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Sales of Veterinary Medicinal Products Containing Antimicrobials in France in 2022

Annual report

November 2023

INVESTIGATE, EVALUATE, PROTECT

Sales of Veterinary Medicinal Products Containing Antimicrobials in France in 2022

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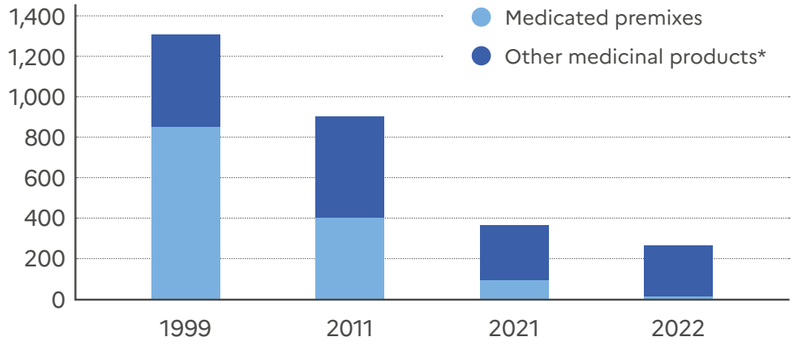
SALES OF VETERINARY MEDICINAL PRODUCTS CONTAINING ANTIMICROBIALS IN FRANCE IN 2022

ENTRY INTO FORCE OF EUROPEAN REGULATIONS WITH NEW RESTRICTIONS ON USE

Sharp fall in the tonnage of antibiotics sold



* Other medicinal products: injections, other oral forms, intramammary and intrauterine.

TOTAL TONNAGE OF ANTIBIOTICS

-26%

IN ONE YEAR

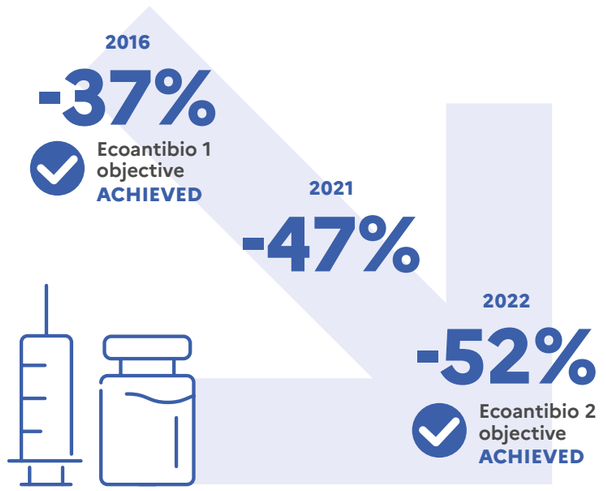
TONNAGE FOR PREMIXES

-82%

IN ONE YEAR

EXPOSURE TO ANTIBIOTIC TREATMENTS ON THE DECLINE

REFERENCE YEAR 2011



CHANGE IN EXPOSURE TO ANTIBIOTICS

REFERENCE YEAR 2011

Less pronounced reductions for pets than for livestock animals

Sharp falls in exposure to the most critical antibiotics

FLUOROQUINOLONES

↘ -88%

THIRD- AND FOURTH-GENERATION CEPHALOSPORINS

↘ -95%

COLISTIN

↘ -79%

MONITORING OF USES NOW EXTENDED TO ALL ANTIMICROBIALS

What is an antimicrobial?

Any substance with a direct action on micro-organisms used for treatment or prevention of infections or infectious diseases.

ANTIMICROBIALS

ANTIBIOTICS
+
ANTIFUNGALS
+
ANTIPROTOZOALS
+
ANTIVIRALS

How can antimicrobial use be monitored?

Sales survey of veterinary medicinal products

- Annual monitoring of antibiotic sales since 1999.
- First data on sales of antifungals and antiprotozoals in 2022.

Monitoring of antimicrobial use data by animal species

- Launch of data collection via the Calypso* system in 2023.

* An online application used to manage data and features useful to veterinarians in fulfilling certain tasks and regulatory obligations associated with their professional duties.
Reporters = veterinarians + dispensing chemists + medicated feedingstuff manufacturers and distributors

November 2023

Report summary

The year 2022 saw the entry into force of the new European veterinary pharmacy regulations and a sharp fall in the tonnage of antibiotics sold. Animal exposure to antibiotics continues its remarkable decline. There has been a gradual reduction in the use of oral treatments, combined with good results for the most critical antibiotics. The results observed in 2022 undoubtedly reflect the initial effects of the new European regulations. However, reductions in exposure remain uneven across species, and were less marked in the case of pets. From 2023, monitoring of sales will be supplemented by monitoring of antimicrobial use by animal species.

The year 2022 saw the entry into force of the European regulations and a sharp fall in the tonnage of antibiotics sold

European Regulations 2019/6 and 2019/4, respectively on veterinary medicinal products and medicated feed, came into force in 2022. One of their key goals is to combat antimicrobial resistance. New measures have thus been introduced at European level to better regulate and reduce the use of certain antimicrobials. Indeed, Regulation (EU) 2019/4 now imposes a ban on the preventive use of antimicrobials via medicated feed, and restrictions on the prescription of antimicrobials in medicated feed.

In 2022, the total sales volume for antibiotics amounted to 276 tonnes, a fall of 95 tonnes compared with the previous year. This tonnage has fallen by 79% since monitoring of sales began in 1999, and by 26% in one year. This sharp fall over 2022 is mainly due to a decrease in the tonnage for medicated premixes (-81 tonnes, or -82% in one year), and to a lesser extent in the tonnage for oral powders and solutions (-12 tonnes, or -7% in one year).

The results observed in 2022 undoubtedly reflect the initial effects of the new European regulations.

Animal exposure to antibiotics continues its remarkable decline

Sales data can be used to estimate the level of exposure of animals to antibiotics. According to the Animal Level of Exposure to Antimicrobials (ALEA) indicator calculated for oral and parenteral treatments, animal exposure in France has fallen by 9% compared with 2021. The reduction in exposure via premixes in 2022 accounted for 82% of this overall reduction in one year. Since 2011, the reference year for the first EcoAntibio plan, animal exposure to antibiotics has fallen by 52%.

There has been a gradual reduction in the use of oral treatments, combined with good results for the most critical antibiotics.

There has been a 18% reduction in oral exposure in one year, mainly due to an 85% fall for medicated premixes. Overall, there was no shift from the use of premixes to another pharmaceutical form in 2022. Considerable reductions were recorded for tetracyclines, polymyxins, sulfonamides and trimethoprim compared with 2021.

There has been a 68% reduction in oral exposure compared with 2011. For the first time since monitoring began, animal exposure to antibiotics via injections was higher than that via the oral route.

Large falls in exposure have been observed since 2011 for the most critical antibiotics: -95% for newer-generation cephalosporins, -88% for fluoroquinolones and -79% for colistin.

However, reductions in exposure remain uneven across species and are less marked in the case of pets

Exposure to antibiotics has declined for all food-producing species since 2011: -23% for cattle, -67% for pigs, -72% for poultry and -64% for rabbits. The level of exposure of cats and dogs in 2022 was however similar to that estimated in 2011 (-3%). The number of intramammary treatments per dairy cow has fallen by 32% since 2011 (-13% for treatments administered at dry-off and -45% for treatments administered during lactation).

Over the last year, the change in exposure has varied according to the species: +1% for cattle, -21% for pigs, -12% for poultry, -35% for rabbits and -3% for cats and dogs. After increases in recent years, exposure levels for cats, dogs and horses appear to be stabilising. The trend in exposure of cats, dogs and horses calls for vigilance and should continue to be monitored.

From 2023, monitoring of sales will be supplemented by monitoring of data on antimicrobial use

In 2022, the collection of data on sales of veterinary medicinal products was extended to all antimicrobials. Initial estimates have therefore been made of the levels of animal exposure to antifungals and antiprotozoals.

The European regulations require Member States to collect data on antimicrobial use by animal species. These more precise data should improve targeting of the actions to be taken to combat antimicrobial resistance. In France, the reporting by veterinary medicinal product retailers of data on antimicrobial use was launched in April 2023 via the Calypso online application[1].

[1] https://www.veterinaire.fr/la-profession-veterinaire/calypso-la-plateforme-au-service-du-quotidien-des-veterinaires

CONTENTS

1 Sales monitoring and background information

1.1 About sales monitoring

Antimicrobial resistance is a major public health issue concerning both human and veterinary medicine. Monitoring of sales of antibiotics 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 antibiotics in France since 1999. This monitoring is based on annual reporting by marketing authorisation (MA) holders, in accordance with the provisions of Article L. 5141-14-1 of the French Public Health Code. In addition to the volumes of sales of medicinal products, the pharmaceutical companies also provide an estimated breakdown of sales by target animal species.

This monitoring is carried out according to the standards defined in Chapter 6.9 of the Terrestrial Animal Health Code[2] of the World Organisation for Animal Health (WOAH). Data on sales of antibiotics in France are sent to WOAH, which publishes an annual report on antimicrobials used in animals worldwide[3]. These data are also made available via a global interactive database called ANIMUSE[4].

In addition, France participates in the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) scheme, which was launched in 2009 by the European Medicines Agency (EMA) at the request of the European Commission[5]. This project aims to collect harmonised data on antimicrobial sales for all countries in the European Union.

This year for the first time, the collection of sales data in France was extended to all veterinary medicinal products containing antimicrobials. Antimicrobials are defined in the European Regulation as any substance with a direct action on micro-organisms used for treatment or prevention of infections or infectious diseases, including antibiotics, antivirals, antifungals and antiprotozoals. In addition to antibiotics, therefore, data collection has been extended to include antifungals and antiprotozoals (see Section 5 of this report), in order to prepare for reporting to the EMA of data on sales volumes of veterinary antimicrobials, as provided for in Article 57 of European Regulation (EU) 2019/6.

1.2 Targets for reducing antibiotic use

1.2.1 Targets achieved since the launch of the first EcoAntibio plan

In the field of animal health, France has committed to preserving the effectiveness of antibiotics through the implementation of two successive action plans[6]. In late 2011, the French Ministry

[2] https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/
[3] https://www.woah.org/en/document/annual-report-on-antimicrobial-agents-intended-for-use-in-animals/
[4] https://amu.woah.org/amu-system-portal/home
[5] https://www.ema.europa.eu/en/veterinary-regulatory/overview/antimicrobial-resistance/european-surveillance-veterinary-antimicrobial-consumption-esvac
[6] https://agriculture.gouv.fr/antibioresistance-tout-savoir-sur-le-plan-ecoantibio

of Agriculture launched the first national plan to reduce the risks of antimicrobial resistance in veterinary medicine. Covering the period 2012 to 2016, this plan set an initial overall target of reducing animal exposure to antibiotics by 25% over five years (Table 1). Following the success of the EcoAntibio 1 plan, a second plan was published in April 2017 with a view to maintaining this momentum by consolidating the gains made and continuing the actions previously undertaken.

The Act on the future of agriculture, food and forestry (LAAAF[7]) of 13 October 2014 set a goal of reducing the use of certain antibiotics of critical importance in human and veterinary medicine. 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 antibiotics among the parties involved in the distribution and/or prescription of veterinary medicinal products during 2014, which resulted in a sharper fall in sales in 2015.

The discovery of the first plasmid-mediated mechanism of resistance to colistin led to the establishment of reinforced surveillance in Europe for this antibiotic. In France, the EcoAntibio 2 plan has set a specific target for colistin.

Table 1: Targets for reducing antibiotic use in veterinary medicine in France

Source	Target	Reference year	Result
EcoAntibio 1	25% reduction in animal exposure to antibiotics in five years	2011	-37% in 2016
LAAAF	25% reduction in three years in the use of antibiotics belonging to the classes of fluoroquinolones (FQ) and third- and fourth-generation cephalosporins (C34G)	2013	-81% FQ -75% C34G in 2016
EcoAntibio 2	Reduce animal exposure to antibiotics over the long term	2016	-24% in 2022
EcoAntibio 2	50% reduction in exposure to colistin in the cattle, pig and poultry sectors in five years	Average for 2014 and 2015	-67% in 2020

Table adapted from the article by Urban *et al*. 2022[8]

The EcoAntibio action plans and the initiatives taken by the production sectors have created momentum enabling the national targets for reducing animal exposure to antibiotics to be achieved.

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

8 URBAN, D., CHEVANCE, A., BOUCHARD, D., CHAUVIN, C., ORAND, J.-P., & MOULIN, G. (2022). Reduction in antibiotic use in the animal sectors: What measures, what results, what prospects? *INRAE Productions Animales*, *35*(4), 257–274 https://productions-animales.org/article/view/7189

1.2.2 Entry into force of the European regulations in 2022

The European veterinary pharmacy regulations that came into force in January 2022 included a series of measures designed to better regulate and reduce the use of certain antimicrobials[9]. The fight against antimicrobial resistance is indeed one of the key goals of the European regulations on veterinary medicinal products (Regulation (EU) 2019/6) and on medicated feed (Regulation (EU) 2019/4).

Table 2: Articles in the European regulations governing the use of antimicrobials

Regulation (EU)	Category	Article numbers	Content of the article
2019/6 Medicinal products	Restrictions on use	37(3 to 5); 107(5); 118; 152(1)	List of antimicrobials reserved for humans
		107(6)	List of antimicrobials whose use outside the terms of the marketing authorisation (off-label use) is prohibited or subject to conditions
		107(3 to 4)	Prophylactic use limited to antibiotics for individual treatment – Limited metaphylactic use
	Prescription	34(1c); 105(1 to 4); 105(10)	Veterinary prescription after clinical examination – valid for 5 days – quantity of medicine prescribed limited to the amount required for treatment
	Surveillance	57(1 to 3); 58(3)	Collection of data on sales and use
2019/4 Medicated feed	Quality	7(3)	Specific maximum levels of cross-contamination
	Prescription	16(5); 16(8)	Prescription after veterinary diagnosis, valid for 5 days
		16(9)	Prescription limited to a single medicated premix
	Restrictions on use	16(7)	The duration of treatment shall comply with the summary of product characteristics of the veterinary medicinal product incorporated in the feed and shall not exceed two weeks for antibiotic medicinal products
		17(3)	Not for prophylactic use

Table adapted from the article by Urban *et al*. 2022[10]

In the context of this new regulation, the risk of emergence of antimicrobial resistance phenomena has become grounds for refusing marketing authorisation for a medicinal product if the risk of development of antimicrobial resistance outweighs the benefits for animal health.

[9] https://www.anses.fr/fr/content/les-nouvelles-mesures-europ%C3%A9ennes-en-faveur-de-la-lutte-contre-l%E2%80%99antibior%C3%A9sistance

[10] URBAN, D., CHEVANCE, A., BOUCHARD, D., CHAUVIN, C., ORAND, J.-P., & MOULIN, G. (2022). Reduction in antibiotic use in the animal sectors: What measures, what results, what prospects? *INRAE Animal Productions*, *35*(4), 257-274 https://productions-animales.org/article/view/7189

The use of antimicrobials in animals is now more closely regulated (Table 2). Collection of data on antimicrobial medicines used in animals has been set up at European level.

On 19 July 2022, the European Commission adopted an implementing act defining a list of antimicrobials or groups of antimicrobials to be reserved for treating infections in humans only[11]. As a result, from January 2023 (six months after publication), the use of these antimicrobials in animals is no longer authorised in the European Union. The list is based on the EMA's recommendations[12] on implementing measures under Article 37(5) of Regulation (EU) 2019/6.

In addition, Regulation (EU) 2019/6 is one of the first European regulations to include "mirror" measures to prohibit the use, in animals or in products of animal origin exported to the EU from third countries, of antimicrobial medicinal products for the purpose of promoting growth and increasing yield, and of antimicrobials reserved for human use.

In June 2023, the EMA also published a scientific opinion on Article 107(6) on use of antimicrobials outside the terms of the marketing authorisation[13].

All the European regulatory provisions will support the new objective of reducing antibiotic sales in the European Union.

1.2.3 A new European objective

In order to build "a healthy planet for all", the European Green Deal[14] calls for the EU to better monitor, report, prevent and remedy air, water, soil and consumer product pollution, among other things. In the framework of this Green Deal, the European Commission published a communication on the EU Action Plan on 12 May 2021[15]. This sets out the targets for agriculture and food, with the Farm to Fork and Biodiversity Strategies. Reducing the use of pesticides, fertilisers and antimicrobials are among the "zero pollution" targets for 2030. Annex 2 of this EU Action Plan sets out the origin, reference values, methodologies and context of these targets.

Regarding antibiotics for farm animals and in aquaculture, the target is a 50% reduction in overall EU sales by 2030, using 2018 as the reference year.

[11] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/11653-Drug-resistance-list-of-antimicrobial-medicines-reserved-for-treating-humans_en
[12] https://www.ema.europa.eu/en/documents/regulatory-procedural-guideline/advice-designation-antimicrobials-groups-antimicrobials-reserved-treatment-certain-infections-humans/6-veterinary-medicinal-products_en.pdf
[13] https://www.ema.europa.eu/en/documents/regulatory-procedural-guideline/scientific-advice-under-art1076-regeu2019/6-establishment-list-antimicrobials-which-shall-not-be-used-accordance-art-112-113-114-which-shall_en.pdf
[14] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2019%3A640%3AFIN
[15] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0400&qid=1623311742827#footnote20

2 Tonnage of antibiotics and level of animal exposure in France

2.1 Tonnages of antibiotics sold

2.1.1 Tonnage in 2022

In 2022, the total volume of sales amounted to 276 tonnes of antibiotics. Five antibiotic classes (tetracyclines, penicillins, sulfonamides, aminoglycosides and macrolides) accounted for 87% of the tonnage (Table 3). Antibiotics of critical importance (newer-generation cephalosporins and fluoroquinolones) accounted for 0.3% of the tonnage.

Table 3: Breakdown of the tonnage in 2022 presented by antibiotic class and pharmaceutical form

	MEDICATED PREMIXES	ORAL FORMS EXCLUDING PREMIXES	INJECTIONS	INTRAMAMMARY & INTRAUTERINE	TOPICAL MEDICINES	TOTAL	SHARE OF THE CLASS (%)
AMINOGLYCOSIDES	0.58	12.62	25.07	1.27	0.20	39.73	14.40%
OTHER ANTIBIOTICS		1.60		0.04	0.02	1.66	0.60%
CEPHALOSPORINS 1&2G		3.65	0.04	1.14		4.83	1.75%
CEPHALOSPORINS 3&4G			0.10	0.00		0.10	0.04%
FLUOROQUINOLONES		0.43	0.27		0.00	0.70	0.25%
LINCOSAMIDES		2.43	0.62	0.01		3.06	1.11%
MACROLIDES	0.44	14.43	5.72			20.59	7.46%
PENICILLINS	0.35	29.10	25.82	1.93		57.20	20.73%
PHENICOLS		0.22	5.18		0.12	5.51	2.00%
PLEUROMUTILINS	0.28	1.85	0.01			2.14	0.78%
POLYMYXINS	0.10	7.72	0.37	0.11	0.00	8.31	3.01%
QUINOLONES		1.41				1.41	0.51%
SULFONAMIDES	5.58	33.03	5.72		0.41	44.74	16.21%
TETRACYCLINES	9.04	57.35	8.08	1.23	2.43	78.13	28.32%
TRIMETHOPRIM	0.81	5.87	1.11			7.79	2.82%
TOTAL	17.18	171.70	78.11	5.72	3.19	275.89	100.00%
SHARE OF THE FORM (%)	6.23%	62.23%	28.31%	2.07%	1.16%	100.00%	

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

2.1.2 Change in tonnage of antibiotics

Since monitoring began in 1999, there has been a 1038 tonne decrease in the tonnage of antibiotics, i.e. a 79% fall. The tonnages shown in Figure 1 do not include topical medicines.

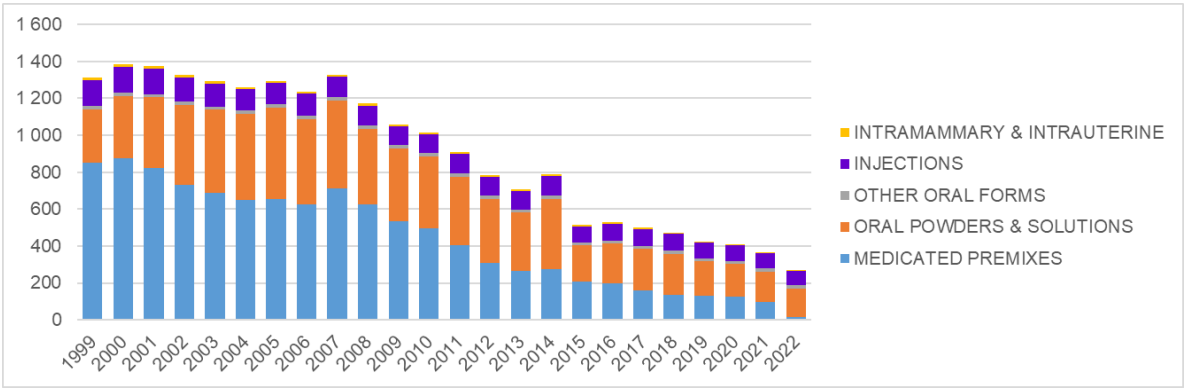


Figure 1: Change in tonnage by pharmaceutical form since 1999

The tonnage of antibiotics in 2022 was 70.0% lower than that in 2011, the reference year for the first EcoAntibio plan. Although tonnages have declined for all pharmaceutical forms, this change is overwhelmingly attributable to a fall in sales of orally administered antibiotics (-95.8% for medicated premixes and -58.5% for oral powders and solutions).

Tonnage has fallen by 25.9% compared with 2021, which is a much steeper decline than in the last five years. This change in one year is mainly due to a decrease in the tonnage for medicated premixes (-82.5%). This phenomenon should be seen in light of the entry into force of Regulation (EU) 2019/4: since 28 January 2022, the prophylactic use of medicated feed containing an antimicrobial has been prohibited, and metaphylactic uses have been more tightly regulated.

The tonnage of oral powders and solutions has also continued to fall (-7.2% in 1 year). There was no observed shift from one form to another in 2022.

Compared with 2021, a reduction of 66 tonnes has been recorded for sulphonamides and tetracyclines, representing falls of 39.4% and 33.0% respectively in one year. Detailed data by pharmaceutical form and class are shown in Annex 5.

2.1.3 Green Deal target – trends for France

A 50% reduction in overall sales of antibiotics for farm animals and aquaculture in the EU by 2030 is the new "collective" target set at European level.

It is nevertheless interesting to look at the trend in antibiotic sales in France in relation to this sales reduction target. The indicator shown in Figure 2 corresponds to the ratio between the quantity of antibiotics sold and the animal biomass (in mg/PCU); this indicator is calculated annually in the ESVAC report[16].

[16] https://www.ema.europa.eu/en/veterinary-regulatory/overview/antimicrobial-resistance/european-surveillance-veterinary-antimicrobial-consumption-esvac#annual-report-on-sales-of-veterinary-antimicrobial-medicinal-products-section

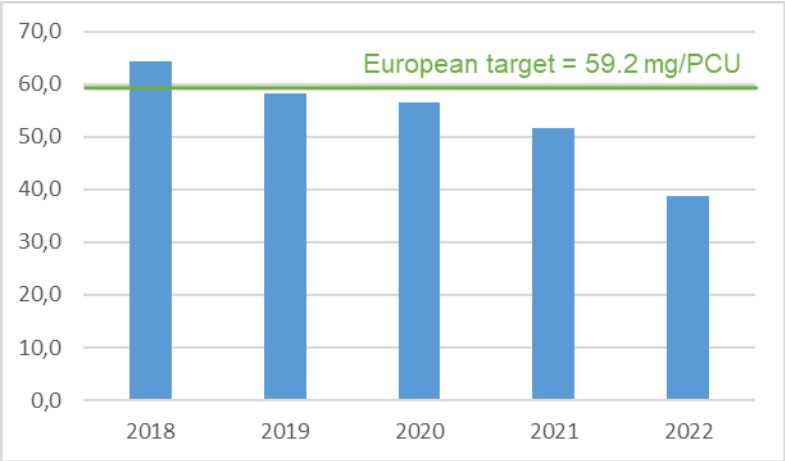


Figure 2: Change in antibiotic sales in France for treatments intended for farm animals and in aquaculture (in mg/PCU)

According to the European authorities, the aim of the Green Deal is to reduce sales below the threshold of 59.2 mg/PCU by 2030. Thanks to successive reductions in the tonnage of antibiotics sold, France reached this threshold by 2019. The sharp fall in this indicator over the last year is mainly explained by the large decrease in the use of medicated premixes.

2.2 Indicators of exposure to antibiotics

The ALEA exposure indicator

The tonnage of antibiotics sold can be used to monitor changes in sales over time. However, this indicator does not accurately reflect the use of antibiotics to treat animals, because the tonnage does not take account of the animal biomass in France, which changes every year, or the therapeutic activity of antibiotics (because the most recent antibiotics are generally more potent and require the administration of a smaller dose of active substance). A fall in tonnage could therefore hypothetically be due to a shift in use towards more recent compounds, which may be of critical importance for human and veterinary medicine.

To monitor changes in antibiotic prescription over time, an exposure indicator known as the ALEA has been developed. To obtain the ALEA, the body weight treated is estimated by taking into account the dosage and duration of administration of each medicine; it is then divided by the animal biomass potentially using antibiotics over the year. This exposure indicator is particularly useful for measuring the impact of actions taken at national level.

