



ASSURING THE SAFETY, QUALITY AND EFFICACY
OF VETERINARY MEDICINES

SALES OF ANTIMICROBIAL PRODUCTS
AUTHORISED FOR USE AS
VETERINARY MEDICINES,
ANTIPROTOZOALS,
ANTIFUNGALS,
AND
COCCIDIOSTATS,
IN THE UK IN 2009

2010





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SUMMARY

This is the twelfth in a series of reports designed to provide information about the sales of veterinary antimicrobial products in the UK. The data for this report have been calculated using the methodology developed in 2002.

Summary of the main points and changes to the report (all tonnages are expressed as active ingredient (a.i) unless otherwise stated)

The main points and changes presented in this year's report are:

- Report for the first time sales of veterinary antimicrobial products in the UK from 2009.
- There is a net 18 tonne increase in sales of veterinary antimicrobials, most of which is accounted for by a small increase in sales of most classes of antimicrobials.
- There is an increase in sales of products for food-producing animals of 22 tonnes and a decrease of 4 tonnes for non-food animals only.
- No sales of antimicrobial growth promoters are reported as their use and sale were banned from 1 January 2006.
- In 2009 79 Kg fewer fluoroquinolones were sold than in 2008. For cephalosporins, there was an increase of 354 Kg.
- No data on antimicrobial products imported under the SIC/STC systems have been included in this report as routine validation of the database of applications identified duplicate applications and other errors, which would lead to over-reporting of data. VMD is currently considering how to address this issue.
- For the fourth year in a row the kilograms of antimicrobial active ingredient used per tonne of live weight of animals slaughtered for food remained constant at 0.06Kg/tonne.

Trends

Total Sales

During 2005 total sales of antimicrobials decreased by 8 tonnes to 446 tonnes, decreased by a further 41 tonnes in 2006 to 405 tonnes, fell by 18 tonnes in 2007 to 387 tonnes and again fell in 2008 to 384 tonnes. In 2009 total sales increased by 18 tonnes to 402 tonnes.

The sales of veterinary therapeutic antiprotozoals in 2009 were 3 tonnes, a decrease of 12 tonnes since 2008. Sales of these products are exclusively for food-producing animals. The sales of veterinary antifungals were 7.6 tonnes in 2009; an increase of 3.5 tonnes on the previous year.



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There were no sales of veterinary antimicrobial growth promoters in 2009 following the EU ban on their use or sale from 1 January 2006.

Sales of coccidiostats in 2009 were 234 tonnes, an increase of 27 tonnes from 2008. Sales of coccidiostats have not been at this level since 2003. Coccidiostats are used in food-producing animals only, particularly poultry reared on deep litter systems.

Food-Producing Animals

In 2009 sales of antimicrobial products for therapeutic use in food-producing animals accounted for approximately 87% (349 tonnes) of the total annual sales of 402 tonnes which was comparable with previous years. However it is not possible to identify the proportion of the 349 tonnes which was administered to animals that did not enter the food chain.

Approximately 45-55% of the total sales of therapeutic antimicrobials were accounted for by tetracyclines in each year from 2004 to 2009. In each of the reporting years between 1 and 2 tonnes of fluoroquinolones were sold (less than 1% of the total). Between 69% and 82% of therapeutic antimicrobial products for food-producing animals only were sold for use as medicated feedingstuffs, over the reporting period (2004–2009), most of which are sold for use in pig and poultry farming.

Overall the sales of therapeutic antimicrobial products for use in food-producing animals showed an increase in 2009, from the 2008 sales. There was an increase in sales of therapeutic antimicrobials in 2009 for some of the individual food-producing species e.g. pig and poultry only products increased by 10 tonnes and poultry only products increased by 6 tonnes in 2009 compared to 2008. Stable sales were seen for cattle only and pig only (11 and 62 tonnes a.i. respectively). Sales of multi-species products (excluding pig and poultry only) also increased from 2008 to 2009.

Non-Food-Producing Animals

Sales of antimicrobials for veterinary medicinal products authorised only for therapeutic use in non-food-producing animals in 2009 accounted for 8.5% (34 tonnes) of the total annual therapeutic sales (402 tonnes). It is currently not possible to determine what proportion of the 19 tonnes (5%) of antimicrobials sold for therapeutic use in either food-producing or non-food-producing animals was used in companion animals.

In 2009 there was an increase in the amount of antimicrobials sold for use in dogs only (0.9 tonnes) and a decrease (4.7 tonnes) in sales for horses only. The majority (98%) of dog only antimicrobial products sold were in tablet form, whereas the horse only antimicrobial products sold were mainly for adding to feed (95%).



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Context

Animal health background

In addition to the normal animal health challenges facing farming the following would have had an impact on the requirement to use antimicrobials:

- In 2009 there was another wet summer in the UK causing large scale flooding in many areas; and
- Swine dysentery was increasing in pigs.

Regulatory Background

All therapeutic antimicrobial products in the UK may be dispensed only under veterinary prescription.

Numbers of Livestock in the National Herd

The following table shows the number of food-producing animals recorded each year in Defra's June Census for each of the last six reporting years. All figures are quoted in thousands of individual animals and are not adjusted for seasonality.

	2004	2005	2006	2007	2008	2009
Cattle	10,588	10,392	10,270	10,304	10,107	10,025
Pigs	5,159	4,862	4,933	4,834	4,714	4,724
Sheep	35,817	35,416	34,722	33,946	33,131	32,038
Poultry	181,759	173,909	173,081	167,667	166,200	159,288

Interpreting the figures

The figures in this report should only be regarded as indicative of overall trends in sales. There is no central record kept of the use of antimicrobials in animals in the UK. However it is reasonable to assume that there is a direct relationship between the quantities of antimicrobials sold and used in the UK. Our assessment does not include any measure of the quality or the degree of uncertainty for the figures reported.



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INTRODUCTION

Antimicrobial resistance is a serious problem in human medicine resulting in increasing concerns about the use of antimicrobial products in human medicine, veterinary medicine, animal production, agriculture and horticulture. The UK Government has made clear that it takes this problem seriously and has developed a comprehensive strategy to address it so that the effectiveness of antimicrobial products in both humans and animals can be maintained. A key element of this strategy is the collection and publication of information on the quantities of antimicrobial products sold each year for veterinary use in the UK.

The Veterinary Medicines Directorate (VMD), an Executive Agency of the Department for Environment, Food and Rural Affairs (Defra), is responsible for the authorisation of veterinary medicines in the UK. For the past twelve years, in response to recommendations made by the Advisory Committee on the Microbiological Safety of Food (ACMSF), we have collected, collated and published figures on UK sales volumes of active antimicrobial ingredients used in products authorised as veterinary medicines, growth promoters or coccidiostats. The report has been extended over time to include antiprotozoal and antifungal products.

