laparotomy prior to presentation, 4 did not have surgery. Duration of clinical signs upon presentation was 31.6 days (SE 13.7, range, 10 to 71). Upon arrival, retroperitoneal abscess was associated with fever (>102.7°F; >39.3°C) in 12/36 (33%), tachycardia (>80 bpm) in 9/36 (25%), and tachypnea (> 40 breaths/min) in 6/34 (9%) of animals. Dehydration was present in 36.3 % (13/36) of the animals. Bacteriological culture was performed in 80.5% (29/36) and was positive in 72.5% (21/29). The most common bacteria isolated was *Truperella pyogenes* (27.5%) followed by mixed bacterial growth, with the presence of the *T. pyogenes* (20.6%). HCT was decreased in 58%; neutrophilia was present in 30/35; fibrinogen was increased in 65% (23/35) with a mean of 6 g/ L (SE 1.5, range 2-11); total proteins were increased in all animals (mean 65.6 g/L; SE 6.2, range 52.7-79.8) with low albumin in 80% (mean 23 g/L; S.E 4.85, range 14.3-33.8); and increased globulins in 37% (mean 42.6 g/L; SE: 5.8; range 22.5-58.5). Hypocalcaemia was present in 77% and hypokalemia in 42%. Thirty-one animals had surgical drainage (86%). One animal had its abscess drained prior to admission. The volume of collected fluid was estimated between 10 and 40 liters. Lavage of the abscess cavity was performed in 26 animals (81%) with tap water and povidone-iodine solution during an average of 10.5 d (SE 8.1, range 0 to 32). All animals received parenteral antibiotics (mean duration, 16.3 days, SE 7.2, range 1 to 42 days); 4 of them were treated with antibiotics only. Duration of hospitalization was 13.5 days (SE 8.13, range 1 to 46 days). Thirty-three animals (92%, 33/36) were discharged from the hospital. Three animals (8%, 33/36 cases) were euthanized during hospitalization. Long-term prognosis was available for 16 animals (48.5%, 16/33). Nine (56%) completed at least 1 lactation after hospital's discharge, 7 (44%) did not complete a lactation after being discharged.

Significance

The majority of the affected animals underwent right flank surgery, but the nature of this study cannot identify specific details of the procedure leading to this infection. Chronic, low-grade fever following a laparotomy was found on most animals. Abscess formation and distension is a slow process explaining the long duration before referral. Ultrasound examination confirmed our suspicion and was helpful to determine the drainage site. Because the most common bacteria was T. pyogenes, ß-lactams are suggested as antibiotic treatment. The long period of hospitalization was required to lavage the large cavity until significant contraction was observed. Based on the short and long-term prognosis, we conclude that treatment can be successful following surgical drainage.

© Copyright American Association of Bovine Practitioners; open access distribution.

Extended withdrawal time (EWDT) of drugs to prevent residues in food following extra label use

Pritam K. Sidhu,[1] BVSc & AH, MVSc, PhD; **Ronette Gehring**,[1] BVSc, MMedVet (Pharm); **Lisa A. Tell**,[2] DVM, DABVP, DACZM; **Ronald E. Baynes**,[3] DVM, PhD; **Danielle A. Mzyk**,[3] BScv; **Jim E. Riviere**,[1] DVM, PhD
[1]Institute of Computational Comparative Medicine, Kansas State University, Manhattan, KS 66506
[2]University of California-Davis, Davis, CA 95616
[3]College of Veterinary Medicine, North Carolina State University, Raleigh, NC 27606

Introduction

Safety of food originated from animals is an emerging global health problem, and ensuring food safety is a challenge for the producers and governments who deal with protecting the food supply chain from contamination with hazardous microbes, chemicals and/or drugs. In the United States (US), the Food Animal Residue Avoidance Databank (FARAD) program is a unique consortium of scientific experts who help maintain a proper balance among animal health, food safety, and regulatory policies. Veterinarians must often use drugs in an extra-label manner to treat food animals due to limited availability of Food and Drug Administration (FDA) approved drugs. Extra-label drug use (ELDU) is allowable under the Animal Medicinal Drug Use Clarification Act (AMDUCA). Following ELDU, and before products derived from the treated animal can be sold and marketed, an extended withdrawal time (EWDT) needs to be established, based on appropriate scientific data. The objective of this paper is to discuss the scientific basis for determination of EWDT of drugs used in food animals using kinetic modeling approach.