2.2.1 Body weight treated in 2022

Medicated premixes generally contain older medicinal compounds and are administered over a long period. Although they accounted for nearly 6% of the tonnage, they represented 1% of body weight treated (Table 4).

In 2022, oral treatments represented 48% of the body weight treated, compared with 52% for parenteral treatments.

Fluoroquinolones and newer-generation cephalosporins were used to treat around 1% of the body weight treated.

Table 4: Body weight treated in 2022 by class of antibiotics and pharmaceutical form (in tonnes)

	MEDICATED PREMIXES	ORAL POWDERS & SOLUTIONS	OTHER ORAL FORMS*	INJECTIONS	TOTAL	SHARE OF THE CLASS (%)
AMINOGLYCOSIDES	2 090	83 403	4 058	612 722	702 273	13.54%
OTHER ANTIBIOTICS	0	0	5 954	0	5 954	0.11%
CEPHALOSPORINS 1&2G	0	18	11 513	498	12 029	0.23%
CEPHALOSPORINS 3&4G	0	0	0	15 923	15 923	0.31%
FLUOROQUINOLONES	0	7 309	1 173	30 670	39 152	0.75%
LINCOSAMIDES	0	30 329	1323	22 519	54 171	1.04%
MACROLIDES	2 905	104 115	2 127	486 507	595 654	11.49%
PENICILLINS	3 459	314 186	64 864	901 135	1 283 644	24.75%
PHENICOLS	0	4 302	0	136 235	140 537	2.71%
PLEUROMUTILINS	3 621	14 290	0	312	18 223	0.35%
POLYMYXINS	2 822	357 825	3 811	51 685	416 143	8.02%
QUINOLONES	0	19 800	52	0	19 852	0.38%
SULFONAMIDES	19 451	199 072	9 729	142 514	370 766	7.15%
TETRACYCLINES	26 401	712 869	10 001	421 518	1 170 789	22.58%
TRIMETHOPRIM	14 976	179 118	5 596	141 203	340 893	6.57%
TOTAL (in tonnes)	56 274	1 815 440	108 523	2 170 452	4 150 689	100.00%
SHARE OF THE FORM (%)	1.36%	43.74%	2.61%	52.29%	100.00%	

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

2.2.2 Change in exposure by pharmaceutical form

The level of animal exposure to antibiotics has decreased by 48.0% since 1999 (Figure 3). Overall exposure in 2022 has fallen by 51.6% compared with 2011. All routes of administration and animal species combined, animal exposure in France has fallen by 8.6% compared with 2021.

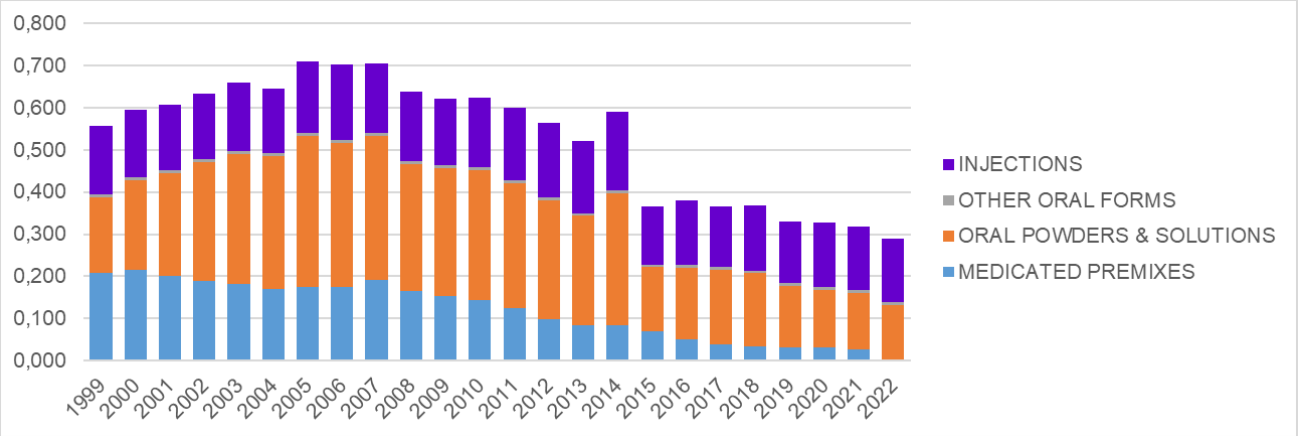


Figure 3: Change in ALEA by pharmaceutical form since 1999

Exposure to antibiotics via medicated premixes has decreased by 96.8% since 2011, and by 85.0% compared with 2021. The reduction in exposure via premixes in 2022 accounted for 82% of the overall reduction in animal exposure in this year. In general, there was no observed shift from premixes to another form in 2022.

Exposure via oral powders and solutions decreased by 5.2% between 2021 and 2022, and has fallen by 57.4% 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 17.5% reduction in oral exposure in one year, and a 67.7% fall compared with 2011.

Parenteral exposure has fallen by 12.3% since 2011 and has been relatively stable over the last few years (+1.4% in one year). Exposure via injections now accounts for more than half of all animal exposure to antibiotics in France (52% in 2022 versus 28% in 2011).

2.2.3 Change in exposure by class

After a sharp fall in animal exposure during the first EcoAntibio plan (-36.6% between 2011 and 2016), the level of exposure has continued to decline (-23.7% compared with 2016).

Figure 4 shows the decrease in animal exposure by class: this decrease observed since 2011 is mainly due to a fall in exposure to polymyxins (-79.1%), tetracyclines (-52.8%), sulfonamides (-51.1%), macrolides (-34.7%), third- and fourth-generation cephalosporins (-94.7%) and fluoroquinolones (-87.6%).

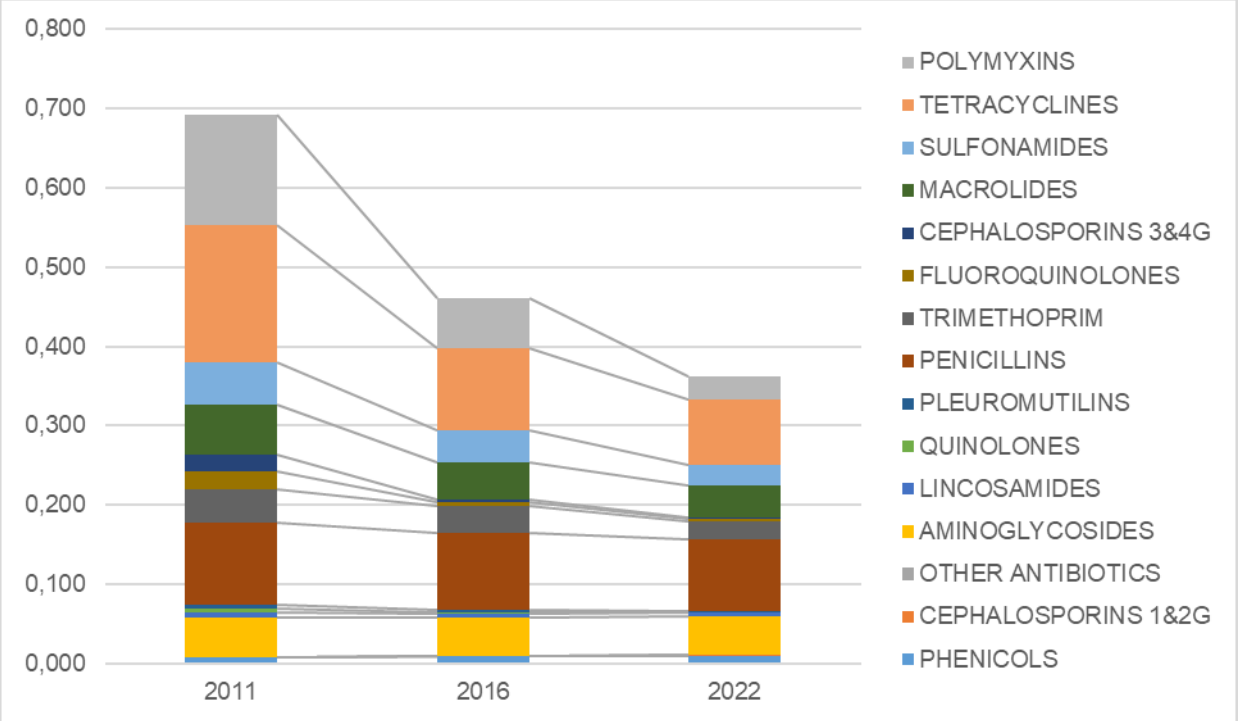


Figure 4: Change in ALEA indicators by antibiotic class between 2011, 2016 and 2022

Compared with 2021, considerable reductions have been recorded for tetracyclines, polymyxins, sulfonamides and trimethoprim (Figure 5).

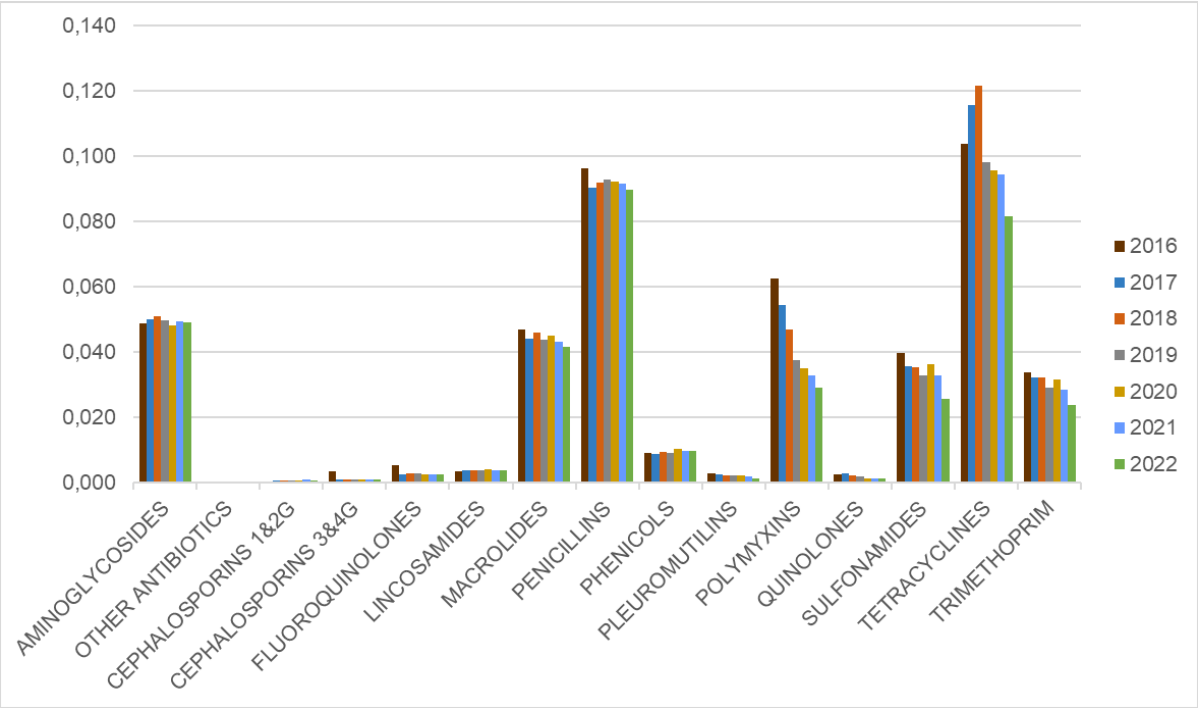


Figure 5: Change in animal exposure in France by antibiotic class since 2016 (ALEA)

3 Indicators of sales and exposure to antibiotics by species

This section summarises the exposure trends for the main animal species (detailed data per species are provided in Annex 5).

Changes in data on sales attributed to horses, sheep/goats and fish are not detailed in this section, mainly due to methodological uncertainties (see Section 7.1). Nevertheless, while there has been a 1.2% fall in exposure of horses over the last year, the estimated increase between 2020 and 2021 (+17.7%) calls for continued vigilance.

3.1 Indicators by species in 2022

3.1.1 Tonnage of antibiotics and level of exposure

By dividing the tonnage sold by the animal biomass potentially using antibiotics, it is estimated that the equivalent of 19 mg of antibiotics per kilogram of body weight was sold in 2022, with differences depending on the species (Table 5).

Table 5: Tonnages by species in 2022 and quantities of antibiotics per kilogram of body weight

	Cattle	Pigs	Poultry	Rabbits	Cats & Dogs	Sheep & Goats	Horses	Fish	Other	Total
Tonnage sold	111.16	60.32	45.90	11.49	20.68	13.29	10.70	1.71	0.64	275.89
% of total tonnage	40.29%	21.86%	16.64%	4.16%	7.50%	4.82%	3.88%	0.62%	0.23%	100.00%
Sales in mg/kg	13.37	22.09	24.45	180.54	119.13	22.60	21.46	37.81	18.48	19.26

According to the ALEA estimates for 2022 (Table 6), rabbits, cats and dogs were the species most exposed to antibiotics via the oral and parenteral routes.

Table 6: Body weight treated and ALEA exposure indicator by species in 2022

	Cattle	Pigs	Poultry	Rabbits	Cats & Dogs	Sheep & Goats	Horses	Fish	Other	Total
Body weight treated (tonnes)	2 113 169	991 721	531 510	72 794	126 283	173 814	126 051	9 445	5 902	4 150 689
Share of body weight treated	50.91%	23.89%	12.81%	1.75%	3.04%	4.19%	3.04%	0.23%	0.14%	100.00%
Biomass (tonnes)	8 314 115	2 730 633	1 877 374	63 635	173 600	588 037	498 492	45 164	34 878	14 325 928
Share of the biomass	58.04%	19.06%	13.10%	0.44%	1.21%	4.10%	3.48%	0.32%	0.24%	100.00%
ALEA	0.254	0.363	0.283	1.144	0.727	0.296	0.253	0.209	0.169	0.290

3.1.2 Antibiotic exposure profile according to the European categorisation

The EMA's Antimicrobial Advice Ad Hoc Expert Group (AMEG) has categorised antibiotics based on the public health consequences of antimicrobial resistance linked to their use in animals. This European categorisation, published in 2019, is intended as a tool to support decision-making by veterinarians on which antibiotic to use[17]. However, this categorisation does not replace treatment recommendations, which take other factors into account.

Category B "Restrict" antibiotics are critically important in human medicine; their use in animals should be restricted to mitigate the risk to public health. This category refers to all third- and fourth-generation cephalosporins, fluoroquinolones and other quinolones, as well as polymyxins (including colistin).

Category C "Caution" antibiotics include aminoglycosides (with the exception of spectinomycin), aminopenicillins in combination with a beta-lactamase inhibitor, first- and second-generation cephalosporins, phenicols, lincosamides, pleuromutilins, macrolides and rifaximin. There are generally alternatives to these antibiotics in human medicine. On the other hand, for certain veterinary therapeutic indications, there are no usable antibiotic alternatives in category D, making the use of these category C antibiotics necessary.

Category D "Caution" antibiotics should be used as first-line treatments whenever possible. These antibiotics should nevertheless be used in a prudent manner, and only when therapeutically necessary.

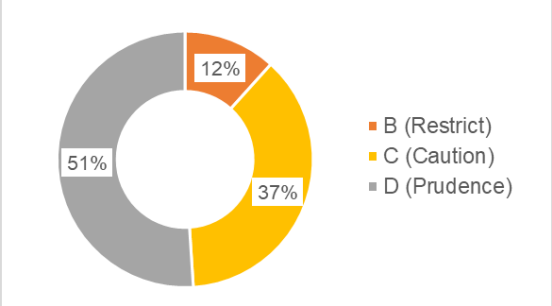


Figure 6: Profile of animal exposure to antibiotics in France in 2022 according to the Antimicrobial Advice Ad Hoc Expert Group (AMEG) categories

In 2022 in France, more than half of the antibiotics administered to animals orally and parenterally fell into category D (Figure 6). The animal exposure profiles nevertheless varied from one species to another (Table 7).

These profiles should be interpreted with caution, as they depend largely on the availability of medicinal products on the market, and do not take account of exposure levels, which vary depending on the animal species.

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

Table 7: Profile of exposure by species to antibiotics in France in 2022 according to the Antimicrobial Advice Ad Hoc Expert Group (AMEG) categories

	Cattle	Pigs	Poultry	Rabbits	Cats & Dogs	Sheep & Goats	Horses	Total
B (Restrict)	6%	15%	33%	15%	5%	4%	1%	12%
C (Caution)	50%	30%	6%	22%	74%	26%	2%	37%
D (Prudence)	44%	55%	61%	63%	21%	70%	97%	51%

In order to protect the confidentiality of data on medicinal product sales, the exposure profile for fish is not shown in Table 7.

3.2 Cattle

Cattle are treated with medicines containing antibiotics administered by the oral, parenteral, intramammary, intrauterine and dermal routes. In 2022, the quantity of antibiotics corresponding to topical medicines accounted for 0.5% of the total tonnage of antibiotics sold for cattle.

Oral and parenteral treatments

The ALEA exposure indicator for cattle has fallen by 22.6% since 2011, with a decrease of 18.2% for parenteral treatments and 34.3% for oral treatments (Figure 7). The level of exposure in 2022 was similar to that estimated in 2021 (+0.5%): +1.2% for injections and -1.7% for oral treatments. Exposure via medicated premixes and other oral forms accounted for less than 0.5% of the exposure of cattle in 2022.

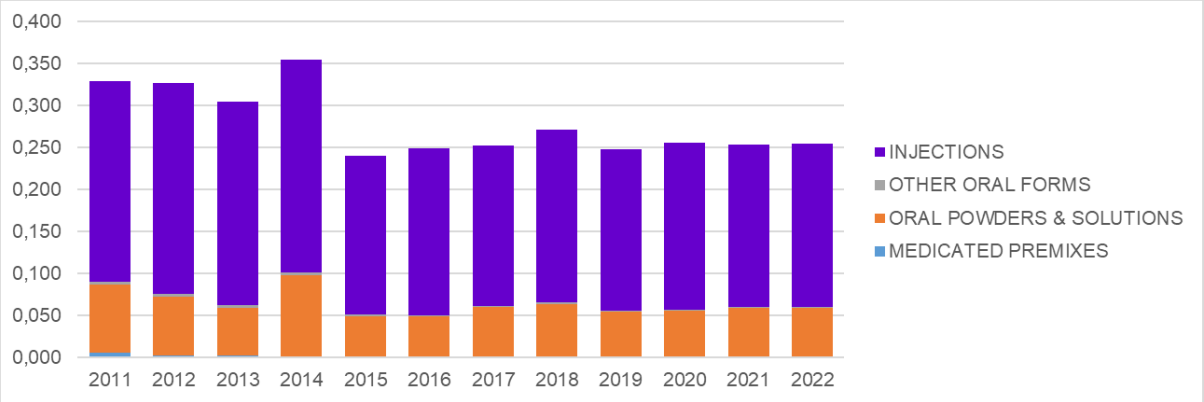


Figure 7: Change in ALEA by pharmaceutical form for cattle since 2011

After a 24.2% decrease between 2011 and 2016, the level of exposure of cattle has been relatively stable in recent years (+2.0% compared with the ALEA in 2016).

Large falls in exposure compared with 2011 have been observed for newer-generation cephalosporins (-95.3%), fluoroquinolones (-89.1%) and macrolides (-24.1%) (Figure 8).

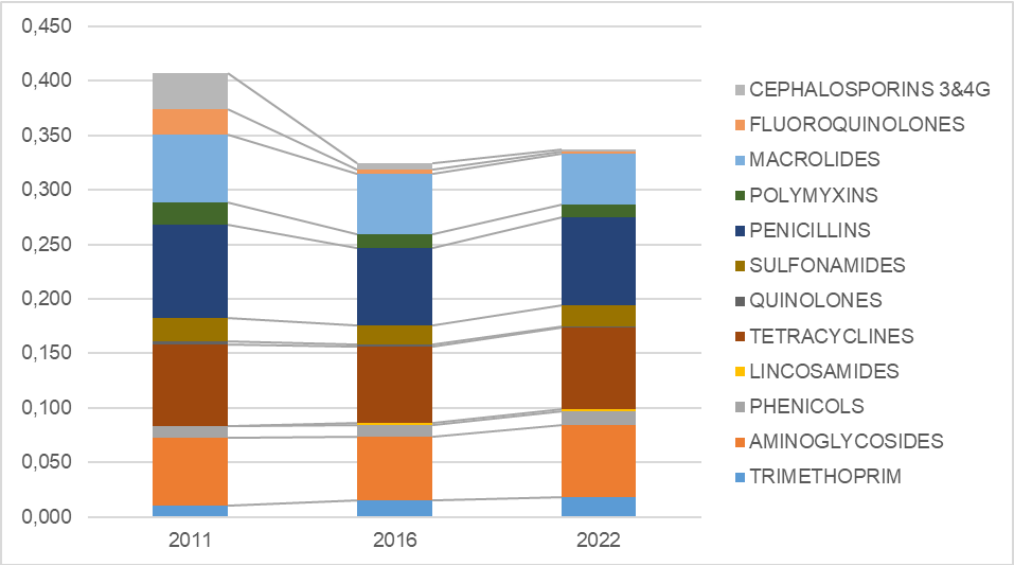


Figure 8: Change in ALEA indicators by class for cattle between 2011, 2016 and 2022

Since 2016, there has been a relative stabilisation of exposure of cattle to most antibiotic classes, except for macrolides (-16.6%) and penicillins (+15.4%) (Figure 9). Between 2021 and 2022, antibiotic exposure fell mainly for tetracyclines (-6.7%), and increased for penicillins (+7.9%) and aminoglycosides (+2.9%).

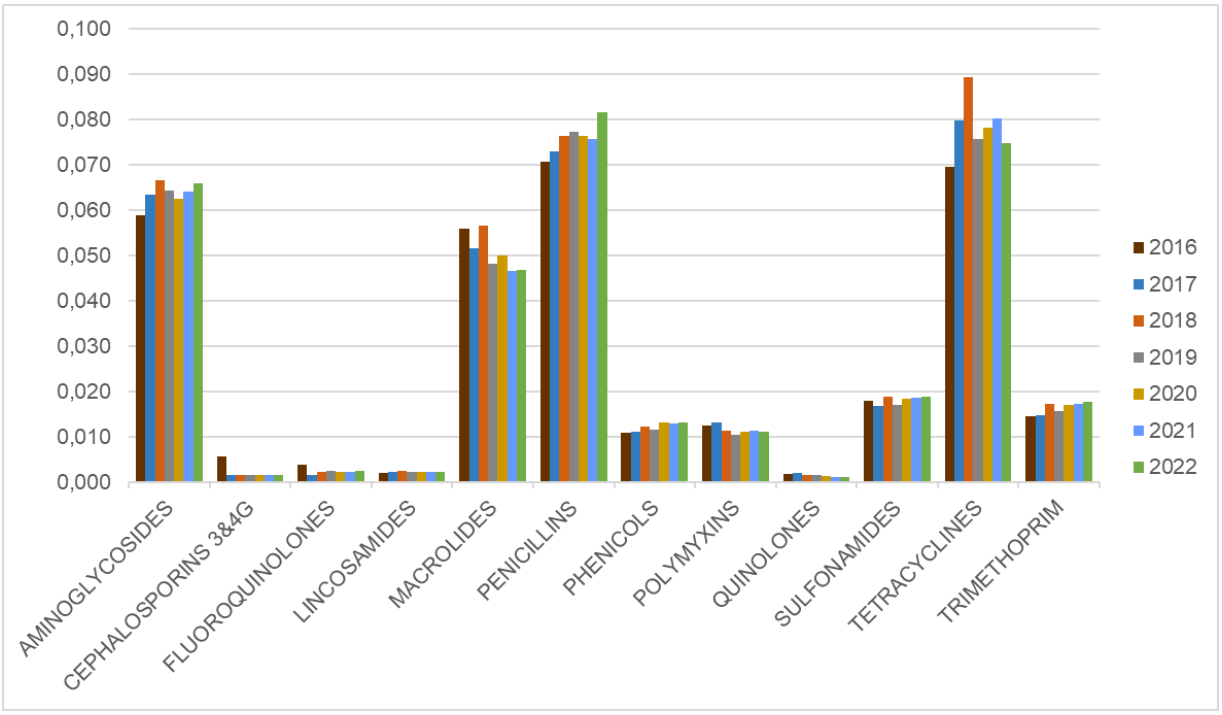


Figure 9: Change in exposure of cattle by antibiotic class since 2016 (ALEA)

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 antibiotic usage pattern for these two physiological stages. In

cattle, 87.0% of the body weight treated by the parenteral route seemed to correspond to the "Other cattle" category. Calves were mainly treated orally (69.3% of body weight treated of calves). They were mainly treated with tetracyclines, while penicillins and aminoglycosides were the classes used most often to treat other cattle parenterally (Figure 10).

