RESEARCH BRIEF

# Towards improved surveillance of antimicrobial and anthelmintic usage (AMHU) in beef cattle and sheep in Great Britain

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## Background and context

Antimicrobial and anthelmintic usage (AMHU) in livestock production has increased over the last 50+ years. Microbial and helminthic exposure to such drugs is understood to have contributed to increased resistance to treatment, causing significant economic impact in the human and animal health sectors.

A recent systematic review[1] of usage and resistance to antimicrobials and anthelmintics on beef and sheep farms in Great Britain identified:

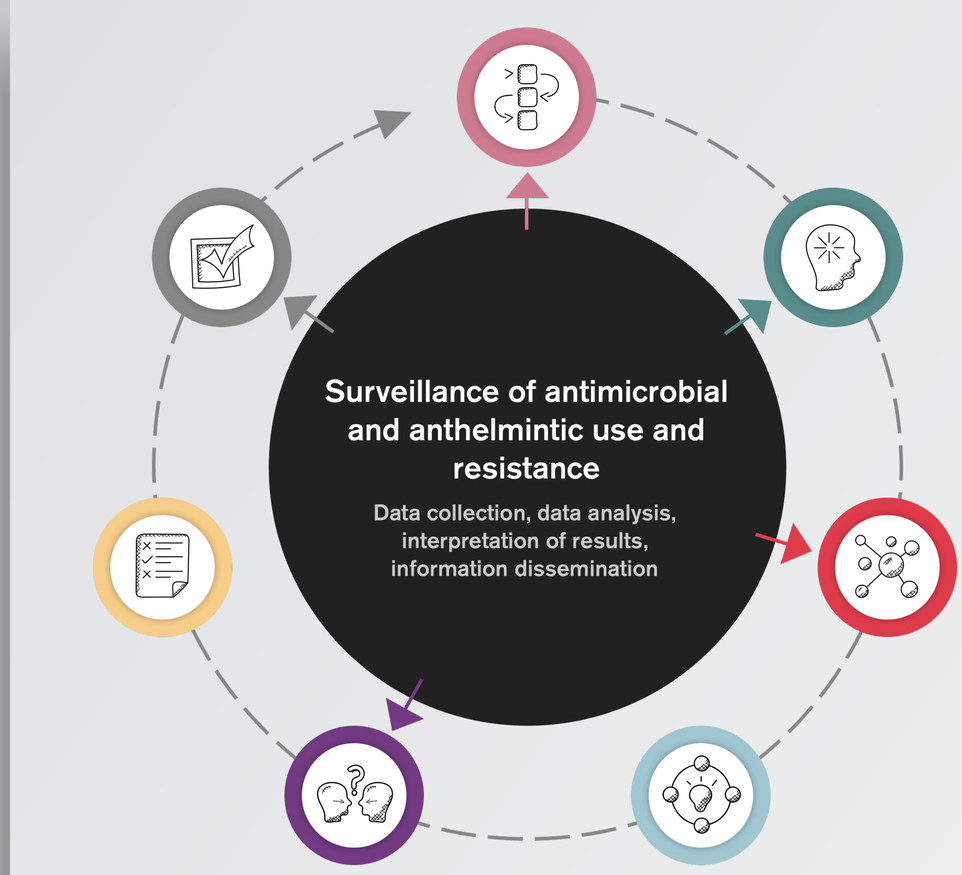
> A lack of data on use of antimicrobials (AM) and anthelmintics (AH)

> A lack of standardised metrics

> High levels of antibiotic resistance to commonly used antibiotics

## Antimicrobial and anthelmintic usage surveillance

Surveillance of AMHU is an important part of a mitigation-policy cycle for antimicrobial and anthelmintic resistance (AMHR). It is used to guide decisions on treatment, identify populations at risk, understand the epidemiology of AMHR and inform the development and evaluation of strategies and interventions. The value of surveillance is realised when the information it produces is used to make decisions (see diagram).