These reports are based on sales data provided voluntarily by the veterinary pharmaceutical companies marketing these products in the UK from 1998-2004. Data for 2005 and later were collected as a statutory requirement in accordance with the provisions of EC Directive 2001/82 (as amended), following entry into force of the Veterinary Medicine Regulations 2005 (at the time of collecting the data the Veterinary Medicines Regulations 2009 was in force). It is reasonable to assume that there is a close correlation between the reported quantities of products sold and those used in the UK in the species indicated.

A glossary of terms used in this report can be found at Annex 1.

Methods Used

The following paragraphs provide a brief overview of the methods used to analyse the data provided by pharmaceutical companies and to calculate the sales figures in this report.

Collection of data

We collect data from veterinary pharmaceutical companies in the first half of each calendar year for the previous full calendar year. These data are collated and verified before they are imported into a bespoke spreadsheet for analysis.



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Categorisation of data

Additional information, drawn from regulatory data on each of these products, is included in a spreadsheet. These data include the authorised administration methods, target species and an appropriate conversion factor to calculate the proportion of active antimicrobial ingredient in each product. All of these data are rechecked before any further calculations are undertaken. Data are then analysed by chemical grouping, administration methods, target species and against livestock slaughter figures.

In this year's report we have reported sales of products indicated for use in food-producing animals only, non-food animals only and for both food-producing and non-food animals. It is hoped that this will provide a valid picture of the apportionment of sales for use of veterinary therapeutic antimicrobials in the UK.

Collation and publication

The resulting figures are collated into a report format and patterns and trends of sales are identified. It is not within the remit of this report to interpret these patterns. However, where appropriate, we do include information on factors that we are aware of and might have affected sales or use of antimicrobial products during the reporting period.

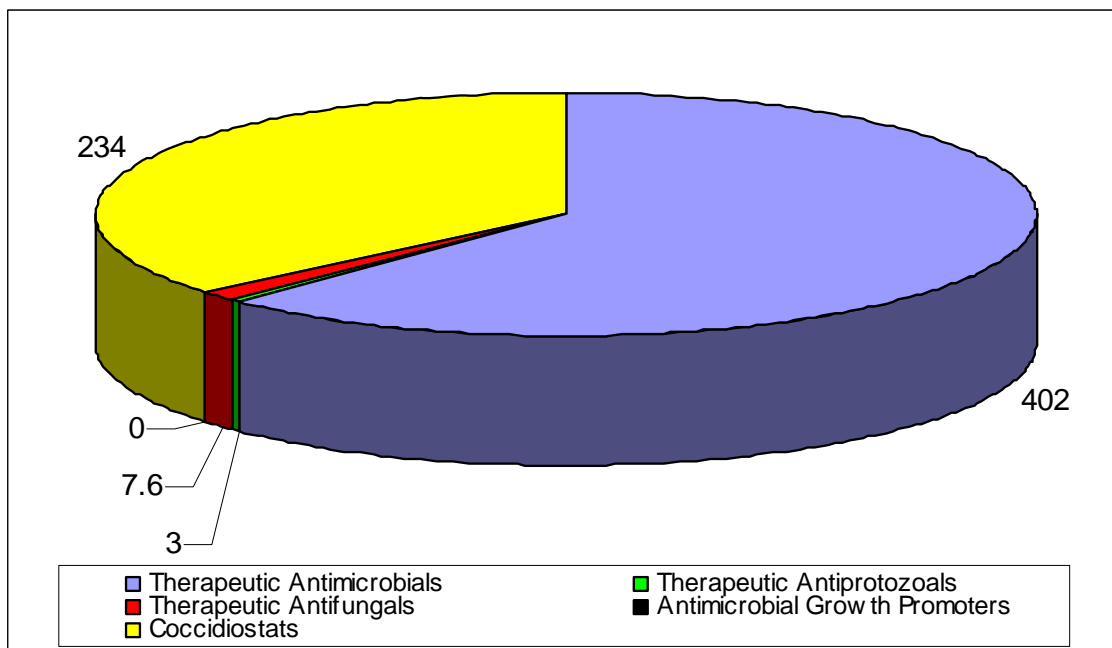
Finally, we seek comments on the draft report from the Veterinary Products Committee (VPC), the Government's independent expert advisory committee on veterinary medicines and from the Defra Antimicrobial Resistance Coordination (DARC) Group.

RESULTS

TOTAL SALES

The quantities of sales in 2009 for each of the five categories of veterinary products reported are illustrated in Figure 1. Therapeutic antimicrobials were the largest selling group (402 tonnes), followed by coccidiostats (234 tonnes), with no sales of antimicrobial growth promoters. Therapeutic antiprotozoals and antifungals were the smallest selling categories (3 tonnes and 8 tonnes respectively).

Figure 1: Quantities of therapeutic antimicrobials, antiprotozoals, antifungals and coccidiostats and antimicrobial growth promoters in tonnes a.i. sold in the UK in 2009¹



The numbers of products sold within each category of antimicrobials reported are summarised in Table 1. This is a summary of the numbers of products sold to help clarify the reported data. It is not a list of products that had marketing authorisations in 2009.

¹ Not all of the therapeutic antimicrobials are used to treat clinical disease manifested in animals. Some may be used prophylactically in whole groups of animals to prevent the establishment of disease in otherwise healthy animals, or metaphylactically to prevent spread of disease within a herd or flock. It is not possible within this report to estimate the proportion of therapeutic antimicrobials that were used to prevent or to treat diseases in animals.



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Table 1: Numbers of products sold in 2004-2009 by reporting group of products

Group of Veterinary Product Sold	Number of Products Sold by Group 2004	Number of Products Sold by Group 2005	Number of Products Sold by Group 2006	Number of Products Sold by Group 2007	Number of Products Sold by Group 2008	Number of Products Sold by Group 2009
Therapeutic Antimicrobials comprising:	339	325	317	312	334	340
<i>Tetracyclines</i>	50	48	45	46	46	48
<i>Trimethoprim/Sulphonamides</i>	45	46	40	40	41	36
<i>β-lactams</i>	120	113	120	110	131	122
<i>Aminoglycosides</i>	40	29	26	28	28	29
<i>Macrolides</i>	19	23	21	22	22	28
<i>Fluoroquinolones</i>	25	26	27	27	25	31
<i>Others</i>	40	40	38	39	41	46
Therapeutic Antiprotozoals	13	12	11	12	10	12
Therapeutic Antifungals	15	13	13	13	15	13
Coccidiostats	10	9	9	9	11	11

Total Sales: Therapeutic Antimicrobials

The gross quantities of antimicrobial active ingredients in therapeutic products sold between 2004 and 2009 are shown in Table 2. These sales are divided into those sold for use in food-producing animals only, non-food-producing animals only and those sold for use in a combination of both food and non-food animals. They are expressed as tonnes of base active ingredient. Table 2 also illustrates the trend in sales of these groups of products over the period 2004-2009. These figures are expressed graphically in Figure 2.

