



Targets Task Force: Two Years On

October 2019

A report summarising the progress against antibiotic use targets identified by the UK livestock industry's Targets Task Force in October 2017.

RESPONSIBLE USE OF MEDICINES IN AGRICULTURE ALLIANCE

ruma

Contents

Foreword.....	3	Laying hen sector	29
Introduction	4	Overview	29
The Big Picture	5	Antibiotic use	29
		Next actions.....	31
Cattle sectors: beef and dairy.....	6	Pig sector.....	32
Overview	6	Overview	32
Use of antibiotics	6	Antibiotic use	32
Vaccine uptake	13	Data collection	33
Health and welfare metrics	14	Industry initiatives	34
Benchmarking and data collection.....	15	Next actions.....	34
Farmer and veterinary training	16	Poultry meat sector.....	36
Industry initiatives	17	Overview	36
Next actions.....	18	Antibiotic use	36
Fish sector: trout.....	19	Next actions.....	38
Overview - trout	19	Sheep sector	39
Data collection	19	Overview	39
Antibiotic use	19	Antibiotic use	39
Vaccination	21	Data collection	40
Good practice	22	Reduce disease ‘hotspots’	41
Next actions.....	22	Next actions.....	43
Fish sector: salmon.....	23	Appendices.....	44
Overview - salmon	23	Appendix 1:	
Data collection	23	Cross-sector campaigns.....	44
Antibiotic use	23	Appendix 2:	
Vaccination	25	EMA Classifications	44
Good practice	25	Appendix 3:	
Next actions	26	The Targets Task Force	46
Gamebird sector	27	Appendix 4:	
Overview	27	Abbreviations and Glossary	47
Antibiotic use	27	Appendix 5:	
Next actions.....	28	Summary of progress against targets	49

Foreword

Peter Borriello

Chief Executive, Veterinary Medicines Directorate

This report highlights the tremendous industry efforts and progress on reducing antibiotic use, with key focus on responsible antibiotic use and strategies to reduce the entry and spread of diseases on farm. These accomplishments have been achieved through strong leadership by industry bodies in promoting antibiotic stewardship, training and the sharing of best practice, as well as vets and farmers working together.

The pig sector have demonstrated the value of antibiotic benchmarking in their electronic Medicines Book for pigs, which was introduced in 2018 and has enabled producers to understand their own patterns of antibiotic use. This has helped them to make informed decisions around animal treatments and contributed to the ongoing antibiotic reductions. It is encouraging that the cattle and sheep sectors have also now created benchmarking methods, although further work is needed to increase the availability of antibiotic usage data.

Highest-priority Critically Important antibiotics (HP-CIAs) have continued to fall in all sectors, strongly aided by prescribing principles and guidelines promoted by industry bodies and farm assurance schemes. The reduction of HP-CIAs in cattle has been particularly marked in 2018, which has been greatly supported by the strengthened Red Tractor HP-CIA guidelines requiring that they can only be used as a last resort.

Challenges still remain, and the document highlights on-going and emerging infection risks, such as mycoplasmosis in gamebirds and Swine Dysentery in pigs. We look forward to continuing to support the sectors in their work on antibiotic reduction.



Introduction

The Targets Task Force was first conceived in Spring 2016 as the RUMA Alliance prepared for the release of the final report in Lord O'Neill's seminal AMR Review¹. By the time the Government response to the AMR Review was published in September 2016², the concept of the Targets Task Force had gathered momentum and was ideally positioned to deliver on the key Government objective of a set of industry-developed, sector-specific targets by the end of 2017.

The Task Force first convened in December 2016 and comprised a veterinary surgeon and leading farmer for each of the sectors covering beef, dairy, laying hens, fish (both salmon and trout), gamebirds, pigs, poultry meat and sheep. This facilitated session laid out the challenge and the timetable. Both the Veterinary Medicines Directorate (VMD) and Food Standards Agency (FSA) observed and agreed to provide input on data gathering and methodology. The group then met bi-monthly, going back to sector leaders each time to consult and develop plans. The results of this hard work were captured in the Targets Task Force report³, published in October 2017.

This 'Two Years On' update follows on from the 'One Year On' progress report published in November 2018. As before, it reflects the different approaches each sector has taken and should therefore be read alongside the original Targets Task Force report for full context. However, the targets contained in the original report have also being included throughout this report for ease of reference.

It should be noted that 2018 usage and sales data are the latest available for many species, and that there has been a readjustment of 2016 and 2017 sales data within the report due to an error in data submission to the Veterinary Medicines Directorate (VMD) that has since been rectified and recalculations carried out. Please also be aware where 'mg/kg' units of measurement have been reported, these have been calculated using European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) methodology. This includes the use of standardised animal categories and weights, which represent the average weight at time of treatment and align with the Population Correction Unit (PCU) for that species or sector. More information on the PCU calculation is available by going to www.gov.uk and searching 'PCU'⁴.

Finally, the Targets Task Force was refreshed and reconvened in September 2019 with a view to looking beyond the 2020 deadline for these targets, to develop fresh goals for the different sectors. These will build on the considerable successes already achieved by the sectors, with significant focus on safeguarding animal health and welfare through disease prevention and optimising antibiotic stewardship.

¹ AMR Review www.amr-review.org

² Antimicrobial resistance review: government response www.gov.uk/government/publications/government-response-the-review-on-antimicrobial-resistance

³ RUMA Targets Task Force www.ruma.org.uk/targets-task-force/

⁴ Understanding the mg/PCU calculation used for antibiotic monitoring in food producing animals www.gov.uk/government/publications/understanding-the-mgpcu-calculation-used-for-antibiotic-monitoring-in-food-producing-animals

Big Picture



- **UK sales of antibiotics for food producing animals have fallen 53% since 2014 to 30 mg/kg⁵ and are one of the lowest in Europe.⁵**
- **Highest-priority Critically Important Antibiotic (HP-CIA) sales for food producing animals have fallen 68% between 2014 and 2018 from an already low level, and 19% between 2017 and 2018.⁶**
- **Less than 30% of the UK's antibiotics are now estimated to be used to treat disease in farm animals.⁷ Over a billion farm animals are reared and managed in the UK every year.**
- **The targets for the UK livestock sectors are due to be achieved by 2020.**



⁵ UK Veterinary Antibiotic Resistance and Sales Surveillance Report UK-VARSS 2018 www.gov.uk/government/publications/veterinary-antimicrobial-resistance-and-sales-surveillance-2018

⁶ ESVAC report 2017 www.ema.europa.eu/en/documents/report/sales-veterinary-antimicrobial-agents-31-european-countries-2017-en.pdf

⁷ UK One Health Report 2013-2017 www.gov.uk/government/publications/uk-one-health-report-antibiotic-use-and-antibiotic-resistance-in-animals-and-humans



Cattle sectors: beef and dairy

Overview

Challenges with obtaining industry level data continue, and again, overall use has been calculated from convenience samples in both dairy and beef sectors, which should be interpreted with caution.

However, use of highest-priority Critically Important Antibiotics (HP-CIAs) has fallen significantly across both sectors. Progress has been made towards developing an electronic medicines 'hub' for cattle, with phase two of a pilot project due to complete in March 2020. Vaccine use in the target areas has risen and a wide range of tools, training and industry initiatives have been rolled out.

Use of antibiotics

Antibiotic use in beef cattle

Target
Monitor national antibiotic use in the beef herd annually, aiming for a 10% reduction 2016-2020 or to reach use of 10 mg/kg by 2020, whichever is the lower level on a mg/kg basis.
Latest progress
Antibiotic use in beef cattle was 21 mg/kg in 2017, with a shift away from use of HP-CIAs indicated (no baseline, small convenience sample).

Table 1: Progress towards overall antibiotic use targets in the beef sector

	2016	2017	2018	Target 2020	% change compared with baseline	% change compared with 2017
Total use (mg/kg) ^a	N/A	19.0	21.0	10 mg/kg or 10% reduction from baseline	N/A	11%

^a FarmVet systems data

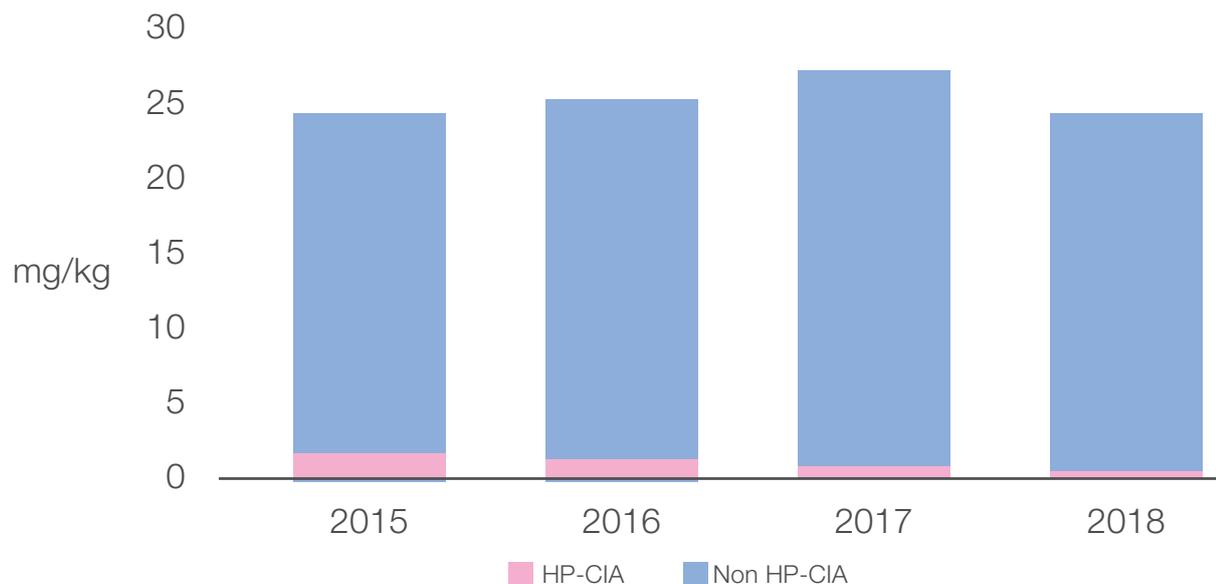
The beef usage data collected from a small convenience sample representing just 5.5% of the UK national herd (3,458 farms) show an increase compared with the previous year (Table 1). However, the sample is small overall and contains a range of beef production systems comprising suckler cows, rearing cattle (including dairy cross calves), and growing and finishing cattle which may not be present in the same proportions as they are in the national herd. There is also inconsistency in the farms from which data have been collected between the two years: only 56% of farms in the 2018 sample were present in the 2017 sample. For these reasons, these usage data should be interpreted with caution.



Subset of 2,350 beef farms

In order to get a better indication of the likely trends in use over time, a sub-set (2,350) of beef farms was analysed, taken from the same convenience sample but only including farms where data was also available for 2015, 2016 and 2017 (Figure 2). This shows the same decrease in use of HP-CIAs that other data sources have shown, and a generally flat overall usage pattern over time.

Figure 1: Trends in total and HP-CIA antibiotic use in the subset of beef farms from the convenience sample 2015-2018 (n=2,350)



Source: FarmVet Systems data

The total antibiotic usage figure is higher in this smaller subset of farms than the full 2018 sample (25 mg/kg versus 21 mg/kg). This may reflect some of the differences in the make-up of the farms included in these samples. Analysis of data from British Cattle Movement Service (BCMS) suggests that smallholders (defined as farms with ≤ 10 births and ≤ 10 animals moving on to the farm) are under-represented, as these are 20% and 16% of the full and smaller sub-set of farms respectively, compared with 33% for all GB beef farms.

Antibiotic use in dairy cattle

Target
Reduce antibiotic use in dairy cows – intra-mammary dry cow by 20% 2015-2020, lactating cow by 10% 2015-2020, total use by 20% 2016-2020.
Latest progress
<ul style="list-style-type: none"> • Intra-mammary tubes (dry cow) was 0.644 DCDVet in 2018. • Intra-mammary tubes (lactating cow) was 0.776 DCDVet in 2018. • Total use in dairy cows was 17 mg/kg in 2018.



Table 2: Progress towards overall antibiotic use targets in the dairy sector

	2015	2016	2017	2018	Target 2020	% change compared with baseline
Intra-mammary tubes – dry cow (DCDVet) ^a	0.732*	0.605	0.547	0.644	0.586	-12%
Intra-mammary tubes – lactating cows (DCDVet) ^a	0.808*	0.818	0.694	0.776	0.727	-4%
Total usage (mg/kg) ^b	24	26.2*	16.0	17.0	21.0	-35%

* Baseline year

^a UK-VARSS 2018

^b FarmVet systems data

As noted in the last update, these figures are taken from a convenience sample representing 673,616 dairy cows from 2,978 farms, which is 30% of the national dairy herd. As a consequence of this and changes of farms in the sample from year to year which may not reflect the distribution of farms across the country, caution should be exercised when interpreting these data.

It must also be noted that due to corrections provided by FarmVet Systems for oral and intramammary products, the total mg/kg figure for 2017 has been reduced from 17 mg/kg to 16 mg/kg. The figure for 2018, at 17 mg/kg (Table 2), is therefore slightly higher than 2017 but still a reduction of 36% compared with the baseline year 2016, and lower than the 2020 target. Sales of both dry cow and lactating cow products have increased slightly during 2018.

Sealant tube use

Target
Increase sealant tube use in dairy cows from 0.5 to 0.7 courses per cow (as an alternative to antibiotic dry cow therapy).
Latest progress
No major change in sales of teat sealants between 2018 and 2015.

Table 3: Progress towards teat sealant tube use target

	2015 baseline	2016	2017	2018	Target 2020	% change compared with baseline
Sealant tube use ^a (average number of courses/dairy cow)	0.5	N/A	N/A	0.51	0.70	+2%

^a Calculated using Defra annual livestock numbers (all dairy cows >2 years of age that have had a calf), Veterinary Medicine Directorate (VMD) 2018 aggregated sales data, and on the assumption that four tubes represents a course.

Little change is shown in internal teat sealant use (Table 3). The British Cattle Veterinary Association (BCVA) has issued a policy to its members that all cows which comply with recommendations for use of internal teat sealants should be considered for such non-antibiotic treatments along with reducing the use of antibiotics at drying off.



