Encouraging improved animal health and responsible medicines use through data collection and benchmarking within the UK beef industry

Jon Massey [1], Judith L. Capper[2], Rachel Adams [1], Lisa C. Morgans [1], David C. Barrett [1], Kristen K. Reyher [1]

[1] Bristol Veterinary School, University of Bristol, UK
[2]Livestock Sustainability Consultancy, UK

| Introduction

The responsible use of farm animal medicines - specifically antimicrobials (AMs) - is a key concern for all food system stakeholders. Various AM use (AMU) benchmarking metrics are already in use by UK livestock industries (Mills et al. 2018; e.g. mg/kg, mg/population-corrected unit (PCU), average daily dose (ADD), etc.). The relevance, applicability and adoptability of each metric depends greatly on the quality of input data.

This project explored the availability and quality of medicines use data available on UK beef farms to support benchmarking, along with strategies for collection and reporting in practical and meaningful terms for promotion of responsible medicines use.

| Diversity of UK beef production

In contrast to other livestock industries, UK beef farms are uniquely heterogenous in terms of cattle breeds (size and weight), herd sizes, production systems and marketing strategies. This poses significant challenges for AMU benchmarking in terms of defining and measuring the population at risk of treatment, and of meaningful categorisation. Specifically, the weight, number, age range, growth rate, and length of time an animal stays on a holding can vary significantly between farms, or even within batches/groups of animals on a farm.

| Project Methodology

- Recruited convenience sample of 15 farms across 5 defined sectors (calf rearers, spring-calving suckler herds, autumn-calving suckler herds, store cattle finishers and intensive dairy-bred cattle finishers)
- On-farm interviews and questionnaires used to ascertain livestock demographics and key farm information regarding production system, animal health, medicines usage, and housing
- Collected medicines usage data from farms' supplying veterinarians and on-farm records

Medicine Book www.farmmatters.co.uk

Date		Record Count	
31/05/2017 - 01/06/2018		5294	

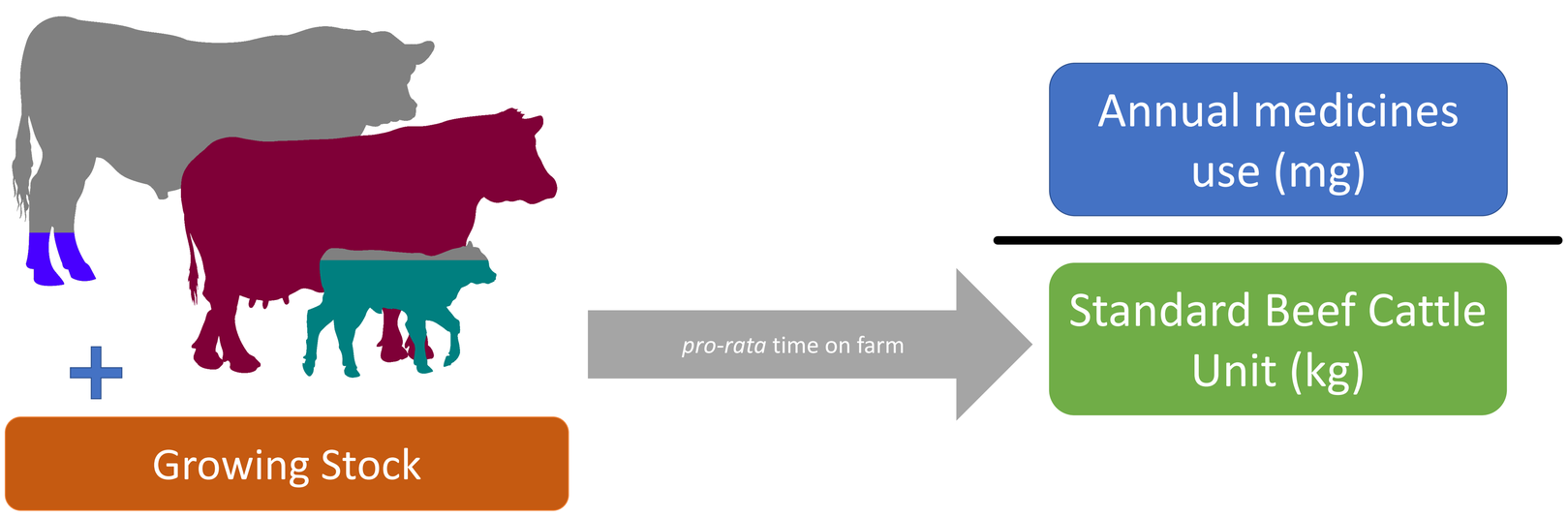
Date of treatment	Date treatment finished*	#	Identity of Animal/Group Treated	Medicine	Dose	Batch Number	Withdrawal		Name of person who adminstered the treatment	Reason for treatment
							Meat	Milk		
31/05/2017		1	UK341199701696	Metacam 20 mg/ml Solution for Injection for Cattle, Pigs and Horses	1.50ml	j21024E22	15/06/2017			PNEUMONIA
31/05/2017		1	UK341199701696	Zactran 150 mg/ml Solution for Injection for Cattle and Pigs	2.00ml	EY2047CE	03/08/2017			PNEUMONIA
31/05/2017		1	UK324214502892	Metacam 20 mg/ml Solution for Injection for Cattle, Pigs and Horses	1.50ml	j21024E22	15/06/2017			PNEUMONIA
31/05/2017		1	UK363395305834	Metacam 20 mg/ml Solution for Injection for Cattle, Pigs and Horses	1.50ml	j21024E22	15/06/2017			PNEUMONIA
31/05/2017		1	UK345244501342	Metacam 20 mg/ml Solution for Injection for Cattle, Pigs and Horses	1.50ml	j21024E22	15/06/2017			PNEUMONIA
31/05/2017		1	UK344089702583	Draxxin 100 mg/ml Solution for Injection for Cattle and Pigs	2.00ml	B103208	22/06/2017			PNEUMONIA
31/05/2017		1	UK344089702583	Metacam 20 mg/ml Solution for Injection for Cattle, Pigs and Horses	1.50ml	j21024E22	15/06/2017			PNEUMONIA
31/05/2017		1	UK322009401575	Metacam 20 mg/ml Solution for Injection for Cattle, Pigs and Horses	1.50ml	j21024E22	15/06/2017			PNEUMONIA
31/05/2017		1	UK322009101572	Metacam 20 mg/ml Solution for Injection for Cattle, Pigs and Horses	1.50ml	j21024E22	15/06/2017			PNEUMONIA
31/05/2017		1	UK322009401575	Zactran 150 mg/ml Solution for Injection for Cattle and Pigs	3.00ml	EY2047CE	03/08/2017			PNEUMONIA
31/05/2017		1	UK322009101572	Zactran 150 mg/ml Solution for Injection for Cattle and Pigs	3.00ml	EY2047CE	03/08/2017			PNEUMONIA
31/05/2017		1	UK344231702398	Metacam 20 mg/ml Solution for Injection for Cattle, Pigs and Horses	2.00ml	j21024E22	15/06/2017			PNEUMONIA
31/05/2017		1	UK351406101636	Metacam 20 mg/ml Solution for Injection for	2.00ml	j21024E22	15/06/2017			PNEUMONIA

