



Make sure your beef is good . . . and safe

Misuse of drugs hurts us several ways. We all pay the price for injection site lesions.

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ESTIMATES show 20 percent of all U.S. beef can be attributed to dairy cattle. Beef from virtually every cow in your herd has the potential to reach the meat counter at a local grocery store and has become increasingly important in America's kitchens and restaurants. Not just sold as fast-food hamburger, it's also used for roasts, fajitas, and an endless array of innovative, flavorful value-added food items available at many restaurants and grocery stores.

Watch injections

Meat packers and processors spend lots of time and money trimming muscle cuts scarred from improperly placed injections. Studies show approximately 50 percent of outside rounds (flanks) from cows have lesions that require trimming. Tough muscle cuts damaged by injections do not provide the consumer with an enjoyable eating experience. Previous research shows injection site lesions and other defects such as bruises and condemnations cost the industry nearly \$70 per market cow.

Choosing injection sites carefully and practicing good injection technique are critical. There are several ways lesions can form when a drug is administered. Some are very irritating to muscle tissues. These include certain vaccines, the anti-inflammatory drug flunixin, and antibiotics such as oxytetracycline. These drugs can cause muscle cell death and local inflammation directly which becomes scar tissue.

Injecting a large volume of a drug in one place also can cause tissue damage. If the volume is more than 10cc, it should be split into several injections placed in different locations.

Always follow the labeled instructions. If the label indicates a drug can be given under the skin (subcutaneous or SQ), use that method instead of making an intramuscular (IM) injection. If the label indicates the drug should be given IM, the recommended site for injection is into the neck, in front of the shoulder. The rump and flank are not appropriate locations for injections.

Correct injection technique involves using clean single-use needles. Bacteria growing on an unsterile needle between uses can cause muscle abscesses. Dull needles cause addi-

tional trauma and have a greater chance of breaking off. If a needle breaks off for whatever reason, it must be removed before the animal is marketed.

Occurrence of violative drug residues in beef is low, but most residues reported come from cull cows and bob veal. In 2005, the USDA reported 670 suspect dairy cattle tested at slaughter were condemned for having a violative drug residue. In the same year, 917 total residues were found out of more than 32 million head of cattle that were slaughtered. This level of residues is a significant improvement from the 1970s, when testing first was used. However, the federal government has adopted a "zero tolerance" approach to violative residues.

The most frequently implicated drug in dairy cattle is penicillin. This drug is available over-the-counter. However, the withdrawal time listed on the label is only correct when the labeled dose is given. Giving a larger than label dose or giving penicillin for a longer period of time is an extra-label drug use. By law, any time a drug is used extra-label, it must be under the direct order of a veterinarian who has addressed the extra-label dose and withdrawal time.

That shouldn't be there

The antibiotic gentamicin is not approved for use in cattle, although it continues to cause a few violative residues every year. This drug accumulates in the kidney and remains there, possibly detectable for years after the drug was given. Because of the unpredictable withdrawal times, several veterinary groups strongly discourage the use of this drug in all ruminant animals.

The anti-inflammatory, flunixin, is also a frequent source of drug residues. This may

come as a surprise to many who use it. The withdrawal time for beef is fairly short when given in the vein (IV), about four days. However, because of the inflammation caused when it is given by the extra-label IM route, the drug takes much longer to disappear from the cow's system. The Food Animal Residue Avoidance Database (FARAD) recommends flunixin should not be given IM or SC because of injection site lesions and prolonged tissue clearance. The FDA stresses that going IM for convenience purposes is an unacceptable reason for extra-label use.


Regardless of the drug used, it is important to consider how it is given to an animal. If a cow is severely ill and dehydrated, it may take longer for the drug to be absorbed and eliminated by the body. Giving a large-volume injection in a single site may also hamper the process of absorption and cause a longer withdrawal time. Repeating a dose of a long-acting "single shot" drug can also prolong the withdrawal time. In these cases, a veterinarian's consultation is required.

Other mistakes possible

The drugs we have discussed are only a few of the sources of violative residues found at slaughter. Any medication that has a withdrawal time for beef has the potential to cause a residue. Mistakes can happen, but they can be prevented with a strong system of treatment protocols, record keeping, and precautionary testing.

Keeping adequate treatment records is required by law to ship milk and to market beef. The required components include the animal ID, drug used, dosage, route, and number of times treated. Consider how long the withdrawal time can be for some of the common residue-causing pharmaceuticals that we discussed. It can be easy to forget exactly which day a cow was treated, or how many times a dose was given after a few weeks have passed. If a beef residue ever occurs, the FDA may ask to examine a farm's treatment records. They also are the legal record.

Developing a treatment protocol tailored for your farm is a great way to ensure drugs are used properly. Protocols ensure consistency of drug use which will work to improve treatment effectiveness, compliance with withdrawal times, and adherence to labeled instructions. Having a protocol also can save money by preventing a drug from being given unnecessarily and reduces the chance that a costly drug residue can occur.

Work with your herd veterinarian to put together a written protocol for the most common sick cow problems such as mastitis, retained placenta, or pneumonia. Farms using a protocol should undergo periodic review with the herd veterinarian to make sure that it still is appropriate and legal, especially when the regulations regarding particular drugs change. If in doubt, it always is a good idea to test a cow before putting her on the truck. Your safest bet is to use caution and keep the cow at home until you are certain she has cleared all residues. 

Medication	Problem caused	Reason	Solution
Penicillin, other antibiotics with long withdrawal times	Residues at slaughter	Higher dose than label instructions causes longer withdrawal time	Follow label instructions and consult veterinarian for withdrawal time if off-label use
Flunixin meglumine	Residues; injection site lesions	Tissue irritation causes scar; longer withdrawal times	Only give flunixin intravenously
Live virus vaccine	Injection site lesions	Tissue irritation	Give injection in neck, subcutaneously, if possible
Many medications can cause problems at slaughter. It is important to take the proper steps to prevent injection site lesions and drug residues in beef.			

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