HP-CIAs in beef and dairy

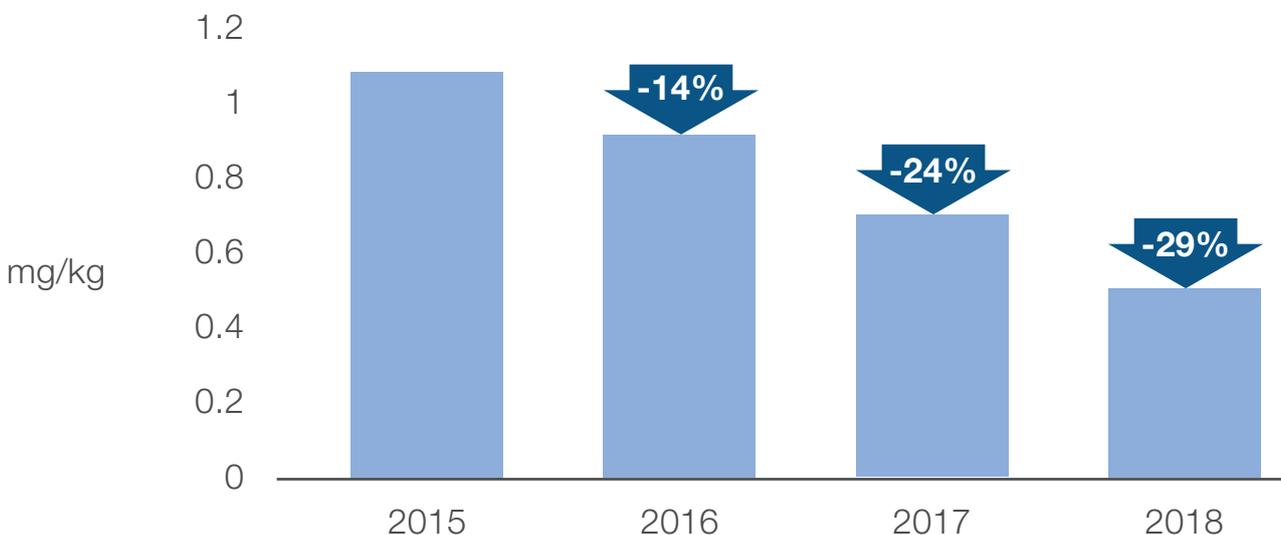
Target
Halve HP-CIA use:
• Halve use of injectable cattle HP-CIAs 2016-2020.
• Halve use of HP-CIAs in the beef sector 2016-2020.
• Halve use of intra-mammary HP-CIAs in the dairy sector 2015-2020.
Latest progress
• Injectable HP-CIA licensed for use in cattle herds was 0.502 mg/kg in 2018.
• HP-CIA intra-mammary use was 0.120 DCDVet in 2018.

Table 4: Progress towards injectable HP-CIA target in beef and dairy cattle

	2015 (original baseline)	2016 (new baseline)	2017	2018	New 2020 Target	% change compared with new baseline
HP-CIA injectable for cattle (mg/kg) ^a	1.075	0.922	0.704	0.502	0.461	-46%

^a UK-VARSS 2018

Figure 2: Injectable HP-CIAs licensed for cattle



Source: FarmVet Systems data

The use of injectable HP-CIA products used across both beef and dairy cattle is showing a consistent and strong downward trend (Table 4 and Figure 2) demonstrating the industry's commitment to reducing the use of these products. Use has almost halved since 2016 to levels that, according to the FarmVet systems usage data, represent 2% and 1% of total antibiotic active ingredient used in dairy and beef cattle respectively.



This move away from HP-CIAs may have played some part in the apparent lack of reductions in total antibiotic use in these sectors in 2018, as the non-HP-CIA products incorporate higher amounts of antibiotic active ingredient per course. Note both baseline and target levels have changed slightly due to a retrospective amendment to the 2016 Veterinary Antimicrobial Resistance and Sales Surveillance (VARSS) data⁸. HP-CIA intra-mammary product sales show a sharp and consistent downward trend (Table 5), achieving the target for 2020 with a 64% reduction compared with the baseline in 2015.

Table 5: Progress towards intra-mammary HP-CIA target

	2015 Baseline	2016	2017	2018	Target 2020	% change compared with baseline
HP-CIA intra-mammary tubes (DCDVet) ^a	0.332	0.236	0.174	0.120	0.166	-64%

^a UK-VARSS 2018

Kite/Solway Vets – benchmarking data

Since 2015 Kite Consulting, in conjunction with Solway Vets and National Milk Records⁹, has provided antibiotic benchmarking services and farmer training to dairy processors and retailers throughout the country. Data presented from 674 farms with 154,000 dairy cows for the 12 months ending 30 June 2019 provide a useful comparison (Table 6). Of these 674 farms, 45% used no HP-CIAs at all, 54% used no 3rd or 4th generation cephalosporins, and 72% used no fluroquinolones.

Table 6: Progress towards targets from Kite/Solway Vets sample

	Baseline	Year ending in 12 months to June 18	Year ending in 12 months to June 19	Target 2020
Intra-mammary tubes – dry cow (DCDVet) ^a	0.732	0.500	0.460	0.586
Intra-mammary tubes – lactating cow (DCDVet) ^a	0.808	0.660	0.550	0.727
Total use (mg/kg) ^a	26.2	23.7	21.9	21.0
HP-CIA injectables (mg/kg) ^a	0.922	0.990	0.277	0.461
HP-CIA intra-mammary use (DCDVet) ^a	0.332	0.190	0.058	0.166

^a Prescription data from farms in programme

⁸ Erratum to UK Veterinary Antibiotic Resistance and Sales Surveillance Report UK-VARSS 2017 assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/837180/PCDOCS-1692413-v1-Erratum_to_UK-VARSS_2017.pdf

⁹ Kite Consulting/Solway Vets/NMR www.kiteconsulting.com/wp-content/uploads/2019/07/Antibiotic-monitoring-document.pdf



Kingshay – benchmarking data

Kingshay¹⁰ has been collecting and collating antibiotic usage data from 409 of their clients over three years, comprising a total of 81,657 dairy cows (Table 7).

Table 7: Progress towards targets from Kingshay sample

Kingshay	Baseline	Year ending in 12 months to Aug 17	Year ending in 12 months to Aug 18	Year ending in 12 months to Aug 19	Target 2020
Intra-mammary tubes – dry cow (DCDVet) ^a	0.732	0.519	0.522	0.519	0.586
Intra-mammary tubes – lactating cow (DCDVet) ^a	0.808	0.795	0.801	0.601	0.727
Total use (mg/kg) ^a	26.2	20.2	20.5	17.3	21.0
HP-CIA injectables (mg/kg) ^a	0.922	1.079	0.729	0.542	0.461
HP-CIA intra-mammary use (DCDVet) ^a	0.332	0.418	0.353	0.242	0.166
Sealant tube use (average no. of courses/ dairy cow) ^a	0.50	0.66	0.67	0.63	0.70

^a Kingshay

Westpoint Farm Vets and Kingshay – HP-CIAs

Westpoint Farm Vets¹¹ carried out a study in conjunction with Kingshay examining whether changes made to the Red Tractor assurance standard in June 2018 were driving further reductions in use of HP-CIAs. Prescription data for 2,764 dairy, beef and sheep farms from across the UK were analysed, looking at sales of all antibiotics and HP-CIAs. In the six months leading up to May 2018, the average monthly volume of HP-CIAs sold was 1,833,832 mg. In June 2018, requirements to use HP-CIAs only as a last resort under vet direction guided by sensitivity or diagnostic testing were introduced. From June 2018 to December 2018 the average monthly volume of HP-CIAs sold fell to 147,357 mg. The reduction in HP-CIA prescriptions from January to December represented a fall of 92% (Table 8 and Figure 3).

¹⁰ Kingshay www.kingshay.co.uk

¹¹ Westpoint Farm Vets www.westpointfarmvets.co.uk



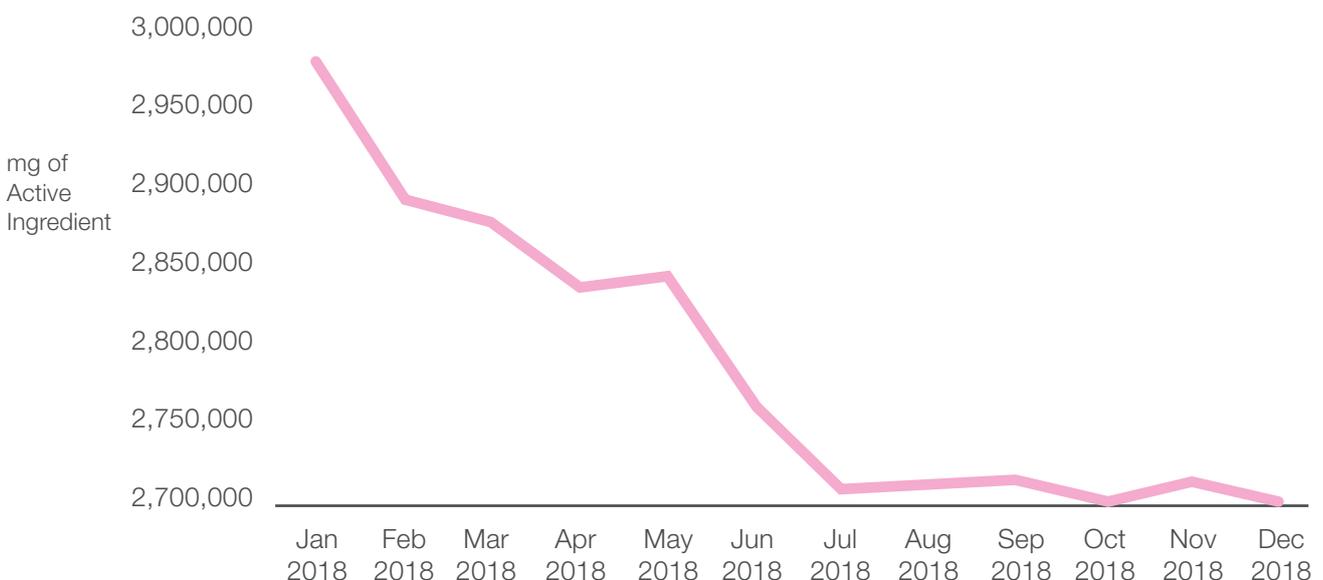
Substituting HP-CIAs, which often require smaller amounts of active ingredient per treatment, with lower priority antibiotics requiring larger active ingredient dose rates can push up overall antibiotic use; however, total sales of antibiotics to these farms also reduced from a mean of 110,831,696 mg in the months January to May, to a mean of 86,918,562 mg June to December, representing a fall of 22%.

Table 8: Sales from Westpoint Vets study post-Red Tractor standard changes

Westpoint/ Kingshay	Mean monthly sales Jan-May 2018	Mean monthly sales Jun-Dec 2018	Difference	% Reduction
HP-CIAs active ingredient (mg) ^a	1,833,832	147,357	1,686,475	92
Total antibiotic active ingredient use (mg) ^a	110,831,696	86,918,562	23,913,134	22

^a Prescribed farm sales via Westpoint Farm Vets

Figure 3: Sales of HP-CIAs from Westpoint Vets study post-Red Tractor standard changes



Source: Westpoint Farm Vets

Universities of Liverpool and Edinburgh – beef enterprises

Work conducted by Dr Peers Davies and Dr Alex Corbishley at the Universities of Liverpool and Edinburgh respectively, has provided a valuable analysis of antibiotic use across a range of beef enterprise types. The data collected from over 300 beef herds show clearly that calf rearing enterprises recorded considerably higher antibiotic use than suckler herds or grower/finishers.

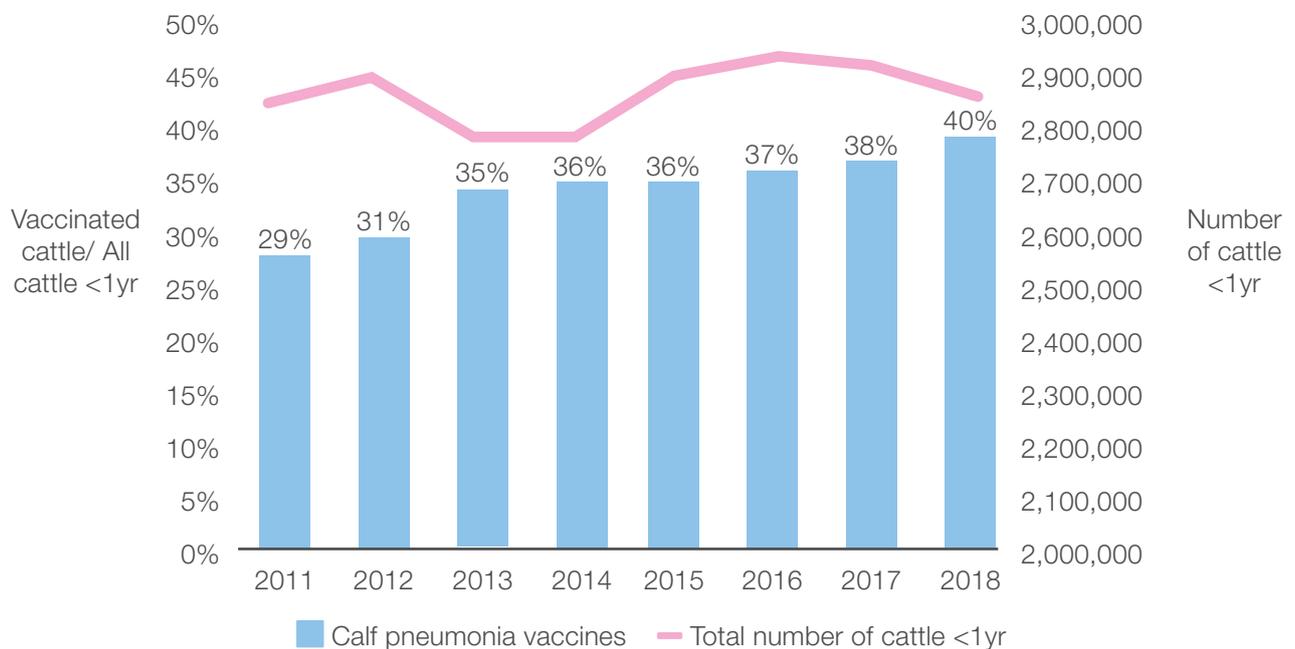
As found in other studies, distribution of use over farms within an enterprise category was skewed with a small number of farms showing very high usage figures. As such there were large differences between the average (mean) use recorded across a group of farms, and the median use. Some seasonal patterns of use were also evident in suckler and grower/ finisher systems. The data, which are currently in preparation for publication, corroborate the national data in terms of very low use of HP-CIAs on the beef herds in the study.



