



Targets Task Force: One Year On

November 2018

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

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Introduction

Gwyn Jones, Chair of RUMA

The Targets Task Force was first conceived in Spring 2016 as the Responsible Use of Medicines in Agriculture (RUMA) Alliance prepared to respond to 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 as it would be 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 specialist veterinary surgeon and leading farmer for each of the sectors covering beef, dairy, laying hens, fish, 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. The chapters for each sector in the report, while sharing some standard headings, are very different. Similarly, the structures, content and lengths vary, with distinctions in the way the targets are expressed. This reflects not only the very different nature and challenge of each part of the industry but also the way in which the reports were conceived and are now owned and delivered by their respective sectors.

This 'One Year On' review reflects these differences, so this report should be read alongside the original Targets Task Force report for full context. However, the targets contained in the original report have also been included throughout this report, in brief, for reference.

It should be noted that 2017 sales and usage data are the latest available for many species, with the exception of gamebirds, for which 2018 data have now been collected and included here.

Please also be aware that 'mg/kg' units of measurement have been used in this report, but should be assumed to be equivalent to mg/PCU, where a standardised Population Correction Unit (PCU) has been calculated for that species. This is in line with changes to how the VMD reported its annual Veterinary Antimicrobial Resistance and Sales Surveillance (VARSS)⁴ figures for 2017. More information on the PCU calculation and standardised weights at time of treatment is available by going to www.gov.uk and searching 'PCU'⁵.

Finally, the work of the Targets Task Force was officially recognised when the group won the highly competitive 'Prescribing and Stewardship' category at the Public Health England-endorsed Antibiotic Guardian Awards 2018, beating a number of healthcare organisations and NHS Trusts. This rightly reflects the incredible achievements of this group in driving grassroots action on antibiotics in farming.

¹AMR Review www.amr-review.org

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

³RUMA Targets Task Force <https://www.ruma.org.uk/targets-task-force/>

⁴VARSS <https://www.gov.uk/government/collections/veterinary-antimicrobial-resistance-and-sales-surveillance>

⁵Understanding the mg/PCU calculation used for antibiotic monitoring in food producing animals <https://www.gov.uk/government/publications/understanding-the-mgpcu-calculation-used-for-antibiotic-monitoring-in-food-producing-animals>

The Big Picture

- **UK sales of antibiotics for food-producing animals have fallen 40% since 2013; overall use in 2017 was 37mg/kg, one of the lowest in the EU.**
- **Highest Priority Critically Important Antibiotic (HP-CIA) sales fell 52% between 2013 and 2017 from an already low level, and 29% between 2016 and 2017: just 7kg of colistin was sold for veterinary use last year.**
- **Only 30% of the UK's antibiotics are now estimated to be used to treat disease in farm animals. Over a billion farm animals are reared and managed in the UK every year.**
- **Further specific targets for each livestock sector, described in the Targets Task Force report, are due to be achieved by 2020.**





Cattle sectors beef and dairy

Overview

After the targets were published in 2017, both dairy and beef sectors formed stewardship groups to take the cattle sector targets forward; these have recently joined forces to ensure this is managed both effectively and efficiently. While there is clear crossover, each sector has published an action plan to set out short, medium and long term plans. Amalgamating the common areas between the beef and dairy sectors, where they exist, has necessitated some amendments of targets which are noted in the following text.

Significant progress has been made in implementing individual aspects of the plan, but ongoing challenges with data collection and collation means that until this is resolved, it will continue to be hard to clearly and accurately demonstrate progress.

Antibiotic use in beef cattle

Target
Monitor national antibiotic usage levels in the national beef herd annually, aiming for a 10% reduction 2016-2020 or reach a usage level of 10mg/kg by 2020, whichever is the lower level on a mg/kg basis.
Latest progress
Antibiotic use in beef cattle was 19mg/kg in 2017 (no baseline).

The beef sector is without any baseline for antibiotic use, so has taken steps to identify sources of sector-specific data for this purpose. Antibiotic usage for 2017 is 19mg/kg, and work is on-going to establish a retrospective baseline usage figure for 2016.

This 2017 beef antibiotic usage figure has been sourced from veterinary practice data⁶ based on 2,705 farms in Great Britain, with the majority of these (86%) being in England. The sample overall represents 6% of production for GB and 5% for the UK. It is therefore a relatively small sample and the results may not be representative of the whole UK beef population.

Efforts are now going into collecting detailed usage data on an ongoing basis, which will provide a better reference for progress by the close of the target period in 2020.

⁶These data have been provided by FarmVet Systems, a software company which extracts and cleanses sales data from Practice Management Systems and which can determine whether the medicine has been delivered to a farm keeping cattle.



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
Intra-mammary tubes (dry cow) was 0.677 DCDVet in 2017 (8% reduction)
Intra-mammary tubes (lactating cow) was 0.818 DCDVet in 2017 (1% increase)
Total usage in dairy cows was 17mg/kg in 2017 (29% reduction).

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

	2015	2016	2017	2020 target	Change compared with Baseline
Intra-mammary tubes – dry cow (DCDVet)*	0.732†	0.748	0.677	0.586	-8
Intra-mammary tubes – lactating cow (DCDVet)*	0.808†	0.977	0.818	0.727	+1
Total usage in dairy cows (mg/kg)**	24.0	26.2†	17.0	21.0	-35

† Baseline year * From VARSS sales data ** From FarmVet systems data; the sample of dairy farms in 2017 represented 31% of all dairy cattle in the UK

Figures collected for 2017 show a total antibiotic usage of 17mg/kg. This is a reduction of 35% compared with the baseline year 2016. However, it is important to note that this figure is taken from an indicative dataset – albeit a large one presenting 31% of the national dairy herd – to provide a convenience sample. With the sample populations of farms differing year to year, caution is urged in reading a trend into this until more data are available. In addition, the average herd size for the farms in the FarmVet sample is 28% higher than the overall UK mean, so the antibiotic usage may not be representative of all dairy farms across the UK.

Two additional datasets received from separate consultancies provide usage figures from their dairy clients, and demonstrate the importance of developing a consistent data collection process (see section on benchmarking for details of a proposed eMB-Cattle). Since 2015 Kite Consulting⁷, in conjunction with Solway Vets, has provided antibiotic benchmarking services and farmer training to dairy processors and retailers throughout the country. Data presented include 585 farms for the 12 months ending between 1 March 2018 and 30 June 2018. Similarly, Kingshay Consultants⁸ have been collecting and collating antibiotic usage data from 100 of their clients over two years, providing a comparative set of figures. These two datasets – although considerably smaller than the data used for the Veterinary Antimicrobial Resistance and Sales Surveillance (VARSS) report 2017 – nevertheless provide a useful comparison.

⁷Kite Consulting <http://www.kiteconsulting.com>

⁸Kingshay <http://www.kingshay.com>



Table 2: Progress towards overall dairy antibiotic use targets from Kite/Solway Vets sample

Kite/Solway Vets	Baseline	Year ending in 12 mths to Jun 2018	Target
Intra-mammary tubes – dry cow (DCDVet)	0.732	0.50	0.586
Intra-mammary tubes – lactating cow (DCDVet)	0.808	0.66	0.727
Total usage (mg/kg)	26.2	23.72	21.0

Table 3: Progress towards overall dairy antibiotic use targets from Kingshay sample

Kingshay	Baseline	Year ending in 12 mths to Aug 2017	Year ending in 12 mths to Aug 2018	Target
Intra-mammary tubes – dry cow (DCDVet)	0.732	0.519	0.522	0.586
Intra-mammary tubes – lactating cow (DCDVet)	0.808	0.795	0.801	0.727
Total usage (mg/kg)	26.2	20.2	20.5	21.0

Sealant tube use in dairy cattle

Target
Increase sealant tube use in dairy cows from an average of 0.5 to 0.7 courses per cow.
Latest progress
Data not yet available, due 2019.

No national data are available for sales of internal teat sealants due to the way this information is currently reported to the VMD, but this should be available in 2019. In the meantime, Kingshay has recorded a figure from its sample of 100 cows.

Table 4: Progress towards dairy cows sealant tube targets from Kingshay sample

Kingshay	Baseline (2015)	Year ending in 12 mths to Aug 2017	Year ending in 12 mths to Aug 2018	Target
Sealant tube usage (average number of courses per dairy cow)	0.5	0.66	0.67	0.7



HP-CIAs in beef and dairy

Target
Halve Highest Priority Critically Important Antibiotic (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 use in cattle herds was 0.760mg/kg in 2017 (21% reduction)
HP-CIA use in beef cattle was 0.3mg/kg in 2017 (no baseline)
HP-CIA intra-mammary use was 0.223 DCDVet in 2017 (33% reduction).

