

Veterinary Medical Writing

SECTION EDITOR



Louisa Marcombes
louisa@boudimedi.fr

Editorial

There have been countless columns written about “herd immunity” during and since the COVID-19 pandemic. But what does it take to write about a real-life herd? As in a herd of domestic cattle, sheep, llama or buffalo? Or even a flock of chickens, turkeys or geese? Would you be confident writing medical content for these production animal species? In this issue of Veterinary Medical Writing, large-animal-veterinarian-turned medical writer Rhona Fraser draws on her experience as a dairy practitioner in New

Zealand. In her article, Rhona highlights the aspects of production animal health that are different from those of human and companion animal practice that should be reflected in all medical communications based on these species. A perhaps unpalatable truth, however, is that production animal diseases must be considered for their economic impact as well as the individual’s well-being. In addition, there are essential additional regulatory aspects of food safety and animal welfare. Finally, the close association of, for example, cattle with their environment has always

been appreciated by large animal veterinarians in a way which has eluded their human- and companion-animal counterparts. One could say that they are the original One Health practitioners. After a brief hiatus, *From the Horses’ Mouth* returns for 2023. Featured in this issue is a report on the first data published from the RECOVER database, which suggests there is more to be learnt about the outcomes of cats and dogs for cardiopulmonary resuscitation. Also revealed are details of a gem of a One Health podcast.

Louisa Marcombes

Welly boots and spreadsheets: A rough guide to production animal medicine for medical writers

Rhona Fraser

Freelance Medical and Veterinary Writer
Matamata, New Zealand
rhona@medical-writing-solutions.com

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How does veterinary medical writing differ from human medical writing? Formulating an answer to this question is a core preoccupation of EMWA’s Veterinary Medical Writing – Special Interest Group. Companion animal medicine and human medicine may be inherently different. However, the fundamental principles of successful clinical case management are similar:¹ The focus is on the individual, whether the patient is human or veterinary. In contrast, we frame clinical production animal health, a term that refers to species such as cattle, sheep, swine, and poultry, in the context of the herd. Economic considerations, welfare concerns, environmental impacts, and additional regulatory requirements must all be considered alongside the health of the individual production animal. As a result, the role of the production animal veterinarian has evolved profoundly over the past few decades from the welly-wearing James Herriot stereotype to a position more reminiscent of the business consultant.² They still wear the wellies, but the modern dairy vet’s involvement on the farm goes beyond the clinical, with knowledge transfer and

consultancy at the fore and a proactive approach promoting disease prevention.³ Here, I have drawn on my own experience as a dairy veterinarian in New Zealand to highlight the unique aspects of production animal health that medical writers should be aware of. Although I focus on dairy practice in this article, many of the principles described here apply to global best practices in the beef, swine, lamb, and poultry industries.

The herd approach

Economic pressures, demographic shifts, technological innovations, and evolving regulatory frameworks have transformed the modern global dairy industry. Increasing milk production per cow and a limited supply of skilled workers heighten the need for establishing farm-specific protocols. Such systems minimise human error and ensure best practices are embedded at each dairy production site.⁴ Although regularly faced with the individual sick animal, this often indicates a more extensive underlying problem requiring a comprehensive review of husbandry practice at the herd level.⁵ As production diseases are multifactorial and often directly related to the production process, the dairy vet will analyse management aspects such as nutrition, the environment, and housing in parallel with clinical

Knowledge transfer may involve workshops and tutorials at the clinic or farm.

information. Monitoring and early diagnostic warning systems on farms – a micro version of disease surveillance in large human populations – are essential tools for problem analysis and facilitating a proactive early intervention and prevention approach.⁵ The farm vet systematically interprets production data, reviews feed rations calculations, and provides an overall assessment of herd health status.⁶ The data collected informs a comprehensive whole herd approach, includes nutritional advice, reproductive analysis and management, milk quality management, and consultancy planning, and requires an understanding of the farm at an operational level.⁷

Communication

Communication in small animal medicine follows a similar consultative approach to human medicine: gathering history, examining the patient, and producing and carrying out a treatment plan.