Häsler B, based on Aenishaenslin et al, 2021 (doi: 10.3389/fvets.2021.611931)

**While a substantial amount of information and knowledge exists on antimicrobials, knowledge on anthelmintic usage and resistance epidemiology is lagging behind.**

## Aim and method

We conducted two workshops and held interviews with 26 stakeholders implicated in AMHU surveillance in GB. Using PESTLE – Political, Economic, Sociological, Technological, Legal and Environmental factors – analysis, we explored potential barriers and incentives towards enhancing AMHU surveillance in beef cattle and sheep sub-sectors. Key findings and recommendations that emerged during these discussions are summarised below.

## The current AMHU surveillance landscape in beef cattle and sheep sub-sectors in GB

| ANTIMICROBIALS | ANTHELMINTICS |
|---|---|
| **AMHU information generation** | |
| Sales data on antimicrobials (AM) a statutory requirement for food-producing animals since 2005 [2]<br>Medicine recording in food-producing animals is a legal requirement[3]<br>Standardised metrics of measurement of AM consumption for national surveillance: mg/Population Correction Unit (PCU)[4] | No anthelmintic usage (AHU) sales data from the pharmaceutical industry, or sub-sector specific AHU data captured/reported for national surveillance |

**The current AMHU surveillance landscape in beef cattle and sheep sub-sectors in GB** (continued)

| ANTIMICROBIALS | ANTHELMINTICS |
|---|---|
| **AMHU information generation** (continued)<br><br>Standardised metrics for farm-level benchmarking published by Cattle Health and Welfare Group (CHAWG)[5] and Sheep Health and Welfare Group (SHAWG)[6]: total mg/kg of beef or sheep weight over an annual period of recording<br><br>Beef antimicrobial usage (AMU) data from veterinary practices using VetImpress software is cleaned and reported to the Veterinary Medicines Directorate (VMD) by FarmVet Systems and is currently the sole provider of beef specific AMU data for national surveillance. This provides coverage for only 9.6% of all slaughtered GB beef[7]<br><br>No sheep specific AMU data reported for national surveillance<br><br>2021: New Medicine Hub for cattle and sheep sub-sectors launched by the Agriculture and Horticulture Development Board (AHDB) | No agreed standardised metrics for anthelmintic usage (AHU) thus far |
| **AMHR information generation**<br><br>Harmonised monitoring of antimicrobial resistance (AMR) from healthy food-producing animals and products at retail mandated by the EU commission since 2013<br><br>Clinical surveillance of AMR from voluntary submission of carcases or other diagnostic samples submitted by private veterinary surgeons to the government veterinary laboratories<br><br>European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) project collects information on how AMs are used in animals in the EU. Identification of risk factors for the development and spread of AMR in animals. | No national anthelmintic resistance (AHR) surveillance system in place |
| **Information dissemination, sharing and generation of knowledge**<br><br>UK-VARSS reports<br>• Sales data on AMU<br>• Sub-sector-specific AMU data<br><br>Responsible Use of Medicines in Agriculture Alliance (RUMA) Targets Task Force reports publish sub-sector specific AMU data contextualised to the targets they have set for the individual sub-sectors | None thus far for AHU |
| **Use of knowledge to define targets and implement strategies for AMHU**<br><br>Informing the UK AMR National Action Plan for optimising AMU in agriculture<br><br>National level AMU benchmarking<br><br>Used by RUMA and the Targets Task Force in setting their AMU targets for the different sub-sectors<br><br>Used by non-governmental organisations, industry bodies and research institutions to guide research activities and the forwarding of agendas towards responsible AMU<br><br>AMU for farm-level benchmarking and decision making | None thus far for AHU |

