RESIDUES IN MILK AFTER THE USE OF HEALTH TREATMENTS

Nicole Neeser, DVM
Minnesota Department of Agriculture
St. Paul, Minnesota, USA

Summary

Despite all of the efforts placed on disease prevention in milking flocks, some sheep will still get sick and require some sort of treatment. In many cases, this treatment involves using drugs which may create residues in the milk during and after administration. The regulations for drug residues and the use of drugs in food animals can be difficult to understand at times. However, dairy sheep producers need to adhere to drug residue guidelines and requirements just as dairy cattle or goat producers do. Avoiding residues is important for maintaining the quality and flavor of the resulting products as well as for preventing health problems in humans consuming these products.

Residues

Drug residues are residual drugs that are found in the milk or meat of an animal during and after treatment. The presence of residues in milk can be problematic for human health in multiple ways. Originally, the primary reason for eliminating drug residues from milk was to prevent severe reactions in humans that might be allergic to the drug. Beta lactams (Penicillin like drugs) were the drugs that were of primary concern. Although these reactions do not commonly occur, their severe consequences warrant significant attention.

Recently, more attention has been focused on antibiotic resistance in human pathogens caused by the use of drugs in food producing animals. Indirectly, residues in the milk or meat may select for resistant bacterial populations which may eventually transfer their resistance genes to human bacterial pathogens. While residues do not necessarily cause resistance, it is important to understand that they may be related in some situations. This issue has raised the public's awareness of treating food producing animals with antibiotics and many groups perceive this to be an unacceptable practice. By working to prevent drug residues, sheep producers can protect the natural and wholesome image of the products made from sheep's milk.

Other factors make antibiotic residues undesirable in sheep's milk. Some residues can create an off-flavor in the milk or subsequent products. Residues may also interfere with the normal production process for some cheeses by inhibiting or killing bacteria necessary for the cheese production. Although these interruptions in production can be overcome, the presence of antibiotic residues in sheep's milk gives consumers the perception that products made from this milk are tainted and ultimately harmful.

The presence of drug residues is also highly scrutinized by regulatory authorities. All milk producers are required to adhere to the Pasteurized Milk Ordinance regardless of

whether they produce cow's milk, goat milk or sheep milk. This is the regulation that describes antibiotic testing requirements designed to prevent antibiotic residues from entering the food chain. Each load of raw milk must be tested for the presence of antibiotic residues prior to its use in any product intended for human consumption. If a positive test occurs, that load of milk and any milk it has been mixed with must be discarded or diverted for use in an approved manner. Often, this results in disposing of the milk in a manure pit and a significant financial loss for the milk producer.

Although drug residues could be completely avoided by eliminating use of drugs during lactation, every sheep producer will find a need to use some drugs, whether they are antibiotics or other kinds of drugs, such as antiparasitics (treat internal and external parasites) at some point. Using these agents is acceptable provided the milk is withheld from sale for use in the human food chain for an adequate amount of time (milk withholding time). On the surface, this seems easy; however, very few drugs have an approved milk withholding time specified for sheep. Most milk withholding times are specified only for dairy cattle and cannot necessarily be translated into the same time for sheep. Nevertheless, dairy sheep producers have the same responsibility as other milk producers have to keep the milk they produce free from antibiotics.

One antibiotic is available and labeled to treat milking sheep. This drug has no meat or milk withdrawal time: Naxcel™. Provided this drug is used according to label instructions (1 to 2 mL/100 pounds once a day intramuscularly), no milk residues are created during or after its use. Naxcel™ is labeled to treat pneumonia in sheep. A prescription from a veterinarian is required to obtain this drug; however, dairy sheep producers can be confident they are producing milk free from residues when they choose this drug. In cattle, a residue has never been detected when this drug has been used according to label directions.

Antibiotics are usually the drugs most residue violations result from, however, as a sheep producer you must also be aware of residues created from other commonly used drugs, such as those used to treat parasites. In the U.S., there are no antiparasitic drugs that have an approved milk withdrawal for sheep. It is best to use caution and avoid treating sheep while they are in the milking string. Rather, utilize preventive treatments for internal and external parasites prior to lactation and after the ewe has been dried off.

