Managing Manure from Domestic Animals to Avoid Negative Impacts

Developed by:

Holly George, University of California Cooperative Extension

Susan Kocher, University of California Cooperative Extension

Bruce Miller, Utah State University

Melody Hefner, University of Nevada Cooperative Extension

With Contributions From:

Cinda Williams, University of Idaho

Living On the Land

We’ll be covering:

- Negative impacts domestic animals can have on land.
- We’ll focus mostly on impacts from manure and how these impacts can be avoided and minimized.


What impacts can animals cause?
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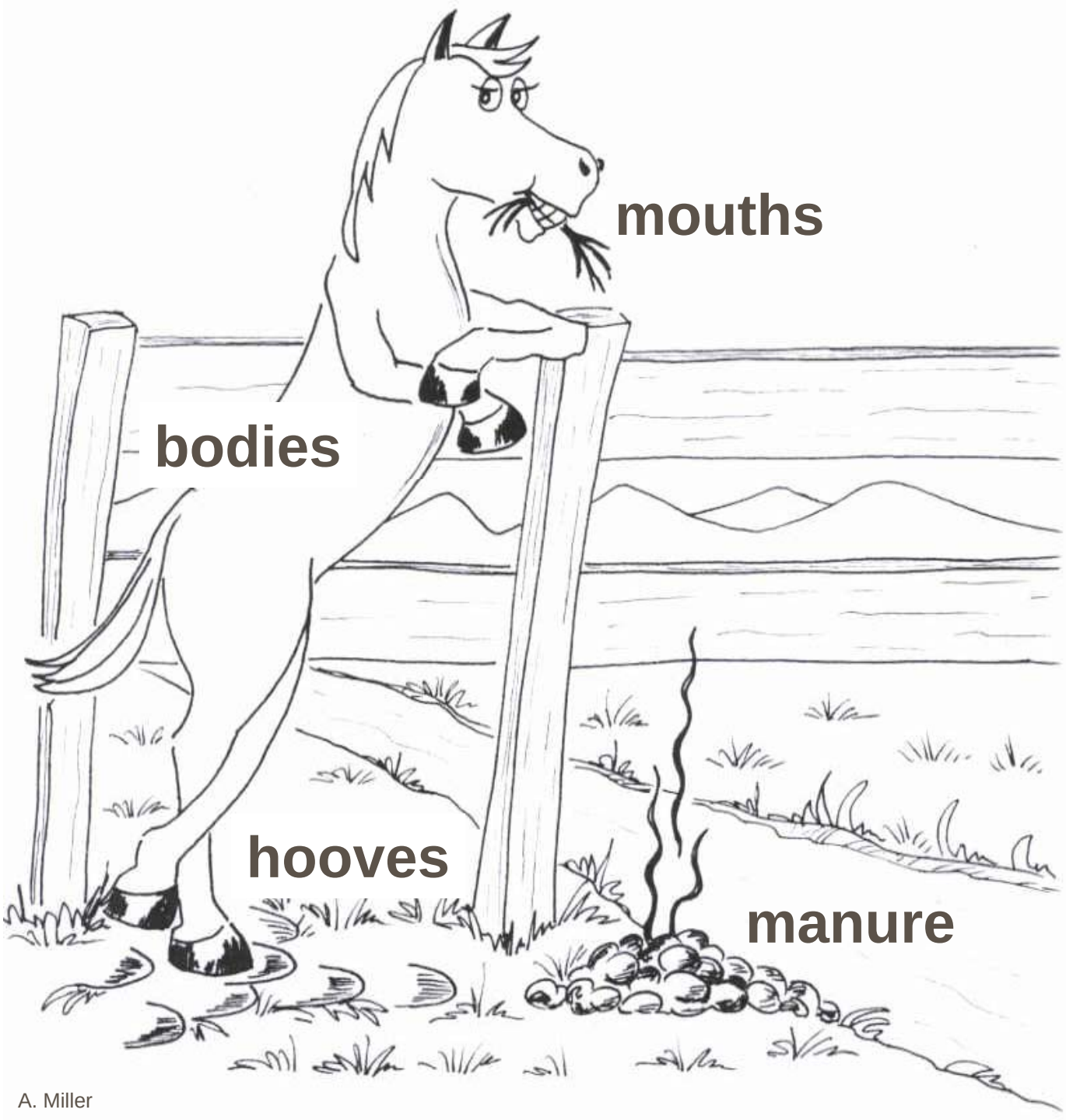