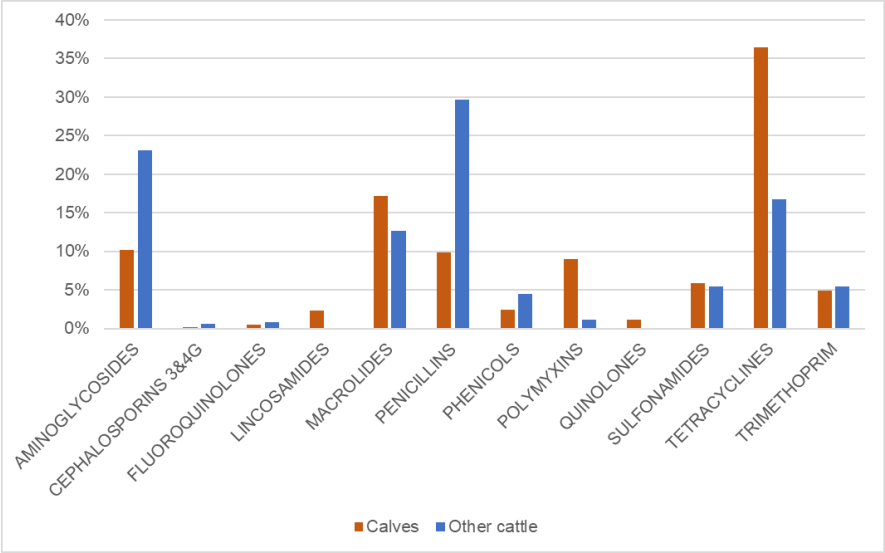


Figure 10: Antibiotic usage patterns for calves and other cattle in 2022, based on body weight treated

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 summary of product characteristics. 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 11).

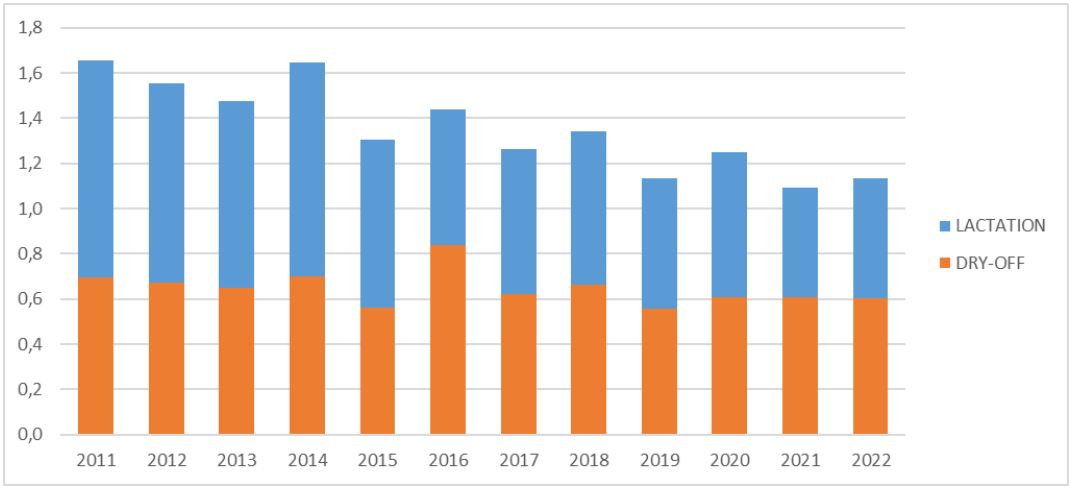


Figure 11: Change in the number of intramammary treatments per dairy cow since 2011

There were an estimated 1.13 intramammary treatments per dairy cow in 2022. This indicator has fallen by 31.5% compared with 2011. There was an increase of 3.7% over the last year, but it can be seen that this indicator is relatively changeable from year to year.

In 2022, the number of intramammary treatments was estimated to be 53 per 100 dairy cows during lactation, and 61 per 100 cows at dry-off. Between 2011 and 2022, the number of intramammary treatments per dairy cow fell by 12.9% for dry-off treatments and by 45.0% for lactation treatments.

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 first- and second-generation cephalosporins, penicillins and aminoglycosides.

The number of intramammary treatments per dairy cow based on newer-generation cephalosporins declined by 99.3% between 2013 and 2022, and has fallen by 13.9% compared with 2021. According to the reported data, two out of 1,000 dairy cows received intramammary treatment with third- and fourth-generation cephalosporins in 2022.

3.3 Pigs

Pigs are treated with medicines containing antibiotics administered orally, parenterally and dermally. In 2022, the quantity of antibiotics corresponding to topical medicines accounted for 0.03% of the total tonnage of antibiotics sold for pigs.

■ Oral and parenteral treatments

The ALEA exposure indicator for pigs has fallen by 67.1% since 2011, with a decrease of 4.2% for parenteral treatments and 75.5% for oral treatments (Figure 12). Exposure levels have fallen sharply over the past year: -20.7% between 2021 and 2022. This decline is primarily due to reduced exposure to medicated premixes (-88.7% in one year). Exposure fell by 5.8% for oral powders and solutions and 1.3% for injections.

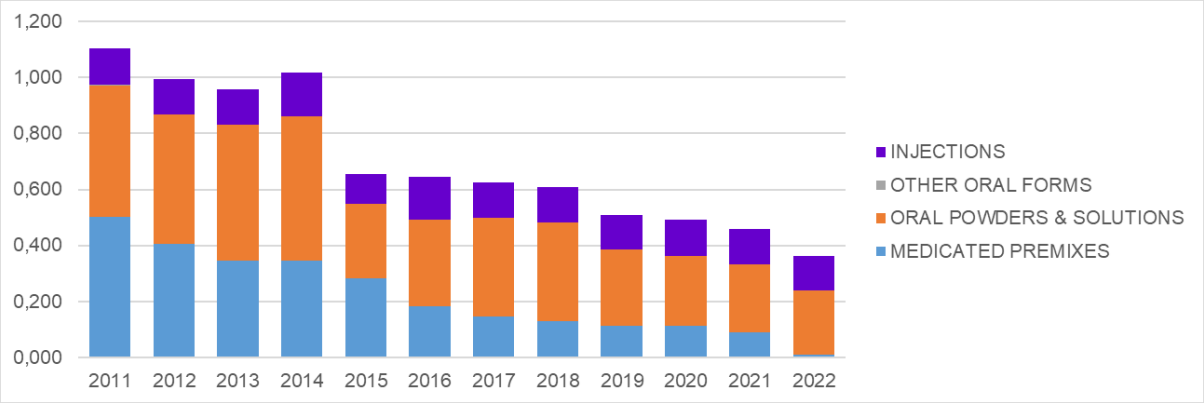


Figure 12: Change in ALEA by pharmaceutical form for pigs since 2011

After a 41.5% fall between 2011 and 2016, the level of exposure of pigs has continued to decline (-43.7% compared with 2016).

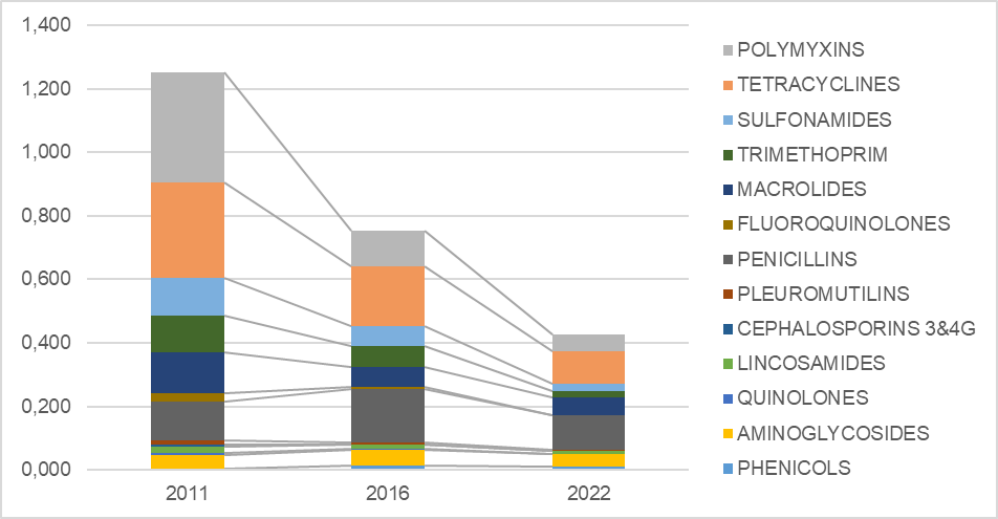


Figure 13: Change in ALEA indicators by class for pigs between 2011, 2016 and 2022

Compared with 2011, large falls in exposure have been observed for polymyxins (-85.6%), tetracyclines (-65.3%), sulfonamides and trimethoprim (-81.9%), and macrolides (-57.8%)

(Figure 13). After an increase between 2011 and 2016, the level of exposure to penicillins has fallen sharply in recent years.

Between 2016 and 2021, exposure of pigs fell progressively for most antibiotic classes (Figure 14), then large decreases were recorded compared with 2021 for tetracyclines (-22.4%), penicillins (-20.7%), and sulfonamides and trimethoprim (-49.9%). These decreases in one year were mainly due to a sharp fall in the use of medicated feed containing antibiotics (see Section 6.3 of this report). There does not appear to have been any shift of exposure to another pharmaceutical form.

Over this period, exposure to macrolides fell by 12.2%, although a change in practices was observed: whereas in 2016 oral exposure accounted for the majority, exposure by the parenteral route has increased by 66.4% and accounted for 70% of exposure to macrolides in 2022 (compared with 37% in 2016). Injection products containing tulathromycin accounted for 55% of the exposure of pigs to macrolides in 2022.

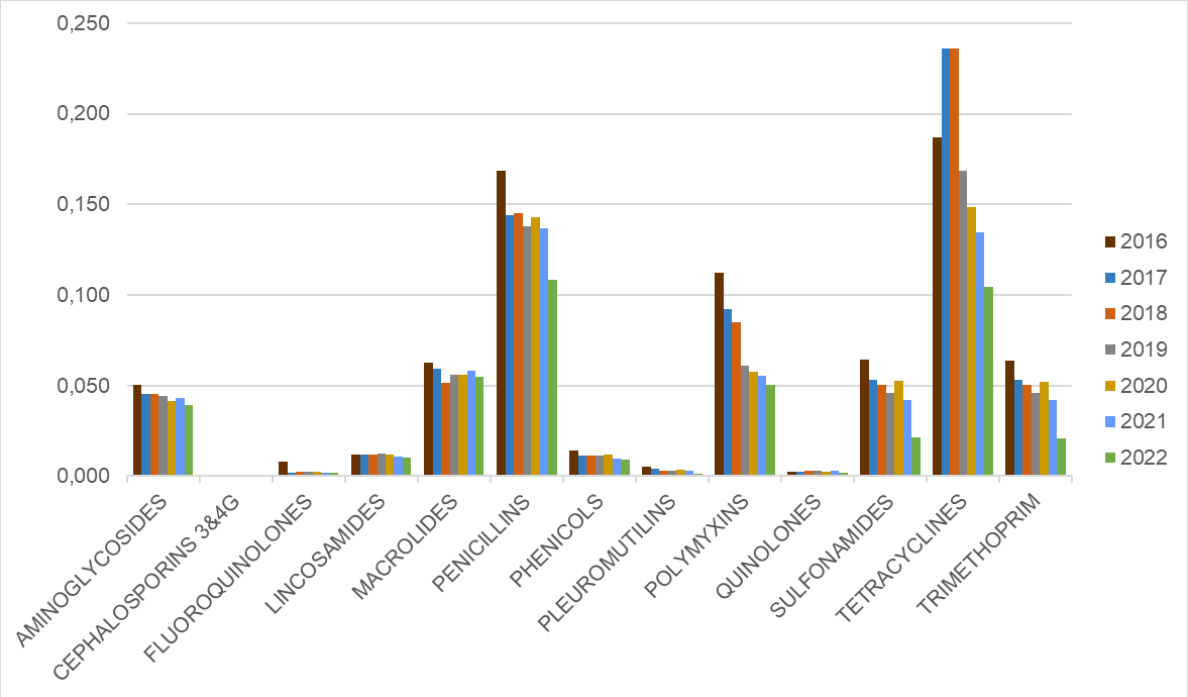


Figure 14: Change in exposure of pigs by antibiotic class since 2016 (ALEA)

3.4 Poultry

Antibiotic treatments in poultry are mainly administered orally, with some treatments administered parenterally.

■ Oral and parenteral treatments

The ALEA exposure indicator for poultry has fallen by 71.8% since 2011 (Figure 15). The level of exposure fell by 12.2% between 2021 and 2022, with reductions of 72.0% for medicated premixes and 9.3% for oral powders and solutions.

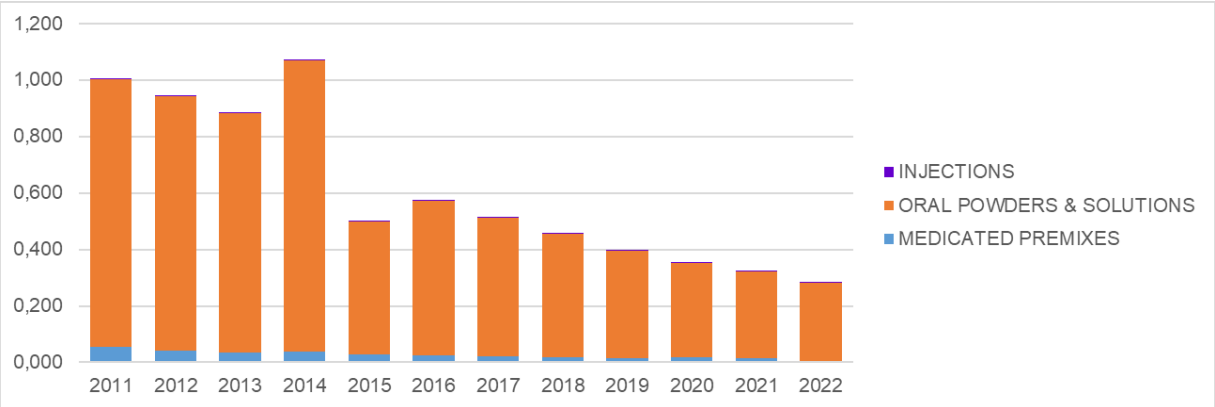


Figure 15: Change in ALEA by pharmaceutical form for poultry since 1999

After a 43.0% fall between 2011 and 2016, the level of exposure of poultry has continued to decline (-50.6% compared with 2016).

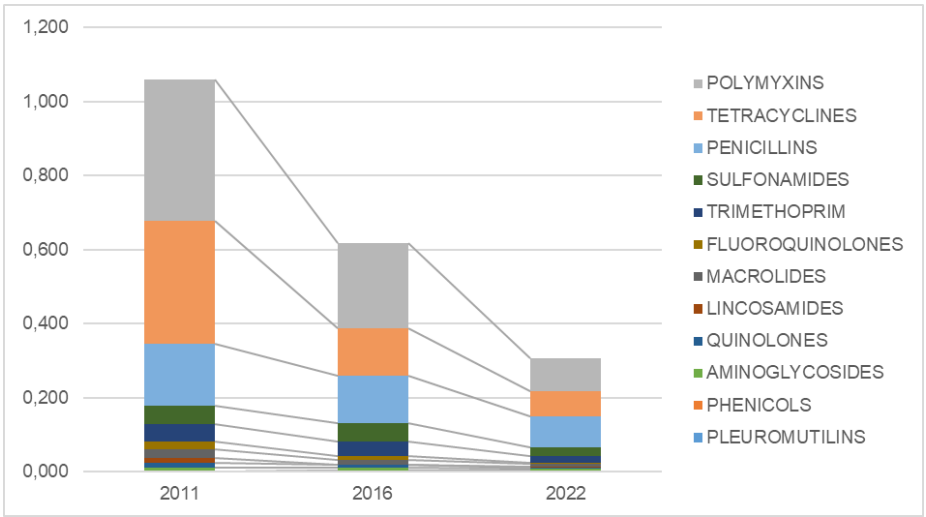


Figure 16: Change in ALEA indicators by class for poultry between 2011, 2016 and 2022

Large falls in exposure have been observed for polymyxins (-77.3%), tetracyclines (-79.6%) and penicillins (-49.0%), compared with 2011 (Figure 16).

Between 2016 and 2022, exposure of poultry fell steadily for the majority of antibiotic classes (Figure 17). Considerable reductions have been recorded compared with 2021 for tetracyclines (-16.7%) and polymyxins (-12.9%).

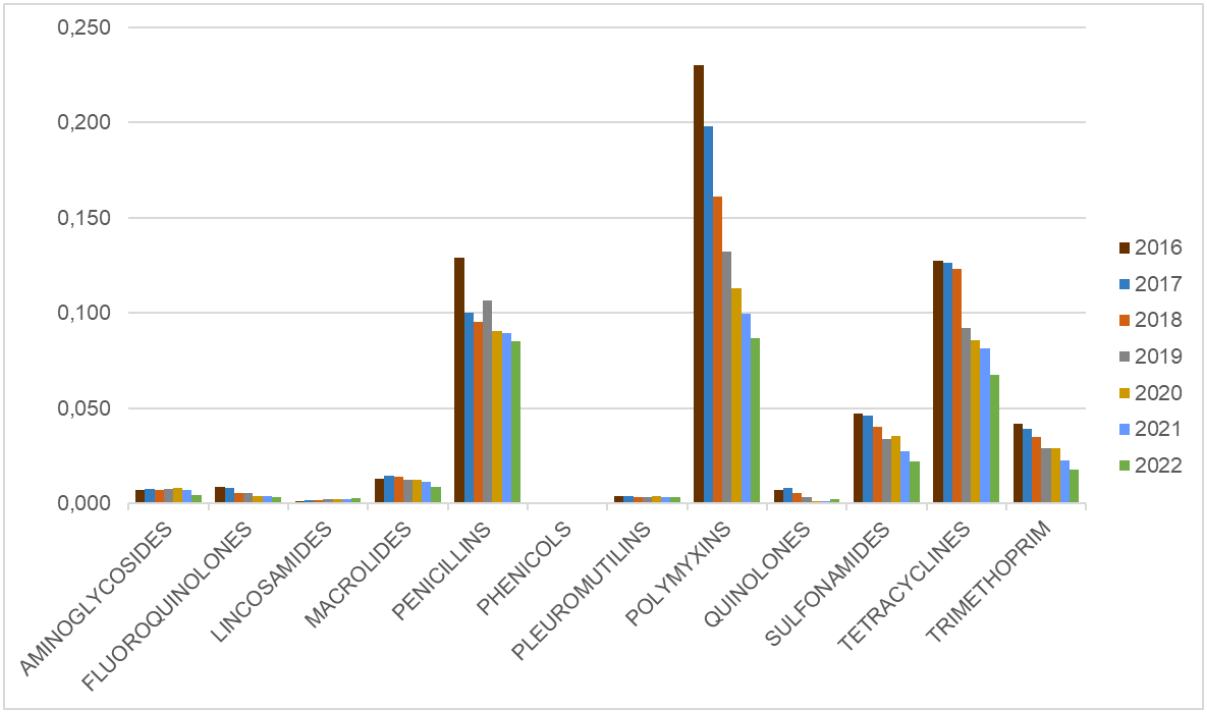


Figure 17: Change in exposure of poultry by antibiotic class since 2016 (ALEA)

MA holders estimated the breakdown of sales for turkeys, chickens and other poultry for each presentation. The term "chickens" here refers to the species *Gallus gallus*, and covers all production types (broilers, breeders, egg layers, etc.). Despite the uncertainty in these estimates, it is possible to calculate exposure levels and estimate the antibiotic usage patterns for these animal species.

In 2022, 64.7% of the body weight treated for poultry corresponded to chickens, while turkeys accounted for 23.1%. Considering the bird population, the level of exposure of turkeys seems to be 1.6 times higher than that of the species *Gallus gallus*. Antibiotic usage patterns were fairly similar for both species (Figure 18). Polymyxins were the class of antibiotics most commonly used in turkeys, while penicillins were mainly used to treat *Gallus gallus*.

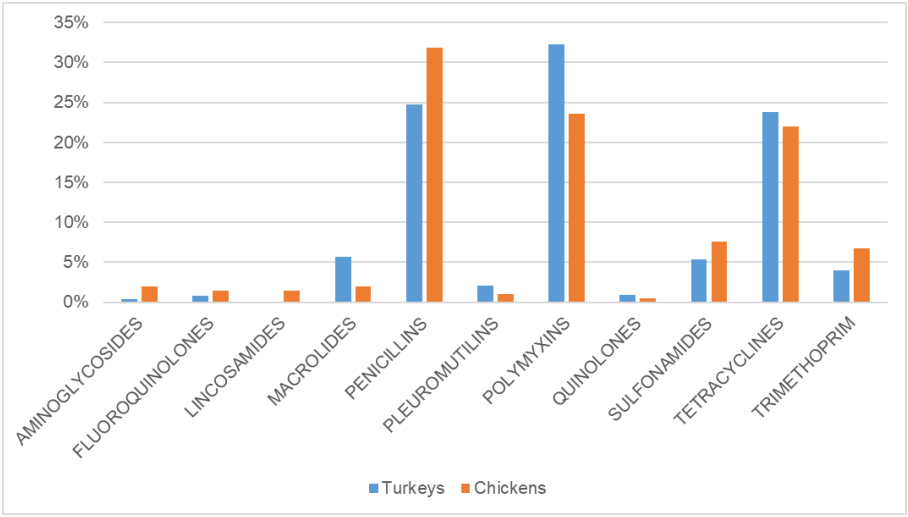


Figure 18: Antibiotic usage patterns for turkeys and chickens (*Gallus gallus*) in 2022, based on body weight treated

3.5 Rabbits

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

Oral and parenteral treatments

The level of exposure of rabbits to antibiotics has decreased by 64.0% since 2011 (Figure 19). Exposure levels have fallen sharply over the past year: -34.9% between 2021 and 2022. This decline is primarily due to reduced exposure to medicated premixes (-78.9% in one year). Exposure fell by 5.4% for oral powders and solutions.

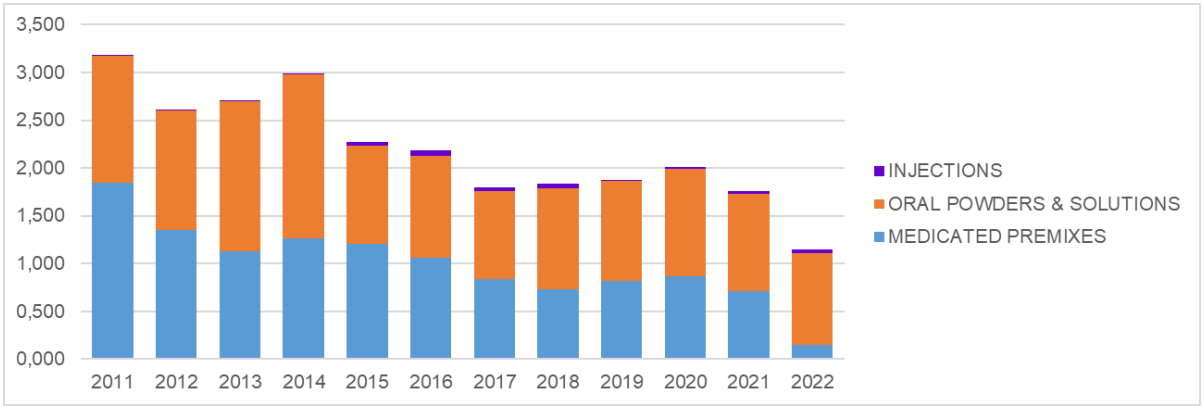


Figure 19: Change in ALEA by pharmaceutical form for rabbits for rabbits since 2011

After a 31.3% fall between 2011 and 2016, the level of exposure of rabbits has continued to decline (-47.6% compared with 2016).

Compared with 2011, large falls in exposure have been observed for tetracyclines (-71.7%), aminoglycosides (-66.7%), pleuromutilins (-75.9%), sulfonamides (-50.0%) and trimethoprim (-42.9%) (Figure 20).

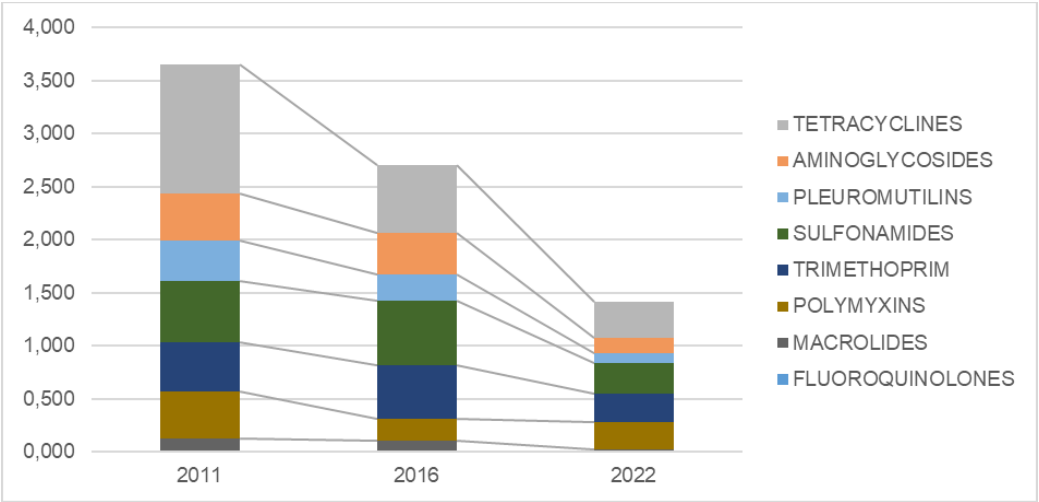


Figure 20: Change in ALEA indicators by class for rabbits between 2011, 2016 and 2022

Exposure of rabbits to tetracyclines, sulfonamides and trimethoprim fluctuated between 2017 and 2021 (Figure 21). Considerable reductions have been recorded compared with 2021 for tetracyclines (-33.4%), sulfonamides (-31.9%), macrolides (-90.6%) and pleuromutilins (-54.3%). These decreases in one year were mainly due to a sharp fall in the use of medicated feed containing antibiotics (see Section 6.3 of this report). There does not appear to have been any shift of exposure to oral powders and solutions, except for polymyxins. In the case of colistin, there has been a shift from the use of medicated premixes to oral powders and solutions. However, exposure to the polymyxins class remained stable: exposure levels to bacitracin and colistin were similar to those estimated in 2021.