# Recommendations

## Part 1: AMHU information generation – data capture

| | |
|---|---|
| + Voluntary reporting | A voluntary approach without imposing firmer legal requirements to report data into a central repository such as the new Medicine Hub (established by AHDB) should be given time to prove effective in its acceptability and uptake before firmer legal requirements are considered. Voluntary mechanisms were deemed to be effective and more respectful of the farming community, which is often lacking agency in the system. |
| + Continue to use a central repository | Workshop participants welcomed the Medicine Hub and were supportive of its use. Veterinarians are very well placed to promote the Medicine Hub to their farm clients to encourage uptake and communicate the benefits of its usage to farmers, predominantly in its usefulness for farm-level benchmarking. |
| + Use financial incentives to increase reporting | The proposed Animal Health and Welfare Pathway (or alternative outcome-based payment schemes) could require reporting AMU for payments if an acceptable and feasible mechanism can be identified in participation with farmers and other stakeholders. For successful implementation of the Pathway, there should be sufficient economic incentive to join although penalties should not apply in cases of high AMU where the use is justified. Reporting of AMU data could be a requirement for payment through requiring direct engagement with the Medicine Hub for cattle and sheep. |
| + Use accreditation schemes to increase reporting | Accreditation schemes could also require reporting AMHU, into a central repository such as the Medicine Hub, comparable to Red Tractor Farm Assurance and the electronic Medicines Book for pigs. |
| + Cooperation and coordination | Agreement between accreditation providers to include reporting as a standard across all providers should be encouraged as it would likely have the most beneficial impact on AMU surveillance coverage, reducing pushback from the sectors and eliminating the risk of farmers choosing alternative schemes. Agreements would have to be made between AHDB and the providers of accreditation in order for accreditors to access their licensee's data. |
| + Co-design should continue | Farmers were positive about their involvement in programmes developed by DEFRA and AHDB. For effective implementation of strategies to improve AMHU data capture, co-design with farmer involvement should continue. |
| + Transparency of farm data usage for voluntary reporting | Farmers may be disincentivised to report their data, including to the Medicine Hub, for fears of scrutiny and penalisation over their AMU. This can be counteracted by implementing mechanisms that ensure full transparency for farmers on how, and for whom, their medicine data is used. |
| + Standardise sales and usage | Veterinary practice management and farm management software providers should be encouraged to standardise medicine sales and usage recording which is easily shared with the Medicine Hub for cattle and sheep and allows species differentiation. This would ideally be complemented by veterinary practices having separate species accounts. |
| + Flexibility in recording AMHU | The requirement for farmers to record their AMHU data in a particular format may impose a barrier towards its accurate capture. Farmers should be able to record their data in ways that are efficient and comfortable for them. New methods or algorithms for converting data into formats compatible for national surveillance could standardise data output rather than data input. However, data recording in the form of free text should be discouraged due to the difficulty of its conversion into compatible data.[8] |
| + Alternative strategies for scarce veterinary coverage | In regions of GB where access to specialist livestock veterinarians is reduced, alternative strategies need to be investigated further to encourage uptake of data reporting if a voluntary system continues. |

+ Include agro-pharmaceutical data

Sales data from the pharmaceutical industry and agro-suppliers and other non-veterinary suppliers of anthelmintics are a prospective source of AHU data, as they are a major seller in the system and should be considered as enablers in AHU surveillance. Making the reporting of AHU data from non-veterinary suppliers a compulsory activity should be considered, comparable to the reporting of prescription data by pharmacies in EU member states.

+ Fill gaps in anthelmintic usage

Before a formal AHU surveillance component is designed, gaps in knowledge in AHU and AHR need to be addressed in order to understand the needs and benefits of AHU surveillance. Further research into AHU and AHR (including the environmental implications) and improved feedback mechanisms to communicate AHR back to farmers are required in order to generate evidence for the purpose of AHU surveillance and how the information will be used in the AHR mitigation-policy cycle.

## Part 2: Use of knowledge to generate targets

+ Realistic expectations

Feasible targets enable accurate representation of the national beef and sheep herd/flock and provide confidence in national statistics and observed trends over time. It will take time for beef and sheep AMU surveillance to reach that achieved in poultry, pigs, aquaculture, and gamebirds.

+ Continue linking data

Efforts should continue towards linking of existing databases into a central repository with effective governance structures that regulate data ownership and accessibility and help to increase data generation for surveillance and to prevent farmers needing to duplicate data entry.

+ Capture different types of data

National AMHU surveillance may benefit from capturing health, welfare, and geo-temporal data to enhance the knowledge generated from AMHU data and make national surveillance information more relevant and useful to farmers, veterinarians and other stakeholders in the system.

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