It is a problem-orientated approach. Although the management of the individual sick farm animal follows a similar structure, the communication process is more solution-focused, addressing underlying issues to improve the overall performance of the farm.⁵ This is a longer-term procedure centred on defining, prioritising,

and agreeing on goals with the producer. Excellent, clear communication fostering a partnership between the veterinarian and the farmer is central to achieving the mutual trust and understanding necessary to achieve these goals.² Furthermore, educating farmers is critical to a successful client relationship and achieving improved herd health and welfare goals.⁸ Vets seldom lack clinical veterinary knowledge; the challenge for the dairy veterinarian is ensuring excellent communication with farm staff.⁸

Knowledge transfer may involve workshops and tutorials at the clinic or farm. Standard operating procedures tailored for the individual farm systemise farm practices ensuring consistent, evidence-based husbandry. Successful engagement, rewarding relationships and optimal animal health and welfare outcomes happen when vets take this farmer-centred approach. Understanding the client's unique circumstances and priorities and promptly communicating clearly with plain language improves client satisfaction and, most importantly, engagement.

Prescribing for farmers

The use of on-farm antimicrobials is a good example. Antimicrobials are essential in treating, preventing, and controlling food-animal diseases. In New Zealand, prescribing antimicrobials is regulated by the Agricultural Compounds and Veterinary Medicines Act.⁹ You must have a bona fide veterinarian-client relationship to prescribe restricted veterinary medicines, such as antibiotics. This means visiting the farm at least once a year, although most farmers have more frequent visits. Veterinarians undertake an annual consult with their clients to decide on an allowance of restricted veterinary medicines (RVM) available for the season and to ensure farm staff understand drug classes and uses.¹⁰

We discuss common conditions on farms, such as mastitis, metritis, and lameness. Together we determine treatment strategies and estimate the amount of medication required based on the farm's history. In practice, this allows farmers to keep a stock of medicines on the farm to use for immediate treatment of common conditions as

required. The annual RVM consultation provides access to the agreed allotment of medicines throughout the year. The only exception is "red" antibiotics (see below), for which access must be reviewed every four months. In my experience, this discourages the use of these critically important antibiotics. When conducted comprehensively, the RVM discussion educates farmers on the effective and responsible use of medicines. As inappropriate treatments are often unsuccessful and expensive, I have found farmers to be receptive to such discussions, providing an open and collaborative approach is taken by the vet. Dairy veterinarians are inherently available to farmers – when they encounter a scenario outside our discussions, farmers mostly call to confirm an appropriate treatment strategy. This may not happen in every client-vet relationship, but it is possible. Through education, our farmers adopt an evidence-based, informed approach in collaboration with their trusted advisor rather than indiscriminately reaching for antibiotics. It is important to remember that although vets possess expert clinical knowledge, farmers have specialist knowledge of their farm's systems. Thus, the veterinarian's style and manner of approach to these conversations determine the likelihood of a successful outcome.

The Antimicrobial Strategic Group of the

New Zealand Veterinary Association (NZVA) produced guidelines to help direct veterinarians on the judicious use of antibiotics. A traffic light system for guiding prescribing was created based on the WHO classification of first (green) and second (amber) line antibiotics followed by "red" antibiotics⁽¹¹⁾, which are considered critically important and used in treating refractory conditions in human and veterinary medicine. A summary of the types of antibiotics listed at each level is provided in Figure 1. We utilise the traffic light system during RVM consults to advise treatment plans for common conditions the farmer encounters. Routine use of red antibiotics, such as third-generation cephalosporins, is discouraged – these prescriptions must be reviewed every four months.

The Dairy AntibioGram (DAB) contributes to ethical product stewardship by monitoring antibiotic effectiveness on common mastitis pathogens in bulk milk samples. The DAB utilises an advanced screening tool called broth microdilution, a quantitative test, to define the minimum inhibitory concentration. Previously agar disc diffusion assays were used to determine antibiotic sensitivities. However, they have significant limitations and require care with interpretation.¹² In addition, we can build a database with this DAB, so antimicrobial use