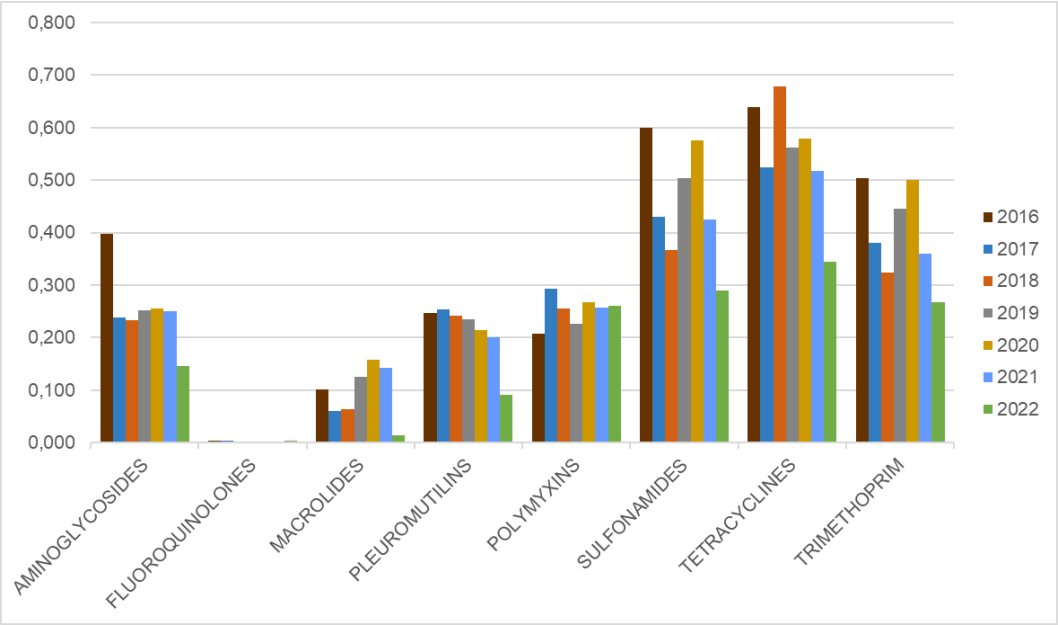


Figure 21: Change in exposure of rabbits by antibiotic class since 2016 (ALEA)

3.6 Cats & dogs

Cats and dogs are treated with medicines containing antibiotics administered by the oral, parenteral, dermal, auricular and ocular routes. In 2022, the quantity of antibiotics corresponding to topical medicines accounted for 12.4% of the total tonnage of antibiotics sold for cats and dogs. An analysis of topical treatments is presented in this section.

■ Oral and parenteral treatments

After a 19.5% fall between 2011 and 2016, the level of exposure of cats and dogs has increased in recent years (+21.0% compared with the ALEA in 2016). The level of exposure of cats and dogs to antibiotics was similar (-2.6%) to that estimated in 2011 (Figure 22).

Following a 10.2% increase between 2020 and 2021, the level of exposure fell by 3.1% in one year.

Exposure via injections has fallen by 40.4% compared with 2011, but it increased by 3.7% between 2020 and 2021. Oral exposure has increased by 22.4% compared with 2011, but has fallen by 5.1% over the last year. In 2022, tablets accounted for 75.0% of antibiotic exposure, compared with 24% for injections.

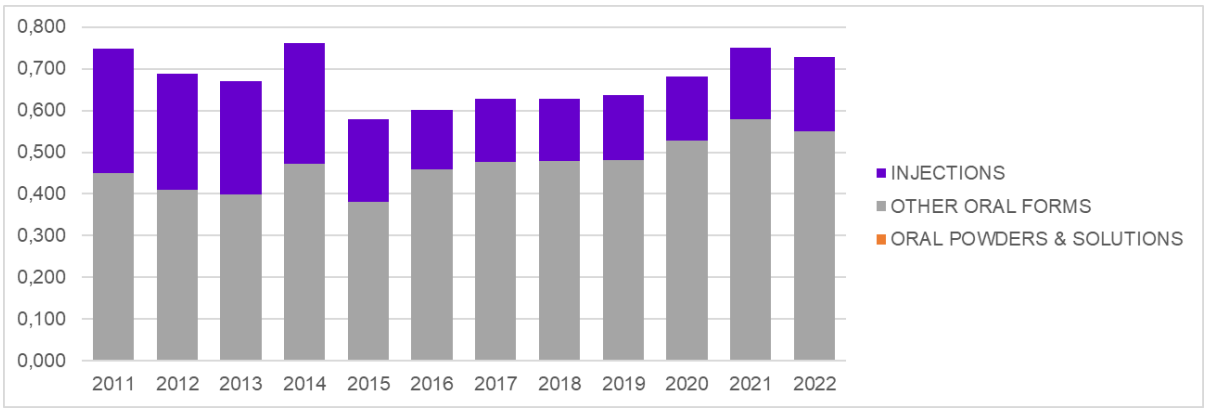


Figure 22: Change in ALEA by pharmaceutical form for cats and dogs since 2011

Between 2011 and 2016, sharp falls in exposure were observed for aminoglycosides, fluoroquinolones, latest-generation cephalosporins and macrolides (Figure 23). Since 2016, levels of exposure to the main classes have increased: +43.2% for penicillins, +22.8% for aminoglycosides and +18.0% for first-generation cephalosporins (cephalexin). The increase in exposure of cats and dogs observed since 2016 will need to be monitored.

After a 19.5% fall between 2011 and 2016, exposure to penicillins has increased sharply in recent years. This increase particularly concerned tablets combining amoxicillin and clavulanic acid: the level of exposure for these tablets in 2022 was 83.8% higher than in 2011 and 47.8% higher than in 2016. These treatments accounted for 46% of the exposure of cats and dogs in 2022.

When monitoring began in 1999, amoxicillin combined with clavulanic acid accounted for almost 30% of tablets containing penicillins; this percentage rose to 83% in 2011 and reached 97% in 2022.

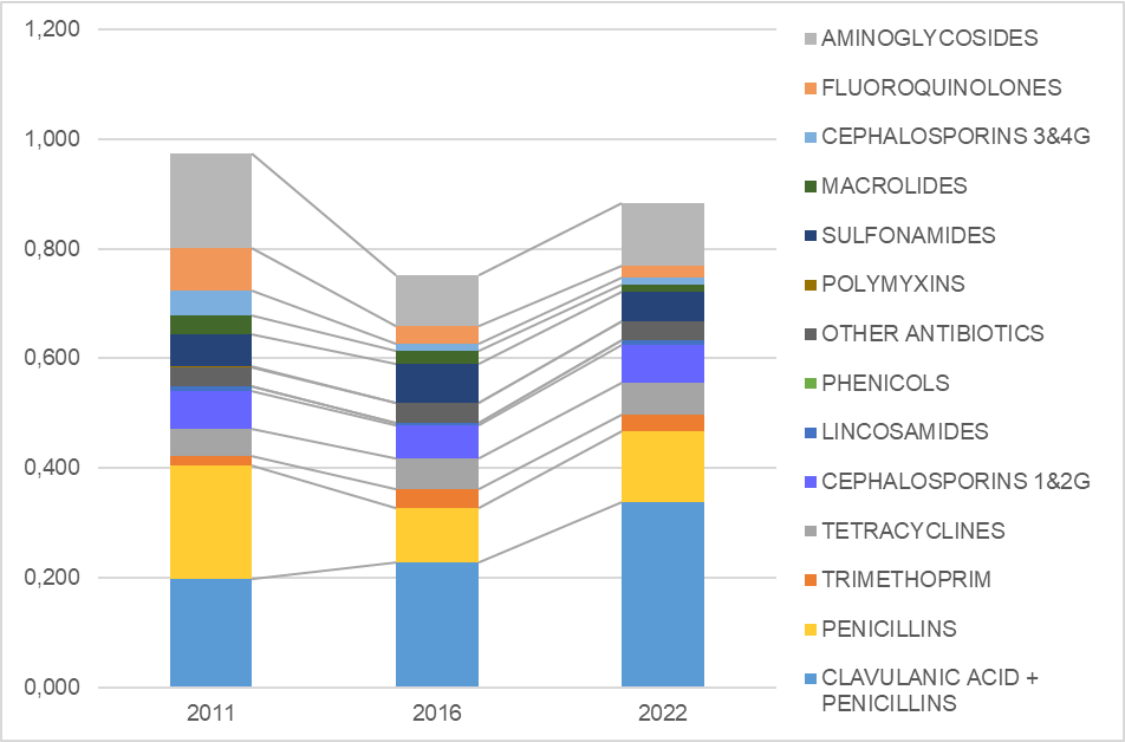


Figure 23: Change in ALEA indicators by class for cats and dogs between 2011, 2016 and 2022

After increases observed between 2020 and 2021, exposure of cats and dogs fell for the majority of classes, except for penicillins (Figure 24): +4.5% for penicillins combined with clavulanic acid and +3.1% for other penicillins compared with 2021.

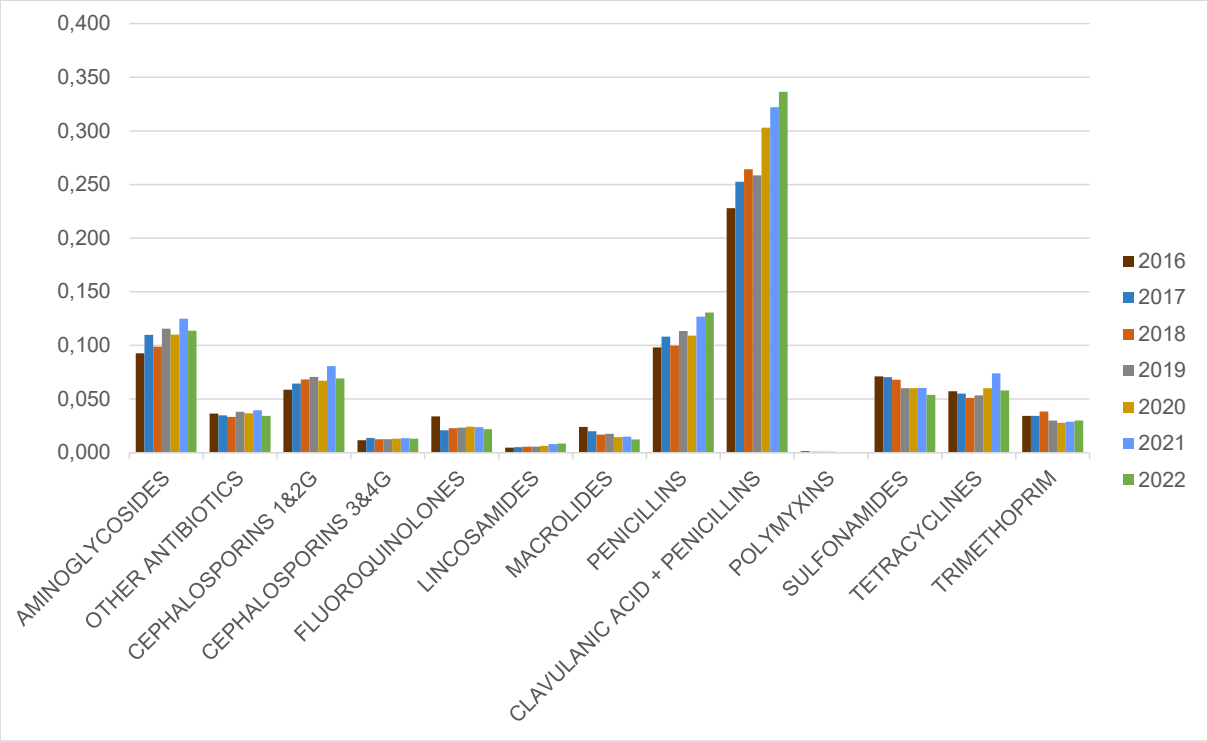


Figure 24: Change in exposure of cats and dogs by antibiotic class since 2016 (ALEA)

Topical treatments

Topical medicines are products for local use such as sprays, creams and ear or eye solutions. They accounted for 12.4% of the total tonnage of antibiotics sold for cats and dogs in 2022, with 2.57 tonnes of antibiotics. Since 2016, this tonnage has been fairly stable at between 2.3 and 2.6 tonnes.

It is possible to estimate the number of treatments per animal, which corresponds to the ratio between the number of animals treated with topical medicines and the number of animals present in France. The assumption used to estimate the number of animals treated is that one unit of presentation sold corresponds to one animal treated.

In 2022, the number of treatments per animal was estimated to be 0.179; i.e., almost two out of 10 pets received a topical treatment containing antibiotics during the year. Topical medicines are mainly used as ear and eye treatments in cats and dogs (Figure 25). It should be noted that most medicines marketed as ear treatments contain both antibiotics and antifungals (see Section 5.2 of this report).

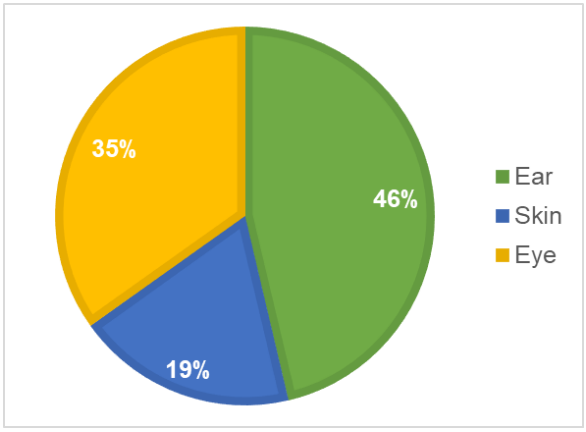


Figure 25: Breakdown of topical treatments in cats and dogs in 2022 by treatment types (ear, skin and eye)

4 Exposure to fluoroquinolones, newer-generation cephalosporins and colistin

4.1 Background

■ Fluoroquinolones and third- and fourth-generation cephalosporins

These antibiotics are considered to be 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[18], Act No. 2014-1170 of 13 October 2014) set a target of a 25% reduction in three years in the use of antibiotics 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 were:

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

The Interministerial order of 18 March 2016 established the list of antibiotic 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 transferable resistance to colistin led to the establishment of reinforced surveillance for this antibiotic.

In France, in its opinion[19] on colistin published in October 2016, ANSES recommended a 50% reduction in the use of this antimicrobial. Following this opinion, the EcoAntibio 2 plan (Action 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. This reference was calculated as follows:

$ALEA_{2014\text{-}15}$ = (body weight $treated_{2014}$ + body weight $treated_{2015}$) / ($Biomass_{2014}$ + $Biomass_{2015}$)

4.2 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

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

19 https://www.anses.fr/fr/system/files/MV2016SA0160.pdf

pets (oral and parenteral) and sheep and goats (parenteral). Off-label uses not quantified by the pharmaceutical companies are not considered in this monitoring.

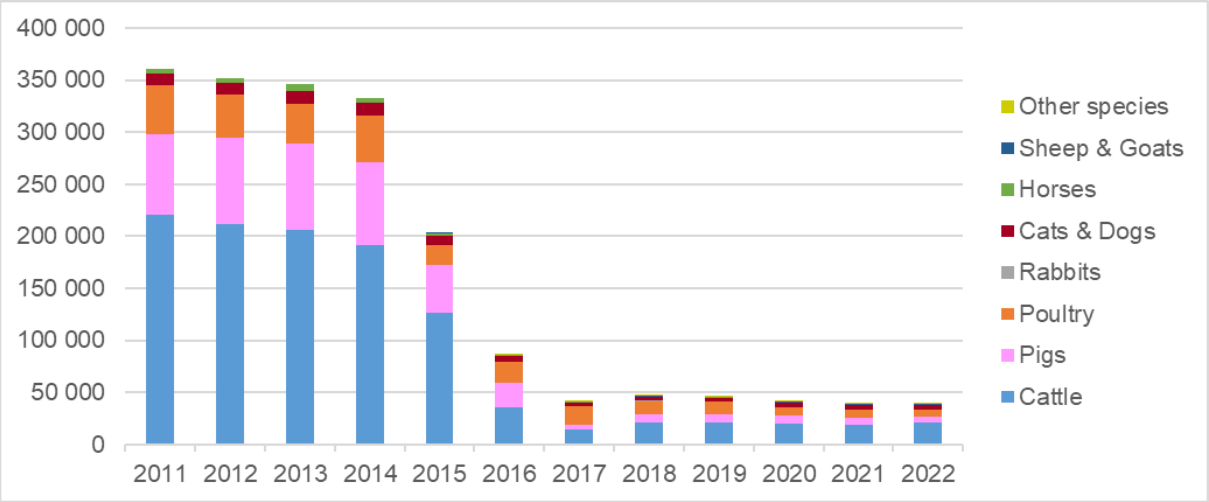


Figure 26: Change in body weight treated with fluoroquinolones according to the species (in tonnes)

For 2022, the body weight treated with fluoroquinolones corresponded mainly to four animal categories (Figure 26): cattle (54.7%), poultry (17.3%), pigs (14.3%) and cats & dogs (9.7%). Horses accounted for 1.1% of the body weight treated, sheep/goats 2.3% and rabbits 0.5%.

In 2022, 78.3% of the body weight treated with fluoroquinolones corresponded to injections, 18.7% to oral powders and solutions, and 3% to tablets.

Exposure of animals to fluoroquinolones decreased by 87.3% between 2013 and 2022 (Table 8). Following a sharp fall until 2017, exposure then stabilised for all animal species except poultry, where the decline in exposure has continued.

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

	Cattle	Pigs	Poultry	Cats & Dogs	Horses	All species
Change in 2022 compared with 2013	**-88.3%**	**-93.0%**	**-78.0%**	**-72.3%**	**-91.8%**	**-87.3%**

4.3 Third- and fourth-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 are not considered in this monitoring.

The number of intramammary treatments per dairy cow based on newer-generation cephalosporins declined by 99.3% between 2013 and 2022, and has fallen by 13.9% compared with 2021. Since 2020, these treatments have only concerned those administered during the lactation period.

In 2022, the body weight treated with injections containing third- and fourth-generation cephalosporins mainly corresponded to cattle (81.1%), followed by cats and dogs (14.2%) and pigs (3.6%). Horses accounted for 1.1% of the body weight treated (Figure 27).

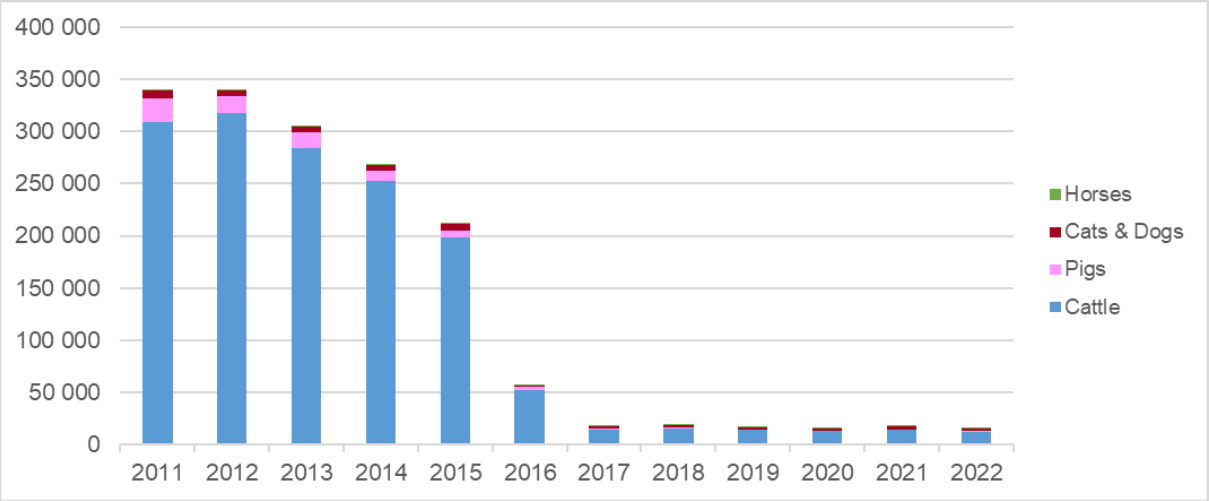


Figure 27: Change in body weight treated with third- and fourth-generation cephalosporins according to the species (in tonnes)

Exposure of animals to newer-generation cephalosporins via injections decreased by 94.2% between 2013 and 2022 (Table 9). After a sharp decline until 2017, exposure has been stable for each animal species.

Table 9: Change in exposure to third- and fourth-generation cephalosporins according to the species

	Cattle	Pigs	Cats & Dogs	Horses	All species
Change in 2022 compared with 2013	**-94.9%**	**-96.0%**	**-65.8%**	**-84.9%**	**-94.2%**

4.4 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 are not considered in this monitoring.

With an ALEA of 0.029 for 2022, exposure to colistin has fallen by 11.5% in one year. This fall is due to a 10.9% drop in oral exposure (premixes, oral powders and solutions) and a 12.3% drop in parenteral exposure (Figure 28). In 2022, exposure to colistin via medicated premixes accounted for only 0.7% of total colistin exposure (versus 22.8% on average for the years 2014 and 2015).

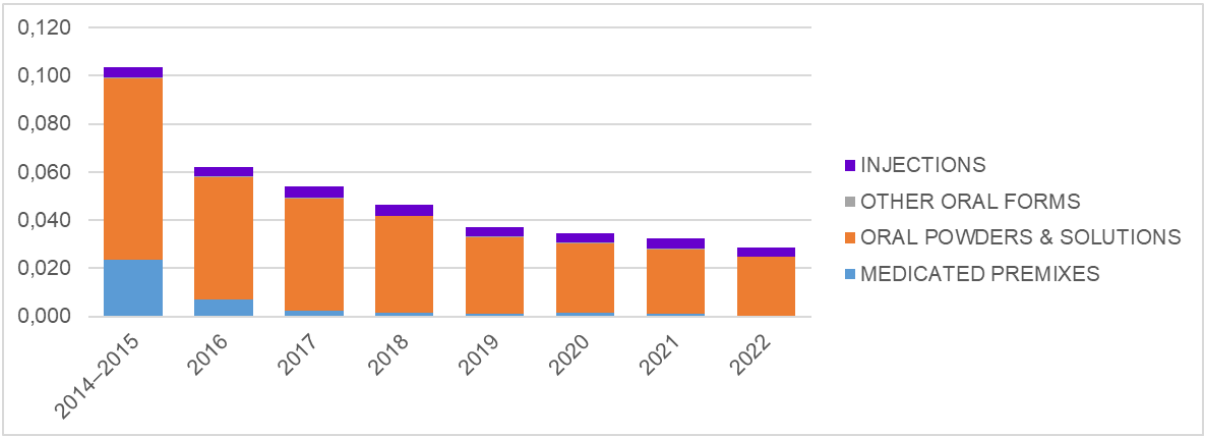


Figure 28: Change in exposure to colistin (ALEA)

In 2022, the body weight treated with colistin corresponded mainly to three animal species (Figure 29): poultry (39.8%), pigs (33.4%) and cattle (22.6%). Other species are also treated with this antibiotic, but the percentages of body weight treated attributable to these species were relatively low: 2.6% for rabbits, 1.5% for sheep and goats, 0.1% for horses and 0.03% for cats and dogs.

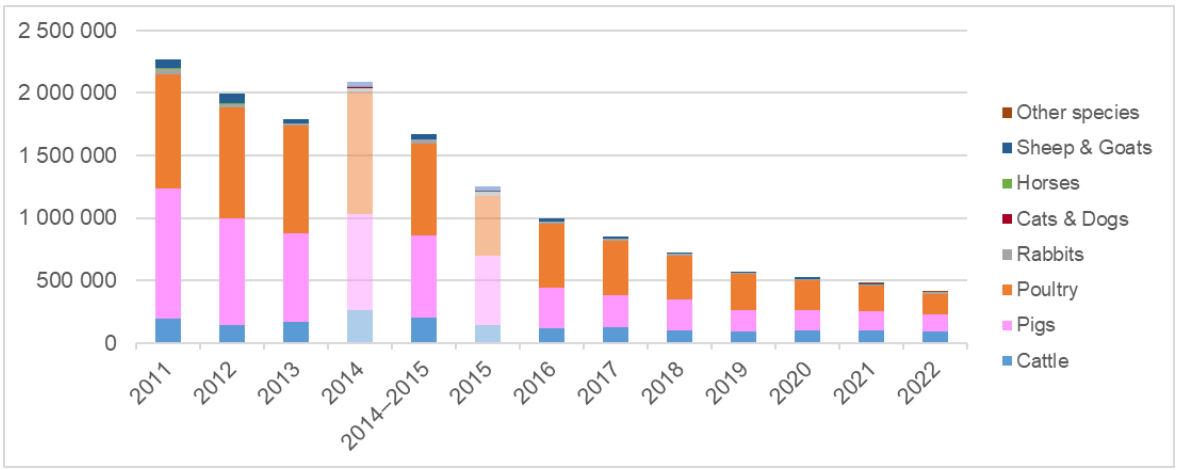


Figure 29: Change in body weight treated with colistin according to the species (in tonnes)

One of the objectives of the EcoAntibio 2 plan (Action 12) was 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. This target was achieved in 2020, with a 66.6% reduction in cumulative exposure to colistin for these three sectors.

