Flunixin Meglumine Residues and Injection Site Damage ... a Serious Problem That Needs Our Profession's Attention

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Introduction

Did you know that flunixin meglumine (FM) residues are the second leading violative residue reported by the USDA-FSIS? Flunixin meglumine residue violations are surpassed only by the residue violations from over the counter (OTC) procaine penicillin G and are the leading prescription (Rx) drug residues in all food animals. The FDA-CVM, in the FDA Veterinarian Newsletter 2007, Volume XXII, Number 2, reminded all veterinarians to use FM correctly. In that newsletter, the FDA-CVM noted investigations of several residue reports which led the agency to believe that unapproved routes of administration, such as intramuscular use, were traced to violative residues. The agency reminded veterinarians that the drug was only approved for intravenous use and that the convenience of an alternate route of administration, such as intramuscular, was not an AMDUCA acceptable reason for extralabel drug use.

Materials and Methods

The USDA-FSIS most recently published residue reports, which were from 2005, 2006, and 2007, were examined to evaluate the most common OTC and Rx drugs found as violative residues. Inspector generated samples were targeted for evaluation as these samples represent the sampling technique used by the USDA-FSIS which reports the majority of violative residues. Inspector generated sampling targets animals that have evidence of injection sites or evidence of disease in body systems which might have caused antibiotic use. The most common initiating disease signs were lameness, mastitis, uterine infection, and pneumonia. In addition to examining USDA-FSIS residue monitoring records, FM injection sites were examined at necropsy from several cattle in which the medication's use records could document FM use, and the injection site from the drug would be definitively established. Flunixin meglumine analysis of the injection site damaged tissue was not available.

Results

Flunixin meglumine was the second most common violative residue reported from inspector generated samples from cattle and was the most common violative residue reported for a veterinary prescription drug. A table developed by USDA-FSIS which summarizes the FM violative residues by cattle production class will be presented. Photos from flunixin injection sites will be included on the poster. These photos were of FM injection sites as early as 10 days post-injection and as long as 22 days post-injection. The tissue damage illustrated in the photographs was extensive.

Significance

Failure to follow the administration instructions on the FDA-approved FM label has been noted to be a cause of FM violative residues. The high USDA-FSIS reported rate of violative residue suggests either failure to follow the four-day withdrawal period for FM when given intravenously as approved by the FDA, or FM is being used in an extralabel manner with non-approved routes of administration which extends the withdrawal time, and that sufficiently extended withdrawal times as required by AMDUCA are not being set by prescribing veterinarians. The tissue damage caused by intramuscular and subcutaneous injection appears severe. It is unreasonable to believe that an anti-inflammatory drug given by an unapproved route of administration which causes extensive tissue damage would make an animal feel better. In light of the FDA's FM extralabel use caution to veterinarians and the USDA-FSIS finding high rates of FM violative residues, it becomes very important that all of us caution our clients against extralabel use of FM and set examples for our clients by following the FDA-approved route of administration (intravenous) for this medication. Simply put, if FM cannot be used as directed by the FDA, it is a medication that needs to remain on the shelf.

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The Bovine PRACTITIONER

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Two issues of *The Bovine Practitioner* are published annually, one in the spring and one in the summer. It also serves as a communication medium between bovine practitioner organizations around the world. All manuscripts and communications must be presented in English.

Most articles in the journal are peer-reviewed or refereed. Papers submitted for publication in the peer-reviewed section are anonymously reviewed by three members of the editorial board. In some cases, papers may be reviewed by an outside expert(s) who is not a regular member of the editorial board. Papers published in the peer-reviewed section of the journal will be identified with a "Peer-Reviewed" banner at the top of the first page. Papers rejected by the editorial board for publication as peer-reviewed articles do not automatically qualify for publication in the non-peer-reviewed sections.

Articles published in *The Bovine Practitioner* are intended to address the needs of bovine practitioners. Types of articles considered appropriate for the journal include research reports, case reports, review articles, retrospective studies and articles describing new techniques.

All papers should begin with an abstract. Research reports should follow with an introduction, materials and methods (including experimental design and statistical analysis), results, discussion and conclusions. At the author's discretion, results and discussion may be combined.

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Two manuscripts and a diskette or CD should be submitted to the editor through the mail or via a parcel delivery service. Manuscripts should be double-spaced, using 12-point Times type and 1-inch margins. Both lines and pages should be numbered. When possible Microsoft Word should be used.

Figures, tables and photographs are welcome. Figures should be numbered on the back: legends for figures should be submitted on a separate sheet of paper. Photographs can be submitted as digital images or prints; prints are preferred over 2x2 slides.

English units of measure should be used for weights, measures and temperature. If the author desires, it is acceptable to follow English units with metric units in parenthesis, i.e....440 lb (200 kg) steer had a rectal temperature of 101.5°F (38.6°C). When the use of brand names is necessary, they should be listed in footnotes or endnotes, including the name of product, manufacturer, and manufacturer's city and state.

References to literature cited in the paper must be identified in the text by the use of superscripts. References should be listed in **alphabetical order**. Suggested style for citations in the reference section is as follows:

1. Allen WM, Sansom BF: Parturient paresis (milk fever) and hypocalcemia (cows, ewes, and goats), in Howard JL (ed): *Current Veterinary Therapy III. Food Animal Practice.* Philadelphia, WB Saunders Co, 1993, pp 304-308.
2. Barth AD, Cates WF, Harland RJ: The effect of body fat and loss of fat on breeding soundness classification of beef bulls. *Can Vet J* 36:758-764, 1995.
3. Nutrient Requirements of Beef Cattle, ed 7. Washington DC, National Academy Press, 1996.
4. Syvrud R: Vaccination for bovine respiratory syncytial virus: Benefits for both cow/calf and feedlot cattle. *Proc Am Assoc Bov Pract* 21:204-206, 1989.

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