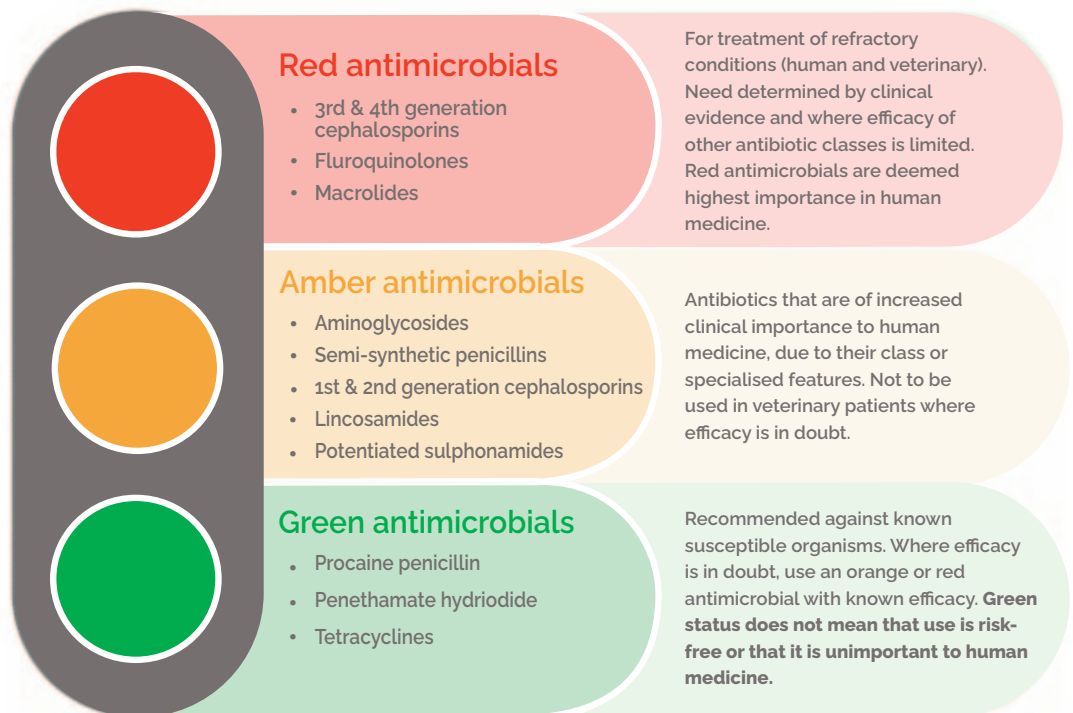


Figure 1. The "traffic light" guidance for antimicrobial use in veterinary patients, adapted from the New Zealand Veterinary Association prescribing guidelines. Antimicrobials are classified according to their importance to human medicine in the face of antimicrobial resistance.

Adapted from the New Zealand Veterinary Association. Reproduced with permission.

patterns and their effects on resistance can be monitored and investigated. They can determine the “wild type” population from the “non-wild” type using epidemiological cut-off values, thus detecting the emergence of antimicrobial-resistant phenotypes. I have found the DAB to be an indispensable tool for evidence-based guidance on prescribing antibiotics. Dairy vets strive to lead the way with prudent antimicrobial use. Recent reports from the EMA indicate that sales of antibiotics for animal use have almost halved between 2011 and 2021.¹³

Historically antibiotics were used as growth promoters in livestock. Europe and New Zealand banned this practice following public pressure in 2006¹⁴ and 2002,¹⁵ respectively. However, outlawing this practice resulted in an increased requirement for therapeutic antibiotics despite improvements in husbandry. Unfortunately, these therapeutic antibiotics had more overlap with those used in human medicine.¹⁶

Antibiotic medications are also a critical global resource, with antimicrobial resistance recognised as one of the most severe public health threats.^{17,18} On January 28, 2022, the EU enforced new veterinary medicine regulations (veterinary medicines Regulation EU 2019/6 and medicated feed EU 2019/4), aiming to reinforce responsible antibiotic use.¹⁹ In parallel with this, the New Zealand Veterinary Association declared an ambitious goal: By 2030, New Zealand will not need antimicrobials to maintain animal health and wellness.²⁰ New Zealand ranks as the third lowest consumer of antimicrobials globally, behind Norway and Iceland.²⁰ This is perhaps due to the extensive nature of their production systems. New Zealand Food Safety has reported a steady decline in antibiotic use, with sales for multi-species products decreasing by 5% from 2018 to 2019.²¹ Focus on minimising dry cow therapies have yielded some significant gains, dropping antibiotic use by almost 20% over two years (2017–19).²¹ Elsewhere, the latest UK Veterinary Antibiotic Resistance and Sales Surveillance data shows that sales of antibiotics for livestock use are at their lowest levels, now reduced by 55% since 2014. In addition, critically important antibiotics sales (crucial for treating human diseases) have declined by a profound 83% since 2014.²²

Monitoring and early diagnostic warning systems on farms – a micro version of disease surveillance in large human populations - are essential tools for problem analysis and facilitating a proactive early intervention and prevention approach.