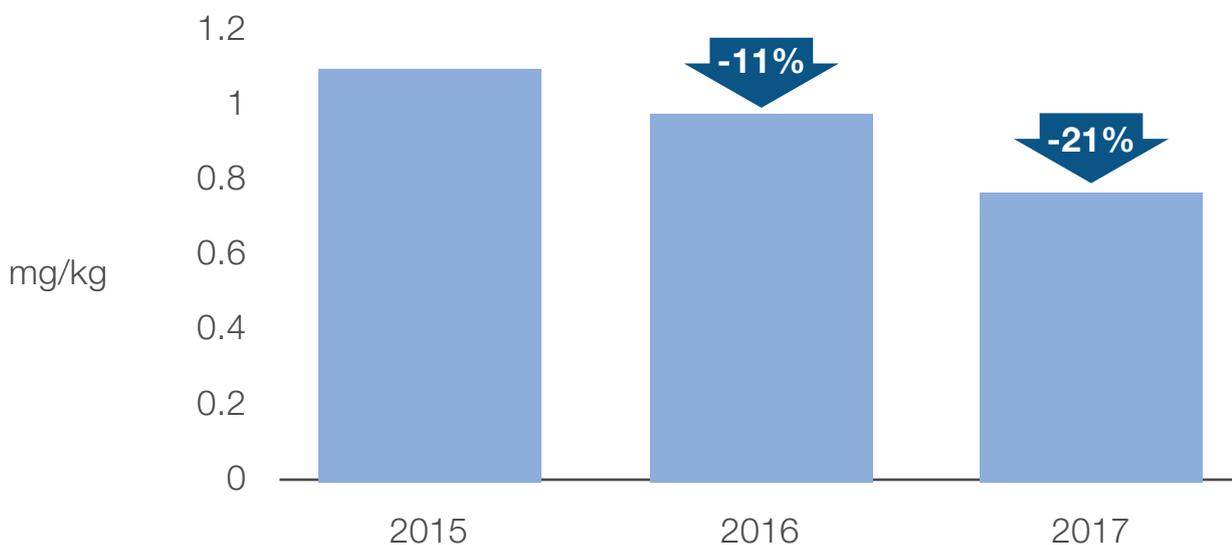
Injectable HP-CIA use in cattle is measured by the VMD through sales data and, as this is based on sales records of injectable HP-CIA products with cattle in their license, these data cannot be separated into an indication of sales for dairy cattle and sales for beef cattle. A further complication is that the beef sector opted for a base year of 2016 whereas dairy uses 2015. The target has been harmonised by agreeing a 2016 baseline for injectable HP-CIAs licensed for cattle, as measured by the VMD data and reported in the annual VARSS report.

Table 5: Progress towards injectable HP-CIA targets in cattle from VARSS data

	Original baseline (2015)	New Baseline (2016)	2017	New 2020 Target	2016-17 change
HP-CIA injectable for cattle (mg/kg)	1.075	0.959	0.760	0.480	-21%

In 2016, the new agreed base year for all cattle, this figure was 0.959mg/kg and in 2017 it was 0.760mg/kg. This means a decline of 21% from the base year.

Figure 1: Injectable HP-CIAs licensed for cattle, taken from VARSS data





It is possible to report beef cattle-only HP-CIA usage data for 2017 from the FarmVet veterinary practice data. This relatively small convenience sample suggests that use of HP-CIAs was 0.3mg/kg in beef cattle in 2017, and represented 1.5% of the total antibiotic use of that beef cattle dataset. As with overall antibiotic usage data from this sample, there is currently no baseline (2016) data available.

Sales of HP-CIA intra-mammary products are reported each year in the VARSS report. These are mainly for use in dairy cows. In 2017, these showed a decline of a third (33%) over the 2015 baseline year.

Table 6: Progress towards targets of intra-mammary HP-CIA sales from VARSS data

	Baseline 2015	2016	2017	2020 target	2015-17 change
HP-CIA intra-mammary tubes (DCDVet)	0.332	0.308	0.223	0.166	-33

Vaccine uptake

Target

Monitor use of cattle vaccines. Work with industry stakeholders (e.g. pharmaceutical companies) to monitor use of vaccinations targeting respiratory disease in cattle, aiming for an increase year on year between 2017 and 2020. Baseline data will be in place by December 2017.

Latest progress

Baseline data on cattle vaccination 2011-2017 has been collated and a full report was published in November 2018⁹.

While this target was originally specified for beef cattle, the dairy cattle section in the Targets Task Force Report referred to the need to control endemic disease to help reach targets. Hence the target now encompasses dairy as well as beef cattle to ensure this receives specific attention in both sectors.

The Agriculture and Horticulture Development Board (AHDB) has worked in partnership with MSD Animal Health⁹ to compile a report entitled 'Use of vaccines in dairy and beef cattle production'¹⁰. This report is based on wholesaler data and cattle population information from Defra annual statistics.

It is difficult to distinguish use of respiratory vaccinations in dairy and beef cattle from product sales data. Therefore this report relates to all cattle and establishes a baseline level for 2017 which can be monitored going forward to identify vaccination trends.

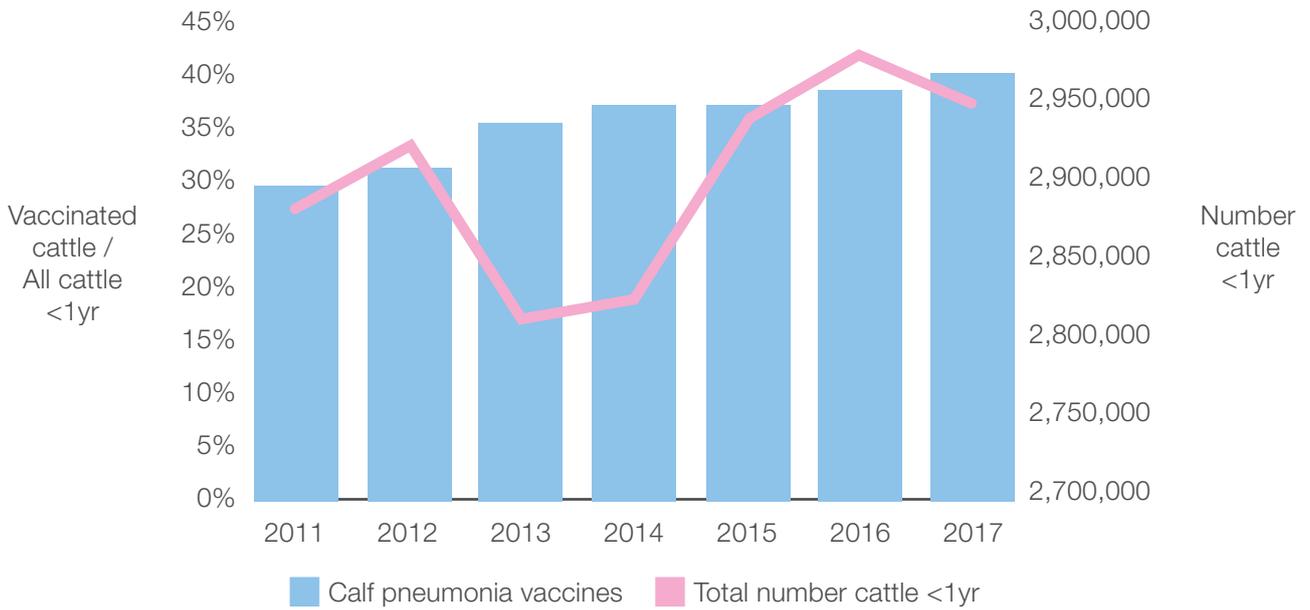
Vaccination rates for calf pneumonia have increased steadily over the period 2011 and 2017, to a rate of 38% of cattle less than one year old vaccinated in 2017.

⁹MSD Animal Health <http://www.msd-animal-health.co.uk>

¹⁰AHDB Use of vaccines in dairy and beef cattle production, available from <https://ahdb.org.uk>

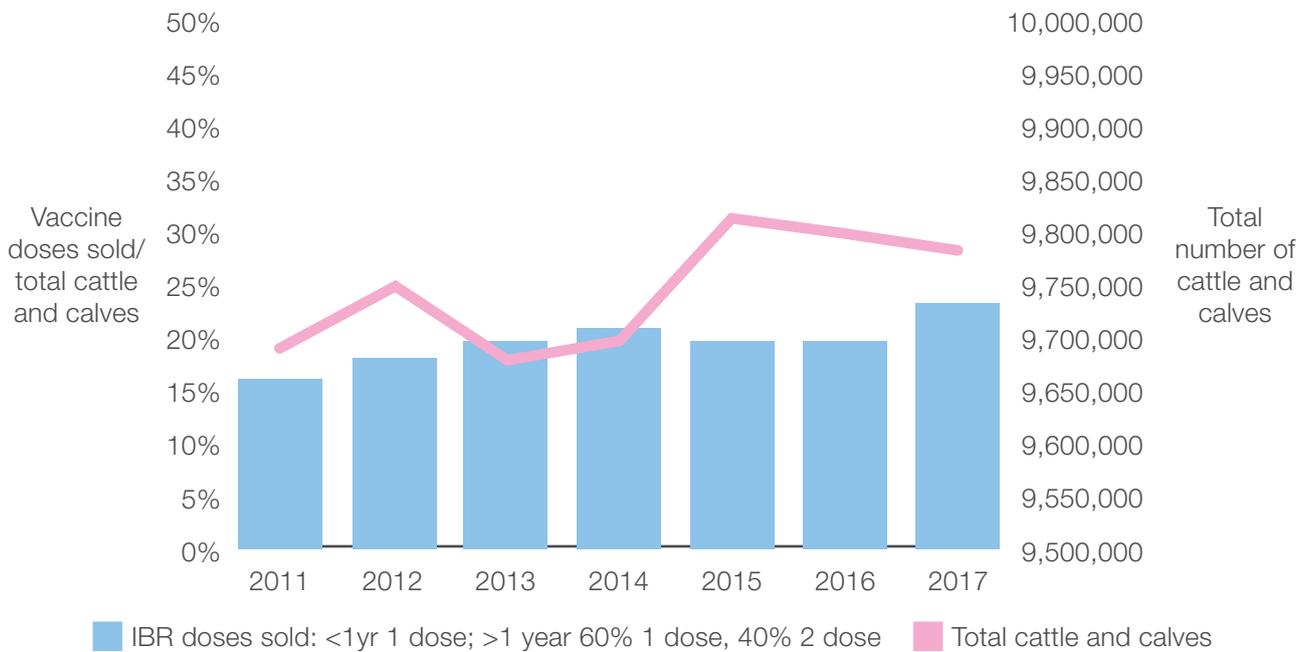


Figure 2: Pneumonia vaccine uptake in the cattle sectors



Infectious Bovine Rhinotracheitis (IBR) is a common cause of respiratory disease particularly in older cattle. IBR vaccine uptake increased from 16% in 2011 to a high in 2017 when it was estimated that almost one in four (23%) of all cattle in the UK were vaccinated for IBR.