Vaccine uptake

As last year, the Agriculture and Horticulture Development Board (AHDB) has worked in partnership with MSD Animal Health to compile a report entitled 'Use of vaccines in cattle and sheep production'¹². Data have been drawn from wholesale vaccine sales data collated by Kynetec¹³ alongside cattle population data from Defra annual statistics covering the period 2011 to 2018. Pneumonia is thought to be responsible for a significant, but unknown, amount of antibiotic use in cattle. Pneumonia vaccine uptake in calves (cattle less than a year old) rose steadily from 29% in 2011 to 38% in 2017. For 2018, the proportion of cattle vaccinated increased a further two percent points to 40%, an increase of 5% on 2017 (Figure 4). The number of doses of vaccine for Infectious Bovine Rhinotracheitis (IBR) sold in 2018 was also up by one percent point, an increase of 4% (Figure 5).

Figure 4: Pneumonia vaccination uptake for cattle <1 year old



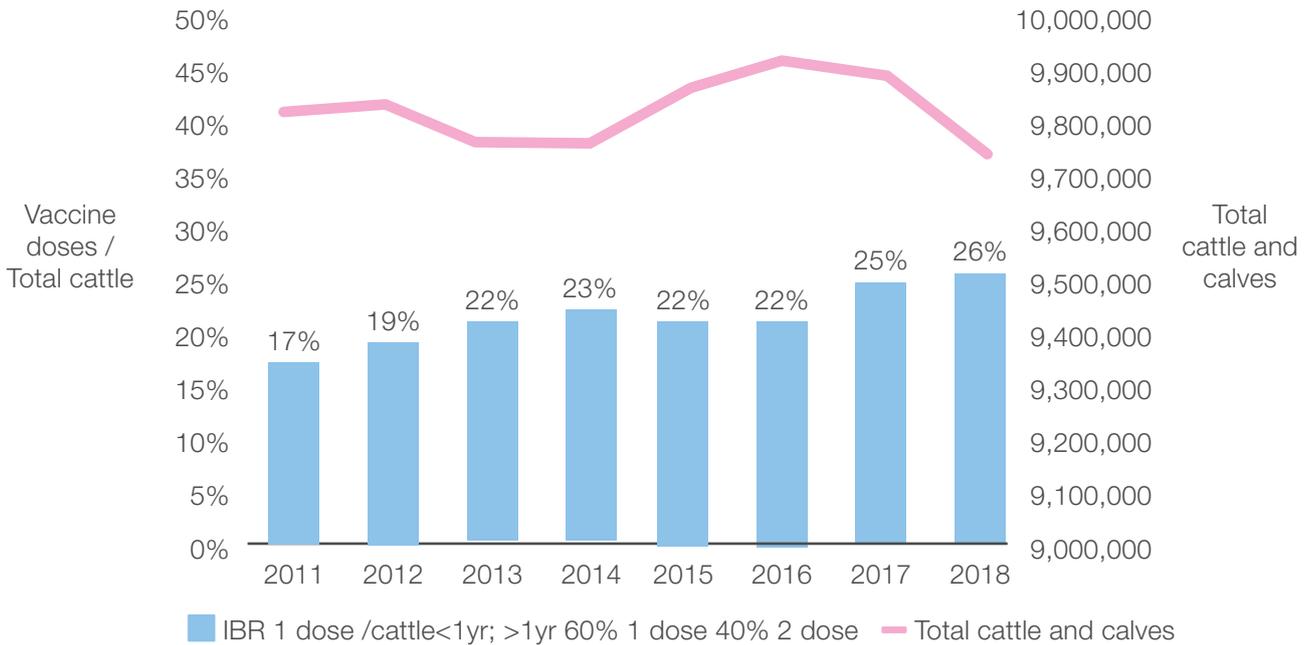
Source: Kynetec/AHDB

¹² Use of vaccines in cattle and sheep: Update report ahdb.org.uk/knowledge-library/use-of-vaccines-in-cattle-and-sheep-production

¹³ Kynetec Market Data, December 2018



Figure 5: IBR vaccination uptake for cattle <1 year old



Source: Kynetec/AHDB

The #VaccinesWork campaign (see Appendix 1) has been taken over by the National Office of Animal Health (NOAH) in light of the wide range of resources its members, which include vaccine manufacturers, can offer.

Health and welfare metrics

Target
Monitor national beef and dairy herd health and welfare metrics. The group will monitor available metrics of national cattle health and welfare alongside antibiotic use data to ensure reductions in antibiotic use are not impacting negatively on health and welfare.
Latest progress
The biennial CHAWG report will be used for this, and metrics strengthened in key areas where required.

The Cattle Health and Welfare Group (CHAWG) produced its biennial report in September 2018, and this was covered in the last Targets Task Force Update, published November 2018¹⁴. A new report is expected in autumn 2020 and this should provide some indication of the direction of travel of health and welfare.

¹⁴ CHAWG www.chawg.org.uk



Benchmarking and data collection

Target

Farm level benchmarking of antibiotic use. Determine a standard methodology for calculating on farm antibiotic use in beef (and dairy) cattle for benchmarking within and between farms, taking account of different production systems. This will include standardising data entry, definition of reasons for treatment, transfer of product information from the VMD and any other protocols used by third party software providers to help to establish a uniform on-farm data set.

Latest progress

Farm-level antibiotic usage metrics have been developed by the dairy and beef sectors; projects to develop farm-level benchmarking and an electronic Medicines Hub (eMH) for cattle and sheep are in progress.

Dairy metrics

The CHAWG Antimicrobial Use (AMU) group published a set of standard metrics¹⁵ for benchmarking antibiotic use on UK dairy farms in 2018 following consultation with the wider dairy industry. The recommendations are that the following core metrics are calculated on dairy farms, for both total use and use of HP-CIAs:

- Core Metric One = mg/Population Correction Unit (PCU)
- Core Metric Two = Average number of antibiotic courses per dairy cow for dry cow therapy
- Core Metric Three = Average number of antibiotic courses per dairy cow for lactating cow therapy

Beef metrics

An industry consultation issued by the CHAWG AMU group in August 2019 aimed to identify a common set of measures for antibiotic use for UK beef farms. The new metrics are due to be ratified shortly. These metrics will allow producers to understand their antibiotic use and monitor how this is changing over time and relative to the whole industry; the metrics will also be incorporated in the electronic medicines hub for cattle and sheep, see below.

Electronic medicines hub progress

With the support of industry, AHDB Pork launched an electronic medicines book (eMB-Pigs) in 2016 to help UK pig producers collect accurate on-farm antibiotic usage data. The move was a reaction to increased concern over antibiotic use, and a desire for a strong evidence base with which to defend the sector but also to allow producers to benchmark their antibiotic use.

Work in the cattle and sheep sectors is ongoing to explore what a similar industry tool could look like for their respective industries. Following an initial pilot project with cattle in 2018, a second phase of work for what is being called an 'e-Medicines Hub (eMH)' was commissioned, this time for both cattle and sheep data. The aim is to test this with producers during 2020.

¹⁵ CHAWG AMU dairy benchmarking metrics report beefandlamb.ahdb.org.uk/wp-content/uploads/2019/07/CHAWG-AMU-Dairy-Benchmarking-Metrics-Report-FINAL.pdf



Funded by AHDB, this pilot will allow centralised capture of antibiotic use data by a standardised method to provide:

1. National sector level reporting of antibiotic use in line with ESVAC methodology, this will be required to comply with the forthcoming Veterinary Medicine Regulations
2. Farm level data for identification of trends in how antibiotics are being used and to facilitate benchmarking within and between farms

The pilot will implement the farm level antibiotic use metrics agreed by CHAWG and the Sheep Health and Welfare Group (SHAWG). Work is also ongoing to explore how the eMH could access records from external sources to avoid farmers having to duplicate entry of data held on other systems, such as the British Cattle Movement System (BCMS) or their own herd management software system.

Farmer and veterinary training

Target
Promotion of training at farm and veterinary surgeon level <ol style="list-style-type: none">a) Work with CHAWG stakeholders to promote training of both veterinary surgeons and farmers in responsible use and prescribing of medicines in beef (& dairy) production systemsb) BCVA to monitor numbers of veterinary surgeons attending prescribing CPD coursec) Integration of National Office of Animal Health (NOAH) training package into existing and new training deliveryd) Monitor uptake of responsible use of medicines courses across the industry.
Latest progress
To support the sector in achieving the proposed targets, various industry initiatives and technical training are underway.

MilkSure¹⁶, an industry funded initiative, educates farmers on their use of antibiotics to improve stewardship and avoid potential antibiotic residues in milk. By October 2019, this scheme had 2,313 accredited farms (just under 20% of dairy farms in the UK). 220 vets had also qualified as 'MilkSure champions', with 98% of these stating the programme was useful and 93% highlighting their farmers were likely to make changes on their farms to reduce the risk of medicine residues. Many practices have also reported that they have altered their own prescribing/dispensing behaviours because of the training. MilkSure 'Top Up' has since been developed, allowing accredited farms to top up their accreditation through an annual medicine competency test and risk assessment carried out with their vets. Annual antibiotic use and staff training reviews are also included.

AHDB Dairy and Tesco Sustainability Dairy Group have delivered 15 workshops across Great Britain on mastitis to over 250 farmers between February and March 2019. The interactive workshops were supported by Promar and reviewed the basic concepts of mastitis control and the importance of establishing when cows get infected (during lactation or during the dry period). It also covered how clinical mastitis data and somatic cell count data can be used to identify the pattern of mastitis which is the most important on the farm.

¹⁶ MilkSure www.milksure.co.uk



The College of Agriculture, Food & Rural Enterprise in Northern Ireland delivered a course in January 2019 on the responsible use of antibiotics in the dairy herd: it comprised of 20 courses delivered to 393 eligible trainees¹⁷. Training on responsible use of antibiotics is also to be a standard within the FQAS scheme¹⁸ for Northern Ireland's beef sector. This will result in 12,000 farmers' receiving the training delivered by vets over the next three years.

XL Vets offered 130 mastering medicine courses to employees and group members from June 2018 to June 2019, with 642 vets completing the interactive training. The course aimed to increase knowledge of safety and good practice, as well as outline legislative requirements for on-farm medicine use. It also increased trainees' understanding about the different types of medicines used and how these relate to the common diseases relevant on their clients' farms.

The Animal Medicines Best Practice Programme (AMBP) eLearning for farmers was launched by NOAH in July 2018¹⁹. For the remainder of 2018, uptake among farmers was slow, possibly due to a lack of farm assurance requirement for training. However, the update to Red Tractor Dairy standards, which took effect on 1 October 2019 and requires at least one person responsible for administering medicines to have undertaken training, has resulted in an increase in the rate of uptake of the dairy course, with 60 farmers completing training. This response illustrates the importance of farm assurance schemes as a mechanism to deliver improvements in knowledge and understanding of animal medicines and the responsible use of antibiotics on farm.

Industry initiatives

Target
<p>Dissemination of responsible use of medicines messages. Work with CHAWG stakeholders to disseminate responsible use of medicine messages across the beef industry. All CHAWG members with communication routes reaching beef farmers will disseminate at least annually a responsible use of medicine message focusing on ways to reduce antibiotic use.</p>
Latest progress
<p>AHDB has delivered a wide range of events, webinars, blogs and podcasts in 2018-2019 focused on antibiotics, antibiotic resistance and improving animal health, thereby reducing the need to use antibiotics.</p>

Examples of activity include:

- AHDB Beef and Lamb Workshops: 77 attendees at six farmer workshops on Body Condition Scoring and Iceberg Diseases; 138 delegates attended workshops on liver fluke in autumn 2018; 80 delegates attended workshops on the responsible use of antibiotics in February 2019.
- AHDB Beef and Lamb webinars: 664 people attended webinars ranging from responsible use of medicines to managing lameness and feeding cows to boost colostrum; over 3,000 people viewed them afterwards on YouTube.
- The AHDB Mastitis Pattern Analysis Tool: developed to identify the pattern of mastitis associated with the greatest number of cases; the main risk factors associated with that pattern of mastitis can then be identified and action taken to reduce new cases.

¹⁷ Daera press release www.daera-ni.gov.uk/news/training-dairy-farm-families-responsible-use-antibiotics-farm

¹⁸ LMCNI www.lmcni.com/farm-quality-assurance/

¹⁹ NOAH www.noah.co.uk/farmer-training/



- Dry cow mastitis management: a new suite of tools and resources.
- Workshops on ‘mechanics of the foot’: practical sessions with Dr Nick Bell and Owen Atkinson of Dairy Veterinary Consultancy on ‘how to keep the business on its feet’; 81 attendees with a further 50 at an event on lameness at an AHDB Strategic Dairy Farm.
- AHDB’s strategic farms: 65 delegates at an event on Neospora; 300 attended another on calf and youngstock welfare; other topics include grouping and housing options for calves, optimal nutritional strategies for calves, and effective pain management.
- AHDB Dairy Webinars: Topics include ‘New thinking on Johne’s and getting the best from your Johne’s Disease review’; ‘Managing mineral nutrition for outwintered livestock’; ‘Responsible antimicrobial use on UK dairy farms – the Farmer Action Group project’; ‘The Swedish take on responsible antibiotic use’.
- AHDB Dairy films: 1,368 views for the ‘Calf to Calving’ film on optimising health and growth of heifer calves; 1,118 views for ‘Best practice for vaccination of beef and dairy cattle’; 3,114 views for ‘Controlling mastitis through selective dry cow management’.
- Antimicrobial resistance podcast: looks at antimicrobial resistance and the use of antibiotics on farm, featuring a EuroDairy French exchange visit to a GB pilot farm.
- Case studies: ‘Sharing Knowledge to Tackle Antimicrobial Resistance across Europe’ provides learnings from these exchange visits; ‘Antibiotics Anonymous’ final meeting’ uses the stable schools approach from Denmark for a super-farmer action group led by Lisa Morgans, Bristol Vet School; ‘Reducing antibiotic use on UK dairy farms’ following an exchange visit to the Netherlands.

Next actions

The focus will continue on development of the eMH, as concern remains over how representative the usage data from the convenience samples are. The ambition is to boost progress by better farm level monitoring of antibiotic use and farmer-vet engagement.

Quarter PRO, a new initiative for udder health, is being launched by AHDB in 2020 as part of the existing Mastitis Control Plan. It will include aspects such as a webinar for vets covering the importance of mastitis control in light of task force targets and the impact of mastitis treatments on antibiotic use; also how to reduce antibiotic use in dairy herds through improvements in mastitis control and working with herds to put in place mastitis control plans will be discussed.