The overall sales of therapeutic antimicrobial products remained broadly the same over the period 2004-2009, varying between 384 and 454 tonnes. Since 2005 sales have been declining annually until 2009, when sales increased, see Table 2 and Figure 2. The fluctuations year-on-year are most likely to reflect natural changes in the incidence of disease in animals over that period. Sales in 2009 have shown an increase of 18 tonnes to 402 tonnes. In 2009, sales of therapeutic products for use in food-producing animals only have also increased from 327 to 349 tonnes of active ingredient, sales of therapeutic antimicrobials



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for use in non-food-producing animals have increased from 2004 to 2009 from 29 tonnes to 38 tonnes but decreased again in 2009 to 34 tonnes. Sales of products for use in either food-producing or non-food-producing species varied between 18 and 32 tonnes showing no specific trend.

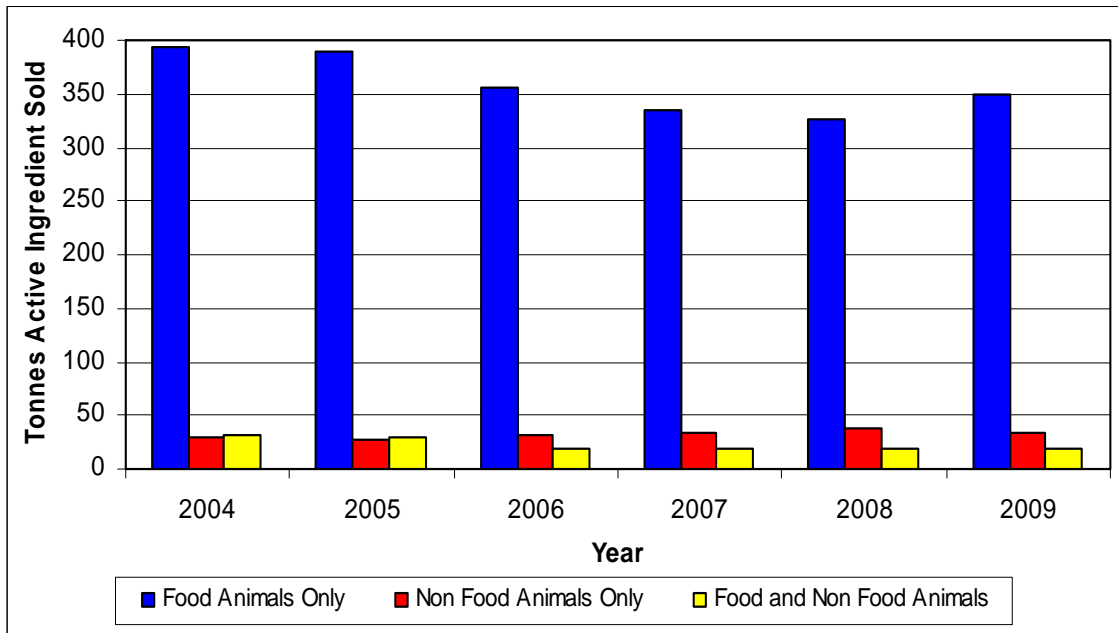
Table 2: Sales of therapeutic antimicrobials 2004–2009, in the categories of food animals only, non-food animals only and combined food and non-food animals

	2004	2005	2006	2007	2008	2009
	Tonnes Active Ingredient					
Indicated for food animals only	393	390	356	335	327	349
<i>Annual Actual increase/decrease</i>	16	(3)	(34)	(21)	(8)	22
Indicated for non-food animals only	29	27	31	34	38	34
<i>Annual Actual increase/decrease</i>	(1)	(2)	4	3	4	(4)
Indicated for a combination of both food and non-food animals	32	29	18	19	19	19
<i>Annual Actual increase/decrease</i>	4	(3)	(11)	1	-	-
Total sales of therapeutic antimicrobials	454	446	405	387	384	402



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Figure 2: Sales of antimicrobial therapeutic products (tonnes active ingredient) 2004–2009 in food animals only, non-food animals only and in a combination of food and non-food animals



Total Sales: Therapeutic Antiprotozoals

The sales of therapeutic antiprotozoal products reported to the VMD are summarised in Table 3. Therapeutic antiprotozoals are products primarily used in the treatment and/or prevention of parasitic protozoal infections, e.g. *Eimeria* spp. Sales of therapeutic antiprotozoals showed a marked decrease in 2009 relative to 2008, but sales had remained relatively stable between 2004-2008 at 12-15 tonnes. All antiprotozoal products authorised in the UK are for use in food-producing animal species.

Table 3: Sales of therapeutic antiprotozoals (tonnes active ingredient) in the UK 2004–2009

	2004	2005	2006	2007	2008	2009
	Tonnes Active Ingredient					
Antiprotozoals	13	12	14	14	15	3
<i>Annual Actual Increase / Decrease</i>	11	(1)	2	(-)	1	(12)



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Total Sales: Therapeutic Antifungals

The sales of therapeutic antifungal products reported to the VMD under the drug classifications imidazoles, triazoles, griseofulvin, aliphatic halogenitros and polyene macrolides are given in Table 4. Therapeutic antifungals are products primarily used to destroy or suppress the reproduction or growth of pathogenic fungi. Of the 13 sold products authorised to treat veterinary antifungal infections, 11 are indicated for use only in non-food animals. Sales have fluctuated over the period 2004-2009, between 3.1 and 7.6 tonnes.

Table 4: Sales of therapeutic antifungals (tonnes active ingredient) in the UK 2004–2009

	2004	2005	2006	2007	2008	2009
	Tonnes Active Ingredient					
Antifungals	5.1	7.1	5.2	3.1	4.1	7.6
<i>Annual Actual Increase / Decrease</i>	(8.7)	2	(1.9)	(2.1)	1	3.5

Total Sales: Antimicrobial Growth Promoters

The sales of antimicrobial growth promoting products from 2004-2009 are summarised in Table 5. Sales volumes have decreased since 2004 (32 tonnes) to 2006 when no sales were reported. No sales were reported since 1 January 2006 following the EU-wide ban of the sale or use of antimicrobial growth promoters.

Table 5: Sales of antimicrobial growth promoting products (tonnes active ingredient) in the UK 2004-2009

	2004	2005	2006	2007	2008	2009
	Tonnes Active Ingredient					
Growth Promoting Products	32	14	0	0	0	0
<i>Annual Actual Increase / Decrease</i>	(4)	(18)	(14)	(0)	(0)	(0)



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Total Sales: Coccidiostats

The sales of coccidiostats from 2004 to 2009 are shown in Table 6. Sales from 2004 have shown a generally decreasing trend until 2008 and then increased in 2009. Coccidiostats are not related to any antimicrobial product currently used in human therapy. They are used exclusively in animals particularly poultry to prevent coccidiosis.

