were the species most exposed to antimicrobials (Table 4).

Table 4: Body weight treated and ALEA exposure indicator by species in 2020

	Cattle	Pigs	Poultry	Rabbits	Cats & Dogs	Sheep & Goats	Horses	Fish	Other	Total
Body weight treated (tonnes)	**2,229,852**	**1,387,516**	**751,172**	**148,068**	**117,761**	**203,973**	**113,124**	**7,570**	**3,067**	**4,962,103**
Share of body weight treated	44.94%	27.96%	15.14%	2.98%	2.37%	4.11%	2.28%	0.15%	0.06%	100.00%
Biomass (tonnes)	**8,755,976**	**2,824,954**	**2,097,267**	**77,534**	**178,670**	**562,418**	**514,761**	**46,272**	**35,183**	**15,093,035**
Share of the biomass	58.01%	18.72%	13.90%	0.51%	1.18%	3.73%	3.41%	0.31%	0.23%	100.00%
ALEA	**0.255**	**0.491**	**0.358**	**1.910**	**0.659**	**0.363**	**0.220**	**0.164**	**0.087**	**0.329**

4 Change in sales and in exposure to antimicrobials

4.1 Milestone years in interpretation of the results

The monitoring of sales of antimicrobials in veterinary medicine began in 1999.

After several months of discussions with stakeholders, the first EcoAntibio plan was published in November 2011. One of this plan's objectives was to reduce the use of antimicrobials by 25% in five years, taking 2011 as the reference year.

The Act on the future of agriculture, food and forestry of 13 October 2014[8] set a target of a 25% reduction in three years in the use of antimicrobials belonging to the classes of fluoroquinolones and third- and fourth-generation cephalosporins, taking 2013 as the reference year. This Act also introduced several measures, such as an end to discounts, rebates and reductions as of 1 January 2015. This led to stockpiling of medicines containing antimicrobials among the parties involved in the distribution and/or prescription of veterinary medicinal products during 2014, which resulted in sales falling in 2015.

Following on from the 2012-2016 EcoAntibio plan, the second EcoAntibio plan was published in April 2017, in order to ensure that the decline in animal exposure to antimicrobials was sustained. One of its goals is a 50% reduction in five years in exposure to colistin in the cattle, pig and poultry sectors (using the average ALEA for 2014-2015 as a reference).

Throughout this report, therefore, the results for 2020 have been compared with those of the reference years (2011 and 2013).

4.2 Change in tonnage of antimicrobials

Since monitoring began in 1999, there has been a fall of nearly 900 tonnes in the tonnage of antimicrobials, i.e. a 69% fall (Figure 1).

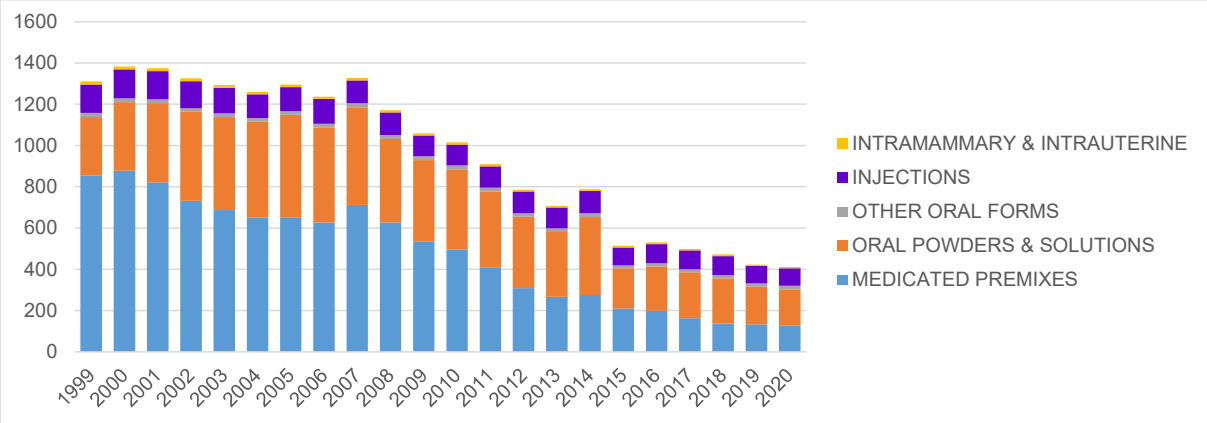

Figure 1: Change in tonnage by pharmaceutical form since 1999

[8] http://www.legifrance.gouv.fr/affichLoiPubliee.do;jsessionid=5691BBA0E2987B8FCBB6195E53853F64.tpdjo07v_2?type=general&idDocument=JORFDOLE000028196878

The tonnage of antimicrobials in 2020 was 54.8% lower than the tonnage in 2011. This decrease is largely attributable to a fall in sales of orally administered antimicrobials (-69.0% for medicated premixes and -52.5% for oral powders and solutions).

Tonnage has fallen by 2.7% compared with 2019. This change in one year is mainly due to the decrease in the tonnage for medicated premixes (-5.2%) and oral powders and solutions (-3.9%). The tonnage of tetracyclines has mainly fallen compared with 2019 (-10.9%). Detailed data by pharmaceutical form and class are shown in Annex 2.

4.3 Change in exposure by pharmaceutical form

The level of exposure of animals to antimicrobials has decreased by 41.3% since 1999 (Figure 2). Overall exposure in 2020 has fallen by 45.4% compared with 2011. All routes of administration and animal species combined, animal exposure in France is relatively stable compared with 2019 (-0.6%).

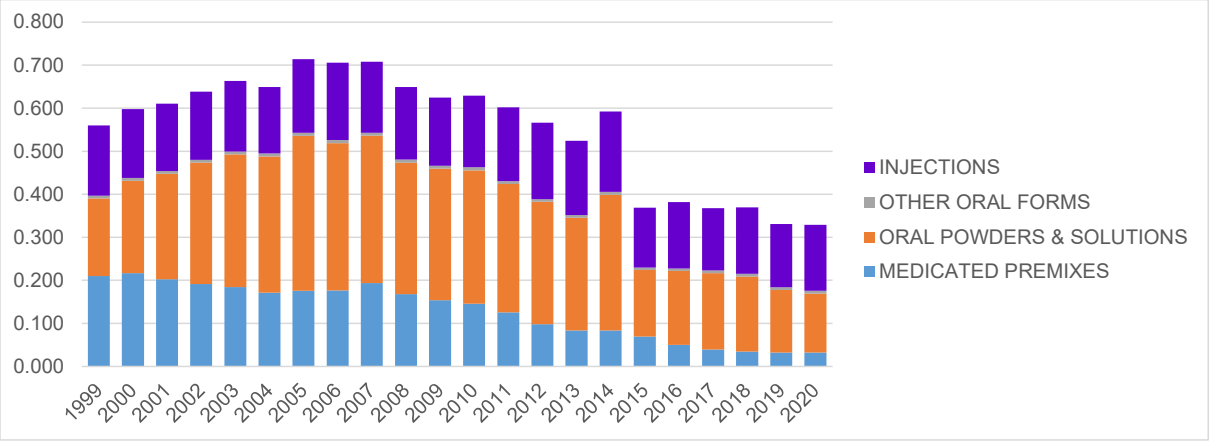

Figure 2: Change in ALEA by pharmaceutical form since 1999

Exposure to antimicrobials via medicated premixes has decreased by 74.4% since 2011 and is stable compared with 2019 (-0.2%). Exposure via oral powders and solutions decreased by 6.0% between 2019 and 2020, and has fallen by 54.2% since 2011. Exposure via other oral forms (tablets, pastes, boluses, etc.) is low and has been relatively stable since 1999. Overall, there has been a 4.5% reduction in oral exposure in one year, and a 59.2% fall compared with 2011.

Exposure via the parenteral route has increased by 4.2% compared with 2019. Exposure via injections has fallen by 10.7% since 2011.

4.4 Change in exposure by class

There was a sharp 36.5% fall in animal exposure observed between 2011 and 2016. Over the last four years, the decline in exposure has continued and is now comparatively lower than during the first EcoAntibio plan (-13.9% compared with 2016).

Figure 3 shows the decrease in animal exposure by class since 2011: this is mainly due to a fall in exposure to polymyxins (-74.4%), tetracyclines (-44.9%), third- and fourth-generation cephalosporins (-94.8%), fluoroquinolones (-87.6%), macrolides (-29.5%) and sulfonamides (-31.8%).

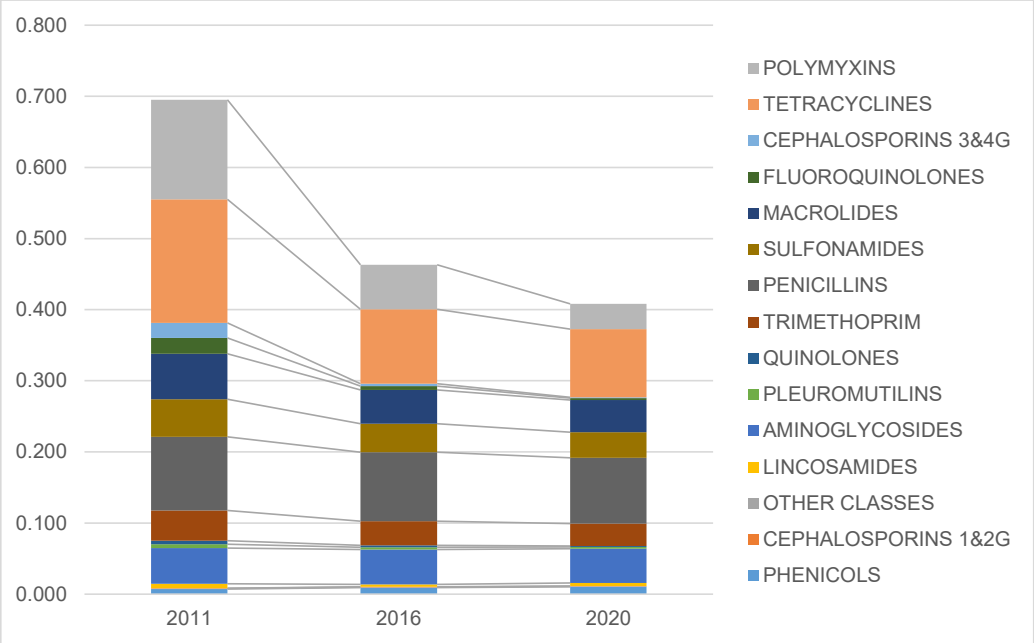

Figure 3: Change in ALEA indicators by antimicrobial class between 2011, 2016 and 2020

Between 2019 and 2020, antimicrobial exposure decreased for all classes except for lincosamides, macrolides, phenicols, sulfonamides and trimethoprim (Figure 4). Polymyxin exposure fell by 5.0% and tetracycline exposure decreased by 3.0%.

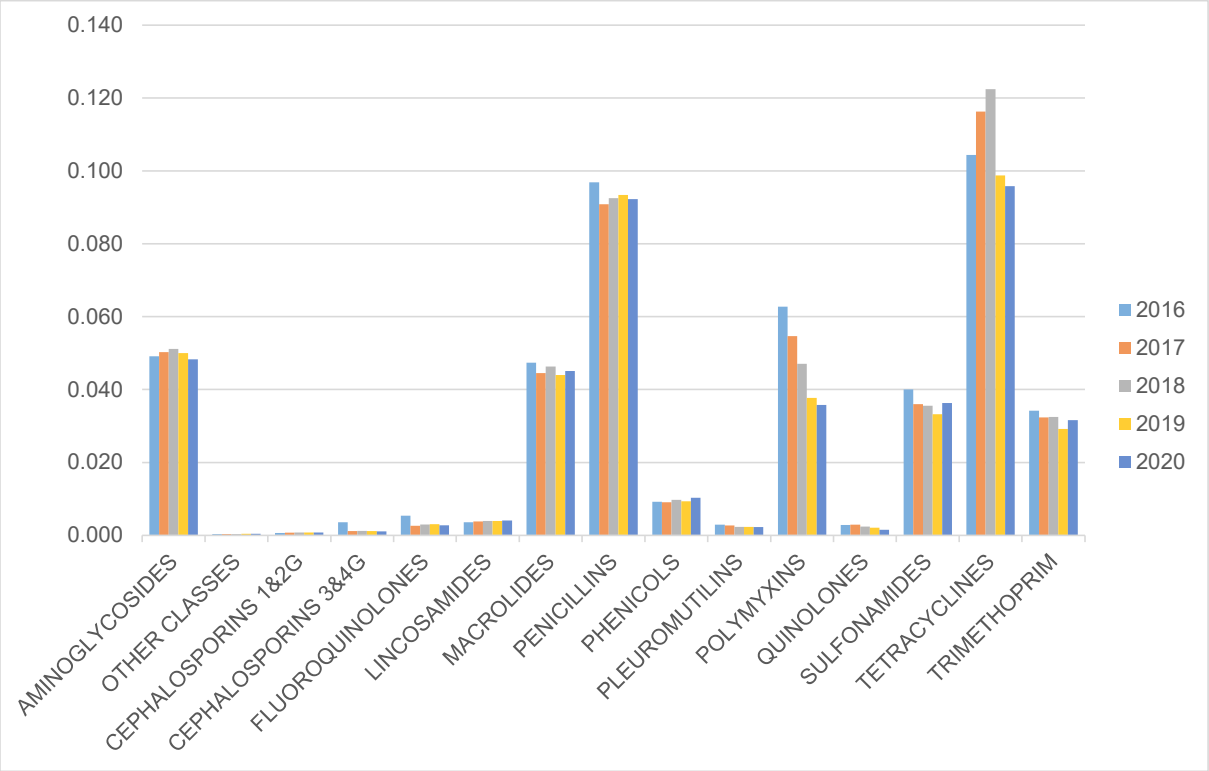

Figure 4: Change in animal exposure in France by antimicrobial class since 2016 (ALEA)

5 Change in exposure to antimicrobials by species

This section summarises the main changes in exposure by animal species. Detailed data for each species are available in Annex 3.

5.1 Cattle

Cattle are treated with medicines containing antimicrobials administered by the oral, parenteral, intramammary, intrauterine and dermal routes. In 2020, the quantity of antimicrobials corresponding to topical medicines accounted for 0.5% of the total tonnage of antimicrobials sold for cattle. Given this low percentage, topical treatments will not be described in this section.

Oral and parenteral treatments

The level of exposure of cattle to antimicrobials has fallen by 22.5% since 2011, based on ALEAs calculated for oral and parenteral treatments. Between 2019 and 2020, the ALEA increased by 2.9%. Exposure via injections has fallen by 16.7% compared with 2011, and it increased by 3.5% between 2019 and 2020 (Figure 5). Oral exposure has fallen by 37.8% compared with 2011 and has been stable over the last year (+0.8%).

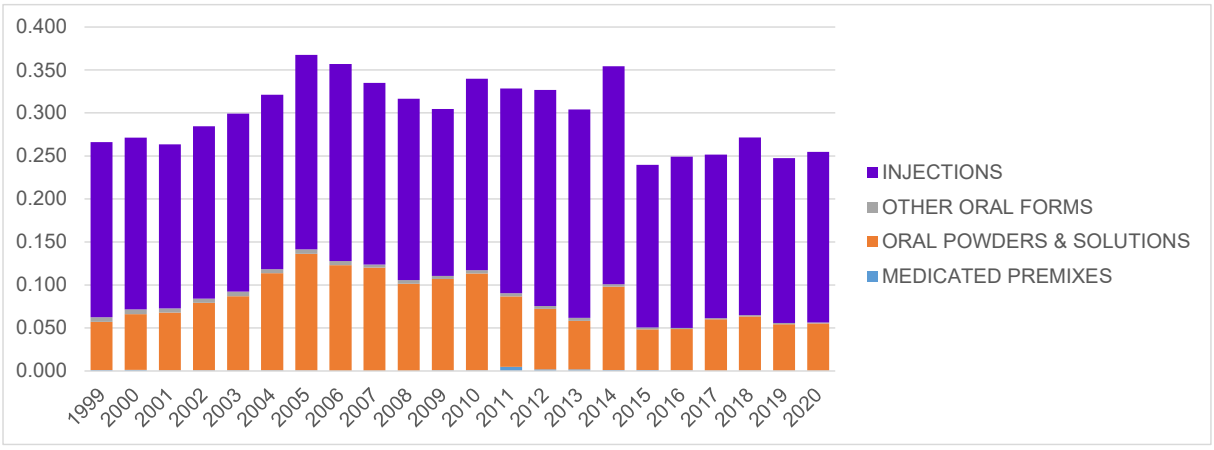

Figure 5: Change in ALEA by pharmaceutical form for cattle since 1999

After a 24.2% decrease between 2011 and 2016, the level of exposure of cattle has been relatively stable in recent years (+2.2% compared with the ALEA in 2016).

Large falls in exposure have been observed for newer-generation cephalosporins (-95.4%), fluoroquinolones (-90.0%), macrolides (-18.9%) and polymyxins (-46.3%), compared with 2011 (Figure 6).

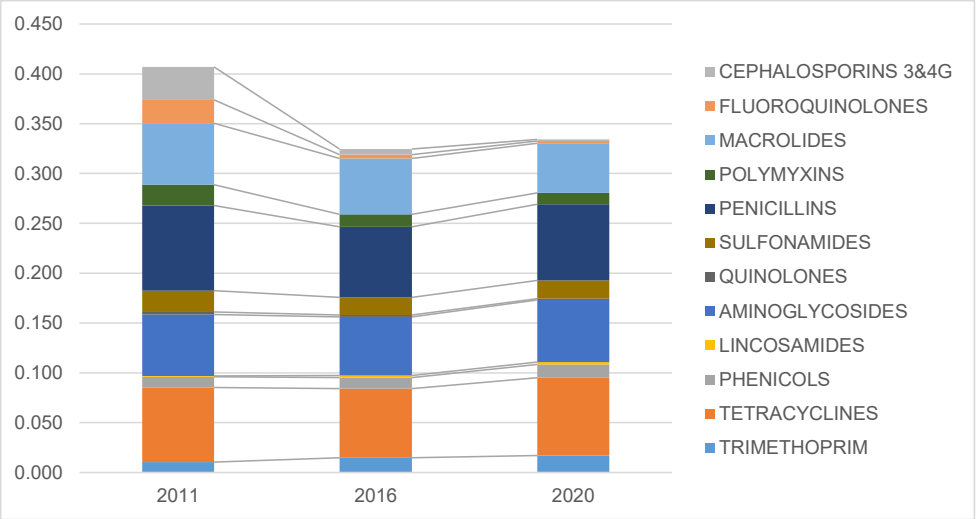

Figure 6: Change in ALEA indicators by class for cattle between 2011, 2016 and 2020

Since 2016, there has been a relative stabilisation of cattle exposure to most antimicrobial classes (Figure 7). Between 2019 and 2020, antimicrobial exposure fell mainly for aminoglycosides (-3.0%), and increased for macrolides (+3.4%), phenicols (+13.0%) and tetracyclines (+3.0%).

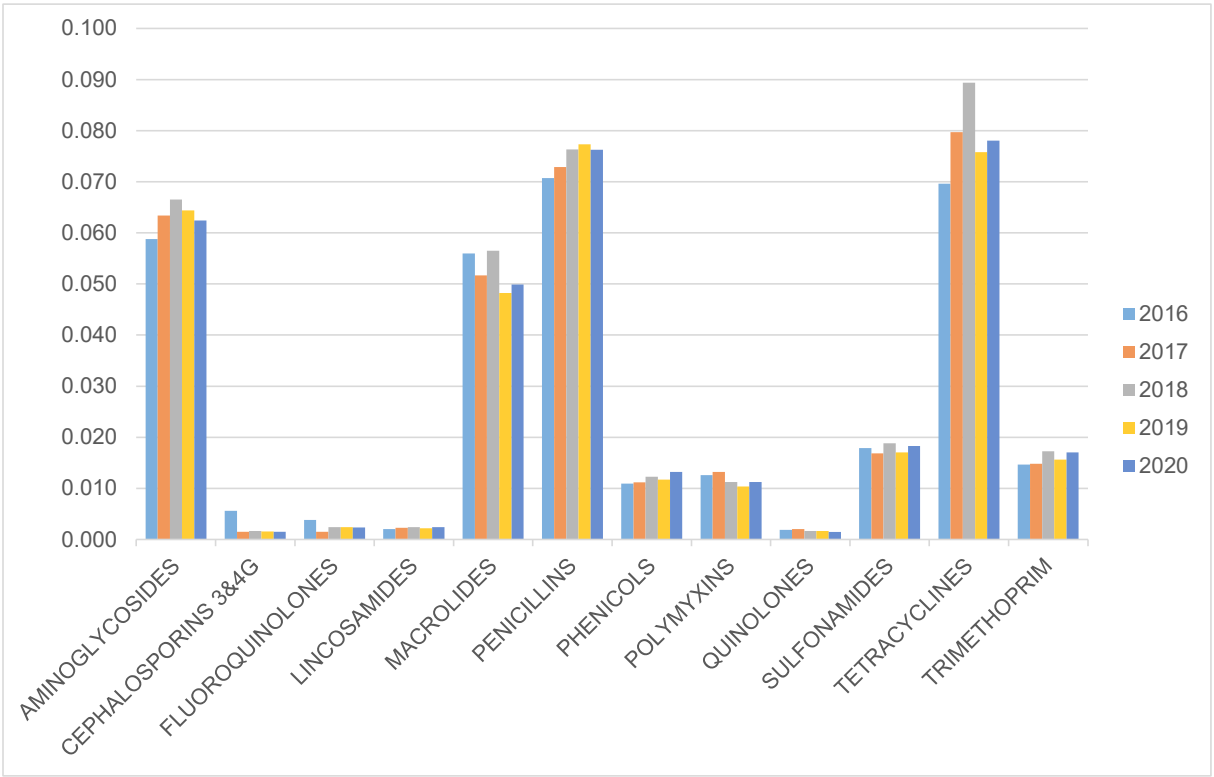

Figure 7: Change in exposure of cattle by antimicrobial class since 2016 (ALEA)

Different usage patterns between calves and other cattle

MA holders estimated the breakdown of sales for the "Calves" and "Other cattle" categories for each presentation. Although this is a difficult and approximate exercise, this information can be used to estimate the antimicrobial use pattern for these two physiological stages.

In cattle, 92.2% of the body weight treated by the parenteral route seems to correspond to "Other cattle" (Figure 8).

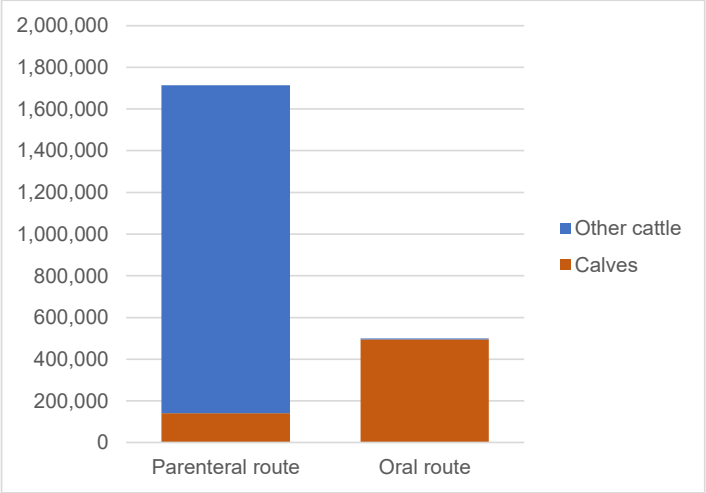

Figure 8: Body weight treated for calves and other cattle in 2020 (in tonnes)

Calves mainly seem to be treated with tetracyclines, while penicillins and aminoglycosides are the classes used most often to treat other cattle orally and parenterally (Figure 9).

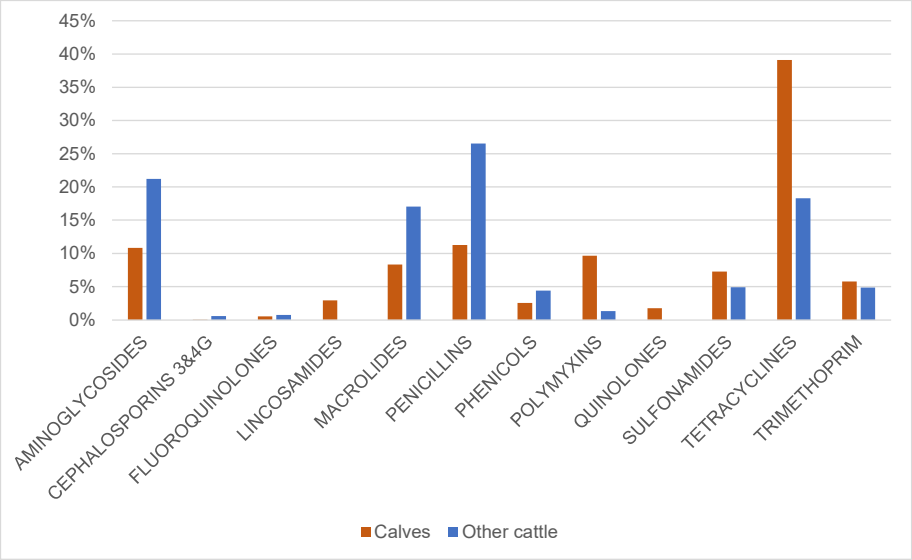

Figure 9: Antimicrobial usage patterns for calves and other cattle in 2020, based on body weight treated

Intramammary treatments

For each intramammary medicine, the number of treatments during the lactation period was calculated by dividing the number of applicators sold by the number of applicators required to treat an udder quarter, as described in the medicine's SPC. The number of treatments at dry-off was calculated by dividing the number of applicators sold by four (all quarters treated for each animal). It is interesting to monitor the change in the number of intramammary treatments per dairy cow (Figure 10).

There were an estimated 1.23 intramammary treatments per dairy cow in 2020. This indicator has fallen by 25.4% compared with 2011. There was an increase of 8.8% over the last year, but it can be seen that this indicator is relatively changeable from year to year.

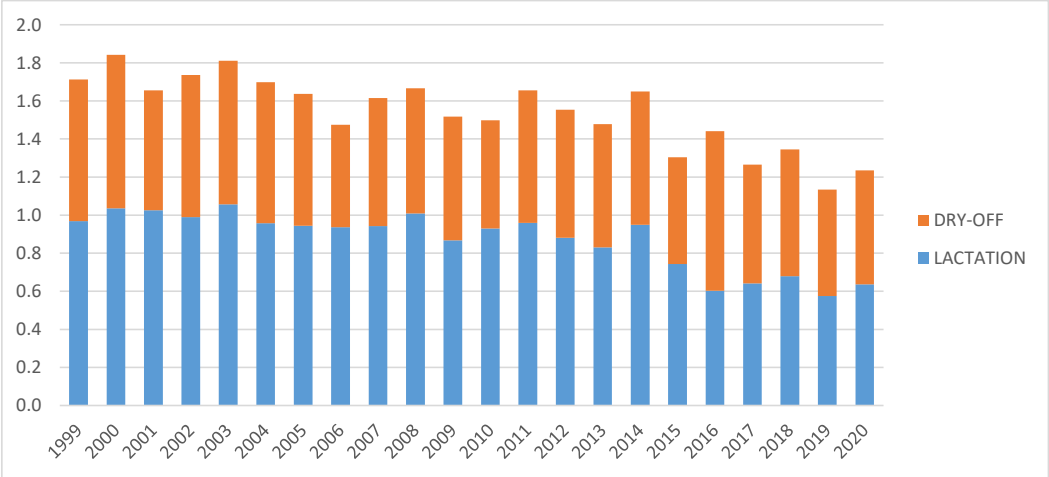

Figure 10: Change in the number of intramammary treatments per dairy cow since 1999

In 2020, the number of intramammary treatments was estimated to be 64 per 100 dairy cows in the lactation period, and 60 per 100 cows at dry-off. Medicinal products administered at dry-off appeared to account for 42.0% of intramammary treatments in 2011 versus 48.5% for 2020.

