

**SALES OF ANTIMICROBIAL PRODUCTS
AUTHORISED FOR USE AS VETERINARY
MEDICINES, GROWTH PROMOTERS,
COCCIDIOSTATS AND ANTIPROTOZOALS, IN
THE UK IN 2001**



**ASSURING THE SAFETY, QUALITY AND EFFICACY
OF VETERINARY MEDICINES**



CONTENTS

List of Tables	3
List of Figures	4
Summary	5
Introduction	8
Results	10
Total Sales	10
Sales by Chemical Antimicrobial Group	14
Sales by Route of Administration	16
Sales by Food Animal Species	18
Antimicrobial Sales and Livestock Reared	20
Antimicrobial Sales and Other Food Animal Commodities	23
How can we improve this report?	24
Annex 1: Previously Published Figures 1998-2000	26
Annex 2: Glossary of Terms	28



LIST OF TABLES

- Table 1. Sales of antimicrobial therapeutic products (tonnes active ingredient) 1998 – 2001 in food and non-food animals
- Table 2. Percentage changes between sales of therapeutic antimicrobials, in food and non-food animals 1998-2001
- Table 3. Sales of antimicrobial growth-promoting products (tonnes active ingredient) in the UK 1998 - 2001
- Table 4. Sales of coccidiostats (tonnes active ingredient) in the UK 1998 - 2001
- Table 5. Sales of antiprotozoals (tonnes active ingredient) in the UK 1998 - 2001
- Table 6. Sales of antimicrobial therapeutic products by chemical grouping (tonnes active ingredient) 1998 – 2001
- Table 7. Sales of therapeutic antimicrobials (tonnes active ingredient) by route of administration in food animals 1998 – 2001
- Table 8. Sales of antimicrobial intramammary products (tonnes active ingredient) 1998 – 2001
- Table 9. Sales of therapeutic antimicrobials (tonnes active ingredient) by food animal species 1998 – 2001
- Table 10. Live weight ('000 tonnes) of animals slaughtered for food use 1998 – 2001
- Table 11. Total live weight ('000 tonnes) of animals slaughtered for food use (data sources see above) against antimicrobial products sales (tonnes active ingredient) 1998-2001
- Table 12. Litres of milk produced per tonne of antimicrobial lactating cow intramammary product (tonnes active ingredient) sold



LIST OF FIGURES

- Figure 1: Quantities of therapeutic antimicrobials and antiprotozoals, coccidiostats and antimicrobial growth promoters sold in the UK in 2001.
- Figure 2. Sales of antimicrobial therapeutic products (tonnes active ingredient) 1998 – 2001 in food and non-food animals
- Figure 3. Sales of antimicrobial therapeutic products (tonnes active ingredient) 1998 – 2001
- Figure 4. Sales of therapeutic antimicrobials (tonnes active ingredient) by route of administration in food animals 1998 – 2001
- Figure 5. Sales of therapeutic antimicrobials (tonnes active ingredient) by food animal species 1998 – 2001
- Figure 6. Live weight ('000 tonnes) of animals slaughtered for food use 1998 – 2001



SUMMARY

This is the fourth in a series of reports designed to provide information about the sales of veterinary antimicrobial products in the UK. This report includes some changes to the format used in previous years. It also uses a new method for calculating the figures. These changes are explained below.

Format of the Report

The format of this year's report has been changed to:

- make the figures more readily understandable by including graphs;
- introduce an additional reporting category; antiprotozoals;
- make the historic figures comparable with current figures by including data not available in earlier years: and
- include information comparing usage with production of additional foods of animal origin, i.e. milk.

Revised data

Following a visit to Denmark where we studied the methods used there to calculate the quantities of antimicrobials sold, we engaged a consultant to carry out a comprehensive review of the methods used to calculate the quantity of antimicrobial active ingredient in each product and the categories under which product sales are reported. As a result of this review we have revised our system for calculating sales figures for this year's report. We have also used this new calculation method to revise the figures previously reported for the years 1998 to 2000 inclusive. We have not revised any figures for data submitted before 1998 because fundamental differences in the way those data were reported (e.g. provided by cost rather than weight) would mean that they would not provide meaningful comparisons to the current data.

Trends

Total Sales

The total sales of therapeutic antimicrobials in the UK remained relatively steady between 1998 and 2001. During 2001 sales of antimicrobials for therapeutic use in all animals amounted to 459 tonnes. This is comparable to those sales reported in 2000 (462 tonnes), but marginally higher than those reported for 1998 (449 tonnes) and 1999 (445 tonnes).



The total sales of antimicrobial growth promoters in 2001 (43 tonnes) appear to have increased to near their 1998 amount (46 tonnes). However there were data missing for 1999 and 2000, and the changes in sales between these years and 2001 may therefore not be as great as they appear. Sales of these products are exclusively for food producing animals.

Sales of coccidiostats in 2001 were 242 tonnes, the highest sales of the four reporting years. However it is known that in 1998 and 1999 there were missing data. Direct comparisons of sales between these years and 2001 therefore cannot be made. Coccidiostats are used in food producing animals only, particularly poultry.

The sales of therapeutic antiprotozoals in 2001 were 25 tonnes, continuing the downward trend in sales of these products for the third consecutive year (2000 – 26 tonnes, 1999 – 27 tonnes). Missing data in 1998 make comparison of sales for this year impractical.