Table 6: Sales of coccidiostats (tonnes active ingredient) in the UK 2004-2009

	2004	2005	2006	2007	2008	2009
	Tonnes Active Ingredient					
Coccidiostats	224	231	207	196	207	234
<i>Annual Actual Increase / Decrease</i>	(16)	7	(24)	(11)	11	27

The sales of coccidiostats have been sub-divided into ionophore and non-ionophore compounds and are summarised in Table 7. They show that there is a decreasing trend in use of ionophore coccidiostats from 2004-2008 (79% - 73%). Sales of non-ionophore coccidiostats have been relatively stable. Sales of both ionophore and non-ionophore coccidiostats increased in 2009.

Table 7: Sales of ionophore and non-ionophore coccidiostats (tonnes active ingredient) in the UK 2004–2009

	2004	2005	2006	2007	2008	2009
	Tonnes Active Ingredient					
Ionophores	173	173	151	144	150	169
Non-ionophores	51	59	56	52	57	65
Total	224	231	207	196	207	234



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IMPORTED SALES

In previous reports the VMD has presented data showing the amounts of active ingredients imported into the UK via the Special Import Certificate (SIC) and Special Treatment Certificate (STC) schemes. When this report was being prepared, the VMD undertook routine validation of the SIC/STC data. The VMD found that applicants were frequently duplicating applications and that some other errors had occurred when applications were made. These factors meant that the calculated SIC/STC summary data over-reported imports.

The VMD is currently considering how to address the issue but until it is resolved imported sales data cannot be reported. When we have reliable data an addendum to this report will be issued.



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SALES BY CHEMICAL ANTIMICROBIAL GROUP

The sales of various chemical groups of antimicrobials between 2004 and 2009 are shown in Table 8 and Figure 3. These represent the main chemical groups of veterinary antimicrobials sold in the UK. Definitions of these groups can be found in the glossary at Annex 1. In all years, tetracyclines, β -lactams (including penicillin) and trimethoprim/sulphonamides accounted for the vast majority of the therapeutic antimicrobials sold. For example, in 2009, they accounted for 81% of sales, with tetracyclines accounting for 44%, β -lactams 19% and Trimethoprim/sulphonamides 18%. Most tetracyclines were sold for the treatment of pigs and poultry as medicated feedingstuffs (POM-VPS) under veterinary prescription.

Table 8 and Figure 3 indicate a stable trend in sales of sulphonamides/trimethoprim, tetracyclines and aminoglycosides over the past 5 years with an increase in sales of β -lactams. Fluoroquinolones have shown a general increase in sales from 2004-2007 and small decreases in 2008 and 2009. The others group has shown a gradual increase from 2004-2009.

The numbers of different products sold within each of these chemical classes of products are given in Table 1.

Table 8: Sales of total antimicrobial therapeutic products by chemical grouping (tonnes active ingredient) 2004–2009

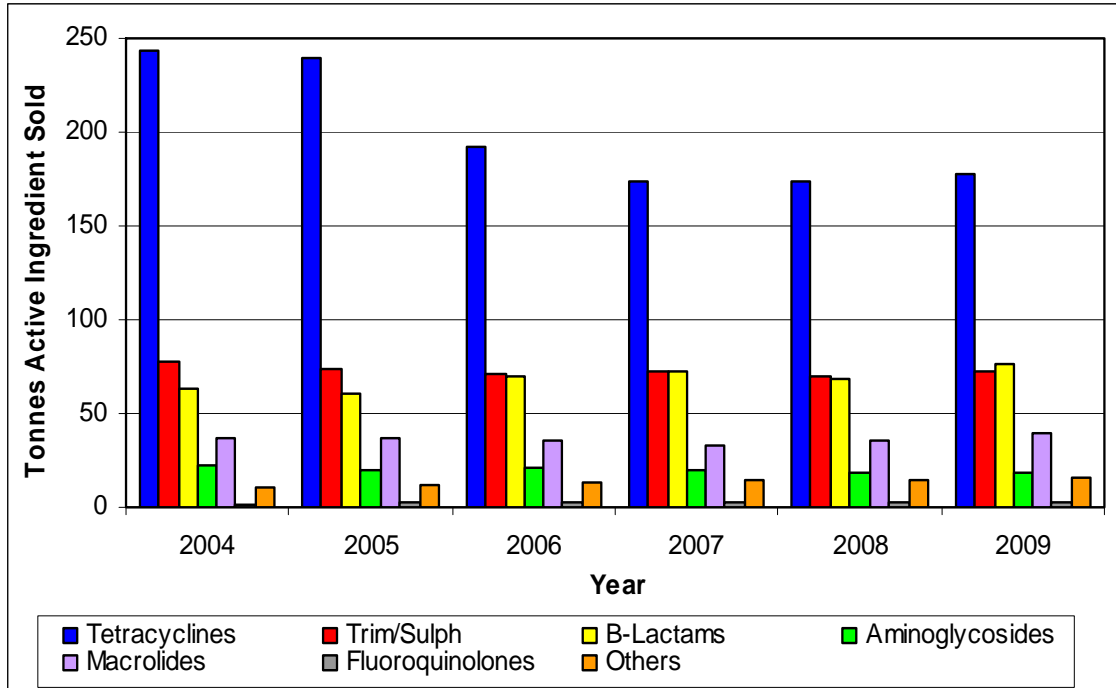
	2004	2005	2006	2007	2008	2009
	Tonnes Active Ingredient					
Tetracyclines	243	240	192	174	174	177
Trimethoprim/ Sulphonamides	77	74	71	73	70	73
β -Lactams	63	60	70	72	69	76
Aminoglycosides	22	20	21	20	18	19
Macrolides	37	37	36	33	35	39
Fluoroquinolones *	1	2	2	2	2	2
Other	11	12	13	14	15	16
Total	454	446	405	387	384	402

*fluoroquinolones (kg) 1,412 1,451 1,616 1,951 1,928 1,849



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Figure 3: Sales of total antimicrobial therapeutic products (tonnes active ingredient) 2004–2009



Where it is possible within the bounds of company confidentiality, the larger classes of antimicrobials have been sub-divided, as suggested by a stakeholder, to give a more detailed picture of antimicrobial use in the UK, see Table 9.