Aminoglycosides, polymyxins and tetracyclines were the classes most used in the lactation period, as well as first- and second-generation cephalosporins and penicillins to a lesser extent. The classes most commonly used at dry-off were aminoglycosides, first- and second-generation cephalosporins and penicillins.

The number of intramammary treatments per dairy cow based on newer-generation cephalosporins fell by 98.8% between 2013 and 2020 and is stable compared with 2019 (+1.1%). According to the reported data, three out of 1,000 dairy cows received intramammary treatment with third- and fourth-generation cephalosporins.

5.2 Pigs

Pigs are treated with medicines containing antimicrobials administered orally, parenterally and locally (dermal treatments). In 2020, the quantity of antimicrobials corresponding to topical medicines accounted for 0.02% of the total tonnage of antimicrobials sold for pigs. Given this low percentage, topical treatments will not be described in this section.

Oral and parenteral treatments

The level of exposure of pigs to antimicrobials has decreased by 55.5% since 2011. Between 2019 and 2020, the ALEA fell by 3.2%. Exposure via injections was similar to 2011 (+0.2%), and increased by 5.8% between 2019 and 2020 (Figure 11). Compared with 2011, exposure has fallen by 77.8% for medicated premixes and by 46.8% for oral powders and solutions. Oral exposure has fallen by 62.8% compared with 2011, with a 6.1% decline over the last year.

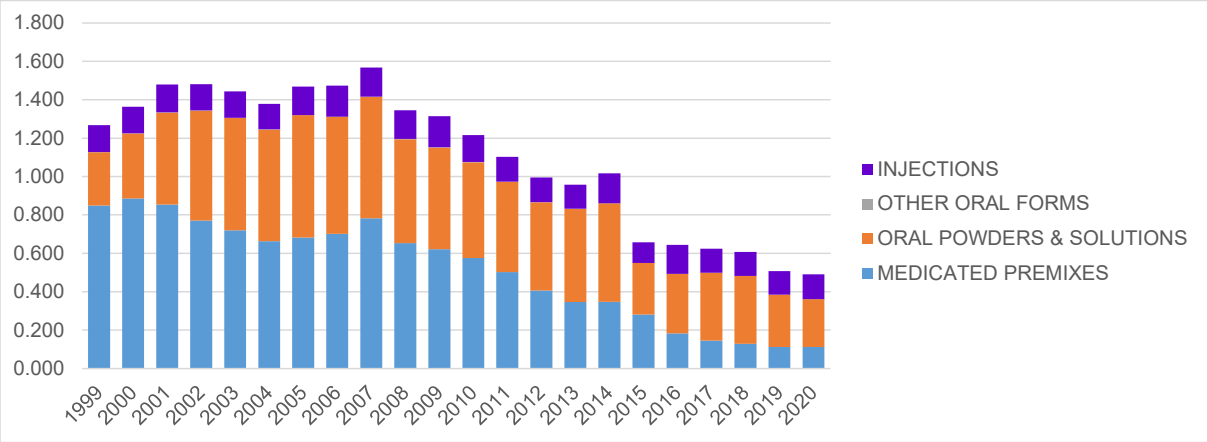

Figure 11: Change in ALEA by pharmaceutical form for pigs since 1999

After a 41.5% fall between 2011 and 2016, the level of exposure of pigs has continued to decline over the last few years (-23.8% compared with the ALEA in 2016).

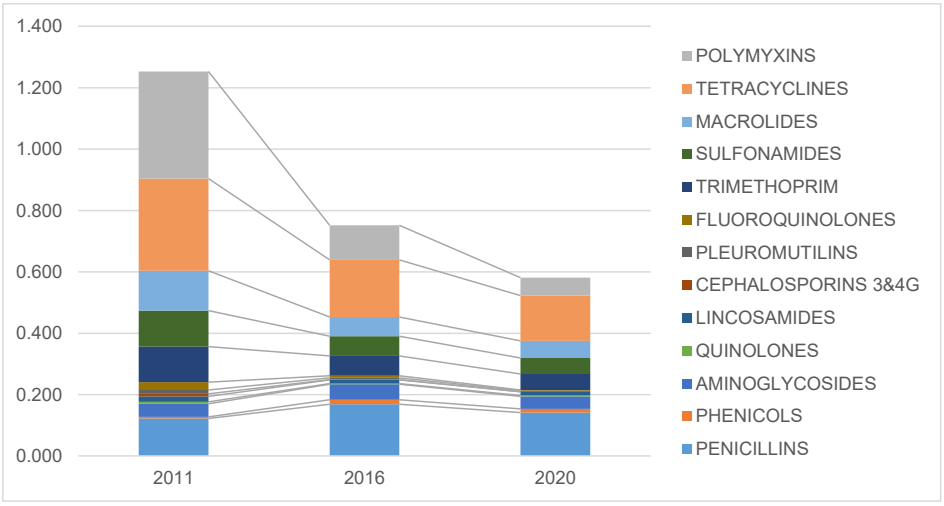

Figure 12: Change in ALEA indicators by class for pigs between 2011, 2016 and 2020

Large falls in exposure have been observed for polymyxins (-83.2%), tetracyclines (-50.9%), macrolides (-57.3%), sulfonamides and trimethoprim (-55.3%), compared with 2011 (Figure 12). After an increase in penicillin exposure between 2011 and 2016, there has been a further decrease over the last few years.

Since 2016, a gradual decrease in exposure of pigs has been observed for most antimicrobial classes (Figure 13). Between 2019 and 2020, antimicrobial exposure increased mainly for sulfonamides (+13.3%) and trimethoprim (+13.6%), and decreased for tetracyclines (-12.6%).

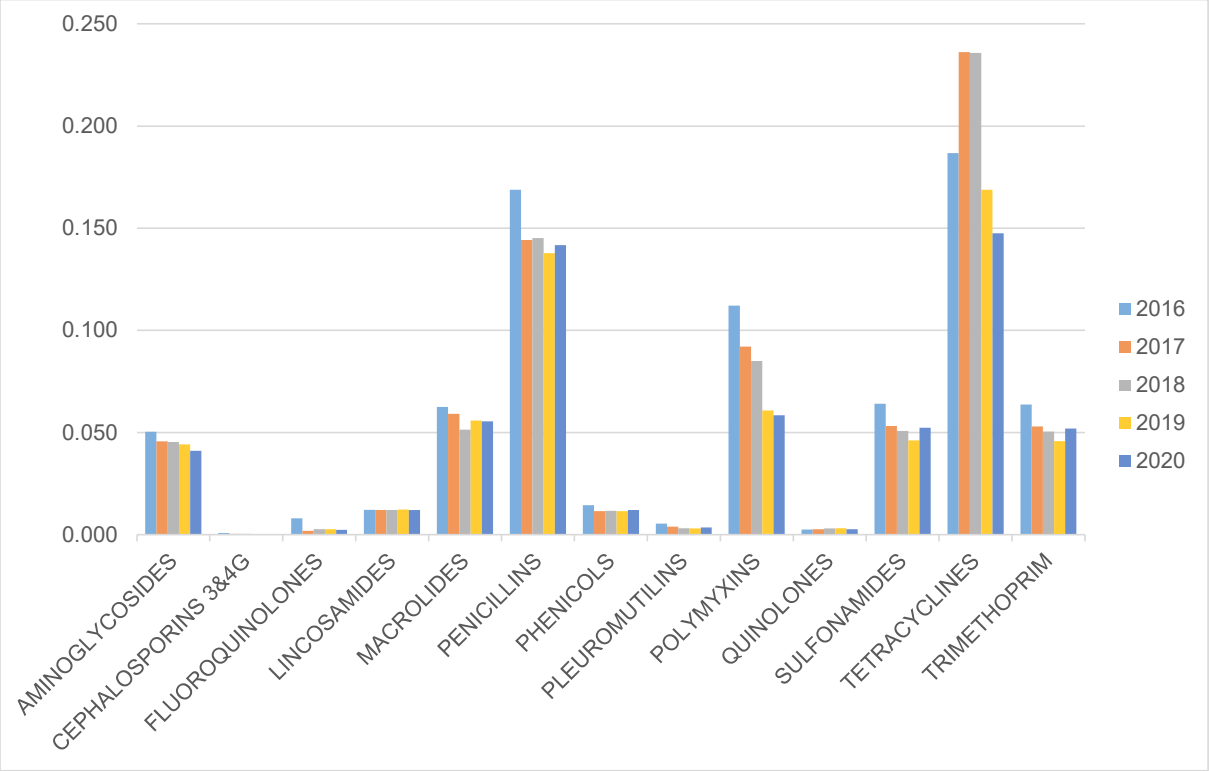

Figure 13: Change in exposure of pigs by antimicrobial class since 2016 (ALEA)

5.3 Poultry

Poultry are treated with medicines containing antimicrobials administered orally and parenterally.

Oral and parenteral treatments

The level of exposure of poultry to antimicrobials has decreased by 64.4% since 2011. Between 2019 and 2020, the ALEA fell by 9.7% (Figure 14). Exposure to antimicrobials has decreased by 68.9% for medicated premixes and by 64.1% for oral powders and solutions, compared with 2011. The decline in exposure via powders and oral solutions was sustained over the last year (-10.4%).

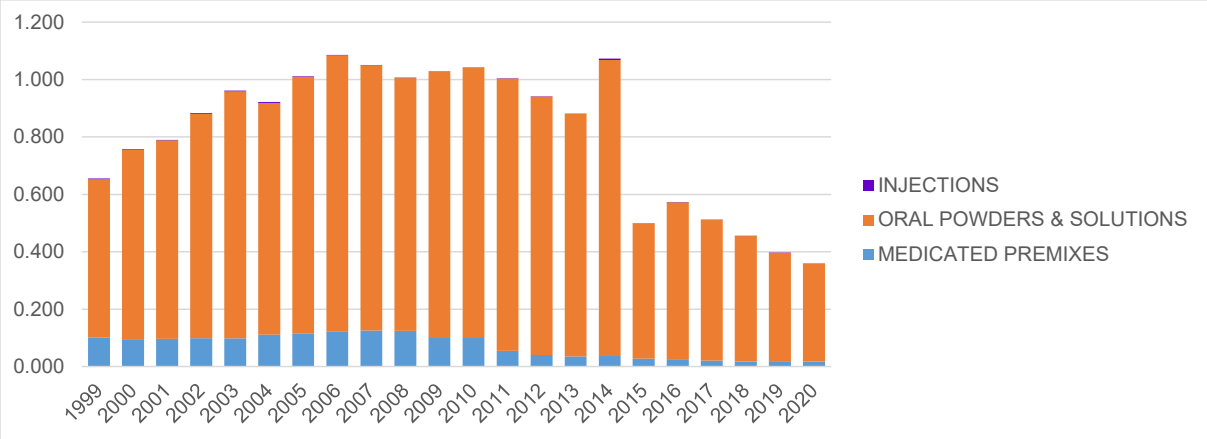

Figure 14: Change in ALEA by pharmaceutical form for poultry since 1999

After a 43.0% fall between 2011 and 2016, the level of exposure of poultry has continued to decline in recent years (-37.5% compared with the ALEA in 2016).

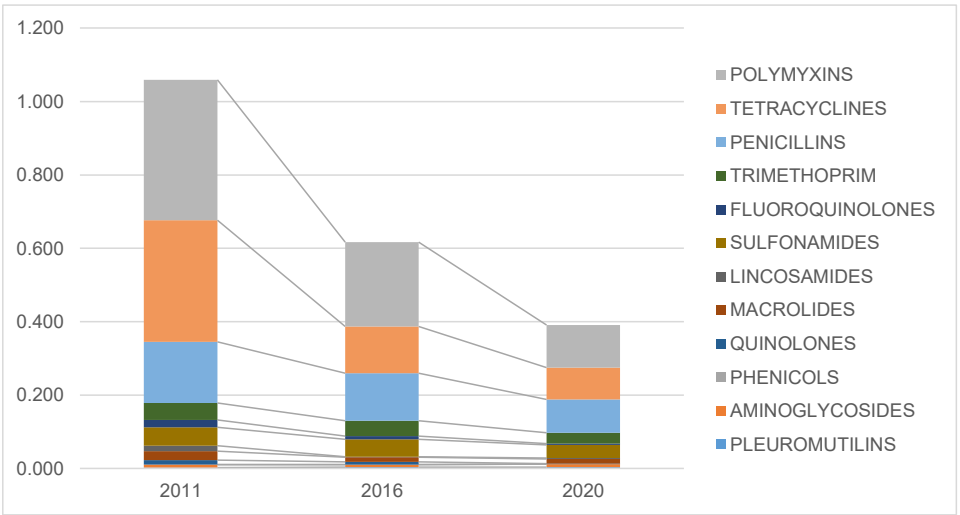

Figure 15: Change in ALEA indicators by class for poultry between 2011, 2016 and 2020

Large falls in exposure have been observed for polymyxins (-69.5%), tetracyclines (-74.0%), penicillins (-45.2%), trimethoprim (-36.3%) and fluoroquinolones (-79.9%), compared with 2011 (Figure 15).

Since 2016, a gradual decrease in poultry exposure has been observed for most antimicrobial classes (Figure 16). Between 2019 and 2020, antimicrobial exposure fell mainly for penicillins (-14.4%), polymyxins (-12.0%) and tetracyclines (-6.6%).

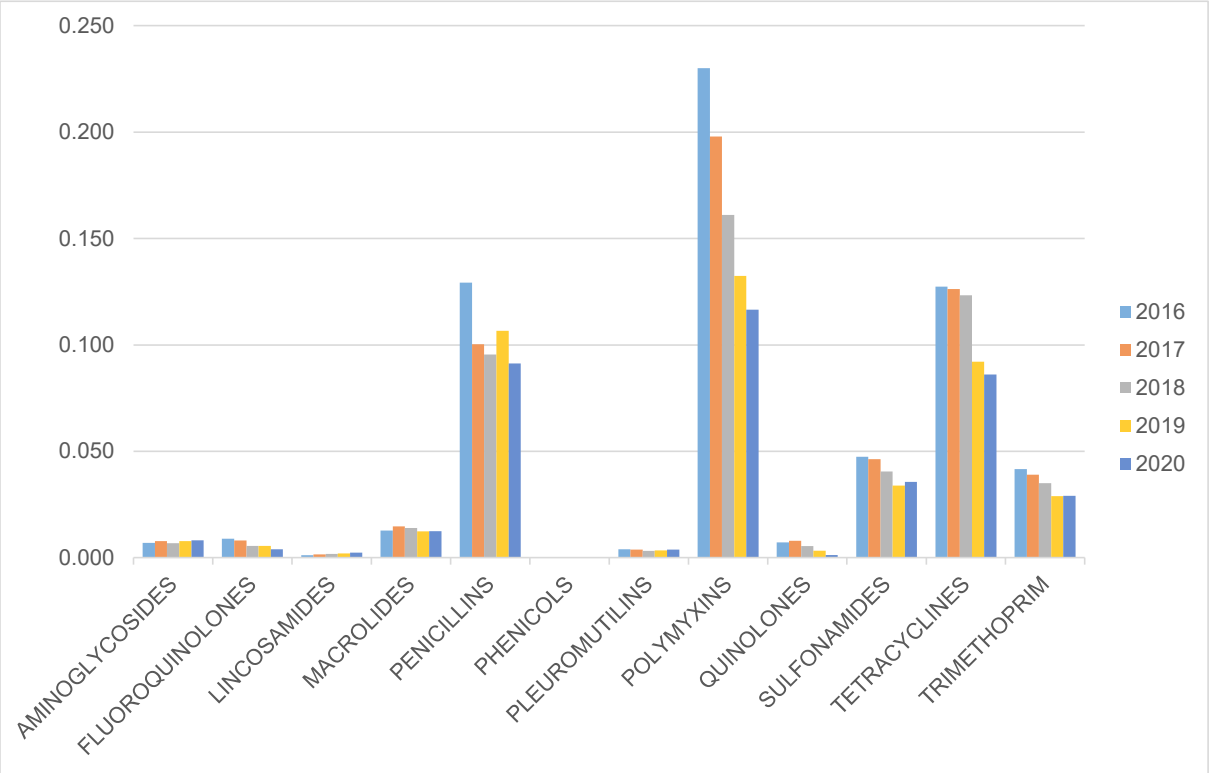

Figure 16: Change in exposure of poultry by antimicrobial class since 2016 (ALEA)

Usage patterns for turkeys and chickens

MA holders estimated the breakdown of sales for turkeys, chickens and other poultry for each presentation. Although this is a difficult and approximate exercise, this information can be used to estimate the antimicrobial use pattern for these animal species.

In 2020, 58.9% of the body weight treated for poultry corresponded to chickens, while turkeys represented 26.4% of this body weight treated (Figure 17).

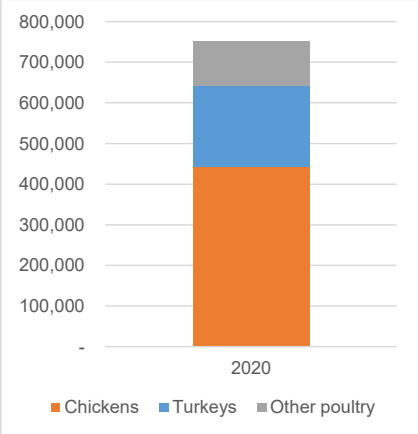

Figure 17: Body weight treated for chickens, turkeys and other poultry in 2020 (in tonnes)

Based on 2020 sales data, antimicrobial usage patterns seem to be quite similar for turkeys and chickens (Figure 18). The main classes used seem to be polymyxins, penicillins, tetracyclines and sulfonamides-trimethoprim. Macrolides seem to be used more in turkeys than in chickens.

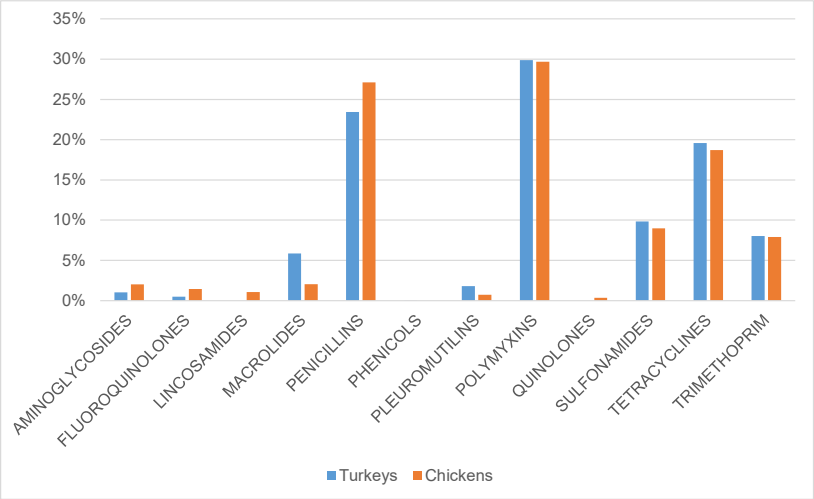

Figure 18: Antimicrobial usage patterns for turkeys and chickens in 2020, based on body weight treated

5.4 Rabbits

Rabbits are treated with medicines containing antimicrobials administered orally and parenterally.

Oral and parenteral treatments

The level of exposure of rabbits to antimicrobials has decreased by 39.9% since 2011. Between 2019 and 2020, the ALEA increased by 2.4%. Exposure has decreased by 55.1% for medicated premixes and by 20.1% for oral powders and solutions, compared with 2011 (Figure 19). The increase in exposure observed over the last year is mainly due to an increase in exposure from powders and oral solutions (+3.3%).

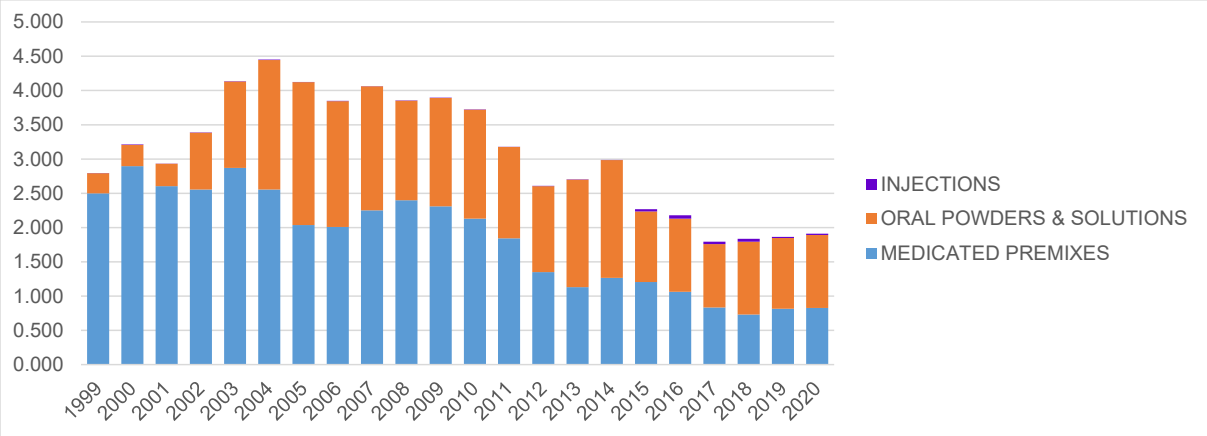

Figure 19: Change in ALEA by pharmaceutical form for rabbits for rabbits since 1999

After a 31.3% decrease between 2011 and 2016, the level of exposure of rabbits fell sharply in 2017 (-18% in one year) and has then increased slightly in recent years. The ALEA in 2020 was 12.5% lower than in 2016.

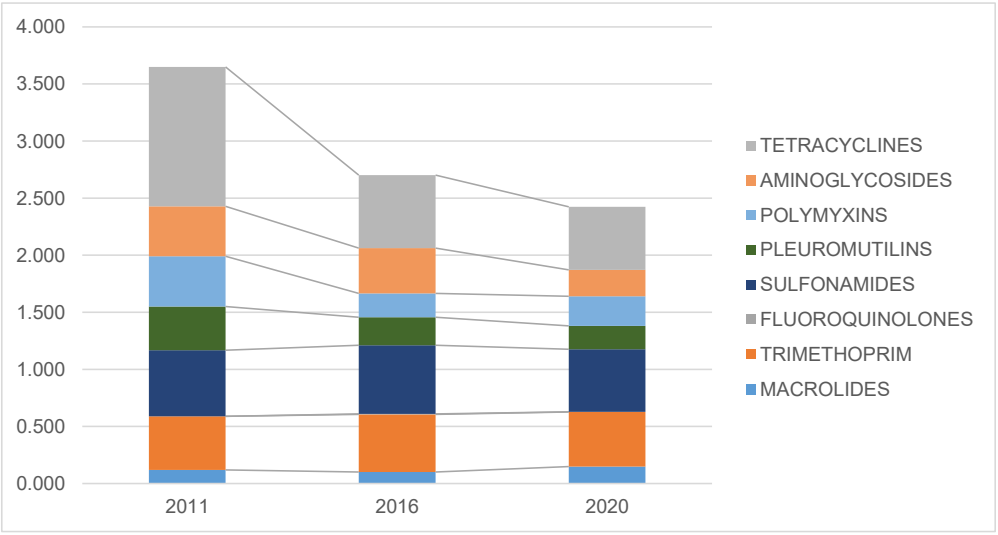

Figure 20: Change in ALEA indicators by class for rabbits between 2011, 2016 and 2020

Large falls in exposure have been observed for tetracyclines (-54.7%), aminoglycosides (-47.2%), polymyxins (-41.3%) and pleuromutilins (-46.5%), compared with 2011 (Figure 20).

Exposure of rabbits to tetracyclines, sulfonamides and trimethoprim has fluctuated since 2016 (Figure 21). Between 2019 and 2020, antimicrobial exposure fell mainly for pleuromutilins (-13.3%), and increased for macrolides (+19.6%), polymyxins (+14.5%), sulfonamides (+9.0%) and trimethoprims (+7.2%)

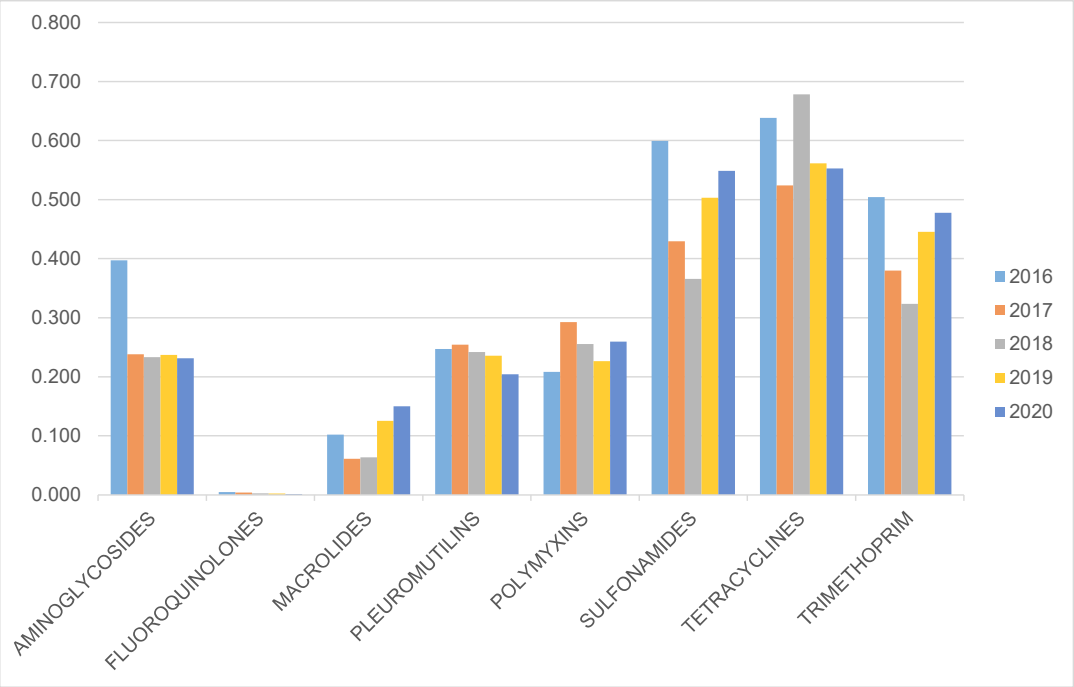

Figure 21: Change in exposure of rabbits by antimicrobial class since 2016 (ALEA)

5.5 Cats and dogs

Cats and dogs are treated with medicines containing antimicrobials administered by the oral, parenteral, dermal, auricular and ocular routes. In 2020, the quantity of antimicrobials corresponding to topical medicines accounted for 12.6% of the total tonnage of antimicrobials sold for cats and dogs. For the first time, an analysis of topical treatments is presented in this section.

Oral and parenteral treatments

The level of exposure of cats and dogs to antimicrobials has decreased by 11.8% since 2011. Between 2019 and 2020, the ALEA increased by 5.1%. Exposure via injections has fallen by 50.3% compared with 2011, with a 3.6% decline between 2019 and 2020 (Figure 5). Oral exposure has fallen by 13.7% compared with 2011, and has increased by 8.0% over the last year. In 2020, tablets accounted for 77.0% of antimicrobial exposure, compared with 22% for injections.