Sustainability considerations and the One Health approach

Humans, animals, and the ecosystem do not exist in isolation. The health or otherwise of one group will impact the others. Therefore, it is incumbent upon production animal veterinarians to play their part in taking an integrative approach towards medicine and food safety.¹⁶ However, a one-health approach can be challenging as veterinary, medical, and political interests are not always aligned. In addition, vets and farmers have concerns about compromising animal health and welfare through restrictions on antimicrobial use. On September 16, 2021, the European Parliament rejected a motion to increase antimicrobials restricted to human-only use. An open letter with 9,000 signatories from veterinarians and animal welfare organisations appealed against the resolution, arguing an unacceptable threat to animal welfare.²³

Mastitis is a typical example of a common dairy production disease and always presents significant health, welfare, and production challenges. It is also a critical control point for organisms causing foodborne diseases in dairy products. By controlling mastitis, we can simultaneously reduce environmental contamination and improve milk quality, quantity, and human and animal health.¹⁶ The treatment and prevention of mastitis account for approximately 85% of antimicrobial use on New Zealand farms.²⁴ Introducing blanket dry cow

therapy (administration of intramammary antimicrobials to the whole herd at the end of the milking season) revolutionised mastitis control by curing current infections and preventing new infections in the dry period.²⁵ A further advance came from teat sealants and selective dry cow therapy, dramatically reducing antibiotics on farms without impacting the health and welfare of the cow or milk quality.²⁶

In the global dairy industry, sustainability is increasingly taking a central role. Traditionally, producers reward farmers for the quantity and quality of milk. Standards used vary by geographic region: European producers receive a premium for milk volume in Europe, whereas New Zealand dairy farmers receive compensation for milk protein and fat content. In addition, all farmers incur bonuses or penalties for hygiene and animal health parameters.²⁷ However, the trend is for

dairy companies to introduce sustainability incentives. New Zealand’s dairy co-operative, Fonterra, is a company owned by the farmers who supply it and membership improves the economic return of the individual. They launched The Cooperative Difference in 2019 – a holistic framework for looking after people, animals, the environment, and the co-op itself.²⁸ The base level, Te Pūtake, requires farms to complete an Animal Wellbeing Plan (in consultation with their vet), design an environmental plan, and meet all expectations of being a good employer. On completion, they may progress to Te Puku – awarded for maintaining milk quality excellence for at least 30 days of the season. Te Tihi is a recognition award for top performers from Fonterra, celebrating suppliers delivering excellent milk quality for over 90% of the season.²⁸

Arla Foods introduced a similar sustainability incentive in Europe. This has proved to be highly successful, with around 95% of their farmers signing up for this voluntary rewards system²⁹ and engaging in more sustainable farm practices. This future-focused system sees farmers rewarded for performing well in areas like feed efficiency, fertiliser use, land use, protein efficiency and animal robustness – which refers to animal health and is measured by cow mortality percentage rates.³⁰





Another crucial component of sustainable dairying is efficient heifer rearing. Vets focus on enabling farmers to reach the target of rearing a fully grown healthy heifer, capable of delivering their first calf without complications at 23 months.³¹ Losing production efficiency contributes to waste and poor sustainability in dairy practices.

Regulatory considerations

Medicating farm animals is usually by injection, in water, or feed preparations. Doses are calculated on a body weight basis, requiring accurate estimations to ensure correct dosing.²⁰ For food-producing animals, preventing pharmaceutical residues from entering the food chain is of critical importance. After treatment, a significant proportion of antibiotics remain unchanged or are excreted as active metabolites (17% – 90%),³¹ so livestock manure from treated animals has the potential to contaminate the environment. This contamination not only deteriorates the water quality but also impacts all trophic levels, from soil microbes to plants and food production. Therefore, food safety and milk quality begin on-farm. To avoid harmful residues in food products, all medications for food-producing animals must have defined withdrawal times,³² within which agricultural produce must not enter the food chain. Residues can enter the

milk supply through failure to withhold milk for the appropriate amount of time or contaminated feed.

In the case of antibiotics, the main consequence of antibacterial residues entering the food chain is its effect on the human gut microbiome, which is pivotal in determining health status and can be negatively affected by these antibiotic residues.¹⁶ Studies suggest an imbalance of the microbiome may allow the proliferation of harmful bacteria and health issues such as colitis, intestinal disorders, and colorectal cancer.³³ To safeguard against any failure of on-farm protective measures, dairy companies implement an additional level of residue management through screening and pasteurisation.³⁴ In addition, there are various third-party quality assurance services. For example, in New Zealand, the Ministry for Primary Industries runs the National Chemical Contaminants Programme, testing milk and dairy products to ensure that residues and contaminant levels fall within acceptable standards. However, more work is needed to understand how pharmaceutical residues impact human, veterinary, and environmental health.