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Table 9: Sales of antimicrobial therapeutic products by sub-chemical grouping (tonnes active ingredient) 2004–2009

	2004	2005	2006	2007	2008	2009
Trimethoprim/ Sulphonamides	77	74	71	73	70	73
Trimethoprim	13	12	12	12	12	12
Sulphonamides	64	62	59	61	58	61
β-Lactams	63	60	70	72	69	76
Cephalosporins* [#]	3	4	6	6	6	7
Penicillins**	14	12	13	15	13	14
Other Penicillins***	46	44	51	51	50	55
Aminoglycosides	22	20	21	20	18	19
Streptomycins	6	6	6	7	6	6
Neomycin and Framycetin	6	5	5	2	1	1
Others****	11	9	10	11	11	12

cephalosporins (kg) 3,240 3,969 5,639 6,215 6,242 6,596

* = all generations of cephalosporins are included in this group.

** = includes potassium penicillin, benzyl penicillin, procain penicillin.

*** = includes cloxacillin, amoxycillin, ampicillin, nafcillin, penthamate hydroide.

**** = includes gentamicin, apramycin, kanamycin, spectinomycin.



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SALES BY ROUTE OF ADMINISTRATION

General

The major routes of administration of antimicrobials sold in 2004–2009 are listed in Table 10 and Figure 4. In 2009 medicated feedingstuffs made up 61% of the total therapeutic antimicrobials sold, whilst oral/water and injectable products accounted for 28% and 10% respectively. Intramammary products and other therapeutic antimicrobial products (creams, aerosols, drops, etc) contributed 0.8% and 0.4% respectively.

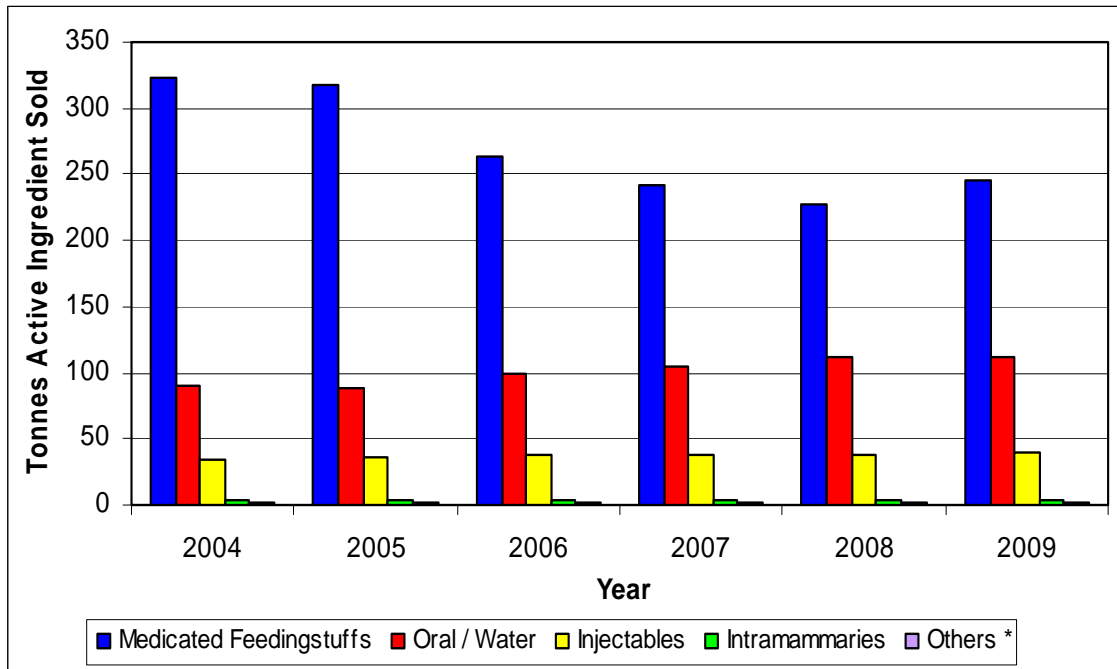
Table 10: Sales of total therapeutic antimicrobials (tonnes active ingredient) by route of administration 2004–2009

	2004	2005	2006	2007	2008	2009
	Tonnes Active Ingredient					
Medicated Feedingstuffs	323	317	264	241	228	245
Oral/Water	91	88	99	104	112	112
Injectables	34	36	37	37	38	40
Intramammaries	4	3	3	3	4	3
Others	2	2	2	2	2	2
Total	454	446	405	387	384	402



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Figure 4: Sales of total therapeutic antimicrobials (tonnes active ingredient) by route of administration 2004–2009



* others includes aerosols, creams, ear and eye medications.

Intramammary Products

Sales of intramammary products vary between 3,125 and 4,092 kilograms active ingredient across the period 2004-2009 (see Table 11). Sales of lactating cow products decreased to 1,298 kilograms in 2009 and sales of dry cow therapy products decreased to 1,873 kilograms.

Table 11: Sales of antimicrobial intramammary products (kilograms active ingredient) 2004–2009²

	2004	2005	2006	2007	2008	2009
	Kilograms Active Ingredient					
Dry Cow Products	1,979	1,750	2,002	1,880	2,317	1,873
Lactating Cow Products	1,886	1,375	1,266	1,383	1,775	1,298
Total	3,865	3,125	3,268	3,263	4,092	3,171

² Sales of intramammary products are reported in kilograms.



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SALES BY ANIMAL SPECIES

Food Animal Species

The breakdown of the sales of antimicrobials indicated for use in food animal species only is shown in Table 12 and Figure 5. Table 12 shows that in 2009 59% of antimicrobial products sold for food animals only were authorised for use in a combination of pigs and poultry only. Between 6 and 9% of total antimicrobials sold for use in food-producing animals were for use in more than one food producing species (excluding those for pig and poultry only) in any year between 2004 and 2009. The largest percentage of single species products is sold for use in pigs and these sales contributed 18% in 2009 of the total sales of products for food-producing animals only. Multi-species products are authorised for use in more than one food-producing animal only. This group does not include 'pig and poultry only' products.