Ongoing training and knowledge exchange activities will continue, particularly focusing on hotspot areas of use, with the aim of improving animal health and reducing the need to use antibiotics, and to ensure that where antibiotics are used, they will be used prudently and responsibly.



Fish sectors: trout

Overview - trout

The trout sector has made considerable progress against targets in this second year. While salmon producers tend to be integrated into defined supply chains, trout producers are mostly small, independent operators. This means the challenges they face are extremely diverse, not least of which is lack of access to effective vaccines. The British Trout Association (BTA) is the primary representative organisation in the trout sector, and is committed to monitoring antibiotic use and focusing on biosecurity and good management practices in order to minimise the use of antibiotics.

Data collection

Target
Information on the use of all antibiotics to be gathered and collated.
Latest progress
The trout sector captured around 90% of usage data in 2018.

Last year, the sector captured around 90% of usage data, comprising 6,200 tonnes of fish production in England and 6,285 tonnes in Scotland. The sector is working at improving this to 100%, despite the challenge of being comprised of many small independent businesses. It is important to note that around 30% of trout are reared for restocking waters for angling rather than directly for food production. Antibiotic use on these restocking fish will be captured in the weight of active ingredient, but will not be captured in the 'kg' denominator i.e. production weight.

Antibiotic use

Overall antibiotic use

Target
Overall antibacterial use in trout to be a maximum of 20 mg/kg.
Latest progress
The trout sector has met with its sector target, with recorded use of 13 mg/kg.

The results show that 0.16 tonnes of antibiotics were used on the sample of trout farms, representing 13 mg/kg, a 32% reduction on the figure reported in 2017. Reductions were seen particularly with oxytetracyclines and florfenicol (which reduced by 48% and 50% respectively) (Table 9 and Figure 6). The quinolone oxolinic acid is now the most commonly used antibiotic class in this sector, and it is made available under a Special Import Certificate.

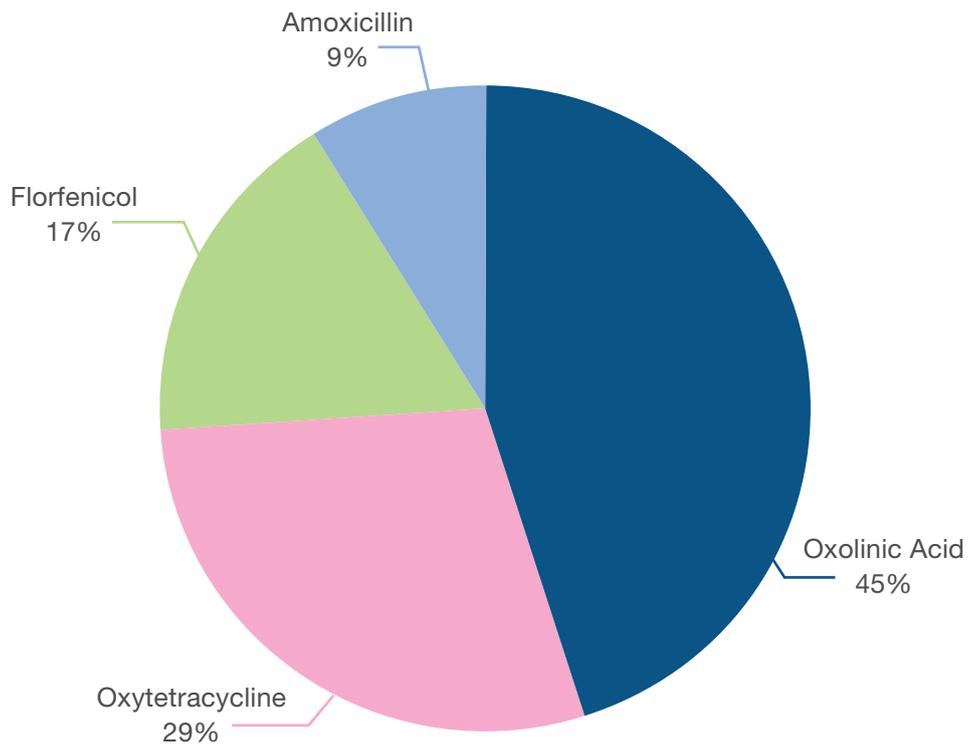


Table 9: Active ingredient (mg/kg) of antibiotics used on the sample of trout farms, 2017-2018

Antibiotic	Active ingredient in mg/kg (%)		% Change
	2017	2018	2017-2018
Oxytetracycline	7.3 (38)	3.8 (29)	-48
Oxolinic acid	6.6 (34)	5.8 (45)	-12
Florfenicol	4.4 (23)	2.2 (17)	-50
Amoxicillin	0.9 (5)	1.2 (9)	+34

Source: BTA

Figure 6: Active ingredient (% mg/kg) of antibiotics used on the sample of trout farms, 2018



Source: BTA



Highest-priority Critically Important Antibiotics

Target
No HP-CIAs to be used routinely in any farmed fish species, but only following sensitivity testing which shows no other treatment option.
Latest progress
No highest-priority Critically Important Antibiotics (HP-CIAs) were used in the British trout sector in 2018; sensitivity testing has been and will remain standard practice in trout farming.

Vaccination

Target
All sea-grown Rainbow Trout to be vaccinated against relevant bacteria pathogens before transfer to marine sites.
Target
Use of appropriate vaccines to be promoted in freshwater trout farms.
Latest progress
Challenges remain in funding, developing and accessing such vaccines for trout.

In the face of emerging bacterial diseases, vaccines are a vitally important tool for preventing disease in trout. Increasing the use as well as improving the availability of cost-effective authorised vaccines is crucial to the success of the sector.

However, the trout sector has lost two vaccines in the past 10 years, both of which were monovalent Furunculosis vaccines. This presents a challenge as with no Furunculosis vaccine remaining for trout, the industry must use bivalent and trivalent salmon vaccines on cascade. These are expensive as they contain pathogens which do not present a problem for trout in freshwater. With climate change and warmer water temperatures, Furunculosis is a major problem to fish health and lack of vaccines can increase the need for antibiotics – but the commercial reward for the vaccine company can be low because of the size of the industry.

The trout industry is reliant on continued availability of two Enteric Redmouth vaccines. This disease is widespread and otherwise requires antibiotic therapy. Temporary supply issues have occurred in 2019.

The trout sector is working very closely with the vaccine companies, the Veterinary Medicines Directorate (VMD) and research institutions to see what opportunities there might be to develop new vaccines. It is hoped that there will be small field trial in the spring 2020 on a Rainbow Trout Fry Syndrome (RTFS) vaccine. If successful this would be a major step forward to applying for a new fully licensed vaccine.



Good practice

Target
Compliance with the Code of Good Practice (CoGP) for Scottish Finfish, Aquaculture, and UK Quality Trout or equivalent, to be accepted as the norm for all finfish producers.
Latest progress
100% of Table trout producers are members of Quality Trout UK.

Fish health management has always been pivotal to the successful operation of UK trout farms, and biosecurity and fish health management key pillars of the industry. To this end, all farms are required to have detailed veterinary health and biosecurity plans.

Quality Trout UK (QYUK)²⁰ has been established since 2000 and is the only European Union producer association that operates an EN 45011 standard specifically for trout production. QTUK incorporated the Code of Good Practice (CoGP) first in 2006 and again in 2012 to maintain parity between standards. QTUK is benchmarked against the CoGP and farms compliant with QTUK are also considered compliant against the relevant sections of the CoGP. Revisions to the CoGP are reflected in the QTUK standards.

Next steps

The BTA will continue to co-ordinate efforts to capture 100% of sector data, and to establish effective vaccines for the key diseases.

²⁰ Quality Trout UK www.qualitytrout.co.uk



Fish sectors: salmon

Overview - salmon

The Scottish salmon farming sector has continued to progress towards the goals established at the start of the Targets Task Force initiative. Working with the Targets Task Force has yielded wide-ranging benefits, and in particular, cross-sector working has been a key beneficial outcome of the initiative. A specific and notable success of the first year of working towards the targets was the development of the Scottish Salmon Producers Organisation (SSPO) Prescribing Vets group. Through this group, a clear mechanism to collate and review antibiotic use data was established which forms the basis of data collection into the future.

Data collection

Target
Information on the use of all antibiotics to be gathered and collated.
Latest progress
Data on antibiotic use was collected and collated from all (100%) salmon producers in Scotland.

Information on antibiotic use by the Scottish salmon farming sector for 2018 has been collected from all prescribing veterinary practices. As such, the dataset collected accounts for 100% of salmon produced in Scotland.

The SSPO Prescribing Vets group, formed in 2017, has continued to meet at regular quarterly intervals. The group has also expanded, as necessary, to maintain veterinary representation for all salmon farming companies.

SSPO continues to liaise with the British Trout Association (BTA), Fish Veterinary Society (FVS), British Veterinary Association (BVA) and Veterinary Medicines Directorate (VMD) over the collection of antibiotic use data. SSPO attended the 2018 FVS conference and presented on preventative health management in the sector.

Antibiotic use

Overall antibiotic use

Target
Overall antibiotic use in salmon to be a maximum of 5 mg/kg.
Latest progress
The salmon sector recorded use of 6.5 mg/kg in 2018.



Preventative health management remains central. Overall, antibiotic use fell in 2018 compared with 2017, with a total of 1,011.3 kg of antibiotic used by the sector during the year. This overall use equated to 6.5 mg/kg of production, slightly higher than the ambitious target initially established for salmon in 2017. However, it is important to highlight that significant differences occur in required dosing for the various available antibiotics and the majority of antibiotics used in 2018 were either oxytetracycline hydrochloride (58.0%) or florfenicol (40.8%), requiring larger doses of active ingredient, with minimal use of oxolinic acid (1.2%), requiring smaller doses.

The fall in antibiotic use in 2018 was primarily due to a reduction in the number of treatments required in the seawater phase of production. The bi-phasic life cycle of salmon, and differences in antibiotic use between the freshwater and seawater phases, can significantly impact the overall levels of antibiotic used. Treatments during the seawater phase are rare compared with freshwater, but when overall use across the sector is low, a slight increase in the number of treatments during the seawater phase (where treatment biomasses are relatively high) can significantly impact overall use. However, by number, antibiotic treatments are still relatively infrequent in the salmon farming sector.

It is noteworthy that usage data provide a yearly overview when in fact the production cycle of farmed salmon can be as long as three years, with up to a year spent in freshwater and up to two years in seawater. Consequently, appraising use in individual years is not necessarily representative and it is important to look at longer term trends in the usage data.

Salmon are farmed in the natural, wild lochs around Scotland. They are highly sensitive to environmental changes. As poikilotherms, the development and physiology of salmon, like many of the pathogens that can affect them, is strongly influenced by water temperature. Variations in the quality and composition of the water, including the presence of potentially harmful organisms in the water (algae, plankton), can also compromise fish health. For these reasons, salmon farmers and fish health professionals need to remain vigilant to changing environmental conditions. Although antibiotic use decreased in 2018, environmental challenges were still evident and the sector remains mindful that variable environmental conditions (for example due to global climate change) may impact health management in the future. Usage figures to date and in the future will therefore reflect a balance between minimising antibiotic use and ensuring fish health and welfare.

Note: 2017 usage levels (17.2 mg/kg) was based on “estimated” production statistics. Published statistics of actual production from 2017 are now available and the usage figure has been updated to 16.1 mg/kg. Production statistics for 2018 have already been published and therefore data for 2018 are based on ‘actual’ not ‘estimated’ production.

Highest-priority Critically Important Antibiotics

Target
No HP-CIAs to be used routinely in any farmed fish species, but only following sensitivity testing which shows no other treatment option.
Latest progress
No HP-CIAs were used in the Scottish salmon farming sector in 2018. Sensitivity testing remains standard practice.



Vaccination

Target
All Atlantic salmon to continue to be vaccinated against relevant bacterial pathogens before the seawater production phase.
Latest progress
All Atlantic salmon (100%) continue to be vaccinated prior to seawater transfer.

Vaccines continue to be widely used to protect against the most significant bacterial and viral pathogens. New vaccines are continuously under development to improve efficacy and to broaden the suite of pathogens the fish are protected against.

Target
In the absence of appropriate licensed vaccines, autogenous vaccines to be developed and used wherever possible.
Latest progress
In salmon, autogenous vaccines continue to be used to support health management of cleanerfish where necessary.

Cleanerfish are a relatively new aquaculture species in Scotland. They are used as a biological control, to assist in the management of sea lice and as such they are intrinsically linked to salmon farming. The use of biological control, in this manner, is considered unique across livestock sectors both in the UK and globally.

Maintaining the health of cleanerfish is important. The Scottish salmon farming sector has a focus on preventative health management, and continues to work with the research and pharmaceutical sectors to develop efficacious vaccines for cleanerfish. Where commercial vaccines are not currently available, and where necessary and appropriate, autogenous vaccines continue to be used to support cleanerfish health management.

Good practice

Target
Compliance with the Code of Good Practice for Scottish Finfish. Aquaculture, and Quality Trout UK or equivalent, to be accepted as the norm for all finfish producers.
Latest progress
In salmon, autogenous vaccines continue to be used to support health management of cleanerfish where necessary.



Fish health management, and in particular preventative health management, has always been pivotal to the successful operation of Scottish salmon farms. Biosecurity and fish health management are key pillars of the industry's Code of Good Practice (CoGP), which requires all farms to have detailed veterinary health and biosecurity plans. The CoGP undergoes regular reviews to ensure it remains up to date. All salmon farms are currently compliant with the CoGP.

Next actions

Looking forward, the Scottish salmon farming sector will maintain its focus on preventative health management. Changing environmental conditions remain a concern but salmon farmers have always been innovative, and will seek to utilise the latest science and technology to help predict and mitigate against these challenges.

The Prescribing Vets group will meet at regular intervals, and although its status as a working group continues, it is expecting to start seeking wider engagement with relevant regulatory bodies such as the VMD, the Scottish Environment Protection Agency (SEPA) and the Animal and Plant Health Agency (APHA).

Antibiotics will continue to be used in a responsible manner where necessary, balancing a desire to reduce overall use against the need to protect fish health and welfare.



Gamebird sector.....

Overview

Around 41 million pheasants and nine million partridges are reared annually on UK game farms and shoots for release into the countryside to supplement wild stocks for game shooting²¹ – an industry independently assessed to bring in excess of £2.2 billion a year²² to the UK economy. The number of birds being reared is increasing at a rate of around 2.5% per annum²³. In common with other livestock sectors, the use of antibiotics in gamebirds increased through the 1990s and 2000s, exacerbated by the near absence of more specific medications for treating common and debilitating gamebird diseases. Concerted action was therefore needed to bring antibiotic use down.