Table 10: Change in exposure to colistin according to the species

	Cattle	Pigs	Poultry	Cattle + Pigs + Poultry	All species
Change in ALEA in 2022 compared with the average ALEA for 2014-2015	**-48.6%**	**-78.3%**	**-72.5%**	**-72.1%**	**-72.4%**
Change in ALEA in 2022 compared with ALEA 2021	**-2.7%**	**-9.4%**	**-12.9%**	**-11.0%**	**-11.5%**

Compared with the average ALEA for 2014-2015, colistin exposure fell by 48.6% for cattle, 78.3% for pigs and 72.5% for poultry (Table 10). Cumulative exposure for the three sectors fell by 72.1% in 2022, compared with the average ALEA for 2014-2015 (Figure 30).

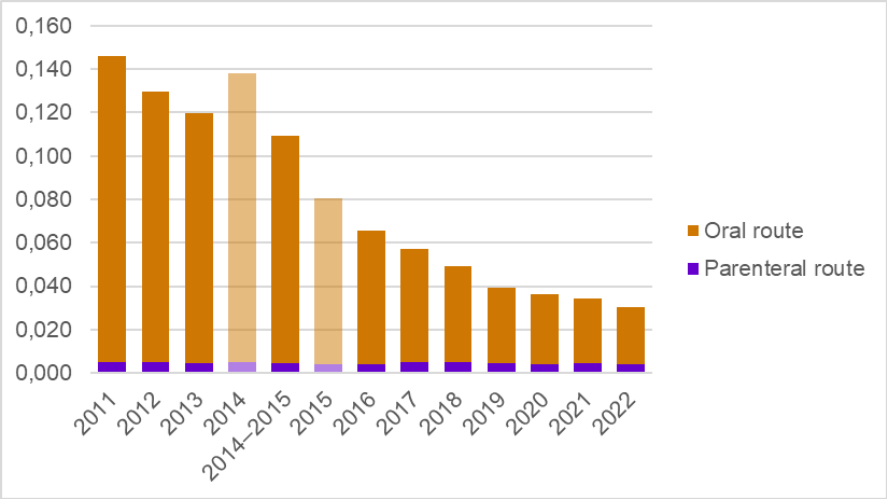


Figure 30: Change in exposure to colistin for cattle, pigs and poultry combined

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 antibiotics 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.

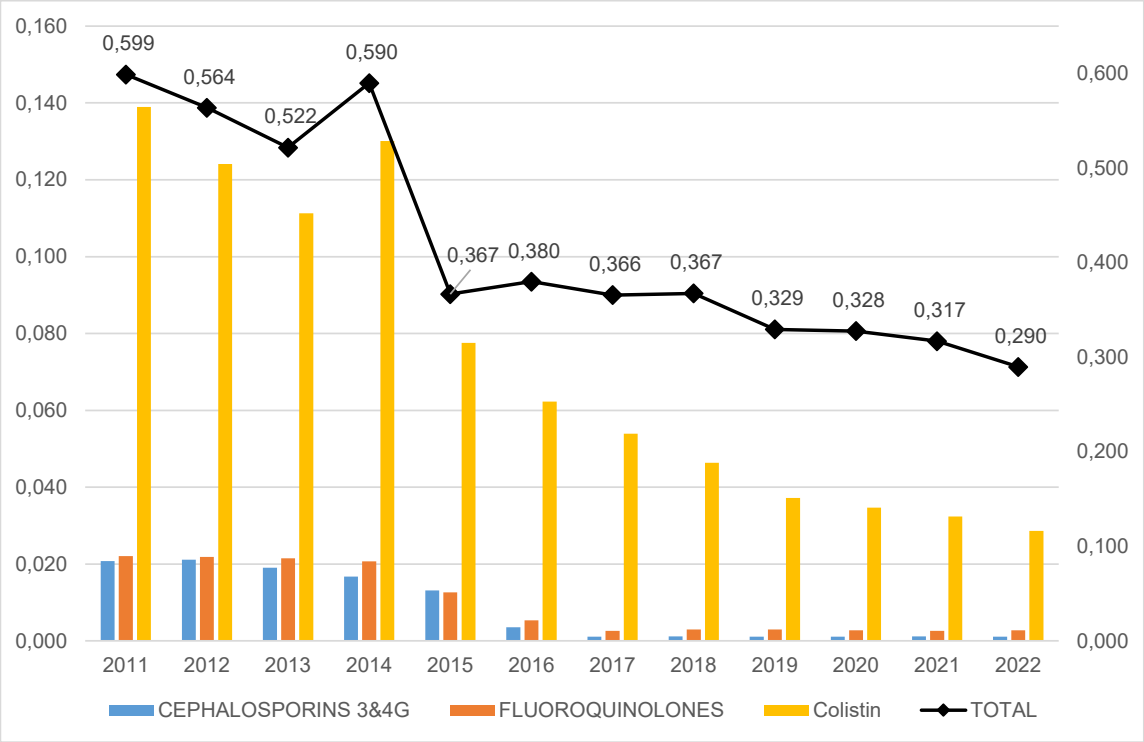


Figure 31: Change in exposure to newer-generation cephalosporins, fluoroquinolones and colistin and to all antibiotics since 2011 (ALEA)

Between 2011 and 2022, overall animal exposure fell by 51.6% (Figure 31). Over this period, there were large falls in exposure for newer-generation cephalosporins (-94.7%), fluoroquinolones (-87.6%) and colistin (-79.4%).

5 Exposure to antiprotozoals and antifungals

5.1 Background

No time to wait: securing the future from drug-resistant infections[20] is the title of a report submitted to the Secretary-General of the United Nations in April 2019. One of this report's key messages is that antimicrobial resistance is a global problem that threatens a century of progress in health and achievement of the sustainable development goals. The following observation was made: "Antimicrobial (including antibiotic, antiviral, antifungal and antiprotozoal) agents are critical tools for fighting diseases in humans, terrestrial and aquatic animals and plants, but they are becoming ineffective."

The recitals of European Regulation (EU) 2019/6 state that: "The use of antimicrobials in medicinal products that are used in animals may accelerate the emergence and spread of resistant micro-organisms and may compromise the effective use of the already limited number of existing antimicrobials to treat human infections." Thus, in order to assess the uses of antimicrobials in veterinary medicine, Article 57 of this Regulation requires Member States to collect data on antimicrobial medicinal products used in animals.

In France, Order No. 2022-414 of 23 March 2022 adapted French legislation to European Union law in the field of veterinary medicinal products and medicated feed. Article L. 5141-14-1 of the French Public Health Code concerns the collection of data on sales and use, which has been extended to antimicrobials in accordance with the European regulations[21].

Antimicrobials are defined in the European Regulation as any substance with a direct action on micro-organisms used for treatment or prevention of infections or infectious diseases, including antibiotics, antivirals, antifungals and antiprotozoals.

Delegated Regulation (EU) No 2021/578 sets out the requirements for the collection of data on antimicrobial medicinal products[22]. The Veterinary Anatomical Therapeutic Chemical Classification System (ATCvet) is used to identify the medicinal products covered by this data collection.

In order to prepare for the transmission of data to the EMA, this year the collection of sales data in France was extended to all veterinary medicinal products containing antimicrobials. There are no veterinary antiviral medicines currently authorised in France.

Few data on resistance to antifungal and antiprotozoal substances are currently available; the monitoring of uses that is currently being developed will enable the most suitable public policies to be put in place to deal with this emerging problem.

5.2 Antifungals

In 2022, the total volume of sales amounted to 2.05 tonnes of antifungals. This tonnage breaks down into 1.44 tonnes for topical medicines and 0.6 tonnes for oral medicines.

[20] https://cdn.who.int/media/docs/default-source/antimicrobial-resistance/amr-gcp-tjs/iacg_final_summary_en.pdf?sfvrsn=86e3bcfc_5
[21] https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000045405020/2022-03-25/
[22] https://eur-lex.europa.eu/eli/reg_del/2021/578/oj

The azoles class accounted for 37% of this tonnage of antifungals (see Annex 3 describing the substances by type and class of antimicrobials).

■ Topical treatments

Topical medicines containing antifungals are products for local application used as skin (shampoos, skin sprays) or ear treatments (ointments, gels, ear solutions). These medicines are mainly used for cats and dogs.

It is possible to estimate the number of treatments per animal, which corresponds to the ratio between the number of animals treated with topical medicines and the number of animals present in France. The assumption used to estimate the number of animals treated is that one unit of presentation sold corresponds to one animal treated.

In 2022, for cats and dogs, the number of treatments per animal was estimated to be 0.088; i.e. almost one out of 100 pets received a topical treatment containing an antifungal agent during the year. The vast majority of medicines sold were products containing both antifungals and antibiotics for ear treatments (see Section 3.6 of this report).

■ Oral treatments

Some medicines containing antifungals are administered orally (oral powders and solutions, tablets) to cats, dogs and horses. In order to preserve the confidentiality of data on medicinal product sales, only sales attributed to cats and dogs will be detailed in this section.

Using the same methodology as the one used to calculate the ALEA indicator for antibiotics (see Annex 2), it is possible to estimate an indicator of animal exposure to antifungals via oral treatments. The daily doses and treatment durations as defined in the MAs were used to estimate the body weight treated.

The indicator of exposure of cats and dogs to antifungals was estimated to be 0.004 for 2022. Around four out of 1000 pets received an oral treatment containing an antifungal agent during the year.

5.3 Antiprotozoals

In 2022, the total volume of sales amounted to 10.33 tonnes of antiprotozoals. Various pharmaceutical forms are marketed: injections, oral solutions, medicated premixes and oral suspensions.

Annex 3 lists the antiprotozoal substances marketed in France in 2022.

■ Oral and parenteral treatments

Using the same methodology as the one used to calculate the ALEA indicator for antibiotics (see Annex 2), it is possible to estimate an indicator of animal exposure to antiprotozoals.

The exposure indicator corresponds to the ratio of body weight treated to the biomass of animals potentially treated. The daily doses and treatment durations as defined in the MAs were used to estimate the body weight treated. The biomass of animals potentially treated with antibiotics was calculated using the weights of adult animals for those with a life cycle of more than one year, and the weights at slaughter for the others.

Using this methodology, the indicator of animal exposure to antiprotozoal agents was estimated to be 0.024 for 2022. It should be noted that this indicator underestimates the use of antiprotozoals in France, as the medicines are generally administered to young animals. Nevertheless, when monitoring their use, the most important thing is the trend in the indicator over time.

Table 11: Indicator of exposure to different antiprotozoals by animal species in 2022

	Cattle	**Pigs**	**Poultry**	**Cats & Dogs**	**Sheep & Goats**
AMPROLIUM			0.029		
DECOQUINATE	*				*
HALOFUGINONE	0.001				
TRIAZINES (diclazuril, toltrazuril)	0.017	0.022	0.008		*
OTHER ANTIPROTOZOALS (antimony, imidocarb, melarsomine)	*			0.051	
Total antiprotozoals	**0.022**	**0.022**	**0.037**	**0.051**	**0.040**

* In order to protect the confidentiality of data on medicinal product sales, these data are not presented.

It should be noted that some substances (such as paromomycin) have both antibiotic and antiprotozoal activity. Where this is the case, exposure to these substances is not taken into account in the antiprotozoal exposure indicator (Table 11) but in the antibiotic exposure indicator.

6 Setting up the collection of data on antimicrobial use

6.1 Data collection in accordance with the European regulations

Article 57 of Regulation (EU) No 2019/6 introduces the collection of data on the use of antimicrobial medicines by animal species and category, at European level. Member States 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[23]. As stated in Recital 50, these data will be used to determine the trends and identify possible risk factors that could lead to the development of measures to limit the risk of antimicrobial resistance and to monitor the effects of measures already introduced. Member States must therefore collect data on antimicrobials and report them to the EMA, which will publish an annual report.

Commission Delegated Regulation (EU) 2021/578 of 29 January 2021[24] sets out the categories of antimicrobial medicinal products covered by the data collection requirement. The use data concern both veterinary antimicrobials and human antimicrobials that can exceptionally be used in animals. The data collected by the Member States and reported to the EMA should be accurate, complete and consistent. To ensure compliance with these data quality requirements, Member States will have to define a data quality management plan. Commission Implementing Regulation (EU) 2022/209 of 16 February 2022 establishes the format of the data to be reported to the EMA[25].

As indicated in Article 57, Member States shall be allowed to apply a progressive stepwise approach to collect these data on use according to animal species. From 2023 onwards, data must be collected at least for the following species and categories: cattle, pigs, chickens (making a distinction between broilers and layers) and turkeys. The first data to be submitted to the EMA for other food-producing species and horses will be for 2026. Lastly, for non-food producing species, namely dogs, cats and fur animals, the first data to be reported will concern the year 2029.

To meet these European requirements, France has decided to collect data on use from veterinarians, pharmacies and animal feed operators[26]: This collection will cover all antimicrobial medicines and all animal species from 2023. Although at European level, a step-by-step timetable has been defined for reporting data to the EMA according to the species, the reporting of data on antimicrobial use in France will apply to all species from 2023.

6.2 Launch of collection in France in 2023 via Calypso

In France, the reporting by veterinary medicinal product retailers of data on antimicrobial use is one of the objectives of a project called "Calypso".

[23] https://eur-lex.europa.eu/eli/reg/2019/6/oj
[24] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32021R0578&qid=1617967331741&from=EN
[25] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022R0209
[26] https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000045405020/2022-03-25/

Calypso is an online application used to manage the data and functions that veterinarians need to carry out certain tasks and regulatory obligations related to their professional practice[27]. Managed by the French Veterinary Association in consultation with veterinary professional organisations (SNVEL, AVEF, AFVAC, SNGTV)[28] and ANSES-ANMV, and with financial support from the Ministry of Agriculture and Food Sovereignty and the Fund for transformation of public action (FTAP), Calypso has been accessible to veterinarians since 14 March 2023. A number of functions are already available: viewing of the personal data of veterinarians and their care facilities; management and monitoring of continuing veterinary training; automatic reporting of sales of medicines containing antimicrobials; monitoring of the vaccination plan for ducks against highly pathogenic avian influenza (HPAI). Other features will be delivered over the coming months.

The requirement to report data on the use of antimicrobials for all animal species applies to all retailers of veterinary medicinal products, and manufacturers and distributors of medicated feed.

- Practising veterinarians

Since 4 April 2023, practising veterinarians have been able to transmit data on antimicrobial use via a data stream between their management software and Calypso, provided that the management software used in the veterinary care facility supports this feature (automatic transmission of data to Calypso is only possible with certified software). Several software packages have already been certified and certification is under way for others: the list of software packages is regularly updated on the Calypso web page[29].

- Manufacturers and distributors of medicated feed

Since 2018, manufacturers and distributors of medicated feed have been providing ANSES-ANMV with data on sales of medicated feed containing antibiotics (see Section 6.3). Since 4 April 2023, these animal feed operators have been transmitting data on antimicrobial use by uploading a pre-formatted Excel spreadsheet to the Calypso application, or by using this application to declare no sales.

- Dispensing pharmacists

A module for manual entry of antimicrobial sales has been available since October 2023. A pilot phase with pharmacists is under way to help them become familiar with this module. Work will also be undertaken to enable pharmacists to transmit these prescribing data electronically via their pharmacy software.

- Other veterinarians

A module for manual entry of antimicrobial sales has been available since October 2023. This module can be accessed by other veterinarians: practising veterinarians without IT systems, army and zoo veterinarians, veterinarians within the departmental fire and rescue services (SDISs) and veterinarians working under the EU's principle of "freedom to provide services".

[27] https://www.veterinaire.fr/la-profession-veterinaire/calypso-la-plateforme-au-service-du-quotidien-des-veterinaires

[28] SNVEL: National Union of Private Practice Veterinarians; AVEF: French Equine Veterinary Association; AFVAC: French Association of Veterinarians for Pets; SNGTV: French National Society of Veterinary Technical Groups

[29] https://www.veterinaire.fr/la-profession-veterinaire/calypso-la-plateforme-au-service-du-quotidien-des-veterinaires

ANSES-ANMV is responsible for analysing the data collected in Calypso and transmitting national data to the EMA on an annual basis.

6.3 Sales data confirm the decline in the use of medicated feed containing antibiotics

Data on antibiotic use by species have been collected for medicated feed since 2018. This is because, following publication of the Act on the future of agriculture in 2014[30], Decree No. 2016-1788 made it mandatory for manufacturers and distributors of medicated feed to report sales of antibiotics to ANSES-ANMV.

A recent report[31] presented the results of the monitoring of antibiotic use in medicated feed for 2022. It also included a study of results since 2018, and a study comparing data reported by manufacturers and distributors of medicated feed with data reported by marketing authorisation (MA) holders.

These sales data confirm a particularly sharp fall in the use of antibiotics in medicated feed between 2021 and 2022: -76.7 tonnes, i.e. -78.5%. According to sales monitoring based on reporting by MA holders, there was an estimated 82.5% fall in the tonnage of medicated premixes in one year (see Section 2.1.2 of this report).

These results reflect the initial effects of the new European regulations. Since 28 January 2022, the prophylactic use of medicated feed containing an antimicrobial has been prohibited, and metaphylactic uses have been more tightly regulated.

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

31 https://www.anses.fr/en/content/monitoring-antibiotic-deliveries-manufacturers-and-distributors-medicated-feed-france

Sales of medicated feed containing antibiotics in France

In 2022, the equivalent of 17.2 tonnes of antibiotics were sold in the form of medicated premixes, according to national monitoring of sales based on reporting by MA holders and operators. This amount is lower than the tonnage of antibiotics sold in the form of medicated feed according to reporting by feed manufacturers and distributors (21.0 tonnes). This difference can be explained by a time lag between the purchase of premixes by manufacturers and the sale of medicated feed to farmers.

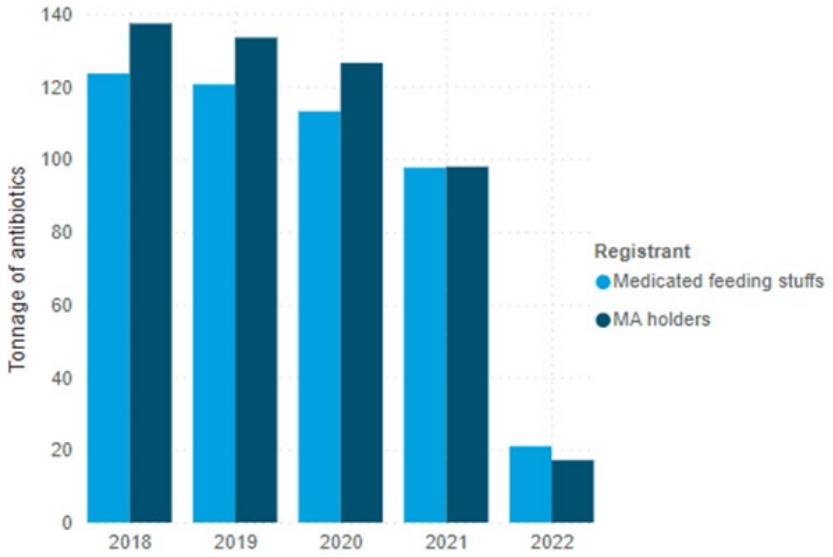


Figure 32: Annual change in the tonnage of antibiotics sold via medicated feed

Sales monitoring slightly underestimates reporting for all species, especially sheep and goats (Figure 33).

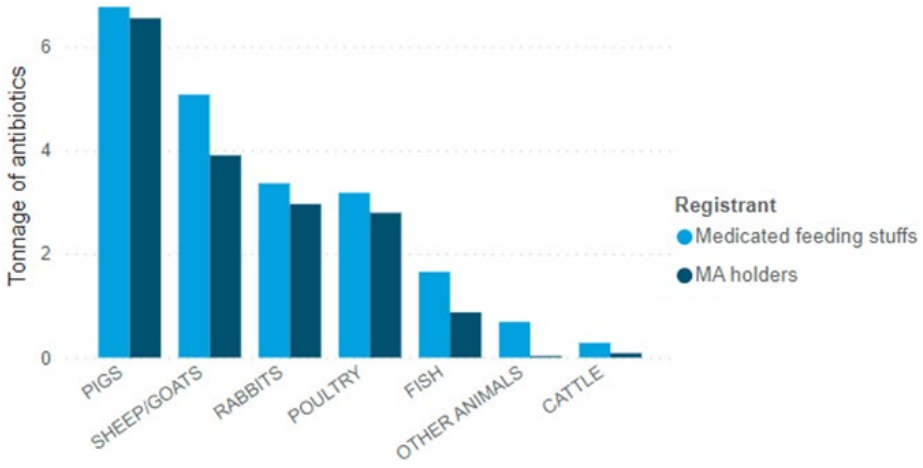


Figure 33: Tonnages of antibiotics sold in feed in 2022 by species and according to the two reporting sources

(MA Holders: Marketing Authorisation Holders)

In the report, separate results are presented for sheep and goats, for the different poultry species and production categories, and by physiological stage for pigs.

7 Discussion

7.1 Uneven trends in exposure to antibiotics depending on the animal species

■ Reductions in exposure for the main food-producing species

Since the 2000s, various steps to promote the prudent use of antibiotics have been taken in the different livestock sectors. This momentum has since been supported at national level by the EcoAntibio plans. This mobilisation of the different players has led to more extensive thinking about the use of medicines in animal husbandry, reinforced preventive measures (biosecurity, vaccination), and a change in farming practices in consultation with farmers and veterinary practitioners[32].

Large reductions in antibiotic exposure in food-producing animals have been recorded in the last 20 years: a fall of around 75% for pigs, poultry and rabbits compared with their maximum exposure levels, and around 30% for cattle. Following the launch of the EcoAntibio 1 plan, considerable reductions were observed between 2011 and 2016. Exposure then continued to decline over the period 2017 to 2022 for pigs, poultry and rabbits. Exposure of cattle to oral and parenteral antibiotics seems to have stabilised during the second EcoAntibio plan, while the number of intramammary antibiotic treatments per dairy cow has continued to fall over this period.

The continual fall in sales of medicated premixes containing antibiotics since 2007 has contributed to a large reduction in oral exposure in livestock. Historically, premixes have been more commonly used for disease prevention or metaphylaxis because they are easy to administer over long periods, whereas products intended to be given via drinking water tend to be administered in the acute stages of clinical disease, and for shorter periods.

Reductions in antibiotic exposure over the past year have been especially marked for pigs and rabbits, with a large fall in the use of premixes containing antibiotics. Exposure of poultry to antibiotics has decreased by 12.2% in one year. In 2022, the reduction in exposure via premixes accounted for 92% of the overall fall in exposure for rabbits, 83% for pigs and 28% for poultry. The latter figure is lower, as premixes already accounted for less than 5% of poultry exposure in 2021. Apart from a shift in the use of colistin in rabbits towards oral powders, it would appear that the use of medicated feed has not been replaced by treatment with other pharmaceutical forms.

The results observed over the last year undoubtedly reflect the initial effects of the European regulations that came into force in January 2022. Indeed, Regulation (EU) 2019/4 now imposes a ban on the preventive use of antimicrobials via medicated feed, and restrictions on the prescription of antimicrobials in medicated feed.

■ Trends to monitor for cats, dogs and horses

In 2022, the level of oral and parenteral exposure of cats and dogs was similar to that estimated in 2011. After an estimated 19.5% reduction during the first EcoAntibio plan, the ALEA has increased in recent years. This increase concerns the main classes used in these pets:

[32] Streamlining the use of veterinary drugs in livestock. Special issue *INRAE Animal Productions*, *35*(4) https://productions-animales.org/issue/view/718

penicillins, aminoglycosides and first-generation cephalosporins. Tablets accounted for 75.0% of antibiotic exposure in cats and dogs in 2022.

This increase in exposure to penicillins recorded since 2016 particularly concerns tablets combining amoxicillin and clavulanic acid, which accounted for 46% of the exposure of cats and dogs in 2022. Exposure via these potentiated amoxicillin tablets has risen by 47.8% compared with 2016. During the EcoAntibio plans, there has been a sharp decline in the use of critically important antibiotics, 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[33]. These antibiotics should only be considered if there is no clinically effective antibiotic in Category D. Amoxicillin without beta-lactamase inhibitors belongs to Category D. The share of amoxicillin combined with clavulanic acid in the sales of tablets containing penicillins continues to increase and reached 97% in 2022. It will be necessary to remain vigilant and continue monitoring the development of these antibiotics. To ensure the prudent and responsible use of antibiotics, veterinarians are encouraged to consider the European AMEG categorisation in their prescribing choices[34].