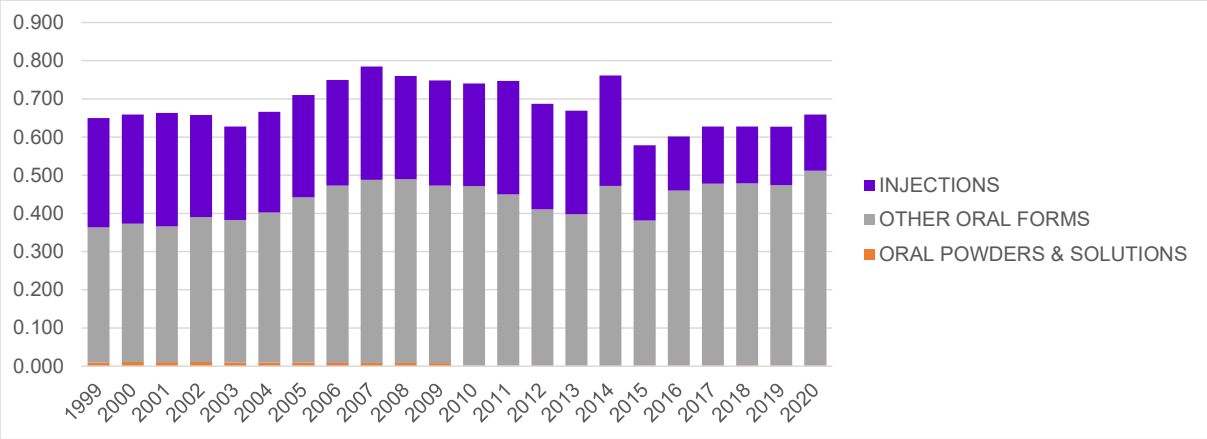

Figure 22: Change in ALEA by pharmaceutical form for cats and dogs since 1999

After a 19.5% fall between 2011 and 2016, the level of exposure of cats and dogs has increased in recent years (+9.6% compared with the ALEA in 2016).

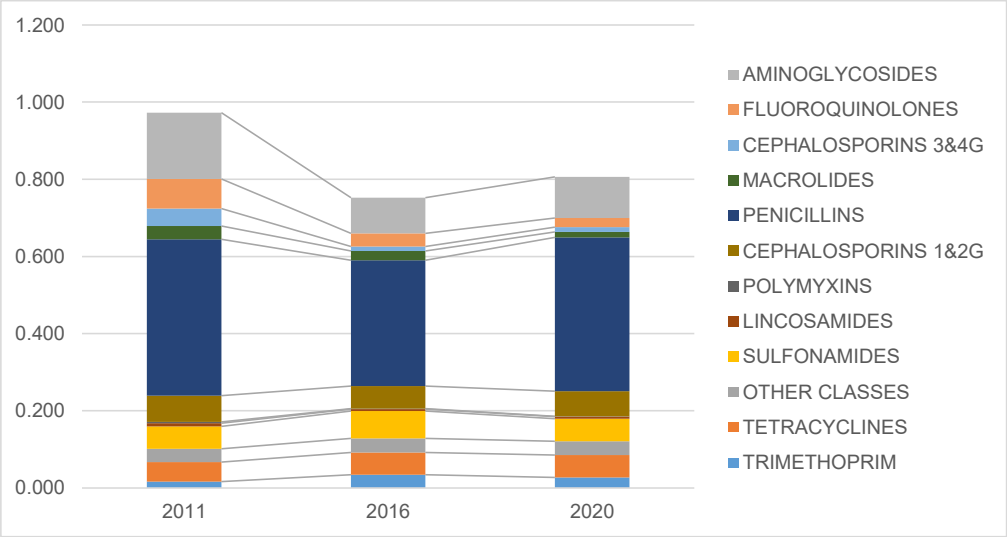

Figure 23: Change in ALEA indicators by class for cats and dogs between 2011, 2016 and 2020

Large falls in exposure have been observed for aminoglycosides (-38.1%), fluoroquinolones (-69.3%), newer-generation cephalosporins (-71.9%) and macrolides (-59.6%), compared with 2011 (Figure 23).

After a 19.5% fall between 2011 and 2016, exposure to penicillins has increased: the level of exposure in 2020 was nearly the same as that in 2011 (-1.6%).

Since 2016, there has been a relative stabilisation of exposure of cats and dogs to most antimicrobial classes, except for penicillins (Figure 24). Between 2019 and 2020, exposure to penicillins increased by 9.0%. This increase particularly concerned tablets combining amoxicillin and clavulanic acid.

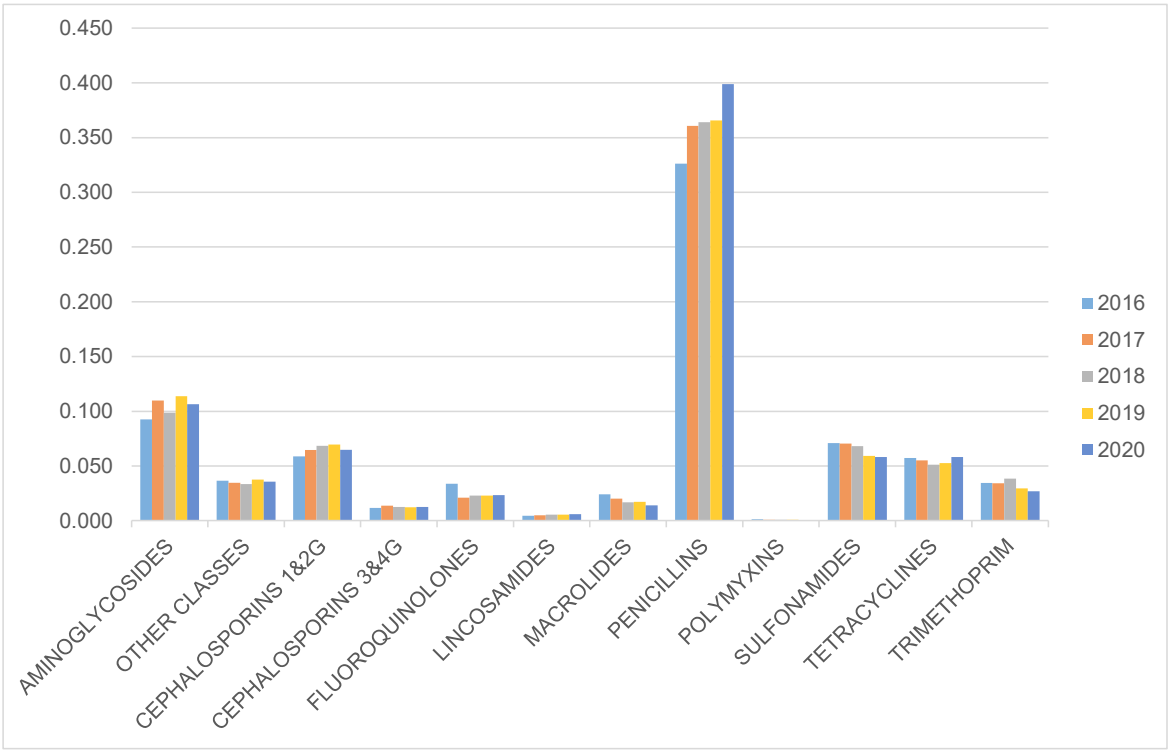

Figure 24: Change in exposure of cats and dogs by antimicrobial class since 2016 (ALEA)

Topical medicines for cats and dogs

Topical medicines are products for local use such as sprays, creams and ear or eye solutions. They accounted for 12.6% of the total tonnage of antimicrobials sold for cats and dogs in 2020, with 2.57 tonnes of antimicrobials. Since 2016, this tonnage has been fairly stable at between 2.3 and 2.6 tonnes. Around 90% of the quantity of antimicrobials sold for topical treatment was for dermal treatments, using sprays or ointments.

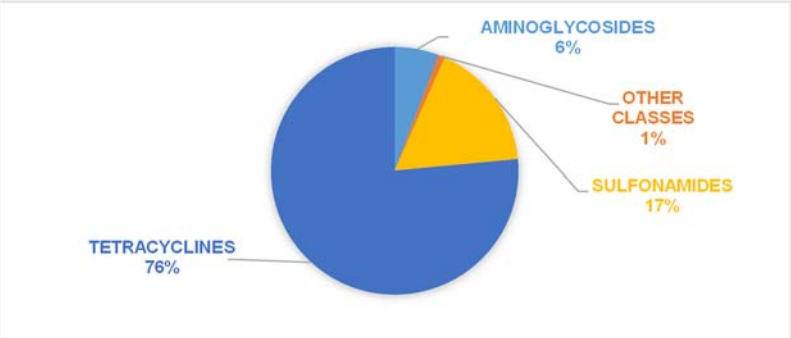

Figure 25: Shares of the different classes in the tonnage of antimicrobials sold for dermal treatments for cats and dogs

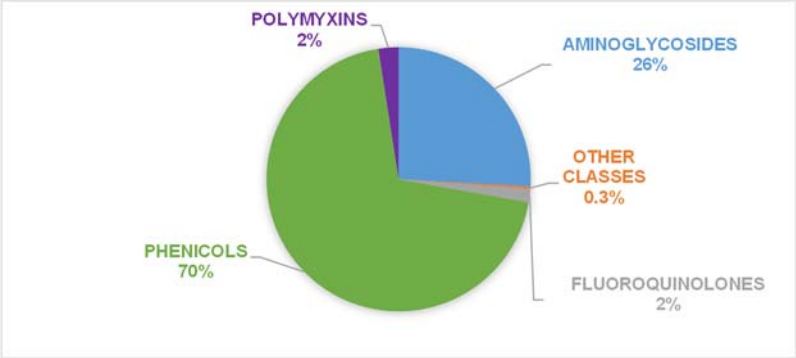

Figure 26: Shares of the different classes in the tonnage of antimicrobials sold for ear treatments for cats and dogs

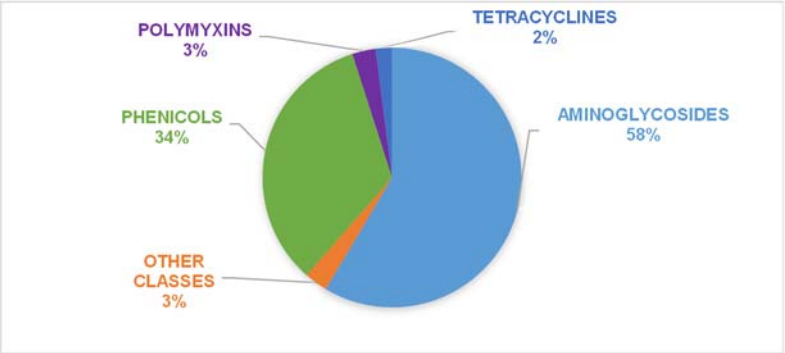

Figure 27: Shares of the different classes in the tonnage of antimicrobials sold for eye treatments for cats and dogs

6 Exposure to fluoroquinolones, third- and fourth-generation cephalosporins and colistin

6.1 Background

■ Fluoroquinolones and third- and fourth-generation cephalosporins

These antimicrobials are considered as particularly important in human medicine because they are among the only alternatives for the treatment of certain infectious diseases in humans.

The Act on the future of agriculture, food and forestry (LAAAF[9], Act No. 2014-1170 of 13 October 2014) set a target of a 25% reduction in three years in the use of antimicrobials belonging to each of these classes. The year 2013 was taken as a reference for this objective, which was to be achieved by the end of December 2016 at the latest.

On 16 March 2016, a decree was published to regulate the prescription and dispensing of medicines used in veterinary medicine and containing one or more antibiotic substance of critical importance. The two most important provisions for French veterinary medicine are:

- a ban on the prescription for preventive purposes of antimicrobials of critical importance;
- the requirement to conduct a clinical examination followed by an antibiogram before prescribing an antimicrobial of critical importance for curative or metaphylactic purposes. Some exceptions apply.

The Interministerial order of 18 March 2016 establishes the list of antimicrobial substances of critical importance (four substances belonging to the third- and fourth-generation cephalosporins and five substances belonging to the fluoroquinolones), as well as the list of methods for carrying out the bacterial strain susceptibility test. The Ministerial order of 18 December 2017 has since amended the list of validated standards and methods applicable for susceptibility testing.

■ Colistin

A scientific article published in November 2015 describing the first plasmid-mediated mechanism of resistance to colistin led to the establishment of reinforced surveillance for this antimicrobial.

At European level, in July 2016, the Antimicrobial Advice Ad Hoc Expert Group (AMEG)[10] recommended reducing the use of colistin within three to four years to no more than 5 mg/PCU (Population Correction Unit) for European countries that are high or moderate consumers, and no more than 1 mg/PCU for European countries with the lowest use of colistin.

In France, in its report[11] on colistin published in October 2016, ANSES recommended a 50% reduction in the use of this antimicrobial. Following this opinion, the EcoAntibio2 plan (Action

[9] http://www.legifrance.gouv.fr/affichLoiPubliee.do;jsessionid=5691BBA0E2987B8FCBB6195E53853F64.tpdjo07v_2?type=general&idDocument=JORFDOLE000028196878

[10] http://www.ema.europa.eu/docs/en_GB/document_library/Scientific_guideline/2016/07/WC500211080.pdf

[11] https://www.anses.fr/fr/system/files/MV2016SA0160.pdf

12) set a five-year goal of a 50% reduction in exposure to colistin in the cattle, pig and poultry sectors, taking the average ALEA for 2014-2015 as a reference (see Chapter 4.1 of this report). This reference is calculated as follows:

$ALEA_{2014\text{-}15}$ = (body weight treated$_{2014}$ + body weight treated$_{2015}$) / (Biomass$_{2014}$ + Biomass$_{2015}$)

6.2 Change in exposure to fluoroquinolones

Fluoroquinolones are authorised for use in cattle (oral and parenteral route), pigs (parenteral), poultry (oral), rabbits (oral and parenteral), cats and dogs (oral, parenteral and local), other pets (oral and parenteral) and sheep and goats (parenteral). According to the reports submitted by the pharmaceutical companies, fluoroquinolones are also used to treat horses. Off-label uses not quantified by the pharmaceutical companies as part of this monitoring have not been considered.

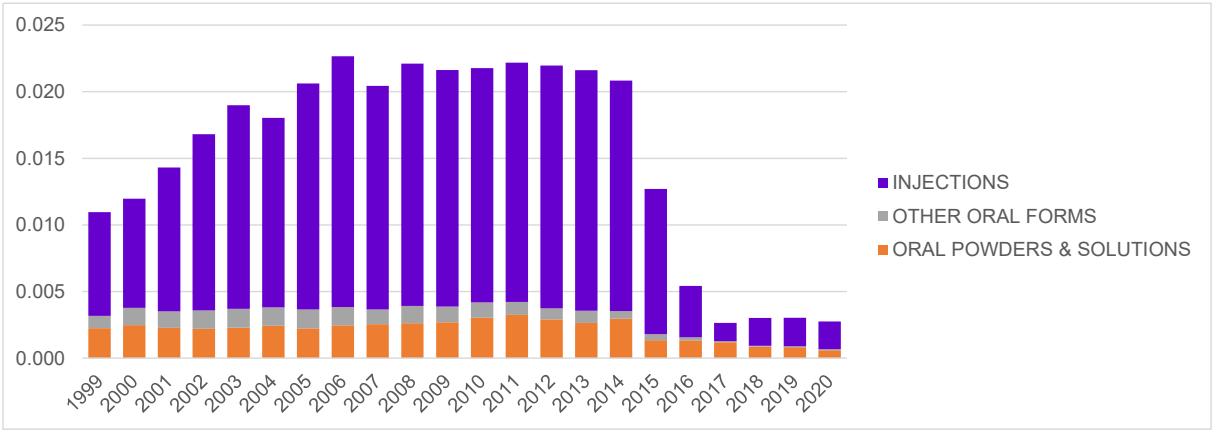

Figure 28: Change in exposure to fluoroquinolones (ALEA)

Exposure to fluoroquinolones fell by 87.3% between 2013 and 2020, all species and routes of administration combined (Figure 28). After a sharp decline until 2017, the level of exposure has been relatively stable in recent years.

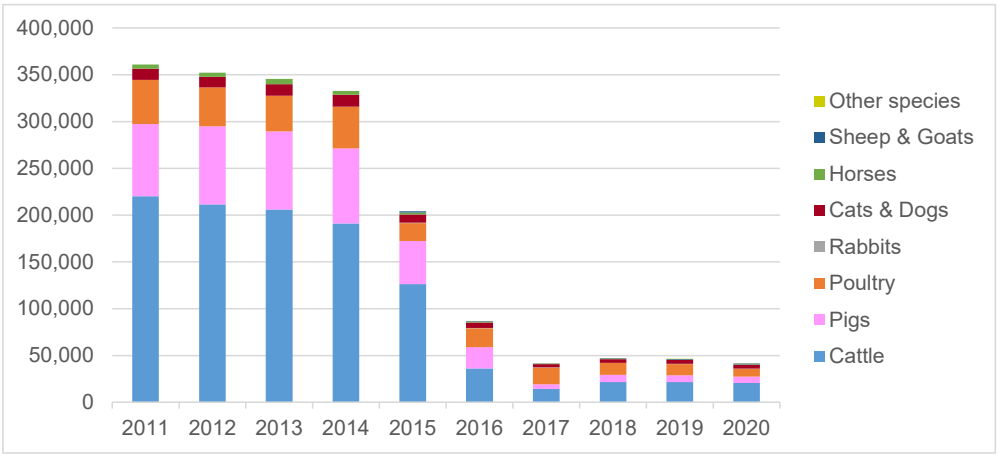

Figure 29: Change in body weight treated with fluoroquinolones according to the species (in tonnes)

For 2020, the body weight treated with fluoroquinolones corresponded mainly to four animal species (Figure 29): cattle (49.8%), poultry (20.1%), pigs (16.3%) and cats & dogs (10.1%). Horses accounted for 1.1% of the body weight treated, sheep/goats 2.3% and rabbits 0.3%.

Table 5: Change in exposure to fluoroquinolones according to the species

	Cattle	Pigs	Poultry	Cats & Dogs	Horses	All species
Change in 2020 compared with 2013	**-89.3%**	**-91.8%**	**-75.8%**	**-70.2%**	**-91.4%**	**-87.3%**
- Oral route	-97.4%		-75.8%	-78.7%		-81.3%
- Parenteral route	-88.7%	-91.8%		-64.4%	-91.4%	-88.4%
Change in 2020 compared with 2019	**-2.6%**	**-7.1%**	**-28.5%**	**1.8%**	**-1.0%**	**-9.3%**
- Oral route	-36.5%		-28.5%	0.2%		-25.6%
- Parenteral route	2.3%	-7.1%		2.7%	-1.0%	-2.4%

Between 2019 and 2020, the ALEA fell by 9.3% for all species and routes of administration combined. Over the last year, a sharp fall in exposure to fluoroquinolones has been observed in poultry (Table 5).

6.3 Change in exposure to newer-generation cephalosporins

Third- and fourth-generation cephalosporins are authorised only for the intramammary route in cattle, and the parenteral route in pigs, cattle, horses, cats and dogs. They are not authorised in poultry. Off-label uses not quantified by the pharmaceutical companies as part of this monitoring have not been considered.

The number of intramammary treatments per dairy cow based on newer-generation cephalosporins decreased by 98.8% between 2013 and 2020, and is stable compared with 2019 (+1.1%).

Exposure to newer-generation cephalosporins decreased by 94.3% between 2013 and 2020, all species combined (Figure 30). After a sharp decline until 2017, the level of exposure has been relatively stable in recent years.

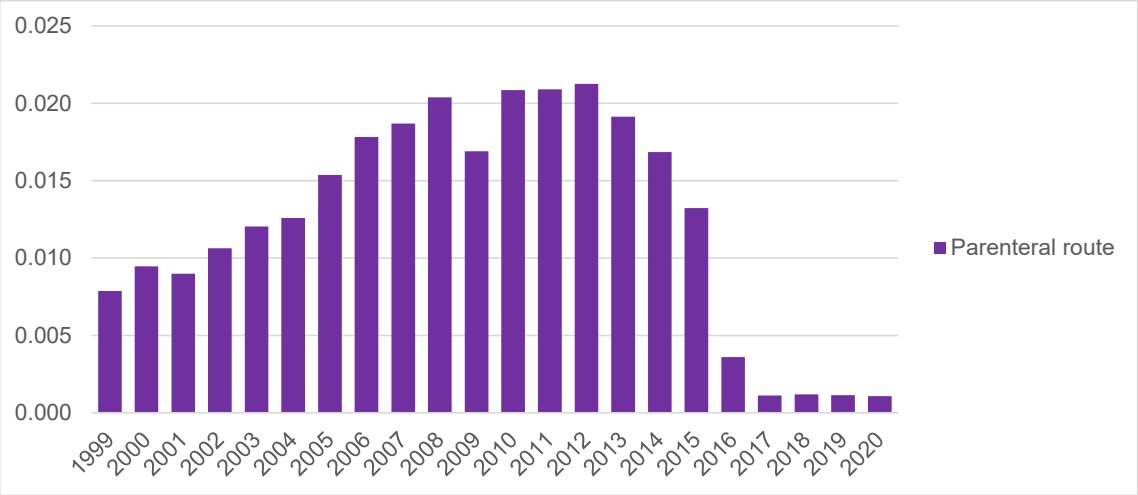

Figure 30: Change in exposure to newer-generation cephalosporins (ALEA)

In 2020, the body weight treated with third- and fourth-generation cephalosporins mainly corresponded to cattle (81.7%), followed by cats and dogs (13.9%) and pigs (3.4%). Horses accounted for 1.0% of the body weight treated (Figure 31).

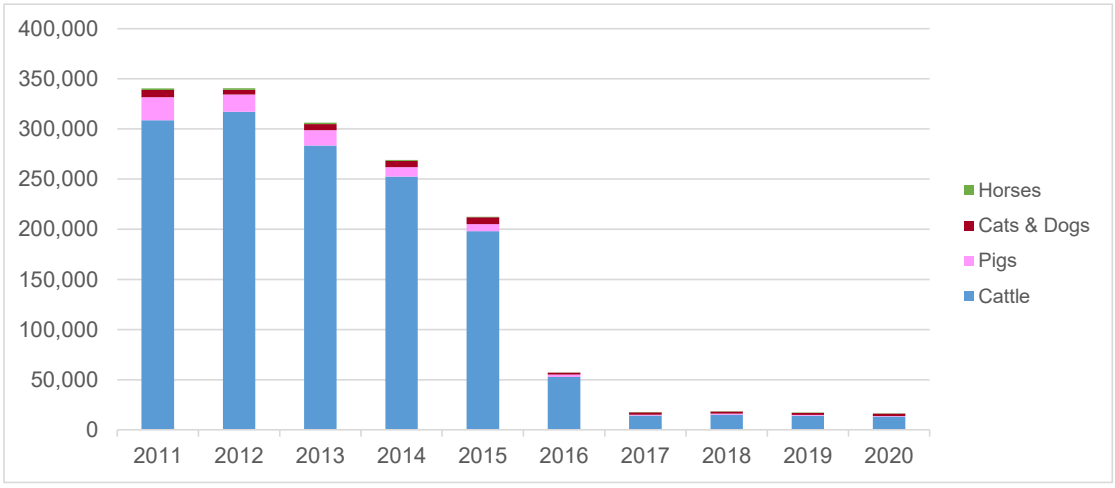

Figure 31: Change in body weight treated with third- and fourth-generation cephalosporins according to the species (in tonnes)

Over the last year, a 3.9% decrease in exposure to third- and fourth-generation cephalosporins has been observed (Table 6).

Table 6: Change in exposure to third- and fourth-generation cephalosporins according to the species

	Cattle	Pigs	Cats & Dogs	All species
Change in 2020 compared with 2013	-95.0%	-96.3%	-66.6%	-94.3%
Change in 2020 compared with 2019	-4.1%	-26.1%	1.9%	-3.9%

6.4 Change in exposure to colistin

Medicines containing colistin are authorised for different species and administered by different routes (parenteral, oral or intramammary). Off-label uses not quantified by the pharmaceutical companies as part of this monitoring have not been considered.

With an ALEA of 0.035 for 2020, exposure to colistin has fallen by 74.6% compared with 2011 (Figure 32): this fall is greatest for medicated premixes (-95.6%), followed by oral powders and solutions (-69.6%). Exposure by the parenteral route is relatively low compared with oral exposure; it has decreased by 16.7% since 2011. In 2020, exposure to colistin via medicated premixes accounted for only 4.7% of total colistin exposure.

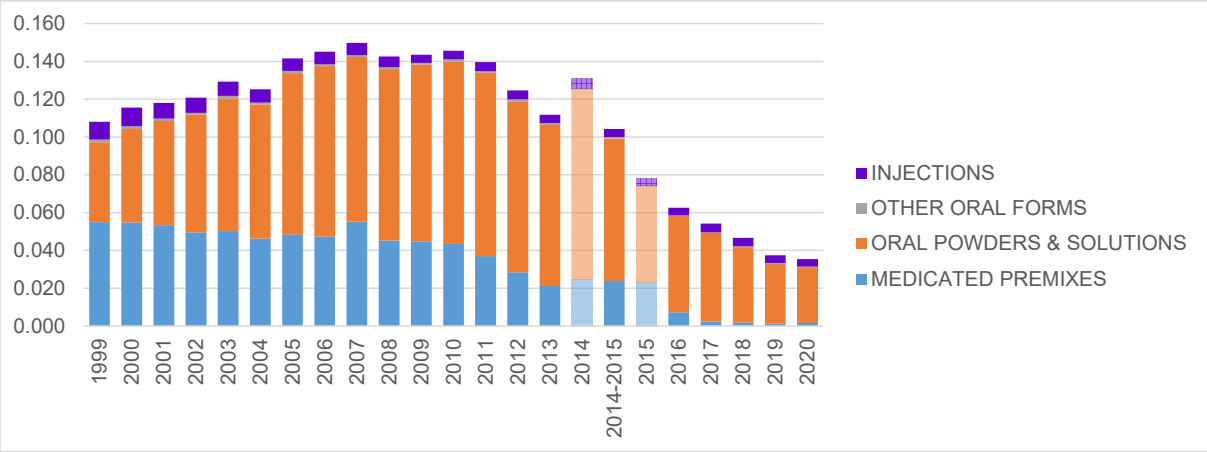

Figure 32: Change in exposure to colistin (ALEA)

In 2020, the body weight treated with colistin corresponded mainly to three animal species (Figure 33): poultry (45.7%), pigs (30.9%) and cattle (18.4%). Other species are also treated with this antimicrobial, but the percentages of body weight treated attributable to these species were relatively low: 2.7% for rabbits, 2.2% for sheep and goats, 0.1% for horses and 0.02% for cats and dogs.

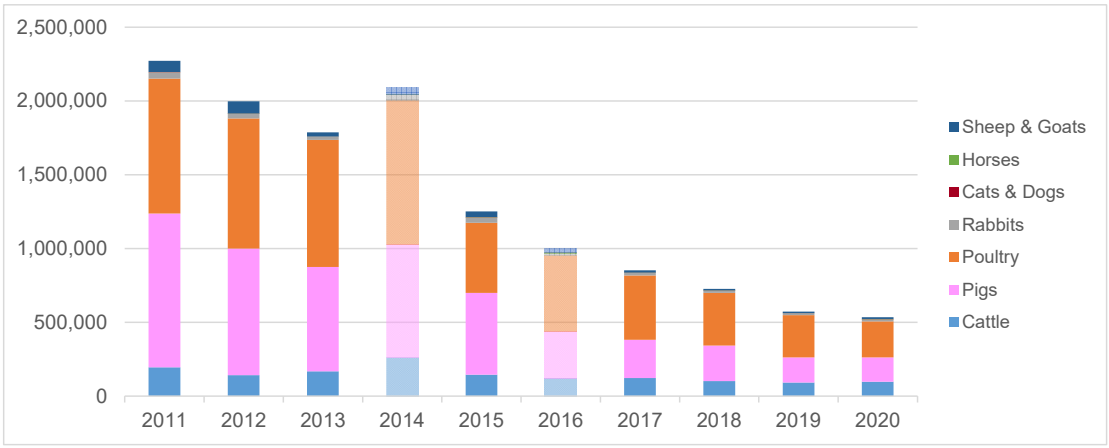

Figure 33: Change in body weight treated with colistin according to the species (in tonnes)

■ AMEG's recommendation on reducing use

At European level, in July 2016, the Antimicrobial Advice Ad Hoc Expert Group (AMEG)[12] recommended reducing the use of colistin to no more than 5 mg/PCU (Population Correction Unit) in three to four years for European countries that are high or moderate consumers, and to no more than 1 mg/PCU for European countries with the lowest use. These objectives, to be achieved in three to four years, were designed to contribute to a 65% reduction in the use of colistin in Europe.