Figure 3: IBR vaccine uptake in the cattle sectors





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 2018¹¹ which has provided a broad analysis of the available health and welfare metrics available across Great Britain. Work is also on-going to compile an annual mortality analysis of data from the Cattle Tracing System.

While this target was originally specified for beef cattle, the dairy cattle section in the Targets Task Force Report referred to the need to use existing welfare metrics to monitor and review any adverse impact as a result of antibiotic reductions. Hence the target now encompasses dairy as well as beef cattle to ensure this receives specific attention in both sectors.

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 dataset.

Latest progress

Projects to develop farm-level benchmarking and an eMB-Cattle service are in progress.

While this target was originally specified for beef cattle, the dairy cattle section in the Targets Task Force Report referred to the need for data collection. Hence the target now encompasses dairy as well as beef cattle to ensure this receives specific attention in both sectors.

AHDB is currently developing a pilot electronic-Medicine Book (eMB) for use by both dairy and beef farmers that will allow centralised capture of antibiotic use data in a standardised method to provide:

1. National cattle sector-level reporting of antibiotic use in line with ESVAC methodologies
2. Farm level data for identification of usage trends and benchmarking between farms

The pilot will report at the end of 2018 and a decision made then about whether to develop this into a fully functional electronic medicine book, similar to that which already exists for pigs¹².

¹¹CHAWG www.chawg.org.uk

¹²eMB <https://pork.ahdb.org.uk/health-welfare/health/antimicrobial-usage/e-medicine-book-emb-pigs/>



AHDB is also funding work led by the University of Bristol¹³ to develop metrics that can be adopted by beef producers to accurately assess, record and benchmark farm medicine use and therefore be used as key performance indicators for individual enterprises as well as the industry as a whole. Metrics for recording and benchmarking antibiotic use is a key feature of this work. Working with its nine collaborators from academia, veterinary practice and the processing sector, this project will investigate the use of both veterinary prescription records and on-farm records from a number of beef farms for medicine benchmarking. This work will feed into eMB-Cattle during early 2019. In parallel the CHAWG antimicrobial use working group is undertaking a review of antibiotic benchmarking metrics for dairy cattle and is aiming to have these finalised by the end of 2018.

As well as this, there are a number of systems that have been developed by commercial companies to collect, record and collate antibiotic use data, which are available to farmers and veterinary surgeons. The Kite and Kingshay datasets shown earlier are two such examples. Supply chains are also known to be collecting antibiotic usage data, including farmer-owned dairy co-operatives, processors and retailers. It is hoped that competitive situations can be avoided by encouraging these groups to participate in anonymous standardised aggregation of these data – potentially through eMB-Cattle or similar platform – to provide a more complete national picture.

Finally, the University of Nottingham School of Veterinary Medicine and Science Herd Health Group have developed an online antibiotics use calculator. Also funded by AHDB, this evaluates antibiotic use on dairy and sheep farms, and is available for all producers to download¹⁴. These user-friendly calculators can be used to evaluate key areas and to encourage more responsible use of antibiotics. Other tools are available in the commercial sector such as veterinary practice software and herd management programmes.

Farmer and veterinary training

Target

Promotion of training at farm and veterinary surgeon level.

- 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 systems
- b) British Cattle Veterinary Association (BCVA) to monitor numbers of veterinary surgeons attending prescribing CPD course
- c) Integration of National Office of Animal Health (NOAH) training package into existing and new training delivery
- d) Monitor uptake of responsible use of medicines courses across the industry.

Latest progress

A key overarching training programme has been developed and other training initiatives have achieved increased participation.

¹³University of Bristol AMR projects <http://www.bristol.ac.uk/vetscience/research/infection-immunity/main/>

¹⁴Available on the AHDB website <https://dairy.ahdb.org.uk/resources-library/technical-information/health-welfare/amu-calculator/>



While this target was originally specified for beef cattle, the dairy cattle section in the Targets Task Force Report referred to the need for training. Hence the target now encompasses dairy as well as beef cattle to ensure this receives specific attention in both sectors.

Led by NOAH, industry has developed the Animal Medicines Best Practice Programme (AMBP)¹⁵ to support the responsible use of antibiotics across UK farms. See Appendix 1 for more details.

Another dairy sector initiative, MilkSure¹⁶, is aimed at British dairy farmers and the course covers all the technical and practical aspects necessary to safeguard residue free milk. Registrations are increasing every week with many milk purchasers encouraging their producers to do the course; as such over 500 farmers registered on the course in the last year (Autumn 2017-2018). There has been huge demand for veterinary training on MilkSure and nearly 200 veterinary surgeons have undertaken this specific training to date, all of whom found it to be useful.

Independently of these, BCVA¹⁷ calculated that over the past year, more than 1,000 trained veterinary surgeons have undertaken a BCVA training course with content relevant to the responsible use of antibiotics.

Both the NOAH AMBP and MilkSure courses are accredited through the dairy industry's professional development assessor DairyPro, meaning participants can earn 'professional development' points towards becoming Dairy Pro-endorsed. BCVA training is also Continuous Professional Development (CPD) accredited for participating veterinary surgeons.

Industry initiatives

Target
Dissemination of responsible use of medicines messages.
Latest progress
A number of industry campaigns have taken place over the past year.

Events

RUMA attended the Dairy-Tech event in February and hosted a 'Drop-in Antibiotics Clinic' hosted by a range of industry veterinary surgeons, members of the Targets Task Force, and industry leaders in the AMR issue.

¹⁵NOAH AMBP Programme <https://www.noah.co.uk/farmer-training/>

¹⁶MilkSure www.milksure.co.uk/

¹⁷BCVA CPD <https://www.bcva.eu/cpd>



Calf Health campaign

The joint stewardship group has coordinated a positive and proactive PR campaign to drive awareness and engagement of antibiotic stewardship specific to calf health. #CalfHealth aims to raise awareness of the responsible use of medicines and improved calf health and welfare through proactive health planning with specific reference to respiratory disease, transition from unit to unit and grouping and colostrum management. With no budget the campaign has utilised the networks of stakeholder groups to spread these key calf health messages. A host of resources can be found on the www.farmantibiotics.org site.

Colostrum and vaccines campaigns

Campaigns promoting better colostrum management and vaccination were run during 2018. Cattle were a particular target for both these. More information on both is available in Appendix 1.

Endemic disease

Activity continues for ongoing industry campaigns such as BVDFree and Action Johnes, which has been updated in the 2018 CHAWG report. Bovine Viral Diarrhoea (BVD) and Johne's Disease are both immune-suppressants so controlling or eradicating them more effectively should have a knock-on impact on antibiotic use.

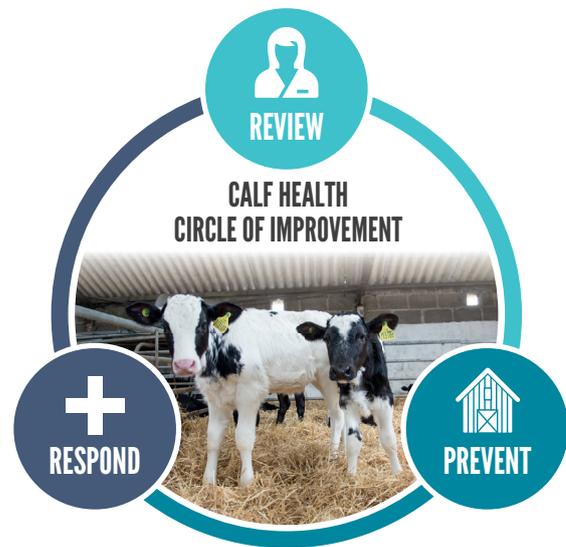
Other developments

A new policy position on feeding waste milk to calves was published by RUMA in August 2018¹⁸:

“Waste milk (excluding colostrum) from cows under the statutory withdrawal period for antibiotics should not be fed to youngstock. Based on current evidence it is recommended that a practical solution for on-farm disposal is to dispose of waste milk in the slurry pit. RUMA encourages further research into disposal options to identify practical alternatives and to gain a better understanding of any potential environmental interactions associated with disposal via this route.”*

**Colostrum from treated cows can be fed to newborn calves for the first 24 hours of life as the benefits to calf health are, based on current evidence, viewed to outweigh any potential negatives. AHDB has further detailed information about feeding colostrum and newborn calf health.*

Figure 4: Calf Health campaign infographic



¹⁸RUMA position on feeding waste milk to calves <https://www.ruma.org.uk/ruma-position-on-feeding-waste-milk-to-calves/>



Next actions

Efforts will continue to develop systems to collect and collate data at a national level, as well as benchmark at farm level, as both these aspects are critical to driving improvements in stewardship within both sectors, and monitoring progress. Understanding how supply chains and Red Tractor assurance can support these efforts will be an important part of this.

The new vaccine use report issued in November 2018 will be used to raise awareness of the importance of considering vaccines and using them correctly. This will also link with an ongoing drive to reduce the burden of endemic disease.

The #ColostrumIsGold campaign will run again in February 2019, and will specifically target dairy-bred calf rearing.

Uptake of the new AMBP training programme will be promoted to both sectors.



Fish sectors trout and salmon.....

Overview

Both the salmon and trout sectors have made considerable progress against targets in this first year. As two completely distinct sectors, salmon producers tend to be integrated into defined supply chains whereas trout producers are mostly small, independent operators. This means the challenges they face are extremely diverse.

Data collection

Target
Information on the use of all antibiotics to be gathered and collated.
Latest progress
The trout sector captured 70% of usage data in 2017 and is working towards improving data collation further.
Information on antibiotic use in the Scottish salmon farming sector for 2017 has been collected from all prescribing veterinary practices, and now covers 100% of salmon produced in Scotland.

