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## Quantifying antimicrobial drug usage in calves from birth to 6 months of age on Irish suckler beef and dairy farms

B Earley, C G Todd, A Arguello, A Cappelleri, M McGee

*Irish Agriculture and Food Development Authority, Animal & Grassland Research and Innovation Centre, Teagasc, Grange, Dunsany, Co. Meath, Ireland*

bernadette.earley@teagasc.ie

**Application** Baseline data are now available on antimicrobial drug usage in calves on commercial farms in Ireland.

**Introduction** Concern about the use of antimicrobials in food producing animals is increasing. Our aim was to quantify antimicrobial drug usage in calves using health treatment records from Irish suckler beef and dairy farms.

**Material and methods** Health treatment records for calves born between July 1, 2014 and June 30, 2015 on 79 suckler beef and 44 dairy farms were analysed. Calves were followed from birth until 6 months of age. According to standard farm protocol, calves exhibiting clinical signs of any disease were identified and antimicrobial treatment was administered. Farmers recorded the following information for each treatment administered: calf identification, age at treatment, disease event, drug name, number of treatment days, and amount of drug administered. Summary of product characteristics (SPC) were retrieved from the Health Products Regulatory Authority and drugs were classified by active substance(s). Guidelines were recently published on technical units and appropriate indicators for quantification of antimicrobial usage (Collineau *et al.*, 2017). Defined daily dose for animals (DDDvet) and defined course dose for animals (DCDvet) were the technical units used to measure antimicrobial consumption. DDDvet represents the assumed average dose per kg animal per species per day. DCDvet represents the assumed average dose per kg animal per species per treatment course. Treatment incidence (TI) was the indicator used to quantify antimicrobial usage, and the calculations applied were:

$$TI_{DDDvet} = \frac{\text{total active substance administered}}{DDDvet \times \text{standard BW} \times \text{total calf-days}} \times 1000 \quad TI_{DCDvet} = \frac{\text{total active substance administered}}{DCDvet \times \text{standard BW} \times \text{total calf-days}} \times 1000$$

Total amount of active substance administered was determined from the health treatment records. DDDvet and DCDvet for cattle, as assigned by the European Medicines Agency, were used in the calculations. Standard body weight (BW) at treatment was 135 and 108 kg for suckler beef and dairy calves, respectively. Total number of calf-days at risk was determined using movement data from the Animal Identification and Movement central database.

**Results** In total, 3,204 suckler beef calves and 5,358 dairy calves, representing 540,953 and 579,997 calf-days at risk, respectively, were included in the study. A total of 1,770 antimicrobial treatments were administered to suckler beef (n = 841) and dairy calves (n = 929) between birth and 6 months of age. Antimicrobial drug usage is summarised for suckler beef and dairy calves in Table 1. There was large variation in  $TI_{DDDvet}$  and  $TI_{DCDvet}$  by farm.

**Table 1**  $TI_{DDDvet}$  (per 1,000 calf-days at risk) and  $TI_{DCDvet}$  (per 1,000 calf-days at risk) for the ten most frequently administered active substances to suckler beef and dairy calves from birth to 6 months of age

Suckler beef calves (n = 3,204)				Dairy calves (n = 5,358)					
Active substance	Route <sup>1</sup>	n <sup>2</sup>	$TI_{DDDvet}$	$TI_{DCDvet}$	Active substance	Route	n	$TI_{DDDvet}$	$TI_{DCDvet}$
Marbofloxacin	P	145	0.603	0.244	Florfenicol	P	159	0.482	0.157
Florfenicol	P	128	0.534	0.174	Enrofloxacin	P	106	0.748	0.196
Amoxicillin	P	110	0.831	0.238	Amoxicillin	O	100	0.085	0.021
Oxytetracycline	P	95	0.572	0.162	Marbofloxacin	P	74	0.180	0.073
Amoxicillin	O	81	0.100	0.025	Sulfadiazine, trimethoprim	O	59	0.106	0.022
Enrofloxacin	P	57	0.212	0.056	Neomycin	O	57	0.153	0.038
Neomycin	O	34	0.073	0.018	Oxytetracycline	P	56	0.556	0.157
Sulfadiazine, neomycin	O	32	0.076	0.015	Chlortetracycline	O	56	0.019	0.003
Sulfadoxine, trimethoprim	P	26	0.098	0.027	Sulfadimidine	O	54	0.279	0.066
Sulfadiazine, trimethoprim	P	24	0.081	0.029	Tetracycline	O	48	0.040	0.009

<sup>1</sup>Route of administration: parenteral (P) or oral (O); <sup>2</sup>number of treatments administered

**Conclusion** A range of injectable and oral antimicrobial products were administered to calves on suckler beef and dairy farms. Further research is investigating the risk factors associated with antimicrobial usage in calves on Irish farms.

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### Reference

Collineau, L., Belloc, C., Stärk, K.D.C., Hémonic, A., Postma, M., Dewulf, J. and Chauvin, C. 2017. Zoonoses and Public Health 64, 165-184.