

Principles of Environmental Stewardship

Most producers are familiar with the benefits of stewardship of our soil resources. Practices such as reduced tillage, contour farming, terracing, and others have produced a dramatic improvement in agriculture’s stewardship of those soil resources.

What stewardship principles apply to the management of manure? Stewardship of air and water resources will be fundamental to the future survival of animal production systems. Several fundamental principles of good stewardship must be considered in the future production of livestock and poultry. With the assistance of Table 1-2, you can complete a review of your operation’s implementation of these principles.

Awareness of environmental risks

The potential impact of an individual operation on the environment varies with animal concentration, weather, terrain, soils, and a host of other conditions. What are the highest risk situations or practices for your livestock/poultry operations? Are you developing plans and investing resources to address the highest risk situations? Identification of critical environmental risks specific to your operation is the starting point of any good stewardship program. This curriculum provides one set of tools for assessing risks, commonly found in Appendixes A and B of individual lessons. Many land-grant university cooperative extension programs and livestock and poultry

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Table 1-2. Environmental stewardship assessment. Check response most appropriate to your livestock or poultry operation to identify areas that may need improvement on your farm.

Stewardship principle	Low risk	Medium risk	High risk	Don't know
"My livestock operation..."	My operation fully attains this stewardship principle.	My operation is progressing toward this stewardship principle.	My operation requires significant changes to achieve this stewardship principle.	
"...has completed an environmental assessment and identified high-priority environmental risks."				
"... does not discharge from buildings or manure storage."				
"...maintains balance in nutrients entering and leaving (as managed products)."				
"...implements a nutrient plan for land application."				
"...is a good neighbor."				
"...complies with all environmental regulations."				
"...considers environmental issues before expansion."				

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commodity groups provide additional excellent resources for assessing environmental risk.

No point source discharge

Livestock and poultry production systems should be managed to allow no discharges to surface water from point sources such as animal housing and storage facilities. The “No Discharge” management standard for animal manure is distinctly different from our management of human waste, which commonly is discharged into surface waters following treatment. To attain this high environmental standard, livestock/poultry operations should be designed and managed to prevent discharges to waters of the state and United States except under the most unusual weather conditions (see Module C, Manure Storage and Treatment).

Minimizing discharges from nonpoint sources (e.g., land application) is also central to good environmental stewardship. Decisions related to timing and site selection of land application should be made to minimize the risk of discharges.

Balance in the use of nutrients

Nitrogen (N) and phosphorus (P) represent a double-edged sword. These are essential nutrients for all life forms but can become water quality contaminants when mismanaged. Livestock and poultry systems must maintain a balance between the nutrients arriving on-farm as purchased feed and fertilizer and the nutrients leaving as managed products (crops, animals, or animal products). An excess of nutrients arriving on farms results in a concentration of those nutrients (see Lesson 2, Whole Farm Nutrient Planning) and an increased risk of environmental losses (e.g., nitrates leaching to groundwater, ammonia volatilizing in the atmosphere, and P in runoff to surface waters).

Nutrient plan for land application

Land application will continue to be the ultimate destination of most manure. A good stewardship program includes a plan for managing manure nutrients in crop production systems. The plan must maintain a balance between nutrient application and crop use as well as minimize the risk of runoff and leaching of nutrients. “Manure...Take Credit” should be the slogan of every producer and advisor managing manure in a cropping program (see Module D, Land Application Nutrient Management).

Be a good neighbor

The byproducts of animal production create several potential nuisances (including odors, flies, noise, and others) in rural communities. A producer must be fully aware of these potential problems and the degree of concern they cause neighbors. Where reasonable technologies and management strategies are available to reduce or eliminate these nuisances, such strategies should be implemented (see Module E, Outdoor Air Quality). Where such options do not exist, producers may need to consider alternatives for offsetting these nuisances.

Know the rules

Good stewardship requires knowledge of and compliance with current regulatory requirements as established by federal, state, and local governments

(Appendix B in most lessons). Most regulatory standards establish a **minimum** standard for environmental management. Knowledge of those rules and careful planning of manure management systems to attain those standards is essential. However, good stewardship often will require higher standards.

Expansion without environmental compromise

Concentration of livestock has allowed many producers to remain economically competitive. However, animal concentration also increases the concentration of nutrients, pathogens, odors, and other potential environmental concerns. Livestock expansion should occur only in areas where

- a beneficial end use of manure nutrients is available,
- separation distances and/or environmental strategies exist for maintaining quality of life for neighbors, and
- no high-risk, site-specific situations exist.