Co-ordinated by the Game Farmers’ Association (GFA), and with full involvement of the Veterinary Medicines Directorate (VMD), in 2016 the gamebird sector rolled out a carefully planned campaign which has been pursued with vigour since, and has resulted in a 52% reduction in use thus far (2018 data).

Results for the 2019 gamebird rearing season are now being collected via gamebird vets and the game feed trade, in accordance with the now well-established GFA/VMD methodology. Collated by the VMD, they will be available in late 2019. Further significant reductions are anticipated.

The gamebird sector campaign will continue next year and beyond, seeking to reduce antibiotic use as fast and as far as possible, whilst always ensuring that this is done responsibly, without animal welfare being compromised.

Target
Reduction in tonnage of 25% in 2017 and a further 25% between 2017 and 2020.
Latest progress
Antibiotic use reduced by 36% between 2016 and 2017, and by a further 25% between 2017 and 2018.

Antibiotic use

Through industry collaboration, it has been possible to obtain data on 90% of antibiotic sales. Figures released towards the end of 2018 showed that in its first two years, this campaign cut antibiotic use in the sector by 52% overall, with antibiotics incorporated into gamebird feeds slashed by 70%. These are among the fastest reductions seen in any livestock sector.

The gamebird sector campaign has intensified still further since that point, with the Royal College of Veterinary Surgeons (RCVS) joining a list of supporting bodies comprising the British Association for Shooting and Conservation, the British Veterinary Association, the Countryside Alliance, the British Veterinary Poultry Association, the National Gamekeepers’ Organisation, the Game and Wildlife Conservation Trust, RUMA, and the Game Feed Trade Association.

²¹ Game and Wildlife Conservation Trust Review of 2018, page 57.

²² ‘The Value of Shooting’ Report, PACEC, 2014.

²³ Game and Wildlife Conservation Trust Review of 2018, *ibid*.



Regular joint communications have been sent out by this coalition to all their members, reaching every part of the industry and building a sense of joint responsibility to bring antibiotic use down. Particularly important in 2019 has been a further VMD/RCVS communication, reminding everyone what the law requires in terms of prescribing. This very widely distributed circular also promotes a 'hotline' for the reporting of any improper activity.

Target
Reduce HP-CIAs use by at least the same 25% margin by 2017.
Latest progress
Use of fluoroquinolones reduced by 22% between 2016 and 2017, and by a further 5% between 2017 and 2018. A small amount of colistin use (0.6kg) was reported in 2016 but has since been eliminated.

Data collection has shown that the only HP-CIAs used in gamebird rearing in 2017 and 2018 are fluoroquinolones, representing just 0.5% of active antibiotic ingredient used by the sector in 2018. A total of 63.5 kg of fluoroquinolones was used in gamebirds in 2016, reducing to 47.2 kg in 2018, a fall of 26%. Further falls will be needed to meet the sector target by 2020 but the observed reductions are on track to achieve this.

Next actions

Despite these very significant and rapid reductions, the sector remains a high user. This is partly species-related and partly due to the way gamebirds must be reared in order to thrive, factors which were explained in the 2018 Targets Task Force update report. Responsible reduction of antibiotics nonetheless remains a key principle for the sector, and the GFA will continue to lead the drive towards further reductions in future, going as fast and as far as is possible but - very importantly - without compromising animal welfare.

Prevention is always better than cure and so the gamebird sector started new research in 2019 into common gamebird diseases and their avoidance, as well as their cure. Overseen by specialist gamebird vets and part-funded by industry, this significant new work should yield benefits in terms of further antibiotic reductions in due course.

Mycoplasmosis is one disease posing unprecedented problems for the sector at the moment. It is a serious infection, with strains specific to gamebirds causing severe symptoms including blindness and, ultimately, death. Treatments are limited, with antibiotics believed essential in many cases. Research has shown, however, that some strains do not respond to antibiotics and for these culling rather than treating birds is now being promoted, not least to reduce pointless use of antibiotics.

The campaign will build on the successful approach thus far of knowledge sharing throughout the industry. There will be a meeting with all specialist gamebird vets and representatives of the game feed sector at least once annually to seek more ways to reduce antibiotic use and to plan ahead year-on year. Educational events for those who rear and release gamebirds will continue to be run by many of the organisations involved with the campaign. Best practice examples will be publicised via the sector's trade press, which is also very supportive.

Given the achievement of the overall 2020 target two years early, the sector has set a further notional target of an additional 10% reduction (above original target) by 2020.



Laying hen sector.....

Overview

The collection of antibiotic usage data for the UK laying hen sector is organised by the British Egg Industry Council (BEIC). Producers requirement to share these data with BEIC is obligatory through the Lion Scheme, which represents over 90% of the UK egg industry.

All egg producers, pullet rearers and breeding companies are required to report any use of an antibiotic to their subscriber. This is reported to the BEIC on a quarterly basis and denominator data are available from monthly records of the total number of birds in the scheme, averaged over the year.

The data published here as 'daily doses/100 chicken days at risk' represents the average number of doses administered per chicken over a 100-day period and is based on the actual number of doses administered, which is provided directly to BEIC

Antibiotic use

Target
Total bird/days medicated remains below 1%.
Latest progress
Total bird/days medicated remained below 1%.

The BEIC reports that the usage data presented for 2018 show the members of the BEIC Lion Code²⁴, which represent over 90% of the industry, have met the sector target for percentage bird days treated to remain below 1%.

The data indicate that the laying hen sector used 3.2 tonnes of antibiotic active ingredient. This represents 0.63 daily doses/100 days (or % bird days treated), a reduction of 13% from 2016 but an increase of 11% from 2017. Given the generally low level use of antibiotics in this sector, year-to-year fluctuations on an overall downward trend is to be expected.

There continues to be a focus on disease prevention, including widespread vaccination programs. It is also a requirement for all farms to have a written biosecurity and veterinary health plan and, in addition, the Lion Training Passport²⁵ provides a common training standard on key topics, including welfare, biosecurity and medicine use.

Target
Fluoroquinolone + colistin (HP-CIA) days medicated remains below 0.05%.
Latest progress
No highest-priority Critically Important Antibiotics (HP-CIAs) were used in 2018.

²⁴ British Lion Code of Practice www.britisheggindustryCouncil.co.uk/download/LCoPV7.pdf

²⁵ Lion Training Passport liontrainingpassport.co.uk



It is encouraging to see that no HP-CIAs were used in 2018, which is again in line with the target to keep their use below 0.05% bird days treated. Colistin and 3rd and 4th generation cephalosporins cannot be used under the BEIC Lion Code. In addition, fluoroquinolones cannot be used in day old chicks and any other use can only be where it has been confirmed no other medication is appropriate in order to maintain bird welfare.

When analysed to the level of active ingredient class, tetracycline and pleuromutilins account for 80% of the use and there were no highest-priority Critically Important Antibiotics (HP-CIAs) used (Table 10 and Figure 7).

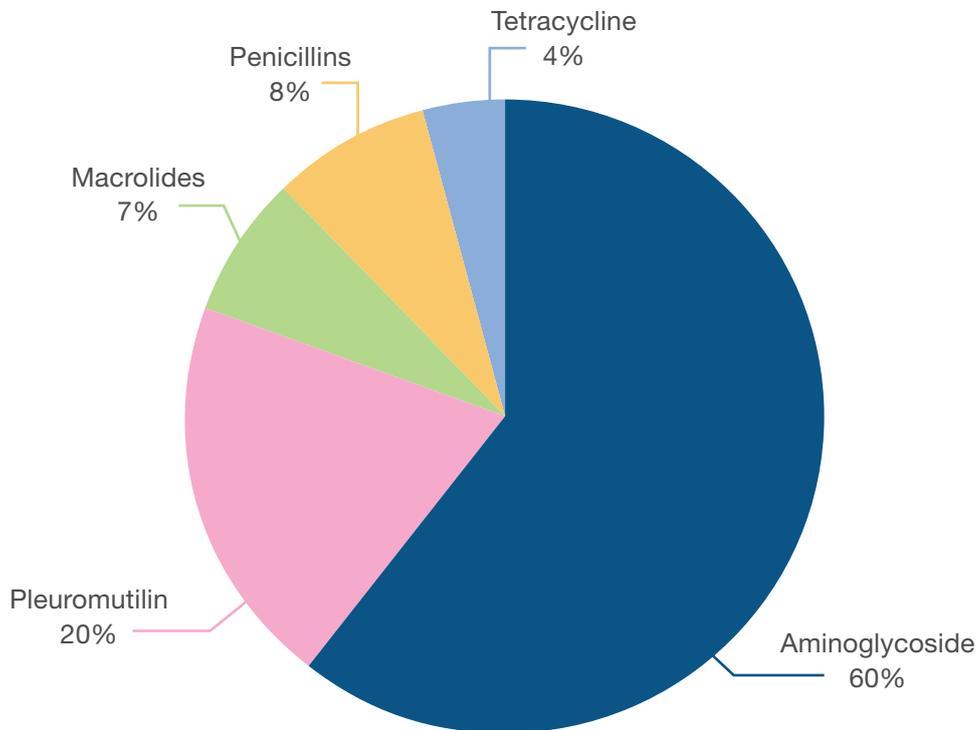
Table 10: Actual daily doses of active ingredient used by members of the BEIC Lion Code 2016-2018

	2016 bird doses (%)	2017 bird doses (%)	2018 bird doses (%)	% Change (2016-2018)
Tetracyclines	0.293(40)	0.314 (55)	0.380 (60)	+30
Pleuromutilins	0.280 (38)	0.168 (29)	0.128 (20)	-54
Penicillins	0.060 (8)	0.056 (10)	0.053 (8)	-11
Macrolides	0.049 (7)	0.022 (4)	0.045 (7)	-8
Aminoglycosides	0.018 (2)	0.011 (2)	0.027 (4)	+48
Other, includes: Fluoroquinolones*	0.002 (0.3)	0	0	-100
Colistin*	0.028 (4)	0	0	
Total	0.73	0.57	0.63	-13

* Highest-Priority Critically Important Antibiotics



Figure 7: Percentage of actual daily doses of antibiotics used by members of the BEIC Lion Code in 2018



Source: BEIC

Next actions

Going forward to the 2019 and 2020 reporting years, BEIC will maintain the sector target of percentage bird days treated remaining below 1%. Industry focus on disease prevention, including widespread vaccination programmes, will continue. BEIC is already starting to collect data on reasons for medication which will allow it to provide feedback to prescribing veterinarians from 2020. It is also developing an IT system accessible to subscribers to facilitate data validation of data in real time going forward. This will be in use for routine data collection from January 2020.



Pig sector.....

Overview

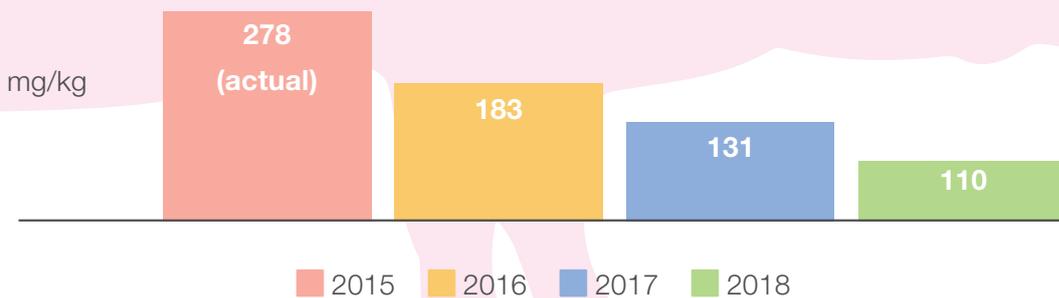
The continued efforts within the pig sector have resulted in further reductions in antibiotic use in line with the RUMA targets set in 2017. The UK pig sector remains committed to achieving the target by 2020. Overall, the pig sector has reduced antibiotic use by around 60% since data was collated nationally in 2015, and the use of highest-priority Critically Important Antibiotics (HP-CIAs) is now at an extremely low level.

The sector welcomes the industry-wide approach to tackling this issue and is confident it will achieve the ambitious targets while safeguarding animal health and welfare.

Antibiotic use

Target
Reductions in mg/kg from a 2015 baseline of 263.5mg/kg: <ul style="list-style-type: none">• Year 1 reduction 35% to reach 171 mg/kg in 2016.• Year 2 reduction 25% to reach 128 mg/kg in 2017.• Year 3 reduction 10% to reach 115.5 mg/kg in 2018.• Year 4 reduction 10% to reach 104 mg/kg in 2019.• Year 5 reduction 5% to reach 99 mg/kg in 2020.
Latest progress
Overall antibiotic use in pigs has reduced to 110 mg/PCU in 2018.

Figure 8: Annual reductions in use of antibiotics in the UK pig sector



Source: eMB via AHDB



Target

HP-CIA use will not rise above 0.1 mg/kg for fluoroquinolones and 0.015 mg/kg for 3rd/4th generation cephalosporins; a maximum of 0.1mg/kg for colistin, subject to review.

Latest progress

Use of HP-CIAs as a whole – 3rd/4th generation cephalosporins, fluoroquinolones and colistin – fell from 0.98 mg/kg in 2015 to 0.06mg/kg in 2018, of which colistin represented only 0.004 mg/kg.

The sector has already met its HP-CIA targets and despite significant disease challenges, is on track to meet its target of reducing use to 99 mg/kg by 2020 (Figure 8). However, this will require continued and consistent actions at both farm and industry-wide level, including both veterinary surgeons and producers. At farm level there are now more tools available to support a responsible approach to medicine use, which have been taken up widely by producers. These include training and benchmarking.

The caveat to progress is disease. Over the past year the prevalence of Swine Dysentery, a highly transmissible disease, has increased. This is anticipated to have an impact on antibiotic usage levels for 2019 and 2020. As identified in the original pig sector Targets Task Force report, outbreaks of disease will unfortunately still occur occasionally and, when these are bacterial diseases like Swine Dysentery, they will require antibiotic treatment. In these circumstances, antibiotics may have to be used for the treatment of sick pigs, to suppress disease expression to prevent further spread, and also in elimination strategies as an adjunct to traditional depopulation/ repopulation health improvement strategies.