Food-Producing Animals

In 2001 sales of antimicrobial products for therapeutic use in food-producing animals accounted for approximately 91% (420 tonnes) of the total annual sales of 459 tonnes. This compared with 93% in 2000, 90% in 2001 and 90% in 1998. It is not possible to identify the quantity of antimicrobials sold for use in food-producing animals that were administered to animals that did not enter the food chain (for example, cattle barred from use in food as they were over thirty months old).

Almost half of the total sales of therapeutic antimicrobials were accounted for by tetracyclines (41%, 49%, 48%, 51% in years 2001-1998). In each of the four reporting years 1-2 tonnes of fluoroquinolones were sold (less than 1% of the total). Between 64% and 73% of therapeutic antimicrobial products for food animals were sold as medicated feedingstuffs, over the reporting period (1998 – 2002), most of which are used in the pig and poultry industries.

Ninety-one percent of all antimicrobials sold for use in food animals in 2001 were for therapeutic purposes while the remaining 9% were for growth promotion. These figures are similar for the other reporting years for therapeutic products (2000 – 95%, 1999 – 94%, 1998 – 90%). There was a slight decrease in sales of antimicrobial growth promoters from 46 tonnes of the base active ingredient in 1998 to 43 tonnes in 2001.

The biggest increases in sales of therapeutic antimicrobials in 2001 were for products for pigs (increased by 10 tonnes or 10%) and poultry (increased by 4 tonnes or 25%). Sales of multi-species products decreased (by 21 tonnes or 7%) over the same period.



Context

Animal health background

In addition to the normal animal health challenges facing the industry, during 2001:

- the UK pig industry suffered from the presence of diseases such as Porcine Dermatitis and Nephropathy Syndrome and Post-weaning Multi-systemic Wasting Syndrome (PDNS/PMWS);
- the UK also suffered its largest recorded outbreak of Foot-and-Mouth Disease in 2001; and
- in addition the industry faced the ongoing consequences of the EU ban in 1999 of some antimicrobial growth promoters.

Interpreting the figures

The figures in this report should only be taken to indicate overall trends in sales. There is currently no central record kept of the use of antimicrobials in the UK. However it is reasonable to assume that there is a direct relationship between the quantity of antimicrobials sold in the UK and those used in the UK.

The data used to produce this report were provided voluntarily by the veterinary pharmaceutical companies marketing these products in the UK. We are grateful for their cooperation. Consequently we are unable to measure the quality or to quantify a degree of uncertainty for the figures reported. Some minor discrepancies may occur in the figures reported as a result of data rounding.

We are currently looking at how to refine the species attribution for products sold for use in more than one species.



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. In the UK, the Government has made clear that it takes this problem seriously. A comprehensive Government strategy has been developed to address this issue so that the effectiveness of antimicrobial products 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 four years, in response to recommendations made by the Advisory Committee on the Microbiological Safety of Food (ACMSF), we have collated and published figures on UK sales volumes of active antimicrobial ingredients authorised as veterinary medicinal products, growth promoters or coccidiostats. (Figures for 2000 were published in February 2002.)

These reports are based on sales data provided voluntarily by the veterinary pharmaceutical companies marketing these products in the UK. It is reasonable to assume that there is a close correlation between the reported quantities of products sold and those used in the UK.

As well as including the sales figures for 2001, this year's report also restates sales figures for 1998 to 2000. (Tables showing previously published figures are included at Annex 1 to this report.) This follows revision of the reporting methodology we have employed and to the report format.

The format of this year's report has changed to:

- make the figures more readily understandable;
- introduce an additional reporting category; antiprotozoals;
- make the historic figures comparable with current figures by including data not available in earlier years; and
- include information comparing usage with production of additional foods of animal origin, such as milk.

A glossary of terms used in this report can be found at Annex 2.



Methods Used

The following paragraphs provide a brief overview of the methods that we have 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 quarter of each calendar year. These data are collated and verified before they are imported into a bespoke IT spreadsheet.

Categorisation of data

Additional information on each of these products, is included in the database from regulatory data. 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.

This data set is then sub-divided into chemical groups, administration methods, target species etc. A number of antimicrobial products are authorised for use in more than one species. For these products we do not currently have any means of assessing the quantities sold for use in each of the species for which they are authorised. In these cases we therefore apportion the sales equally between the species. The resulting figures are added to the figures calculated from single species use products to provide total sales figures for products for use in food-producing and non food-producing species.

Collation and publication

The resulting figures are collated into a report format, and patterns and trends of sales are identified. (It is not the remit of this report to interpret these patterns. However where appropriate, we do include information on factors that 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 the Defra Antimicrobial Resistance Coordination (DARC) Group.

