

# Safe Disposal of Veterinary Pharmaceuticals

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## Introduction

Pharmaceutical compounds are increasingly being detected at low levels in ground and surface waters. Although environmental concentrations of pharmaceuticals measured to date are far lower than the intended therapeutic doses, there is concern that the potential exists for these chemicals to have an adverse impact on aquatic life and human health. Disposal of pharmaceutical compounds is becoming a complex environmental issue. According to the United States Geological Survey (USGS), little is known about the potential health effects to humans or aquatic organisms exposed to the low levels of most of the chemicals or mixtures commonly found in their studies. But the safety and health of the environment is directly affected by the disposal method, so it is important that we all be responsible when disposing of these products. Presently, the American Veterinary Medical Association (AVMA) does not offer specific guidelines for disposal of pharmaceutical waste, but they do offer an educational video on the subject, available by visiting [www.avma.org](http://www.avma.org) and searching "drug disposal".

## Objectives

The purpose of this guide sheet is to help producers understand the risks associated with improper disposal of veterinary pharmaceuticals and identify environmentally sound disposal methods. After reading this document, a producer should:

- Recognize the potential risks of pharmaceutical products to the environment when not disposed of properly.
- Understand how to properly dispose of unused and expired pharmaceutical products.

## Presence and Risks of Pharmaceutical Compounds in Water

A report by the Toxic Substances Hydrology Program of the United States Geological Survey (USGS) (Kolpin et al., 2002) indicated that water samples collected and analyzed from 139 streams in 30 states during 1999 and 2000 revealed a broad range of chemicals from human and veterinary drugs, among other household, industrial, and agricultural chemicals. In 80 percent of the streams that were sampled, at least one of the 95 targeted chemicals was detected, and often more than one chemical was found. Of the 95 chemicals tested for in the study, 82 were detected at least once. Insect repellents, antibiotics, caffeine, steroids, hormones, and other compounds were among the list of chemicals found in the stream samples. Though research on the impacts of these chemicals on aquatic life is limited, some researchers speculate that individual or mixtures of pharmaceutical chemicals may impact fertility of fish and other aquatic animals and may bioaccumulate in the tissue and blood of aquatic animals. Another issue of growing concern is the contribution of pharmaceuticals in water to the development of antibiotic resistance. In addition to rivers and streams, pharmaceuticals have also been detected in treated drinking water at very low concentrations. Research has not determined the human health effects of exposure to these very low concentrations of pharmaceuticals and the extent of occurrence of pharmaceuticals in drinking water.

## Acceptable Disposal Options

### *Drug Collection Options*

Although no take-back programs aimed specifically at veterinary pharmaceuticals currently exist, a program by the U.S. Department of Justice's Drug Enforcement Administration (DEA) may be accepting of these products. The "National Take-Back Initiative" is sponsored every spring and fall by the DEA and offers citizens an opportunity to safely turn in expired and unwanted medications with no inventory of products and no identification of participants. The program offers resources to law enforcement agencies nationwide who wish to hold a take-back event for waste pharmaceuticals. Locations registered to hold an event are listed on the agency's website at <http://www.deadiversion.usdoj.gov/> in the weeks leading up to the nationally-sponsored take-back days. If events are not currently being sponsored in your area, a request to local law enforcement may generate interest in sponsoring such an event in collaboration with the National Take-Back Initiative.

### *Disposal in Trash*

Throwing medications in the trash can be dangerous since children and pets can find and accidentally consume them. Some municipal or local trash services may offer programs where pharmaceutical products can be dropped off for disposal. Contact your local trash service to inquire about such options in your area. Expired medication is considered hazardous waste, so your local hazardous waste disposal facility may have recommendations for proper disposal.

If no other options exist and the medications must be disposed of in the trash, take precautions to help ensure that the products cannot be accidentally consumed by a person or animal. Liquids can be solidified by mixing them with cat litter, sawdust, or flour. Solid medications can be crushed or dissolved in liquid prior to adding them to cat litter or sawdust to make them unpalatable. These mixtures should be placed in a disposal container that can be sealed. The container can then be placed in a garbage bag for removal with household waste.

### *Returning to a Veterinary Clinic*

Local veterinary clinics may accept unwanted and expired pharmaceutical products for safe disposal, though they are not required to do so. Check with your local clinic for options. Likewise, drug companies may be willing to accept unused, expired medications.

## Steps To Reduce the Amount of Waste

- Only purchase what you need and can use prior to reaching the product's expiration date.
- Refuse samples from your veterinarian if you do not expect to use them.
- Keep track of the livestock medications you have on the farm by keeping them organized so you are not as likely to purchase more than you can use.
- If you have products sitting around that are expired or no longer needed, remember to assess all of your options for disposal before you throw it in the trash.

## Summary

Research is on-going to identify types and concentrations of pharmaceutical compounds in the environment and determine effects on aquatic life and human health. As studies like these continue, current efforts should remain focused on reducing improper disposal of these compounds. Keep livestock medications organized in a central location on the farm to reduce the chance of purchasing more than can be used by the expiration date. If expired and unwanted medications are currently on the farm, check with a local veterinary clinic, waste collection company, or the DEA website shown above for opportunities to safely dispose of these products. If other options are not available, take precautions when disposing of these products in the trash to ensure that people or animals do not consume them.

## References

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