African swine fever (ASF) continues to spread in Eastern Europe and this year there has been an outbreak in Belgium. It also continues to spread across South East Asia. While ASF has not yet entered the UK pig herd, there is concern about the proximity of the European outbreaks and the risk of ASF entering the UK via contaminated meat products. If the UK were to experience an outbreak there would be a significant impact on the pig herd. ASF requires immediate culling, zoning, movement and trade restrictions and this could put increased stocking pressure on units which may impact on the use of antibiotics. In response to the risk of ASF being brought into the UK, Government has started a poster campaign at ports and borders to warn travellers about the risk of illegally bringing in pork meat from affected areas. Government also targeted communications at university and college students ahead of the academic year.

Data collection

Antibiotic data submitted to the electronic Medicines Book for pigs (eMB-Pigs), covered 89% of pigs slaughtered in the UK in 2018. Red Tractor assurance pig standards have required the submission of data to eMB-Pigs every quarter since 2017. The availability of accurate usage data has helped farmers and vets to review, refine and more recently benchmark use. This has been of significant assistance in driving responsible use of antibiotics in pig production.

The Animal and Plant Health Agency (APHA) has offered diagnostic support to all producers consistently utilising more antibiotics to try to help them address the specific issues experienced on their unit. Uptake of this support has been positive. The Agriculture and Horticulture Development Board (AHDB) has also introduced a benchmarking tool in eMB-Pigs which allows producers to compare their data with units of a similar system and size. It continues to review and update this tool for producers.



Industry initiatives

Uptake of training provision (including Animal Medicines Best Practice), the Pig Health Scheme and the Significant Disease Charter continues to be positive and reinforces the messaging around the responsible use of medicines.

Red Tractor assurance standards were updated in October 2018 and Spring 2019 so that producers are now required to have on their farms a downloadable copy of the Practical Guide to Responsible Use of Antibiotics on Pig Farms, a publication produced by the Pig Health and Welfare Council. Staff deemed competent by the vet to administer medicines and veterinary treatments must have read the guide. It is also now a requirement that visitors are provided with farm-dedicated clothing/overalls/new disposable overalls and footwear or new robust overshoes when entering biosecure areas.

Biosecurity remains a priority in terms of maintaining a disease free status or limiting the spread of disease; the National Pig Association (NPA) and AHDB have established a new campaign, #MuckFreeTruck (Figure 9), to try to prevent the spread of diseases via any kind of haulage that may interact with the pig unit, and focus on the need to clean vehicles to a set standard before moving pigs, feed or deadstock from site to site. The campaign has been accompanied by a survey for livestock hauliers which will be used to identify areas requiring improvement, particularly in terms of washing facilities at abattoirs.

Figure 9: The #MuckFreeTruck campaign image



Next actions

Vet practices continue to work closely with their farmer clients, reviewing antibiotic use every quarter and exploring options for antibiotic reduction at a farm level. It is important to remain cognisant of the fact that every farm is different and the full range of therapeutic interventions should be maintained in order to secure or improve pig health and welfare.

As well as the disease challenges with swine dysentery and ASF, there are significant policy changes ahead which will influence the use of antibiotics in pig production in the next few years. These include new EU veterinary medicines and medicated feeds regulations, and the loss of therapeutic zinc oxide, which has been used for many years in weaner rations to help control post weaning diarrhoea.



While further reductions in antibiotic use are expected, emphasis must move towards achieving sustainable levels of use. Antibiotics are a necessary tool to treat and control pig disease and zero antibiotic use could seriously compromise animal welfare and therefore should not be a policy goal. For this reason, the sector is working to ensure antibiotics are used optimally, not minimally. This means the correct antibiotic, at the correct dose, for the correct duration, to the correct animal(s) by the correct route.

Currently much work is being done looking at managing pig diseases with lower antibiotic use by:

- Targeting therapy on the minimum number of animals for the minimum effective course of treatment. This approach is seeing a substantive shift from in-feed to alternative forms of administration which are more targeted, especially via the pigs' water supply.
- Use of vaccines in the pig sector is already widespread but continues to evolve and increase. Research is ongoing to develop and evolve the vaccines available to pig producers. Use of autogenous vaccines is also employed where commercial vaccines are not available, or prove ineffective, but practical and cost issues are limitations.

Improvements in pig flow on the farm, in ventilation of buildings and other management practices continue to show benefits in reducing the need for antibiotics through the reduction of disease challenge.

Other farm level work focuses on health improvement so as to reduce the need to treat pigs with antibiotics in the first instance:

- Disease elimination strategies which may involve use of targeted medication for bacterial diseases such as Enzootic Pneumonia, often in association with vaccination and partial depopulation techniques.
- Depopulation/repopulation strategies.

Retailers continue to engage with their designated supply chains on the topic of antibiotics, many supporting collation of data, more veterinary engagement and further training to ensure the use of antibiotics within their supply chain is responsible.



Poultry meat sector.....

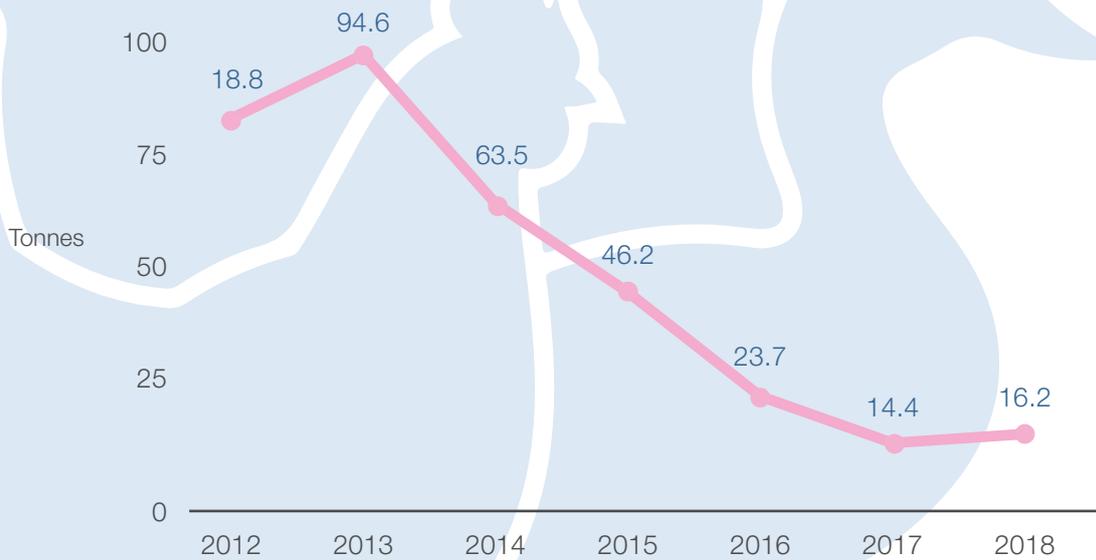
Overview

As detailed in the 2019 British Poultry Council (BPC) report²⁶, the British poultry meat sector’s focus on excellence in bird health and welfare has helped to achieve:

- >80% reduction in the total use of antibiotics in the last seven years (2012-2018)
- 82.6% reduction in the use of HP-CIAs in the last seven years (2012-2018)

In 2018, the UK poultry meat sector’s antibiotic use was under the target set for both chickens (25 mg/kg) and turkeys (50 mg/kg) and comprised 7.68%²⁷ of the total antibiotics licensed for use in food producing animals in 2018, as compared to 21% in 2012 (Figure 10).

Figure 10: Total antibiotic use in the UK poultry meat sector 2012-2018



Source: BPC

Antibiotic use

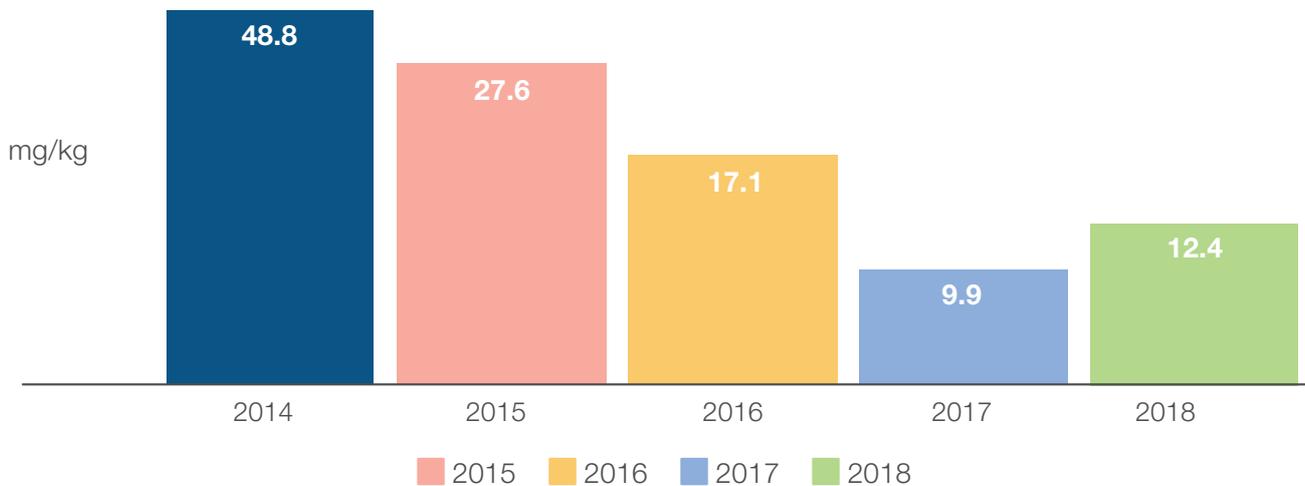
Target
Antibiotic use in chicken meat sector of 25 mg/kg, 2018-2020.
Latest progress
The sector was within this target, using 12.4 mg/kg in 2018 (Figure 11).

²⁶ BPC Antibiotic Stewardship Report www.britishpoultry.org.uk/bpc-antibiotic-stewardship-report-2019/

²⁷ UK-VARSS 2018



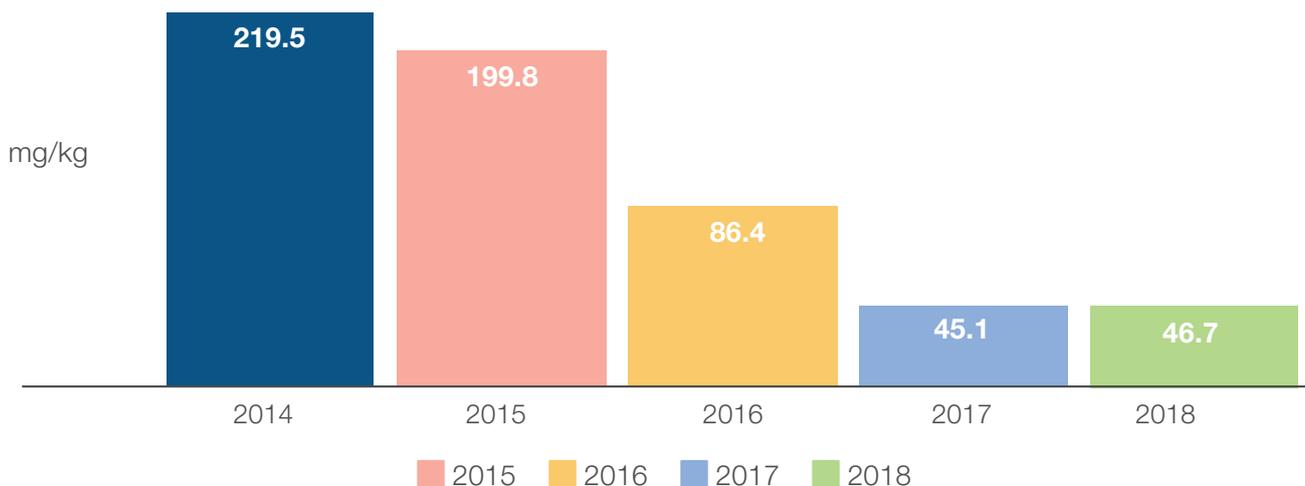
Figure 11: Antibiotics used in UK broiler chicken production 2014-2018



Source: BPC

Target
Antibiotic use in turkey sector of 50 mg/kg, 2018-2020.
Latest progress
The sector was within this target, using 46.7 mg/kg in 2018 (Figure 12).

Figure 12: Antibiotics used in UK turkey production 2014-2018



Source: BPC



Next actions

The sector is stepping up its efforts in responsible use of antibiotics and is working with the government to contribute to the 'One Health' approach set out by the UN on Antimicrobial Resistance. The Stewardship programme is repeating an independent study to determine the prevalence of Extended Spectrum β -lactamase (ESBL) and AmpC-producing *E. coli* in UK chicken flocks. The findings of this study will be reported later in 2019.

A working group has been set up to 'horizon-scan' for technological innovations including diagnostic and sensitivity testing tools used in human medicine to ensure early diagnosis in livestock. It is working with animal and human health experts to develop a methodology for rapid on-farm diagnostics to increase speed of antibiotic sensitivity testing.



Sheep sector

Overview

Under the leadership of the sheep representatives within the Target Task Force, the cross-industry Sheep Antibiotic Guardian Group (SAGG) has formed, as a sub-group of Sheep Health and Welfare Group (SHAWG). Membership includes: National Sheep Association (NSA), Sheep Veterinary Society (SVS), National Farmers Union (NFU), Agriculture and Horticulture Development Board (AHDB), Quality Meat Scotland (QMS) and Hybu Cig Cymru – Meat Promotion Wales (HCC).

SAGG has met regularly to ensure that timely, coordinated messages reach the sheep industry and that activity against these targets is recorded.

Big wins achieved as a result of this include the contribution of data to a comprehensive report on vaccine use showing increased uptake in the sheep sector, data indicating a reduction in use of oral antibiotics at lambing time, and extensive communication campaigns promoting vaccination against Enzootic Abortion of Ewes (EAE) and improved colostrum management.

Antibiotic use in sheep

Target
Monitor national sector antibiotic use levels, aiming for a 10% reduction, and reduce the use of highest-priority Critically Important Antibiotics (HP-CIAs) by 50%.
Latest progress
Current data suggest that mean use from separate groups of flocks range from 3 to 17 mg/kg.

There is still no centralised system for data collection from sheep farmers so data of antibiotic use in the sheep industry is made up of small data sets – usually collected by private vets or producer groups or for academic purposes.

