

Sales Of Antimicrobial Products  
Used As Veterinary Medicines,  
Growth Promoters And  
Coccidiostats In The UK From  
1993-1998

## **SUMMARY**

This paper reports for the first time data for sales of veterinary antimicrobial products in the UK. It shows there was a significant rise in the sale of antimicrobials from 1993-1996, followed by a fall in 1997 and 1998 to pre-1994 levels. Over the period 1993-1998 inclusive antimicrobials sales in food animals accounted for 95% (555 tonnes) of the mean annual sales of 584 tonnes. Just under half (47%) of the total sales of antimicrobials for use in food animals is accounted for by tetracyclines whereas fluoroquinolones account for only about 1 tonne (0.2%).

Between 83%-90% of the antimicrobials sold for use in food animals during the 6-year period were for therapeutic purposes, with growth promoters accounting for 10-17%. About 80% of antimicrobial products are administered via feedstuffs and most is used for pigs and poultry but further work is needed to determine the species breakdown more accurately.

The VMD will continue to collect and publish information on antimicrobial sales on an annual basis and seek to refine the data as more information becomes available. As results of antimicrobial resistance surveillance become available, it will be possible to compare trends in the sales of antimicrobials with patterns of resistance. The figures also provide a baseline for consideration of the Government's policy to seek to reduce the overall use of antimicrobials in order to maintain antimicrobial efficacy.

## INTRODUCTION

The emergence of antimicrobial resistance as a serious problem in human medicine has led to increasing concerns about the use of antimicrobial products in medicine, veterinary medicine, animal production, agriculture and horticulture. These concerns have been set out in recent national and international reports, including those from the House of Lords Committee, the Advisory Committee on the Microbiological Safety of Food, the European Union's Committee for Veterinary Medicinal Products and the Council of Ministers, and the World Health Organisation.

In the UK, the Government has made clear that it takes the problem of antimicrobial resistance very seriously and a comprehensive strategy is being developed to address the issue in order to maintain the effectiveness of antimicrobial products. A key element of this plan is the collection of information on the amounts of antimicrobial products used in veterinary medicine and animal production in the UK. This information would assist the regulatory authority to monitor changes in the overall use of antimicrobial products, relate these to changes in antimicrobial resistance and identify where reviews of prescribing practices might be appropriate.

The Veterinary Medicines Directorate (VMD), an executive agency in the Ministry of Agriculture, Fisheries and Food which is responsible for the authorisation of veterinary medicines in the UK, has collected sales figures of antimicrobials authorised as veterinary medicinal products, growth promoters or coccidiostats (the last two are authorised under separate arrangements by the EU as feed additives) for the period 1993-1998. The information was provided by the veterinary pharmaceutical companies marketing these products in the UK. This paper summarises the information that has been provided.

## TOTAL SALES

Table 1 shows the amounts of therapeutic antimicrobials and antimicrobial growth promoters sold for use in food animals (including aquaculture) from 1993-1998 expressed as tonnes of base active ingredients. The table also includes the total sales of therapeutic antimicrobials sold for use in non-food animals (horses, dogs, cats etc.) and the total amounts of antimicrobials sold for use in food animals and non-food animals during this period.

**Table 1 : Sales of antimicrobial therapeutic products and growth promoters (tonnes active ingredient) 1993-1998**

	1993	1994	1995	1996	1997	1998
Therapeutic antimicrobials - food animals	392	445	486	533	495	433
Annual increase/decrease		14%	9%	10%	-7%	-13%
Antimicrobial growth promoters	83	88	122	96	69	89
Annual increase/decrease		6%	39%	-21%	-28%	29%
Total antimicrobials - food animals	475	533	608	629	564	522
Annual increase/decrease		12%	14%	3%	-10%	-7%
Therapeutic antimicrobials - non-food animals*	20	24	32	30	32	32
Annual increase/decrease		20%	33%	-6%	7%	0%
Total antimicrobials - food animals and non-food animals	495	557	640	659	596	554
Annual increase/decrease		13%	15%	3%	-10%	-7%

\* horses, dogs, cats etc.

Therapeutic and total antimicrobial sales in food animals reached a peak in 1996 and then fell by 1998 to just below the levels sold in 1994. The amounts of antimicrobial growth promoters peaked a year earlier, then fell sharply in 1997 after the withdrawal of avoparcin before rising again in 1998. Between 83-90% of the antimicrobials sold for use in food animals during the 6-year period were for therapeutic purposes, with growth promoters accounting for 10-17%. In non-food animals the amounts sold increased to 1995 and remained similar thereafter.

## SALES BY ANTIMICROBIAL GROUP

Table 2 shows the sales of various groups of antimicrobials in food animals from 1993-1998.

**Table 2 : Sales of therapeutic antimicrobials (tonnes active ingredient) for use in food animals 1993-1998**

	1993	1994	1995	1996	1997	1998
Tetracyclines	231	250	255	300	283	233
Trimethoprim/sulphonamides	87	110	119	125	93	80
$\beta$ -lactams	54	56	59	63	62	60
Aminoglycosides	12	16	36	25	21	24
Macrolides	<1	3	5	6	18	24
Fluoroquinolones	<1	1	1	1	2	1
Others*	8	9	11	13	16	11
Total	392	445	486	533	495	433

\* Includes lincosamides, tiamulin, oxolinic acid, novobiocin, thiostreptan.

