Texas Dairy Matters

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ANTIBIOTIC RESIDUES – DO ROUTE AND PRODUCTION MATTER?

Ellen Jordan, Ph.D. and Todd Bilby, Ph.D.
Extension Dairy Team
Department of Animal Science
Texas A&M AgriLife Extension Service
The Texas A&M University System

How many times have you heard the phrase "follow the label for withdrawal times"? Unfortunately drug residue violations continue to happen. Some of these violations are for approved pharmaceuticals, so what has happened? From 2005-2010, flunixin was the second most common residue violation behind penicillin in culled dairy cattle.

Flunixin is a non-steroidal anti-inflammatory drug (NSAID) administered to dairy cattle to control fever associated with respiratory disease and mastitis. Cattle treated with flunixin at the labeled dose have a four day withdrawal time for slaughter and a 36 hour milk withhold time.

So why do violations occur even if the correct withdrawal times are met? There are several potential reasons.

- Was the correct dose given?
- Was it given intravenously?
- How much was the cow producing?

The legal route of administration for flunixin given to dairy cows is intravenous only. Both intramuscular and subcutaneous administration are extra-label drug uses, for which appropriate

milk and meat withholding times have not been established. Recently researchers from North Carolina State University reported on how altering the route of administration can affect the half-life of flunixin.

Cows were given two doses of flunixin 12 hours apart via intravenous, intramuscular, or subcutaneous routes. Milk and blood samples were then taken and the half-life of flunixin was determined to be 3.42 hours for intravenous treatment and increased to 4.48 hours if given intramuscularly and to 5.39 hours when administered subcutaneously. Since the half-life is shorter for intravenous treatment, the recommended withholding time calculated for this route of administration would be too short if an intramuscular or subcutaneous injection had been used.

In addition to the significant effect of route of administration, the production level of the cow influenced the rate at which flunixin was eliminated. Cows producing less than 44 pounds of milk cleared the pharmaceutical slower than those producing over 66 pounds of milk. Although there aren't a lot of other studies looking at milk production and clearance, several others have shown similar results. Thus if cows are low producers, they are more apt to require prolonged withdrawal periods.

It is critical for the dairy industry to provide both milk and meat that are free of antibiotic residues for the consuming public. Whenever using any pharmaceutical, check with your veterinarian to insure that you are using the correct dose, method of administration, and withdrawal times for the production level of the cow you are treating.

Reference

Kissell, L.W., G.W. Smith, T.L. Leavens, R.E. Baynes, H. Wu, and J.E. Riviere. 2012. Plasma pharmacokinetics and milk residues of flunixin and 5-hydroxy flunixin following different routes of administration in dairy cattle. J. Dairy Sc. 95:7151-7157.