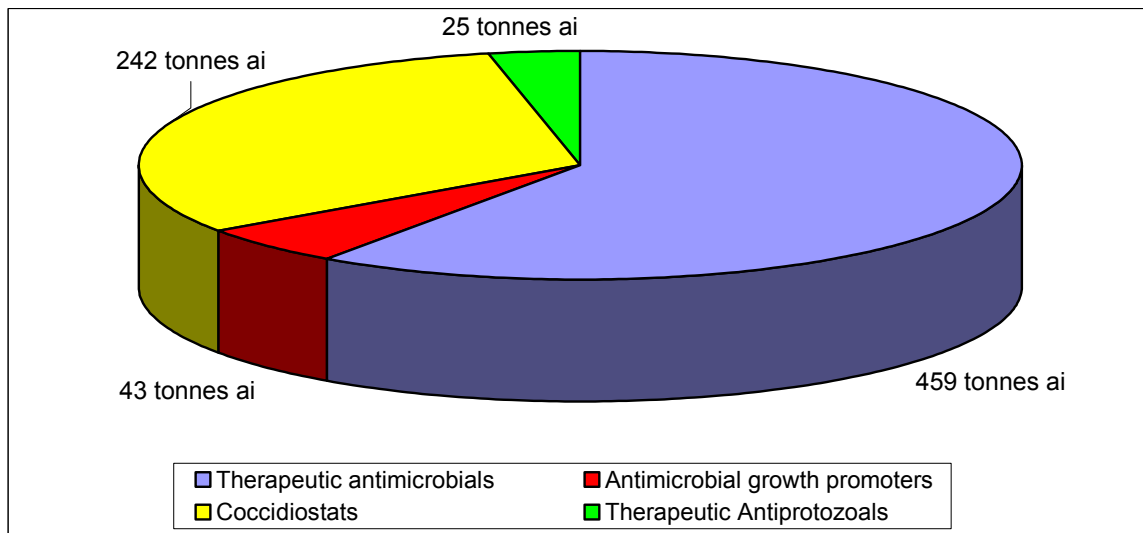


RESULTS

TOTAL SALES

Figure 1 illustrates the quantities of sales in 2001 for each of the four groups of veterinary products reported on within this document. Therapeutic antimicrobials were the largest selling group (459 tonnes a.i.), followed by coccidiostats (242 tonnes a.i.), then antimicrobial growth promoting products (43 tonnes a.i.). Therapeutic antiprotozoals were the smallest selling group of the four (25 tonnes a.i.).

Figure 1: Quantities of therapeutic antimicrobials and antiprotozoals, coccidiostats and antimicrobial growth promoters sold in the UK in 2001.



Total Sales: Therapeutic Antimicrobials

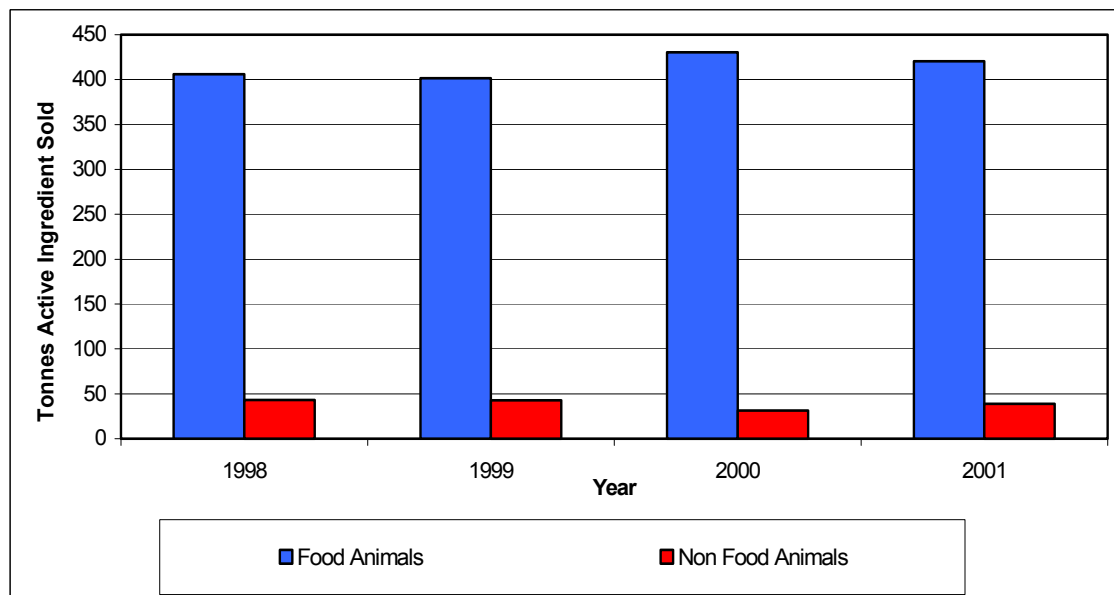
Table 1 shows the gross quantities of antimicrobial active ingredients in therapeutic products sold between 1998 and 2001. The sales are divided into those sold for use in food-producing animals and non food-producing animals and expressed as tonnes of base active ingredient. These figures are also expressed graphically in Figure 2.



Table 1: Sales of antimicrobial therapeutic products (tonnes active ingredient) 1998 – 2001 in food and non-food animals

	1998	1999	2000	2001
	Tonnes Active Ingredient			
Therapeutic Antimicrobials– Food Animals	406	402	431	420
Therapeutic Antimicrobials– Non-Food Animals	43	43	31	39
Total	449	445	462	459

Figure 2: Sales of antimicrobial therapeutic products (tonnes active ingredient) 1998 – 2001 in food and non-food animals



In 2001 sales of therapeutic products for use in food-producing animals decreased compared to 2000, following an increase between 1998 and 2000. Sales of therapeutic antimicrobials for use in non food-producing animals decreased yearly from 1998 to 2000 before increasing again in 2001, but not to the same levels as in 1998.

Table 2 illustrates the percentage changes for sales of therapeutic antimicrobials in food-producing and non food-producing animals for the years 1998-2001. Total sales of therapeutic antimicrobials for food-producing animals were almost constant between 1998 and 1999 but increased by 7% in 2000. Sales in 2001 decreased by 3%, from 431 tonnes in 2000 to 420 tonnes. In contrast, the quantities of therapeutic products sold for use in non food-producing animals increased by 26%, from 31 tonnes in 2000 to 39 tonnes in 2001.