Since 2015, the quantities of colistin sold in France have been below the 5 mg/PCU threshold advocated by the AMEG (Table 7).

Table 7: Change in the quantities of colistin sold according to the European indicator (mg/PCU)

	Tonnage of colistin	PCU (x 1000 tonnes)	Quantity of colistin in mg/PCU
2013	42.70	7,247	5.89
2014	50.57	7197	7.03
2015	29.10	7,222	4.03
2016	19.94	7,217	2.76
2017	15.62	7,097	2.20
2018	13.02	7,107	1.83
2019	9.96	6,985	1.43
2020	9.72	6,965	1.40

■ Objective of the EcoAntibio2 plan

One of the objectives of the EcoAntibio2 plan (Action 12) is a 50% reduction in five years in exposure to colistin in the cattle, pig and poultry sectors, taking as a reference the average ALEA for 2014-15.

Table 8: Change in exposure to colistin according to the species

	Cattle	**Pigs**	**Poultry**	**Cattle + Pigs + Poultry**	**All species**
Change in ALEA in 2020 compared with the average ALEA for 2014-2015	**-48.1%**	**-74.8%**	**-63.1%**	**-66.0%**	**-66.0%**
- Oral route	-60.6%	-76.7%	-63.1%	-68.6%	-68.6%
- Parenteral route	-8.8%	7.9%	-86.0%	-5.2%	-7.1%
Change in ALEA in 2020 compared with ALEA 2019	**8.4%**	**-4.0%**	**-12.0%**	**-6.0%**	**-5.3%**
- Oral route	22.5%	-5.2%	-12.0%	-6.4%	-5.7%
- Parenteral route	-6.2%	+8.8%	-15.2%	-2.3%	-2.1%

Between 2014-15 and 2020, exposure to colistin declined for cattle (-48.1%), pigs (74.8%) and poultry (-63.1%) compared with the average ALEA for 2014-2015 (Table 8). In 2020, the target for the EcoAntibio2 plan was achieved, with a 66.0% reduction in cumulative exposure to colistin for these three sectors (Figure 34).

[12] http://www.ema.europa.eu/docs/en_GB/document_library/Scientific_guideline/2016/07/WC500211080.pdf

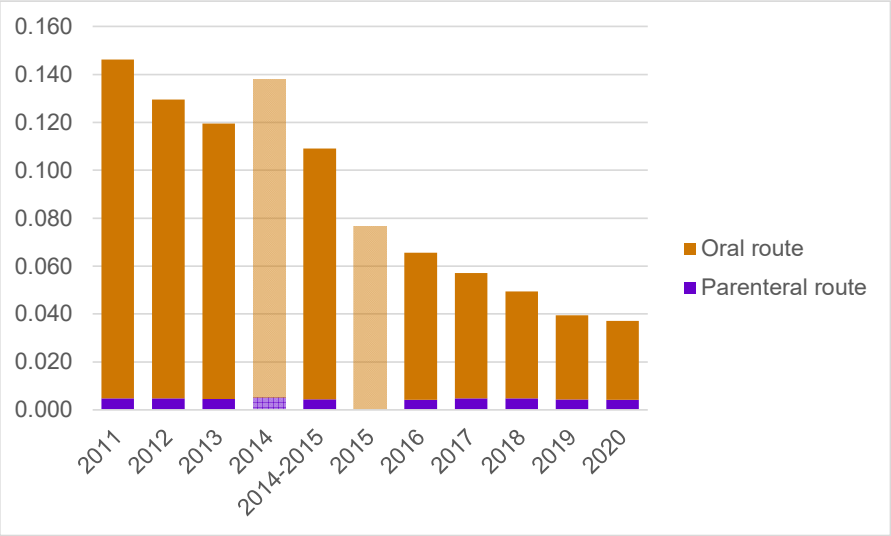

Figure 34: Change in exposure to colistin for cattle, pigs and poultry combined

Change in exposure to newer-generation cephalosporins, fluoroquinolones and colistin since 2011

Third- and fourth-generation cephalosporins, fluoroquinolones and colistin are in Category B "Restrict" according to the AMEG categorisation. This European categorisation of antimicrobials has been defined on the basis of the consequences to public health of antimicrobial resistance in animals and the need for their use in veterinary medicine. Published in 2019, it is intended as a tool to support decision-making by veterinarians on which antibiotic to use.

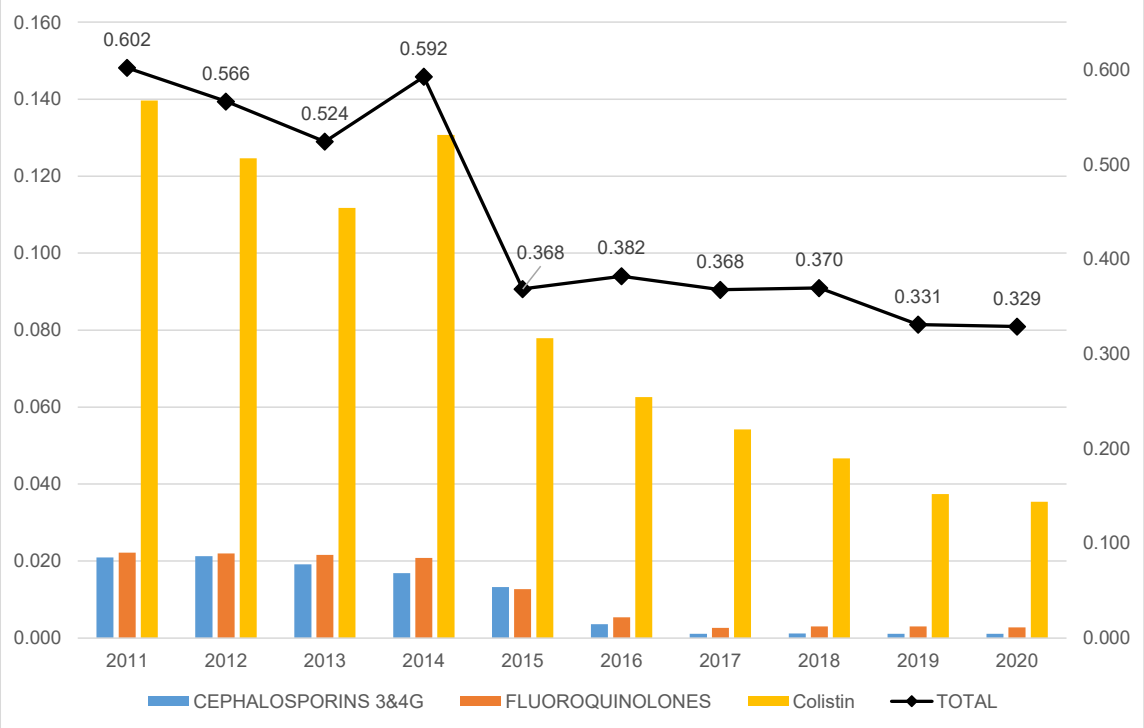

Figure 35: Change in exposure to newer-generation cephalosporins, fluoroquinolones and colistin and in overall exposure since 2011

Between 2011 and 2020, overall animal exposure fell by 45.4% (Figure 35). Over this period, there were large falls in exposure for newer-generation cephalosporins (-94.8%), fluoroquinolones (-87.6%) and colistin (-74.6%).

7 Comparison of exposure indicators between the French and European approaches

7.1 The European approach to calculating exposure

In order to estimate the exposure of animal species in Europe, in 2016, ESVAC published reference values called DDDvet and DCDvet, for cattle, pigs and chickens (poultry)[13]. These values were established on the basis of marketing authorisations issued by nine European countries, including France.

An average daily dose and an average treatment duration were therefore established for each active ingredient, route of administration and, in some cases, pharmaceutical form (medicated premixes). The value of the DDDvet (defined daily dose for animals) corresponds to the dose in mg/kg, and the value of the DCDvet (defined course dose for animals) corresponds to the dose in mg/kg multiplied by the average duration of treatment.

The European approach is different to the French one. Indeed, the ADD and ACD values used in the monitoring scheme in France have been defined for each medicine, according to the doses and treatment durations specified in the SPC (see Part 2 of this report). Nevertheless, the approach adopted by ESVAC should enable an analysis of the changes in antimicrobial exposure for the different animal species in Europe.

7.2 Change in exposure indicators since 2016, according to the two approaches

In 2020, the differences between the body weight treated-day calculated with the French values (shown as nb-ADD) and the European values (shown as nb-DDDvet) were 53.3% for cattle, 10.0% for pigs and 22.1% for poultry (Figure 36).

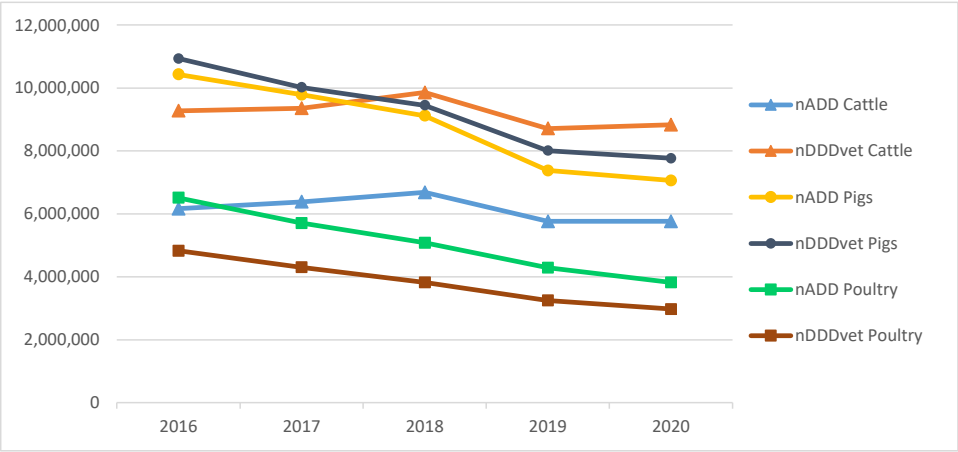

Figure 36: Change in body weight treated-day since 2016 according to the French and European approaches (tonnes)

[13] http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/general/general_content_001493.jsp&mid

The differences between the body weight treated calculated with the French values (shown as nb-ACD) and the European values (shown as nb-DCDvet) in 2020 were 11.4% for cattle, 1.5% for pigs and 18.8% for poultry (Figure 37).

These differences can be explained by the different choices made to establish the reference values in Europe and in France: European values by active ingredient and route of administration versus French values specific to a medicine; average doses and durations according to the medicines authorised in Europe versus maximum doses and durations for a medicine authorised in France.

Nevertheless, the trends in these indicators between 2016 and 2020 are very similar.

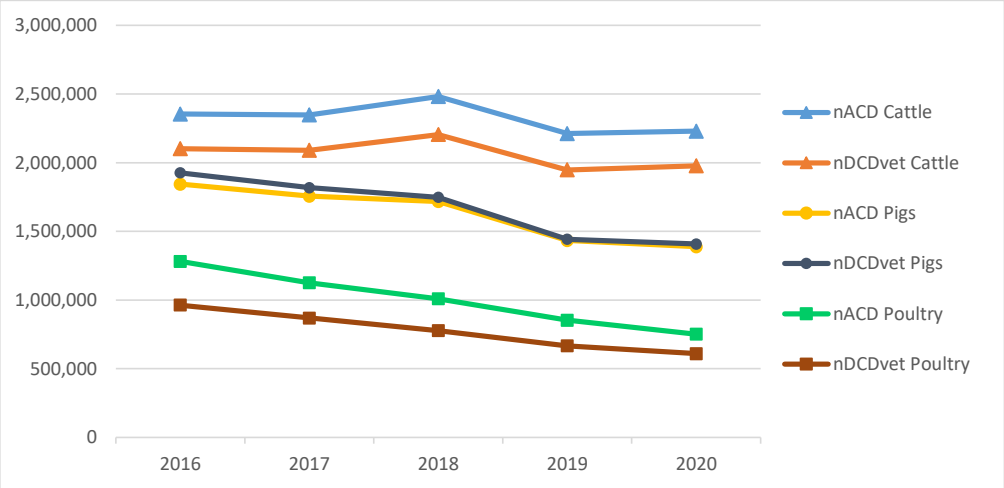

Figure 37: Change in body weight treated since 2016 according to the French and European approaches (tonnes)

If the body weight treated calculated with the European reference values is related to the French animal biomass, an exposure indicator is calculated that is comparable to the ALEA used in the national monitoring scheme.

Table 9: Percentage changes in exposure between 2016 and 2020 according to the European and French approaches for cattle, pigs and poultry

	Cattle	Pigs	Poultry
Third- and fourth-generation cephalosporins			
EU	-74%	-76%	
FR	-73%	-75%	
Fluoroquinolones			
EU	-36%	-72%	-56%
FR	-38%	-70%	-56%
Colistin			
EU	-6%	-50%	-50%
FR	-11%	-48%	-49%
All classes of antimicrobials			
EU	+2%	-26%	-33%
FR	+2%	-24%	-37%

Although the French and European approaches differ in how they define the reference values needed for the exposure calculations, the percentage changes in exposure were very similar for cattle, pigs and poultry between 2016 and 2020 (Table 9).

8 Discussion

8.1 Indicators of sales and indicators of exposure

The results of this sales survey of veterinary medicinal products containing antimicrobials should be interpreted with caution. In this report, the different indicators used describe different phenomena. It is very important to choose the most appropriate indicator to describe a specific change. Antimicrobial sales expressed in tonnage of active substance do not reflect exposure to the different classes because the antimicrobials' therapeutic activity is not taken into account. This indicator may however be of interest for environmental studies.

It is therefore necessary to distinguish between indicators of "sales" (in mg of active ingredient and mg/kg, i.e. quantity of active ingredient relative to the weight of the animal population) and indicators of "exposure" (body weight treated-day, body weight treated, ALEA).

The volume of sales in terms of the quantity of active ingredient is an accurate measurement when applied to all species combined. When it is defined by species, it becomes an estimated measurement because it is based on an estimate by MA holders of the breakdown of sales between the different species potentially using antimicrobials. These estimates by pharmaceutical companies have been in place since 2009, and only partially describe off-label use[14].

All exposure indicators are estimated measurements. This is because they result from estimates of the breakdown of sales by species, but also from dosages and durations of treatment specified by the MA that may sometimes be unrelated to the dosages and durations actually applied in the field.

The biomass of the animal population used in this report corresponds to the weight of the animal population potentially treated with antimicrobials in France. The weights considered are slaughter weights or adult weights. These weights do not generally correspond to the weight at the time of treatment. This leads to an underestimation of actual exposure, although it has no influence on the overall trends observed.

8.2 New European regulatory requirements on the collection of antimicrobial data

8.2.1 European regulations

The new European Regulation (EU) 2019/6 on veterinary medicinal products[15] will come into force in 2022. It introduced a requirement for Member States to report their data on the volume of sales of antimicrobial veterinary medicines to the European Medicines Agency (EMA). Antimicrobials are defined in the Regulation as any substance with a direct action on micro-

[14] The off-label use of veterinary medicinal products is partly taken into consideration in the manufacturers' reports. Exceptional prescription and off-label use of human medicines or extemporaneous preparations containing antimicrobials under the provisions of the cascade approach (Article L. 5143-4 of the French Public Health Code) are not taken into account.

[15] https://eur-lex.europa.eu/eli/reg/2019/6/oj

organisms used for treatment or prevention of infections or infectious diseases, including antibiotics, antivirals, antifungals and anti-protozoals.

Regulation (EU) No 2019/6 also provides for the development of data collection on the use of antimicrobial medicines by animal species and category. Member States will need to put in place adequate national data collection systems in order to obtain high-quality data with complete coverage of use by animal species. The use data concern both veterinary antimicrobials and human antimicrobials that can exceptionally be used in animals.

Commission Delegated Regulation (EU) No 2021/578 of 29 January 2021 has supplemented Regulation (EU) No 2019/6 with regard to data collection requirements[16]. An annex lists the antimicrobial medicines to be reported. The majority of antibiotics are concerned by the obligation to transmit data on veterinary medicinal product sales. For topical medicinal products containing antibiotics, the collection of sales data by Member States is optional.

For antimicrobial use data, transmission will be introduced progressively. Member States will have to collect data annually from January 2023 for the following food-producing animal species: cattle, pigs, chickens (with a distinction between broilers and layers) and turkeys. Data collection for all other food-producing animal species and horses should be operational by 2026, and by 2029 for dogs, cats and fur animals.

8.2.2 Antimicrobial data collection systems in France

Since the start of the first EcoAntibio plan, several projects have been implemented to collect data on the use of antimicrobials in different animal sectors. For example, the GVET veterinary treatment management approach has been developed to modernise the treatment register and measure antimicrobial use in pig farming[17]. A permanent observatory on the use of antimicrobials in veal calf farms has been set up[18]. RefA²vi is a professional network that produces references on the use of antimicrobials in poultry farming[19]. These initiatives involve a wide range of stakeholders such as farmers, veterinarians, agricultural technical institutes, ANSES, production organisations and inter-professional bodies. They are in line with Theme 3 "Shared tools" of the second EcoAntibio plan, and especially its Action 9: Build, maintain and disseminate self-assessment tools for farmers and veterinarians. These projects provide baseline data on antimicrobial use in livestock. The data collected are accurate and can be used to identify possible areas for improvement and encourage changes in practices. However, these projects are based on voluntary approaches by farmers, veterinarians or production organisations.

In order to meet the future requirements of Delegated Regulation (EU) No 2021/578, France will have to develop a comprehensive system for collecting use data. The Act on the future of agriculture, food and forestry (LAAAF[20], Act No. 2014-1170 of 13 October 2014) introduced mandatory reporting of antimicrobial sales throughout France. This law (amended by Act No. 2019-774 of 24 July 2019 on the organisation and transformation of the healthcare system) concerns marketing authorisation (MA) holders, companies manufacturing and distributing

[16] https://eur-lex.europa.eu/eli/reg_del/2021/578/oj

[17] https://ifip.asso.fr/fr/content/gestion-informatique-des-traitements-v%C3%A9t%C3%A9rinaires-gr%C3%A2ce-%C3%A0-gvet

[18] http://www.journees3r.fr/IMG/pdf/texte_3_reduction_intrants_m-chanteperdrix-2.pdf

[19] https://www.itavi.asso.fr/content/reseau-professionnel-de-references-sur-les-usages-dantibiotiques-en-elevage-avicole

[20] http://www.legifrance.gouv.fr/affichLoiPubliee.do;jsessionid=5691BBA0E2987B8FCBB6195E53853F64.tpdjo07v_2?type=general&idDocument=JORFDOLE000028196878

medicated feedingstuffs, veterinarians and pharmacists. Since 2018, only manufacturers and distributors of medicated feedingstuffs have reported their antimicrobial sales to ANSES-ANMV on a quarterly basis.

The Calypso project, led by the Directorate General for Food, is seeking to set up a specific computer system for managing, reporting and accessing data on sales. The analysis of these exhaustive data will in time complement that of the sales data currently reported by MA holders, as it is much finer and more detailed.

8.3 Data on antimicrobials used in animals are becoming increasingly accurate

8.3.1 Use of medicated feedingstuffs

In 2020, medicated premixes accounted for 31% of the tonnage of antimicrobials sold and 10% of the overall exposure of animals. All animal species combined, the use of medicated feedingstuffs has been declining steadily since 2007. According to sales data for 2020, exposure to antimicrobials via medicated premixes has fallen by 74.4% compared with 2011. Over this period, exposure fell by 77.8% for pigs, 68.9% for poultry and 55.1% for rabbits.

Following publication of the Act on the future of agriculture, Decree No. 2016-1788 of 19 December 2016 made it mandatory for manufacturers and distributors of medicated feedingstuffs to report quarterly to ANSES-ANMV. A report[21] published in 2019 provided an initial analysis of these sales data for the first two quarters of 2018. A comparison with the monitoring data based on the reports from MA holders showed close agreement between these two reporting systems. The sales monitoring data appear to slightly overestimate the reports for pigs and poultry and, conversely, to underestimate the reports for sheep/goats, rabbits, and other species (especially game). One possible interpretation is that the reports of sales of medicated premixes by MA holders do not sufficiently take into account uses for minor species, which occur as part of the therapeutic "cascade" outside the recommendations of the MA. The analysis of the data for 2020 has confirmed these results: the breakdown of the quantities of antimicrobials by target species is very similar for the two reporting sources, with a correlation coefficient between the two series equal to 0.990.

ANSES-ANMV will soon be publishing a report to present the results of the sales of medicated feedingstuffs reported by manufacturers and distributors for the years 2018 to 2020. Separate results will be presented for sheep and goats, for the different poultry species and production categories, and by physiological stage for pigs.

8.3.2 Topical treatments in cats and dogs

For the first time in the national monitoring scheme, this report presents data on topical medicines sold to treat cats and dogs. The quantity of antimicrobials in these medicines constitutes a non-negligible share of the total tonnage of antimicrobials sold for these pets

[21] https://hal-anses.archives-ouvertes.fr/anses-02177731

(12.6% in 2020). Most of these veterinary products are authorised for treating both cats and dogs. When MA holders report sales of antimicrobials, they group cats and dogs together in one category, because they are unable to provide a separate estimate of the quantities used for cats and dogs.

According to this first analysis of sales in 2020, treatments containing tetracycline corresponded to 76% of the quantity of antimicrobials sold for dermal treatments.

A study carried out jointly between the AFVAC and ANSES-ANMV estimated the number of treatments per animal in pets[22]. To do this, dispensing data for the years 2015-2017 from 28 volunteer veterinary practices were analysed. This study showed that topical medicines accounted for a large share of the antimicrobials used (34% in dogs, 20% in cats). More than half of the local treatments in dogs were ear treatments, whereas eye treatments were the most common in cats. It would be interesting to continue the analysis of sales data at national level in order to describe exposure by antimicrobial class and treatment type.

8.3.3 Usage patterns for certain categories of animals

For the first time in the national monitoring scheme, this report presents antimicrobial usage patterns for different cattle categories and poultry species. For each medicine presentation, the MA holders provided an estimate of the breakdown of sales for each of these categories. The analysis of the data provided usage patterns by antimicrobial class for calves and other cattle, as well as for chickens and turkeys.

It is important to note that this estimation by the MA holders is a difficult exercise, especially for medicines authorised for several target species. These initial results should therefore be interpreted with caution.

Based on 2020 sales data, antimicrobial usage patterns seem to be quite similar for turkeys and chickens. These poultry were treated mainly with polymyxins, penicillins, tetracyclines, sulfonamides and trimethoprim. Turkeys were treated with macrolides more than broilers. These trends are consistent with the reference values for 2018 that were published by the professional network RefA²vi[23].

Quite different usage patterns were obtained for the cattle categories. For oral and parenteral treatments, calves were treated mostly with tetracyclines, while penicillins and aminoglycosides were the classes most used to treat other cattle.

A cross-sectional study conducted in 2013-2014 on 186 batches of veal calves showed that tetracyclines were overwhelmingly used in these animals, and that polymyxins (colistin), macrolides and sulfonamides were also widely used[24]. A large share of these treatments were administered within the first 15 days of the calves' arrival on the farms. Initial data from the Observatory in the veal calf sector for 2016 showed that antimicrobial use has decreased by 44% since this study[25]. More recent data from the Observatory confirm that the tetracycline class is the most widely used; however, the number of tetracycline treatments per animal seems to be about half of what it was in the 2013-2014 study.

[22] https://hal-anses.archives-ouvertes.fr/anses-03337241v1
[23] https://www.itavi.asso.fr/content/reseau-professionnel-de-references-sur-les-usages-dantibiotiques-en-elevage-avicole
[24] https://hal-anses.archives-ouvertes.fr/anses-01704813
[25] http://www.journees3r.fr/IMG/pdf/texte_3_reduction_intrants_m-chanteperdrix-2.pdf

An 8.4% increase in exposure of cattle to colistin was observed between 2019 and 2020. This increase is due to more frequent use of oral powders and solutions. Based on sales estimates for 2020, nearly 70% of the body weight treated with colistin was for calves.

8.4 Data to be interpreted according to the health and economic context in veterinary medicine

Many factors can help explain changes in the use of antimicrobials in veterinary medicine: the epidemiological context, the economic contexts of the animal sectors and the medicine market, changes in medical practices, etc. Following a study carried out in conjunction with its Monitoring Committee for Veterinary Medicinal Products (CSMV), ANSES-ANMV implemented a web survey to gain a better understanding of the relationships between these various factors and the use of antimicrobials in France for the year 2020. The questionnaire was developed in consultation with the CSMV and several veterinary professional organisations, and was distributed via various media and professional networks in February and March 2021. A total of 467 veterinarians responded to this survey, whose main results were published recently[26].

8.4.1 General trends over several years due to multiple factors

The national monitoring scheme has shown that, following a sharp decline in animal exposure in France between 2011 and 2016, overall exposure has continued to fall over the period 2017 to 2020. The trend in exposure nevertheless varies according to the species.

In the web survey, veterinarians were asked about the change in their antimicrobial prescriptions in 2020 compared with 2019. This survey was unable to provide a reliable estimate of the overall change in antimicrobial use between 2019 and 2020 for the whole of France. The proportion of veterinarians reporting a decrease in prescriptions was 63% for poultry and 54% for pigs. These are the two sectors that have recorded the greatest falls in antimicrobial exposure since 2011, the reference year for the first EcoAntibio plan. For the rabbit sector, 60% of veterinarians in the survey reported a reduction in prescriptions between 2019 and 2020; however, the highest proportion of practitioners reporting an increase in prescriptions was also recorded for this sector (27% of veterinarians). For other species, most veterinarians indicated that antimicrobial prescriptions were stable between 2019 and 2020.

Various factors have contributed to the reductions in exposure observed since the start of the first EcoAntibio plan. Not all of these factors are mentioned in this report, but two examples described in the web survey will be presented below.

According to the survey, the use of vaccines and alternatives was mostly stable or increasing for all species between 2019 and 2020. These results tend to show that the use of vaccines and alternative treatments such as phytotherapy and aromatherapy are common practices for treating animals. "Facilitate the use of alternative treatments" is one of the objectives set by the EcoAntibio 1 and 2 plans to reduce the use of antimicrobial therapy.

[26] Article on the survey in the *Bulletin Epidémiologique*: *Santé animale – Alimentation* https://be.anses.fr/sites/default/files/PER-026_2021-10-15_Antibio-Urban_MagF.pdf

Other factors described by veterinarians in the survey as having an impact on antimicrobial prescriptions include the development of "Antibiotic Free" specifications in the poultry, pig and rabbit sectors over the last few years. The transition of cattle and goat farms to organic agriculture may also have an impact on prescriptions.