As you review these principles of good stewardship, it is important to recognize two fundamental differences between managing the byproducts of animal production and human waste. These differences impact why manure and human waste are managed in fundamentally different ways.

- (1) Animal manure and other byproducts have substantially greater “pollution strength” (concentration of organic compounds and nutrients) than human waste. Human waste has similar characteristics to animal manure, but it is diluted with very large quantities of clean water. For this reason, many of the conventional treatment processes used in municipal waste treatment cannot successfully treat animal manure to acceptable levels for discharge or would be cost prohibitive. As a result, the stewardship principles of no discharge, nutrient planning for land application, and knowing the rules are critical to the

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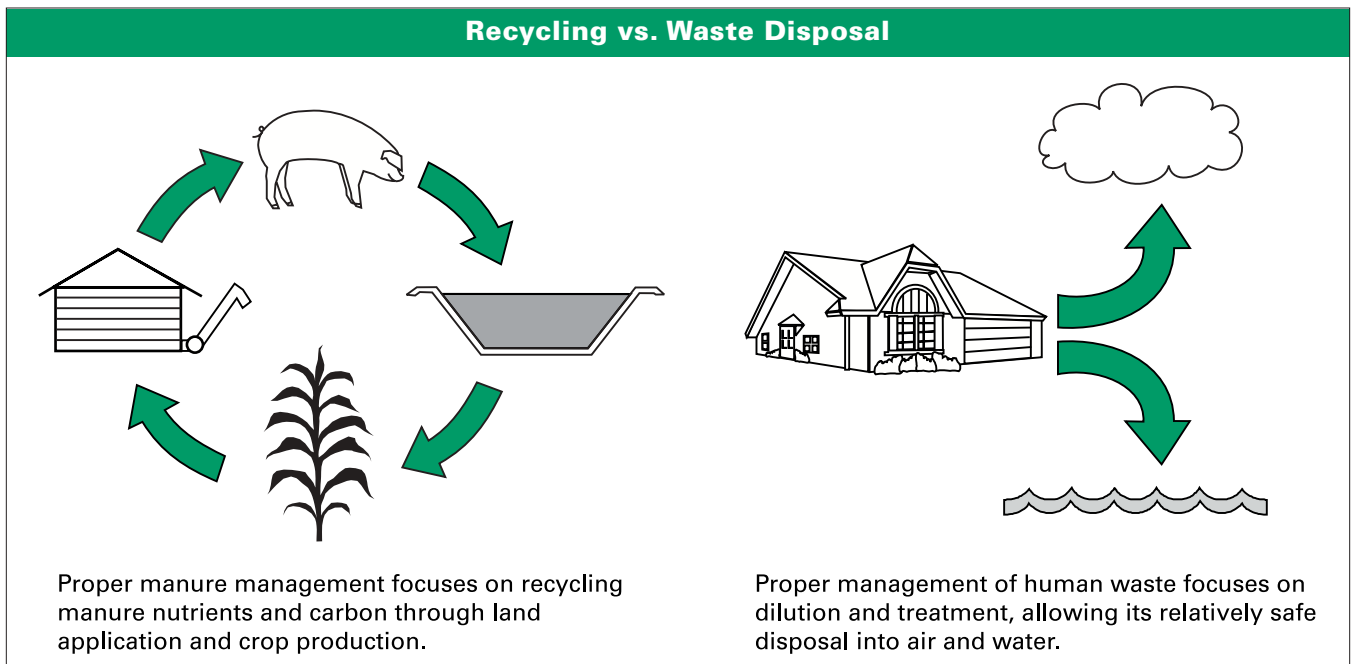


Figure 1-1. Manure management systems focus on recycling of carbon and nutrients while human waste systems focus on disposal.

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- (2) Biological, chemical, and physical processes occurring in the soil provide the primary treatment of livestock manure (Figure 1-1). Soil provides the opportunity for recycling nutrients, using carbon to improve soil quality, and filtering or treating pathogens. Typically, almost no recycling of nutrients and carbon occurs with human waste. If nutrients and carbon are successfully recycled, the benefits to soil quality, conservation of energy (N fertilizers are energy intensive), and reduction in use of resources with limited supplies (P fertilizers) can be substantial. However, livestock producers must recognize and operate within the recycling limitation of soil and cropping systems.