Keeping Livestock and Horses on Small Acreages

Protecting Our Drinking Water, Families and Animals

Fact sheet 1, Small Acreage Livestock and Horse Series, March 2010

Situation

Whether you have a wealth of family experience to draw from or are new to raising livestock and horses, there are always new things to learn and new practices to adopt, particularly when it comes to land management. Many livestock and horse owners in Rhode Island live within residential areas on relatively small parcels of land that are close to neighbors and close to water resources, especially private drinking water wells. They also tend to have different goals and resources compared to larger scale livestock farms. All of these factors pose challenges with managing manure, livestock yards and pastures. Best management practices that reduce pollution risk and protect water resources and health must suit the goals and available resources.

What are the concerns?

Livestock and horse manure. As with human and pet waste, livestock and horse manure contains pathogens and nutrients. They can harm water resources including your own drinking water well or your neighbor's. As rain and snowmelt travel over the land surface and soak down into the groundwater, it can carry pollutants associated with manure and related animal activities.

Photo Courtesy of The University of New Hampshire Cooperative Extension.

Learn to protect

- Your drinking water well
- Animal health and well-being
- The surrounding environment

Be a good steward and a good neighbor…How?

We start with proper:

- Manure storage and recycling
- Livestock yard management
- Pasture Management
- Pond and stream buffers

Do you know?

- One average horse produces about 50 pounds of manure each day or 9 tons of manure each year.

- In the northeast, it takes one to two acres of land to support one average horse or cow. This includes providing feed and safe manure recycling.

Want to learn more?

Read our fact sheet and self-assessment series to learn:

- Proper manure, livestock yard and pasture management
- How to identify potential risks and plan for solutions on your own property

Raising healthy, productive animals goes hand-in-hand with protecting the environment and our family's health – it is all interconnected.

Bacteria and other pathogens such as viruses and parasites can cause disease in both humans and animals. Livestock and horses are especially at risk for continuous parasite infestations when manure, livestock yards and pastures are improperly managed.

Excess nitrogen and phosphorus in surface waters can promote the growth of algae and aquatic weeds and lead to low oxygen levels. This can impact surface waters for many uses including drinking, swimming, fishing, shell fishing and aquatic life. Nitrogen is the nutrient of concern in saltwater such as Narragansett Bay and coastal ponds. Phosphorus is the nutrient of concern in freshwater including drinking water reservoirs.

In addition, elevated nitrate-nitrogen in drinking water can cause health risks in both humans and animals. Federal Drinking Water Standards allow for a maximum of 10 milligrams per liter (parts per million). Elevated nitrate-nitrogen can cause "blue baby syndrome" in which oxygen flow through the bloodstream is inhibited. Infants under six months of age (including women who are nursing and pregnant) are most susceptible. Elevated nitrate-nitrogen can also cause reproductive problems in both humans and animals. Along with total coliform bacteria, it is something that all private well owners should test for annually.

Sediments, manure particles and other organic matter from eroding livestock yards, pastures, cropland and other land areas can also harm surface water quality. When sediments and organic matter are deposited into a surface water, they may destroy aquatic habitats, clog fish gills, and make the water cloudy or turbid. Sediments and organic matter can also contain pollutants, including pathogens, nutrients (especially phosphorus), and some chemicals such as pesticides.

Uncontrolled access to water resources. Many livestock and horse owners rely on streams or ponds to provide animals with drinking water. Animals may also have access to these areas simply due to a lack of fencing. Allowing animals to have uncontrolled access to a surface water or wetland can seriously impact water quality. Animals will trample vegetation along the shoreline, causing erosion, sedimentation and bank instability. The surface water is subject to direct manure and urine deposits and surface runoff from surrounding areas. Animals may also have access to the vicinity of a drinking water well due to limited space or lack of fencing.

Photo courtesy of USDA NRCS.

Understanding the connection between animal numbers and the land needed to support them.

The number of animals that can be supported by the land is based on many factors including the ability to provide feed, water, shelter, safe manure storage and recycling, and animal access to livestock yards and pastures. For planning purposes in the northeast, a general rule of thumb is that it takes one to two acres of land to support one animal unit or 1,000 pounds of live animal weight.

Many small acreage livestock and horse owners do not have the corresponding land, equipment and other resources to raise all of the necessary feed and safely recycle of all the manure produced. This surplus of manure (and nutrients) must be taken to another location that can safely recycle it.

Even if land is ample, improperly managed manure storage areas, livestock yards and pastures, as well as allowing animals to have uncontrolled access to water resources may result in pollution and health risks.

Livestock yards. Livestock yards are typically used for outdoor feeding, handling, exercise and loafing. They are often referred to as corrals, pens, feedlots, paddocks, etc. They are not to be confused with a properly managed pasture that supplies a valuable source of feed. Livestock yards are usually located near a barn or homestead and are usually relatively small in area compared to the number of animals occupying them. Livestock yards tend to be occupied daily for many hours at a time and are also sources of concentrated animal waste. They are often wet and muddy for much of the year and a potential source of continuous parasite infestation for animals. They can cause both animal health and water quality risks.