Table 12: Sales of total therapeutic antimicrobials for food-producing animals only (tonnes active ingredient) by food animal species 2004–2009

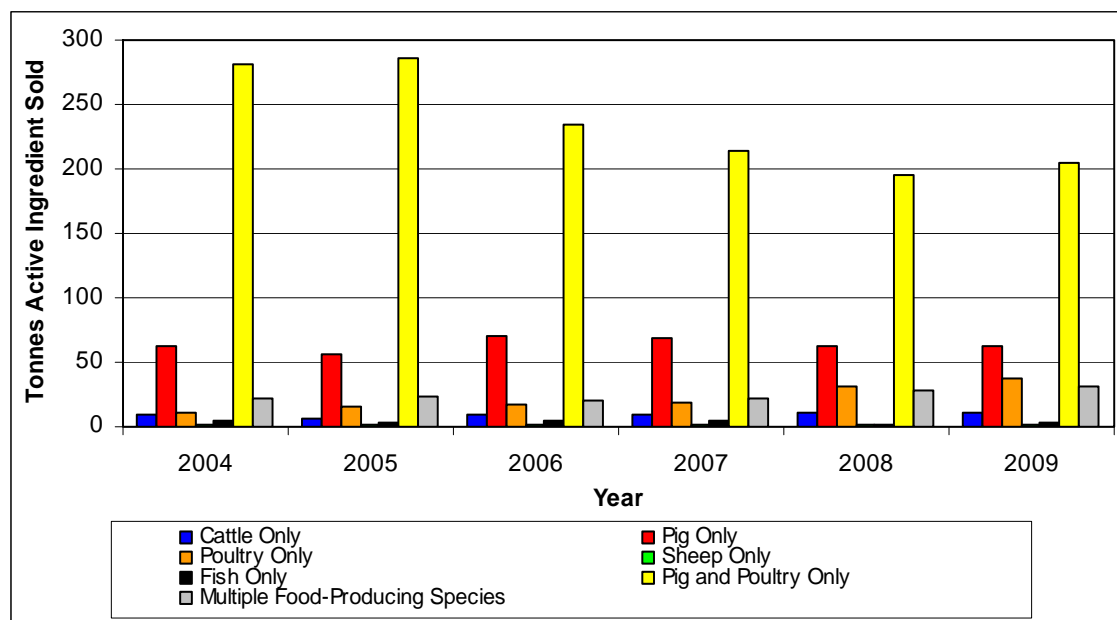
	2004	2005	2006	2007	2008	2009
	Tonnes Active Ingredient					
Cattle Only Products	10	7	10	9	11	11
Pig Only Products	63	56	71	66	62	62
Poultry Only Products	11	15	17	18	31	37
Sheep Only Products	<1	<1	<1	<1	<1	<1
Fish Only Products	4	3	4	4	1	3
Pig and Poultry Combined Only	282	286	234	216	195	205
Multi Species Products In Food Animals Only	22	23	21	22	28	31
Total	393	390	358	335	327	349

This year for the third time we have analysed sales for the category of pig and poultry only products based on estimates of use provided by the pharmaceutical companies with the marketing authorisations for the products. It is estimated in 2009 that 61% of the 205 tonnes sold for use were used in pigs, and 39% were used in poultry. Less than 1% were sold for off-label use in bird species other than those for which the products are authorised for e.g. duck, turkey, game. These approximations are similar to those of earlier years.



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Figure 5: Total sales of therapeutic antimicrobials (tonnes active ingredient) for food-producing animals only 2004–2009



Non-Food Animal Species

Table 13 shows the sales of antimicrobials indicated for use in different species of non-food animals only. In 2009, 57% of all antimicrobials authorised for use in non-food-producing animals were sold only for use in non-food-producing horses only and 37% in dogs only. There is an increasing proportion of sales of non-food-producing animal antimicrobials for dogs over the period 2004-2009 (17-37%).

Table 13: Sales of total therapeutic antimicrobials for non-food-producing animals only (kilograms active ingredient) by animal species 2004-2009³

	2004	2005	2006	2007	2008	2009
Kilograms Active Ingredient						
Dog Only Products	4,976	5,715	7,764	7,249	11,533	12,454
Horse Only Products	14,041	15,629	17,010	19,975	24,139	19,435
Other Products For Use In Non-food Animals Only	10,397	5,122	5,660	6,397	2,243	2,236
Total	29,417	26,466	30,435	33,621	37,915	34,125

³ Sales of therapeutic antimicrobials for non-food-producing animals only are reported in kilograms.



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ANTIMICROBIAL SALES AND LIVESTOCK REARED

The live weights of animals slaughtered for food in the UK from 2004-2009 are shown in Table 14 and Figure 6. The Defra Statistics Division provided the data for livestock. The Centre for Environment, Fisheries and Aquaculture Science (CEFAS) provided the UK fish production data and the Scottish Government and the Department of Agriculture and Rural Development in (DARD) provided the fish production data, for Scotland and Northern Ireland respectively.

The total live weight of animals slaughtered for food generally increased between 2004 and 2007, but slightly fell again in 2008 and 2009 whilst total sales of therapeutic antimicrobials and antimicrobial growth promoters for food animals increased in 2009 (Table 15). Cattle, pig and sheep production decreased in 2009 compared with 2008, while poultry and fish production remained stable.

Table 14: Live weight ('000 tonnes) of animals slaughtered for food use 2004–2009

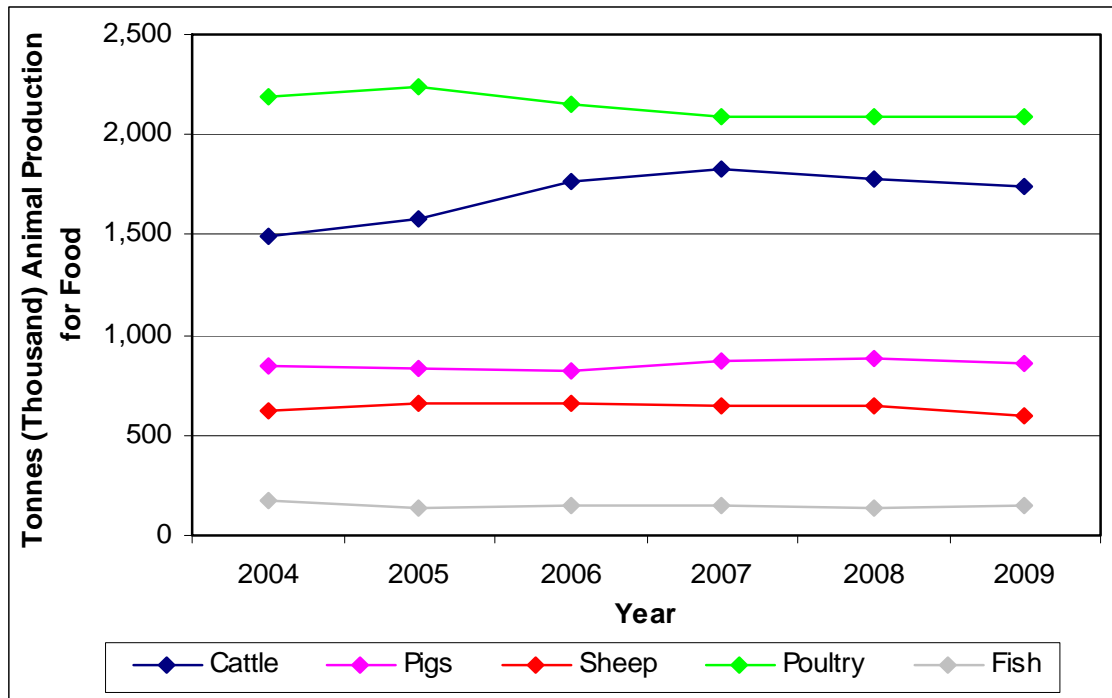
	2004*	2005	2006	2007	2008	2009
	'000 Tonnes live weight animals slaughtered for food					
Cattle	1,498	1,581	1,760**	1,829**	1,784**	1,742
Pigs	845	833	825	875	882	853
Sheep	622	658	655	646	649	603
Poultry	2,190	2,234	2,153	2,091	2,090	2,092
Fish	170	140	145	144	142	147***
Total	5,320	5,446	5,538	5,585	5,547	5,437

* 2004 was a 53 week reporting year. The data for cattle, pigs, and sheep have been normalised by Defra Statistics Branch to a 52 week reporting year to allow direct comparison with data from other years.