The salmon sector successfully achieved one of its primary goals in 2017: the collation of antibiotic use data from the entire sector. During the early stages, the Scottish Salmon Producers Organisation (SSPO) and the Fish Veterinary Society (FVS) liaised to establish a structural mechanism to support the collation of antibiotic use data, and then established, within SSPO, a new and important group: the SSPO Prescribing Vets Group. This forum provides a key mechanism through which information on antibiotic use is collated and discussed.

The formation of the SSPO Prescribing Vets Group has been a notable, if perhaps unexpected, benefit of the Targets Task Force initiative. This group has been formed to support the collation of industry data (specifically antibiotic use data), but has numerous wider benefits. Providing a forum that allows prescribing veterinary surgeons to discuss relevant issues, whilst also engaging with SSPO and the wider industry is invaluable and seen by all as a positive move forward in fish health and welfare for Scottish salmon farmers.

SSPO continues to liaise with the FVS, Veterinary Medicines Directorate (VMD), British Veterinary Association (BVA) and British Trout Association (BTA) over the collection of antibiotic use data. The data collected were passed to VMD for inclusion in the 2017 Veterinary Antimicrobial Resistance and Sales Surveillance (VARSS) report.



Antibiotic use in trout farming

Target
Overall antibacterial usage in trout to be a maximum of 20mg/kg.
Latest progress
The trout sector recorded use of 19mg/kg in 2017.

The BTA is the primary representative organisation in the trout sector, and is committed to monitoring antibiotic usage and focusing on biosecurity and good management practices in order to minimise the use of antibiotics.

Antibiotic use in salmon farming

Target
Overall antibacterial usage in salmon to be a maximum of 5mg/kg.
Latest progress
The salmon sector recorded use of 17.2mg/kg in 2017.

During summer 2018, the SSPO Prescribing Vets Group established a protocol and collated antibiotic use data for 2017 covering 100% of farmed salmon production. This dataset has now been passed to the VMD and is included in this update.

The antibiotic use targets established for the salmon farming sector last year within the Targets Task Force initiative are ambitious. In 2017, 3,052.6kg of antibiotic was used by the sector, including no Highest Priority Critically Important Antibiotics (HP-CIAs). This overall use equated to 17.2mg/kg of production. This means that it was not possible to achieve the target in 2017, albeit with use still relatively low when assessed against national livestock targets.

In considering the reasons behind this, this is the first year in which comprehensive data collection provides an overall figure and this is useful feedback for the sector.

However, other more complex obstacles concern the bi-phasic life cycle of the salmon; differences in antibiotic use between the freshwater and seawater phases can significantly impact the overall level 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.

In 2017 a number of challenges during the seawater phase impacted overall use as well. Salmon 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. Changes in rainfall and resulting changes in salinity, suspended solids, dissolved components etc., can greatly affect the health and immune-competence of fish. Environmental changes also influence the development of planktonic organisms, such as harmful algae and jellyfish, which can further compromise fish health. In 2017, environmental factors such as rainfall and temperature led to challenging farming conditions, which, in some cases, involved bacterial infections for which no vaccines are currently available, hence they required antibiotic intervention.



Now that usage levels have been established with 100% of the sector's data, the SSPO Prescribing Vets Group will support the collation of industry data in future years. The group will also review the target and discuss whether usage should be monitored on an average rolling basis to take account of the disproportionate effect climatic and other environmental factors can have on disease levels in salmon in a single year.

However, with salmon being farmed in the natural, wild lochs around Scotland, farmers have a limited ability to mitigate against environmental changes that can impact fish health and welfare. Looking ahead to 2018 figures, increased water temperatures and reduced rainfall during the year are likely to again impact the use of antibiotics. Further ahead, global climate change remains a challenge for the sector and is likely to impact fish physiology and development as well as the development and presence of fish pathogens in Scotland. The Scottish salmon farming sector is acutely aware of the possible challenges that might result from climate change and is looking to invest in research to better understand both challenges and solutions.

HP-CIAs in trout and salmon

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 British trout sector in 2017; sensitivity testing has been and will remain standard practice in trout farming.
No HP-CIAs were used in the Scottish salmon farming sector in 2017; sensitivity testing remains standard practice.

The majority of antibiotic used to treat salmon was Oxytetracycline Hydrochloride (85.7%), followed by Florfenicol (13.5%). Oxolinic Acid and Amoxicillin Trihydrate together made up less than 1% of the total used (0.74% and 0.02% respectively).

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.

The sector's approach to fish health and welfare is strongly reliant on preventive health management. To that end vaccines are widely used to protect against the most significant bacterial and viral pathogens, and new vaccines are continuously under development to improve efficacy and to broaden the suite of pathogens protected against. For many years, including to date, 100% of salmon have been vaccinated against the key pathogens prior to transfer to sea.



Target
All sea-grown Rainbow Trout to be vaccinated against relevant bacteria pathogens before transfer to marine sites.
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. However, there are very few vaccines licensed for trout, and the sector has lost two vaccines in the past 10 years. As a result the sector is working very closely with vaccine companies and research institutions to investigate opportunities to develop new vaccines.

Target
In the absence of appropriate licensed vaccines, autogenous vaccines to be developed and used wherever possible.
Latest progress
Challenges remain in funding, developing and accessing such vaccines for trout.
In salmon, autogenous vaccines continue to be used to support health management of cleanerfish where necessary.

One of the main challenges is the development costs of vaccines in comparison to the possible commercial return from trout. A fast-track system for the development of vaccines needs to be considered.

Cleanerfish are a relatively new aquaculture species in Scotland. They are used as a biological control, to assist in the management of sea lice in salmon 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. Where commercial vaccines are not currently available, and where necessary and appropriate, autogenous vaccines continue to be used to support health management of cleanerfish.

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
All trout farmed in the UK for the retail market is produced under Quality Trout UK standards.
100% of Scottish farmed Atlantic salmon is produced in compliance with the Code of Good Practice for Scottish Finfish Aquaculture.



The Code of Good Practice for Scottish Finfish Aquaculture (CoGP)¹⁹ was produced in response to the recommendations of the Strategic Framework for Scottish Aquaculture (2003). Since its implementation in 2006, the CoGP has been widely adopted as an industry production standard in Scotland.

Quality Trout UK (QTUK)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 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.

Fish 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 CoGP, which requires all farms to have detailed veterinary health and biosecurity plans. All salmon farms are currently compliant with the CoGP.

Next actions

The trout sector will focus on maintaining use at 20mg/kg or less, increasing its data collection over 70% and exploring options to increase vaccine supply.

Through the SSPO Prescribing Vets Group, the salmon sector will investigate options to increase vaccine use for novel diseases, and to control new health challenges brought by climactic changes without the need for antibiotic treatments.

¹⁹Code of Good Practice for Scottish Finfish Aquaculture <http://thecodeofgoodpractice.co.uk/>

²⁰Quality Trout UK <http://www.qualitytrout.co.uk/>



Gamebird sector.....

Overview

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 to reduce antibiotic use within the sector.

The campaign has rested on getting all participants and influencers within the sector to work together and communicate a single message, ensuring that producers would hear it from every source. The participants and supporters of this joint initiative are: British Association for Shooting and Conservation; the British Veterinary Association, Countryside Alliance, the British Veterinary Poultry Association, the National Gamekeepers' Organisation, the Veterinary Medicines Directorate, the Game Farmers Association, the Game and Wildlife Conservation Trust, RUMA, and the Game Feed Trade Association.

The outcome has been a halving in antibiotic use, meeting the 2020 target two years early²¹. This means the sector is now considering what new targets may be appropriate.

Reductions in tonnage

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 24% between 2017 and 2018.

Through the industry collaboration detailed above, it has been possible to obtain data on 90% of antibiotic sales which – given the nature of gamebird rearing – are mostly administered through feed or water.

The first year reduction target, agreed in advance with RUMA and the VMD, was for an ambitious cut of 25% during 2017. In fact the sector achieved a reduction of 36% in 2017 which was widely welcomed, not least by Government.

A target for a further fall of 25% by the end of 2020 was then confirmed by all parties. Final figures for 2018 usage were signed off by the VMD in October 2018 (the gamebird rearing season having concluded during September) and a fall during 2018 of 24% was confirmed.

²¹Game Farmers Association News <https://www.gfa.org.uk/news.php>



Reduction in HP-CIAs

Target
Reduce Highest Priority Critically Important Antibiotic (HP-CIA) use by at least the same 25% margin by 2017.
Latest progress
Use of fluoroquinolones fell in 2017 as planned, but has risen again in the latest 2018 data.

The only HP-CIA used in gamebird rearing is fluoroquinolones, which forms just 2% of active ingredient sales. The amount used in 2017 reduced but rose again in 2018. While fluoroquinolones still remain a very small part of the gamebird total, they are important medicines in human healthcare so the sector particularly wants to reduce them and this will be a focus for action in 2019.

Next actions

Combining the 2017 and 2018 results means that the gamebird sector has voluntarily reduced antibiotic use by 51% since its campaign was rolled out in 2016. The use of antibiotics in gamebird feed (a part of the above total) has actually fallen by 70% since the GFA-led campaign began.

Despite the 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. Gamebird rearing is not meat production *per se*. Naturally territorial and aggressive, gamebirds are prone to stress and the diseases that go with that, so getting antibiotic use right down in gamebirds is never going to be easy. The reared birds have to be equipped to cope with the challenges they will encounter when released into the wild. They must be reared outside, exposed to environmental disease challenges and to the weather. They must also be genetically close to their wild cousins to have the right traits to cope with life in the countryside.

With the 2020 target all but met two years early, the rapid progress to date indicates scope for further reductions in future. The sector is therefore determined to build on its early successes and to set further challenging reduction targets for the future, while always ensuring that bird welfare is not compromised.