8.4.2 Annual changes due to specific factors in 2020

The epidemiological context may help to explain some of the changes in the use of antimicrobials in veterinary medicine. The year 2020 was marked by the COVID-19 epidemic, which had an economic impact on certain animal sectors such as poultry and rabbit, in particular with the shut-down in the catering industry. The national monitoring scheme recorded a reduction in the body weight treated in these two sectors between 2019 and 2020. However, the ALEA exposure indicator was not affected by this epidemiological factor as it relates the body weight treated to the biomass of the animal population potentially using antimicrobials. Similarly, the avian influenza episode in late 2020, which particularly affected the fattened duck and goose sector, may have influenced the tonnages of antimicrobials sold but had little or no effect on the exposure indicator for poultry.

Nearly 60% of veterinarians in the cattle sector who participated in the web survey indicated that weather conditions had influenced changes in their antimicrobial prescriptions in 2020. This meteorological factor seems to have had an influence on respiratory diseases and mastitis in ruminants. The national monitoring scheme recorded an increase in exposure of cattle to phenicols, tetracyclines and macrolides between 2019 and 2020. These antimicrobials were among the top five classes (along with penicillins and sulfonamides) cited by veterinarians as being used more frequently when the incidence of a disease was reported to be increasing in 2020. The increase in exposure to phenicols, tetracyclines and macrolides in the cattle sector was mainly due to an increase in the use of injections. Most of these injections are authorised for the treatment of respiratory diseases.

Nearly 40% of veterinarians in the cattle sector indicated that stock shortages of veterinary medicines can explain changes in their antimicrobial prescriptions in 2020. These shortages concerned both certain vaccines and antimicrobials, mainly penicillins including benzylpenicillin. Several shortages of benzylpenicillin medicines were indeed reported by pharmaceutical companies to ANSES-ANMV in 2020. These disruptions have clearly influenced the indicators in the cattle sector, since the national monitoring scheme recorded a drop in the use of injections combining benzylpenicillin and an aminoglycoside.

A 5.1% increase in exposure of cats and dogs was recorded between 2019 and 2020. The year 2020 was characterised by fluctuating activity in the dog sector. Against the backdrop of the COVID-19 epidemic, many veterinarians who participated in the survey noted "see-sawing" activity for 2020. INSEE data on the change in veterinarians' turnover showed the impact of the first lockdown (from 17 March to 11 May) and the strong growth in turnover in the second part of 2020 (around +10% compared with 2019)[27]. Although these INSEE data are not specific to dog clinics but come from all animal sectors combined, they do show the economic influence of these lockdown periods. Households are likely to have delayed certain expenditure on pet surgery in 2020.

[27] https://www.insee.fr/en/statistiques/serie/010543827

The increase in overall exposure of cats and dogs over the last year (+5.1%) was mainly due to an increase in exposure to penicillins (+9.0%). Penicillins were the most commonly cited class of medicines used to treat these pets by the veterinarians who participated in the survey. This increase in exposure to penicillins particularly concerns tablets combining amoxicillin and clavulanic acid, which accounted for 44% of the body weight treated of cats and dogs in 2020, compared with 24% in 2011. During the EcoAntibio plans, there has been a sharp decline in the use of critically important antimicrobials, as well as a large fall in exposure to aminoglycosides, which has clearly led to shifts to other classes and pharmaceutical forms. Like the aminoglycosides, amoxicillin combined with clavulanic acid is classified in Category C, "Caution", according to the AMEG categorisation[28]. These antimicrobials should only be considered if there is no clinically effective antimicrobial in Category D. It will be necessary to remain vigilant and monitor the development of these antimicrobials in the coming years. To ensure the prudent and responsible use of antimicrobials, veterinarians are encouraged to consider the European AMEG categorisation in their prescribing choices[29].

[28] https://www.ema.europa.eu/documents/report/infographic-categorisation-antibiotics-use-animals-prudent-responsible-use_fr.pdf

[29] https://www.anses.fr/fr/system/files/2021-06-29-AIC_AMEG.pdf

9 Conclusion

The EcoAntibio 2 plan aims to consolidate the achievements and pursue the actions previously undertaken during the first national plan. Results for 2020 indicate that overall exposure of animals to antimicrobials has fallen slightly compared with 2019 to reach its lowest level since 1999. The trend in exposure over the last year varies, however, according to the species: +2.9% for cattle, -3.2% for pigs, -9.7% for poultry, +2.5% for rabbits and +5.1% for cats and dogs.

All animal species combined, exposure to fluoroquinolones and newer-generation cephalosporins has continued to decline, with reductions of 87.3% and 94.3% respectively compared with 2013. The objective of reducing exposure to colistin set by the EcoAntibio 2 plan has been achieved, with a 66.0% fall in cumulative exposure for the cattle, pig and poultry sectors.

After the success of the first EcoAntibio plan, it seems that the reduction in use has reached a limit for some classes of antimicrobials. Studying the changes in antimicrobial use and its impact on resistance in animal and human health is essential as part of a "One Health" approach.

For a more detailed interpretation of the small fluctuations now observed from one year to the next, more precise data on the use of antimicrobials in each species will be needed. The development of new tools, as planned in the Calypso project, should make it possible to move in this direction.

The momentum for the prudent and responsible use of antimicrobials in veterinary medicine must be maintained.

ANNEXES

Annex 1: Data on animal populations

Numbers of animals potentially using antimicrobials since 1999

Biomasses of animal populations potentially using antimicrobials since 1999

Annex 2: Change in sales and in exposure to antimicrobials for all animal species combined

Indicators by pharmaceutical form

Indicators by antimicrobial class

Annex 3: Change in sales and in exposure to antimicrobials by species

For the species Cattle, Pigs, Poultry, Rabbits, Cats and Dogs

Change in indicators since 1999

Change in body weight treated-day by antimicrobial class (Number of ADDkg in tonnes)

Change in body weight treated by antimicrobial class (Number of ACDkg in tonnes)

Change in exposure by antimicrobial class since 1999

Annex 1: Data on animal populations

■ Numbers of animals potentially using antimicrobials between 1999 and 2020

Table 1: Cattle (number of animals)

Type/ Species	Dairy cows	Suckler cows	1 to 2 yr old dairy heifers	> 2 yr old dairy heifers	1 to 2 yr old beef heifers	> 2 yr old beef heifers	1 to 2 yr old other females	> 2 yr old other females	1 to 2 yr old bullocks	> 2 yr old bullocks	Non-castrated males	0 to 1 yr old cattle	1 to 2 yr old males	> 2 yr old males	Veal calves (slaugh-tered)
BW in kg	650	750	350	500	450	550	400	500	450	700	650	200	400	700	150
1999	4,424,000	4,071,000	1,350,846	951,154	980,827	906,000	393,000	294,000	303,938	273,062	971,562	5,169,611			1,887,941
2000	4,153,000	4,214,000	1,418,000	974,000	1,044,000	943,000	303,000	318,000	315,000	283,000	918,000	5,706,000			1,843,013
2001	4,195,000	4,293,000	1,433,000	1,009,000	1,085,000	946,000	404,000	320,000	315,000	283,000	1,105,438	5,612,562			1,882,763
2002	4,128,000	4,095,000	1,396,000	1,009,000	1,009,000	957,000	383,000	402,000	372,000	314,000	906,509	5,494,491			1,862,961
2003	4,012,000	4,040,000	1,380,000	1,002,000	970,000	918,000	334,000	362,000	302,000	304,000	754,000	4,961,000			1,822,579
2004	3,803,000	4,166,000	1,346,000	982,000	971,000	891000	315,000	327,000	290,000	260,000	774,000	4,994,000			1,751,708
2005	3,957,858	4,068,096	2,035,440		1,899,069		535,667		481,770		633,675	4,611,368			1,750,492
2006	3,882,195	4,156,628	1,147,598	815,049	1,068,008	869,811	270,742	228,202				4,947,374	922,177	447,909	1,700,867
2007	3,869,936	4,247,432	1,120,796	800,649	1,086,069	891,863	295,220	240,939				5,002,669	951,291	453,517	1,564,549
2008	3,863,435	4,313,976	1,109,701	778,266	1,175,059	980,352	304,547	248,282				4,989,176	990,268	499,047	1,506,004
2009	3,747,886	4,271,801	1,188,085	804,095	1,095,383	1,080,162	294,743	258,280				4,816,839	981,930	512,824	1,449,910
2010	3,732,707	4,299,792	1,161,313	834,652	1,026,254	1,026,119	281,584	253,951				4,838,766	709,607	502,191	1,430,931
2011	3,664,153	4,145,382	1,150,334	805,082	942,066	879,626	363,906	330,863				4,887,805	846860	415745	1,396,702
2012	3,643,200	4,109,861	1,171,956	763,931	949,755	852,355	369,777	318,016				4,899,743	880355	396153	1,355,721
2013	3,697,232	4,101,296	1,180,161	779,828	972,396	886,555	376,364	329,521				4,812,509	908,799	409,968	1,311,016
2014	3,698,450	4,138,148	1,204,838	782,487	944,565	910,828	373,930	334,758				4,921,261	892402	422,434	1,286,756
2015	3,661,183	4,207,412	1,242,113	790,870	970,862	893,365	385,612	332,622				4,989,541	860,654	424,203	1,266,898
2016	3,637,015	4,243,082	1,253,823	783,033	984,884	907,090	388,184	335,260				4,943,925	847,632	418,828	1,267,899
2017	3,596,837	4,154,472	1,146,069	741,759	1,006,526	942,969	395,387	457,702				4,674,618	833,380	407,635	1,243,073
2018	3,554,232	4,094,903	1,081,963	695,731	934,343	911,080	390,975	473,173				4,685,327	773,054	399,526	1,258,622
2019	3,490,810	4,014,322	1,055,766	648,657	917,553	869,331	436,508	457,328				4,524,447	773,621	384,549	1,244,238
2020	3,454,904	4,020,083	999,284	562,281	902,338	799,701	408,822	426,359				4,501,653	748,735	377,279	1,185,466

Table 2: Pigs, poultry and rabbits (number of slaughtered animals, except for female rabbits - number of live animals)

	Pigs			Poultry							Rabbits	
Type/ Species	Cull animals	Sows (number)	Fattening pigs	Broilers	Turkeys	Ducks	Guinea fowl	Laying hens	Quails	Geese	Female rabbits	Rabbits
BW in kg	350	300	105	1.8	10	4	1.4	2	0.5	8	4	2.5
1999	608,698	1,029,000	25,490,863	777,896,300	105,470,400	69,566,800	32,725,000	49,054,000	52,907,000	480,000	1,446,000	53,273,000
2000	580,334	1,210,208	25,291,317	734,563,400	113,860,700	73,494,900	34,760,000	48,145,000	52,907,000	612,000	1,376,000	52,279,000
2001	581,548	1,369,000	24,815,811	782,180,300	112,554,300	79,505,400	36,988,000	49,052,000	60,100,000	616,000	1,335,000	52,157,000
2002	582,418	1,360,000	25,102,459	729,489,300	98,661,300	79,243,900	31,071,000	48,664,000	60,400,000	692,000	1,293,000	52,179,000
2003	541,406	1,328,000	25,000,385	739,219,300	95,575,100	73,878,900	29,208,000	49,050,000	54,206,000	645,000	1,196,000	49,647,000
2004	521,412	1,302,000	24,757,765	694,837,500	93,668,900	73,384,800	29,020,000	47,224,000	47,364,000	560,000	1,181,000	50,129,000
2005	491,911	1,266,951	24,359,049	715,915,700	81,146,300	76,148,200	29,902,000	46,753,000	49,400,000	458,000	1,127,000	49,364,000
2006	484,950	1,256,179	24,184,591	636,178,400	72,834,400	74,863,200	27,284,000	45,703,000	46,952,000	469,000	1,053,000	47,994,000
2007	471,395	1,224,100	24,457,730	699,511,600	70,220,900	79,114,700	28,092,000	45,213,000	50,786,000	474,000	1,061,000	48,529,000
2008	445,213	1,225,574	24,539,585	711,875,400	62,857,200	79,134,200	27,936,000	45,990,000	55,137,000	462,000	1,012,000	39,941,000
2009	423,514	1,207,500	24,192,857	718,368,200	58,024,100	75,137,100	27,168,000	45,306,000	47,540,000	448,000	893,000	36,757,000
2010	396,998	1,162,135	24,189,737	740,246,900	56,187,900	77,105,400	26,457,000	46,564,000	52,890,000	324,000	878,000	35,752,000
2011	396,397	1,105,817	24,073,359	781,104,600	53,824,600	79,177,800	26,714,000	42,906,000	53,563,000	296,000	871,000	38,943,000
2012	384,557	1,074,340	23,464,399	767,394,000	50,217,000	77,918,000	24,954,000	43,050,000	53,542,000	295,000	835,000	37,242,000
2013	356,481	1,046,738	23,161,982	790,002,000	44,267,000	74,888,000	24,761,000	48,826,000	54,849,000	249,000	825,000	36,586,000
2014	357,042	1,040,948	23,021,543	745,949,000	45,996,000	76,127,000	25,092,000	49,146,000	52,679,000	241,000	837,000	37,439,000
2015	368,068	1,023,343	22,991,646	777,069,000	45,482,000	76,657,000	25,229,000	50,452,000	51,164,000	226,000	871,000	36,700,000
2016	366,176	993,896	23,161,017	754,772,000	44,995,000	66,232,000	25,539,000	49,535,000	51,195,000	167,000	768,000	33,424,000
2017	348,304	1,005,348	22,765,955	757,124,000	42,097,000	63,454,000	24,920,000	50,504,000	49,466,000	153,000	732,000	31,494,000
2018	351,875	1,026,525	22,836,279	754,039,000	41,249,000	73,183,000	26,130,000	47,971,000	48,343,000	147,000	713,000	30,141,000
2019	336,294	991,614	22,940,150	734,777,000	39,333,000	71,428,000	24,929,000	45,888,000	42,668,000	150,000	670,000	29,219,000
2020	348,599	1,026,154	22,810,457	731,756,000	39,087,000	61,119,000	20,899,000	47,525,000	37,927,000	186,000	642,000	27,932,000

Table 3: Companion and sports animals (number of animals)

	Domestic carnivores		Horses			
Type/Species	**Dogs**	**Cats**	**Sport horses**	**Draught horses**	**Donkeys**	**Ponies**
Body weight (kg)	15	4	550	850	350	300
1999	9,170,000	9,810,000	634,110	93,170	92,622	257,943
2000	9,040,000	9,760,000	634,110	93,170	92,622	257,943
2001	8,910,000	9,715,000	635,586	92,237	99,178	258,543
2002	8,780,000	9,670,000	665,203	91,566	100,612	270,591
2003	8,645,000	9,805,000	667,176	90,920	104,390	271,394
2004	8,510,000	9,940,000	671,459	91,368	105,039	273,136
2005	8,295,000	9,990,000	673,177	89,613	106,544	273,835
2006	8,080,000	10,040,000	666,785	88,217	106,639	271,234
2007	7,950,000	10,365,000	671,715	87,371	104,864	273,240
2008	7,820,000	10,690,000	673,371	91,304	102,718	273,913
2009	7,705,000	10,825,000	686,889	93,137	104,780	279,412
2010	7,590,000	10,960,000	687,417	93,209	104,860	279,627
2011	7,505,000	11,185,000	686,470	93,081	104,716	279,242
2012	7,420,000	11,410,000	682,944	92,603	104,178	277,808
2013	7,340,000	12,045,000	676,095	91,674	103,133	275,022
2014	7,260,000	12,680,000	666,540	90,378	101,676	271,135
2015	7,300,000	13,080,000	655,910	88,937	100,054	266,811
2016	7,340,000	13,480,000	644,535	87,395	98,319	262,184
2017	7,485,000	13,835,000	622,645	80,514	101,985	268,381
2018	7,630,000	14,190,000	608,138	78,639	99,609	262,129
2019	7,780,000	14,550,000	599,070	84,080	105,100	262,750
2020	7,930,000	14,930,000	596,976	83,786	104,733	261,832

Table 4: Sheep and goats (number of live animals, except for kids and lambs – number of slaughtered animals)

Type/Species	Goats	Kids	Dairy ewes	Meat ewes	Covered ewe lambs	Maiden ewes	Lambs	Other sheep
BW in kg	50	9.76	60	80	45	20	15	45
1999	1,362,341	741,132	1,297,000	5,157,000	937,000	348,000	5,336,584	1,771,000
2000	1,362,341	704,766	1,366,038	5,160,188	1,205,963		5,422,589	1,782,514
2001	1,373,565	697,977	1,332,571	4,985,757	1,247,369		5,400,786	1,823,812
2002	1,380,109	725,605	1,329,870	4,884,497	1,265,207		5,120,916	1,819,113
2003	1,370,811	746,987	1,327,743	4,841,187	1,270,733		5,045,598	1,815,842
2004	1,358,242	761,582	1,309,756	4,787,806	1,268,457		4,826,975	1,785,370
2005	1,360,945	913,258	1,299,846	4,749,568	1,262,518		4,724,274	1,760,340
2006	1,367,788	762,212	1,276,350	4,613,460	1,201,634		4,623,501	1,733,031
2007	1,358,729	751,800	1,252,817	4,523,942	1,165,785		4,581,528	1,668,163
2008	1,361,983	707,965	1,272,811	4,168,244	1,118,348		4,233,962	1,562,301
2009	1,410,567	658,507	1,280,508	4,054,899	1,133,234		3,868,100	1,552,740
2010	1,437,620	686,549	1,324,055	3,980,852	1,151,674		3,860,200	1,465,573
2011	1,381,209	707,988	1,297,651	3,851,261	1,103,628		3,958,707	1,406,231
2012	1,307,753	678,094	1,290,933	3,713,872		1,067,159	3,796,118	1,389,970
2013	1,290,623	625,791	1,238,433	3,617,338		1,040,389	3,662,175	1,342,897
2014	1,284,667	589,959	1,230,484	3,562,465		1,057,836	3,688,342	1,330,345
2015	1,261,684	570,425	1,231,793	3,460,147		1,069,763	3,646,166	1,302,838
2016	1,258,204	593,939	1,234,120	3,416,186		1,062,975	3,747,993	1,332,689
2017	1,270,737	549,781	1,247,035	3,333,294		1,054,243	3,622,569	1,266,884
2018	1,302,107	556,555	1,255,072	3,408,470		1,080,978	3,643,552	1,304,200
2019	1,302,759	546,679	1,243,152	3,371,825		1,059,444	3,627,019	1,282,278
2020	1,408,331	533,553	1,215,390	3,383,664		1,073,850	3,611,797	1,500,528

Table 5: Fish (production in kg)

Type/Species	Trout	Carp	Salmon	Bass	Bream	Turbot	Sturgeon	Other
1999	46,160,000	6,000,000		3,150,000	1,000,000	900,000	110,000	
2000	47,500,000	6,000,000		3,600,000	1,400,000	1,000,000	130,000	
2001	47,500,000	6,000,000		3,000,000	1,700,000	700,000	150,000	
2002	42,900,000	6,000,000	5,000,000	3,500,000	1,500,000	750,000	150,000	
2003	37,000,000	6,000,000	800,000	3,700,000	1,100,000	909,000	170,000	1,100,000
2004	37,500,000	6,000,000	70,000	4,000,000	1,600,000	949,000	200,000	1,047,000
2005	34,000,000	6,000,000	1,200,000	4,300,000	1,900,000	791,000	250,000	1,167,000
2006	34,000,000	6,000,000	1,600,000	5,585,000	2,200,000	870,000	250,000	1,182,000
2007	34,000,000	6,000,000	1,800,000	4,764,000	1,392,000	850,000	250,000	1,135,000
2008	34,000,000	6,000,000	0	3,968,000	1,636,000	850,000	250,000	1,106,000
2009	34,000,000	6,000,000	0	3,204,000	1,648,000	531,000	250,000	1,021,000
2010	34,000,000	4,000,000	802,000	2,779,000	1,377,000	394,000	380,000	1,310,000
2011	36,000,000	3,500,000	700,000	3,000,000	1,500,000	300,000	280,000	1,600,000
2012	36,000,000	3,500,000	300,000	2,300,000	1,300,000	250,000	250,000	1,140,000
2013	32,000,000	3,500,000	300,000	1,970,000	1,477,000	255,000	280,000	923,000
2014	34,000,000	3,000,000	300,000	2,021,000	1,105,000	279,000	298,000	638,000
2015	36,713,000	3,000,000	300,000	1,980,000	1,502,000	303,000	241,000	482,000
2016	37,200,000	0	450,000	1,928,000	1,671,000	288,000	450,000	484,000
2017	37,570,000	0	300,000	1,945,000	1,853,000	207,000	500,000	602,000
2018	41,109,000	0	300,000	1,433,000	1,879,000	116,000	453,000	551,000
2019	40,500,000	0	360,000	2,123,000	2,081,000	65,000	500,000	643,000
2020	40,500,000	0	360,000	2,123,000	2,081,000	65,000	500,000	643,000

■ Biomasses of animal populations potentially using antimicrobials from 1999 to 2020

Biomasses of animal populations potentially using antimicrobials (in tonnes)

	Cattle	Pigs	Poultry	Rabbits	Cats & Dogs	Sheep & Goats	Horses	Fish	Other	Total
1999	10,397,639	3,198,285	2,907,401	138,967	176,790	767,366	537,755	57,320	30,652	18,212,175
2000	10,466,102	3,221,768	2,931,104	136,202	174,640	778,715	537,755	59,630	30,860	18,336,775
2001	10,746,012	3,219,902	3,036,354	135,733	172,510	766,708	540,249	59,050	32,184	18,708,702
2002	10,436,923	3,247,604	2,793,233	135,620	170,380	755,166	560,084	59,800	31,002	18,189,811
2003	9,982,187	3,212,933	2,753,116	128,902	168,895	750,080	562,184	50,779	31,484	17,640,558
2004	9,852,206	3,172,660	2,644,174	130,047	167,410	739,349	565,670	51,366	31,308	17,354,188
2005	9,278,685	3,109,954	2,566,981	127,918	164,385	732,896	565,860	49,608	31,308	16,627,595
2006	9,558,491	3,085,968	2,329,518	124,197	161,360	715,460	560,410	51,687	30,602	16,617,692
2007	9,665,091	3,100,280	2,436,728	125,567	160,710	701,271	562,383	50,191	30,293	16,832,514
2008	9,807,349	3,100,153	2,388,839	111,997	159,800	668,976	566,088	47,810	30,405	16,623,560
2009	9,724,506	3,050,730	2,329,853	102,609	158,875	657,068	577,452	46,654	30,405	16,678,152
2010	9,558,447	3,027,512	2,361,950	99,916	157,690	652,172	577,896	45,042	34,972	16,480,626
2011	9,331,444	2,998,187	2,386,525	107,810	157,315	634,255	577,100	46,880	34,972	16,274,487
2012	9,258,486	2,920,659	2,345,318	103,125	156,940	587,405	574,136	45,040	34,836	16,025,944
2013	9,332,284	2,870,798	2,325,960	101,365	158,280	570,503	568,378	40,705	34,836	16,003,109
2014	9,393,431	2,854,511	2,268,865	103,642	159,620	565,165	560,346	41,641	34,858	15,982,078
2015	9,443,444	2,849,950	2,323,787	102,202	161,820	554,086	551,409	44,521	34,858	16,066,077
2016	9,452,929	2,858,237	2,235,226	92,776	164,020	553,500	541,846	42,471	35,127	15,976,132
2017	9,324,458	2,813,936	2,199,462	87,519	167,615	542,822	527,101	42,977	35,127	15,741,017
2018	9,137,254	2,828,923	2,220,364	83,909	171,210	553,481	514,820	45,841	35,183	15,590,985
2019	8,938,071	2,823,903	2,150,851	81,088	174,900	548,105	516,567	46,272	35,183	15,314,939
2020	8,755,976	2,824,954	2,097,267	77,534	178,670	562,418	514,761	46,272	35,183	15,093,035

Annex 2: Change in sales and in exposure to antimicrobials for all animal species combined

Table 6: Change in tonnage of antimicrobials by pharmaceutical form

	MEDICATED PREMIXES	ORAL POWDERS & SOLUTIONS	OTHER ORAL FORMS	INJECTIONS	INTRAMAMMARY & INTRAUTERINE	TOTAL
1999	853	285	19	139	15	**1311**
2000	878	332	19	139	15	**1383**
2001	821	384	18	137	14	**1374**
2002	732	431	18	131	14	**1326**
2003	687	451	18	124	14	**1293**
2004	651	465	18	114	12	**1260**
2005	653	495	19	116	12	**1295**
2006	626	459	20	120	11	**1237**
2007	712	474	19	110	11	**1327**
2008	627	405	20	109	11	**1171**
2009	536	393	18	102	10	**1059**
2010	496	388	19	102	10	**1015**
2011	407	369	19	104	10	**910**
2012	308	346	18	105	9	**786**
2013	267	315	17	101	8	**708**
2014	276	378	19	107	8	**788**
2015	210	194	15	87	8	**514**
2016	199	213	17	93	8	**530**
2017	162	223	16	91	7	**499**
2018	137	219	17	91	8	**472**
2019	133	182	17	84	6	**423**
2020	126	175	18	85	7	**411**
Variation 2020/2019	-7 -5.2%	-7 -3.9%	1 8.6%	1 1.1%	0 6.7%	**-11** **-2.7%**
Variation 2020/2011	-281 -69.0%	-194 -52.5%	-1 -3.3%	-19 -18.5%	-3 -33.2%	**-498** **-54.8%**

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Table 7: Change in body weight treated-day by pharmaceutical form (Number of ADDkg in tonnes)

	MEDICATED PREMIXES	ORAL POWDERS & SOLUTIONS	OTHER ORAL FORMS	INJECTIONS	TOTAL
1999	41,937,523	15,687,276	681,490	7,282,096	**65,588,385**
2000	45,487,889	18,997,926	698,755	7,338,997	**72,523,567**
2001	43,996,214	22,165,044	687,477	7,254,173	**74,102,908**
2002	41,895,291	24,911,326	718,661	7,152,465	**74,677,743**
2003	40,038,192	26,299,946	726,073	7,014,127	**74,078,338**
2004	35,921,980	26,804,473	725,666	6,513,929	**69,966,048**
2005	33,923,490	28,952,099	772,720	6,853,123	**70,501,432**
2006	34,275,063	27,420,511	794,301	7,066,749	**69,556,624**
2007	37,243,221	27,819,999	796,317	6,599,644	**72,459,181**
2008	31,973,271	24,447,844	814,218	6,791,781	**64,027,114**
2009	29,339,104	24,624,010	782,951	6,293,935	**61,040,000**
2010	26,929,498	24,727,098	789,914	6,498,653	**58,945,163**
2011	22,268,222	23,654,185	755,115	6,486,296	**53,163,818**
2012	16,145,372	22,412,893	692,001	6,624,614	**45,874,880**
2013	13,496,041	20,353,596	697,294	6,506,209	**41,053,140**
2014	13,972,326	24,616,281	763,763	6,600,794	**45,953,164**
2015	10,659,440	12,301,933	591,914	5,007,091	**28,560,378**
2016	8,038,695	13,518,872	669,995	5,118,317	**27,345,879**
2017	6,497,851	13,844,517	675,657	4,643,820	**25,661,845**
2018	5,452,429	13,431,974	700,437	4,784,568	**24,369,408**
2019	4,819,232	10,943,305	698,840	4,406,837	**20,868,214**
2020	4,593,751	10,225,801	762,429	4,521,513	**20,103,494**
Variation 2020/2019	-225,481	-717,504	63,589	114,676	**-764,720**
	-4.7%	-6.6%	9.1%	2.6%	**-3.7%**
Variation 2020/2019	-17,674,471	-13,428,384	7,314	-1,964,783	**-33,060,324**
	-79.4%	-56.8%	1.0%	-30.3%	**-62.2%**