Tetracyclines, trimethoprim/sulphonamides and  $\beta$ -lactams (including penicillin) together accounted for 72-81% of therapeutic antimicrobials sold for use in food animals, with tetracycline sales accounting for 42-50%. Most of the tetracyclines are used in pigs and poultry in medicated feedingstuffs (MFS) to treat various disorders including respiratory disease. Large quantities of tetracyclines were used during the 1990s as a result of the introduction of Porcine Reproductive and Respiratory Syndrome (PRRS) to the UK. Better understanding and management of this disease and the introduction of vaccines to prevent respiratory diseases in pigs are likely to have contributed to the decline in tetracycline sales.

Sales of macrolides (e.g. tylosin) and aminoglycosides (e.g. streptomycin and neomycin) increased during the period but fluoroquinolone sales have remained at around 1 tonne of active ingredient since they were first authorised in 1993. The figures reported do not take into account the relative potencies of the different active ingredients. Further information would be needed to address this issue.

Table 3 summarises the sales of coccidiostats for 1993-1998. They are not related to any antibiotic used in human therapy. Coccidiostats are used exclusively in animals to prevent coccidiosis, particularly in poultry. Sales peaked in 1994 and have fallen since then except in 1997.

**Table 3 : Sales of coccidiostats (tonnes active ingredient) in the UK  
1993-1998**

	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
Coccidiostats	114	139	124	113	121	103
Annual increase/decrease		22%	-11%	-9%	7%	-15%

## SALES BY ROUTE OF ADMINISTRATION

Table 4 lists the major types of formulation of antimicrobials sold during 1993-1998. Total sales increased during the period, reaching an overall peak in 1996 before falling in the subsequent two years. This was mainly due to medicated feedstuffs which accounted for 81-84% of products sold.

**Table 4 : Sales of therapeutic antimicrobials (tonnes active ingredient) by route of administration in food animals 1993-1998**

	1993	1994	1995	1996	1997	1998
Medicated feedstuffs	328	361	393	433	405	362
Injectable	37	40	45	43	30	24
Water/Oral	18	34	37	47	51	38
Intramammaries	5	5	7	6	6	7
Other *		5	4	4	3	2
Total	392	445	486	533	495	433

\* Includes aerosols, creams, ear and eye medications.

## SALES BY FOOD ANIMAL SPECIES

Sales of antimicrobials for use in different species of food animals are shown in Table 5. It is clear from this table that 68-72% of antimicrobial products are authorised for use in more than one species.

It is likely that most are used in pigs and poultry but it is currently impossible to determine the exact usage in different species. An independent study is currently being commissioned to provide further data on this aspect of the use of antimicrobials in food animals.

Table 5 also shows considerable decline in the sales of antimicrobials used in the aquaculture industry between 1993-1998 at a time when fish production was on the increase (see Table 6). In 1993 the sale of one tonne of antimicrobial active ingredient produced 5,500 tonnes of salmon and trout, by 1998 the same amount of antimicrobials was producing 25,200 tonnes of fish (four fold increase). The reduction in the sales of antimicrobials in aquaculture is due mainly to better husbandry practices and the introduction of specific fish vaccines.

**Table 5 : Sales of therapeutic antimicrobials (tonnes active ingredient) by species 1993-1998**

Species	1993	1994	1995	1996	1997	1998
Cattle	10	12	14	11	9	11
Sheep	<1	<1	<1	<1	<1	<1
Pigs	89	91	109	117	121	90
Poultry	10	16	17	20	17	14
Fish (salmon and trout)	10	7	7	7	9	5
Multi-Species*	273	319	339	378	339	313
Totals**	392	445	486	533	495	433

\* a combination of two or more of the following species - cattle, pigs, sheep and poultry.

\*\* does not include growth promoters all of which are multi-species.

## ANTIMICROBIALS SALES AND LIVESTOCK REARED

Table 6 shows the relationship between the live weights of animals slaughtered and the volumes of antimicrobials sold during 1993-1998. The table shows an increase in the total live weight of livestock slaughtered between 1993-1995 which corresponds to the trend in sales of antimicrobials during this period. The total live weight of livestock slaughtered declined in 1996, mainly due to the sharp decline in cattle slaughterings as a result of the BSE crisis but increased in the subsequent two years. Antimicrobial sales, on the other hand, reached a peak in 1996 before falling in the following two years. The fall in sales of antimicrobials in 1997 and 1998 occurred at a time when the total live weight of livestock slaughtered increased.

**Table 6 : Live weight ('000 tonnes) of animals slaughtered\* against antimicrobials (tonnes active ingredient) sales 1993-1998**

	1993	1994	1995	1996	1997	1998
Poultry	1632	1703	1775	1851	1909	1953
Cattle	1762	1886	1992	1418	1392	1388
Pigs	1265	1316	1265	1255	1359	1416
Sheep	849	832	851	806	747	813
Fish (salmon and trout)	55	70	76	89	105	126
Total ('000 tonnes)	5563	5807	5959	5419	5511	5696
Total antimicrobials (therapeutic and growth promoters) used in food animals (tonnes)	475	533	608	629	564	522
Live wt of animals produced from the sale of 1 tonne of antimicrobial active ingredient	11,712	10,895	9,801	8,615	9,773	10,912

\*Source - Agriculture in the United Kingdom 1993-1998. Ministry of Agriculture and Food.