Materials and Methods

An extended withdrawal time for extra-label use of FDA approved drugs is calculated using half-life multiplier method (Gehring et al, 2004). The FDA approved label information including species, matrix, dose, route, frequency of

administration, and withdrawal time (WDT) for each drug is obtained from the FARAD website; www.farad.org and EWDT are determined for higher doses following single and multiple doses in target species. To determine how an increased single dose from the label dose affects plasma concentrations, the number of dose doublings are calculated using the following equation:

Number of dose doublings = log2 (dose2/dose1) Equation 1

Where dose 2 = extra-label dose; dose 1 = label dose.

Following multiple administrations of the drug, dose doublings are calculated using the equation 2.

Number of dose doublings = log2((dose2×accumulation factor of 2)/(dose1×accumulation factor of 1))

Equation 2

EWDT = label withdrawal time (WDT) + (# of doublings × tissue half-life) ---Equation 3

Results

Drug plasma concentrations in the animal's body depend upon the amount of drug administered and the rate at which it is cleared from the body. An increased dose from the FDA approved label dose increases concentrations of the drug in the plasma and tissues of the treated animal, and has the potential to cause drug residues in their food products, therefore, need arises to determine EWDT. Examples of scenarios commonly encountered by food animal practitioners in field and calculated EWDT are given below.

1. Drug A label: approved for cattle, beef, non-lactating dairy, 3 to 5 mg/lb (6.6 to 11 mg/kg)/day, IM/IV, do not exceed volume 10 mL per injection site and FDA approved WDT is 22 days.

Extra-label use of Drug A: beef cattle, 9.1 mg/lb (20 mg/kg)/day, IM, 7 doses, volume 15 mL per injection site, EWDT = 42 days.

2. Drug B label: approved for cattle, 1.14 mg/lb (2.5 mg/kg), SC, single injection, don't exceed volume10 mL per injection site and WDT is 18 days.

Extra-label use of Drug B: cattle, 2.27 mg/lb (5.0 mg/kg)/day, SC, 2 doses, q 24h, EWDT = 30 days.

3. Extra-label use of Drug B: goat, 2.27 mg/lb (5.0 mg/kg)/day, SC, 2 doses, q 24h, EWDT = 65 days.

EWDT for Drug B is longer for goat (65 days) than cattle (30 days) when used at the same extra-label dosage schedule because there is no MRL/ tolerance for this drug in goats.

Significance

In compliance with the stipulations set forth by AMDUCA, extended withdrawal intervals are required to ensure that food originated from food animals treated with extra label use of antimicrobials is free from harmful residues. Scientific approaches can be used to establish extended withdrawal times following extra label drug use and provide safe food to consumers.

Acknowledgements

Funded by a USDA grant for the Food Animal Residue Avoidance and Depletion Program.

© Copyright American Association of Bovine Practitioners; open access distribution.

Effects of Tri-Lution® on serum volatile fatty acids, electrolytes, and trace mineral status in commercial veal calves

L.A. Krueger, MS; **G.A. Ayangbile**, PhD
Agri-King, Inc, Fulton, IL 61252

Introduction

Commercial veal calves in the United States may be deficient in iron as an outcome of consuming primarily milk or milk replacer with limited grain intake. Iron deficiency promotes the desired coloration of veal, but may also predispose calves to metabolic stress. Tri-Lution® contains proprietary, probiotic strains of *Saccharomyces cerevisiae* and *Enterococcus faecium*, which is a lactic acid producing bacterium. Together with prebiotic nutrients, these probiotic microbes are hypothesized to sequester coliform bacteria and promote reductive fermentation in the intestine. In January 2017, a commercial veal calf grower in the midwestern United States reported to us that calves fed Tri-Lution® showed improved