Table 2: Percentage changes between sales of therapeutic antimicrobials, in food and non-food animals 1998-2001

	1998	1999	2000	2001
	Tonnes Active Ingredient			
Food Animal Therapeutic	406	402	431	420
Annual % increase/decrease	N/A	-1%	7%	-3%
Non-Food Animal Therapeutic	43	43	31	39
Annual % increase/decrease	N/A	0%	-28%	26%

- Although declining slightly, the sales of therapeutic antimicrobials in food-producing animals in 2001 remained at around the same level as in 2000.

Total Sales: Antimicrobial Growth Promoters

Table 3 summarises the sales of antimicrobial growth-promoting products reported. Sales of antimicrobial growth promoters appeared to decrease from 1998 (46 tonnes) to 1999 (23 tonnes) and remained constant in 2000 (24 tonnes). Sales in 2001 (43 tonnes) appear to have increased back to near their 1998 levels. However we are aware that there are missing data for 1999 and 2000 and these changes may therefore not be as great as they appear.

Table 3: Sales of antimicrobial growth-promoting products (tonnes active ingredient) in the UK 1998 - 2001

	1998	1999*	2000*	2001
	Tonnes Active Ingredient			
Growth Promoting Products	46	23*	24*	43

* missing data

Total Sales: Coccidiostats

Table 4 summarises the sales of coccidiostats reported to the VMD. The full sales data for coccidiostats for 1999 are not known, but it is assumed that the 88 tonnes reported were below what was actually sold. With this in mind, the large increase in coccidiostat sales between 1999 and 2000 probably reflects missing data in 1998 and 1999 rather than higher sales in subsequent years. Coccidiostats are not related to any product currently used in human therapy. They are used exclusively in animals to prevent coccidiosis, particularly in poultry.



Table 4: Sales of coccidiostats (tonnes active ingredient) in the UK 1998 - 2001

	1998*	1999*	2000	2001
	Tonnes Active Ingredient			
Coccidiostats	102*	88*	216	242
Annual Increase / Decrease	N/A	N/A	N/A	12%

* missing data

Total Sales: Therapeutic Antiprotozoals

Table 5 summarises the sales of antiprotozoals reported to the VMD. Antiprotozoals are products primarily used in the treatment of parasitic protozoal infections including amoebiasis, trichomoniasis, trypanosomiasis and leishmaniasis. Sales of antiprotozoals remained at similar values over the years 1999-2001, although a slight overall downward trend can be detected.

Table 5: Sales of antiprotozoals (tonnes active ingredient) in the UK 1998 – 2001

	1998*	1999	2000	2001
	Tonnes Active Ingredient			
Antiprotozoals	7*	27	26	25
Annual Increase / Decrease	N/A	N/A	-4%	-4%

* missing data



SALES BY CHEMICAL ANTIMICROBIAL GROUP

Table 6 and Figure 2 show the sales of various chemical groups of antimicrobials between 1998 and 2001. 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 2. In all years, tetracyclines, trimethoprim/sulphonamides and β -lactams (including penicillin) accounted for the majority of the therapeutic antimicrobials sold. In combination, in 2001, they accounted for 79%, of total sales, with tetracyclines accounting for 41%, Trimethoprim/sulphonamides (TMPs) 22% and β -lactams 16%. Most tetracyclines were sold for use in pigs and poultry as medicated feedingstuffs (MFS).

Table 6 and Figure 3 indicate that sales significantly increased for all of the major therapeutic groups during 2001, in comparison to 2000, except for tetracyclines, which showed a decrease, and TMPs, which remained static. Reasons for this increase may include those noted earlier under the Section on Results: Total Sales. The most significant percentage changes are in the sales of aminoglycosides, macrolides and β -lactams. These showed increases of 44%, 22% and 20% respectively, in 2001, compared to 2000.

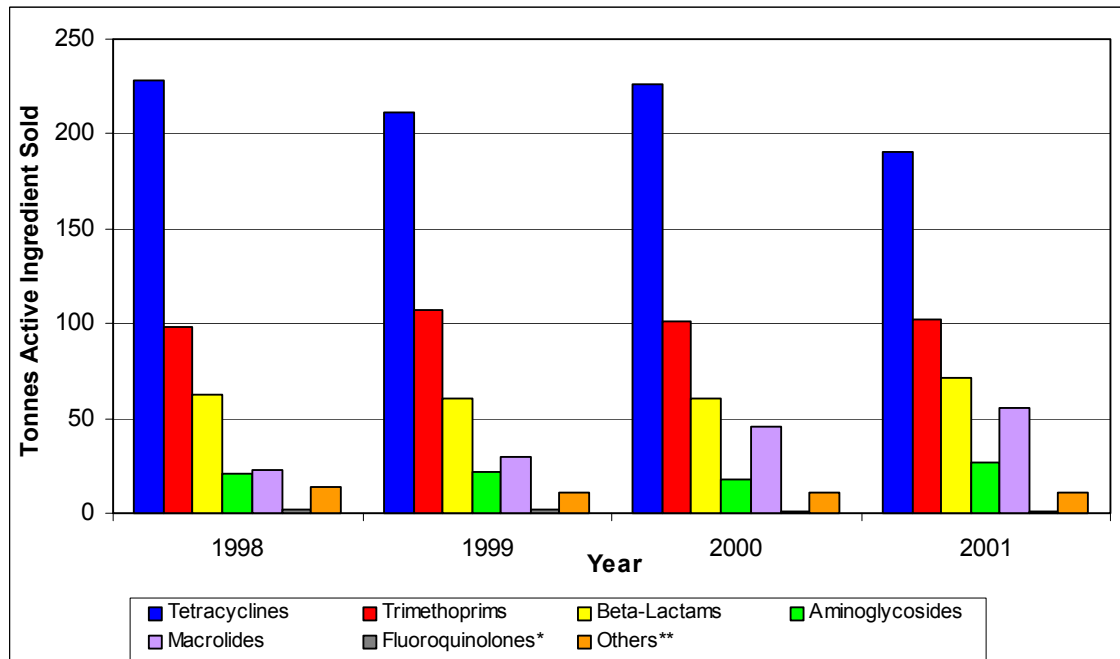
Table 6: Sales of antimicrobial therapeutic products by chemical grouping (tonnes active ingredient) 1998 – 2001