Refer to our Worksheet 1 *Livestock Yards and Access: Assessing Your Risks* for a minimum recommended area per animal for sizing a livestock yard. This minimum livestock yard area should not be confused with the total land area needed to support one animal unit or 1,000 pounds of live weight (a stocking rate).

Pastures. When properly managed, a typical pasture in the northeast consists of perennial cool season grasses and legumes (such as white clover) that are nutritious and desirable to the grazing animals. They provide some or all of an animal's forage needs during the grazing season which typically occurs during the months of April through October. Pastures need to have rest periods during that time to allow for vegetative re-growth. Many livestock and horse owners confuse pastures with livestock yards. A properly managed livestock yard is actually an important part of good pasture management, because it provides the animals with an outdoor loafing and exercise area when pastures are in need of rest and vegetative re-growth.

Pastures that are over-grazed and improperly managed can contain sparse vegetation, bare spots, and an abundance of undesirable weeds. The desirable pasture plants will have a very low residue height (one inch or less) which weakens the roots and allows for the bare spots, weed invasions and increased surface runoff and soil erosion.

Understanding Animal Units

How much an animal weighs directly relates to the amount of feed it requires and the amount of manure it generates. It is the basis for determining the amount of land that can support a certain number of animals. This is often referred to as a stocking rate.

- One animal unit = 1,000 pounds of live animal weight. One animal unit is roughly equal to:

  1 average horse or beef cow
  Or 5 to10 sheep or goats
  Or 2 to 5 pigs
  Or 250 layer hens

- In the northeast, a general rule of thumb is that one to two acres of land is needed to support one animal unit. This includes providing feed and safe manure recycling.

- One average horse weighs about 1,000 pounds and equals one animal unit. This horse will generate about 9 tons of manure or 24 cubic yards of manure and bedding waste each year.

Your actions can make a difference

Protecting and improving our water resources and health requires each of us to take action. To become a responsible animal owner and land steward, learn about, plan for and adopt the practices that best suit your farm and protect your drinking water, families, and animals.

What are some solutions?

Some basic components of a sound livestock and horse management program should include proper:

- Manure storage and recycling
- Livestock yard management
- Pasture management
- Pond and stream buffers

Refer to our additional fact sheets and self-assessment worksheets for more information. Available on-line in the Publications section at web.uri.edu/safewater

- ☑ Fact sheet 2: *Livestock Yards and Manure Storage Areas on Small Acreages: Protecting Our Drinking Water, Families and Animals*
- ☑ Fact sheet 3: *Pastures, Fencing, and Watering on Small Acreages: Protecting Our Drinking Water, Families and Animals*
- ☑ Fact sheet 4: *Keeping Livestock and Horses on Small Acreages: Assessing Your Risks to Water Resources*
- ☑ Self-assessment worksheet 1: *Livestock Yards and Access: Assessing Your Risks*
- ☑ Self-assessment worksheet 2: *Manure Storage: Assessing Your Risks*

For More Information and Assistance

University of Rhode Island Cooperative Extension Home*A*Syst Program, 401-874-5398, or **web.uri.edu/safewater**

USDA Natural Resources Conservation Service and your local Conservation District, 401-828-1300, **www.ri.nrcs.usda.gov** for assistance with animal waste management, soil maps, and other programs.

Your local government: check for local ordinances and other laws that may apply to raising livestock and horses in your community.

The information in this fact sheet is partially adapted from the following resources:

Bonnie E. Lamb and W. Michael Sullivan. 1993. Horse-Keeping on Small Acreage: Protecting Groundwater and Surface Water. University of Rhode Island College of Resource Development, Department of Natural Resources Science, Cooperative Extension

Good Neighbor Guide For Horse-Keeping: Manure Management. 1990. University of New Hampshire, Cooperative Extension.

Schmidt, J.L. and B.F. Wolfley. 1992. Protecting Groundwater: Managing Livestock On Small Acreage. Washington State University, Cooperative Extension. Publication Number EB1713.

The USDA Natural Resources Conservation Service Agricultural Waste Management Field Handbook and Livestock Waste Facilities Handbook.

This fact sheet originated in April 2005 as part of the University of Rhode Island Cooperative Extension (URI CE) Healthy Landscapes Program and is authored by Holly K. Burdett, Research Associate, URI CE Home*A*Syst Program, Department of Natural Resources Science, and Dr. W. Michael Sullivan, Professor of Agronomy, Department of Plant Sciences, College of the Environment and Life Sciences, University of Rhode Island. This fact sheet was revised in March 2010 by Holly K. Burdett.

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