



Hyde, Robert and Green, Martin J. and Remnant, J.G. and Down, Peter and Huxley, J.N. and Davies, Peers and Hudson, Chris and Breen, James (2017) Tool to measure antimicrobial use on farms. *Veterinary Record*, 180 (7). p. 183. ISSN 2042-7670

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Tool to measure antimicrobial use on farms

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Antimicrobial use in livestock continues to be a prominent topic in mainstream media and pressure to improve monitoring and reduce antimicrobial use is increasing across the livestock sector. The Government's response to the O'Neill report stated that DEFRA has committed to a reduction in antibiotic use in livestock and fish farmed for food, to a multispecies average of 50mg/kg by 2018¹. There will be ongoing pressure to monitor and reduce antibiotic use at a farm and practice level.

A variety of methods of measuring antimicrobial usage exist, the most common being either the mg of antimicrobials used per kg of livestock (mg/PCU [Population corrected unit]), defined daily dose (DDDvet) or defined course dose (DCDvet). The last two methods are effectively an estimation of doses or courses of an antibiotic per animal². All methods have their limitations, for example mg/PCU may have the potential to encourage incomplete courses of antibiotics, or selection of antimicrobials simply based on a low mg/kg dose rate. DDDvet and DCDvet overcome some issues by assigning a standard dose/course rate across products and analysing how many doses or courses are prescribed per animal. However, DDDvet and DCDvet take no clear account of the actual amount (mg) of active agent used.

To assess differences between these methods and to conduct sensitivity analyses for different treatment approaches, we have developed a user-friendly antimicrobial use calculator for ruminants. The calculator is useful for full farm evaluations as well as to compare different treatment scenarios.

The calculator has already highlighted several interesting patterns at farm level, which, from feedback we have received, are not widely recognised:

1) The use of selective antibiotic dry cow therapy (DCT). This is often highlighted as a key method to reduce antimicrobial usage on farm but when analysed using mg/PCU, the reduction in antimicrobial usage is very modest (reducing antibiotic DCT by half would typically reduce antibiotic usage by around only 2mg/PCU). However when the same scenario is assessed using a DCDvet scale a reduction in the number of courses of antibiotics used is of course larger because four tubes of DCT represent one course. The method of measuring antimicrobial use clearly has a large impact on how farms are assessed and benchmarked, and also on areas to be the early targets for achieving reductions. Therefore, it is vital we use a common approach for measuring antimicrobial usage at local and regional levels.

2) Treatment of clinical mastitis: Reduction in lactating cow intramammary therapy usage provides a comparatively small reduction in mg/PCU (a reduction from treating every cow with a course of commonly used lactating tubes to zero would result in a herd reduction of around 2 mg/PCU). However, if injectable products are widely used to treat mastitis on-farm, a reduction of (for example) 30 bottles (100 ml) of an antimicrobial product would result in a typical difference of 10 to 15 mg/PCU. In general, injectable products have a large impact on herd usage when measured in mg/PCU.

3 The off-licence use of antibiotic footbaths: An extremely large mass of active ingredient may be used as a topical therapy for a large number of animals and this can result in huge increases in

usage. For example, 12 treatments of an antibiotic footbath per year would typically represent an increase of around 15 to 20 mg/PCU for a dairy herd.

Veterinarians in the farm animal industry are gatekeepers of antibiotic usage, and pressure will continue to mount rapidly at a farm, practice and national level to further reduce antibiotic use. Of course, the major route to reduction is through disease prevention using non-antimicrobial methods, a key role for veterinary surgeons.

A full version of the calculator will be made freely available in the near future, to register interest and to receive a copy, please email a request with your name and practice/business to svxrh1@exmail.nottingham.ac.uk.

References

¹(www.gov.uk/government/uploads/system/uploads/attachment_data/file/553471/Gov_response_AMR_Review.pdf)

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