Table 8: Change in body weight treated by pharmaceutical form (Number of ACDkg in tonnes)

	MEDICATED PREMIXES	ORAL POWDERS & SOLUTIONS	OTHER ORAL FORMS	INJECTIONS	TOTAL
1999	3,820,859	3,281,363	122,867	2,975,938	**10,201,027**
2000	3,974,651	3,925,451	128,356	2,933,734	**10,962,192**
2001	3,788,900	4,582,475	117,759	2,927,877	**11,417,011**
2002	3,480,322	5,135,194	117,363	2,872,109	**11,604,988**
2003	3,247,260	5,435,508	119,417	2,893,534	**11,695,719**
2004	2,969,194	5,498,622	117,164	2,678,732	**11,263,712**
2005	2,926,740	5,975,773	122,421	2,837,270	**11,862,204**
2006	2,927,972	5,689,829	120,798	2,983,577	**11,722,176**
2007	3,256,585	5,764,845	116,362	2,777,477	**11,915,269**
2008	2,789,002	5,074,768	121,082	2,803,621	**10,788,473**
2009	2,563,942	5,101,107	111,425	2,640,435	**10,416,909**
2010	2,398,407	5,110,385	116,605	2,741,597	**10,366,994**
2011	2,035,767	4,859,987	109,164	2,788,404	**9,793,322**
2012	1,572,826	4,551,739	101,161	2,850,537	**9,076,263**
2013	1,336,389	4,190,107	100,277	2,758,424	**8,385,197**
2014	1,334,647	5,042,333	104,372	2,986,441	**9,467,793**
2015	1,106,967	2,496,473	86,162	2,229,608	**5,919,210**
2016	794,288	2,749,711	91,579	2,465,365	**6,100,943**
2017	613,961	2,797,403	94,481	2,280,525	**5,786,370**
2018	535,150	2,716,752	99,098	2,409,949	**5,760,949**
2019	491,783	2,227,530	98,659	2,248,115	**5,066,087**
2020	483,852	2,063,394	105,709	2,309,148	**4,962,103**
Variation 2020/2019	-7,931	-164,136	7,050	61,033	**-103,984**
	-1.6%	-7.4%	7.1%	2.7%	**-2.1%**
Variation 2020/2019	-1,551,915	-2,796,593	-3,455	-479,256	**-4,831,219**
	-76.2%	-57.5%	-3.2%	-17.2%	**-49.3%**

Table 9: Change in the indicator of exposure by pharmaceutical form (ALEA)

	MEDICATED PREMIXES	ORAL POWDERS & SOLUTIONS	OTHER ORAL FORMS	INJECTIONS	TOTAL
1999	0.210	0.180	0.007	0.163	**0.560**
2000	0.217	0.214	0.007	0.160	**0.598**
2001	0.203	0.245	0.006	0.156	**0.610**
2002	0.191	0.282	0.006	0.158	**0.638**
2003	0.184	0.308	0.007	0.164	**0.663**
2004	0.171	0.317	0.007	0.154	**0.649**
2005	0.176	0.359	0.007	0.171	**0.713**
2006	0.176	0.342	0.007	0.180	**0.705**
2007	0.193	0.342	0.007	0.165	**0.708**
2008	0.168	0.305	0.007	0.169	**0.649**
2009	0.154	0.306	0.007	0.158	**0.625**
2010	0.146	0.310	0.007	0.166	**0.629**
2011	0.125	0.299	0.007	0.171	**0.602**
2012	0.098	0.284	0.006	0.178	**0.566**
2013	0.084	0.262	0.006	0.172	**0.524**
2014	0.084	0.315	0.007	0.187	**0.592**
2015	0.069	0.155	0.005	0.139	**0.368**
2016	0.050	0.172	0.006	0.154	**0.382**
2017	0.039	0.178	0.006	0.145	**0.368**
2018	0.034	0.174	0.006	0.155	**0.370**
2019	0.032	0.145	0.006	0.147	**0.331**
2020	0.032	0.137	0.007	0.153	**0.329**
Variation 2020/2019	-0.000	-0.009	0.001	0.006	**-0.002**
	-0.2%	-6.0%	8.7%	4.2%	**-0.6%**
Variation 2020/2019	-0.093	-0.162	0.000	-0.018	**-0.273**
	-74.4%	-54.2%	4.4%	-10.7%	**-45.4%**

Table 10: Change in tonnage sold by antimicrobial class

	AMINOGLYCOSIDES	OTHER CLASSES*	CEPHALOSPORINS 1&2G	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	81.7	0.9	5.2	0.9	3.3	5.9	79.4	90.5	4.3	31.1	67.2	19.8	259.3	623.8	37.5	1,310.8
2000	89.6	1.0	5.3	1.1	3.7	8.0	88.3	96.8	4.7	33.0	70.4	16.5	270.7	655.7	38.6	1,383.2
2001	92.5	1.0	5.2	1.0	4.1	9.3	101.9	94.4	4.4	25.8	72.0	14.9	245.6	666.2	36.2	1,374.5
2002	90.1	0.9	6.2	1.2	4.2	10.9	108.2	97.5	5.6	25.3	67.9	15.8	228.5	629.9	33.9	1,326.1
2003	81.7	0.3	6.8	1.3	4.4	10.2	101.9	91.9	4.3	21.9	67.3	14.0	209.0	645.7	32.5	1,293.4
2004	78.6	0.8	6.7	1.4	4.3	9.5	96.5	84.4	4.9	16.2	63.1	12.5	209.7	637.8	33.8	1,260.2
2005	76.7	0.7	7.1	1.6	4.4	10.1	99.9	88.7	4.7	8.3	66.3	13.3	215.2	662.9	35.5	1,295.4
2006	77.6	1.0	6.4	1.9	4.8	9.0	102.7	92.7	6.1	10.0	66.8	13.0	211.4	600.1	33.1	1,236.7
2007	74.3	0.7	7.2	2.0	4.7	9.1	97.6	93.6	5.9	10.0	73.8	10.9	224.6	678.7	33.8	1,326.8
2008	72.9	0.7	7.2	2.1	4.9	7.8	94.9	85.0	5.0	7.9	65.7	7.9	194.9	584.6	29.6	1,171.1
2009	64.9	0.6	7.0	1.8	4.9	7.1	83.4	86.7	4.8	8.2	66.4	7.5	182.0	505.0	28.3	1,058.6
2010	62.5	0.6	5.9	2.3	5.3	6.7	81.4	90.6	5.1	7.6	65.0	8.0	174.8	472.2	26.4	1,014.6
2011	63.6	0.7	7.0	2.3	5.3	5.4	70.4	90.3	4.6	6.8	60.7	6.2	171.3	389.8	25.0	909.5
2012	57.4	0.7	6.6	2.3	4.9	4.7	61.0	86.2	4.7	5.6	51.3	5.3	145.3	328.4	21.3	785.8
2013	54.4	0.6	6.4	2.1	4.8	4.6	51.9	86.7	4.7	5.6	42.8	4.7	136.3	281.9	20.2	707.6
2014	57.6	0.6	7.3	2.0	4.9	4.6	58.4	98.2	5.9	6.4	51.4	5.6	146.7	315.4	22.7	787.7
2015	48.3	0.5	4.4	1.5	2.7	3.1	36.5	64.3	3.8	5.4	30.6	2.8	106.8	187.7	15.5	514.0
2016	55.8	1.3	6.4	0.4	1.7	3.0	36.8	77.6	5.6	4.5	20.2	3.2	111.0	185.4	17.2	530.2
2017	54.8	1.3	5.4	0.1	1.2	3.0	34.0	72.7	5.4	4.2	16.4	3.3	91.8	189.0	16.1	498.7
2018	52.0	1.4	5.6	0.1	1.0	3.0	32.1	71.0	5.8	3.5	13.7	2.8	84.2	180.4	15.1	471.9
2019	50.1	1.6	5.1	0.1	1.0	3.2	30.5	70.0	5.4	3.5	10.4	2.3	81.3	144.7	13.3	422.7
2020	49.9	1.7	5.4	0.1	0.8	3.3	30.0	68.4	5.9	3.4	10.3	1.8	87.4	128.9	14.1	411.4
Variation 2020 / 2019	-0.2 -0.5%	0.1 3.3%	0.2 4.7%	-0.0 -4.1%	-0.2 -19.8%	0.1 3.9%	-0.5 -1.6%	-1.5 -2.2%	0.5 9.0%	-0.1 -1.5%	-0.1 -1.0%	-0.6 -24.4%	6.0 7.4%	-15.8 -10.9%	0.8 5.8%	-11.3 -2.7%
Variation 2020 / 2011	-13.7 -21.6%	1.0 159.6%	-1.7 -24.0%	-2.2 -95.4%	-4.5 -85.2%	-2.1 -39.5%	-40.4 -57.4%	-21.8 -24.2%	1.3 29.4%	-3.3 -49.5%	-50.4 -83.0%	-4.5 -71.8%	-83.9 -49.0%	-260.9 -66.9%	-11.0 -43.8%	-498.2 -54.8%

* Other classes: dimetridazole, metronidazole, pyrimethamine and rifaximin

Table 11: Change in sales by antimicrobial class in mg of active ingredient per kilogram of body weight (mg/kg)

	AMINOGLYCOSIDES	OTHER CLASSES	CEPHALOSPORINS 1&2G	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	4.49	0.05	0.29	0.05	0.18	0.32	4.36	4.97	0.24	1.71	3.69	1.08	14.24	34.25	2.06	71.97
2000	4.88	0.05	0.29	0.06	0.20	0.44	4.81	5.28	0.25	1.80	3.84	0.90	14.76	35.76	2.11	75.43
2001	4.94	0.05	0.28	0.05	0.22	0.50	5.45	5.04	0.24	1.38	3.85	0.79	13.13	35.61	1.94	73.47
2002	4.95	0.05	0.34	0.06	0.23	0.60	5.95	5.36	0.31	1.39	3.73	0.87	12.56	34.63	1.86	72.91
2003	4.63	0.02	0.39	0.07	0.25	0.58	5.78	5.21	0.24	1.24	3.81	0.79	11.85	36.60	1.84	73.32
2004	4.53	0.05	0.39	0.08	0.25	0.55	5.56	4.86	0.28	0.93	3.63	0.72	12.09	36.75	1.95	72.62
2005	4.61	0.04	0.43	0.10	0.26	0.60	6.01	5.33	0.28	0.50	3.99	0.80	12.94	39.87	2.14	77.91
2006	4.67	0.06	0.39	0.11	0.29	0.54	6.18	5.58	0.37	0.60	4.02	0.78	12.72	36.11	1.99	74.42
2007	4.41	0.04	0.43	0.12	0.28	0.54	5.80	5.56	0.35	0.59	4.39	0.65	13.34	40.32	2.01	78.82
2008	4.39	0.04	0.43	0.13	0.29	0.47	5.71	5.12	0.30	0.48	3.95	0.48	11.72	35.17	1.78	70.45
2009	3.89	0.04	0.42	0.11	0.29	0.43	5.00	5.20	0.29	0.49	3.98	0.45	10.91	30.28	1.70	63.47
2010	3.79	0.04	0.36	0.14	0.32	0.41	4.94	5.50	0.31	0.46	3.95	0.49	10.61	28.65	1.60	61.56
2011	3.91	0.04	0.43	0.14	0.32	0.33	4.33	5.55	0.28	0.42	3.73	0.38	10.53	23.95	1.54	55.89
2012	3.58	0.04	0.41	0.15	0.31	0.29	3.81	5.38	0.29	0.35	3.20	0.33	9.07	20.49	1.33	49.03
2013	3.40	0.04	0.40	0.13	0.30	0.29	3.25	5.41	0.29	0.35	2.68	0.29	8.51	17.61	1.26	44.22
2014	3.60	0.04	0.46	0.13	0.31	0.29	3.65	6.14	0.37	0.40	3.22	0.35	9.18	19.73	1.42	49.29
2015	3.01	0.03	0.28	0.09	0.17	0.20	2.27	4.00	0.24	0.34	1.90	0.17	6.64	11.69	0.97	31.99
2016	3.49	0.08	0.40	0.02	0.11	0.19	2.31	4.86	0.35	0.28	1.27	0.20	6.95	11.60	1.08	33.18
2017	3.48	0.08	0.35	0.01	0.07	0.19	2.16	4.62	0.34	0.26	1.04	0.21	5.83	12.01	1.02	31.68
2018	3.34	0.09	0.36	0.01	0.06	0.20	2.06	4.55	0.37	0.23	0.88	0.18	5.40	11.57	0.97	30.26
2019	3.27	0.11	0.33	0.01	0.06	0.21	1.99	4.57	0.35	0.23	0.68	0.15	5.31	9.45	0.87	27.60
2020	3.31	0.11	0.35	0.01	0.05	0.22	1.99	4.53	0.39	0.23	0.68	0.12	5.79	8.54	0.93	27.26
Variation 2020 / 2019	0.03 1.0%	0.01 4.8%	0.02 6.3%	-0.00 -2.7%	-0.01 -18.6%	0.01 5.4%	-0.00 -0.2%	-0.03 -0.7%	0.04 10.6%	-0.00 0.0%	0.00 0.4%	-0.04 -23.3%	0.48 9.0%	-0.91 -9.6%	0.06 7.4%	-0.34 -1.2%
Variation 2020 / 2011	-0.60 -15.4%	0.07 179.9%	-0.08 -18.0%	-0.13 -95.0%	-0.27 -84.0%	-0.12 -34.8%	-2.34 -54.0%	-1.01 -18.3%	0.11 39.5%	-0.19 -45.5%	-3.05 -81.7%	-0.27 -69.5%	-4.74 -45.0%	-15.41 -64.3%	-0.61 -39.4%	-28.63 -51.2%

* Other classes: dimetridazole, metronidazole, pyrimethamine and rifaximin

Table 12: Change in body weight treated-day by antimicrobial class (Number of ADDkg in tonnes)

	AMINOGLYCOSIDES	OTHER CLASSES	CEPHALOSPORINS 1&2G	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	5,314,542	61,559	114,400	613,705	829,639	1,349,919	7,803,382	5,961,946	109,518	6,675,463	14,437,030	1,249,525	7,852,979	18,560,113	5,778,494	65,588,385
2000	5,790,509	66,635	117,557	760,098	910,333	1,827,150	10,182,164	6,500,314	117,177	7,621,741	15,235,272	1,015,743	8,058,445	19,832,367	5,992,872	72,523,567
2005	5,561,951	49,954	187,279	1,108,247	1,151,521	2,135,486	10,726,611	6,005,841	118,931	2,284,051	14,573,360	814,949	6,145,501	23,670,632	5,072,329	70,501,432
2010	3,897,394	46,634	165,331	1,155,511	1,287,784	1,456,974	8,496,503	6,131,167	176,394	1,846,633	14,689,549	514,581	4,908,991	17,180,935	3,958,591	58,945,163
2011	3,654,028	46,985	183,603	1,136,265	1,195,462	1,206,384	7,122,720	6,164,475	168,934	1,426,662	13,670,947	409,713	4,769,510	14,999,077	3,744,852	53,163,818
2012	3,204,704	46,118	171,364	1,132,043	1,131,367	993,472	5,332,637	5,922,552	183,028	956,083	11,683,542	355,498	4,032,944	13,540,269	3,199,166	45,874,880
2013	3,070,545	39,617	159,934	1,059,444	1,164,270	940,810	4,483,224	5,885,842	198,502	975,148	9,899,925	310,410	3,836,174	11,694,340	3,101,504	41,053,140
2014	3,106,743	42,623	184,568	885,300	1,059,271	844,865	4,302,549	6,673,130	238,659	1,036,269	11,804,079	367,309	4,726,287	13,297,098	3,959,069	45,953,164
2015	2,373,930	38,953	111,221	666,725	576,541	557,216	3,175,101	4,168,534	151,309	960,734	6,857,935	194,040	3,473,229	7,386,913	2,799,112	28,560,378
2016	2,744,630	53,770	142,021	229,201	301,301	510,600	2,951,786	5,293,507	245,700	792,199	4,978,331	224,474	3,730,804	7,326,946	3,108,162	27,345,879
2017	2,588,778	50,936	135,580	53,729	174,030	454,343	2,654,092	4,900,231	231,367	733,420	4,132,924	231,703	3,308,263	8,046,216	2,992,456	25,661,845
2018	2,446,134	48,682	136,507	55,028	169,473	454,735	2,415,123	4,734,239	241,543	666,253	3,507,572	188,330	3,088,256	8,170,749	2,810,684	24,369,408
2019	2,249,402	54,938	133,706	49,031	165,129	461,272	2,094,498	4,706,512	229,810	635,946	2,691,359	157,683	2,838,536	6,381,049	2,442,957	20,868,214
2020	2,186,593	52,108	136,449	45,647	146,019	464,247	2,037,940	4,616,442	245,753	544,527	2,559,467	117,092	3,067,968	5,863,326	2,609,179	20,103,494
Variation 2020/2019	-62,809	-2,830	2,743	-3,384	-19,110	2,975	-56,558	-90,070	15,943	-91,419	-131,892	-40,591	229,432	-517,723	166,222	-764,720
	-2.8%	-5.2%	2.1%	-6.9%	-11.6%	0.6%	-2.7%	-1.9%	6.9%	-14.4%	-4.9%	-25.7%	8.1%	-8.1%	6.8%	-3.7%
Variation 2020/2011	-1,467,435	5,123	-47,154	-1,090,618	-1,049,443	-742,137	-5,084,780	-1,548,033	76,819	-882,135	-11,111,480	-292,621	-1,701,542	-9,135,751	-1,135,673	-33,060,324
	-40.2%	10.9%	-25.7%	-96.0%	-87.8%	-61.5%	-71.4%	-25.1%	45.5%	-61.8%	-81.3%	-71.4%	-35.7%	-60.9%	-30.3%	-62.2%

Table 13: Change in body weight treated by antimicrobial class (Number of ACDkg in tonnes)

	AMINOGLYCOSIDES	OTHER CLASSES	CEPHALOSPORINS 1&2G	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	1,060,632	7,358	7,453	143,160	199,415	114,768	935,311	1,717,621	107,144	424,983	2,015,945	227,976	1,262,505	3,199,139	952,470	10,201,027
2000	1,096,686	8,082	7,666	173,693	219,348	159,385	1,073,405	1,847,755	116,123	450,470	2,170,515	203,194	1,301,343	3,364,520	982,166	10,962,192
2005	1,058,202	5,309	11,628	255,451	342,811	180,234	1,239,789	1,672,908	116,663	127,628	2,365,591	157,703	1,071,517	4,317,924	871,721	11,862,204
2010	814,488	5,573	10,054	343,656	358,790	118,128	1,100,719	1,664,584	130,965	100,523	2,408,038	100,095	876,094	3,144,169	717,989	10,366,994
2011	821,642	5,499	10,692	340,257	360,937	97,872	1,041,634	1,684,123	118,668	85,261	2,277,429	80,587	865,545	2,829,732	691,141	9,793,322
2012	763,087	5,368	10,290	340,522	352,116	81,143	964,367	1,623,236	120,378	74,402	2,004,615	70,471	736,271	2,719,525	597,435	9,076,263
2013	752,769	4,211	9,290	306,104	345,740	80,026	896,653	1,619,472	119,729	72,993	1,788,447	61,695	704,402	2,392,974	576,469	8,385,197
2014	783,277	4,311	10,410	269,171	332,885	78,789	1,033,443	1,814,348	151,584	69,690	2,098,679	73,240	785,985	2,748,798	660,231	9,467,793
2015	537,161	3,909	7,130	212,424	203,997	56,727	675,590	1,107,705	97,565	58,293	1,268,372	38,624	562,214	1,649,132	455,263	5,919,210
2016	784,122	5,995	9,632	57,406	86,547	57,366	756,587	1,547,375	146,684	46,840	1,002,724	44,698	639,298	1,667,867	545,606	6,100,943
2017	791,893	5,838	10,810	17,619	41,439	59,372	700,305	1,430,701	142,802	41,976	861,223	45,852	567,301	1,830,365	509,088	5,786,370
2018	798,042	5,722	11,692	18,530	46,842	60,941	722,272	1,443,185	151,367	36,210	734,174	37,395	554,197	1,908,496	506,075	5,760,949
2019	765,969	6,555	12,159	17,252	46,421	60,208	673,626	1,430,638	142,994	35,117	577,011	31,581	508,485	1,512,211	446,673	5,066,087
2020	728,689	6,367	11,586	16,337	41,508	61,192	680,955	1,392,386	155,849	33,689	540,246	23,354	547,434	1,446,172	476,825	4,962,103
Variation 2020/2019	-37,280	-188	-573	-915	-4,913	984	7,329	-38,252	12,855	-1,428	-36,765	-8,227	38,949	-66,039	30,152	-103,984
	-4.9%	-2.9%	-4.7%	-5.3%	-10.6%	1.6%	1.1%	-2.7%	9.0%	-4.1%	-6.4%	-26.1%	7.7%	-4.4%	6.8%	-2.1%
Variation 2020/2011	-92,953	868	894	-323,920	-319,429	-36,680	-360,679	-291,737	37,181	-51,572	-1,737,183	-57,233	-318,111	-1,383,560	-214,316	-4,831,219
	-11.3%	15.8%	8.4%	-95.2%	-88.5%	-37.5%	-34.6%	-17.3%	31.3%	-60.5%	-76.3%	-71.0%	-36.8%	-48.9%	-31.0%	-49.3%

Table 14: Change in ALEA by antimicrobial class (for the oral and parenteral routes only)

	AMINOGLYCOSIDES	OTHER CLASSES	CEPHALOSPORINS 1&2G	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	0.058	0.000	0.000	0.008	0.011	0.006	0.051	0.094	0.006	0.023	0.111	0.013	0.069	0.176	0.052	0.560
2000	0.060	0.000	0.000	0.009	0.012	0.009	0.059	0.101	0.006	0.025	0.118	0.011	0.071	0.183	0.054	0.598
2001	0.060	0.000	0.000	0.009	0.014	0.010	0.064	0.097	0.006	0.019	0.121	0.010	0.066	0.196	0.051	0.610
2002	0.060	0.000	0.001	0.011	0.017	0.013	0.071	0.094	0.008	0.019	0.123	0.010	0.064	0.209	0.048	0.638
2003	0.059	0.000	0.001	0.012	0.019	0.012	0.070	0.097	0.006	0.017	0.130	0.010	0.060	0.231	0.047	0.663
2004	0.062	0.000	0.001	0.013	0.018	0.011	0.066	0.090	0.007	0.013	0.126	0.009	0.061	0.234	0.048	0.649
2005	0.064	0.000	0.001	0.015	0.021	0.011	0.075	0.101	0.007	0.008	0.142	0.009	0.064	0.260	0.052	0.713
2006	0.063	0.001	0.001	0.018	0.023	0.010	0.076	0.104	0.009	0.008	0.146	0.009	0.063	0.239	0.050	0.705
2007	0.060	0.000	0.001	0.019	0.020	0.009	0.068	0.103	0.009	0.008	0.150	0.008	0.065	0.247	0.052	0.708
2008	0.058	0.000	0.001	0.020	0.022	0.009	0.070	0.095	0.008	0.006	0.143	0.006	0.059	0.210	0.047	0.649
2009	0.052	0.000	0.001	0.017	0.022	0.008	0.066	0.094	0.007	0.006	0.144	0.006	0.054	0.199	0.045	0.625
2010	0.049	0.000	0.001	0.021	0.022	0.007	0.067	0.101	0.008	0.006	0.146	0.006	0.053	0.191	0.044	0.629
2011	0.050	0.000	0.001	0.021	0.022	0.006	0.064	0.103	0.007	0.005	0.140	0.005	0.053	0.174	0.042	0.602
2012	0.048	0.000	0.001	0.021	0.022	0.005	0.060	0.101	0.008	0.005	0.125	0.004	0.046	0.170	0.037	0.566
2013	0.047	0.000	0.001	0.019	0.022	0.005	0.056	0.101	0.007	0.005	0.112	0.004	0.044	0.150	0.036	0.524
2014	0.049	0.000	0.001	0.017	0.021	0.005	0.065	0.114	0.009	0.004	0.131	0.005	0.049	0.172	0.041	0.592
2015	0.033	0.000	0.000	0.013	0.013	0.004	0.042	0.069	0.006	0.004	0.079	0.002	0.035	0.103	0.028	0.368
2016	0.049	0.000	0.001	0.004	0.005	0.004	0.047	0.097	0.009	0.003	0.063	0.003	0.040	0.104	0.034	0.382
2017	0.050	0.000	0.001	0.001	0.003	0.004	0.044	0.091	0.009	0.003	0.055	0.003	0.036	0.116	0.032	0.368
2018	0.051	0.000	0.001	0.001	0.003	0.004	0.046	0.093	0.010	0.002	0.047	0.002	0.036	0.122	0.032	0.370
2019	0.050	0.000	0.001	0.001	0.003	0.004	0.044	0.093	0.009	0.002	0.038	0.002	0.033	0.099	0.029	0.331
2020	0.048	0.000	0.001	0.001	0.003	0.004	0.045	0.092	0.010	0.002	0.036	0.002	0.036	0.096	0.032	0.329
Variation 2020 / 2019	-0.002 -3.5%	-0.000 -1.4%	-0.000 -3.3%	-0.000 -3.9%	-0.000 -9.3%	0.000 3.1%	0.001 2.6%	-0.001 -1.2%	0.001 10.6%	-0.000 -2.7%	-0.002 -5.0%	-0.001 -25.0%	0.003 9.2%	-0.003 -3.0%	0.002 8.3%	-0.002 -0.6%
Variation 2020 / 2011	-0.002 -4.4%	0.000 24.8%	0.000 16.8%	-0.020 -94.8%	-0.019 -87.6%	-0.002 -32.6%	-0.019 -29.5%	-0.011 -10.9%	0.003 41.6%	-0.003 -57.4%	-0.104 -74.4%	-0.003 -68.8%	-0.017 -31.8%	-0.078 -44.9%	-0.011 -25.6%	-0.273 -45.4%

Annex 3: Change in sales and exposure to antimicrobials by species

Cattle

Table 15: Change in indicators for cattle

	Tonnage sold (tonnes)	Sales in mg/kg	Body weight treated-day (tonnes)	Body weight treated (tonnes)	ALEA
1999	168.88	**16.24**	8,007,921	2,767,006	**0.266**
2000	178.67	**17.07**	8,512,471	2,839,540	**0.271**
2001	174.78	**16.26**	8,509,324	2,831,180	**0.263**
2002	175.61	**16.83**	8,989,229	2,968,454	**0.284**
2003	172.29	**17.26**	9,119,792	2,986,137	**0.299**
2004	193.94	**19.68**	10,188,074	3,164,445	**0.321**
2005	206.98	**22.31**	11,119,608	3,410,079	**0.368**
2006	200.58	**20.98**	10,833,169	3,411,037	**0.357**
2007	198.70	**20.56**	10,430,334	3,238,130	**0.335**
2008	183.53	**18.71**	9,833,258	3,105,792	**0.317**
2009	172.78	**17.77**	9,567,689	2,963,954	**0.305**
2010	182.56	**19.10**	10,226,948	3,247,701	**0.340**
2011	183.26	**19.64**	9,142,586	3,064,806	**0.328**
2012	165.83	**17.91**	8,681,343	3,024,280	**0.327**
2013	146.94	**15.75**	7,975,452	2,838,932	**0.304**
2014	179.25	**19.08**	9,801,195	3,328,807	**0.354**
2015	124.13	**13.14**	6,259,157	2,263,594	**0.240**
2016	124.22	**13.14**	6,165,796	2,354,621	**0.249**
2017	131.01	**14.05**	6,385,530	2,347,798	**0.252**
2018	136.46	**14.93**	6,680,243	2,481,999	**0.272**
2019	118.04	**13.21**	5,763,180	2,212,099	**0.247**
2020	116.92	**13.35**	5,762,794	2,229,852	**0.255**
Variation 2020/2019	-1.11	**0.15**	-386	17,753	**0.007**
	-0.9%	**1.1%**	0.0%	0.8%	**2.9%**
Variation 2020/2011	-66.33	**-6.29**	-3,379,792	-834,954	**-0.074**
	-36.2%	**-32.0%**	-37.0%	-27.2%	**-22.5%**

