$ $ $ N312 Waste Management System $ $ $

Are you tired of slop, mud and wasted hay around your bale rings? Then a beef waste management system could be for you. These management buildings are designed for capturing as much manure as possible so it can be spread evenly on pasture and/or crop ground. In the publication *How Feeding –site Mud and Temperature Affect Animal Performance* published by Kansas State University it has research about the percent of potential loss of gain of beef feeders in the depth of mud they are standing in. Also in "Cattle Today" there is an article titled *Mud can be an Enemy to Cattle's Health* by Heather Smith Thomas and it talks about problems for calves if they are delivered in mud. Cost share is available for different type waste management facilities, including Beef, Dairy, Swine, and Poultry. Please call the office for more information or if you are interested in this type of system.

One example is a N312 Beef waste management

Manage and store animal waste from beef production to prevent or minimize degradation of soil and water resources. Such systems are planned to preclude discharge of pollutants to surface or groundwater and to recycle nutrients through correct application to pasture or crop lands. At no time can hay, equipment, or other materials be stored in the structure. Structure must be maintained for 10 years.

Cost-share funds authorized for:

A. 75% cost-share
   1. Concrete floor space utilized to store dry waste from feeding area
   2. Roof to cover manure storage area. Square footage of the roofing must equal the square footage of the manure storage floor space.
   3. 4 foot concrete wall necessary to enclose dry storage area.
   4. 8 inch concrete curb along 3 sides of feeding area.

B. 50 % cost-share
   1. Concrete feeding area floor space.
   2. Roof to cover feeding area. Square footage of the roofing must equal the square footage of the feeding floor space.
   3. Gravel/geotextile mat for heavy use area as determined by NRCS Engineer.

C. Critical area grading and seeding of areas around building as determined by NRCS Engineer.

Cost-share funds not authorized for:

A. Costs incurred to develop or implement a Comprehensive Nutrient Management Plan (CNMP) which must be completed prior to receiving cost share.
B. Concrete floor space utilized by bedding, bunks, waterers, and hay rings. Square footage of the roofing must equal the square footage of bedding, bunk, waterer, and hay ring floor space.
C. Any components above what is necessary for the number of animals at the time of application.
D. Isolated structures not considered a component of a waste management system.
E. Mobile agitation, pumping, and related equipment.
F. Permitted animal waste systems.

How Feeding-Site Mud and Temperature Affect Animal Performance

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The use of temporary feeding sites during winter and early spring to supply feed and/or water to livestock is a common livestock management practice. When selecting a location, producers should be aware of how these sites affect environmental and animal performance. Animal growth performance can be greatly affected by improper site selection and management. This publication highlights issues producers should evaluate when selecting a winter feeding site and describes how these factors affect animal performance.

Effects of Mud on Animal Performance

Winter feeding sites can become muddy quickly when animals are active after moisture falls. Research is clear on the negative effect of muddy conditions on animal performance.

- Bond et al. (1970) reported that mud reduced daily gains of animals by 25 to 37 percent and increased the amount of feed required per pound of gain by 20 to 33 percent.
- The National Research Council (1981) reports that small amounts of mud (4 to 8 inches deep) can reduce feed intake of animals by 5 to 15 percent, while larger amounts of mud (12 to 24 inches deep) can decrease feed intake by up to 15 to 30 percent.
- The University of Nebraska has estimated the effect of mud on animal performance based on temperature conditions in the range of 21 to 39°F. (*Table 1*)
- Smith (1971) also reported that animals in areas of muddy conditions have an increased need for energy to maintain their maintenance requirement. *(Table 2)*

Table 1. Risk potential caused by mud, 21 to 39°F [a]

Mud Depth	Potential Loss of Gain
No mud	0%
Dewclaw deep	7%
Shin Deep	14%
Below hock	21%
Hock deep	28%
Belly deep	35%

[a] Beef Feeder, University of Nebraska, August 1991.

Table 2. Estimated effect of mud on net energy needed for maintenance requirements[a]

Lot condition	Multiplier for NEm[b]
Outside lot with frequent deep mud	1.30
Outside lot, well mounded, bedded during adverse (chill stress) weather	1.10
No mud, shade, good ventilation, no chill stress	1.00

[a] Smith, 1971.
[b] Net Energy for Maintenance.

Effects of Climate on Animal Performance

The relationship between animals and their thermal environments can be described by determining the thermoneutral zone. This is the range in effective ambient temperature where rate and efficiency of performance in animals is maximized. For healthy cattle, this is approximately 23 to 77°F (Hahn,
1999). When the temperature falls below an animal's lower critical temperature or rises above the upper critical temperature,the animal must use more energy to keep warm or cool. Also, as temperatures rise above or fall below the thermoneutral zone, animal bunching may occur, which can reduce or eliminate vegetative cover. A wet hair coat is the most important factor in determining an animal's lower critical temperature. Brownson and Ames (1985) estimate that a steer may experience cold stress at 32°F with a dry winter coat, but this may change to 60°F if the animal's coat is wet. *(Table 3)*

Table 3. Estimated lower critical temperatures for cattle with varying hair coats[a]

Hair Coat	Feed Level	Lower Critical Temperature (°F)
Summer coat or wet	Maintenance	60
Fall coat	Maintenance	45
Winter coat	Maintenance	32
Heavy winter coat	Maintenance	19

[a] Brownson and Ames, 1985.

Weather Protection

Climatic variation is a large component in determining the comfort level of cattle. A seven-year study by Hoffman and Self (1970) reported that cattle given access to shelter during winter months had the following benefits:

- Increased gain by 15 percent.
- Improved feed efficiency by 11 percent.

Summary

Livestock producers should make management decisions to minimize animal exposure to mud and provide protection from adverse weather conditions to maximize animal performance.

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