Two separate industry producer groups have made their antibiotic use available for this report. One industry producer group collated 2018 antibiotic purchase data from 305 flocks (186,000 ewes, 252,690 lambs weaned, 96,000 purchased store lambs). In this group a single flock out of the 305 used highest-priority Critically Important Antibiotics (HP-CIAs), hence mean use of HP-CIAs was 0.002 mg/kg. A second industry producer group collated both 2017 and 2018 antibiotic administration data from 405 farms (266,000 ewes) across Wales and the South West of England. There was an increase in the administration of antibiotics at lambing time in 2018 as a result of the adverse weather conditions.

In an academic study²⁸, data were collated from 152 sheep-only flocks via 12 veterinary practices across Britain. The mean antibiotic use on these flocks in the three years from 2015 to 2017 ranged from 15.2 to 16.9 mg/kg, and medians ranged from 9.1 to 10.9 mg/kg. The method of antibiotic administration was dominated by parenteral antibiotics making up 86% of the total use, which comprised 49% oxytetracycline, 28% penicillins, 10% aminoglycosides and 8% macrolides. HP-CIA prescriptions made up 0.31% of the total.

²⁸ Lovatt, F.M. & Davies, P.D – poster presentation at AACTING conference Bern July 2019



Otherwise data is collated by individual veterinary practices – either for all sheep flock clients or specifically for groups of clients. As an example, one such practice²⁹ has collated data for its Flock Health Club members over the past three years. For the 15 flocks in the club representing 8,800 breeding ewes and over 14,000 lambs reared, the mean flock use was around 13.5 mg/kg with a range from 1.8 to 33.6 mg/kg in individual flocks.

Table 11: Summary of antibiotic use in sheep flocks from various sources

	Year (s)	No. of flocks	Mean use mg/kg	Median use mg/kg	HP-CIA use	Range mg/kg
Producer group 1 ^a	2018	305	3.8	2.5	0.002 mg/kg	0-37
Producer group 2 ^a	2018	405	7.5	4.8	-	-
Producer group 2 ^a	2017	405	7.0	3.7	-	-
Academic study ^b	2015	152	15.2	9.1	0.31%	-
	2016	152	16.9	10.6		
	2017	152	16.7	10.9		
Veterinary practice ^c	2016	13	14.0	14.1	-	2.0-33.6
	2017	15	13.2	13.0		1.8-22.0
	2018	15	13.9	13.4		2.6-26.7

^a Various anonymised, via personal communication with F. Lovatt, SAGG

^b Lovatt, F.M. & Davies, P.D – poster presentation at AACTING conference Bern July 2019

^c North Park Veterinary Group, Devon

Despite these datasets, figures representative of the entire sheep industry continue to prove difficult to obtain. Small scattered data sets mean that it is not yet possible to determine precise use trends.

Data collection

Target
Deliver a knowledge exchange plan to tackle veterinary surgeon and farmer behaviour.
Latest progress
Collaboration between the leading sheep sector groups has ensured the effective communication of a variety of campaigns and best practice messages.

The metrics document³⁰, published in July 2019, has two core metrics for measuring antibiotic use on-farm in sheep flocks:

- Total mass of antibiotic per unit of sheep weight (mg/kg), with separate identification of HP-CIAs
- Antibiotics given to lambs at less than a week old

²⁹ North Park Veterinary Group, Devon

³⁰ Calculation of metrics for benchmarking antibiotic use on sheep farms beefandlamb.ahdb.org.uk/wp-content/uploads/2019/07/Sheep-AMU-Metric-document-version-1.0-17Jul19.pdf



Progress is also being made in the development of electronic collection of data by groups such as AHDB and Welsh Lamb and Beef Producers Ltd (WLBP). As mentioned in the Cattle section, work in the cattle and sheep sectors is ongoing to explore what an industry tool similar to that used by the pig sector (eMB-Pigs) could look like for their respective industries. Following an initial pilot project with cattle in 2018, a second phase of work for what is being called an 'e-Medicines Hub (eMH)' was commissioned, this time for both cattle and sheep data. The aim is to test this with producers during 2020. Funded by AHDB, this pilot will allow centralised capture of antibiotic use data by a standardised method to provide:

1. National sector level reporting of antibiotic use in line with a widely recognised international methodology, this will be required to comply with the forthcoming Veterinary Medicine Regulations
2. Farm level data for identification of trends in how antibiotics are being used and to facilitate benchmarking within and between farms

The pilot will implement the farm level antibiotic use metrics agreed by SHAWG and the Cattle Health and Welfare Group (CHAWG). Work is also ongoing to explore how the eMH could access records from external sources to avoid farmers having to duplicate entry of data held on other systems, such as their own herd management software system.

Reduce disease 'hotspots'

Target

Deliver a knowledge exchange plan to tackle veterinary surgeon and farmer behaviour.

Latest progress

Collaboration between the leading sheep sector groups has ensured the effective communication of a variety of campaigns and best practice messages.

In the producers' group of 405 flocks in Wales and the South West mentioned earlier (Producer group 2, Table 11), just under 50% of the antibiotics administered were done so to treat foot issues, and the percentage of farms using the foot rot vaccine increased from 21% in 2017 to 30% in 2018.

Knowledge exchange (KE) activities have included campaigns on the uptake of the five-point plan and foot health as well as farmer workshops and articles in the veterinary and farming press. A social media campaign was organised by SAGG in July 2019 on vaccination for abortion control³¹.

Vaccines sales data has been tracked and a comprehensive report on sheep and cattle vaccine use published by AHDB (with thanks to MSD Animal Health and Kynotec)³². Almost 39 million (38.7 million) doses of vaccines were sold for use in UK sheep in 2018; this was the highest number of doses for seven years. Regarding the disease hotspots:

- Sales of foot rot vaccines climbed steadily from 10% in 2013 to a high of 15% of breeding ewes in 2017; there was a small drop in uptake of foot rot vaccine in 2018 as 13% of breeding ewes were vaccinated, although this may have been due to the very dry summer. Foot rot vaccination is one of the important elements of the five-point plan³³ to control lameness.

³¹ EAE campaign www.bit.ly/EAEcampaign

³² Use of vaccines in cattle and sheep - 2018 sales update ahdb.org.uk/knowledge-library/use-of-vaccines-in-cattle-and-sheep-production

³³ Clements, R.H. and S.C. Stoye, The 'Five-Point Plan': a successful tool for reducing lameness in sheep. *Veterinary Record*, 2014. 175(9): p. 225



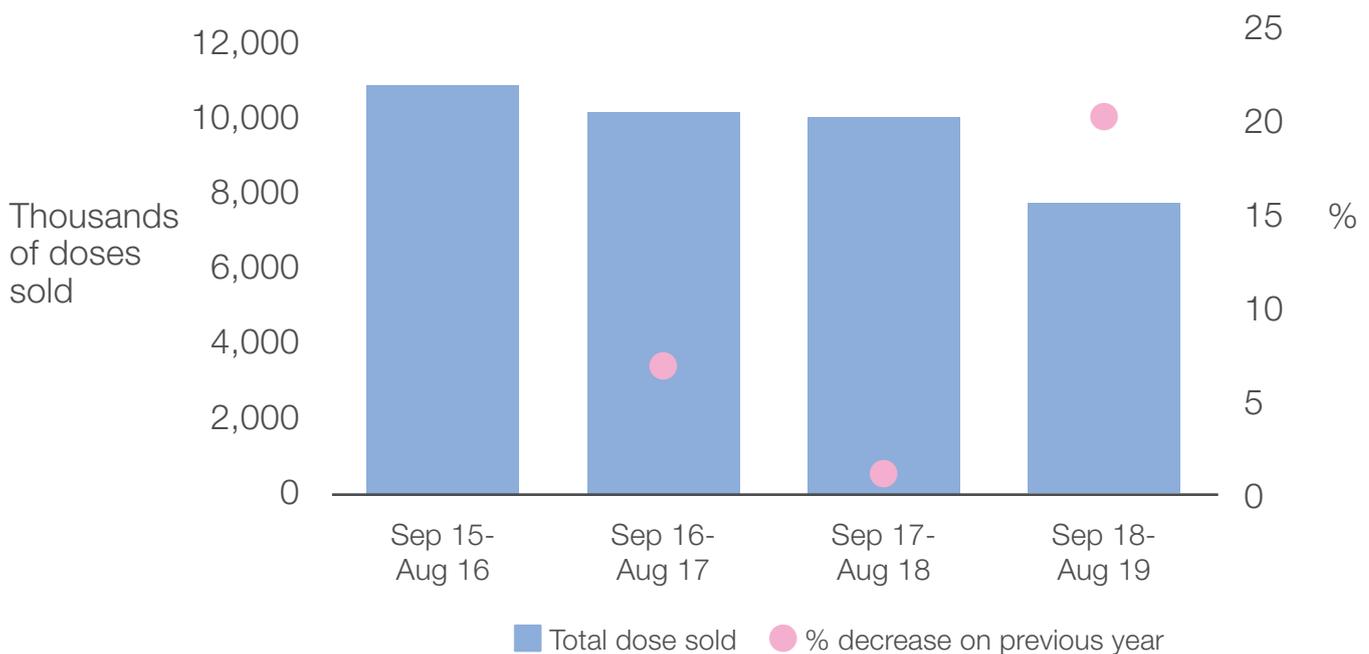
- Sales data on vaccines to control EAE indicated that 41% of first-time breeding ewes were vaccinated in 2018 (compared with 40% in 2016 and 2017).

It is also worth noting that for the first time in six years, over two-thirds of all sheep which should be vaccinated against clostridial diseases were vaccinated, and over half were vaccinated against *Pasteurella*.

Target
Reduce use in neonatal lambs, aiming to decrease sales by 10% each year over the next five years.
Latest progress
National sales data on oral antibiotics used in neonatal lambs showed a 21.5% fall between 2018 and 2019.

Preliminary industry data has suggested that sales of oral antibiotics³⁴ licensed to be used in UK neonatal lambs has consistently fallen since 2016, with a particularly large decrease during lambing in 2019 compared with 2018. These data include figures for the sales of both Orojet and Spectam Scourhalt for the whole of UK including Northern Ireland (Figure 13). Note that figures published in the 2018 update report were for Great Britain only.

Figure 13: Sales of oral antibiotics for UK lambs



Source: Kynetec

SAGG has continued to campaign for responsible use of antibiotics in neonatal lambs with emphasis on the #ColostrumIsGold campaign (see Appendix 1) as well as appropriate ewe body condition score and nutrition in both pregnant and lactating ewes.

³⁴ Kynetec data supplied by kind permission of MSD Animal Health



SAGG has concentrated on key hotspots areas with co-ordinated knowledge exchange messages to both sheep farmers and vets based on #PlanPreventProtect principles. Industry guidelines³⁵ have been published and made widely available. Work has been undertaken to explore the social factors that influence the decisions made by veterinary surgeons as they prescribe antimicrobials to sheep farmers for either the treatment or prevention of watery mouth in lambs³⁶. Such studies are useful to inform ongoing knowledge exchange activities with veterinary surgeons.

In addition to the specific campaign mentioned previously, social media, articles and veterinary-led farmer meetings have been used to promote appropriate preventative flock health care and responsible use of antibiotics in the hotspot areas. In particular:

- The #ColostrumIsGold campaign aimed to both reduce the number of cases of neonatal lamb diseases such as watery mouth and joint ill as well reduce the routine use of antibiotics
- #PlanPreventProtect has been used across each hotspot areas as sheep farmers are encouraged to plan ahead, prevent disease occurring, for example with good hygiene and environmental conditions and protect animals, for example through vaccination or adequate colostrum intake

Next actions

As well as the eMH, an on-farm Farm Medicine Tracker³⁷ is being developed to enable the recording of individual doses of medicines and record their use for both individual and groups of animals, the conditions being treated as well as providing 'pen-side' good practice advice to the farmer on responsible use of medicines.

SAGG is particularly keen to collect antibiotic usage data from a more representative sample of UK sheep farms. Considerable effort is being made to ensure that there is good communication and co-operation throughout the industry and that exactly comparable data is collated by each of the developing electronic systems.

³⁵ Industry guidance document for veterinary surgeons and farmers on responsible use of antibiotics in sheep beefandlamb.ahdb.org.uk/wp-content/uploads/2019/07/Responsible-AMU-guidance-for-sheep_Version-1.0_June-2019.pdf

³⁶ Doidge C, Hudson C, Lovatt F, Kaler J (2019) To prescribe or not to prescribe? A factorial survey to explore veterinarians' decision making when prescribing antimicrobials to sheep and beef farmers in the UK. PLoS ONE 14(4): e0213855. doi.org/10.1371/journal.pone.0213855

³⁷ Personal communication mike.howe@nadis.org.uk; p.sketchley@btinternet.com

Appendices

Appendix 1 Cross-sector campaigns

#ColostrumIsGold

Launched in February 2018 and co-ordinated by RUMA, #ColostrumIsGold aimed to promote the benefits of feeding colostrum quickly, in the right quality and of the right quantity. Following the '3 Qs' means newborn mammals are more likely to receive the passive immunity they need from the antibodies contained in the mother's colostrum. The energy colostrum provides is also particularly important. All of these factors mean the newborn is less likely to require antibiotic treatments later in life.

The campaign was targeted at cattle, sheep and pig producers with the support of veterinary surgeons, and ran mainly via Twitter with support materials such as facts, tips and case studies on a stand-alone www.colostrumisgold.org.uk website which linked to the resource database on www.farmantibiotics.org.

The campaign was well-received, with 1,953 tweets posted throughout its duration, resulting in a potential reach of 818,000 and potential impressions of 5.5 million. The campaign won the Community Communications category at the 2018 Antibiotic Guardian Awards, endorsed by Public Health England and aimed primarily at the human healthcare community. Similar reach was achieved in 2019.

#VaccinesWork

A #VaccinesWork campaign was launched in September 2018, with a similar structure to #ColostrumIsGold.

The campaign was also targeted at cattle, sheep and pig producers with the support of veterinary surgeons, and ran mainly via Twitter with support materials such as facts, tips and case studies on a stand-alone www.vaccineswork.org.uk website which linked to the resource database on www.farmantibiotics.org.

Vaccine use is a more complex issue and it is expected to take several years to build up momentum on this issue. NOAH has now taken on the management of the campaign as it fits well with many of its members who are vaccine manufacturers.

Appendix 2 EMA Classifications

European Medicines Agency (EMA) Antimicrobial Expert Group (AMEG) Classification of WHO Critically Important Antimicrobials (CIAs) based on degree of risk to humans due to antimicrobial resistance development following use in animals (Table 12).

However draft AMEG proposals published in February 2019 (which are due to be finalised in December 2019) look at a greater number of antimicrobial classes and propose an additional 'Caution' level (Table 13).