Table 16: Change in body weight treated-day by antimicrobial class for cattle (number of ADDkg in tonnes)

	AMINOGLYCOSIDES	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	2,051,114	552,250	363,336	109,246	1,060,944	2,671,680	106,775	924,376	190,161	543,702	1,864,871	274,735	8,007,921
2000	2,081,634	698,186	385,935	110,986	1,111,140	2,725,880	115,972	982,092	192,575	608,013	1,965,475	270,884	8,512,471
2005	1,800,135	1,037,117	532,505	125,507	1,204,988	2,380,816	116,312	1,087,936	243,147	517,911	4,108,318	266,810	11,119,608
2010	1,331,289	1,029,375	683,992	75,496	1,187,433	2,155,593	147,893	889,301	172,925	535,451	3,590,307	248,104	10,226,948
2011	1,640,395	1,053,442	594,700	41,793	1,189,808	2,357,580	130,998	643,979	114,178	967,078	2,310,134	535,679	9,142,586
2012	1,540,014	1,064,093	558,221	72,409	1,313,439	2,324,174	133,378	482,855	92,384	625,796	2,256,595	301,159	8,681,343
2013	1,512,270	993,813	589,359	73,014	1,281,128	2,283,850	157,427	605,123	96,560	622,219	1,489,584	319,250	7,975,452
2014	1,569,920	840,298	510,672	113,018	1,531,565	2,060,061	176,751	1,074,489	160,252	677,013	2,829,341	420,901	9,801,195
2015	1,257,963	634,460	287,427	105,061	974,866	1,592,095	108,196	576,095	65,253	485,491	1,594,158	263,188	6,259,157
2016	1,367,551	216,021	102,871	96,064	1,135,214	1,767,052	140,830	477,589	89,836	623,605	1,601,722	480,179	6,165,796
2017	1,489,041	48,458	40,057	106,826	989,915	1,864,586	143,817	497,392	95,420	567,286	2,058,180	485,962	6,385,530
2018	1,483,254	48,667	54,325	109,558	1,098,113	1,802,819	149,200	408,796	77,292	607,844	2,337,225	545,638	6,680,243
2019	1,368,940	43,318	51,303	99,060	845,199	1,764,472	139,566	366,822	75,326	534,245	1,858,440	474,597	5,763,180
2020	1,323,530	39,961	50,353	104,583	827,843	1,751,851	153,379	406,376	63,189	555,582	1,788,497	507,362	5,762,794
Variation 2020 / 2019	-45,410	-3,357	-950	5,523	-17,356	-12,621	13,813	39,554	-12,137	21,337	-69,943	32,765	-386
	-3.3%	-7.7%	-1.9%	5.6%	-2.1%	-0.7%	9.9%	10.8%	-16.1%	4.0%	-3.8%	6.9%	0.0%
Variation 2020 / 2011	-316,865	-1,013,481	-544,347	62,790	-361,965	-605,729	22,381	-237,603	-50,989	-411,496	-521,637	-28,317	-3,379,792
	-19.3%	-96.2%	-91.5%	150.2%	-30.4%	-25.7%	17.1%	-36.9%	-44.7%	-42.6%	-22.6%	-5.3%	-37.0%

Table 17: Change in body weight treated by antimicrobial class for cattle (number of ACDkg in tonnes)

	AMINOGLYCOSIDES	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	672,296	127,314	89,974	21,849	465,815	828,336	106,775	296,921	38,033	140,098	751,371	72,478	2,767,006
2000	672,494	157,321	93,665	22,197	485,154	831,158	115,972	312,159	38,514	155,832	730,747	69,422	2,839,540
2005	651,062	232,823	184,729	25,101	517,638	807,173	116,312	322,856	48,630	133,373	1,085,831	69,427	3,410,079
2010	504,733	289,427	222,391	15,099	541,240	753,250	117,261	262,789	34,585	129,856	938,915	64,376	3,247,701
2011	575,529	308,533	220,333	8,359	574,329	797,457	99,980	195,504	22,836	199,112	698,957	96,895	3,064,806
2012	541,878	316,976	211,464	14,482	588,579	791,196	98,910	142,928	18,477	148,016	750,997	74,835	3,024,280
2013	536,315	283,418	205,889	14,603	583,324	787,419	103,554	169,048	19,312	149,794	575,405	78,862	2,838,932
2014	564,380	252,366	191,073	22,604	694,078	722,809	125,988	262,555	32,051	170,775	895,139	111,824	3,328,807
2015	380,885	198,232	126,224	21,012	448,679	497,297	80,819	145,628	13,051	123,599	649,419	74,413	2,263,594
2016	556,013	52,873	36,305	19,213	529,194	668,511	103,612	119,036	17,967	169,024	658,220	138,273	2,354,621
2017	590,987	14,294	14,153	21,365	481,984	679,323	104,551	123,658	19,084	157,216	743,618	137,990	2,347,798
2018	607,832	15,284	21,809	21,912	516,249	697,346	112,170	102,983	15,458	172,044	816,733	157,994	2,481,999
2019	575,431	14,212	21,674	19,812	431,310	691,291	104,527	92,679	15,065	152,674	677,294	139,723	2,212,099
2020	546,563	13,351	20,688	20,917	436,883	667,963	115,706	98,457	12,638	160,238	683,295	149,251	2,229,852
Variation 2020 / 2019	-28,868	-861	-986	1,105	5,573	-23,328	11,179	5,778	-2,427	7,564	6,001	9,528	17,753
	-5.0%	-6.1%	-4.5%	5.6%	1.3%	-3.4%	10.7%	6.2%	-16.1%	5.0%	0.9%	6.8%	0.8%
Variation 2020 / 2011	-28,966	-295,182	-199,645	12,558	-137,446	-129,494	15,726	-97,047	-10,198	-38,874	-15,662	52,356	-834,954
	-5.0%	-95.7%	-90.6%	150.2%	-23.9%	-16.2%	15.7%	-49.6%	-44.7%	-19.5%	-2.2%	54.0%	-27.2%

Table 18: Change in exposure of cattle by antimicrobial class

	AMINOGLYCOSIDES	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	0.065	0.012	0.009	0.002	0.045	0.080	0.010	0.029	0.004	0.013	0.072	0.007	0.266
2000	0.064	0.015	0.009	0.002	0.046	0.079	0.011	0.030	0.004	0.015	0.070	0.007	0.271
2001	0.062	0.014	0.013	0.002	0.046	0.077	0.010	0.031	0.004	0.014	0.062	0.007	0.263
2002	0.060	0.017	0.016	0.002	0.050	0.075	0.013	0.033	0.005	0.014	0.067	0.007	0.284
2003	0.062	0.020	0.019	0.002	0.051	0.076	0.011	0.033	0.005	0.013	0.076	0.007	0.299
2004	0.066	0.021	0.017	0.002	0.049	0.079	0.012	0.031	0.004	0.014	0.098	0.007	0.321
2005	0.070	0.025	0.020	0.003	0.056	0.087	0.013	0.035	0.005	0.014	0.117	0.007	0.368
2006	0.068	0.026	0.022	0.003	0.053	0.085	0.016	0.034	0.005	0.014	0.106	0.007	0.357
2007	0.065	0.027	0.020	0.002	0.044	0.079	0.015	0.031	0.004	0.016	0.104	0.007	0.335
2008	0.062	0.029	0.020	0.002	0.053	0.074	0.013	0.031	0.003	0.016	0.081	0.008	0.317
2009	0.053	0.024	0.019	0.002	0.053	0.069	0.011	0.031	0.003	0.013	0.086	0.007	0.305
2010	0.053	0.030	0.023	0.002	0.057	0.079	0.012	0.027	0.004	0.014	0.098	0.007	0.340
2011	0.062	0.033	0.024	0.001	0.062	0.085	0.011	0.021	0.002	0.021	0.075	0.010	0.328
2012	0.059	0.034	0.023	0.002	0.064	0.085	0.011	0.015	0.002	0.016	0.081	0.008	0.327
2013	0.057	0.030	0.022	0.002	0.063	0.084	0.011	0.018	0.002	0.016	0.062	0.008	0.304
2014	0.060	0.027	0.020	0.002	0.074	0.077	0.013	0.028	0.003	0.018	0.095	0.012	0.354
2015	0.040	0.021	0.013	0.002	0.048	0.053	0.009	0.015	0.001	0.013	0.069	0.008	0.240
2016	0.059	0.006	0.004	0.002	0.056	0.071	0.011	0.013	0.002	0.018	0.070	0.015	0.249
2017	0.063	0.002	0.002	0.002	0.052	0.073	0.011	0.013	0.002	0.017	0.080	0.015	0.252
2018	0.067	0.002	0.002	0.002	0.056	0.076	0.012	0.011	0.002	0.019	0.089	0.017	0.272
2019	0.064	0.002	0.002	0.002	0.048	0.077	0.012	0.010	0.002	0.017	0.076	0.016	0.247
2020	0.062	0.002	0.002	0.002	0.050	0.076	0.013	0.011	0.001	0.018	0.078	0.017	0.255
Variation 2020 / 2019	-0.002 -3.0%	-0.000 -4.1%	-0.000 -2.6%	0.000 7.8%	0.002 3.4%	-0.001 -1.4%	0.002 13.0%	0.001 8.4%	-0.000 -14.4%	0.001 7.1%	0.002 3.0%	0.001 9.0%	0.007 2.9%
Variation 2020 / 2011	0.001 1.2%	-0.032 -95.4%	-0.021 -90.0%	0.001 166.7%	-0.012 -18.9%	-0.009 -10.7%	0.003 23.3%	-0.010 -46.3%	-0.001 -41.0%	-0.003 -14.2%	0.003 4.2%	0.007 64.2%	-0.074 -22.5%

Pigs

Table 19: Change in indicators for pigs

	Tonnage sold (tonnes)	Sales in mg/kg	Body weight treated-day (tonnes)	Body weight treated (tonnes)	ALEA
1999	652.36	**203.97**	34,209,612	4,054,918	**1.268**
2000	694.04	**215.42**	37,973,460	4,392,299	**1.363**
2001	696.42	**216.29**	40,547,095	4,762,837	**1.479**
2002	654.75	**201.61**	40,357,940	4,808,885	**1.481**
2003	621.60	**193.47**	38,154,596	4,637,863	**1.443**
2004	575.40	**181.36**	35,268,371	4,372,872	**1.378**
2005	595.52	**191.49**	36,175,213	4,567,621	**1.469**
2006	575.93	**186.63**	36,287,510	4,547,478	**1.474**
2007	635.80	**205.08**	38,646,399	4,861,904	**1.568**
2008	537.10	**173.25**	32,867,792	4,169,442	**1.345**
2009	484.15	**158.70**	31,004,975	4,011,249	**1.315**
2010	446.86	**147.60**	28,215,325	3,683,343	**1.217**
2011	354.38	**118.20**	24,146,712	3,305,508	**1.103**
2012	291.81	**99.91**	19,563,214	2,903,956	**0.994**
2013	270.97	**94.39**	17,364,177	2,748,267	**0.957**
2014	284.77	**99.76**	18,283,703	2,901,647	**1.017**
2015	185.45	**65.07**	11,855,983	1,871,096	**0.657**
2016	189.40	**66.26**	10,431,195	1,843,021	**0.645**
2017	181.27	**64.42**	9,785,124	1,755,851	**0.624**
2018	166.69	**58.92**	9,115,244	1,717,114	**0.607**
2019	140.62	**49.80**	7,376,223	1,433,492	**0.508**
2020	133.04	**47.10**	7,058,906	1,387,516	**0.491**
Variation 2020/2019	-7.58	**-2.70**	-317,317	-45,976	**-0.016**
	-5.4%	**-5.4%**	-4.3%	-3.2%	**-3.2%**
Variation 2020/2011	-221.34	**-71.10**	-17,087,806	-1,917,992	**-0.611**
	-62.5%	**-60.2%**	-70.8%	-58.0%	**-55.5%**

Table 20: Change in body weight treated-day by antimicrobial class for pigs (number of ADDkg in tonnes)

	AMINOGLYCOSIDES	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	2,291,933	45,380	210,054	1,049,513	6,125,907	1,642,529	0	2,471,098	9,416,970	538,283	3,173,009	9,143,660	2,615,815	34,209,612
2000	2,663,876	47,623	239,199	1,367,730	8,496,477	1,679,057	0	2,376,589	9,629,601	331,960	3,085,774	10,067,534	2,628,024	37,973,460
2005	3,040,918	59,745	352,557	1,640,894	8,934,122	1,807,141	0	437,141	8,610,420	186,353	2,420,581	10,016,206	2,239,518	36,175,213
2010	1,583,945	96,608	235,854	1,083,449	6,864,480	1,983,725	27,004	251,499	7,817,966	113,403	2,222,722	6,852,999	2,101,195	28,215,325
2011	1,141,682	54,160	245,300	868,818	5,564,533	1,701,565	30,948	253,080	7,550,506	99,895	1,764,218	5,502,986	1,751,966	24,146,712
2012	905,334	42,420	252,297	826,715	3,678,768	1,722,109	48,428	278,240	6,035,677	73,886	1,465,634	4,776,944	1,452,262	19,563,214
2013	853,437	41,862	245,849	754,568	2,901,541	1,674,548	38,906	261,364	4,643,856	66,294	1,283,114	5,108,942	1,273,334	17,364,177
2014	836,266	22,300	209,187	695,790	2,410,657	2,048,115	57,096	217,338	5,243,607	69,534	1,884,345	5,104,040	1,873,843	18,283,703
2015	559,988	16,965	108,331	421,383	1,952,929	1,289,384	38,376	185,092	3,292,519	30,573	1,405,418	2,955,046	1,396,912	11,855,983
2016	767,591	6,753	49,877	375,572	1,581,085	1,843,102	99,056	125,040	1,660,301	36,237	1,243,263	3,077,716	1,236,500	10,431,195
2017	588,637	2,354	14,431	302,513	1,442,729	1,551,612	75,332	86,199	1,211,293	37,319	1,049,173	3,712,165	1,047,039	9,785,124
2018	538,015	2,645	20,596	293,501	1,094,843	1,507,214	79,408	68,105	1,123,835	43,078	1,008,999	3,619,870	1,006,273	9,115,244
2019	498,575	2,290	18,703	304,614	929,466	1,440,386	77,780	63,347	770,744	45,090	883,871	2,611,380	877,929	7,376,223
2020	476,722	1,659	17,920	293,021	876,039	1,457,395	79,964	70,408	746,035	36,472	1,009,698	2,276,215	1,004,906	7,058,906
Variation 2020 / 2019	-21,853	-631	-783	-11,593	-53,427	17,009	2,184	7,061	-24,709	-8,618	125,827	-335,165	126,977	-317,317
	-4.4%	-27.6%	-4.2%	-3.8%	-5.7%	1.2%	2.8%	11.1%	-3.2%	-19.1%	14.2%	-12.8%	14.5%	-4.3%
Variation 2020 / 2011	-664,960	-52,501	-227,380	-575,797	-4,688,494	-244,170	49,016	-182,672	-6,804,471	-63,423	-754,520	-3,226,771	-747,060	-17,087,806
	-58.2%	-96.9%	-92.7%	-66.3%	-84.3%	-14.3%	158.4%	-72.2%	-90.1%	-63.5%	-42.8%	-58.6%	-42.6%	-70.8%

Table 21: Change in body weight treated by antimicrobial class for pigs (number of ACDkg in tonnes)

	AMINOGLYCOSIDES	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	230,989	14,239	67,875	65,479	377,507	364,211	0	287,041	1,032,593	92,905	511,084	1,231,271	466,800	4,054,918
2000	256,647	14,943	77,199	87,602	491,457	404,491	0	279,007	1,068,529	66,632	518,129	1,358,297	477,216	4,392,299
2005	273,117	21,489	113,933	103,587	600,690	408,334	0	67,516	1,067,625	34,997	483,103	1,581,645	450,933	4,567,621
2010	176,413	47,064	73,599	66,463	461,338	409,202	13,502	40,592	981,045	21,490	428,285	1,106,873	407,015	3,683,343
2011	129,151	22,976	77,079	52,793	390,083	366,887	15,474	38,084	1,042,911	19,551	351,086	900,363	348,439	3,305,508
2012	112,035	17,231	83,597	57,987	305,917	378,060	21,133	43,681	857,499	14,731	294,976	811,971	291,887	2,903,956
2013	113,374	15,365	83,485	54,925	252,768	379,163	15,486	40,890	706,438	13,361	259,458	910,183	257,303	2,748,267
2014	113,499	9,648	80,243	53,096	259,872	489,256	24,270	29,356	763,937	14,021	280,877	889,149	278,546	2,901,647
2015	77,695	6,679	46,133	33,110	174,345	303,701	14,669	22,667	555,507	6,158	199,112	509,600	197,266	1,871,096
2016	144,100	2,283	22,745	34,608	178,833	482,412	41,201	15,194	320,196	7,279	183,351	533,980	181,996	1,843,021
2017	128,376	956	5,001	33,794	166,182	406,073	32,410	11,183	259,013	7,529	149,611	664,735	149,186	1,755,851
2018	128,507	966	7,493	34,155	145,297	410,601	33,025	8,897	240,634	8,681	143,399	667,095	142,883	1,717,114
2019	124,875	752	7,257	34,874	157,569	389,417	32,493	8,468	171,775	9,062	130,300	476,769	129,168	1,433,492
2020	115,864	556	6,747	33,967	156,775	400,432	34,162	9,884	164,975	7,343	147,738	416,787	146,783	1,387,516
Variation 2020 / 2019	-9,011	-196	-510	-907	-794	11,015	1,669	1,416	-6,800	-1,719	17,438	-59,982	17,615	-45,976
	-7.2%	-26.1%	-7.0%	-2.6%	-0.5%	2.8%	5.1%	16.7%	-4.0%	-19.0%	13.4%	-12.6%	13.6%	-3.2%
Variation 2020 / 2011	-13,287	-22,420	-70,332	-18,826	-233,308	33,545	18,688	-28,200	-877,936	-12,208	-203,348	-483,576	-201,656	-1,917,992
	-10.3%	-97.6%	-91.2%	-35.7%	-59.8%	9.1%	120.8%	-74.0%	-84.2%	-62.4%	-57.9%	-53.7%	-57.9%	-58.0%

Table 22: Change in exposure of pigs by antimicrobial class

	AMINOGLYCOSIDES	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	0.072	0.004	0.021	0.020	0.118	0.114	0.000	0.090	0.323	0.029	0.160	0.385	0.146	1.268
2000	0.080	0.005	0.024	0.027	0.153	0.126	0.000	0.087	0.332	0.021	0.161	0.422	0.148	1.363
2001	0.091	0.004	0.026	0.032	0.191	0.130	0.000	0.073	0.342	0.015	0.163	0.485	0.149	1.479
2002	0.090	0.005	0.029	0.037	0.207	0.126	0.000	0.066	0.323	0.012	0.159	0.492	0.147	1.481
2003	0.083	0.005	0.031	0.034	0.192	0.123	0.000	0.042	0.338	0.009	0.144	0.502	0.134	1.443
2004	0.087	0.005	0.030	0.032	0.179	0.118	0.000	0.032	0.320	0.010	0.152	0.475	0.141	1.378
2005	0.088	0.007	0.037	0.033	0.193	0.131	0.000	0.022	0.343	0.011	0.155	0.509	0.145	1.469
2006	0.086	0.014	0.039	0.030	0.204	0.140	0.000	0.018	0.355	0.009	0.157	0.477	0.148	1.474
2007	0.078	0.015	0.033	0.028	0.196	0.148	0.000	0.015	0.410	0.010	0.166	0.518	0.155	1.568
2008	0.073	0.014	0.038	0.027	0.167	0.127	0.000	0.011	0.361	0.009	0.148	0.421	0.137	1.345
2009	0.073	0.013	0.040	0.026	0.162	0.141	0.006	0.012	0.345	0.007	0.141	0.401	0.131	1.315
2010	0.058	0.016	0.024	0.022	0.152	0.135	0.004	0.013	0.324	0.007	0.141	0.366	0.134	1.217
2011	0.043	0.008	0.026	0.018	0.130	0.122	0.005	0.013	0.348	0.007	0.117	0.300	0.116	1.103
2012	0.038	0.006	0.029	0.020	0.105	0.129	0.007	0.015	0.294	0.005	0.101	0.278	0.100	0.994
2013	0.039	0.005	0.029	0.019	0.088	0.132	0.005	0.014	0.246	0.005	0.090	0.317	0.090	0.957
2014	0.040	0.003	0.028	0.019	0.091	0.171	0.009	0.010	0.268	0.005	0.098	0.311	0.098	1.017
2015	0.027	0.002	0.016	0.012	0.061	0.107	0.005	0.008	0.195	0.002	0.070	0.179	0.069	0.657
2016	0.050	0.001	0.008	0.012	0.063	0.169	0.014	0.005	0.112	0.003	0.064	0.187	0.064	0.645
2017	0.046	0.000	0.002	0.012	0.059	0.144	0.012	0.004	0.092	0.003	0.053	0.236	0.053	0.624
2018	0.045	0.000	0.003	0.012	0.051	0.145	0.012	0.003	0.085	0.003	0.051	0.236	0.051	0.607
2019	0.044	0.000	0.003	0.012	0.056	0.138	0.012	0.003	0.061	0.003	0.046	0.169	0.046	0.508
2020	0.041	0.000	0.002	0.012	0.055	0.142	0.012	0.003	0.058	0.003	0.052	0.148	0.052	0.491
Variation 2020 / 2019	-0.003 -7.3%	-0.000 -26.1%	-0.000 -7.1%	-0.000 -2.6%	-0.000 -0.5%	0.004 2.8%	0.001 5.1%	0.001 16.7%	-0.002 -4.0%	-0.001 -19.0%	0.006 13.3%	-0.021 -12.6%	0.006 13.6%	-0.016 -3.2%
Variation 2020 / 2011	-0.002 -4.8%	-0.007 -97.4%	-0.023 -90.7%	-0.006 -31.7%	-0.075 -57.3%	0.019 15.8%	0.007 134.3%	-0.009 -72.5%	-0.289 -83.2%	-0.004 -60.1%	-0.065 -55.3%	-0.153 -50.9%	-0.064 -55.3%	-0.611 -55.5%

Poultry

Table 23: Change in indicators for poultry

	Tonnage sold (tonnes)	Sales in mg/kg	Body weight treated-day (tonnes)	Body weight treated (tonnes)	ALEA
1999	221.36	**76.14**	10,422,240	1,905,620	**0.655**
2000	237.18	**80.92**	11,983,009	2,219,218	**0.757**
2001	249.28	**82.10**	12,904,377	2,398,575	**0.790**
2002	250.98	**89.85**	13,170,636	2,464,931	**0.882**
2003	261.95	**95.15**	13,884,626	2,646,125	**0.961**
2004	251.27	**95.03**	12,945,531	2,437,520	**0.922**
2005	254.57	**99.17**	13,548,164	2,599,957	**1.013**
2006	237.66	**102.02**	13,095,819	2,530,206	**1.086**
2007	254.37	**104.39**	13,452,994	2,558,716	**1.050**
2008	242.17	**101.38**	12,708,317	2,404,093	**1.006**
2009	216.43	**92.89**	12,419,498	2,397,571	**1.029**
2010	203.73	**86.26**	12,716,425	2,462,472	**1.043**
2011	202.29	**84.77**	12,308,690	2,398,377	**1.005**
2012	177.24	**75.57**	11,230,872	2,208,711	**0.942**
2013	157.37	**67.66**	10,353,833	2,051,564	**0.882**
2014	178.41	**78.64**	12,072,243	2,434,618	**1.073**
2015	98.94	**42.58**	5,915,651	1,161,503	**0.500**
2016	105.49	**47.20**	6,508,707	1,280,621	**0.573**
2017	94.62	**43.02**	5,706,081	1,126,018	**0.512**
2018	86.29	**38.86**	5,082,210	1,009,035	**0.454**
2019	73.67	**34.25**	4,289,564	852,912	**0.397**
2020	69.44	**33.11**	3,821,765	751,172	**0.358**
Variation 2020/2019	-4.23	**-1.14**	-467,799	-101,740	**-0.038**
	-5.7%	**-3.3%**	-10.9%	-11.9%	**-9.7%**
Variation 2020/2011	-132.86	**-51.66**	-8,486,925	-1,647,205	**-0.647**
	-65.7%	**-60.9%**	-69.0%	-68.7%	**-64.4%**

Table 24: Change in body weight treated-day by antimicrobial class for poultry (number of ADDkg in tonnes)

	AMINOGLYCOSIDES	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	149,763	171,228	178,220	351,930	947,342	0	27,543	2,598,982	428,235	623,244	5,136,192	502,050	10,422,240
2000	200,499	192,263	338,080	348,275	1,415,277	0	26,541	3,098,379	413,193	710,480	5,460,224	539,524	11,983,009
2005	143,423	158,259	352,080	437,560	1,309,916	0	3,933	3,917,861	301,897	746,458	6,343,124	651,779	13,548,164
2010	197,486	220,997	279,249	288,851	1,463,482	0	27,666	5,338,647	184,259	495,167	4,388,268	388,632	12,716,425
2011	136,423	236,062	276,976	228,390	1,639,173	0	31,348	4,477,953	149,819	766,438	4,508,289	649,937	12,308,690
2012	115,917	207,589	78,505	199,025	1,448,987	0	31,053	4,307,656	141,169	608,794	4,216,967	506,047	11,230,872
2013	167,311	190,535	96,329	180,858	1,508,469	0	29,173	4,238,210	127,780	525,097	3,411,934	430,258	10,353,833
2014	49,832	223,391	14,878	246,495	2,106,306	1,776	56,904	4,810,375	119,304	616,370	3,864,384	505,903	12,072,243
2015	30,149	95,717	13,058	106,837	886,978	0	46,928	2,321,896	75,427	547,656	1,819,578	466,368	5,915,651
2016	125,538	100,330	19,435	111,101	1,227,093	665	44,456	2,544,305	80,483	668,852	1,615,991	573,888	6,508,707
2017	135,861	88,802	23,427	124,111	960,276	892	43,250	2,140,508	87,458	635,038	1,501,744	531,828	5,706,081
2018	117,545	62,705	27,369	118,743	926,254	984	35,415	1,760,294	60,731	549,118	1,462,875	470,152	5,082,210
2019	132,685	59,749	31,690	110,464	1,025,934	861	37,941	1,395,351	35,959	447,367	1,053,471	380,705	4,289,564
2020	134,176	41,636	35,874	109,194	861,236	746	40,187	1,199,250	14,116	451,219	979,606	368,388	3,821,765
Variation 2020 / 2019	1,491	-18,113	4,184	-1,270	-164,698	-115	2,246	-196,101	-21,843	3,852	-73,865	-12,317	-467,799
	1.1%	-30.3%	13.2%	-1.1%	-16.1%	-13.4%	5.9%	-14.1%	-60.7%	0.9%	-7.0%	-3.2%	-10.9%
Variation 2020 / 2011	-2,247	-194,426	-241,102	-119,196	-777,937	746	8,839	-3,278,703	-135,703	-315,219	-3,528,683	-281,549	-8,486,925
	-1.6%	-82.4%	-87.0%	-52.2%	-47.5%		28.2%	-73.2%	-90.6%	-41.1%	-78.3%	-43.3%	-69.0%