	1998	1999	2000	2001
Tetracyclines	228	212	226	190
Trimethoprim/Sulphonamides	99	108	101	102.
β -Lactams	63	61	60	72
Aminoglycosides	21	22	18	26
Macrolides	23	29	45	55
Fluoroquinolones	2	2	1	1
Other	14	11	11	11
Total	449	445	462	459

Macrolide antimicrobial products showed the largest increase in sales over the reporting period; 23 tonnes in 1998 to 55 tonnes in 2001. The majority of these sales comprised medicated feedingstuffs for use in pigs. A smaller number of macrolides sold were authorised for use in other food-producing animals (cattle, sheep and poultry). These were administered by a range of methods, including orally and by injection.



Figure 3: Sales of antimicrobial therapeutic products (tonnes active ingredient) 1998 – 2001



* Includes products with the quinolone ingredient Oxolinic acid.

** Includes Chloramphenicol[#], Clindamycin, Diethanolamine, Florfenicol, Fusidic acid, Lincomycin, Metronidazole, Nitrofurazone, Novobiocin, Polymixin B Sulphate, Tiamulin, and Valnemulin.

This ingredient is only authorised for use in non-food animal species and is banned for use in food animals.



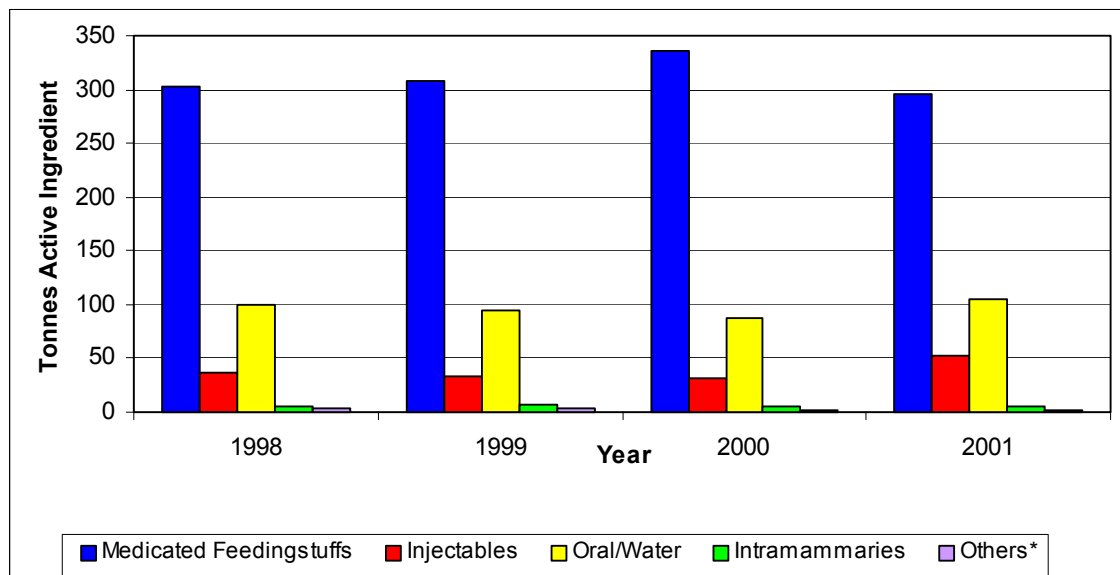
SALES BY ROUTE OF ADMINISTRATION

Table 7 and Figure 4 list the major routes of administration of antimicrobials sold in 1998 - 2001. Medicated feedingstuffs made up 64% of the therapeutic antimicrobials, whilst water/oral medication and injectables contributed 23% and 11% respectively in 2001. Intramammary products and other therapeutic antimicrobial products (creams, aerosols, drops, etc) in 2001 contributed 1% and 0.4% respectively. Compared to the 2000 sales figures, there was a slight decrease (less than 1%) in sales in 2001, although there were increased sales of injectable and oral/water administered products. In contrast, sales of medicated feedingstuffs decreased by 12% whilst sales of intramammary products showed little change.

Table 7: Sales of therapeutic antimicrobials (tonnes active ingredient) by route of administration in food animals 1998 – 2001

	1998	1999	2000	2001
Medicated Feedingstuffs	303	307	336	296
Injectables	38	34	32	51
Oral / Water	100	95	87	105
Intramammaries	5	6	5	5
Others	3	3	2	2
Total	449	445	462	459

Figure 4: Sales of therapeutic antimicrobials (tonnes active ingredient) by route of administration in food animals 1998 – 2001



* includes aerosols, creams, ear and eye medications.