The 2020 target will be reviewed in the coming months to assess how much further the gamebird sector can drive down antibiotic use whilst always ensuring good bird health and welfare. The lessons learned from this year's gamebird rearing season will be collated during November 2018 at a meeting of specialist veterinary surgeons being hosted by the Game Farmers' Association. Advice arising from that meeting will be provided free of charge to all game rearers in pursuit of further antibiotic reductions next year.



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 in laying hens

Target
Total bird/days medicated remains below 1%.
Latest progress
Members of the BEIC Lion Code, which represent over 90% of the industry, met the sector target for percentage bird days treated to remain below 1%.

The BEIC reports that the usage data presented for 2017 show that members of the BEIC Lion Code²², which represent over 90% of the industry, have managed to reduce use from an already low base, and have met the sector target for percentage bird days treated to remain below 1%.

The data indicate that the laying hen sector used 2.16 tonnes of antibiotic active ingredient, a reduction of 0.45 tonnes (17%) from 2016 (Table 7). This represents 0.57 daily doses/100 days (or % bird days treated), a reduction of 22% from 2016.

This has been achieved with 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 Passport²³ provides a common training standard on key topics, including welfare, biosecurity and medicine usage.

²²British Lion Code of Practice <http://www.britisheggindustryCouncil.co.uk/download/LCoPV7.pdf>

²³Lion Training Passport <http://liontrainingpassport.co.uk/>



Target

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

Latest progress

No Highest Priority Critically Important Antibiotics (HP-CIAs) were used in 2017.

It is encouraging to see that no HP-CIAs were used in 2017, 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 that no other medication is appropriate in order to maintain bird welfare.

When analysed by active ingredient class, tetracycline and pleuromutilins account for 84% of the use and there were no HP-CIAs used. Reductions were seen in most antibiotic classes, but were particularly marked for macrolides and pleuromutilins (Table 7 and Figure 5).

Table 7: Actual daily doses of active ingredient used by members of the BEIC Lion Code 2016/17

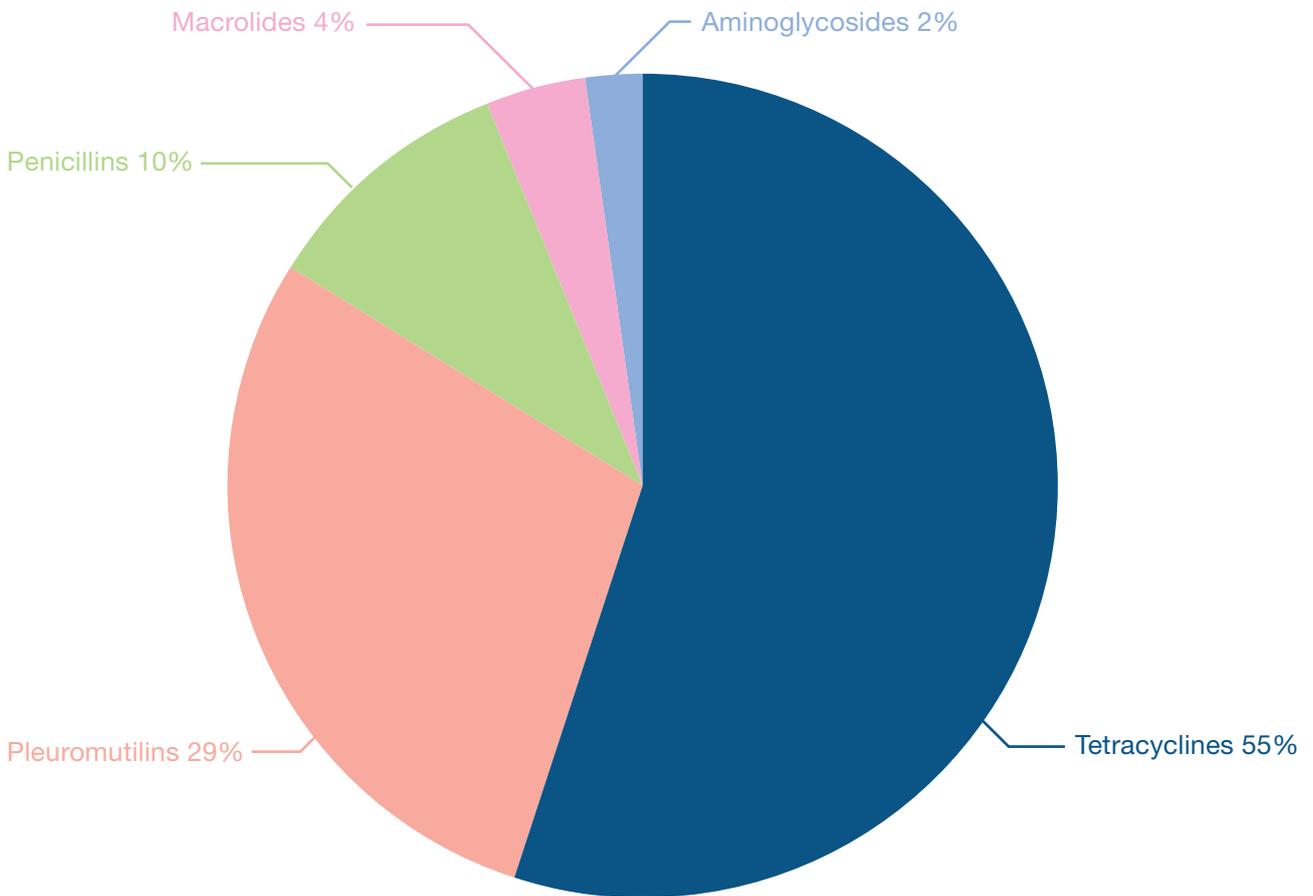
	2016 M. Doses (%)	2017 M. Doses (%)	% Change (2016-2017)
Tetracyclines	45.1(40)	48.1 (55)	7
Pleuromutilins	43.0 (38)	25.7 (29)	-40
Penicillins	9.2 (8)	8.6 (10)	-7
Macrolides	7.5 (7)	3.3. (4)	-56
Aminoglycosides	2.8(2)	1.7 (2)	-39
Other*, includes:	0.3		
Fluoroquinolones**	4.3 (4)	0	-100
Colistin**		0	
Total	112.1	87.5	-22

* Includes fluoroquinolones and colistin

** Highest Priority Critically Important Antibiotics



Figure 5: Percentage of actual daily doses of antibiotics used by members of the BEIC Lion Code in 2017



Next actions

Going forward to the 2018/19 reporting year, 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.



Pig sector.....

Overview

A positive coordinated effort across the pig sector has resulted in large reductions in antibiotic use.

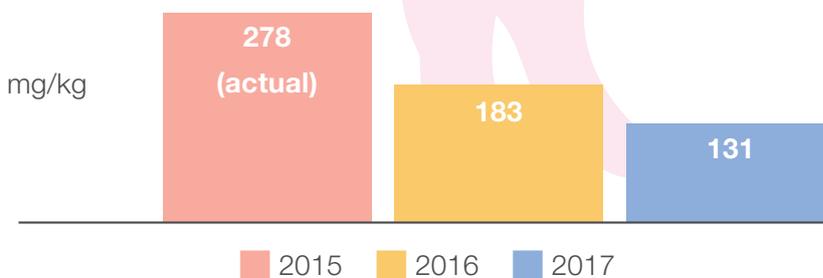
The reductions are in line with the RUMA targets set in 2017 and the UK pig sector remains committed to achieving the target by 2020. Since antibiotic use recording started in 2015, the pig sector has reduced its use by more than 50%²⁴ and reduced Highest Priority Critically Important Antibiotic (HP-CIA) use to an extremely low level. While further reductions are needed – and wanted by the sector – emphasis must now move towards achieving sustainable levels of antibiotic use. Antibiotics are a necessary tool to treat and control pig disease and a zero level of antibiotic use could seriously compromise animal welfare and therefore, it should not be expected that the pig sector will completely eliminate all use of antibiotics.

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

Antibiotic use in pigs

Target
Reductions in mg/kg from an estimated 2015 baseline of 263.5mg/kg:
• Year 1 reduction 35% to reach 171mg/kg in 2016
• Year 2 reduction 25% to reach 128mg/kg in 2017
• Year 3 reduction 10% to reach 115.5mg/kg in 2018
• Year 4 reduction 10% to reach 104mg/kg in 2019
• Year 5 reduction 5% to reach 99mg/kg in 2020
Latest progress
Overall antibiotic usage in pigs halved in two years 2015 - 2017, to reach 131mg/kg.

Figure 6: Antibiotics used in pigs (source: AHDB eMB-Pigs)



²⁴AHDB <https://pork.ahdb.org.uk/news/news-releases/2018/may/uk-pig-industry-halves-antibiotic-usage-in-two-years/>



The sector is on track to meet its target of reducing usage to 99mg/kg by 2020, but it will require continued and consistent actions from veterinary surgeons and producers. The 2017 usage data shows great progress by the industry but it is likely that most of the easy wins have been secured. We will need to tackle specific concerns on-farm as well as industry-wide issues.

This includes tackling endemic diseases within the UK pig herd. Many of the major endemic diseases are viral, thus antibiotics have no effect on them. However, some such as Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) are immunosuppressive and are known to exacerbate bacterial disease thereby requiring antibiotic treatment. Currently the pig industry is working with all branches of the sector to identify possibilities to reduce such viral diseases and thereby reduce the need for antibiotics.

Target
Highest Priority Critically Important Antibiotic (HP-CIA) use will not rise above 0.1mg/kg for fluoroquinolones and 0.015mg/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 was 0.1mg/kg in 2017. Fluoroquinolone use was 0.07mg/kg; 3rd/4th generation cephalosporin use was 0.01mg/kg; colistin use was 0.01mg/kg.