** The OTMS rule ceased on 22 January 2006 when the OCDS scheme replaced it. The OCDS scheme closed on 31 December 2008, so there was no further throughput after that date.

*** Data are estimated as not all data were fully validated at the time of data collection.

Figure 6: Live weight ('000 tonnes) of animals slaughtered for food use 2004–2009



Many farm animals are reared to slaughter without the use of therapeutic antimicrobials. Other animals such as dairy cows may be treated with antimicrobials but may not be slaughtered for food use until a number of years later. However, if it was assumed that total antimicrobials sold for food-producing animals only were used solely in animals slaughtered for food, 1 tonne of antimicrobial would have been used in the production of 12,518, 13,480, 15,556, 16,657, 16,936 and 15,576 tonnes of live weight of animals slaughtered in the years 2004-2009 (see Table 15). Using the same assumptions, between 60 and 80g of antimicrobial was sold for each tonne of live weight animal slaughtered.

The figures for live weight of animals slaughtered are only those animals fed and slaughtered within the UK and no account has been taken of those live animals exported. Furthermore, the live weight slaughter figures do not include animals slaughtered in previous years via the OCDS and OTMS or selective culls (e.g. FMD, avian influenza, etc.), i.e. animals slaughtered but not used in food production. The numbers of cattle slaughtered annually under OTMS over the reporting period 2004–2005 are 801,748 and 706,787 respectively. In 2006 50,400 cattle were culled via the OTMS and 150,411 by the OCDS (total culled 200,811). In 2007 127,559 and in 2008 128,345 cattle were culled respectively via the OCDS. The OCDS scheme closed on 31 December 2008, so there was no further throughput after that date.



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Some animals that receive therapeutic antimicrobials may not enter the food chain for a number of other reasons. Therefore, a proportion of the food-producing animals that have been treated with antimicrobials do not ultimately end up as human food. It is not possible to take these factors into account in preparing this report so our figures are likely to be an over-estimate. If they were taken into account, the quantity of antimicrobials used to produce each tonne of animal slaughtered for human food would be considerably less.

Table 15: Total live weight ('000 tonnes) of animals slaughtered for food use (data sources see above) against total antimicrobial product sales for food-producing animals only (tonnes active ingredient) 2004-2009

	2004	2005	2006*	2007*	2008*	2009*
Total live weight animals slaughtered for food use ('000 tonnes)	5,320	5,446	5,538	5,585	5,547	5,437
Total antimicrobials (therapeutic and growth promoters) (tonnes) sold for food animals (tonnes a.i.)	425	404	356	335	327	349
Live weight of animals slaughtered (tonnes) for food per tonne of antimicrobial a.i. sold	12,518	13,480	15,556	16,672	16,963	15,579
Kg of antimicrobial a.i. sold per tonne of live weight of animals slaughtered for food	0.08	0.07	0.06	0.06	0.06	0.06

* Data are ratioed only against total therapeutic antimicrobials as no antimicrobial growth promoters were sold for use, see Table 5.



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ANTIMICROBIAL SALES AND OTHER FOOD ANIMAL COMMODITIES

Cows' milk production in the UK annually, expressed in millions of litres, is detailed in Table 16. The Defra Statistics (Commodities and Food) Division provided the data for milk production. These data have been compared to the quantities of intramammary products sold over the same period for use in lactating cows. Over the reporting period the quantity of milk produced for each tonne of intramammary product sold for use in lactating cows has fluctuated. Using the same data we can estimate that around 0.1mg of antimicrobial was sold per litre of milk produced.

Table 16: Litres of milk produced per kilogram of antimicrobial lactating cow intramammary product (kilograms active ingredient) sold 2004-2009

	2004	2005	2006	2007	2008	2009
Million litres milk produced	14,127	14,052	13,902	13,619	13,319	13,208
Kilograms a.i. lactating intramammary sold	1,886	1,375	1,266	1,383	1,775	1,298
Million litres milk produced per tonne a.i. lactating intramammary sold	7,490	10,220	10,981	9,847	7,504	10,176
Kilograms a.i. lactating intramammary sold per million litre of milk produced	0.13	0.10	0.09	0.10	0.13	0.10

In addition not all of the approximately 13 billion litres of milk produced annually in the UK (excluding suckled milk) are sold for human consumption. It is estimated that approximately 183 million litres of milk produced are fed back to calves and other animals (e.g. pigs) or are treated on farm as waste in 2009. If milk is produced over the allowed EU quotas it may also be destroyed.



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EUROPEAN SURVEILLANCE OF VETERINARY ANTIMICROBIAL CONSUMPTION

The European Commission (EC) has requested the European Medicines Agency (EMA) to take the lead in collecting data on the use of antimicrobial agents in animals from all MS. The EMA is developing a harmonised approach for the collection and reporting of data based on national sales figures. This is designed to be comparable with usage data of human antimicrobials.

The collection protocol and template have been developed via a Technical Consultative Group (TCG) in which the VMD participated. The protocol is also harmonised with that method used by the European Surveillance of Antimicrobial Consumption (ESAC) in human medicine.

The VMD is currently working as part of a Pilot Group to report 2008 sales data in the ESVAC format. Members of the TCG will subsequently train other MS in the use of the agreed protocol and template. The Pilot Group countries provided the 2008 data by September 2010 and a report for the EC will be prepared by the end of 2010.

The ESVAC format reports sales figures in a slightly different way to the approach used in the UK. Once the ESVAC format has been formally adopted future UK reports will use the new basis to avoid the confusion of two sets of data. We shall provide the data to allow comparison with previous years of UK sales.



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HOW CAN WE IMPROVE THIS REPORT?

We would welcome any comments that readers have on this report.

We will continue to strive to improve this report within the limitations of the data supplied.

We are looking to improve our understanding of the effects of changes in the patterns of sales of antimicrobial products through comparing our figures with other validated information held by Defra and other Government Departments, and in other countries. In March 2010, a number of Government Agencies including the VMD, Defra, FSA, HPA and DH published the second Overview of Antimicrobial Usage and Bacterial Resistance in Selected Human and Animal Pathogens in the UK. This Overview report is available on the VMD website under the 'publications' and 'antibiotic related' tabs along side the original report covering data for 2004.