Several sources of data show that the veterinary market for pets is growing. According to figures published by the French Industry Association for the Study of Veterinary Medicinal Products (AIEMV)[35], this sector has been expanding since 2016 and grew by 8.7% between 2019 and 2020. The latest AIEMV press release showed that sales of medicines for pets rose by 12% between 2020 and 2021. Since 2011, it has been mandatory in France to identify all dogs and cats prior to any change of ownership[36]. According to the figures published for 2022, the number of registrations in the national I-CAD database has increased by around 40% for domestic carnivores[37], albeit with a 12% fall between 2021 and 2022. A survey showed growing medicalisation of pets in recent years[38].

Although the level of exposure has fallen by 3.1% compared with 2021, the sales data for 2022 confirm the upward trend in exposure of cats and dogs over recent years. In this context of a probable increase in medicalisation of pets, the trends in exposure of cats and dogs will need to be monitored in the coming years, and it will be important to understand the factors driving the prescription of antibiotics for these species.

In this respect, studies examining antibiotic prescription practices in cats and dogs in France are rare, and it would therefore be useful to conduct such studies. A recent Australian article looked at the drivers of antibiotic prescribing in pets. Although contextual differences with France cannot be ruled out, the results of this survey are instructive. One of the main findings of this qualitative survey was that the choice not to prescribe antibiotics is not dictated solely by scientific arguments[39]. Among the factors identified as influencing decision-making were the veterinarian's perception of the risk of antimicrobial resistance, their workload and fatigue, their communication skills, a workplace culture favourable to changes in practices, etc. The use of antimicrobials in the absence of a clear indication is often motivated by behavioural

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

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

[35] https://www.simv.org/sites/default/files/marche_2020_france_chiffres_aiemv_publics_-_annuel_2020.pdf

[36] https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000033035507/

[37] https://www.i-cad.fr/uploads/INFOGRAPHIE.premieres.identifications.2022.pdf

[38] https://www.depecheveterinaire.com/le-barometre-royal-canin-sur-les-francais-et-leurs-animaux-confirme-la-medicalisation-croissante_6798487AAC5D9A5B.html

[39] Scarborough, Ri O., *et al*. "'Brave Enough': A Qualitative Study of Veterinary Decisions to Withhold or Delay Antimicrobial Treatment in Pets." Antibiotics 12.3 (2023): 540. doi.org/10.3390/antibiotics12030540

beliefs, mainly the fear of seeing the animal deteriorate and of not meeting owners' expectations.

Data on sales attributed to horses are not detailed in this report due to methodological uncertainties (except for data on critical antibiotics). Estimates by MA holders of the share of antibiotic sales for horses are sometimes uncertain, especially for medicinal products that are authorised for more than one animal species. A 17.7% increase in exposure of horses was observed between 2020 and 2021, and sales data for 2022 seem to confirm the exposure levels estimated in 2021 for penicillins, sulphonamides and trimethoprim. It is likely that there has been a shift from the use of fluoroquinolones and newer-generation cephalosporins towards these classes, following publication in 2016 of the decree governing the prescription and dispensing of critical antibiotics. However, the considerable increase in the exposure of horses in recent years calls for continued vigilance.

7.2 Accurate and useful data on the use of antimicrobials in animals

With the launch of the Calypso application in 2023, data on antimicrobial use will be collected by animal species and sub-category in France. These data concern all veterinary and human medicinal products containing antimicrobials (antibiotics, antivirals, antifungals and antiprotozoals). The collection system is based on reporting by veterinarians, dispensing pharmacists, and manufacturers and distributors of medicated feeds. These data on use are more accurate and better reflect the reality in the field than the sales data provided by MA holders. They will improve the effectiveness of the monitoring of antimicrobial use at different levels[40].

- Veterinarians

The Calypso module for collecting data on use has been designed to make administrative tasks as easy as possible for veterinarians. Setting up data flows between their management software and Calypso is the solution that enables data to be reported automatically. Once a certified version of the management software used in the veterinary care facility has been installed, the data are transmitted automatically. However, manual data entry is also possible for veterinarians who are unable to set up such an IT workflow, and has been available since October 2023.

By connecting to Calypso, veterinarians can monitor the data transmitted via the application. In the coming months, new reporting tables will also enable them to assess their own uses of antimicrobials, through suitable indicators defined by animal species. In view of the national trends, monitoring these indicators over time may be an interesting self-assessment tool for professionals.

- At national level

This collection system provides more precise data on use than the sales data transmitted by MA holders, as it provides greater detail for animal species and sub-categories. For example,

[40] Urban, D., *et al*. "Surveillance of antimicrobial consumption in veterinary medicine in France and in Europe" Bulletin de l'Académie Vétérinaire de France (2023). doi.org/10.3406/bavf.2023.71038

with current sales data, the level of exposure to antimicrobials is estimated for pets without distinguishing between cats and dogs. With the data collected via Calypso, it will be possible to assess the use of antimicrobials for each species separately. The same will be true for sheep, goats and the various poultry species. For the pig sector, data are recorded according to production stage (lactation/post-weaning/fattening). For ruminants, animal sub-categories have been established to provide information on the types of production sector (meat/dairy, etc.).

Data on antimicrobial use at national level will be analysed in annual reports. These data could be useful in the development and assessment of public policies to combat antimicrobial resistance. Gaining a better understanding of uses by animal species will make it possible to identify and implement actions that better reflect the reality in the field as part of the future EcoAntibio 3 plan. These precise data could contribute to the development and optimisation of new best practices in the fight against antimicrobial resistance.

The data collected can also be used at national level to analyse possible associations between antimicrobial uses and antimicrobial resistance in different sectors (human, animal, environment). This intersectoral approach will help support the "One Health" response to antimicrobial resistance in France, which was initiated in 2016 with the adoption of an interministerial roadmap to combat antimicrobial resistance[41].

- In Europe

From September 2024, Member States will have to send the EMA data on use collected for the various animal species and sub-categories in accordance with the timetable set out in Regulation (EU) No 2019/6 (see Section 6.1). Each year, the EMA will publish a report on sales and uses of antimicrobials in the European Union.

In 2022, the EMA published a manual defining the animal categories for which use data will have to be transmitted[42]. The data collected by the Member States will be used to estimate the biomass of animals treated, which corresponds to the "numerator" in the indicators of animal exposure to antimicrobials. In October 2023, a guideline was adopted to define the "denominator" of these indicators, which corresponds to the animal biomass likely to be treated with antimicrobials during the year[43]. The methodology adopted to calculate exposure indicators from use data is similar to that applied in the monitoring of sales of veterinary medicinal products containing antimicrobials in France (taking the dose and duration of treatment into account). This will enable the level of exposure to antimicrobials to be estimated by animal species in each country using harmonised indicators. These indicators will therefore be more accurate than those currently calculated for all food-producing animal species (in mg of antibiotic per kg of body weight)[44].

These indicators, calculated on the basis of use data, should lead to a better assessment of the selection pressure of antimicrobials on bacterial populations. The integrated analysis of indicators of antimicrobial use and data on bacterial resistance to antimicrobials in humans and animals in Europe will make it possible to monitor trends and gain a better understanding of the complex mechanisms of antimicrobial resistance. The fourth JIACRA report (2019-

41 https://sante.gouv.fr/IMG/pdf/feuille_de_route_antibioresistance_nov_2016.pdf

42 https://www.ema.europa.eu/en/documents/other/antimicrobial-use-data-reporting-animal-categories-numerator-manual-reporting-data-ema_en.pdf

43 https://www.ema.europa.eu/en/documents/scientific-guideline/guideline-reporting-antimicrobial-sales-use-animals-eu-level-denominators-indicators_en.pdf

44 https://www.ema.europa.eu/en/documents/report/sales-veterinary-antimicrobial-agents-31-european-countries-2021-trends-2010-2021-twelfth-esvac_en.pdf

2021), which will be published shortly, analyses data from five different monitoring networks coordinated by the three European agencies (EMA, EFSA, ECDC)[45]. This joint report reflects the European Commission's "One Health" approach to antimicrobial resistance, by addressing the human and veterinary sectors together in a holistic and coordinated approach. This type of integrated analysis will provide valuable insights for policymakers across the EU.

[45] https://www.ema.europa.eu/en/veterinary-regulatory/overview/antimicrobial-resistance/analysis-antimicrobial-consumption-resistance-jiacra-reports

ANNEXES

Annex 1: List of tables and figures in this report

List of tables

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Annex 2: Materials and methods

Since 2021, this sales monitoring has been integrated in the ANMV's quality management system according to the ISO 9001 standard, to ensure compliance with data quality requirements.

■ Data used in this report

○ Data on sales of medicinal products containing antibiotics

Monitoring of sales is based on annual reporting by each MA holder marketing veterinary medicinal products containing antibiotics 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 antibiotics 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. Large differences compared with previous years are also subject to a specific audit.

○ Data on French animal populations

To take account of fluctuations in the animal population when interpreting the data, the information published by Agreste[46] is used to assess populations of food-producing animals.

For domestic pets, data are provided by statistics from FACCO[47], 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[48] (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[49] (FEAP).

In order to evaluate the biomasses of animals potentially treated with antibiotics, 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 4.

[46] http://agreste.agriculture.gouv.fr/
[47] http://www.facco.fr/
[48] https://www.ifce.fr/
[49] http://feap.info/

- Data on veterinary medicinal products containing antibiotics

A variety of information on medicinal products containing antibiotics is available in the IRCP index of veterinary medicinal products authorised in France[50]. Some data from the Summary of Product Characteristics (SPC) have been used for each veterinary medicine:

- qualitative and quantitative composition in antibiotics;
- 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 antibiotics 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, dosage 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.

■ Calculating 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 monitoring may be used for different purposes.

Some indicators may be preferred for assessing the correlation between sales of antibiotics 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 antibiotics sold over time;
- exposure indicators, used to better represent the use of antibiotics to treat animals.

- Tonnages of antibiotics sold

The quantity of antibiotics 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.

For some active ingredients expressed in IU (International Units), a conversion coefficient (WHO standard value) has been used to calculate the quantity of antibiotics in mg by medicine presentation. The coefficients used for the national monitoring scheme are those

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

recommended by the EMA in the framework of the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) scheme[51].

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

Tonnages of antibiotics 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 antibiotics for each presentation.

- Quantity of antibiotics 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 antibiotics sold and the biomass of the population potentially using antibiotics can be calculated.

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

- 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 antibiotics 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 antibiotics 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.

The **indicator of exposure** of animals to antibiotics 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 antibiotics.

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 antibiotics sold during the year were administered to animals in France during this same year.

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

The total per year in body weight treated is lower than the sum of body weight treated per class of antibiotics, due to combinations of antibiotics 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 antibiotics.

■ Interpretation of indicators of sales and indicators of exposure

The results of this sales survey of veterinary medicinal products 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. Antibiotic sales expressed in tonnage of active substance do not reflect exposure to the different classes because the antibiotics' 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 antibiotics. These estimates by pharmaceutical companies have been in place since 2009, and only partially describe off-label use[52].

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.

As part of this national monitoring, antibiotic usage patterns are presented for the different categories of cattle (calves and other cattle) and poultry species (*Gallus gallus* and turkeys). It is important to note that this estimation by the MA holders is a complicated exercise, especially for medicines authorised for several target species. These results should therefore be interpreted with caution.

The biomass of the animal population used in this report corresponds to the weight of the animal population potentially treated with antibiotics in France. The weights considered are slaughter weights or adult weights. These weights are generally higher than 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.

■ Important points concerning the 2022 annual report

Some biomass data for the year 2021 have been updated according to the Agreste website. The data from annual agricultural statistics for 2021 and 2022 correspond to the provisional figures[53] published in June 2023.

[52] 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 antibiotics under the provisions of the cascade approach (Article L. 5143-4 of the French Public Health Code) are not taken into account.

[53] https://agreste.agriculture.gouv.fr/agreste-web/disaron/Chd2310/detail/

Annex 3: List of antimicrobial classes and active substances

The tables below describe for each type of antimicrobial (antibiotics, antifungals and antiprotozoals) the substances for which sales have been reported.

Antibiotics (sales between 1999 and 2022)

Class	Substances
AMINOGLYCOSIDES	apramycin
	dihydrostreptomycin
	framycetin
	gentamicin
	kanamycin
	neomycin
	paromomycin
	spectinomycin
OTHER ANTIBIOTICS	fusidic acid
	dimetridazole
	metronidazole
	pyrimethamine
	rifaximin
	thiostrepton
CEPHALOSPORINS 1&2G	cefalexin
	cefalonium
	cefapirin
	cefazolin
CEPHALOSPORINS 3&4G	cefoperazone
	cefovecin
	cefquinome
	ceftiofur
FLUOROQUINOLONES	danofloxacin
	difloxacin
	enrofloxacin
	ibafloxacin
	marbofloxacin
	orbifloxacin
	pradofloxacin
LINCOSAMIDES	clindamycin
	lincomycin
	pirlimycin
MACROLIDES	erythromycin
	gamithromycin
	spiramycin
	tildipirosin
	tilmicosin

Class	Substances
MACROLIDES	tulathromycin
	tylosin
	tylvalosin
PENICILLINS	amoxicillin
	ampicillin
	benzylpenicillin
	cloxacillin
	nafcillin
	penethamate hydriodide
	phenoxymethylpenicillin
PHENICOLS	chloramphenicol
	florfenicol
	thiamphenicol
PLEUROMUTILINS	tiamulin
	valnemulin
POLYMYXINS	bacitracin
	colistin
	polymyxin B
QUINOLONES	oxolinic acid
	flumequine
SULFONAMIDES	phthalylsulfathiazole
	sulfadiazine
	sulfadimethoxine
	sulfadimidine
	sulfadoxine
	sulfaguanidine
	sulfamethoxazole
	sulfamethoxypyridazine
	sulfanilamide
	sulfapyridine
	sulfaquinoxaline
TETRACYCLINES	chlortetracycline
	doxycycline
	oxytetracycline
	tetracycline
TRIMETHOPRIM	trimethoprim

Antifungals (sales in 2022)

Class	Substances
OTHER ANTIFUNGALS	bronopol
	griseofulvin
	nystatin
	terbinafine
AZOLES	clotrimazole
	enilconazole
	itraconazole
	ketoconazole
	miconazole
	posaconazole
	thiabendazole

Antiprotozoals (sales in 2022)

Class	Substances
AMPROLIUM	amprolium
DECOQUINATE	decoquinate
OTHER ANTIPROTOZOALS	antimony
	imidocarb
	melarsomine
HALOFUGINONE	halofuginone
NITROIMIDAZOLES	dimetridazole
TRIAZINES	diclazuril
	toltrazuril

Annex 4: Data on animal populations

Numbers of animals potentially using antibiotics between 1999 and 2022

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	3 405 391	3 972 237	994 152	600 356	856 853	819 562	469 046	458 038				4 530 467	745 141	371 412	1 185 466
2021	3 324 720	3 878 004	971 694	543 702	859 807	793 155	470 413	437 056				4 404 489	717 947	355 241	1 171 523
2022	3 231 865	3 787 528	940 443	516 908	857 719	785 487	469 736	429 122				4 318 546	724 082	352 188	1 098 847

French Agency for Food, Environmental and Occupational Health & Safety
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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	964 560	22 810 457	731 756 000	39 087 000	61 119 000	20 899 000	54 959 000	37 167 000	186 000	427 000	27 523 000
2021	351 043	931 916	22 847 855	719 070 000	35 410 000	57 240 000	19 150 000	57 309 000	37 041 000	135 000	415 000	25 449 000
2022	330 658	873 185	22 409 021	703 401 000	30 173 000	38 610 000	17 578 000	58 191 000	26 965 848	76 000	391 000	23 577 000

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	663 084	89 910	101 148	269 729
2016	7 340 000	13 480 000	656 080	88 960	100 080	266 880
2017	7 485 000	13 835 000	636 260	82 275	104 215	274 250
2018	7 630 000	14 190 000	627 560	81 150	102 790	270 500
2019	7 565 000	14 645 000	603 630	84 720	105 900	264 750
2020	7 500 000	15 100 000	596 790	83 760	104 700	261 750
2021	7 550 000	15 000 000	589 950	72 450	113 850	258 750
2022	7 600 000	14 900 000	584 051	71 726	112 712	256 163

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	**35**	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	1 414 905	533 553	1 277 178	3 247 033		993 341	3 611 797	1 451 387
2021	1 392 992	509 038	1 279 512	3 206 680		1 016 650	3 672 628	1 417 357
2022	1 353 918	501 038	1 247 494	2 969 805		974 841	3 503 851	1 353 007

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	39 600 000	0	360 000	2 100 000	2 000 000	100 000	500 000	200 000
2021	39 600 000	0	360 000	2 128 000	1 881 000	100 000	500 000	595 000
2022	39 600 000	0	360 000	2 128 000	1 881 000	100 000	500 000	595 000

▪ Table 6: Biomasses of animal populations potentially using antibiotics from 1999 to 2022 (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	874 097	537 755	57 320	30 652	18 318 906
2000	10 466 102	3 221 768	2 931 104	136 202	174 640	887 166	537 755	59 630	30 860	18 445 226
2001	10 746 012	3 219 902	3 036 354	135 733	172 510	874 724	540 249	59 050	32 184	18 816 717
2002	10 436 923	3 247 604	2 793 233	135 620	170 380	857 584	560 084	59 800	31 002	18 292 230
2003	9 982 187	3 212 933	2 753 116	128 902	168 895	850 992	562 184	50 779	31 484	17 741 470
2004	9 852 206	3 172 660	2 644 174	130 047	167 410	835 888	565 670	51 366	31 308	17 450 728
2005	9 278 685	3 109 954	2 566 981	127 918	164 385	827 382	565 860	49 608	31 308	16 722 081
2006	9 558 491	3 085 968	2 329 518	124 197	161 360	807 930	560 410	51 687	30 602	16 710 162
2007	9 665 091	3 100 280	2 436 728	125 567	160 710	792 902	562 383	50 191	30 293	16 924 145
2008	9 807 349	3 100 153	2 388 839	111 997	159 800	668 976	566 088	47 810	30 405	16 881 417
2009	9 724 506	3 050 730	2 329 853	102 609	158 875	734 430	577 452	46 654	30 405	16 755 514
2010	9 558 447	3 027 512	2 361 950	99 916	157 690	729 376	577 896	45 042	34 972	16 592 802
2011	9 331 444	2 998 187	2 386 525	107 810	157 315	713 429	577 100	46 880	34 972	16 353 661
2012	9 258 486	2 920 659	2 345 318	103 125	156 940	663 328	574 136	45 040	34 836	16 101 867
2013	9 332 284	2 870 798	2 325 960	101 365	158 280	643 746	568 378	40 705	34 836	16 076 352
2014	9 393 431	2 854 511	2 268 865	103 642	159 620	638 932	560 346	41 641	34 858	16 055 845
2015	9 443 444	2 849 950	2 323 787	102 202	161 820	627 010	557 441	44 521	34 858	16 145 031
2016	9 452 929	2 858 237	2 235 226	92 776	164 020	628 459	551 552	42 471	35 127	16 060 797
2017	9 324 458	2 813 936	2 199 462	87 519	167 615	615 273	538 627	42 977	35 127	15 824 995
2018	9 137 254	2 828 923	2 220 364	83 909	171 210	626 352	531 262	45 841	35 183	15 680 297
2019	8 938 071	2 823 903	2 150 851	81 088	172 055	620 646	520 499	46 272	35 183	15 388 566
2020	8 735 752	2 806 476	2 111 755	73 932	172 900	623 938	514 601	44 860	35 193	15 119 405
2021	8 503 830	2 801 465	2 038 415	68 603	173 250	620 579	503 528	45 164	35 193	14 790 026
2022	8 314 115	2 730 633	1 877 374	63 635	173 600	588 037	498 492	45 164	34 878	14 325 928
Variation 2022/2021	-189 716 -2.2%	-70 832 -2.5%	-161 041 -7.9%	-4 968 -7.2%	350 0.2%	-32 542 -5.2%	-5 035 -1.0%	0 0.0%	-315 -0.9%	-464 098 -3.1%
Variation 2022/2011	-1 017 329 -10.9%	-267 554 -8.9%	-509 151 -21.3%	-44 175 -41.0%	16 285 10.4%	-125 392 -17.6%	-78 608 -13.6%	-1 716 -3.7%	-94 -0.3%	-2 027 734 -12.4%

Annex 5: Change in sales and in exposure to antibiotics for all animal species combined

Table 7: Change in tonnage of antibiotics by pharmaceutical form (in tonnes)

	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	460	20	120	11	**1237**
2007	712	475	19	110	11	**1327**
2008	627	406	20	109	11	**1172**
2009	536	393	18	102	10	**1059**
2010	496	389	19	102	10	**1015**
2011	407	370	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	214	17	93	8	**531**
2017	162	223	16	91	7	**500**
2018	137	220	17	91	8	**473**
2019	133	183	17	84	6	**424**
2020	126	176	18	85	7	**412**
2021	98	166	19	80	6	**368**
2022	17	154	18	78	6	**273**
Variation 2022 / 2021	-81 -82.5%	-12 -7.2%	-1 -4.5%	-2 -2.2%	0 2.6%	**-95** **-25.9%**
Variation 2022/2011	-390 -95.8%	-216 -58.5%	0 -2.5%	-26 -25.0%	-4 -43.1%	**-637** **-70.0%**

Table 8: 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	28 952 123	772 720	6 853 123	**70 501 456**
2006	34 275 063	27 420 922	794 301	7 066 749	**69 557 035**
2007	37 243 221	27 820 730	796 317	6 599 644	**72 459 912**
2008	31 973 271	24 448 710	814 218	6 791 781	**64 027 980**
2009	29 339 104	24 624 590	782 951	6 293 935	**61 040 580**
2010	26 929 498	24 727 831	789 914	6 498 653	**58 945 896**
2011	22 268 222	23 654 557	755 115	6 486 296	**53 164 190**
2012	16 145 372	22 413 148	692 001	6 624 614	**45 875 135**
2013	13 496 041	20 353 615	697 294	6 506 209	**41 053 159**
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	13 519 440	669 995	5 118 317	**27 346 447**
2017	6 497 851	13 845 257	675 657	4 643 820	**25 662 585**
2018	5 452 429	13 432 817	700 437	4 784 568	**24 370 251**
2019	4 819 232	10 952 035	698 840	4 406 837	**20 876 944**
2020	4 589 576	10 189 156	762 098	4 521 424	**20 062 254**
2021	3 579 714	9 763 956	818 116	4 198 427	**18 360 213**
2022	577 281	9 031 771	787 931	4 157 483	**14 554 466**
Variation 2022 / 2021	-3 002 433	-732 185	-30 185	-40 944	**-3 805 747**
	-83.9%	-7.5%	-3.7%	-1.0%	**-20.7%**
Variation 2022 / 2011	-21 690 941	-14 622 786	32 816	-2 328 813	**-38 609 724**
	-97.4%	-61.8%	4.3%	-35.9%	**-72.6%**

Table 9: 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	5 975 777	122 421	2 837 270	**11 862 208**
2006	2 927 972	5 689 912	120 798	2 983 577	**11 722 259**
2007	3 256 585	5 764 991	116 362	2 777 477	**11 915 415**
2008	2 789 002	5 074 942	121 082	2 803 621	**10 788 647**
2009	2 563 942	5 101 223	111 425	2 640 435	**10 417 025**
2010	2 398 407	5 110 532	116 605	2 741 597	**10 367 141**
2011	2 035 767	4 860 062	109 164	2 788 404	**9 793 397**
2012	1 572 826	4 551 791	101 161	2 850 537	**9 076 315**
2013	1 336 389	4 190 112	100 277	2 758 424	**8 385 202**
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	2 749 824	91 579	2 465 365	**6 101 056**
2017	613 961	2 797 552	94 481	2 280 525	**5 786 519**
2018	535 150	2 716 919	99 098	2 409 949	**5 761 116**
2019	491 783	2 229 141	98 659	2 248 115	**5 067 698**
2020	483 256	2 055 288	105 598	2 309 119	**4 953 261**
2021	386 464	1 977 520	114 149	2 208 767	**4 686 900**
2022	56 274	1 815 440	108 523	2 170 452	**4 150 689**
Variation 2022 / 2021	-330 190	-162 080	-5 626	-38 315	**-536 211**
	-85.4%	-8.2%	-4.9%	-1.7%	**-11.4%**
Variation 2022 / 2011	-1 979 493	-3 044 622	-641	-617 952	**-5 642 708**
	-97.2%	-62.6%	-0.6%	-22.2%	**-57.6%**

Table 10: Change in the indicator of exposure by pharmaceutical form (ALEA)

	MEDICATED PREMIXES	ORAL POWDERS & SOLUTIONS	OTHER ORAL FORMS	INJECTIONS	TOTAL
1999	0.209	0.179	0.007	0.162	**0.557**
2000	0.215	0.213	0.007	0.159	**0.594**
2001	0.201	0.244	0.006	0.156	**0.607**
2002	0.190	0.281	0.006	0.157	**0.634**
2003	0.183	0.306	0.007	0.163	**0.659**
2004	0.170	0.315	0.007	0.154	**0.645**
2005	0.175	0.357	0.007	0.170	**0.709**
2006	0.175	0.341	0.007	0.179	**0.702**
2007	0.192	0.341	0.007	0.164	**0.704**
2008	0.165	0.301	0.007	0.166	**0.639**
2009	0.153	0.304	0.007	0.158	**0.622**
2010	0.145	0.308	0.007	0.165	**0.625**
2011	0.124	0.297	0.007	0.171	**0.599**
2012	0.098	0.283	0.006	0.177	**0.564**
2013	0.083	0.261	0.006	0.172	**0.522**
2014	0.083	0.314	0.007	0.186	**0.590**
2015	0.069	0.155	0.005	0.138	**0.367**
2016	0.049	0.171	0.006	0.154	**0.380**
2017	0.039	0.177	0.006	0.144	**0.366**
2018	0.034	0.173	0.006	0.154	**0.367**
2019	0.032	0.145	0.006	0.146	**0.329**
2020	0.032	0.136	0.007	0.153	**0.328**
2021	0.026	0.134	0.008	0.149	**0.317**
2022	0.004	0.127	0.008	0.152	**0.290**
Variation 2022 / 2021	-0.022	-0.007	-0.000	0.002	**-0.027**
	-85.0%	-5.2%	-1.8%	1.4%	**-8.6%**
Variation 2022 / 2011	-0.121	-0.170	0.001	-0.019	**-0.309**
	-96.8%	-57.4%	13.5%	-11.1%	**-51.6%**

