Managing Animals to Avoid Negative Impacts

Lesson Description

Caring for animals humanely requires a great deal of specialized knowledge about animals' needs. These needs include adequate food, water, and healthcare. Basic knowledge will help the animal owner establish a more efficient management system that will cut down on time and costs spent caring for them. These aspects of animal care are often in the forefront of owners minds. However, other aspects of animal care also need to be addressed, including manure management and mud reduction. Considering methods to control and manage both provide a more healthful environment for your animals, thus reducing costs of feed and healthcare.

Lesson Objectives

1. Understand the impacts animals can make on your property and how to avoid these impacts.
2. Learn about methods to reduce and control mud.
3. Develop a manure management strategy.
4. Gain valuable knowledge about composting manure.
5. Evaluate how well their properties meet animal needs.

Module 6, Lesson 2

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Handouts

1. Livestock Manure Production Tables Information Sheet
2. Manure and Nutrient Quantity Calculation Activity Sheet

Supplemental Resources

Manure Management - WSU Clark County Extension

Alternative Bedding - Snohomish Conservation District

Manure Storage and Compost Facilities - Washington County Soil and Water Conservation District

Fertilizing with Manure - WSU Extension

Sacrifice Areas – WSU Clark County Extension

Improving Drainage – WSU Clark County Extension

Rain Barrels & Rain Gardens – WSU Clark County Extension

Managing Small Acreage Horse Farms – OSU Extension

Homework assignment

1. Complete the Manure Production Activity Sheet for your animals, using the Livestock Manure Production Tables Information Sheet.
2. Calculate the size of manure storage needed based on your animals
3. Inventory areas of your property where mud is a problem, and identify at least one method to control mud in each area.

Livestock Manure Production Tables Information Sheet

Manure Production

Animal species and condition*	Dry Manure Production Values – As Excreted					
	N lb/day	P_2O_5 lb/day	K_2O lb/day	Volume cu ft/d	Weight lb/day	Percent Moisture
Beef (Cow)	0.33	0.27	0.31	1.02	63	88
Beef (Yearling)	0.30	0.23	0.24	0.89	55	87
Dairy (Dry)	0.36	0.11	0.28	1.32	82	88
Dairy (Lactating)	0.45	0.16	0.31	1.29	80	88
Ducks	0.70	0.69	0.60	0.73	46	75
Goats	0.45	0.11	0.31	0.63	40	75
Heifers	0.31	0.09	0.29	1.37	85	89
Horses	0.28	0.11	0.23	0.81	50	78
Poultry (Layer)	0.83	0.71	0.41	0.96	61	75
Sheep	0.45	0.16	0.36	0.63	40	75
Swine (Gestating)	0.19	0.14	0.15	0.44	27	91
Swine (Growing)	0.42	0.37	0.27	1.02	63	90
Turkeys	0.74	0.64	0.34	0.69	44	75

*Each figure based on 1,000-pound body weight.

Adapted from Agricultural Waste Management Field Handbook (210-AWMFH) 1992. USDA – National Engineering Handbook, Chapter 4, p. 8-17.

Characteristics of Bedding Materials

Bedding material	Bedding (lbs/cu ft)	Mixed* (lbs/cu ft)	Moisture (percent)
Compost	30	15	20-60
Cornstalks (shredded)	5	11	10-20
Legume hay (chopped)	7	13	10-15
Legume hay (loose)	4	9	10-15
Nonlegume hay (chopped)	6	12	10-15
Nonlegume hay (loose)	4	8	10-15
Sand	105	105	15-30
Sawdust	11	16	10-20
Soil	75	75	15-50
Straw (baled)	5	9	5-15
Straw (chopped)	7	14	5-15
Straw (loose)	3	5	5-15
Straw-oats (baled)	8	19	5-15
Straw-wheat (baled)	6	13	5-15
Wood chips/shavings	9	18	10-20

*Weight of bedding when mixed with manure.

Manure and Nutrient Quantity Calculation Activity Sheet, page 1 of 2

1. Animal species and daily volume and weight of manure produced:

Animal species	Volume (cu ft/day)	Weight (lb/day)
Total daily accumulation		

1a. Multiply the total daily volume and total daily weight by the number of days the animal's manure will be collected. Note that this is only manure generated by the animals. Bedding material, if used, will add to these values.

Total volume (cu ft) = _____ days X _____ total daily accumulation

Total weight (lbs) = _____ days X _____ total daily accumulation

2. Calculate the amount of nutrients present in the manure. Manure test data provides more accurate measurements, but the values in the handout provide a reasonable estimate.

Animal species	N (lb/day)	P_2O_5 (lb/day)	K_2O (lb/day)
Total daily accumulation			

Manure and Nutrient Quantity Calculation Activity Sheet, page 2 of 2

2a. Multiply the total daily nutrient accumulations by the number of days the animal's manure will be collected. Note that this is only manure generated by the animals. Nutrients from bedding material, if used, will add to these values.

Total N (lbs) = _____ days X _____ total daily accumulation

Total P_2O_5 (lbs) = _____ days X _____ total daily accumulation

Total K_2O (lbs) = _____ days X _____ total daily accumulation

Total nutrients will be reduced due to losses that occur from management practices. However, these values represent an estimated fertilizer value for the manure, which may be used on your pastures, gardens, etc.

Managing Animals Website Resources

Manure as a Resource, WSU Puyallup, http://puyallup.wsu.edu/soils/manure/

Shady Springs Farm, Equine Winter Turnout Project
http://www.shadyspringsfarm.com/paddockdesign.html

Equine Resources, Penn State Extension, http://extension.psu.edu/animals/equine

Clark Conservation District, http://www.clarkcd.org/manure-spreader/

Building a compost bin out of pallets, http://www.instructables.com/id/Pallet-Compost-Bin/

Pelleted Bedding Demonstration from University of Maine, http://umaine.edu/livestock/equine/wood-pellet-bedding/

Benefits of Wood Pelleted Bedding, Alameda County Conservation District,
http://www.acrcd.org/Portals/0/Equine%20Fact%20Sheets/Equine_Pellet_Bedding.pdf

Adjusting C:N ratio in Horse Bedding for Composting, Alameda County Conservation District,
http://www.acrcd.org/Portals/0/Equine%20Fact%20Sheets/Equine_C-N_Ratio.pdf

Economics of Composting. Alameda County Conservation District,
http://www.acrcd.org/Portals/0/Equine%20Fact%20Sheets/Equine_Manure_Economics.pdf

Compost, WSU CAHNRS, http://csanr.wsu.edu/compost/

Composting, WSU Small Farms Team, http://smallfarms.wsu.edu/soils-compost/composting.html

Animal Waste Management, Washington Department of Ecology,
http://www.ecy.wa.gov/programs/wq/wqguide/animals.html

Compost & Healthy Soil, Washington Department of Ecology,
http://www.ecy.wa.gov/programs/swfa/organics/soil.html