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Responses of On-site Slaughterhouse Screening Tests After Administration of Ceftiofur

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Introduction

Responses of three on-site slaughterhouse screening tests, along with the FSIS – USDA Post-Screening Multiple Bioassay, are described. On-site tests include the CAST, STOP and FAST.

Kidney, liver and muscle were obtained from lactating dairy cattle after the last of five intramuscular injections of ceftiofur sodium* administered at 24-hour intervals at a dose of 2.2 mg or 1.1 ceftiofur equivalents (CE) per kg of body weight (0.5-1.0 mg/lb). Animals were slaughtered at 12 hours or five or 10 days.

Materials and Methods

Seventeen lactating Holstein cows (561-864 kg BW, first to fifth lactation) were randomly assigned to one of three treatment groups. Animals received five IM injections of ceftiofur sodium at 24-hour intervals at doses of either 2.2 mg CE/kg BW (Group A) or 1.0 mg CE/kg BW (Groups B and C). Cows were slaughtered at 12 hours, five days, and 10 days after the last injection, respectively. Tissues included kidney, liver, and muscle. Residue analysis utilized an HPLC assay with a limit of quantitation of 0.075 Ig CE/g. CAST, STOP, FAST, 2-plate swab tests, and 7-plate bioassay test were conducted by USDA/FSIS on fresh (*i.e.*, not previously frozen) kidney, and previously frozen defrosted kidney, liver, and muscle.

Results and Conclusions

At the 12-hour slaughter period at 2.2mg CE/kg BW, only one FAST assay sample was positive. At five and ten days at 1.1 mg/kg BW, all fresh sample assays for STOP, CAST and FAST were negative. Positive samples at the slaughterhouse would be frozen and express- shipped to the USDA lab, where they would be thawed. There, the on-site assays would be repeated and a 7-plate assay conducted. Only positive 7-plate assays would be violative and subjected to further determinative analysis. Results of concurrently performed HPLC assays confirmed that all samples were below established tolerances for muscle, kidney and liver. Ceftiofur administration at approved dosages and routes is unlikely to result in positive screening assays on fresh tissue with slaughter at >12 hours after last dose. The current slaughterhouse assay tests FAST, STOP and CAST may provide false results on frozen samples; however, USDA utilizes the 7-plate assay for final determination, and all study samples were negative.

Approved use of ceftiofur will not result in positive screening test results. The one positive FAST sample was well below the tolerance for ceftiofur established by FDA, and was not the highest of the samples assayed by HPLC.

Table 1. On-site slaughterhouse screening test results from fresh (FSH) kidney and previously frozen (FZN) kidney, liver, and muscle from cows dosed with ceftiofur sodium at a dose of 2.2 mg CE/kg IM once daily for five consecutive days, and slaughtered 12 hours after the last injection

#+/# Tested	FAST FZN	FAST FSH	CAST FZN	STOP FSH	STOP FZN	2-Plate FZN	7-Plate FZN
Muscle	0/6	ND	0/6	ND	0/6	0/6	0/6
Kidney	5/6	1/6	5/6	0/6	0/6	0/6	0/6
Liver	2/6	ND	2/6	ND	1/6	0/6	0/6

*Naxcel® Sterile Powder, Pharmacia Animal Health

Pasteurella Vaccination with Metaphylaxis for Calf Health

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Introduction

The objective of the study was to determine the benefit of simultaneous *Pasteurella/Mannheimia* vaccination as an addition to metaphylaxis for the prevention of bovine respiratory disease complex (BRDC).

Methods and Materials

Calves were high-risk, assembled stocker/feeder calves of 414 lb average weight. The study was a comparison of BRDC in these calves following metaphylaxis with tilmicosin[a] alone versus vaccination with *Mannheimia* (Pasteurella) *haemolytica,* serotype 1, biotype A (MhA1) and *Pasteurella multocida* bacterin with metaphylaxis (dual prophylaxis). In the pilot study, experiment 1, the calves were vaccinated with an experimental MhA1 oil emulsion bacterin-toxoid. In experiment 2, a commercially available MhA1/*Pasteurella multocida* bacterin-toxoid[b] was used.

Results and Conclusions

In experiment 1, dual prophylaxis resulted in more healthy calves during the receiving period ($p<0.05$) and fewer calves experiencing two or more episodes of BRDC or death ($p<0.01$) compared to untreated control calves. Tilmicosin alone also reduced the number of calves experiencing severe BRDC ($p<0.05$) compared to controls.

In experiment 2, dual prophylaxis compared to metaphylaxis alone resulted in an increase in the number of healthy calves during the feedyard receiving period ($p<0.05$) and a decrease in the number of calves experiencing two or more episodes, or dying, of BRDC ($p<0.01$). It is calculated that dual prophylaxis increased the value of each calf by $12.50 and would increase net return during the entire feeding period by $18 to $34.

[a]Micotil 300, Elanco Animal Health Division, Eli Lilly and Co., Indianapolis, IN 46285
[b]Pulmoguard™ PHM-1, Pasteurella Haemolytica Multocida Bacterin-Toxoid, Boehringer Ingelheim Vetmedica, Inc., St. Joseph, Missouri 64506