

# Failure of high-capacity pneumatic darts to consistently deliver tulathromycin to calves after remote drug delivery

**J.F. Coetzee**, BVSc, Cert CHP, PhD, DACVCP, DACAW<sup>1</sup>; **M.D. Kleinhenz**, DVM<sup>1</sup>; **D.R. Magstadt**, DVM<sup>1</sup>; **V.L. Cooper**, DVM, MS, PhD<sup>1</sup>; **N.K. Van Engen**, BS<sup>1</sup>; **J.S. Smith**, DVM, MPS, DACVIM<sup>1</sup>; **N. Rand**, DVM<sup>2</sup>; **P.G. Gordon**, DVM, DABVP<sup>1</sup>

<sup>1</sup>Veterinary Diagnostic and Production Animal Medicine, Iowa State University College of Veterinary Medicine, Ames, IA 50011

<sup>2</sup>Rand Veterinary Services, Marshalltown, IA 50158

## Introduction

Remote drug delivery (RDD) using pneumatic darts is becoming widespread in beef production systems with an estimated 4 million darts sold last year. Data concerning the impact of pneumatic dart delivery of antimicrobials in cattle are deficient in the published literature. In this report we describe a case of failure of high-capacity pneumatic darts to consistently deliver tulathromycin to calves after RDD.

## Materials and Methods

Fifteen calves weighing between 748 lb (340 kg) and 906 lb (412 kg) received 10 mL of tulathromycin (Draxxin®, Zoetis) injected using a Type U 10.0 cc 3/4 inch 14 gauge needle (Gel collar) pneumatic dart (Pneu-Dart®) administered with a Model 178B breech loading projector. Calves were restrained in a mobile chute and the dart was delivered over a fixed distance of 30 feet (9.1 m) in accordance with the manufacturer's instructions. After RDD, blood samples were

collected for tulathromycin, CK, and AST determination, and injection sites were examined over 24 h.

## Results

Darts remained in-situ for  $1.07 \pm 0.01$  hours after RDD. Four of 15 calves failed to develop significant injection site lesions at 24 h and had no detectable plasma tulathromycin concentrations after RDD. Furthermore, CK concentrations were also significantly lower in these 4 calves at 12, 24 and 48 h ( $P < 0.05$ ) post-injection. Darts recovered from calves without injection site reactions weighed 24 g compared to 13.5 g.

## Significance

RDD of tulathromycin was unsuccessful in 4 of 15 calves. Given the low incidence of dart recovery reported in practice, this finding has important implications for the welfare of sick calves treated using RDD technology.

# Does dart gun delivery of antibiotics cause changes in drug disposition or meat quality?

**Tom Hairgrove**, DVM, MS<sup>1</sup>; **Ron Gill**, MS, PhD<sup>1</sup>; **Crystal Waters**, BS<sup>1</sup>; **Rhonda Miller**, MS, PhD<sup>1</sup>; **Travis Mays**, MS<sup>2</sup>; **Michael Miller**, BS<sup>1</sup>; **Virginia Fajt**, DVM, PhD<sup>3</sup>

<sup>1</sup>Animal Science, Texas A&M University, College Station, TX 77840

<sup>2</sup>Texas Veterinary Medical Diagnostic Laboratory, College Station, TX 77840

<sup>3</sup>Veterinary Physiology and Pharmacology, College Station, TX 77840

## Introduction

Use of remote delivery devices in non-restrained cattle has increased in the last few years, and it is unknown whether this route will result in subcutaneous delivery, appropriate drug levels, or tissue damage. The objectives were to assess the plasma disposition of labeled doses of tulathromycin, tildipirosin, and ceftiofur crystalline free acid (CCFA) delivered via dart and to determine impact on meat quality.

## Materials and Methods

Forty steers were administered CCFA, tulathromycin, tildipirosin, or saline via dart. Type 'U' RDD (14 gauge, 3/4 inch cannula with Gel Collar end port discharge) darts were delivered via Pneu-Dart's X-Caliber Gauged CO2 Projector/Rifle, 25 feet (7.6 m) from the cattle, and into the left biceps femoris muscle. Blood samples were collected for 10 days after drug administration. Animals were fed to slaughter