A. Miller

What parts of animals cause impacts?

Impacts from hooves

- On pastures
  - Compaction
  - Trails
  - Reduced productivity
- On stream banks
  - Trampling
  - Erosion
  - Pollution

Impacts from mouths

- Overgrazing plants can weaken their root structure, plants don't recover
- Pasture productivity decreases
- Soil erosion increases

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Impacts from bodies

- Objects in the pasture are damaged
  - Trees, posts, irrigation works, fences
- Weed seeds and pests are transported

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Impacts from manure

- Polluted runoff
- Odor
- Dust
- Insects and parasites

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How to avoid impacts?

- Good grazing management avoids hoof and mouth impacts
- Good facility design avoids animal body impacts

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Good manure management

- Keeps livestock healthy
- Returns nutrients to the soil
- Improves pastures and gardens
- Protects the environment

Poor manure management

- Livestock get sick
- Unsanitary conditions
- Complaints from neighbors
- Increased insect and parasite populations
- Harms environment


USU, Logan, UT

How much manure do animals produce?

- **Example:**
  How much manure will be produced by two horses in a small stable for three months in the winter.

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Horse manure production

- 2 horses, 1000 pounds each
  - WEIGHT: 50 lbs/day x 2 = 100 pounds
  - VOLUME: .81 cubic feet/day
- WEIGHT: 50 lbs/day x 30 days/month x 3 months = 4500 pounds of manure
- VOLUME: 0.81 cu ft/day x 30 days/month x 3 months = 73 cubic feet of manure

How much manure will your animals produce?

Animal	Volume cu ft/day	Weight lbs/day	Moisture percent
Beef	1.02	63	88
Ducks	0.73	46	75
Goats	0.63	40	75
Horse	0.81	50	78
Sheep	0.63	40	75

Nutrient value of manures

Animal	N lbs/ton	P_2O_5 lbs/ton	K_2O lbs/ton
Beef	11.3	8.4	9.5
Chicken	27.3	23.5	13.2
Goat	22.0	5.4	15.1
Horse	12.1	4.6	9.0
Sheep	22.5	7.6	19.5

Manure can be a resource

- Livestock remove nutrients from land while grazing
- Returning manure to soil promotes soil fertility and plant growth
- Important nutrients
  - Nitrogen (N)
  - Potassium (K or K2O)
  - Phosphorus (P2O5)

www.senecaway.com/compost.htm

Can I use all my manure?

- How much will you have?
- Where can you safely store or compost it?
- Where can you safely incorporate it in or on your property?

whatcom.wsu.edu/ag/compost

How much manure is enough?

- To provide annual phosphorus needs for a one acre pasture:
  - one 1000-pound cow
  - one 1400-pound horse
  - three market (150-pounds) hogs
  - twelve 100-pound sheep
  - 225 laying hens

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Effective management depends on

- Collection
- Storage
- Application
- Removal

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Manure collects in:

- Pasture
- Cages
- Bedded stall or barn
- Dry lots/confinement areas, paddocks, corrals or other "sacrifice areas"

Pasture collection

- Requires the least amount of effort
- Natural weathering reduces volume up to 60 percent
- Nutrients are directly recycled
- May require occasional dragging of pasture to break up and distribute the manure