Use of HP-CIAs as a whole – 3rd/4th generation cephalosporins, fluoroquinolones and colistin – fell from 0.98mg/kg in 2015 to 0.1mg/kg in 2017. HP-CIAs represented just 0.08% of total antibiotic use in 2017.

Data collection

Antibiotic data submitted to the pioneering electronic Medicines Book for pigs (eMB-Pigs), which now has a benchmarking facility, covered 87% of pigs slaughtered in the UK in 2017. Red Tractor Pig Standards require the submission of data to eMB every quarter, which helps drive responsible use of antibiotics in pig production.

Industry initiatives

Pig Industry Antibiotic Stewardship Programme

Launched by the National Pig Association (NPA) in 2016, this set out the ways in which the pig sector planned to reduce, refine and replace antibiotic use. A progress report published in July 2018²⁵ outlines the detailed activities ongoing in the pig sector around antimicrobial stewardship and disease control.

The Pig Health Scheme

The Pig Health Scheme, successor to the British Pig Health Scheme (BPHS), was launched by AHDB in 2018. Through the scheme, producers can get information on diseases they may not be aware of, or may have accepted as ‘liveable with’ on their units.

²⁵NPA Pig Industry Antibiotic Stewardship Programme <http://www.npa-uk.org.uk/hres/NPA%20Pig%20Industry%20Stewardship%20Programme%20July%202018>



The scheme is free of charge and easy to sign up to, so producers can quickly start to see the benefit. Pigs are assessed at slaughter by trained veterinary assessors, looking at 12 different conditions in the lungs, heart, liver, tail and skin. Producers will receive a report on pigs from their unit that have been sent to slaughter, which can then be discussed with the farm's veterinary surgeon. Pig producers can join the Pig Health Scheme through their Pig Hub account, using the same log-in details as for the eAML2 system, at www.pighub.org.uk.

Training

The new cross-sector Animal Medicines Best Practice (AMBP) training programme, launched by the National Office of Animal Health (NOAH) at the House of Commons in July 2018, contains a module on pigs. See Appendix 1 for more details.

There are many other ongoing initiatives within the pig industry to extend education in effective disease control strategies. The enormous awareness-raising activity of the issue of antimicrobial resistance is supporting the uptake of these.

Biosecurity and disease control

There is significant cross industry collaboration with farmers and veterinary surgeons working together to improve biosecurity and disease control on farms to raise the overall health status of the national pig herd. The feed industry is also supporting the drive, working with producers to ensure optimum nutrition delivers benefits to pig health at the different stages of production.

Diseases and organisms change with time and with geography; the sector must not be complacent thinking it has solved disease issues as there will always be a new disease around the corner. Biosecurity, both to keep disease out of a pig unit and reduce disease spread within a unit, is key to a healthy herd. While this is widely known, lapses are not uncommon and a real effort needs to be made to tighten up across the industry.

However, alternatives to antibiotics should also be sought. Vaccines are a good tool but do not provide a silver bullet. Alternatives must be robustly tested using appropriate methods with novel technologies encouraged. Innovation in this area now will be key to ensuring antibiotic use remains low in the future.

Next actions

Improvements to biosecurity and the infrastructure of pig buildings is necessary to improve the overall health of pigs. Better use of diagnostics and surveillance data is needed to support decisions about treatment and management of disease, and collaboration between farmers and veterinary surgeons will be encouraged to facilitate better disease control. Finally, to ensure that pig welfare is maintained, continued monitoring of indicators is vital to notify any changes to treatment regimes. This protection is of utmost importance.

Prompt veterinary investigation of disease outbreaks is important to guide appropriate treatment. This involves necessary laboratory testing, particularly where outbreaks are more severe or persistent. There are two main areas requiring investment in the application of technology. Firstly, the development of faster, accurate and cheap diagnostic tools to help avoid antibiotic usage in cases where the disease is not caused by a bacterial infection but is not easily distinguishable on clinical signs alone. Secondly, further development in the use of early warning systems to help identify unwell pigs early in the course of disease for early intervention and treatment.

The potential of machine learning providing predictive analytics could possibly play an important role in helping farmers and veterinary surgeons choose between treating a problem with antibiotics and opting for an alternative in the future.



Poultry meat sector.....

Overview

The poultry meat sector became the first UK livestock sector to pioneer a data collection mechanism and share antibiotic usage data with the VMD. Since 2011 it has led the way in improving understanding of its use of antibiotics and sharing of best practice on responsible use of antibiotics with other livestock sectors in the UK and across the world.

By using antibiotics responsibly and sharing learnings and success stories, British Poultry Council (BPC) members, who represent 90% of UK poultry meat production, openly communicate their actions and share best practice in a precompetitive way. As detailed in its 2018 report²⁶, the British poultry meat sector's focus on excellence in bird health and welfare has helped achieve:

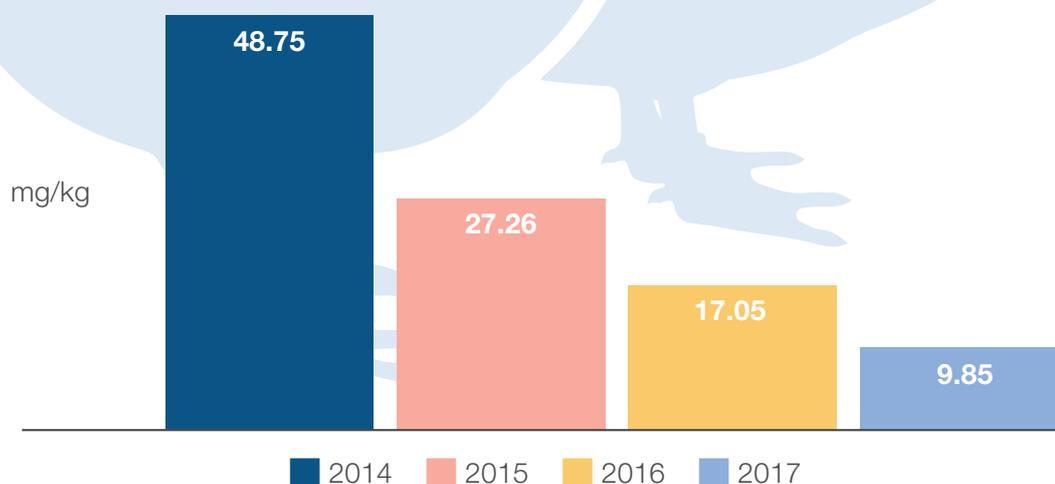
- 82% reduction in the total use of antibiotics in the last six years (2012-2017)
- 91% reduction in the use of fluoroquinolones (HP-CIA) in the last six years (2012-2017)
- 39.36% reduction in the total use of antibiotics in the last year (2016-2017)

In 2017, the UK poultry meat sector's antibiotic use was under the target set for both chickens (25mg/kg) and turkeys (50mg/kg), and comprised 9.72% of the total antibiotics licensed for use in food producing animals, as compared to 21% in 2012.

Antibiotic use in poultry meat

Target
Antibiotic usage in chicken meat sector of 25mg/kg, 2018-2020
Latest progress
The sector was within this target, using 9.85mg/kg in 2017.

Figure 7: Antibiotics used in chickens (source: BPC 2018)

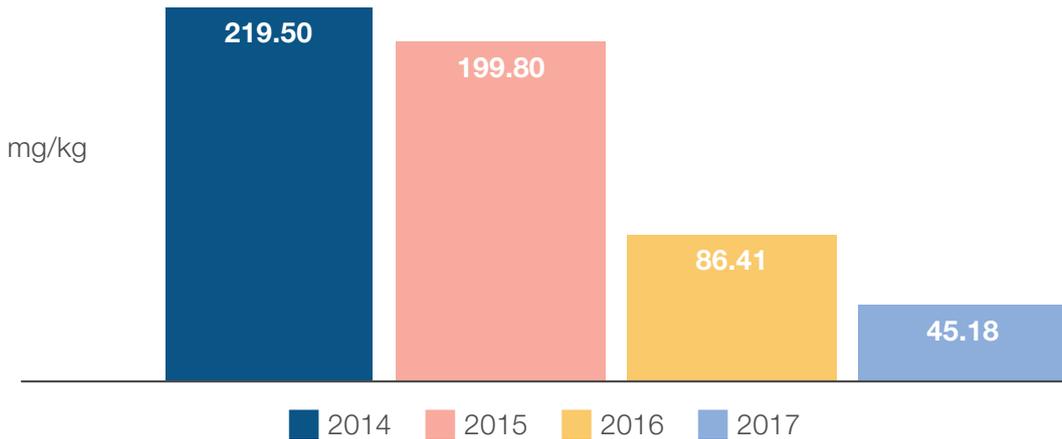


²⁶BPC Antibiotic Stewardship Report <https://www.britishpoultry.org.uk/bpc-antibiotic-stewardship-report-2018/>



Target
Antibiotic usage in turkey sector of 50mg/kg, 2018-2020
Latest progress
The sector was within this target, using 45.18mg/kg in 2017.

Figure 8: Antibiotics used in turkeys (source: BPC 2018)



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 United Nations on Antimicrobial Resistance.

The British poultry meat sector is also committed to supporting scientific research into examining the link between antibiotic use and resistance in the poultry production chain, understanding patterns of transmission, and tackling antimicrobial resistance.

It wants to use the diagnostic and sensitivity testing tools used in human medicine to better map bird health and welfare, evaluate the impact of disease control programmes and implement robust surveillance. 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 and ensure early diagnosis.

The British poultry meat sector is also committed to exploring alternatives to antibiotics.



Sheep sector

Overview

The sheep industry is made up of a high number of small separate farms, each of which uses local general veterinary practices. This presents a wide and diverse population of veterinary surgeons and farmers to be reached with messages.