Medical writing for production animals

In many ways, the medical writing based on a dog

with mastitis – drug licensing, drug safety, clinician education, patient or client information – is equivalent to that of a human patient with mastitis. For the bovine patient with mastitis who is part of a food production system, however, medical communications require keeping the context of the commercial value of the patient and the health impact at a herd level. Vets and farmers must also consider specific regulatory and welfare considerations. Furthermore, in common with companion animals, the evidence derived from production animal studies is often degraded by poor study design and reporting.^{35,36} However, interestingly, in some fields, such as reproduction, a higher proportion of studies in dairy cattle (33% of articles reviewed) are of sufficient quality to draw sound conclusions than comparable studies in canine (7%) or equine reproduction (11%).³⁷

In summary, the global dairy industry has evolved and will continue as a One Health approach becomes the orthodoxy. Establishing solid relationships with clients and understanding their unique goals and challenges – effecting a “precision” herd medicine approach – is paramount for shaping sustainable change on the farm necessary to ensure global food security. An empathetic approach to educating all stakeholders is key to this success. Open collaboration between industries can benefit animals, humans, and the environment. This should be our collective goal.

Disclaimers

The opinions expressed in this article are the author’s own and not necessarily shared by her employer or EMWA.

Disclosures and conflicts of interest

The author declares no conflicts of interest.

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Author information

Rhona Fraser, BSc, BVMS, Freelance Medical and Veterinary Writer, originally from Scotland, has spent the last decade living in New Zealand. Educating and collaborating with farmers has always been her passion. After 19 years, she's swapped the field for a desk and transferred this enthusiasm to the realm of medical writing.



From the Horse's Mouth

The quarterly pick of the news from the veterinary world

The first data on small animal cardiopulmonary resuscitation (CPR) outcomes from the RECOVER registry was published in the December 2022 issue of *The Journal of Veterinary Emergency and Critical Care*, as reported by vetlit.org. The RECOVER registry is an online medical database created for the standardised collection of outcomes of cats and dogs undergoing CPR in participating veterinary practices and hospitals. The registry is run by the RECOVER initiative (recoverinitiative.org), the organisation responsible for developing the pioneering RECOVER guidelines published in 2012. The guidelines are designed for use by the veterinary team to prepare for and manage cardiopulmonary arrest in their feline or canine patients and are an early example of evidence-based clinical guidelines in the veterinary field. Based on CPR events recorded on the registry between February 2016 and November 2021, this study found that from over 700 CPR events, only 3% of dogs and 2% of cats survived until hospital discharge. This compares to 7% to 8% of human patients. The authors highlighted the need for further studies to understand better the factors associated with favourable outcomes.

In January 6, 2023, the *Veterinary Times* reported on the first figures that indicate the preliminary effects of the cost-of-living crisis in the UK on pets, pet owners, and veterinarians. Their article, which detailed a recent survey by the Dogs' Trust, reported that the charity had received 50,000 calls from owners wanting to relinquish their pets in 2022. Furthermore, they also surveyed 4,000 members of the UK public. A third of respondents who were dog owners reported that they were worried about their ability to care for their pets due to rising prices, with veterinary costs being the most common concern, as stated by 46% of respondents, followed by the cost of pet food

(18%). Against a rate of inflation of 10.7% in the UK in November 2022, 3% of owners reported they would consider rehoming their pets if costs continued to rise, which could eventually result in as many as 350,000 dogs needing new homes. However, with 62% of non-dog-owning respondents reporting that the current economic situation would “definitely” or “probably” stop them from acquiring a dog in 2023, the challenge of rehoming these relinquished pets could be substantial. In response to the pressures experienced by owners due to the rise in the cost of living, the Dog's Trust has opened six temporary canine food banks at a selection of their 21 rehoming centres in the UK.

If one of your new year's resolutions was to find an informative podcast or two, you could do worse than checking out this podcast from the *Humanimal Hub*, the Humanimal Connection. The first series, which comprises seven half-hour-long episodes, was launched in June 2022 and covered a diverse range of topics. From discussing the techniques adopted from human medicine to treat gunshot injuries in wild South African rhinos to lessons that human vaccine technology can learn from the veterinary sector in the wake of the COVID-19 pandemic. Make sure you catch up on season 1 before season 2 launches in 2023, which Humanimal hub Chair of trustees Professor Roberto La Ragione promises will have a very different feel.