Table 11: Change in tonnage sold by antibiotic class (in tonnes)

	AMINOGLYCOSIDES	OTHER ANTIBIOTICS*	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	66.4	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	67.2	13.0	211.4	600.1	33.1	1 237,1
2007	74.3	0.7	7.2	2.0	4.7	9.1	97.6	93.6	5.9	10.0	74.5	10.9	224.6	678.7	33.8	1 327,5
2008	72.9	0.7	7.2	2.1	4.9	7.8	94.9	85.0	5.0	7.9	66.6	7.9	194.9	584.6	29.6	1 172,0
2009	64.9	0.6	7.0	1.8	4.9	7.1	83.4	86.7	4.8	8.2	67.0	7.5	182.0	505.0	28.3	1 059,1
2010	62.5	0.6	5.9	2.3	5.3	6.7	81.4	90.6	5.1	7.6	65.7	8.0	174.8	472.2	26.4	1 015,3
2011	63.6	0.7	7.0	2.3	5.3	5.4	70.4	90.3	4.6	6.8	61.1	6.2	171.3	389.8	25.0	909.9
2012	57.4	0.7	6.6	2.3	4.9	4.7	61.0	86.2	4.7	5.6	51.6	5.3	145.3	328.4	21.3	786.0
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	707.7
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	20.8	3.2	111.0	185.4	17.2	530.7
2017	54.8	1.3	5.4	0.1	1.2	3.0	34.0	72.7	5.4	4.2	17.2	3.3	91.8	189.0	16.1	499.5
2018	52.0	1.4	5.6	0.1	1.0	3.0	32.1	71.0	5.8	3.5	14.6	2.8	84.2	180.4	15.1	472.8
2019	50.4	1.6	5.1	0.1	1.0	3.2	30.5	70.0	5.4	3.5	11.1	2.3	81.3	144.7	13.3	423.6
2020	50.1	1.7	5.4	0.1	0.8	3.3	30.0	68.4	5.9	3.4	10.7	1.8	87.4	128.9	14.1	412.0
2021	47.2	1.8	5.4	0.1	0.7	3.2	26.4	65.7	5.5	2.9	9.8	1.6	73.1	113.0	11.5	367.9
2022	39.5	1.6	4.8	0.1	0.7	3.1	20.6	57.2	5.4	2.1	8.3	1.4	44.3	75.7	7.8	272.7
Variation 2022 / 2021	-7.6 -16.2%	-0.2 -10.6%	-0.6 -10.5%	-0.0 -8.9%	-0.0 -5.0%	-0.1 -4.1%	-5.8 -21.9%	-8.5 -12.9%	-0.1 -2.2%	-0.7 -25.3%	-1.5 -15.3%	-0.2 -12.1%	-28.8 -39.4%	-37.3 -33.0%	-3.7 -32.3%	-95.2 -25.9%
Variation 2022 / 2011	-24.1 -37.9%	1.0 149.4%	-2.2 -31.4%	-2.2 -95.5%	-4.6 -86.8%	-2.4 -43.6%	-49.8 -70.8%	-33.1 -36.6%	0.8 17.9%	-4.6 -68.4%	-52.8 -86.4%	-4.8 -77.5%	-127.0 -74.1%	-314.1 -80.6%	-17.3 -68.9%	-637.2 -70.0%

* Other antibiotics: dimetridazole, metronidazole, pyrimethamine and rifaximin

Table 12: Change in sales by antibiotic class in mg of active ingredient per kilogram of body weight (mg/kg)

	AMINOGLYCOSIDES	OTHER ANTIBIOTICS*	CEPHALOSPORINS 1&2G	CEPHALOSPORINS 3&4G	FLUOROQUINOLONES	LINCOSAMIDES	MACROLIDES	PENICILLINS	PHENICOLS	PLEUROMUTILINS	POLYMYXINS	QUINOLONES	SULFONAMIDES	TETRACYCLINES	TRIMETHOPRIM	TOTAL
1999	4.46	0.05	0.29	0.05	0.18	0.32	4.34	4.94	0.24	1.70	3.67	1.08	14.15	34.05	2.05	71.56
2000	4.86	0.05	0.29	0.06	0.20	0.43	4.79	5.25	0.25	1.79	3.82	0.89	14.68	35.55	2.09	74.99
2001	4.92	0.05	0.28	0.05	0.22	0.49	5.41	5.01	0.24	1.37	3.83	0.79	13.05	35.41	1.92	73.05
2002	4.93	0.05	0.34	0.06	0.23	0.59	5.92	5.33	0.31	1.38	3.71	0.86	12.49	34.44	1.85	72.50
2003	4.60	0.02	0.39	0.07	0.25	0.58	5.75	5.18	0.24	1.24	3.79	0.79	11.78	36.39	1.83	72.90
2004	4.50	0.05	0.38	0.08	0.25	0.54	5.53	4.84	0.28	0.93	3.61	0.72	12.02	36.55	1.94	72.21
2005	4.59	0.04	0.43	0.10	0.26	0.60	5.97	5.30	0.28	0.49	3.97	0.79	12.87	39.64	2.13	77.47
2006	4.65	0.06	0.38	0.11	0.29	0.54	6.15	5.55	0.36	0.60	4.02	0.78	12.65	35.91	1.98	74.03
2007	4.39	0.04	0.42	0.12	0.28	0.54	5.77	5.53	0.35	0.59	4.40	0.64	13.27	40.10	2.00	78.44
2008	4.32	0.04	0.43	0.13	0.29	0.46	5.62	5.04	0.30	0.47	3.94	0.47	11.54	34.63	1.75	69.42
2009	3.87	0.04	0.42	0.11	0.29	0.42	4.98	5.17	0.29	0.49	4.00	0.45	10.86	30.14	1.69	63.21
2010	3.77	0.04	0.36	0.14	0.32	0.40	4.90	5.46	0.31	0.46	3.96	0.48	10.53	28.46	1.59	61.19
2011	3.89	0.04	0.43	0.14	0.32	0.33	4.31	5.52	0.28	0.41	3.73	0.38	10.48	23.84	1.53	55.64
2012	3.56	0.04	0.41	0.14	0.31	0.29	3.79	5.35	0.29	0.35	3.20	0.33	9.02	20.40	1.32	48.81
2013	3.38	0.04	0.40	0.13	0.30	0.28	3.23	5.39	0.29	0.35	2.66	0.29	8.48	17.53	1.26	44.02
2014	3.59	0.04	0.46	0.12	0.31	0.29	3.64	6.11	0.37	0.40	3.20	0.35	9.14	19.64	1.42	49.06
2015	2.99	0.03	0.27	0.09	0.16	0.19	2.26	3.98	0.24	0.34	1.89	0.17	6.61	11.63	0.96	31.84
2016	3.47	0.08	0.40	0.02	0.11	0.19	2.29	4.83	0.35	0.28	1.29	0.20	6.91	11.54	1.07	33.04
2017	3.46	0.08	0.34	0.01	0.07	0.19	2.15	4.59	0.34	0.26	1.09	0.21	5.80	11.94	1.02	31.57
2018	3.32	0.09	0.36	0.01	0.06	0.19	2.05	4.53	0.37	0.23	0.93	0.18	5.37	11.51	0.97	30.15
2019	3.28	0.11	0.33	0.01	0.06	0.21	1.98	4.55	0.35	0.23	0.72	0.15	5.29	9.40	0.86	27.52
2020	3.32	0.11	0.35	0.01	0.05	0.22	1.99	4.53	0.39	0.23	0.71	0.12	5.78	8.53	0.93	27.25
2021	3.19	0.12	0.36	0.01	0.05	0.22	1.78	4.44	0.37	0.19	0.66	0.11	4.94	7.64	0.78	24.88
2022	2.76	0.11	0.34	0.01	0.05	0.21	1.44	3.99	0.38	0.15	0.58	0.10	3.09	5.28	0.54	19.04
Variation 2022 / 2021	-0.43	-0.01	-0.03	-0.00	-0.00	-0.00	-0.35	-0.45	0.00	-0.04	-0.08	-0.01	-1.85	-2.36	-0.23	-5.84
	-13.5%	-7.7%	-7.6%	-5.9%	-1.9%	-1.0%	-19.4%	-10.1%	1.0%	-22.8%	-12.5%	-9.2%	-37.4%	-30.9%	-30.1%	-23.5%
Variation 2022 / 2011	-1.13	0.07	-0.09	-0.13	-0.27	-0.12	-2.87	-1.53	0.10	-0.26	-3.16	-0.28	-7.38	-18.55	-0.99	-36.60
	-29.1%	184.7%	-21.7%	-94.9%	-85.0%	-35.6%	-66.6%	-27.7%	34.6%	-63.9%	-84.5%	-74.3%	-70.5%	-77.8%	-64.5%	-65.8%

* Other classes: dimetridazole, metronidazole, pyrimethamine and rifaximin

Table 13: Change in body weight treated-day by antibiotic 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	14 573 384	814 949	6 145 501	23 670 632	5 072 329	70 501 456
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	14 690 282	514 581	4 908 991	17 180 935	3 958 591	58 945 896
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	13 671 319	409 713	4 769 510	14 999 077	3 744 852	53 164 190
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	11 683 797	355 498	4 032 944	13 540 269	3 199 166	45 875 135
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	9 899 944	310 410	3 836 174	11 694 340	3 101 504	41 053 159
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	4 978 899	224 474	3 730 804	7 326 946	3 108 162	27 346 447
2017	2 588 778	50 936	135 580	53 729	174 030	454 343	2 654 092	4 900 231	231 367	733 420	4 133 664	231 703	3 308 263	8 046 216	2 992 456	25 662 585
2018	2 446 132	48 682	136 507	55 028	169 473	454 735	2 415 123	4 734 239	241 543	666 253	3 508 417	188 330	3 088 256	8 170 749	2 810 684	24 370 251
2019	2 257 702	54 938	133 706	49 031	165 129	461 272	2 094 498	4 706 512	229 810	635 946	2 691 789	157 683	2 838 536	6 381 049	2 442 957	20 876 944
2020	2 193 474	52 108	136 449	45 647	146 019	464 247	2 037 940	4 616 442	245 753	544 527	2 511 346	117 092	3 067 968	5 863 326	2 609 179	20 062 254
2021	2 065 202	55 754	140 648	48 182	138 679	421 887	1 750 471	4 373 981	233 288	458 953	2 296 418	105 467	2 616 112	5 545 851	2 217 315	18 360 213
2022	1 743 199	48 055	123 243	44 411	131 555	393 740	1 331 085	3 941 016	227 693	188 872	1 929 483	99 104	1 714 934	4 312 968	1 552 844	14 554 465
Variation 2022 / 2021	-322 003	-7 699	-17 405	-3 771	-7 124	-28 147	-419 386	-432 965	-5 595	-270 081	-366 935	-6 363	-901 178	-1 232 883	-664 471	-3 805 748
	-15.6%	-13.8%	-12.4%	-7.8%	-5.1%	-6.7%	-24.0%	-9.9%	-2.4%	-58.8%	-16.0%	-6.0%	-34.4%	-22.2%	-30.0%	-20.7%
Variation 2022 / 2011	-1 910 829	1 070	-60 360	-1 091 854	-1 063 907	-812 644	-5 791 635	-2 223 459	58 759	-1 237 790	-11 741 836	-310 609	-3 054 576	-10 686 109	-2 192 008	-38 609 725
	-52.3%	2.3%	-32.9%	-96.1%	-89.0%	-67.4%	-81.3%	-36.1%	34.8%	-86.8%	-85.9%	-75.8%	-64.0%	-71.2%	-58.5%	-72.6%

Table 14: Change in body weight treated by antibiotic 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
	1 067 372	7 489	10 896	218 523	312 948	184 307	1 153 792	1 569 252	121 861	230 899	2 182 588	149 779	1 050 189	4 064 879	840 298	11 263 712
2005	1 058 202	5 309	11 628	255 451	342 811	180 234	1 239 789	1 672 908	116 663	127 628	2 365 595	157 703	1 071 517	4 317 924	871 721	11 862 208
	1 048 722	8 985	11 496	296 009	376 593	164 527	1 257 883	1 731 032	151 399	127 409	2 421 720	155 718	1 042 325	3 964 054	835 189	11 722 259
2010	814 488	5 573	10 054	343 656	358 790	118 128	1 100 719	1 664 584	130 965	100 523	2 408 185	100 095	876 094	3 144 169	717 989	10 367 141
2011	821 642	5 499	10 692	340 257	360 937	97 872	1 041 634	1 684 123	118 668	85 261	2 277 504	80 587	865 545	2 829 732	691 141	9 793 397
2012	763 087	5 368	10 290	340 522	352 116	81 143	964 367	1 623 236	120 378	74 402	2 004 667	70 471	736 271	2 719 525	597 435	9 076 315
2013	752 769	4 211	9 290	306 104	345 740	80 026	896 653	1 619 472	119 729	72 993	1 788 452	61 695	704 402	2 392 974	576 469	8 385 202
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	1 002 837	44 698	639 298	1 667 867	545 606	6 101 056
2017	791 893	5 838	10 810	17 619	41 439	59 372	700 305	1 430 701	142 802	41 976	861 372	45 852	567 301	1 830 365	509 088	5 786 519
2018	798 041	5 722	11 692	18 530	46 842	60 941	722 272	1 443 185	151 367	36 210	734 342	37 395	554 197	1 908 496	506 075	5 761 116
2019	767 494	6 555	12 159	17 252	46 421	60 208	673 626	1 430 638	142 994	35 117	577 097	31 581	508 485	1 512 211	446 673	5 067 698
2020	729 953	6 367	11 586	16 337	41 508	61 192	680 955	1 392 386	155 849	33 689	530 140	23 354	547 434	1 446 172	476 825	4 953 261
2021	729 983	6 846	13 990	17 491	38 926	56 485	637 346	1 352 659	143 355	28 376	484 965	20 790	484 714	1 398 303	423 584	4 686 900
2022	702 273	5 954	12 029	15 923	39 152	54 171	595 654	1 283 644	140 537	18 223	416 143	19 852	370 766	1 170 789	340 893	4 150 689
Variation 2022 / 2021	-27 710	-892	-1 961	-1 568	226	-2 314	-41 692	-69 015	-2 818	-10 153	-68 822	-938	-113 948	-227 514	-82 691	-536 211
	-3.8%	-13.0%	-14.0%	-9.0%	0.6%	-4.1%	-6.5%	-5.1%	-2.0%	-35.8%	-14.2%	-4.5%	-23.5%	-16.3%	-19.5%	-11.4%
Variation 2022 / 2011	-119 369	455	1 337	-324 334	-321 785	-43 701	-445 980	-400 479	21 869	-67 038	-1 861 361	-60 735	-494 779	-1 658 943	-350 248	-5 642 708
	-14.5%	8.3%	12.5%	-95.3%	-89.2%	-44.7%	-42.8%	-23.8%	18.4%	-78.6%	-81.7%	-75.4%	-57.2%	-58.6%	-50.7%	-57.6%

Table 15: Change in ALEA by antibiotic 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	0.110	0.012	0.069	0.175	0.052	0.557
2000	0.059	0.000	0.000	0.009	0.012	0.009	0.058	0.100	0.006	0.024	0.118	0.011	0.071	0.182	0.053	0.594
2001	0.060	0.000	0.000	0.009	0.014	0.010	0.064	0.096	0.006	0.019	0.120	0.010	0.066	0.195	0.051	0.607
2002	0.059	0.000	0.001	0.011	0.017	0.013	0.071	0.094	0.008	0.019	0.122	0.010	0.063	0.208	0.048	0.634
2003	0.059	0.000	0.001	0.012	0.019	0.012	0.069	0.096	0.006	0.017	0.129	0.010	0.060	0.230	0.046	0.659
2004	0.061	0.000	0.001	0.013	0.018	0.011	0.066	0.090	0.007	0.013	0.125	0.009	0.060	0.233	0.048	0.645
2005	0.063	0.000	0.001	0.015	0.021	0.011	0.074	0.100	0.007	0.008	0.141	0.009	0.064	0.258	0.052	0.709
2006	0.063	0.001	0.001	0.018	0.023	0.010	0.075	0.104	0.009	0.008	0.145	0.009	0.062	0.237	0.050	0.702
2007	0.060	0.000	0.001	0.019	0.020	0.009	0.068	0.102	0.009	0.008	0.150	0.008	0.065	0.246	0.051	0.704
2008	0.057	0.000	0.001	0.020	0.022	0.009	0.069	0.093	0.007	0.006	0.141	0.006	0.058	0.207	0.046	0.639
2009	0.051	0.000	0.001	0.017	0.022	0.008	0.065	0.094	0.007	0.006	0.143	0.006	0.054	0.198	0.044	0.622
2010	0.049	0.000	0.001	0.021	0.022	0.007	0.066	0.100	0.008	0.006	0.145	0.006	0.053	0.189	0.043	0.625
2011	0.050	0.000	0.001	0.021	0.022	0.006	0.064	0.103	0.007	0.005	0.139	0.005	0.053	0.173	0.042	0.599
2012	0.047	0.000	0.001	0.021	0.022	0.005	0.060	0.101	0.007	0.005	0.124	0.004	0.046	0.169	0.037	0.564
2013	0.047	0.000	0.001	0.019	0.022	0.005	0.056	0.101	0.007	0.005	0.111	0.004	0.044	0.149	0.036	0.522
2014	0.049	0.000	0.001	0.017	0.021	0.005	0.064	0.113	0.009	0.004	0.131	0.005	0.049	0.171	0.041	0.590
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	0.102	0.028	0.367
2016	0.049	0.000	0.001	0.004	0.005	0.004	0.047	0.096	0.009	0.003	0.062	0.003	0.040	0.104	0.034	0.380
2017	0.050	0.000	0.001	0.001	0.003	0.004	0.044	0.090	0.009	0.003	0.054	0.003	0.036	0.116	0.032	0.366
2018	0.051	0.000	0.001	0.001	0.003	0.004	0.046	0.092	0.010	0.002	0.047	0.002	0.035	0.122	0.032	0.367
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	0.098	0.029	0.329
2020	0.048	0.000	0.001	0.001	0.003	0.004	0.045	0.092	0.010	0.002	0.035	0.002	0.036	0.096	0.032	0.328
2021	0.049	0.000	0.001	0.001	0.003	0.004	0.043	0.091	0.010	0.002	0.033	0.001	0.033	0.095	0.029	0.317
2022	0.049	0.000	0.001	0.001	0.003	0.004	0.042	0.090	0.010	0.001	0.029	0.001	0.026	0.082	0.024	0.290
Variation 2022 / 2021	-0.000 -0.7%	-0.000 -10.2%	-0.000 -11.2%	-0.000 -6.0%	0.000 3.8%	-0.000 -1.0%	-0.002 -3.5%	-0.002 -2.0%	0.000 1.2%	-0.001 -33.7%	-0.004 -11.4%	-0.000 -1.4%	-0.007 -21.0%	-0.013 -13.6%	-0.005 -16.9%	-0.027 -8.6%
Variation 2022 / 2011	-0.001 -2.4%	0.000 23.6%	0.000 28.4%	-0.020 -94.7%	-0.019 -87.6%	-0.002 -36.8%	-0.022 -34.7%	-0.013 -13.0%	0.003 35.2%	-0.004 -75.6%	-0.110 -79.1%	-0.004 -71.9%	-0.027 -51.1%	-0.091 -52.8%	-0.018 -43.7%	-0.309 -51.6%

Annex 6: Change in sales and in exposure to antibiotics by species

Cattle

Table 16: 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**	9 142 589	3 064 807	**0.328**
2012	165.84	**17.91**	8 681 345	3 024 281	**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	124.25	**13.14**	6 165 828	2 354 628	**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**	5 763 182	2 212 100	**0.247**
2020	116.92	13.38	5756439.00	2 228 475	**0.255**
2021	112.52	**13.23**	5 604 153	2 149 813	**0.253**
2022	110.62	**13.30**	5 548 957	2 113 169	**0.254**
Variation 2022 / 2021	-1.90	**0.07**	-55 196	-36 644	**0.001**
	-1.7%	**0.6%**	-1.0%	-1.7%	**0.5%**
Variation 2022 / 2011	-72.64	**-6.33**	-3 593 632	-951 638	**-0.074**
	-39.6%	**-32.3%**	-39.3%	-31.1%	**-22.6%**

Table 17: Change in body weight treated-day by antibiotic 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
	2 048 311	680 314	444 423	103 770	1 136 247	2 699 828	110 448	1 042 451	209 029	578 878	1 841 468	270 829	8 509 324
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
	1 815 065	1 078 489	582 448	123 853	1 173 252	2 425 657	151 054	1 067 341	246 990	509 685	3 711 989	259 556	10 833 169
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	643 982	114 178	967 078	2 310 134	535 679	9 142 589
2012	1 540 014	1 064 093	558 221	72 409	1 313 439	2 324 174	133 378	482 857	92 384	625 796	2 256 595	301 159	8 681 345
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	477 621	89 836	623 605	1 601 722	480 179	6 165 828
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	366 824	75 326	534 245	1 858 440	474 597	5 763 182
2020	1 323 536	39 961	50 353	104 583	827 843	1 751 851	153 379	400 015	63 189	555 582	1 788 497	507 362	5 756 439
2021	1 252 368	42 128	47 394	100 291	757 289	1 592 098	152 591	403 899	45 108	548 976	1 887 232	505 602	5 604 153
2022	1 275 902	38 534	48 556	93 017	717 950	1 701 904	151 472	384 800	43 007	533 976	1 784 826	501 091	5 548 957
Variation 2022 / 2021	23 534	-3 594	1 162	-7 274	-39 339	109 806	-1 119	-19 099	-2 101	-15 000	-102 406	-4 511	-55 196
	1.9%	-8.5%	2.5%	-7.3%	-5.2%	6.9%	-0.7%	-4.7%	-4.7%	-2.7%	-5.4%	-0.9%	-1.0%
Variation 2022 / 2011	-364 493	-1 014 908	-546 144	51 224	-471 858	-655 676	20 474	-259 182	-71 171	-433 102	-525 308	-34 588	-3 593 632
	-22.2%	-96.3%	-91.8%	122.6%	-39.7%	-27.8%	15.6%	-40.2%	-62.3%	-44.8%	-22.7%	-6.5%	-39.3%

Table 18: Change in body weight treated by antibiotic 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
	648 428	202 291	169 904	24 272	478 620	781 082	121 515	305 894	40 729	137 977	969 377	70 423	3 164 445
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
	518 706	233 537	186 472	20 553	510 816	670 371	105 249	300 469	28 334	127 334	832 883	68 907	2 963 954
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	195 505	22 836	199 112	698 957	96 895	3 064 807
2012	541 878	316 976	211 464	14 482	588 579	791 196	98 910	142 929	18 477	148 016	750 997	74 835	3 024 281
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	119 043	17 967	169 024	658 220	138 273	2 354 628
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	92 680	15 065	152 674	677 294	139 723	2 212 100
2020	546 564	13 351	20 688	20 917	436 883	667 963	115 706	97 079	12 638	160 238	683 295	149 251	2 228 475
2021	545 203	14 359	19 575	20 058	395 853	643 185	110 776	97 246	9 022	157 586	681 584	147 463	2 149 813
2022	548 680	12 914	21 415	18 603	388 367	678 412	108 880	92 550	8 601	156 033	621 491	147 941	2 113 169
Variation 2022 / 2021	3 477	-1 445	1 840	-1 455	-7 486	35 227	-1 896	-4 696	-421	-1 553	-60 093	478	-36 644
	0.6%	-10.1%	9.4%	-7.3%	-1.9%	5.5%	-1.7%	-4.8%	-4.7%	-1.0%	-8.8%	0.3%	-1.7%
Variation 2022 / 2011	-26 849	-295 619	-198 918	10 244	-185 962	-119 045	8 900	-102 955	-14 235	-43 079	-77 466	51 046	-951 638
	-4.7%	-95.8%	-90.3%	122.6%	-32.4%	-14.9%	8.9%	-52.7%	-62.3%	-21.6%	-11.1%	52.7%	-31.1%