Sales of intramammary products increased from 5 tonnes active ingredient to 6 tonnes between 1998 and 1999. Sales fell back to 5 tonnes in 2000 and remained constant between 2000 and 2001 (see Table 8). During this period dairy cattle numbers slightly decreased (Defra Statistics Branch).

Table 8: Sales of antimicrobial intramammary products (tonnes active ingredient) 1998 – 2001

	1998	1999	2000	2001
	Tonnes Active Ingredient			
Dry Cow Products	3	4	3	3
Lactating Cow Products	2	2	2	2
Total	5	6	5	5



SALES BY FOOD ANIMAL SPECIES

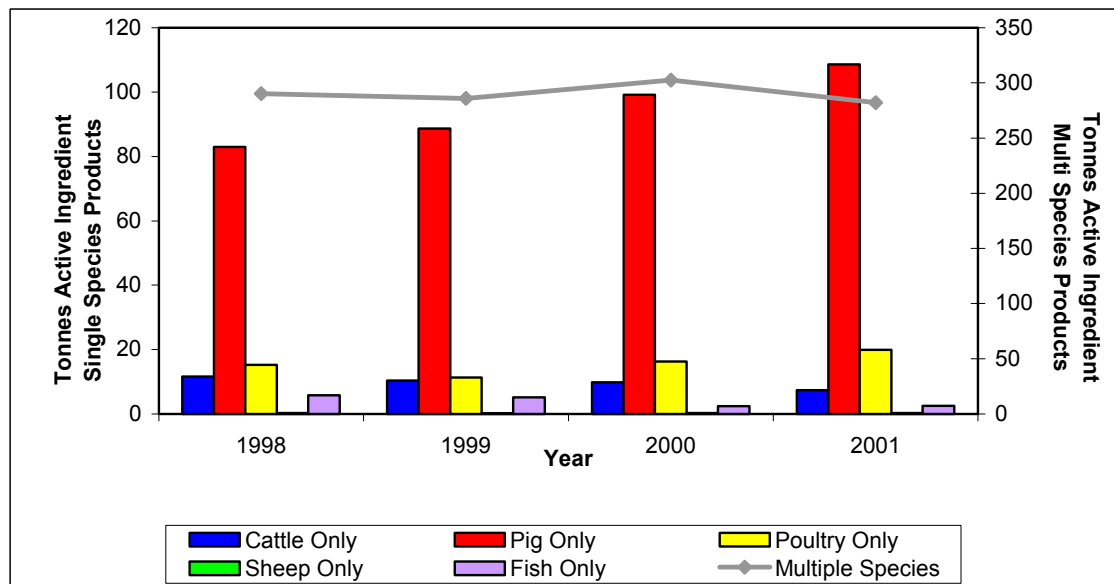
Table 9 and Figure 5 provide a breakdown of the sales of antimicrobials for use in different species of food animals. Figure 5 shows that in 2001 around 67% of antimicrobial products sold were authorised for use in more than one species. These sales are estimates only, as VMD currently has no accurate means of assessing the quantities of such products sold for use in the individual species for which the products are authorised. To provide an estimate of sales per species the VMD currently apportion the total sales equally between all those species for which each product is authorised.

Table 9: Sales of therapeutic antimicrobials (tonnes active ingredient) by food animal species 1998 – 2001*

	1998	1999	2000	2001
Cattle Only Products	12	10	10	7
Pig Only Products	83	89	99	109
Poultry Only Products	15	11	16	20
Sheep Only Products	>1	>1	>1	>1
Fish Only Products	6	5	2	3
Multi Species Products In Food Animals Only*	290	286	303	282
Total	406	402	430	421

* Figures are estimated only.

Figure 5: Sales of therapeutic antimicrobials (tonnes active ingredient) by food animal species 1998 – 2001





In Figure 5, the primary (left hand) axis shows the total tonnages of all single species products sold and the secondary (right hand) axis shows those tonnages for multi-species products sold. Multi-species products include those authorised for use in a combination of two or more species.

The greatest number of antimicrobial products authorised for use in more than one species are authorised for use in pigs and poultry. It is currently impossible to determine how much of a product authorised for use in more than one species has been sold for use in each species. However, we have commissioned an independent study to investigate this split in the largest selling multiple species antimicrobial products, in an attempt more accurately to apportion sales to each species for which they are authorised. The results of this study are expected later in 2003.

The figures indicate that the total quantity of antimicrobials sold in 2001 for use in aquaculture remained the same as in 2000 (at around 2.5 tonnes), despite an increase in farmed fish (salmon and trout) production. These levels of sales are substantially lower than sales in 1998, when only 120,000 tonnes of salmon and trout were produced in the UK and 6 tonnes of fish-only antimicrobials were sold.



ANTIMICROBIALS SALES AND LIVESTOCK REARED

Table 10 and Figure 6 show the live weights of animals slaughtered for food from 1998-2001. (The data for livestock were provided by the Defra Statistics (Commodities and Food) Division. Fish data were provided by the Scottish Executive, the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) and the Department of Agriculture and Rural Development in Northern Ireland (DARD NI).)

The total live weight of animals slaughtered for food fell by around 10% between 2000 and 2001 whilst total sales of therapeutic antimicrobials and antimicrobial growth promoters for food animals increased by 2%. The total live weight of livestock reared for food decreased from 1998 to 1999, increased again in 2000 before decreasing again in 2001. Cattle, pig and sheep production decreased by approximately 19%, 13% and 28% respectively in 2001 compared to 2000.