Under the leadership of the Sheep Target Task Force, a sub group of Sheep Health and Welfare Group (SHAWG), including Agriculture and Horticulture Development Board (AHDB), National Sheep Association (NSA), National Farmers Union (NFU) and Sheep Veterinary Society (SVS), have met regularly to ensure that timely, co-ordinated messages reach the sheep industry and that activity against these targets is recorded.

This group and the sector as a whole has undertaken a wide number of activities over the past year aimed at delivering the targets and focusing specifically on the 'hotspot' areas. Despite this, capturing data to measure progress remains work-in-progress.

Antibiotic use in sheep

Target

Monitor national sector antibiotic usage levels, aiming for a 10% reduction, and reduce the use of highest-priority antibiotics by 50%.

Latest progress

Data collection remains a challenge but a follow-up study of sheep-only farms is due in 2019.

The study of 207 sheep-only farms²⁷ by University of Nottingham included in the Targets Task Force report last year indicated that mean antibiotic use on these farms was 11.4mg/kg (median 5.6mg/kg) in 2015/16. Further work (with funding from MSD Animal Health) will be used to check progress against targets on equivalent farms with publication due by 2019.

²⁷Quantitative analysis of antibiotic usage in British sheep flocks. Davies, P. et al (2017). Veterinary Record



Data collection

Target
Coordinate collation of antibiotic usage data.
Latest progress
Data collection efforts are ongoing; a calculator tool for quantifying antibiotic use on farm is now available to veterinary surgeons and farmers.

There is an on-going challenge to obtain robust and representative data from the large number of small producers within the sheep industry.

A calculator tool²⁸, produced by University of Nottingham and AHDB, is being used by veterinary surgeons and some processors for collating usage across farms, but currently there is no mechanism for central collation of this usage data. A requirement for an electronic medicine book for sheep (eMB-Sheep) will be evaluated once the pilot for cattle has reported (see Cattle section).

Reduce disease ‘hotspots’

Target
Reduce lameness, measured by an increase in foot rot vaccine sales of 5% per year over the next five years.
Latest progress
Although sales of foot rot vaccines increased in 2017, this has not been sustained through 2018.

Sales data on the vaccine for foot rot²⁹ are being tracked as a proxy for this target. Knowledge exchange 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.

Target
Reduce abortion, measured by an increase in vaccine sales by 5% per year over the next five years.
Latest progress
While sales of enzootic abortion vaccines increased significantly in 2017, this has not been sustained through 2018.

²⁸Sheep Veterinary Society <https://www.sheepvetsoc.org.uk/technical/amu-calculator-sheep>

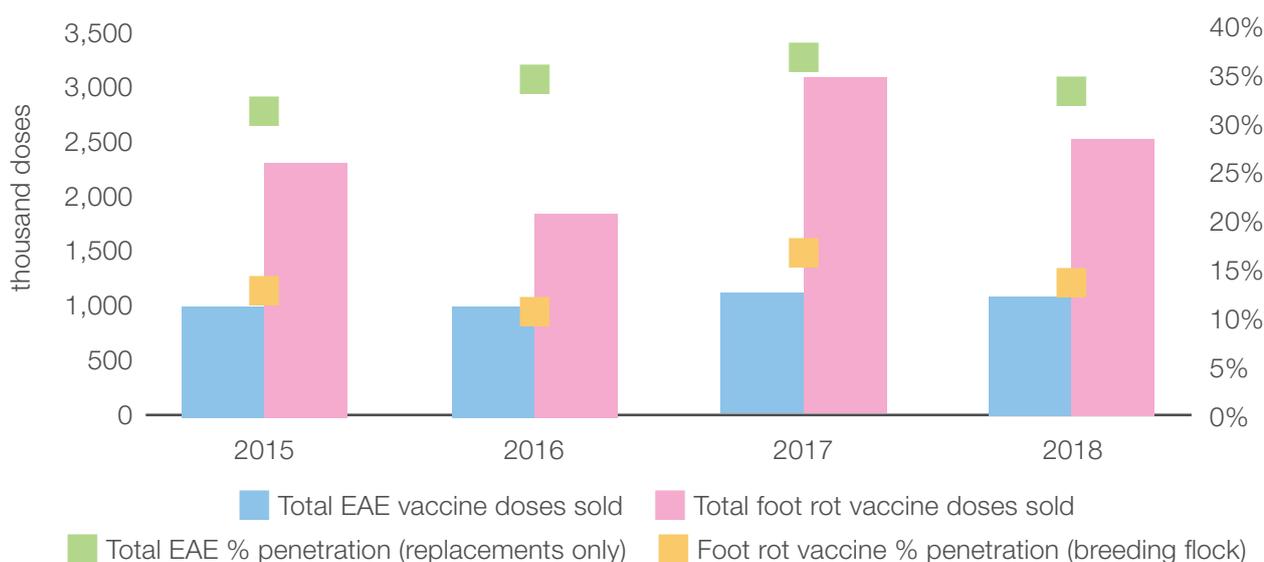
²⁹Data from MSD Animal Health. Annual figures ending in August with penetration rates calculated as total doses sold compared to ‘Breeding flock 1 year and over’ in previous year (DEFRA). Assumption that 80% ewes have one dose, 15% have two doses, 5% have three doses.



Sales data on vaccines to control enzootic abortion (EAE)³⁰ are being tracked. A knowledge exchange campaign was coordinated by AHDB on vaccination for abortion control in the autumns of 2017 and 2018³¹, alongside the RUMA #VaccinesWork campaign (See Appendix 1). Work on diagnosing abortion in spring 2019 is planned to ensure appropriate preventative and treatment is used.

Vaccines sales data^{29,30} are available up to August 2018 and it is disappointing to see that the apparent increase in sales of both foot rot and enzootic abortion vaccines have not been sustained through 2018. This may be due to supply issues faced by the manufacturers of each of these vaccines.

Figure 9: Enzootic Abortion of Ewes and Foot Rot vaccine sales & penetration rates



Target

Reduce use in neonatal lambs, aiming to decrease sales by 10% each year over the next five years.

Latest progress

Sales of oral antibiotics licensed for neonatal lambs decreased considerably between 2016 and 2017, and did not increase in 2018 despite exceptionally poor weather during lambing 2018.

Sales data on oral antibiotics licensed for use in neonatal lambs are being tracked³². Members of SHAWG were heavily involved in the RUMA coordinated campaign #ColostrumIsGold (See Appendix 1), which played an important part in communication, particularly aimed at both reducing the number of cases of neonatal lamb diseases such as watery mouth and joint ill, as well as routine use of antibiotics. Communications about antibiotic prophylaxis at lambing time have also been published in leading veterinary journals and the farming media.

³⁰Data from MSD Animal Health. Annual figures ending in August with penetration rate calculated as total doses compared to estimated replacement ewes (17.5% of 'Lambs under one year' in previous year (DEFRA))

³¹Farmers Weekly report <https://www.fwi.co.uk/livestock/sheep/how-a-farmer-cut-antibiotics-and-the-cost-of-sheep-abortion>

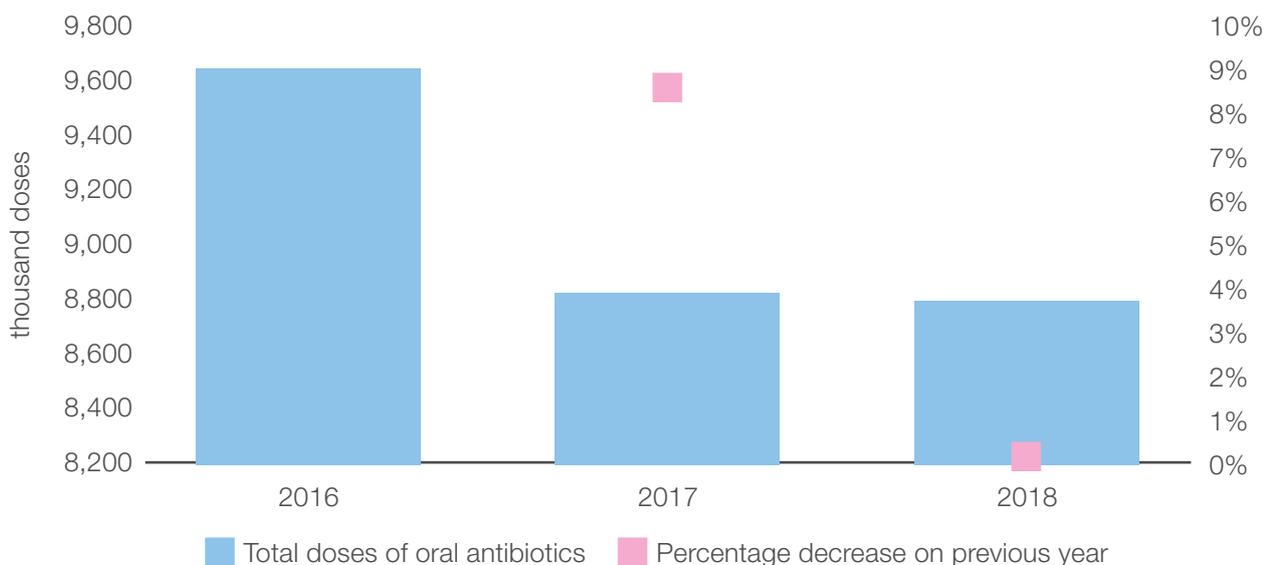
³²Kynotec data supplied and collated via contacts at MSD Animal Health, Ceva & Zoetis



Levy board knowledge exchange activity has included the importance of appropriate ewe body condition score and nutrition in both pregnant and lactating ewes.