We are keen to maximise the value of the published figures to stakeholders. We would welcome any comments that you might have about the contents of this report, including the categories under which information is reported, and on our proposals for improvements.

We would also welcome any information or interpretations that you may have on the patterns and trends of sales of antimicrobials noted in this report. These should be sent to Dr Kay Goodyear at:

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**VETERINARY MEDICINES DIRECTORATE
September 2010**



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ANNEX 1: GLOSSARY OF TERMS

a.i.	Active Ingredient; the part of an antimicrobial medicine that acts against the bacterial infection.
Aminoglycosides	A closely related group of bactericidal antibiotics derived from bacteria of the order Actinomycetales. Polycationic compounds that contain an aminocyclitol with cyclic amino-sugars attached by glycoside linkages. Sulphate salts are generally used. They have broadly similar toxicological features.
Antibiotic	A substance produced by or derived from a micro-organism, which selectively destroys or inhibits the growth of other micro-organisms.
Antifungal	Products that are destructive to or suppress the reproduction or growth of fungi.
Antimicrobial	A compound which, at low concentrations, exerts an action against micro-organisms and exhibits selective toxicity towards them. The term includes any substance of natural, synthetic or semi-synthetic origin that is used to kill, or inhibit the growth of, micro-organisms (bacteria, fungi, protozoa and viruses). Antimicrobials include antibiotics, disinfectants, preservatives and other substances.
Antimicrobial Resistance	The ability of a micro-organism to grow or survive in the presence of an antimicrobial that is usually sufficient to inhibit or kill micro-organisms of the same species.
Antiprotozoal	A drug primarily used in the treatment and/or prevention of parasitic protozoal infections.
β-Lactam	Semi-synthetic antibiotics derived from penicillin G or cephalosporin C, natural antibiotics produced by the mould <i>Cephalosporium acremonium</i> . Bactericidal products that act by inhibiting synthesis of the bacterial cell wall.
Coccidiostat	Product used for the control of coccidiosis, a protozoal infection causing diarrhoea and dysentery.
Defra	Department for Environment, Food and Rural Affairs.



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Fluoroquinolone	A sub-group of the quinolone compounds, having the addition of a fluorine atom and the 7-piperazinyl group. Broad-spectrum antibacterials with properties more suited to the treatment of systemic infections.
Food Animals	Animals produced for food including: cattle, sheep, pigs, poultry, salmon, trout and bees.
Growth Promoter	Substances, which, when given in animal feed, increase feed conversion efficiency or result in better daily live weight gain, or both.
Injectable Product	A therapeutic product which is administered to animals via injection.
Intramammary Product	A product which is administered into the udder.
Ionophore	A small hydrophobic molecule that dissolves in lipid bilayer membranes and increases permeability to inorganic ions.
Macrolide	A large group of antibiotics mainly derived from <i>Streptomyces</i> spp. Weak bases that are only slightly soluble in water. They have low toxicity and similar antimicrobial activity with cross-resistance between individual members of the group. Thought to act by interfering with bacterial protein synthesis.
Medicated Feedingstuff	Feedingstuffs that contain a veterinary medicine and that are intended for feeding to animals without further processing.
Non-Food Animals	Animals not reared for food. These are mainly companion animals including, dogs, cats, horses, small mammals, rabbits and birds.
Non Ionophore Coccidiostat	All coccidiostats with alternative modes of action to those shown by ionophores.
PDNS	Porcine Dermatitis and Nephropathy Syndrome, a disease affecting pigs.
PMWS	Post-weaning Multi-systemic Wasting Syndrome, a disease affecting pigs.
Special Import Certificate	A certificate issued by the VMD on behalf of the Secretary of State to permit veterinary surgeons to legally import veterinary medicinal products with current EU authorisations into the UK to treat animals under the 'cascade'.



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Special Treatment Certificate	A certificate issued by the VMD on behalf of the Secretary of State to permit veterinary surgeons to legally import other products/substances, where the health situation demands and where there is no EU authorised treatment available.
Sulphonamide	A group of bacteriostatic compounds that interfere with folic acid synthesis of susceptible organisms. They all have similar antimicrobial activity but different pharmacokinetic properties.
Tetracycline	A group of antibiotics derived from <i>Streptomyces</i> spp. They are usually bacteriostatic at concentrations achieved in the body and act by interfering with protein synthesis in susceptible organisms. All have a broad spectrum of activity.
Therapeutic Product	A product which treats or prevents disease.
Trimethoprim	Compounds with a similar action to sulphonamides, acting by interfering with folic acid synthesis, but at a different stage in the metabolic pathway. Display a similar spectrum of activity to, and are often used in combination with, sulphonamides.
VMD	Veterinary Medicines Directorate, an Executive Agency of the Department for Environment, Food and Rural Affairs (Defra).
Water/Oral Product	A therapeutic product that is administered to animals orally. Includes tablets, boluses, capsules, dissolvable powders and sachets, solutions, etc.
Zotechnical Feed Additive	A high technology feed additive used routinely in low doses to affect favourably the performance of animals in good health. Includes non-antimicrobial growth promoters, coccidiostats and histomonostats.



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ANNEX 2: CONTRIBUTORS AND PARTICIPANTS

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Contributing Pharmaceutical Companies and Other Marketing Authorisation Holders

Alpharma Inc
Animal Care Ltd
AniMedica
Bayer Plc
Boehringer Ingelheim Ltd
CEVA Animal Health Ltd
Chanelle Animal Health Ltd
Chemo Iberica, SA
Cross Vetpharm Group Ltd
Dechra
Dopharma Research B.V.
ECO Animal Health Ltd
Ecuphar N.V.
Eli Lilly
European Veterinary Supplies Ltd
Eurovet Animal Health
Fort Dodge Animal Health Ltd
Forum Products Ltd
Franklin Pharmaceuticals Ltd
Globalmed Ltd
Gosmore Ltd
Harkers Ltd
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Laboratorios Hipra S.A.
Laboratorios Karizoo S.A.
Lavet Pharmaceuticals Ltd



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LeVet Pharma B.V.
Merial Animal Health Ltd
Minster Veterinary Practice
Munro Wholesale Medical Supplies Ltd
Norbrook Laboratories Ltd
Novartis Animal Health Ltd
Novartis Animal Health Vaccines Ltd
Oropharma
Pfizer Ltd
PHARMAQ Ltd
Phibro Animal Health SA
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Tulivin Laboratories Ltd
Universal Farma S.L.
Univet Ltd
Vétoquinol UK Ltd
Virbac S.A

Statistical Contributors

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