Between 1998 and 2000 there was a drop in poultry production. This increased again in 2001 to the highest level of the last four years. Fish production increased by just under 8% in 2001.

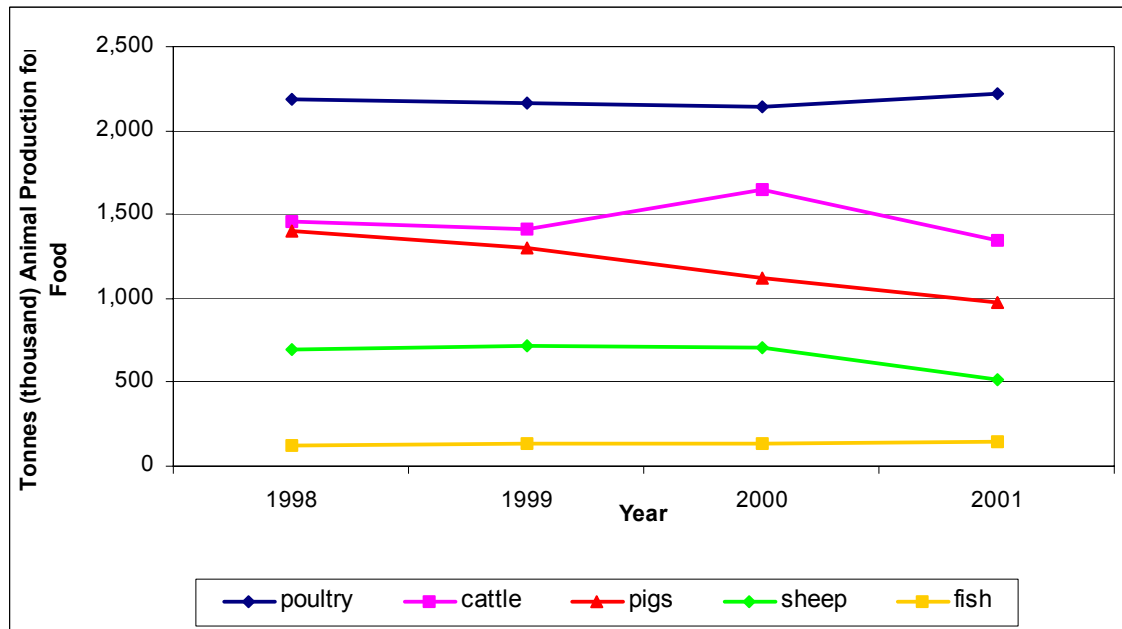
Table 10: Live weight ('000 tonnes) of animals slaughtered for food use 1998 – 2001

	1998*	1999	2000	2001
Live Weight Tonnes ('000) Slaughtered				
Cattle	1,452	1,407	1,645	1,341
Pigs	1,402	1,298	1,121	972
Sheep	699	717	711	514
Poultry	2,184	2,160	2,144	2,218
Fish	122	140	140	151
Total	5,859	5,722	5,761	5,196

* 1998 was a 53 week reporting year. The data for cattle, pigs, sheep have been normalised by Defra Statistics Branch to a 52 week reporting year to allow direct comparison with data from later years.



Figure 6: Live weight ('000 tonnes) of animals slaughtered for food use 1998 – 2001



Many farm animals are reared to slaughter without the use of therapeutic antimicrobials or antimicrobial growth promoters. Other animals such as dairy cows may be treated with antimicrobials but are not slaughtered for food use. However, if it were assumed that total antimicrobials sold for food-producing animals (therapeutic and growth-promoting products) were used only in animals slaughtered for food, 1 tonne of antimicrobial would have been used to produce 12,962, 13,463, 12,661 and 11,222 tonnes of live weight of animals slaughtered in the years 1998-2001 (see Table 11).

Table 11: Total live weight ('000 tonnes) of animals slaughtered for food use (data sources see above) against antimicrobial product sales (tonnes active ingredient) 1998-2001

	1998	1999	2000	2001
Total live weight animals slaughtered for food use	5,859	5,722	5,761	5,196
Total antimicrobials (therapeutic and growth promoters) sold for food animals (tonnes a.i.)	452	425	455	463
Live weight of animals slaughtered for food per tonne of antimicrobial a.i. sold	12,962	13,463	12,661	11,222



The figures for live weight of animals slaughtered are only those animals fed and slaughtered within the UK, i.e. no account has been taken of those live animals exported. Furthermore, the live weight slaughter figures do not include animals slaughtered via the over 30-months scheme (OTMS) or selective culls throughput (e.g. FMD, swine fever-infected animals), i.e. animals not slaughtered for food production. 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 may 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. If they were taken into account, the quantities of antimicrobials used to produce each tonne of animal slaughtered for human food would decrease.



ANTIMICROBIAL SALES AND OTHER FOOD ANIMAL COMMODITIES

Table 12 details the litres of cows milk produced in the UK annually, expressed in millions of litres. These data have been compared to the quantities of intramammary products sold over the same period for use in lactating cows. Between 1998 and 1999 the quantity of milk produced for each tonne of intramammary product sold for use in lactating cows increased, but decreased again in 2000 and 2001.