Table 25: Change in body weight treated by antimicrobial class for poultry (number of ACDkg in tonnes)

	AMINOGLYCOSIDES	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	28,199	34,246	25,460	72,280	227,201	0	3,206	537,962	83,634	106,825	822,576	106,552	1,905,620
2000	36,824	38,453	48,297	79,041	330,106	0	3,121	638,597	82,639	115,988	885,419	110,311	2,219,218
2005	25,240	31,652	50,297	108,775	308,778	0	661	873,760	59,955	114,005	1,058,825	109,156	2,599,957
2010	26,349	44,199	35,268	77,567	368,538	0	5,423	1,091,842	36,501	77,378	723,604	69,254	2,462,472
2011	18,513	47,212	35,467	57,932	397,384	0	6,018	912,966	29,784	121,440	791,760	108,911	2,398,377
2012	15,898	41,518	7,850	50,207	335,192	0	5,967	881,147	28,120	98,256	762,878	88,684	2,208,711
2013	21,771	38,107	9,633	44,439	350,164	0	5,613	861,632	25,547	87,673	623,105	77,827	2,051,564
2014	10,251	44,678	2,125	64,271	482,700	355	11,092	977,909	23,861	105,258	719,571	92,290	2,434,618
2015	5,975	19,143	1,865	26,386	209,891	0	9,086	474,455	15,086	88,749	316,803	79,587	1,161,503
2016	15,489	20,066	2,776	28,527	288,987	133	8,732	514,196	16,097	106,094	284,702	93,242	1,280,621
2017	17,192	17,760	3,358	32,419	220,542	178	8,549	435,472	17,492	101,864	277,615	85,795	1,126,018
2018	15,321	12,541	3,921	31,146	212,239	197	7,016	357,682	12,147	89,962	273,933	77,740	1,009,035
2019	16,956	11,950	4,535	26,560	229,309	172	7,528	284,910	7,192	72,779	198,312	62,337	852,912
2020	17,360	8,327	5,133	26,203	191,460	149	7,960	244,414	2,824	74,754	180,629	60,983	751,172
Variation 2020 / 2019	404	-3,623	598	-357	-37,849	-23	432	-40,496	-4,368	1,975	-17,683	-1,354	-101,740
	2.4%	-30.3%	13.2%	-1.3%	-16.5%	-13.4%	5.7%	-14.2%	-60.7%	2.7%	-8.9%	-2.2%	-11.9%
Variation 2020 / 2011	-1,153	-38,885	-30,334	-31,729	-205,924	149	1,942	-668,552	-26,960	-46,686	-611,131	-47,928	-1,647,205
	-6.2%	-82.4%	-85.5%	-54.8%	-51.8%	#DIV/0!	32.3%	-73.2%	-90.5%	-38.4%	-77.2%	-44.0%	-68.7%

Table 26: Change in exposure of poultry by antimicrobial class

	AMINOGLYCOSIDES	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	0.010	0.012	0.009	0.025	0.078	0.000	0.001	0.185	0.029	0.037	0.283	0.037	0.655
2000	0.013	0.013	0.016	0.027	0.113	0.000	0.001	0.218	0.028	0.040	0.302	0.038	0.757
2001	0.014	0.012	0.023	0.027	0.098	0.000	0.001	0.227	0.027	0.037	0.339	0.038	0.790
2002	0.012	0.011	0.032	0.030	0.108	0.000	0.001	0.256	0.023	0.041	0.382	0.036	0.882
2003	0.010	0.012	0.027	0.032	0.107	0.000	0.000	0.283	0.023	0.042	0.437	0.038	0.961
2004	0.011	0.013	0.022	0.035	0.102	0.000	0.000	0.292	0.024	0.042	0.394	0.038	0.922
2005	0.010	0.012	0.020	0.042	0.120	0.000	0.000	0.340	0.023	0.044	0.412	0.043	1.013
2006	0.011	0.015	0.020	0.045	0.143	0.000	0.003	0.390	0.028	0.044	0.398	0.040	1.086
2007	0.011	0.016	0.016	0.042	0.149	0.000	0.004	0.351	0.021	0.046	0.407	0.043	1.050
2008	0.008	0.016	0.015	0.047	0.132	0.000	0.003	0.360	0.014	0.041	0.378	0.039	1.006
2009	0.009	0.017	0.011	0.036	0.144	0.000	0.004	0.409	0.016	0.045	0.347	0.043	1.029
2010	0.011	0.019	0.015	0.033	0.156	0.000	0.002	0.462	0.015	0.033	0.306	0.029	1.043
2011	0.008	0.020	0.015	0.024	0.167	0.000	0.003	0.383	0.012	0.051	0.332	0.046	1.005
2012	0.007	0.018	0.003	0.021	0.143	0.000	0.003	0.376	0.012	0.042	0.325	0.038	0.942
2013	0.009	0.016	0.004	0.019	0.151	0.000	0.002	0.370	0.011	0.038	0.268	0.033	0.882
2014	0.005	0.020	0.001	0.028	0.213	0.000	0.005	0.431	0.011	0.046	0.317	0.041	1.073
2015	0.003	0.008	0.001	0.011	0.090	0.000	0.004	0.204	0.006	0.038	0.136	0.034	0.500
2016	0.007	0.009	0.001	0.013	0.129	0.000	0.004	0.230	0.007	0.047	0.127	0.042	0.573
2017	0.008	0.008	0.002	0.015	0.100	0.000	0.004	0.198	0.008	0.046	0.126	0.039	0.512
2018	0.007	0.006	0.002	0.014	0.096	0.000	0.003	0.161	0.005	0.041	0.123	0.035	0.454
2019	0.008	0.006	0.002	0.012	0.107	0.000	0.004	0.132	0.003	0.034	0.092	0.029	0.397
2020	0.008	0.004	0.002	0.012	0.091	0.000	0.004	0.117	0.001	0.036	0.086	0.029	0.358
Variation 2020 / 2019	0.000 5.0%	-0.002 -28.5%	0.000 16.1%	0.000 1.2%	-0.015 -14.4%	-0.000 -11.2%	0.000 8.4%	-0.016 -12.0%	-0.002 -59.7%	0.002 5.3%	-0.006 -6.6%	0.000 0.3%	-0.038 -9.7%
Variation 2020 / 2011	0.001 6.7%	-0.016 -79.9%	-0.012 -83.5%	-0.012 -48.5%	-0.075 -45.2%	0.000	0.001 50.5%	-0.266 -69.5%	-0.011 -89.2%	-0.015 -30.0%	-0.246 -74.0%	-0.017 -36.3%	-0.647 -64.4%

Rabbits

Table 27: Change in indicators for rabbits

	Tonnage sold (tonnes)	Sales in mg/kg	Body weight treated-day (tonnes)	Body weight treated (tonnes)	ALEA
1999	75.42	**542.69**	6,820,589	388,697	**2.797**
2000	82.46	**605.43**	8,009,347	437,686	**3.214**
2001	80.80	**595.30**	6,666,321	398,372	**2.935**
2002	89.83	**662.34**	7,115,074	459,635	**3.389**
2003	100.52	**779.80**	8,308,213	533,210	**4.137**
2004	116.77	**897.94**	7,502,825	578,705	**4.450**
2005	114.80	**897.44**	5,426,835	527,722	**4.125**
2006	103.25	**831.33**	5,244,430	477,901	**3.848**
2007	113.66	**905.19**	5,698,173	510,172	**4.063**
2008	103.02	**919.88**	4,933,109	431,942	**3.857**
2009	88.61	**863.58**	4,565,869	399,515	**3.894**
2010	79.90	**799.71**	4,205,492	371,967	**3.723**
2011	71.09	**659.44**	3,667,867	342,378	**3.176**
2012	55.26	**535.81**	2,650,256	268,863	**2.607**
2013	52.46	**517.57**	2,474,604	273,825	**2.701**
2014	61.66	**594.95**	2,849,471	309,151	**2.983**
2015	45.25	**442.74**	2,367,222	231,895	**2.269**
2016	44.22	**476.64**	1,951,622	202,397	**2.182**
2017	31.68	**362.01**	1,638,778	157,143	**1.796**
2018	28.24	**336.61**	1,518,946	154,053	**1.836**
2019	31.07	**383.11**	1,434,321	151,150	**1.864**
2020	30.24	**390.02**	1,344,142	148,068	**1.910**
Variation 2020/2019	-0.83	**6.91**	-90,179	-3,082	**0.046**
	-2.7%	**1.8%**	-6.3%	-2.0%	**2.5%**
Variation 2020/2011	-40.85	**-269.42**	-2,323,725	-194,310	**-1.266**
	-57.5%	**-40.9%**	-63.4%	-56.8%	**-39.9%**

Table 28: Change in body weight treated-day by antimicrobial class for rabbits (number of ADDkg in tonnes)

	AMINOGLYCOSIDES	FLUOROQUINOLONES	MACROLIDES	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	435,842	0	198,522	4,176,822	1,020,245	690	369,180	629,259	139,720	6,820,589
2000	455,506	0	158,203	5,218,611	1,103,266	635	508,684	572,579	254,607	8,009,347
2005	266,428	0	88,044	1,842,977	555,982	4,076	921,562	1,751,995	796,200	5,426,835
2010	541,691	0	106,100	1,567,468	409,766	3,384	507,178	1,071,977	388,281	4,205,492
2011	537,013	0	90,401	1,142,234	520,890	2	438,716	942,285	337,423	3,667,867
2012	455,320	0	92,095	646,790	421,864	1	348,463	694,554	276,243	2,650,256
2013	368,510	0	77,674	684,611	184,793	0	342,637	821,307	279,400	2,474,604
2014	470,499	14	68,957	762,027	366,329	0	474,106	714,165	389,897	2,849,471
2015	369,999	2,949	69,768	728,714	436,009	0	335,229	434,164	252,219	2,367,222
2016	354,925	2,181	65,157	622,703	130,219	0	393,378	394,435	325,133	1,951,622
2017	242,859	1,696	36,587	603,971	191,186	0	259,079	308,579	231,086	1,638,778
2018	213,639	1,182	36,500	562,733	153,659	0	206,165	348,178	181,329	1,518,946
2019	152,012	957	70,718	534,658	111,167	0	292,080	290,460	258,181	1,434,321
2020	142,225	633	81,086	433,932	140,894	0	294,342	274,594	254,193	1,344,142
Variation 2020 / 2019	-9,787	-324	10,368	-100,726	29,727	0	2,262	-15,866	-3,988	-90,179
	-6.4%	-33.9%	14.7%	-18.8%	26.7%		0.8%	-5.5%	-1.5%	-6.3%
Variation 2020 / 2011	-394,788	633	-9,315	-708,302	-379,996	-2	-144,374	-667,691	-83,230	-2,323,725
	-73.5%	#DIV/0!	-10.3%	-62.0%	-73.0%	-100.0%	-32.9%	-70.9%	-24.7%	-63.4%

Table 29: Change in body weight treated by antimicrobial class for rabbits (number of ACDkg in tonnes)

	AMINOGLYCOSIDES	FLUOROQUINOLONES	MACROLIDES	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	42,389	0	11,305	134,736	85,792	138	52,630	63,474	26,325	388,697
2000	44,198	0	9,029	168,342	92,760	127	67,000	57,879	37,899	437,686
2005	29,531	0	5,120	59,451	44,846	815	107,923	280,961	92,333	527,722
2010	45,859	0	14,688	54,508	35,000	677	66,564	155,156	51,571	371,967
2011	47,194	0	13,052	41,159	47,675	0	62,432	131,564	50,489	342,378
2012	43,075	0	13,366	24,754	37,839	0	51,364	99,932	42,275	268,863
2013	33,544	0	11,097	26,490	20,339	0	51,256	131,775	43,222	273,825
2014	45,091	1	10,200	29,242	47,119	0	69,643	108,760	59,088	309,151
2015	34,923	588	11,307	26,540	52,939	0	44,888	61,943	34,801	231,895
2016	36,867	436	9,477	22,914	19,342	0	55,615	59,218	46,800	202,397
2017	20,847	338	5,340	22,244	25,619	0	37,596	45,864	33,254	157,143
2018	19,570	235	5,317	20,297	21,436	0	30,714	56,924	27,155	154,053
2019	19,219	191	10,177	19,121	18,378	0	40,786	45,531	36,115	151,150
2020	17,936	126	11,636	15,845	20,122	0	42,528	42,854	37,035	148,068
Variation 2020 / 2019	-1,283	-65	1,459	-3,276	1,744	0	1,742	-2,677	920	-3,082
	-6.7%	-34.0%	14.3%	-17.1%	9.5%		4.3%	-5.9%	2.5%	-2.0%
Variation 2020 / 2011	-29,258	126	-1,416	-25,314	-27,553	0	-19,904	-88,710	-13,454	-194,310
	-62.0%	#DIV/0!	-10.8%	-61.5%	-57.8%		-31.9%	-67.4%	-26.6%	-56.8%

Table 30: Change in exposure of rabbits by antimicrobial class

	AMINOGLYCOSIDES	FLUOROQUINOLONES	MACROLIDES	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	0.305	0.000	0.081	0.970	0.617	0.001	0.379	0.457	0.189	2.797
2000	0.325	0.000	0.066	1.236	0.681	0.001	0.492	0.425	0.278	3.214
2001	0.320	0.000	0.077	0.904	0.677	0.004	0.473	0.497	0.277	2.935
2002	0.340	0.000	0.080	0.984	0.526	0.005	0.508	0.957	0.320	3.389
2003	0.296	0.000	0.059	1.330	0.420	0.005	0.614	1.424	0.443	4.137
2004	0.262	0.000	0.053	0.988	0.315	0.005	0.685	2.147	0.545	4.450
2005	0.231	0.000	0.040	0.465	0.351	0.006	0.844	2.196	0.722	4.125
2006	0.264	0.000	0.037	0.532	0.346	0.007	0.797	1.871	0.646	3.848
2007	0.286	0.000	0.030	0.584	0.387	0.007	0.882	1.892	0.725	4.063
2008	0.329	0.000	0.020	0.539	0.386	0.007	0.738	1.841	0.609	3.857
2009	0.346	0.000	0.015	0.578	0.465	0.007	0.748	1.739	0.612	3.894
2010	0.459	0.000	0.147	0.546	0.350	0.007	0.666	1.553	0.516	3.723
2011	0.438	0.000	0.121	0.382	0.442	0.000	0.579	1.220	0.468	3.176
2012	0.418	0.000	0.130	0.240	0.367	0.000	0.498	0.969	0.410	2.607
2013	0.331	0.000	0.109	0.261	0.201	0.000	0.506	1.300	0.426	2.701
2014	0.435	0.000	0.098	0.282	0.455	0.000	0.672	1.049	0.570	2.983
2015	0.342	0.006	0.111	0.260	0.518	0.000	0.439	0.606	0.341	2.269
2016	0.397	0.005	0.102	0.247	0.208	0.000	0.599	0.638	0.504	2.182
2017	0.238	0.004	0.061	0.254	0.293	0.000	0.430	0.524	0.380	1.796
2018	0.233	0.003	0.063	0.242	0.255	0.000	0.366	0.678	0.324	1.836
2019	0.237	0.002	0.126	0.236	0.227	0.000	0.503	0.562	0.445	1.864
2020	0.231	0.002	0.150	0.204	0.260	0.000	0.549	0.553	0.478	1.910
Variation 2020 / 2019	-0.006	-0.001	0.025	-0.031	0.033	0.000	0.046	-0.009	0.032	0.046
	-2.4%	-31.0%	19.6%	-13.3%	14.5%		9.0%	-1.6%	7.2%	2.5%
Variation 2020 / 2011	-0.206	0.002	0.029	-0.177	-0.183	0.000	-0.031	-0.668	0.009	-1.266
	-47.2%		24.0%	-46.5%	-41.3%		-5.3%	-54.7%	2.0%	-39.9%

Cats and dogs

Table 31: Change in indicators for cats & dogs

	Tonnage sold (tonnes)	Sales in mg/kg	Body weight treated-day (tonnes)	Body weight treated (tonnes)	ALEA
1999	16.00	**90.52**	598,430	114,904	**0.650**
2000	15.89	**91.01**	600,448	115,055	**0.659**
2001	15.70	**90.99**	616,480	114,392	**0.663**
2002	16.45	**96.57**	654,031	112,040	**0.658**
2003	15.46	**91.54**	645,353	105,961	**0.627**
2004	16.50	**98.58**	658,047	111,431	**0.666**
2005	17.23	**104.84**	705,264	116,726	**0.710**
2006	18.42	**114.17**	743,202	120,969	**0.750**
2007	18.29	**113.82**	766,055	126,125	**0.785**
2008	18.19	**113.80**	761,922	121,448	**0.760**
2009	17.38	**109.38**	754,087	118,934	**0.749**
2010	16.88	**107.04**	741,133	116,706	**0.740**
2011	16.75	**106.50**	728,932	117,524	**0.747**
2012	15.66	**99.80**	661,708	107,800	**0.687**
2013	14.29	**90.26**	663,001	105,939	**0.669**
2014	17.03	**106.72**	758,530	121,478	**0.761**
2015	12.73	**78.67**	576,331	93,609	**0.578**
2016	15.63	**95.30**	661,641	98,642	**0.601**
2017	16.08	**95.94**	675,945	105,164	**0.627**
2018	16.20	**94.63**	689,716	107,424	**0.627**
2019	16.41	**93.81**	692,531	109,642	**0.627**
2020	17.83	**99.79**	761,549	117,761	**0.659**
Variation 2020/2019	1.42	**5.99**	69,018	8,119	**0.032**
	8.7%	**6.4%**	10.0%	7.4%	**5.1%**
Variation 2020/2011	1.08	**-6.71**	32,617	237	**-0.088**
	6.4%	**-6.3%**	4.5%	0.2%	**-11.8%**

Table 32: Change in body weight treated-day by antimicrobial class for cats and dogs (number of ADDkg in tonnes)

	AMINOGLYCOSIDES	OTHER CLASSES	CEPHALOSPORINS 1&2G	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	83,648	61,307	114,400	0	85,021	12,940	56,093	187,477	1,285	6,278	996	75,759	36,287	35,257	598,430
2000	78,470	66,454	117,557	0	92,936	10,354	61,523	180,250	1,205	5,907	3,217	73,714	34,935	31,416	600,448
2005	73,997	49,780	187,279	0	108,200	17,005	59,590	218,166	1,318	4,429	2,550	50,407	41,610	14,518	705,264
2010	61,304	46,411	165,331	5,310	120,390	18,780	48,894	298,510	649	2,511	87	42,505	37,684	10,426	741,133
2011	57,305	46,890	183,603	7,111	98,426	18,797	46,888	287,645	0	2,648	13	45,346	39,820	13,326	728,932
2012	58,129	46,007	169,932	4,807	91,821	15,843	46,007	249,433	0	2,682	0	44,320	38,107	12,388	661,708
2013	54,914	39,533	159,934	6,009	112,477	16,899	39,533	252,949	0	2,816	0	37,619	37,507	10,547	663,001
2014	58,914	42,580	184,568	5,919	94,285	21,179	42,580	313,936	0	3,336	0	51,197	43,258	19,119	758,530
2015	39,410	38,925	111,221	7,180	66,507	17,714	38,925	250,791	74	2,347	0	44,409	38,252	15,132	576,331
2016	39,185	53,750	142,021	1,897	40,055	19,529	39,371	303,585	0	975	0	52,763	47,028	23,405	661,641
2017	43,584	50,936	135,580	2,308	26,428	21,577	33,577	337,475	0	682	0	54,074	46,187	24,300	675,945
2018	37,891	48,682	136,507	2,147	27,296	24,307	28,750	353,675	0	709	0	51,481	44,455	26,528	689,716
2019	41,863	54,938	133,706	2,179	29,495	25,323	30,187	349,307	0	652	0	48,674	47,668	22,965	692,531
2020	43,119	52,108	136,449	2,268	30,215	28,845	25,134	406,777	0	603	0	48,174	55,690	20,499	761,549
Variation 2020 / 2019	1,256	-2,830	2,743	89	720	3,522	-5,053	57,470	0	-49	0	-500	8,022	-2,466	69,018
	3.0%	-5.2%	2.1%	4.1%	2.4%	13.9%	-16.7%	16.5%		-7.5%		-1.0%	16.8%	-10.7%	10.0%
Variation 2020 / 2011	-14,186	5,218	-47,154	-4,843	-68,211	10,048	-21,754	119,132	0	-2,045	-13	2,828	15,870	7,173	32,617
	-24.8%	11.1%	-25.7%	-68.1%	-69.3%	53.5%	-46.4%	41.4%		-77.2%	-100.0%	6.2%	39.9%	53.8%	4.5%

Table 33: Change in body weight treated by antimicrobial class for cats and dogs (number of ACDkg in tonnes)

	AMINOGLYCOSIDES	OTHER CLASSES	CEPHALOSPORINS 1&2G	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	31,474	7,308	7,453	0	7,320	1,980	6,453	63,788	161	1,634	199	14,553	7,342	5,334	114,904
2000	29,868	8,046	7,666	0	10,031	1,289	7,237	61,675	151	1,558	643	14,388	7,015	4,712	115,055
2005	33,816	5,274	11,628	0	12,497	1,249	6,906	61,011	165	1,118	510	10,628	8,339	2,500	116,726
2010	27,913	5,529	10,054	5,310	13,291	1,298	5,638	64,426	81	528	17	8,515	7,537	1,943	116,706
2011	27,075	5,480	10,692	7,111	11,995	1,253	5,480	63,745	0	573	3	9,089	7,964	2,563	117,524
2012	26,981	5,345	9,813	4,807	11,101	824	5,345	59,326	0	570	0	8,739	7,622	2,212	107,800
2013	26,618	4,194	9,290	6,009	12,457	865	4,194	58,106	0	603	0	7,492	7,501	1,981	105,939
2014	28,564	4,302	10,410	5,919	12,546	964	4,302	67,096	0	697	0	11,284	8,651	4,668	121,478
2015	16,147	3,903	7,130	6,886	8,551	740	3,903	48,688	74	499	0	9,613	7,792	3,603	93,609
2016	15,187	5,991	9,632	1,897	5,542	769	3,937	53,509	0	226	0	11,655	9,405	5,649	98,642
2017	18,402	5,838	10,810	2,308	3,519	855	3,358	60,469	0	136	0	11,811	9,238	5,747	105,164
2018	16,918	5,722	11,692	2,147	3,933	953	2,875	62,318	0	142	0	11,654	8,760	6,569	107,424
2019	19,894	6,555	12,159	2,179	4,022	959	3,019	63,977	0	130	0	10,352	9,189	5,150	109,642
2020	19,039	6,367	11,586	2,268	4,184	1,083	2,513	71,256	0	121	0	10,396	10,400	4,816	117,761
Variation 2020 / 2019	-855	-188	-573	89	162	124	-506	7,279	0	-9	0	44	1,211	-334	8,119
	-4.3%	-2.9%	-4.7%	4.1%	4.0%	12.9%	-16.8%	11.4%		-6.9%		0.4%	13.2%	-6.5%	7.4%
Variation 2020 / 2011	-8,036	887	894	-4,843	-7,811	-170	-2,967	7,511	0	-452	-3	1,307	2,436	2,253	237
	-29.7%	16.2%	8.4%	-68.1%	-65.1%	-13.6%	-54.1%	11.8%		-78.9%	-100.0%	14.4%	30.6%	87.9%	0.2%

Table 34: Change in exposure of cats & dogs by antimicrobial class

	AMINOGLYCOSIDES	OTHER CLASSES	CEPHALOSPORINS 1&2G	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	0.178	0.041	0.042	0.000	0.041	0.011	0.037	0.361	0.001	0.009	0.001	0.082	0.042	0.030	0.650
2000	0.171	0.046	0.044	0.000	0.057	0.007	0.041	0.353	0.001	0.009	0.004	0.082	0.040	0.027	0.659
2001	0.170	0.046	0.051	0.000	0.069	0.007	0.042	0.352	0.001	0.008	0.003	0.073	0.039	0.024	0.663
2002	0.174	0.045	0.056	0.000	0.078	0.008	0.047	0.318	0.001	0.008	0.005	0.073	0.042	0.020	0.658
2003	0.182	0.018	0.063	0.000	0.078	0.008	0.041	0.299	0.001	0.008	0.004	0.068	0.041	0.017	0.627
2004	0.203	0.045	0.065	0.000	0.080	0.008	0.044	0.330	0.001	0.007	0.003	0.073	0.043	0.018	0.666
2005	0.206	0.032	0.071	0.000	0.076	0.008	0.042	0.371	0.001	0.007	0.003	0.065	0.051	0.015	0.710
2006	0.201	0.056	0.071	0.004	0.077	0.007	0.055	0.403	0.001	0.008	0.000	0.066	0.046	0.015	0.750
2007	0.195	0.040	0.071	0.023	0.081	0.007	0.039	0.431	0.001	0.005	0.002	0.068	0.052	0.014	0.785
2008	0.186	0.039	0.070	0.028	0.082	0.006	0.038	0.409	0.001	0.006	0.000	0.069	0.048	0.014	0.760
2009	0.172	0.036	0.068	0.031	0.084	0.006	0.036	0.407	0.001	0.005	0.001	0.060	0.048	0.012	0.749
2010	0.177	0.035	0.064	0.034	0.084	0.008	0.036	0.409	0.001	0.003	0.000	0.054	0.048	0.012	0.740
2011	0.172	0.035	0.068	0.045	0.076	0.008	0.035	0.405	0.000	0.004	0.000	0.058	0.051	0.016	0.747
2012	0.172	0.034	0.063	0.031	0.071	0.005	0.034	0.378	0.000	0.004	0.000	0.056	0.049	0.014	0.687
2013	0.168	0.026	0.059	0.038	0.079	0.005	0.026	0.367	0.000	0.004	0.000	0.047	0.047	0.013	0.669
2014	0.179	0.027	0.065	0.037	0.079	0.006	0.027	0.420	0.000	0.004	0.000	0.071	0.054	0.029	0.761
2015	0.100	0.024	0.044	0.043	0.053	0.005	0.024	0.301	0.000	0.003	0.000	0.059	0.048	0.022	0.578
2016	0.093	0.037	0.059	0.012	0.034	0.005	0.024	0.326	0.000	0.001	0.000	0.071	0.057	0.034	0.601
2017	0.110	0.035	0.064	0.014	0.021	0.005	0.020	0.361	0.000	0.001	0.000	0.070	0.055	0.034	0.627
2018	0.099	0.033	0.068	0.013	0.023	0.006	0.017	0.364	0.000	0.001	0.000	0.068	0.051	0.038	0.627
2019	0.114	0.037	0.070	0.012	0.023	0.005	0.017	0.366	0.000	0.001	0.000	0.059	0.053	0.029	0.627
2020	0.107	0.036	0.065	0.013	0.023	0.006	0.014	0.399	0.000	0.001	0.000	0.058	0.058	0.027	0.659
Variation 2020 / 2019	-0.007 -6.3%	-0.002 -4.9%	-0.005 -6.7%	0.000 1.9%	0.000 1.8%	0.001 10.5%	-0.003 -18.5%	0.033 9.0%	0.000	-0.000 -8.9%	0.000	-0.001 -1.7%	0.006 10.8%	-0.002 -8.5%	0.032 5.1%
Variation 2020 / 2011	-0.066 -38.1%	0.001 2.3%	-0.003 -4.6%	-0.033 -71.9%	-0.053 -69.3%	-0.002 -23.9%	-0.021 -59.6%	-0.006 -1.6%	0.000	-0.003 -81.4%	-0.000 -100%	0.000 0.7%	0.008 15.0%	0.011 65.4%	-0.088 -11.8%

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