Preliminary industry data³² has suggested that sales of the oral antibiotics licensed to be used in neonatal lambs decreased considerably between 2016 and 2017 and did not increase through 2018, despite the weather at lambing time 2018 presenting huge challenges across the whole of the UK.

Figure 10: Total doses of lamb oral antibiotics sold in the UK



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 Sheep Veterinary Society Good Practice Guidelines³³ (developed in 2017) were communicated to the industry through 2018 via articles and presentations. Case studies were made available to RUMA campaigns for the hotspots of neonatal disease, abortion and lameness. Regular communications between SHAWG, AHDB, NSA and SVS has ensured all audiences are targeted.

In June 2018, the sheep industry was short-listed for an Antibiotic Guardian³⁴ award in the Community Communications category. This recognised the achievements of the industry in communicating with the large and diverse community of sheep farmers and their veterinary surgeons, animal health product manufacturers and suppliers, as well as processors and retailers.

Social media, veterinary-led farmer meetings and online tools have also been used to promote appropriate preventative flock health care and responsible use of antibiotics in the hotspot areas, controlling lameness, abortion and neonatal diseases.

³³Sheep Veterinary Society <https://www.sheepvetsoc.org.uk/news/svs-good-practice-guidelines-2017>

³⁴Antibiotic Guardian Awards 2018 <https://antibioticguardian.com/awards-2018-winners-and-highly-commended/>



An online campaign, #PlanPreventProtect, has been used across each hotspot area. Sheep farmers are encouraged to plan ahead to prevent disease occurring e.g. with good hygiene and environmental conditions, and protect animals e.g. through vaccination or adequate colostrum intake.

Three webinars, delivered by AHDB and Flock Health Ltd, have been run on the #PlanPreventProtect theme and with specific reference to each of the identified 'hotspots'. These were directed at both veterinary surgeons and farmers with between 201 and 382 delegates registering for each webinar. The presentations have subsequently been shared via social media as well as made available for veterinary surgeons to use within their own Flock Health Clubs (see below).

The sheep group has worked with NOAH in its launch of the Animal Medicines Best Practice (AMBP) programme with training modules on the responsible use of antibiotics for farmers (see Appendix 1). There are also encouraging examples of improving relationships between sheep farmers and their veterinary surgeons, such as:

- SWISH³⁵ – A south west regional sheep veterinary group is encouraging farmer/ veterinary surgeon relationships through providing a unified voice on sheep veterinary topics. In August 2018 over 200 farmers attended a SWISH event where there were specific sessions on responsible use of medicines. There are plans to set up further regional groups in the UK.
- Flock Health Clubs³⁶ – sheep farmer discussion or business groups, being set up by sheep veterinary surgeons in practices throughout the UK. A survey in the summer 2017 indicated that there were 56 UK vets running a Flock Health Club and a further 34 veterinary surgeons intended setting one up. These clubs aim to spread the cost of veterinary surgeon involvement for individual farmers and encourage application of good practice by peer-to-peer learning. The impact of the clubs is currently being independently evaluated by a collaborative research group, iSAGE³⁷, funded by the European Union.

Next actions

AHDB will assess the feasibility of a sheep e-Medicine Book (eMB-Sheep) once the results of the eMB-Cattle pilot have been analysed. This would integrate with the proposed new Livestock Information Service³⁸. Responsible medicine use will be a leading topic at the Sheep Health and Welfare Group Conference³⁹ as well as the Sheep Veterinary Society contribution to the London Vet Show in November 2018.

Regular meetings of key personnel, organised by SHAWG, aim to ensure all veterinary surgeons and sheep farmers continue to work together to promote responsible antibiotic use in each of the hotspot areas through 2019.

³⁵South West Initiative for Sheep Health http://www.vetedit.com/clientFiles/newsletters/SWISHBulletin01Feb17_20239_131322361484625000.pdf

³⁶Flock Health Clubs <http://www.flockhealth.co.uk/Flock-Health-Clubs>

³⁷Innovation for Sustainable Sheep and Goat Production in Europe www.isage.eu

³⁸Livestock Information Service announcement, Defra <https://www.gov.uk/government/news/new-livestock-service-champions-farm-to-fork-traceability>

³⁹SHAWG Conference 2018 <http://beefandlamb.ahdb.org.uk/returns/health-and-welfare/shawg-conference-news/>

Appendices

Appendix 1 Cross-sector campaigns and training initiatives

#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.

#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. At time of compiling this 'One Year On' report, the campaign is not yet concluded but the cattle and sheep vaccination report due to be released from AHDB in November will support the messages and provide a basis for leveraging the campaign in 2019.

Animal **Medicines** **Best Practice**

The Animal Medicines Best Practice (AMBP) programme was developed by NOAH in partnership with stakeholders along the food supply chain to improve co-ordination and consistency in approach to the responsible use of medicines. The training programme gives farmers and veterinary surgeons access to new resources, enabling a coordinated and consistent approach to farmer training in the responsible use of antibiotics. Training modules are available for farmers to access via the NOAH website or directly through an online Lantra eLearning platform. In addition to the direct farmer offering, veterinary surgeons are now able to access resource materials, enabling them to deliver training to their clients. Training modules have been developed for dairy, beef, sheep and pig enterprises. More information at www.noah.co.uk/farmer-training/

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

Category	Risk to Public Health	Antimicrobials Included	Advice on use
Authorised CIAs			
1	Low/limited risk to public health	Narrow spectrum Penicillins, Macrolides, Tetracyclines	General principles of responsible use to be applied
2	Higher risk to public health	Fluoroquinolones, 3rd/4th generation Cephalosporins, Colistin	Restricted to use where there are no alternatives or response to alternatives expected to be poor

Appendix 3 The Targets Task Force

Beef

Hugh Broom, Surrey beef farmer and NFU Livestock Board member

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

Dairy

Di Wastenage, Devon dairy farmer and Royal Association of British Dairy Farmers Council member

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

Laying hens

Richard Kempsey, Technical Director of Stonegate.

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

Mark White, Senior Vice-President of the Pig Veterinary Society and Chairman of PVS Medicines Sub-committee

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

Dr 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
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	The electronic Medicine Book, designed by AHDB to electronically collate antibiotic usage data from the UK pig sector.
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/ PRRSV	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
Red Tractor	A food assurance scheme which covers production standards on safety, hygiene, animal welfare and environment.
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 and sales surveillance.
VMD	Veterinary Medicines Directorate
WHO	World Health Organisation

Appendix 5 Summary of progress against targets

Cattle

TARGET Monitor national antibiotic usage levels in beef cattle annually

Progress Use in beef cattle: 19 mg/kg in 2017 (no baseline; limited dataset)

TARGET Reduce antibiotic use in dairy cattle

Progress In 2017: Intra-mammary tubes (dry cow): 8% reduction; Intra-mammary tubes (lactating cow): 1% increase; Total usage in dairy cows: 29% reduction (limited dataset)

TARGET Increase sealant tube use in dairy cattle

Progress Data not yet available, due 2019

TARGET Halve HP-CIA use

Progress In 2017: Injectable HP-CIA use in cattle herds: 21% reduction; HP-CIA use in cattle: 0.3 mg/kg in 2017 (no baseline, limited dataset); HP-CIA intra-mammary use in dairy cattle: 33% reduction

TARGET Monitor use of cattle vaccines

Progress Baseline data on cattle vaccination 2011-2017 now collated and a full report was published November 2018

TARGET Monitor national beef and dairy herd health and welfare metrics

Progress The biennial CHAWG report will provide data

TARGET Farm level benchmarking of antibiotic use

Progress Farm-level benchmarking and an eMB-Cattle service is being piloted

TARGET Promotion of training at farm and veterinary surgeon level

Progress A key overarching training programme has been developed 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 24% 2017 to 2018

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

Progress Use of fluoroquinolones fell in 2017 but rose again in 2018

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

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

Progress No HP-CIAs were used in 2017

Fish

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

Progress The trout sector captured 70% and the salmon sector 100% of 2017 usage

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

Progress The trout sector recorded use of 19mg/kg in 2017

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

Progress The salmon sector recorded use of 17.2mg/kg in 2017

TARGET No HP-CIAs 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 2017; 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 263.5mg/PCU use in 2015 to 99mg/PCU use by 2020; 128mg/PCU in 2017

Progress Overall antibiotic usage in pigs halved in two years to reach 131mg/kg in 2017

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

Progress Use of the HP-CIAs as a whole was 0.1mg/kg in 2017

Poultry meat

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

Progress The sector was within this target, using 9.85mg/kg in 2017

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

Progress The sector was within this target, using 45.18mg/kg in 2017

Sheep

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

Progress Data collection remains a challenge but a follow-up study of sheep farms is due 2019

TARGET Coordinate collation of antibiotic usage data

Progress A calculator tool for quantifying antibiotic use on farm is now available

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

Progress Sales of foot rot vaccines increased in 2017, but this was not sustained through 2018

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

Progress Sales increased significantly in 2017, this has not been sustained through 2018

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

Progress Sales of oral antibiotics licensed for neonatal lambs decreased considerably 2016 to 2017, and did not increase in 2018 despite exceptionally poor weather during lambing 2018

TARGET Deliver a plan to tackle veterinary surgeon and farmer behaviour

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

Note: While many targets were expressed as mg/PCU in the original report, mg/kg has been used in this update and should be assumed to be equivalent to mg/PCU, where a standardised Population Correction Unit (PCU) has been calculated for that species. This is in line with changes to how the Veterinary Medicine Directorate (VMD) reported its annual Veterinary Antimicrobial Resistance and Sales Surveillance (VARSS) figures for 2017. More information on the PCU calculation and standardised weights at time of treatment is available by going to www.gov.uk and searching 'PCU'.

RESPONSIBLE USE OF MEDICINES IN AGRICULTURE ALLIANCE

ruma

Published 16 November 2018

www.ruma.org.uk

www.farmantibiotics.org