Very little information is readily available regarding appropriate milk withdrawal times in sheep for other drugs. In fact, very few drugs are even approved for sheep in the U.S. which severely limits treatment choices for dairy sheep producers. While some drugs are labeled to treat sheep for specific conditions, these drugs do not have a milk withdrawal time specified for sheep. As a result, sheep producers must work closely with their veterinarians to establish safe milk and meat withdrawal times for drugs they choose to use.

Veterinarians are allowed to prescribe some drugs in an extralabel manner when other drugs are not labeled for use through AMDUCA (Animal Medicinal Drug Use Clarification Act). Extralabel use is any use of a drug that is different than what the drug

is approved for. For example, changes in use specified on the label in dose, duration of treatment, route of administration, or species are extralabel uses of specific drugs and must be prescribed by a veterinarian. Veterinarians can obtain recommendations on the appropriate drug withdrawal time for some drugs from the Food Animal Residue Avoidance Databank (FARAD, www.farad.org).

Through this route, extralabel recommendations for sheep milk withdrawal times have been determined for a few drugs. For instance, the on-label milk withdrawal for cattle treated with oxytetracycline after IV administration is 96 hours. This has been determined to be adequate for sheep as well. For multiple doses or higher doses, 144 hours is recommended. This withdrawal time may not be accurate, however, if the drug was given in another manner, such as subcutaneously.

Even with this database of information, milk withdrawal times are not available for many drugs, especially those that are not antibiotics. Some information on drug withdrawal times is available from other countries that produce more milk from sheep than the U. S. This information can be helpful in estimating withdrawal times. However, beware of using information that cannot be scientifically substantiated. For instance, the British Sheep Dairying Association recommends allowing at least 2 extra days of withdrawal beyond the time recommended for cattle for intramammary antibiotic treatment and at least a 15 day withdrawal for injectable antibiotics (http://www.sheepdairying.com/MemSrv.htm). While these withdrawal periods may be correct for some antibiotics, each drug is metabolized differently, and the time frames needed for withdrawal may be different between drugs. Also, other countries have different drugs that may be labeled for use in sheep that are not approved or labeled for sheep in the U.S. Because of these inconsistencies, it is essential to work with a veterinarian that is familiar with the health and management of the flock and can make these drug treatment recommendations.

Certain drugs are prohibited from use in any food producing animal, including sheep. A few of these drugs may be approved for specific uses, however, uses not indicated on the label (extralabel use) are not allowed. These include some drugs you may have heard of including: chloramphenical, clenbuterol, furazolidone, nitrofurazone, and flouroquinolones like Baytril. In addition, using drugs in the feed in an extralabel manner is also prohibited. These drugs cannot be used in ways in which they were not approved, even with veterinary approval.

Unless you are treating with a drug for which a milk withdrawal time has been determined, utilize milk residue testing to confirm that milk from an individual animal contains a level of drug residue below the required limit. Most tests are not approved for use on individual animals so milk from an individual animal must be combined with milk from negative animals to perform the test correctly. For this reason, it is often more practical to have suspect samples tested at an outside laboratory rather than perform the testing on the farm. Outside laboratories are usually able to test for a wider range of drugs as well. Understand the costs involved in testing for some drug compounds.

Inexpensive tests usually exist for many antibiotics, however, the tests for other compounds such as antiparasitics can be very expensive.

When a sick animal requires treatment, it is important to minimize the chance that any milk from that animal will reach the human food chain. Paying close attention to procedures you use to insure this does not happen can prevent you having to throw milk away due to contamination with a residue. Although residues in the cattle industry happen very infrequently, they often result from inattention to detail and accidentally milking a treated animal into the tank. To prevent this, be sure to visibly identify animals that are treated so anyone who may handle the animal understands that this animal's milk cannot be used.

While avoiding drug residues seems simple on the surface, many issues can make this task difficult when a sick animal requires treatment. As opposed to cattle, the drug arsenal for lactating sheep is limited because many drugs have had little research performed on them to verify proper milk withdrawal times. Despite this, every dairy sheep producer has a responsibility to prevent drug residues. Avoiding residues is of the utmost importance to maintain the image of sheep's milk as a wholesome and healthy product.