

Watering Facility Design

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Determining Need

- How Much? Intake is covered by the previous webinar on livestock watering systems as well as what Bill covered today.
- How Fast? Covered by the previous webinar.
- Under what climatic conditions? The Thermal Heat Index is covered by the previous webinar on livestock watering systems, we will touch on it today.
- Animal Behavior Impacts?

Livestock Watering Behavior Facts

- Very Few Scientific Trial Results published on this subject
- Very Little Information on Any Livestock besides Cattle
- More Scientific Data on Dairy Than Beef
- All Cattle - About 2/3 of their body is Water-It is **Essential! True of most livestock.**

All Sources and Climate Must Be Considered

- Water Intake for Grazing Livestock should be credited by the water (as high as 80%) in the grazed forages in high precipitation periods of the grazing season.
- Other sources (at the barn/parlor/yarding area) should be included when calculating the water supplied to the animals when designing the tank size.

All Sources and Climate Must Be Considered

- When Livestock are expected to be in 'Moderate Heat Stress' THI (or Higher) for a only a few days of the total grazing season, a contingency plan of action should be followed for those few days. For example, we do not recommend sizing the tank for only 1% of the grazing season - MI example.

All Sources and Climate Must Be Considered

- Livestock are in 'Light to Moderate Heat Stress THI (or Higher) for 15%+ of GS (KO Guess), High Water Intake Rates should be used in the tank designs. (Ex. AL- 25%)

All Sources and Climate Must Be Considered

- So Where's the Line!? Kevin Ogles estimate only- around the 41⁰N Latitude line, Appalachian Mountains and elevation affect as well.

Cattle Watering Behavior Facts

- 2% to 5% of the herd will come at a time to drink if the water source is within this distance – Note: shade, minerals, salt, topography factors.
- >10% of herd (25% or more) will come when the distance is greater than this
- This factor has a strong impact on properly sizing the tank/trough.

Cattle Watering Behavior Facts

- They drink 1 to 2 gallons per minute
- They drink for 2 to 3 minutes per drinking event
- So they can drink 6 gallons per drinking event per animal maximum

Cattle Watering Behavior Facts

- Cattle will need 24 – 30 inches of ‘head’ space on a linear tank based on 5% of the herd watering at once.
- They need 18 to 24 inches on a circular tank
- Prefer moderate temperatures of water (63 – 82 ° F) instead of very cold or very hot
- Depth of at least 3 inches – prefer to put muzzle 1 to 2 inches in the water to drink
- Optimal height of tanks - 24 to 32 inches

Table 5.1 Daily water intake of dairy heifers under various temperature conditions.

Air temp. (degrees F)	lb water/ lb TDN	lb TDN/ day	gal water/ day
35	4.7	10.3	5.8
50	5.2	9.2	5.7
70	7.2	9.2	7.9
80	9.0	8.8	9.5
90	22.2	6.6	17.6
95	24.8	6.4	19.0



Wildlife Concerns in NRCS designed Watering Facilities (614):

- 1. Criteria:** Incorporate escape features into the watering facility design unless local knowledge and experience indicate that wildlife will not be at risk of drowning.
- 2. Considerations:** Design fences associated with the watering facilities to allow safe access and exit for area wildlife species. To protect bats and other species that access water by skimming across the surface, fencing material should not extend across the water surface. If fencing across the water is necessary it should be made highly visible by avoiding the use of single wire fences and using fencing materials such as woven wire or by adding streamers or coverings on the fence.
- 3. West vs. East discussion.**

Wildlife Concerns in NRCS designed Watering Facilities:

1. Allowing an escape for wildlife that fall into the tank.
2. Try to not hinder wildlife that drink by skimming surface water – bats, some birds, etc. by our design as part of the grazing system.

Obstruction Removal above the watering facility's surface:

1. Fencing materials – wires, boards, etc. shall not be within 36 inches above the planned water surface anywhere above the tank
2. Arrange fence lines or tank so there are no obstructions above the water surface but one trough/tank can serve two different livestock grazing areas.



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122
100 Gallon
378 Liter
Rubbermaid





Watering Facilities Design For Grazing Systems

- Things to Avoid



“Hold up, Niles. It says here, ‘These little fish have been known to skeletonize a cow in less than two minutes.’ ... Now *there’s* a vivid thought.”



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Consequences of Livestock staying too long in a paddock

Spend disproportionate amount of time there

- Concentrated hoof traffic
 - Soil compaction
 - Denuding forage
 - Runoff to stream



Quick Rotation Disperses Impacts



- Certain blue-green algae can have deleterious health consequences on livestock







Questions

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