Table 12: Litres of milk produced per tonne of antimicrobial lactating cow intramammary product (tonnes active ingredient) sold

	1998	1999	2000	2001
	Tonnes Active Ingredient			
Million litres milk produced	14,217	14,588	14,078	14,292
Tonnes a.i. lactating intramammary sold	2	2	2	2
Million litres milk produced per tonnes a.i.	7,108	7,294	7,039	7,146

Not all of the approximately 14 million litres of milk produced annually in the UK is sold for human consumption. A proportion is fed back to calves. Milk produced over the allowed EU quotas is destroyed.



HOW CAN WE IMPROVE THIS REPORT?

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

This year we have substantially revised the format of this report to make it clearer and more concise (see pages 5 and 8).

We have also updated the methods used to calculate the final published figures, to improve their accuracy (see page 8/9). We will continue to strive for further improvements, where possible, within the limitations of the data with which we are supplied.

We are trying to improve our data collection protocol by revising the method by which we request sales data from the pharmaceutical companies. We will provide each company with a list of the products on which we would like to receive sales data, divided into the main product groupings (therapeutic antimicrobials, therapeutic antiprotozoals and zootechnical feed additives). The list will be provided electronically to reduce the amount of time we take to process these data, and decrease the chances of transcription errors from hard copy information to spreadsheet.

We are currently reviewing our methods for apportioning the sales of products authorised for use in more than one species (see page 9), with the aim of introducing a more accurate methodology in time for our next published report.

We are also 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, including those outside the UK. This is likely to include information held on residues surveillance databases, other national antimicrobial sales/use databases and microbial sensitivity databases.

We will also aim to compare egg production in the UK and sales of antimicrobials for use in poultry. Data to undertake this comparison are currently unavailable to VMD, but we will try and find the relevant information within year.

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:

**The Veterinary Medicines Directorate
Woodham Lane
New Haw
Addlestone
Surrey KT15 3LS**

k.goodyear@vmd.defra.gsi.gov.uk

**VETERINARY MEDICINES DIRECTORATE
March 2003**



ANNEX 1: PREVIOUSLY PUBLISHED FIGURES 1998-2000

The following tables illustrate those sales figures published previously for the years 1998, 1999 and 2000.

Sales of antimicrobial therapeutic products (tonnes active ingredient) 1998-2000 in food and non-food animals

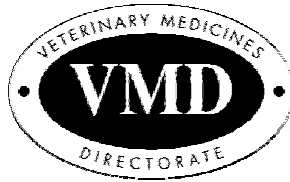
	1998	1999	2000
	Tonnes Active Ingredient		
Therapeutic antimicrobials food animals	433	383	437
Therapeutic antimicrobials non-food animals	32	37	29

Sales of antimicrobial therapeutic products by chemical grouping (tonnes active ingredient) 1998-2000

	1998	1999	2000
	Tonnes Active Ingredient		
Tetracyclines	233	192	228
Trimethoprim/Sulphonamides	80	82	94
Beta-Lactams	60	52	49
Aminoglycosides	24	20	12
Macrolides	24	29	41
Fluoroquinolones	1	1	1
Others	11	7	11

Sales of antimicrobial growth promoting products (tonnes active ingredient) in the UK in 1998-2000

	1998	1999	2000
	Tonnes Active Ingredient		
Growth Promoters	89	28	24



Sales of coccidiostats (tonnes active ingredient) in the UK 1998-2000

	1998	1999	2000
	Tonnes Active Ingredient		
Coccidiostats	103	66	235

Sales of therapeutic antimicrobials (tonnes active ingredient) by route of administration in food animals 1998-2000

	1998	1999	2000
	Tonnes Active Ingredient		
Medicated Feedingstuffs	362	307.5	244
Injectable	24	27	27
Water/Oral	38	40	158
Intramammaries	7	5.5	5.7
Others	2	3	1.2

Sales of therapeutic antimicrobials (tonnes active ingredient) by food animal species 1998-2000

	1998	1999	2000
	Tonnes Active Ingredient		
Cattle	11	11	10
Pigs	90	89	96
Sheep	<1	<1	0.3
Poultry	14	11	24
Fish	5	4	2
Multi-species	313	267	304



ANNEX 2: GLOSSARY OF TERMS

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.
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 withstand an antimicrobial.
Antiprotozoal	A drug primarily used in the treatment of parasitic protozoal infections.
β-Lactams	Semi-synthetic antibiotics derived from cephalosporin C, a natural antibiotic produced by the mould <i>Cephalosporium acremonium</i> . Bactericidal products that act by inhibiting synthesis of the bacterial cell wall. The β -Lactams include penicillins.
Coccidiostat	Products used for the control of coccidiosis, a protozoa causing diarrhoea and dysentery.
Defra	Department for Environment, Food and Rural Affairs.
Fluoroquinolones	A sub-group of the quinolone compounds, having the addition of a fluorine atom and the 7-piperazinyl group. Broad-spectrum antibiotics with properties more suited to the treatment of systemic infections.



Food Animals	Animals produced for food for the purpose of this report: cattle, sheep, pigs, chickens, turkeys, duck, geese, deer, salmon, and trout.
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.
Macrolides	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.
PDNS	Porcine Dermatitis and Nephropathy Syndrome, a disease affecting pigs.
PMWS	Post-weaning Multi-systemic Wasting Syndrome, a disease affecting pigs.
Sulphonamides	A group of bacteriostatic compounds that interfere with folic acid synthesis of susceptible organisms. They all have similar antimicrobial activity but different pharmaco-kinetic properties.
Tetracyclines	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.
Zootechnical Feed Additive	A high technology feed additive, used routinely in low doses to affect favourably the performance of animals in good health. Includes growth promoters, coccidiostats and histomonostats.