- A mixture of manual and automated harmonisation and standardisation techniques were applied to produce a consistent dataset for analysis due to the presence of paper-based on-farm medicine records and a range of logical and technical data formats for veterinary and farm records.
- Study farm medicine records were compared with summary datasets from a large UK beef processor, a large veterinary software provider, and nationally reported figures to better understand the diversity of practices in medicines usage and the challenges these present to measuring and benchmarking efforts.
- A series of focus groups open to interested parties from all sectors and disciplines within the beef industry were also conducted. Broad-ranging discussions including attitudes to, practices within, regulation, measurement and benchmarking medicines use - in addition to strategies for classification and estimation of populations at risk of treatment - were analysed.

| Results

Given the effort required for small-scale data collection, the absence of consistent medicines usage recording in standardised formats presents a significant challenge for any attempt at population-scale collection.

Data analysis revealed difficulty in calculating a true mg/kg figure for medicines use across all sectors and therefore the need for suitable proxy measures. Assessment of the available data, informed by discussions with farmers, resulted in proposal of 2 draft benchmarking AMU metrics: mg per Standard Beef Cattle Unit (mg/SBCU) and % of animals treated (which could also be used for all medicines).



The mg/SBCU metric aims to estimate the population at risk of treatment by defining a standard suckler cow + calf + bull production unit mass alongside a set of growing/finishing animal weights and time duration categories.

Proposal of such a metric using standardised figures derived from national animal population data is a pragmatic approach making use of data readily available on most farms and which aligns with existing beef production key performance indicators.

The % of animals treated metric is designed to use data easily available on farms to stimulate conversations between farmers and veterinarians regarding animal health planning, preventive medicine and responsible medicine usage.

Proposed metrics are currently under broad industry consultation in order to develop a nationally-applicable set of standard metrics for benchmarking medicines use on UK beef farms. A publication with more detailed description of the project's undertakings and findings is in preparation.

Mills, H., Turner, A., Morgans, L., Massey, J., Schubert, H., Rees, G., Barrett D.C., Dowsey, A. & Reyher, K.K. Evaluation of metrics for benchmarking antimicrobial use in the United Kingdom dairy industry. The Veterinary Record, (2018) ISSN 0042-4900 doi: 10.1136/vr.104701

Turner, A., Tisdall, D., Barrett, D.C., Wood, S., Dowsey, A. & Reyher, K.K. Ceasing the use of the highest priority critically important antimicrobials does not adversely affect production, health or welfare parameters in dairy cows. The Veterinary Record, (2018) ISSN 0042-4900 doi.org/10.1136/vr.104702

This work was in part funded by the Agriculture and Horticulture Development Board – Beef and Lamb