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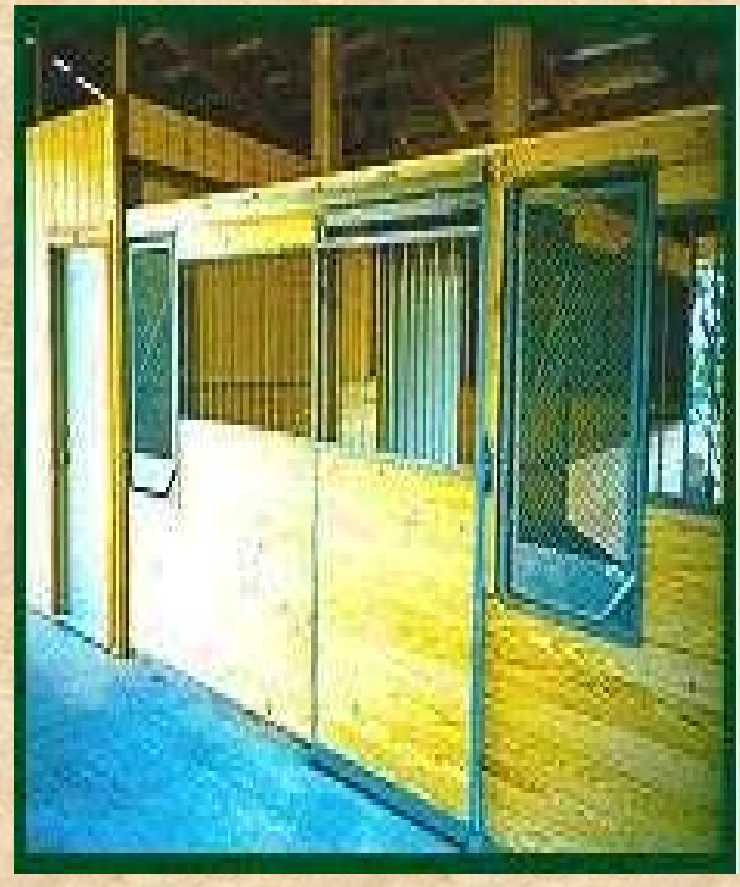
Cage collection

- Small animals like rabbits, fur animals and poultry/birds
- Manure drops through cage and is removed
- Waste includes bedding material such as straw or wood shavings

www.rockingranch.com

Bedded stall or barn

- Horses, cattle, swine, and poultry
- Manure and soiled bedding are removed by manual cleaning



www.nationalhorsestalls.com


Dry lots, corrals or other confinement areas
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Manure storage considerations

- Distance from streams, ponds, wells
- Prevailing wind direction
- Slope of ground
- Soil type

Manure storage - avoiding runoff

- Install buffer strips
  - Vegetated area between storage and stream
- Install berms or ditches
  - Prevents water from entering or leaving storage area

Composting

- Reduces volume
- Kills parasites
- Reduces weed seeds
- Reduces odor
- Provides slow release fertilizer
- Provides soil amendment

Composting requirements

- Oxygen
- Moisture
- Correct carbon to nitrogen ratio (30:1)
- Temperature (120-160 F)

www.nhq.nrcs.usda.gov

What do I do with the manure?

- Apply it to your property
- Arrange with gardeners, landscapers, or farmers to remove it
  - most interested in composted manure
- Haul it yourself
  - most expensive
- Landfilling (bury on your property)
  - not recommended, expensive and potential for runoff increases

Tips for safe manure/compost application

- Minimum of 100 feet from water source (if flat ground)
- Away from natural drainages
- Incorporate as soon as possible

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Tips for safe manure/compost application

- Monitor soil's nitrogen content to avoid overapplication
- Complete the composting process to prevent spreading weed seeds
- Consider seasonal conditions – winter, wet conditions, etc.

The bottom line (no pun intended)

- Manage manure to maintain healthy animals and healthy land
- Applying manure to your property increases the nutrient value and organic content of your soil