

Elimination Kinetics of Tilmicosin Following Intramammary Administration in Lactating Dairy Cattle

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Introduction

Tilmicosin is a macrolide antibiotic approved for both the treatment and control of respiratory disease in beef cattle and dairy cattle under 20 months of age. The drug is not approved for use in lactating dairy cattle; however, tilmicosin is sometimes used in an extralabel manner by bovine practitioners for the intramammary treatment of mastitis. This practice results in detectable residues and has resulted in several instances of milk residue violation referred to the Food Animal Residue Avoidance Databank (FARAD). The purpose of this study was to determine the elimination kinetics of tilmicosin in milk following an intramammary infusion so an appropriate proper milk withdrawal interval could be determined.

Materials and Methods

Following the collection of baseline milk samples, 1,200 mg (4 mL) of tilmicosin were infused into the left front and right rear quarters of six lactating dairy cows. Approximately 12 hours later, an additional 1,200 mg of tilmicosin were infused into the left front and right rear quarters after milking. Milk samples were then collected

from each quarter every 12 hours (at milking time) for a total of 40 days. The concentration of tilmicosin was determined by UPLC-MS in milk samples to assess the rate of drug elimination.

Results

Although there were considerable variations present between quarters and individual cows, tilmicosin reached very high concentrations in milk from treated quarters and had a very long half-life in both treated and untreated quarters. Tilmicosin was detected in all treated quarters for the entire 40 day study period, and was detected in untreated quarters for approximately 30 to 35 days.

Significance

An 82-day milk withdrawal interval was calculated for tilmicosin based on the FDA's tolerance limit method. The results of this study indicate that tilmicosin should not be administered by the intramammary route in lactating dairy cows due to prolonged detection of drug residues in milk.