Table 19: Change in exposure of cattle by antibiotic 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	0.063	0.002	0.002	0.002	0.050	0.076	0.013	0.011	0.001	0.018	0.078	0.017	0.255
2021	0.064	0.002	0.002	0.002	0.047	0.076	0.013	0.011	0.001	0.019	0.080	0.017	0.253
2022	0.066	0.002	0.003	0.002	0.047	0.082	0.013	0.011	0.001	0.019	0.075	0.018	0.254
Variation 2022 / 2021	0.002 2.9%	-0.000 -8.0%	0.000 11.9%	-0.000 -5.1%	0.000 0.3%	0.006 7.9%	0.000 0.5%	-0.000 -2.7%	-0.000 -2.5%	0.000 1.3%	-0.005 -6.7%	0.000 2.6%	0.001 0.5%
Variation 2022 / 2011	0.004 7.0%	-0.032 -95.3%	-0.021 -89.1%	0.001 149.8%	-0.015 -24.1%	-0.004 -4.5%	0.002 22.2%	-0.010 -46.9%	-0.001 -57.7%	-0.003 -12.0%	-0.000 -0.2%	0.007 71.4%	-0.074 -22.6%

Pigs

Table 20: 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	595.54	**191.50**	36 175 237	4 567 625	**1.469**
2006	576.28	**186.74**	36 287 923	4 547 561	**1.474**
2007	636.43	**205.28**	38 647 133	4 862 051	**1.568**
2008	537.85	**173.49**	32 868 661	4 169 616	**1.345**
2009	484.65	**158.86**	31 005 557	4 011 365	**1.315**
2010	447.49	**147.81**	28 216 061	3 683 490	**1.217**
2011	354.68	**118.30**	24 147 061	3 305 578	**1.103**
2012	292.01	**99.98**	19 563 454	2 904 004	**0.994**
2013	270.99	**94.40**	17 364 195	2 748 271	**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	189.83	**66.42**	10 431 703	1 843 122	**0.645**
2017	181.91	**64.64**	9 785 870	1 756 001	**0.624**
2018	167.42	**59.18**	9 116 094	1 717 283	**0.607**
2019	141.05	**49.95**	7 379 031	1 433 918	**0.508**
2020	133.41	**47.54**	7 049 286	1 385 227	**0.494**
2021	111.10	**39.66**	6 152 052	1 282 813	**0.458**
2022	60.30	**22.08**	3 968 513	991 721	**0.363**
Variation 2022 / 2021	-50.80	**-17.57**	-2 183 539	-291 092	**-0.095**
	-45.7%	**-44.3%**	-35.5%	-22.7%	**-20.7%**
Variation 2022 / 2011	-294.38	**-96.21**	-20 178 548	-2 313 857	**-0.739**
	-83.0%	**-81.3%**	-83.6%	-70.0%	**-67.1%**

Table 21: Change in body weight treated-day by antibiotic 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
	2 990 867	49 156	293 612	1 502 272	8 534 591	1 783 549	0	745 779	8 427 154	177 951	2 516 680	9 572 260	2 312 444	35 268 371
2005	3 040 918	59 745	352 557	1 640 894	8 934 122	1 807 141	0	437 141	8 610 444	186 353	2 420 581	10 016 206	2 239 518	36 175 237
	2 968 103	80 702	367 648	1 393 500	9 687 246	1 879 475	0	463 794	8 691 226	152 077	2 360 925	9 284 544	2 216 889	36 287 923
2010	1 583 945	96 608	235 854	1 083 449	6 864 480	1 983 725	27 004	251 499	7 818 702	113 403	2 222 722	6 852 999	2 101 195	28 216 061
2011	1 141 682	54 160	245 300	868 818	5 564 533	1 701 565	30 948	253 080	7 550 855	99 895	1 764 218	5 502 986	1 751 966	24 147 061
2012	905 334	42 420	252 297	826 715	3 678 768	1 722 109	48 428	278 240	6 035 917	73 886	1 465 634	4 776 944	1 452 262	19 563 454
2013	853 437	41 862	245 849	754 568	2 901 541	1 674 548	38 906	261 364	4 643 874	66 294	1 283 114	5 108 942	1 273 334	17 364 195
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	1 660 809	36 237	1 243 263	3 077 716	1 236 500	10 431 703
2017	588 637	2 354	14 431	302 513	1 442 729	1 551 612	75 332	86 199	1 212 039	37 319	1 049 173	3 712 165	1 047 039	9 785 870
2018	538 013	2 645	20 596	293 501	1 094 843	1 507 214	79 408	68 105	1 124 687	43 078	1 008 999	3 619 870	1 006 273	9 116 094
2019	500 947	2 290	18 703	304 614	929 466	1 440 386	77 780	63 347	771 180	45 090	883 871	2 611 380	877 929	7 379 031
2020	478 674	1 659	17 920	293 021	876 039	1 457 395	79 964	70 408	734 463	36 472	1 009 698	2 276 215	1 004 906	7 049 286
2021	470 843	1 814	16 368	237 102	698 276	1 386 981	69 326	53 395	699 689	39 827	788 386	1 977 437	784 492	6 152 052
2022	287 317	1 728	15 222	204 759	431 246	896 748	64 261	23 095	604 535	27 179	311 060	1 381 683	307 944	3 968 513
Variation 2022 / 2021	-183 526	-86	-1 146	-32 343	-267 030	-490 233	-5 065	-30 300	-95 154	-12 648	-477 326	-595 754	-476 548	-2 183 539
	-39.0%	-4.7%	-7.0%	-13.6%	-38.2%	-35.3%	-7.3%	-56.7%	-13.6%	-31.8%	-60.5%	-30.1%	-60.7%	-35.5%
Variation 2022 / 2011	-854 365	-52 432	-230 078	-664 059	-5 133 287	-804 817	33 313	-229 985	-6 946 320	-72 716	-1 453 158	-4 121 303	-1 444 022	-20 178 548
	-74.8%	-96.8%	-93.8%	-76.4%	-92.3%	-47.3%	107.6%	-90.9%	-92.0%	-72.8%	-82.4%	-74.9%	-82.4%	-83.6%

Table 22: Change in body weight treated by antibiotic 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
	276 460	15 176	94 758	100 860	566 895	373 477	0	101 526	1 015 274	33 043	481 144	1 506 007	447 342	4 372 872
2005	273 117	21 489	113 933	103 587	600 690	408 334	0	67 516	1 067 629	34 997	483 103	1 581 645	450 933	4 567 625
	264 474	43 687	119 235	91 145	628 113	432 794	0	54 361	1 096 445	28 473	484 839	1 470 614	456 706	4 547 561
2010	176 413	47 064	73 599	66 463	461 338	409 202	13 502	40 592	981 192	21 490	428 285	1 106 873	407 015	3 683 490
2011	129 151	22 976	77 079	52 793	390 083	366 887	15 474	38 084	1 042 981	19 551	351 086	900 363	348 439	3 305 578
2012	112 035	17 231	83 597	57 987	305 917	378 060	21 133	43 681	857 547	14 731	294 976	811 971	291 887	2 904 004
2013	113 374	15 365	83 485	54 925	252 768	379 163	15 486	40 890	706 442	13 361	259 458	910 183	257 303	2 748 271
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	320 297	7 279	183 351	533 980	181 996	1 843 122
2017	128 376	956	5 001	33 794	166 182	406 073	32 410	11 183	259 163	7 529	149 611	664 735	149 186	1 756 001
2018	128 506	966	7 493	34 155	145 297	410 601	33 025	8 897	240 804	8 681	143 399	667 095	142 883	1 717 283
2019	125 214	752	7 257	34 874	157 569	389 417	32 493	8 468	171 862	9 062	130 300	476 769	129 168	1 433 918
2020	116 143	556	6 747	33 967	156 775	400 432	34 162	9 884	162 407	7 343	147 738	416 787	146 783	1 385 227
2021	120 962	607	6 086	29 620	163 679	382 553	26 952	8 178	155 227	7 998	118 469	376 324	117 634	1 282 813
2022	107 684	579	5 582	27 858	149 981	295 757	25 677	4 365	137 154	5 467	58 113	284 723	57 464	991 721
Variation 2022 / 2021	-13 278	-28	-504	-1 762	-13 698	-86 796	-1 275	-3 813	-18 073	-2 531	-60 356	-91 601	-60 170	-291 092
	-11.0%	-4.6%	-8.3%	-5.9%	-8.4%	-22.7%	-4.7%	-46.6%	-11.6%	-31.6%	-50.9%	-24.3%	-51.2%	-22.7%
Variation 2022 / 2011	-21 467	-22 397	-71 497	-24 935	-240 102	-71 130	10 203	-33 719	-905 827	-14 084	-292 973	-615 640	-290 975	-2 313 857
	-16.6%	-97.5%	-92.8%	-47.2%	-61.6%	-19.4%	65.9%	-88.5%	-86.8%	-72.0%	-83.4%	-68.4%	-83.5%	-70.0%

Table 23: Change in exposure of pigs by antibiotic 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	0.056	0.143	0.012	0.004	0.058	0.003	0.053	0.149	0.052	0.494
2021	0.043	0.000	0.002	0.011	0.058	0.137	0.010	0.003	0.055	0.003	0.042	0.134	0.042	0.458
2022	0.039	0.000	0.002	0.010	0.055	0.108	0.009	0.002	0.050	0.002	0.021	0.104	0.021	0.363
Variation 2022 / 2021	-0.004 -8.7%	-0.000 -2.1%	-0.000 -5.9%	-0.000 -3.5%	-0.004 -6.0%	-0.028 -20.7%	-0.000 -2.3%	-0.001 -45.2%	-0.005 -9.4%	-0.001 -29.9%	-0.021 -49.7%	-0.030 -22.4%	-0.021 -49.9%	-0.095 -20.7%
Variation 2022 / 2011	-0.004 -8.5%	-0.007 -97.2%	-0.024 -92.0%	-0.007 -42.1%	-0.075 -57.8%	-0.014 -11.5%	0.004 82.2%	-0.011 -87.4%	-0.298 -85.6%	-0.005 -69.3%	-0.096 -81.8%	-0.196 -65.3%	-0.095 -81.9%	-0.739 -67.1%

Poultry

Table 24: 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	237.70	**102.04**	13 095 817	2 530 206	**1.086**
2007	254.44	**104.42**	13 452 991	2 558 715	**1.050**
2008	242.25	**101.41**	12 708 314	2 404 093	**1.006**
2009	216.48	**92.92**	12 419 496	2 397 571	**1.029**
2010	203.80	**86.29**	12 716 422	2 462 472	**1.043**
2011	202.33	**84.78**	12 308 689	2 398 377	**1.005**
2012	177.27	**75.58**	11 230 871	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	105.55	**47.22**	6 508 704	1 280 620	**0.573**
2017	94.77	**43.09**	5 706 075	1 126 017	**0.512**
2018	86.47	**38.94**	5 082 203	1 009 033	**0.454**
2019	73.93	**34.37**	4 289 552	852 910	**0.397**
2020	69.51	**32.92**	3 794 471	745 603	**0.353**
2021	59.98	**29.43**	3 324 072	657 602	**0.323**
2022	45.90	**24.45**	2 630 144	531 510	**0.283**
Variation 2022 / 2021	-14.08	**-4.98**	-693 928	-126 092	**-0.039**
	-23.5%	**-16.9%**	-20.9%	-19.2%	**-12.2%**
Variation 2022 / 2011	-156.43	**-60.33**	-9 678 545	-1 866 867	**-0.722**
	-77.3%	**-71.2%**	-78.6%	-77.8%	**-71.8%**

Table 25: Change in body weight treated-day by antibiotic 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
	227 802	179 820	489 500	350 990	1 278 277	0	21 533	3 301 263	404 224	700 095	6 195 693	578 699	12 904 377
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
	134 363	171 914	331 840	444 888	1 373 963	0	36 378	4 128 586	331 625	696 690	5 572 673	580 968	13 095 817
2010	197 486	220 997	279 249	288 851	1 463 482	0	27 666	5 338 644	184 259	495 167	4 388 268	388 632	12 716 422
2011	136 423	236 062	276 976	228 390	1 639 173	0	31 348	4 477 952	149 819	766 438	4 508 289	649 937	12 308 689
2012	115 917	207 589	78 505	199 025	1 448 987	0	31 053	4 307 655	141 169	608 794	4 216 967	506 047	11 230 871
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	2 544 302	80 483	668 852	1 615 991	573 888	6 508 704
2017	135 861	88 802	23 427	124 111	960 276	892	43 250	2 140 502	87 458	635 038	1 501 744	531 828	5 706 075
2018	117 545	62 705	27 369	118 743	926 254	984	35 415	1 760 287	60 731	549 118	1 462 875	470 152	5 082 203
2019	132 684	59 749	31 690	110 464	1 025 934	861	37 941	1 395 340	35 959	447 367	1 053 471	380 705	4 289 552
2020	134 178	41 636	35 874	109 194	861 236	746	40 187	1 171 954	14 116	451 219	979 606	368 388	3 794 471
2021	113 315	38 079	33 732	93 252	819 806	0	32 147	998 811	13 198	339 963	888 192	279 880	3 324 072
2022	50 766	33 772	38 030	67 544	733 295	9	32 779	793 483	21 649	250 231	654 563	199 517	2 630 144
Variation 2022 / 2021	-62 549	-4 307	4 298	-25 708	-86 511	9	632	-205 328	8 451	-89 732	-233 629	-80 363	-693 928
	-55.2%	-11.3%	12.7%	-27.6%	-10.6%		2.0%	-20.6%	64.0%	-26.4%	-26.3%	-28.7%	-20.9%
Variation 2022 / 2011	-85 657	-202 290	-238 946	-160 846	-905 878	9	1 431	-3 684 469	-128 170	-516 207	-3 853 726	-450 420	-9 678 545
	-62.8%	-85.7%	-86.3%	-70.4%	-55.3%		4.6%	-82.3%	-85.5%	-67.4%	-85.5%	-69.3%	-78.6%

Table 26: Change in body weight treated by antibiotic 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
	27 795	34 873	57 890	93 338	269 125	0	896	771 245	64 257	110 243	1 040 685	100 416	2 437 520
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
	24 699	34 383	47 406	105 136	331 984	0	6 947	908 239	65 915	103 369	927 645	93 544	2 530 206
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	514 195	16 097	106 094	284 702	93 242	1 280 620
2017	17 192	17 760	3 358	32 419	220 542	178	8 549	435 471	17 492	101 864	277 615	85 795	1 126 017
2018	15 321	12 541	3 921	31 146	212 239	197	7 016	357 680	12 147	89 962	273 933	77 740	1 009 033
2019	16 956	11 950	4 535	26 560	229 309	172	7 528	284 908	7 192	72 779	198 312	62 337	852 910
2020	17 360	8 327	5 133	26 203	191 460	149	7 960	238 845	2 824	74 754	180 629	60 983	745 603
2021	14 538	7 616	4 821	22 781	181 922	0	6 398	203 516	2 640	55 966	165 688	46 350	657 602
2022	8 147	6 754	5 436	16 285	159 515	4	6 556	163 266	4 330	41 810	127 146	33 710	531 510
Variation 2022 / 2021	-6 391	-862	615	-6 496	-22 407	4	158	-40 250	1 690	-14 156	-38 542	-12 640	-126 092
	-44.0%	-11.3%	12.8%	-28.5%	-12.3%		2.5%	-19.8%	64.0%	-25.3%	-23.3%	-27.3%	-19.2%
Variation 2022 / 2011	-10 366	-40 458	-30 031	-41 647	-237 869	4	538	-749 700	-25 454	-79 630	-664 614	-75 201	-1 866 867
	-56.0%	-85.7%	-84.7%	-71.9%	-59.9%		8.9%	-82.1%	-85.5%	-65.6%	-83.9%	-69.0%	-77.8%

Table 27: Change in exposure of poultry by antibiotic 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	0.113	0.001	0.035	0.086	0.029	0.353
2021	0.007	0.004	0.002	0.011	0.089	0.000	0.003	0.100	0.001	0.027	0.081	0.023	0.323
2022	0.004	0.004	0.003	0.009	0.085	0.000	0.003	0.087	0.002	0.022	0.068	0.018	0.283
Variation 2022 / 2021	-0.003 -39.2%	-0.000 -3.7%	0.001 22.4%	-0.003 -22.4%	-0.004 -4.8%	0.000	0.000 11.3%	-0.013 -12.9%	0.001 78.1%	-0.005 -18.9%	-0.014 -16.7%	-0.005 -21.0%	-0.039 -12.2%
Variation 2022 / 2011	-0.003 -44.1%	-0.016 -81.8%	-0.012 -80.5%	-0.016 -64.3%	-0.082 -49.0%	0.000	0.001 38.5%	-0.296 -77.3%	-0.010 -81.5%	-0.029 -56.2%	-0.264 -79.6%	-0.028 -60.7%	-0.722 -71.8%

Rabbits

Table 28: 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	31.28	**385.77**	1 440 250	152 336	**1.879**
2020	30.42	**411.44**	1 347 630	148 709	**2.011**
2021	22.79	**332.24**	1 096 150	120 474	**1.756**
2022	11.49	**180.54**	517 423	72 794	**1.144**
Variation 2022 / 2021	-11.30	**-151.70**	-578 727	-47 680	**-0.612**
	-49.6%	**-45.7%**	-52.8%	-39.6%	**-34.9%**
Variation 2022 / 2011	-59.60	**-478.90**	-3 150 444	-269 584	**-2.032**
	-83.8%	**-72.6%**	-85.9%	-78.7%	**-64.0%**

Table 29: Change in body weight treated-day by antibiotic 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
	314 180	0	132 567	3 982 799	501 837	3 210	754 560	1 817 533	605 779	7 502 825
2005	266 428	0	88 044	1 842 977	555 982	4 076	921 562	1 751 995	796 200	5 426 835
	295 350	0	77 824	2 049 116	531 688	4 327	861 404	1 428 065	708 858	5 244 430
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	157 941	957	70 718	534 658	111 167	0	292 080	290 460	258 181	1 440 250
2020	147 146	633	81 086	433 932	139 461	0	294 342	274 594	254 193	1 347 630
2021	125 785	709	68 291	373 386	134 040	0	193 285	222 800	159 806	1 096 150
2022	49 315	1 071	5 518	125 727	115 652	0	109 150	113 248	100 242	517 423
Variation 2022 / 2021	-76 470	362	-62 773	-247 659	-18 388	0	-84 135	-109 552	-59 564	-578 727
	-60.8%	51.1%	-91.9%	-66.3%	-13.7%		-43.5%	-49.2%	-37.3%	-52.8%
Variation 2022 / 2011	-487 698	1 071	-84 883	-1 016 507	-405 238	-2	-329 566	-829 037	-237 181	-3 150 444
	-90.8%		-93.9%	-89.0%	-77.8%	-100.0%	-75.1%	-88.0%	-70.3%	-85.9%

Table 30: Change in body weight treated by antibiotic 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
	34 120	0	6 946	128 477	40 942	642	89 143	279 252	70 891	578 705
2005	29 531	0	5 120	59 451	44 846	815	107 923	280 961	92 333	527 722
	32 806	0	4 558	66 101	42 924	865	98 960	232 411	80 199	477 901
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	20 405	191	10 177	19 121	18 378	0	40 786	45 531	36 115	152 336
2020	18 920	126	11 636	15 845	19 779	0	42 528	42 854	37 035	148 709
2021	17 203	141	9 806	13 795	17 667	0	29 139	35 521	24 684	120 474
2022	9 285	214	855	5 848	16 538	0	18 411	21 947	17 008	72 794
Variation 2022 / 2021	-7 918	73	-8 951	-7 947	-1 129	0	-10 728	-13 574	-7 676	-47 680
	-46.0%	51.8%	-91.3%	-57.6%	-6.4%		-36.8%	-38.2%	-31.1%	-39.6%
Variation 2022 / 2011	-37 909	214	-12 197	-35 311	-31 137	0	-44 021	-109 617	-33 481	-269 584
	-80.3%		-93.4%	-85.8%	-65.3%		-70.5%	-83.3%	-66.3%	-78.7%

Table 31: Change in exposure of rabbits by antibiotic 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	0.252	0.002	0.126	0.236	0.227	0.000	0.503	0.562	0.445	1.879
2020	0.256	0.002	0.157	0.214	0.268	0.000	0.575	0.580	0.501	2.011
2021	0.251	0.002	0.143	0.201	0.258	0.000	0.425	0.518	0.360	1.756
2022	0.146	0.003	0.013	0.092	0.260	0.000	0.289	0.345	0.267	1.144
Variation 2022 / 2021	-0.105	0.001	-0.130	-0.109	0.002	0.000	-0.135	-0.173	-0.093	-0.612
	-41.8%	63.6%	-90.6%	-54.3%	0.9%		-31.9%	-33.4%	-25.7%	-34.9%
Variation 2022 / 2011	-0.292	0.003	-0.108	-0.290	-0.182	0.000	-0.290	-0.875	-0.201	-2.032
	-66.7%		-88.9%	-75.9%	-41.2%		-50.0%	-71.7%	-42.9%	-64.0%

Cats and dogs

Table 32: 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	**95.36**	692 531	109 642	**0.637**
2020	17.83	**103.12**	761 549	117 761	**0.681**
2021	19.00	**109.64**	822 724	130 061	**0.751**
2022	18.11	**104.33**	796 598	126 283	**0.727**
Variation 2022 / 2021	-0.88	**-5.31**	-26 126	-3 778	**-0.023**
	-4.7%	**-4.8%**	-3.2%	-2.9%	**-3.1%**
Variation 2022 / 2011	1.36	**-2.17**	67 666	8 759	**-0.020**
	8.1%	**-2.0%**	9.3%	7.5%	**-2.6%**

Table 33: Change in body weight treated-day by antibiotic 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
	73 425	66 410	136 206	0	110 465	10 627	62 165	173 398	1 261	5 445	2 727	63 935	33 805	27 108	616 480
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
	69 460	79 644	185 150	631	99 941	18 233	80 411	254 480	1 326	4 718	330	50 239	37 267	13 595	743 202
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
2021	44 727	55 754	140 648	2 349	31 104	38 477	26 107	432 474	0	641	0	50 089	70 636	22 971	822 724
2022	37 333	48 055	123 243	2 256	27 662	41 227	21 269	450 651	0	606	0	44 293	58 123	23 778	796 598
Variation 2022 / 2021	-7 394	-7 699	-17 405	-93	-3 442	2 750	-4 838	18 177	0	-35	0	-5 796	-12 513	807	-26 126
	-16.5%	-13.8%	-12.4%	-4.0%	-11.1%	7.1%	-18.5%	4.2%		-5.5%		-11.6%	-17.7%	3.5%	-3.2%
Variation 2022 / 2011	-19 972	1 165	-60 360	-4 855	-70 764	22 430	-25 619	163 006	0	-2 042	-13	-1 053	18 303	10 452	67 666
	-34.9%	2.5%	-32.9%	-68.3%	-71.9%	119.3%	-54.6%	56.7%		-77.1%	-100.0%	-2.3%	46.0%	78.4%	9.3%

Table 34: Change in body weight treated by antibiotic 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
	33 948	7 469	10 896	0	13 413	1 285	7 287	55 208	155	1 181	464	12 139	7 169	3 022	111 431
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
	32 426	8 959	11 496	631	12 387	1 205	8 846	65 006	166	1 230	66	10 648	7 468	2 425	120 969
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
2021	21 624	6 846	13 990	2 349	4 136	1 401	2 611	77 778	0	128	0	10 470	12 842	5 003	130 061
2022	19 746	5 954	12 029	2 256	3 784	1 478	2 127	81 127	0	121	0	9 357	10 072	5 214	126 283
Variation 2022 / 2021	-1 878	-892	-1 961	-93	-352	77	-484	3 349	0	-7	0	-1 113	-2 770	211	-3 778
	-8.7%	-13.0%	-14.0%	-4.0%	-8.5%	5.5%	-18.5%	4.3%		-5.5%		-10.6%	-21.6%	4.2%	-2.9%
Variation 2022 / 2011	-7 329	474	1 337	-4 855	-8 211	225	-3 353	17 382	0	-452	-3	268	2 108	2 651	8 759
	-27.1%	8.6%	12.5%	-68.3%	-68.5%	18.0%	-61.2%	27.3%		-78.9%	-100.0%	2.9%	26.5%	103.4%	7.5%

Table 35: Change in exposure of cats & dogs by antibiotic 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	0.116	0.038	0.071	0.013	0.023	0.006	0.018	0.372	0.000	0.001	0.000	0.060	0.053	0.030	0.637
2020	0.110	0.037	0.067	0.013	0.024	0.006	0.015	0.412	0.000	0.001	0.000	0.060	0.060	0.028	0.681
2021	0.125	0.040	0.081	0.014	0.024	0.008	0.015	0.449	0.000	0.001	0.000	0.060	0.074	0.029	0.751
2022	0.114	0.034	0.069	0.013	0.022	0.009	0.012	0.467	0.000	0.001	0.000	0.054	0.058	0.030	0.727
Variation 2022 / 2021	-0.011	-0.005	-0.011	-0.001	-0.002	0.000	-0.003	0.018	0.000	-0.000	0.000	-0.007	-0.016	0.001	-0.023
	-8.9%	-13.2%	-14.2%	-4.2%	-8.7%	5.3%	-18.7%	4.1%		-5.7%		-10.8%	-21.7%	4.0%	-3.1%
Variation 2022 / 2011	-0.058	-0.001	0.001	-0.032	-0.054	0.001	-0.023	0.062	0.000	-0.003	-0.000	-0.004	0.007	0.014	-0.020
	-33.9%	-1.5%	2.0%	-71.3%	-71.4%	6.9%	-64.8%	15.3%		-80.9%	-100.0%	-6.7%	14.6%	84.3%	-2.6%

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