Table 12

Category	Risk to Public Health	Antimicrobials Included	Advice on use
3	Currently restricted to cascade use in companion animals only.		
Authorised CIAs			
2	Higher risk to public health	Fluoroquinolones, systemic third/fourth generation Cephalosporins, (Aminoglycosides, broad-spectrum Penicillins), Colistin	Restricted to use where there are no alternatives or response to alternatives expected to be poor
1	Low/limited risk to public health	Narrow spectrum Penicillins, Macrolides, Tetracyclines	General principles of responsible use to be applied

Table 13

Category	Antimicrobials Included	Advice on use
A “avoid”		No MRLs for food producing animals so can only be used for companion animals exceptionally, in compliance with the prescribing cascade.
B “restrict”	Cephalosporins (3rd & 4th gen), Polymyxins (e.g. colistin), Quinolones (fluoroquinolones and other quinolones)	Should only be used for the treatment of clinical conditions when there are no alternative antimicrobials in a lower category that could be effective. Especially for this category, use should be based on the results of AMR susceptibility testing, whenever possible
C “caution”	Aminoglycosides & aminocyclitol, Aminopenicillins in combination with β -lactamase inhibitors, Amphenicols (florfenicol & thiamphenicol), Cephalosporins (1st & 2nd gen) & cephamycins, Macrolides, Lincosamides, Pleuromutilins, Rifamycins	These antimicrobials should only be used when there is no substance in Category D that would be effective:
D “prudence”	Aminopenicillins, without β -lactamase inhibitors, Cyclic polypeptides (bacitracin), Nitrofurantoin derivatives (e.g. nitrofurantoin)*, Nitroimidazoles*, Penicillins: Anti-staphylococcal penicillins (β -lactamase-resistant penicillins), Penicillins: Natural, narrow spectrum penicillins (β -lactamase-sensitive penicillins), Steroid antibacterials (fusidic acid)*, Sulfonamides, dihydrofolate reductase inhibitors & combinations, Tetracyclines	General recommendation that prudent use principles should be adhered to in everyday practice to keep the risk from use of these classes as low as possible

Appendix 3 The Targets Task Force

Beef

Mark Jelley, NFU National Livestock Board member and beef farmer

Elizabeth Berry, cattle veterinary surgeon and British Cattle Veterinary Association Council member

Dairy

Paul Tompkins, Vice Chair of NFU Dairy Board and dairy farmer

Elizabeth Berry, cattle veterinary surgeon and British Cattle Veterinary Association Council member

Laying hens

Paul McMullin, Consultant Veterinarian to the British Egg Industry Council

Fish

Iain Berrill, Technical Director at the Scottish Salmon Producers Association

Nikos Steiropoulos, fish veterinary surgeon and Junior Vice-President of the Fish Veterinary Society

Gamebirds

Paul Jeavons, Worcestershire game farmer and Chairman of the Health and Welfare committee of the Game Farmers' Association

Isy Manning/Wil Ingram, poultry and gamebird veterinary surgeons from Poultry Health Services

Pigs

Richard Lister, Yorkshire pig farmer and Chairman of the National Pig Association

Richard Pearson, President of the Pig Veterinary Society and pig veterinary surgeon

Poultry meat

Thomas Wornham, Hertfordshire poultry producer

Daniel Parker, European-recognised veterinary specialist in poultry and Veterinary Adviser to the British Poultry Council

Sheep

Charles Sercombe, Leicestershire sheep farmer

Fiona Lovatt, European-recognised veterinary specialist in sheep health and production and representing Sheep Veterinary Society

Appendix 4 Abbreviations and Glossary

AHDA	Animal Health Distributors' Association
AHDB	Agriculture & Horticulture Development Board – parent organisation of the levy boards
AHDB Beef & Lamb	The levy board representing beef and lamb producers in England
AHDB Dairy	The levy board representing dairy producers in Great Britain
AHDB Pork	The levy board representing pig producers in England
AMR	Antimicrobial Resistance
AMU	Antimicrobial Use
Antibiotic	A medicine used to prevent and treat bacterial infections specifically. This report is primarily focused on the use of antibiotics, as a subset of wider antimicrobials.
Antimicrobial	A product which kills or slows the spread of a range of microorganisms including bacteria, viruses, protozoans, and fungi. Antibiotics are antimicrobials.
APHA	Animal and Plant Health Agency, formerly AHVLA
AHWBE	Animal Health and Welfare Board England
BCMS	British Cattle Movement Service
BCVA	British Cattle Veterinary Association
BEIC	British Egg Industry Council
BMPA	British Meat Processors' Association
BPC	British Poultry Council
BTA	British Trout Association
BVPA	British Veterinary Poultry Association
BVA	British Veterinary Association
BVD	Bovine Viral Diarrhoea
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CHAWG	Cattle Health and Welfare Group of Great Britain
CoGP	Code of Good Practice for Scottish Finfish Aquaculture
CTS	Cattle Tracing System
CVO	Chief Veterinary Officer
Dairy UK	The trade association for the British dairy supply chain.
Defra	The UK Government's Department for Environment, Food and Rural Affairs
DCDVet	Defined Course Dose for animals, the assumed average dose per kg animal per species per treatment
DDDVet	Defined Dairy Dose for animals, the assumed average dose per kg animal per species per day
EAE	Enzootic Abortion of Ewes
EFSA	European Food Safety Authority
EMA	European Medicines Agency
EMA AMEG	European Medicines Agency's Antimicrobial Expert Group
eMB-Pigs	The electronic Medicine Book, designed by AHDB to electronically collate antibiotic usage data from the UK pig sector
eMH	The electronic Medicine Hub being developed to capture data from cattle and sheep sectors
ESVAC	European Surveillance of Veterinary Antimicrobial Consumption
FSA	Food Standards Agency

FUW	Farmers Union of Wales
FVA	Fish Veterinary Association
GFA	Game Farmers' Association
HCC	Hybu Cig Cymru, responsible for the development, promotion and marketing of Welsh red meat
HP-CIA	Highest Priority Critically Important Antibiotic (for human medical purposes), as defined by the EMA
IBR	Infectious Bovine Rhinotracheitis
iSAGE	Innovation for Sustainable Sheep and Goat Production in Europe
Metaphylaxis	The treatment of a group of animals after the diagnosis of infection and/or clinical disease in part of the group, with the aim of preventing the spread of infectious disease to animals in close contact and at considerable risk and which may already be (sub-clinically) infected or incubating the disease. Also called Control treatment.
mg/PCU and mg/kg	Milligrams per PCU, the unit of measurement developed by the EMA to monitor antibiotic use and sales across Europe, which has also been adopted by the UK in its national reports although convention in 2017 was to refer to mg per kg for simplicity.
NFU	National Farmers' Union
NFU Cymru	The National Farmers' Union's Welsh arm
NFUS	National Farmers' Union of Scotland
NPA	National Pig Association
NSA	National Sheep Association
PCU	Population Correction Unit, which is used to help measure antibiotic use. PCU takes into account the animal population as well as the estimated weight of each particular animal at the time of treatment with antibiotics
PCV2	Porcine Circovirus Type 2 viruses
PCVAD	Porcine Circovirus Associated Disease
PI	Persistently Infected (with BVD)
Prophylaxis	The treatment of an animal or a group of animals, before clinical signs of infectious disease, in order to prevent the occurrence of disease or infection. Also called Preventative treatment.
PRRS	Porcine Reproductive and Respiratory Syndrome Virus, also known as Blue Ear Disease
PVS	Pig Veterinary Society
QMS	Quality Meat Scotland, the levy board representing the red meat industry in Scotland
RABDF	Royal Association of British Dairy Farmers
RCVS	Royal College of Veterinary Surgeons
Red Tractor	A food assurance scheme which covers production standards on safety, hygiene, animal welfare & environment
RTFS	Rainbow Trout Fry Syndrome
RUMA	Responsible Use of Medicines in Agriculture Alliance
SHAWG	Sheep Health and Welfare Group
SSPO	Scottish Salmon Producers' Association
SVA	Sheep Veterinary Association
SWISH	South West Initiative for Sheep Health
Therapeutic treatment	The curative treatment of a sick animal or group of animals following the diagnosis of infection and/or clinical disease in those animals.
VARSS	Veterinary Antimicrobial Resistance and Sales Surveillance, a collection of reports from the VMD providing the details of UK veterinary antibiotic resistance & sales surveillance
VMD	Veterinary Medicines Directorate
WHO	World Health Organisation

Appendix 5 Summary of progress against targets 2018

Cattle

TARGET Monitor national antibiotic usage levels in beef cattle annually

Progress Use in beef cattle was 21 mg/kg in 2018 (no baseline; limited dataset)

TARGET Reduce antibiotic use in dairy cattle

Progress Intra-mammary tube (dry cow) use in 2018 reduced 12% against 2015
Intra-mammary tube (lactating cow) in 2018 reduced 4% against 2015
Total usage in dairy cows in 2018 reduced 35% against 2016 (limited dataset)

TARGET Increase sealant tube use in dairy cattle

Progress A 2% increase in 2018 against 2015

TARGET Halve HP-CIA use

Progress Injectable HP-CIA use in cattle herds reduced 46% in 2018 against 2016*
Intra-mammary HP-CIA use in dairy cattle reduced 64% in 2018 against 2015

* Adjusted baseline year

TARGET Monitor use of cattle vaccines

Progress Calves vaccinated against pneumonia increased by 5% in 2018 compared with 2017
Cattle vaccinated against IBR increased by 4% in 2018 compared with 2017

TARGET Monitor national beef and dairy herd health and welfare metrics

Progress The biennial CHAWG report in 2020 will provide data

TARGET Farm level benchmarking of antibiotic use

Progress Farm-level benchmarking and an e-Medicine Hub service is being piloted

TARGET Promotion of training at farm and veterinary surgeon level

Progress An overarching training programme has been developed by NOAH, and other training initiatives have achieved increased participation

TARGET Dissemination of responsible use of medicines messages

Progress A wide range of industry campaigns have taken place over the past year

Gamebirds

TARGET Reduction in tonnage of 25% in 2017 and a further 25% between 2017 and 2020

Progress Use reduced by 36% 2016 to 2017, and by a further 25% 2017 to 2018

TARGET: Reduce HP-CIAs use by at least the same 25% margin by 2017

Progress Use of fluoroquinolones fell by 22% between 2016 and 2017 and a further 5% from 2017 to 2018, reducing 26% overall

Laying hens

TARGET Total bird/days medicated remains below 1%

Progress BEIC Lion Code members (90% of the sector) achieved under 1% bird/days treated in 2018

TARGET Fluoroquinolone + colistin (HP-CIA) days medicated remains below 0.05%

Progress No HP-CIAs were used in 2018

Fish

TARGET Information on the use of all antibiotics to be gathered and collated

Progress The trout sector captured 90% and the salmon sector 100% of 2018 usage

TARGET Overall antibacterial usage in trout to be a maximum of 20 mg/kg

Progress The trout sector recorded use of 13 mg/kg in 2018

TARGET Overall antibacterial usage in salmon to be a maximum of 5 mg/kg.

Progress The salmon sector recorded use of 6.5 mg/kg in 2018

TARGET No HP-CIA to be used routinely in farmed fish species, only following sensitivity testing

Progress No HP-CIAs were used in the British trout or Scottish salmon farming sectors in 2018; sensitivity testing remains standard practice

TARGET All Atlantic salmon to be vaccinated before the seawater phase

Progress All Atlantic salmon continue to be vaccinated prior to seawater transfer

TARGET All sea-grown Rainbow Trout to be vaccinated before transfer to marine sites

TARGET Use of appropriate vaccines to be promoted in freshwater trout farms

Progress Challenges remain in funding, developing and accessing vaccines for trout

TARGET In the absence of appropriate vaccines, autogenous vaccines to be developed/used

Progress Challenges remain in funding, developing and accessing these for trout; in salmon, autogenous vaccines continue to be used to support the management of cleanerfish where necessary

TARGET Compliance with the Code of Good Practice (CoGP) for Scottish Finfish Aquaculture, and Quality Trout UK (QTUK) or equivalent, to be accepted as the norm

Progress All UK trout for retail is produced under QTUK standards, and all salmon under CoGP

Pigs

TARGET Reduction from an estimated 263.5 mg/kg use in 2015 to 99 mg/kg use by 2020; 115.5 mg/kg in 2018

Progress Overall antibiotic use in pigs has reduced to 110 mg/kg in 2018

TARGET HP-CIA use will not rise above 0.1 mg/kg for fluoroquinolones, 0.015 mg/kg for 3rd/4th generation cephalosporins, and 0.1 mg/kg for colistin

Progress Use of the HP-CIAs as a whole was 0.06 mg/kg in 2018
Use of colistin represented only 0.004 mg/kg

TARGET Antibiotic usage in chicken meat sector of 25mg/kg, 2018-2020

Progress The sector was within this target, using 12.4 mg/kg in 2018

TARGET Antibiotic usage in turkey sector of 50mg/kg, 2018-2020

Progress The sector was within this target, using 46.7 mg/kg in 2018

Poultry meat

Sheep

TARGET Aim for a 10% reduction, and reduce the use of highest-priority antibiotics by 50%

Progress Mean use from separate flock groups ranges from 3 mg/kg to 17 mg/kg

TARGET Coordinate collation of antibiotic usage data

Progress Agreed standardised metrics have been published

TARGET Reduce lameness, measured by an increase in foot rot vaccine sales of 5% each year

Progress In 2018, 13% of breeding ewes were vaccinated against foot rot, against 15% in 2017 and 10% in 2013

TARGET Reduce abortion, measured by an increase in vaccine sales of 5% each year

Progress In 2018, 41% of first-time breeding ewes were vaccinated, against 40% in both 2016 and 2017

TARGET Reduce use in neonatal lambs, aiming to decrease sales by 10% each year

Progress National sales data showed a 21.5% fall between spring 2018 and spring 2019

TARGET Deliver a plan to tackle veterinary surgeon and farmer behaviour

Progress A co-ordinated knowledge exchange campaign has been executed and industry guidelines published

Note: While many targets were expressed as 'mg/PCU' in the original report, 'mg/kg' has been used in this update, but calculated using European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) methodology. This includes the use of standardised animal categories and weights, which represent the average weight at time of treatment and align with the Population Correction Unit (PCU) for that species or sector. More information on the PCU calculation is available by going to www.gov.uk and searching 'PCU'.

RESPONSIBLE USE OF MEDICINES IN AGRICULTURE ALLIANCE

ruma

Published 29 October 2019

www.ruma.org.uk

www.farmantibiotics.org