

WATER, HEAT STRESS, AND DROUGHT

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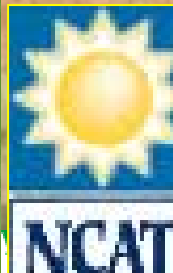


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Livestock Water Use Criteria

- **Animal characteristics**
 - Animal species and breed
 - Animal size
 - Animal age and condition
- **Pasture conditions**
 - Forage type and condition
 - Distance to water
- **Environmental conditions**
 - Average daily temperature
 - Water quality



Livestock Daily Water Needs

- **1000 lb dairy cow - 30 gallons**
- **Dry beef cow - 22 gallons**
- **Beef cow-calf pair - 20 gallons**
- **600 lb beef heifer – 12 gallons**
- **2000 lb beef bull - 19 gallons**
- **Sheep or goat - 2 gallons**



Goats, Sheep, and Water

- **Sheep and goats can survive longer in drought than cattle**

- Smaller size
- Able to subsist on desert and semi-arid plants
- Many breeds are drought tolerant



- **Multi-species grazing with cattle allows you to better balance pasture resources with herd size**

Water Use by Young Animals

- **Young animals need more water than adults**
- **A greater percentage of young animals' body weight is water**
- **Young animals need to drink more often**
 - They take in less water at a time
 - They have a more rapid metabolism



Forages and Water Needs

- **Lush forages decrease livestock water needs**
 - They contain 75-80% moisture
 - Livestock can get some of their water from this lush forage
- **Dry forages increase livestock water needs**
 - Hay and dry feed contains only 10-12% moisture
 - Animals need water to digest and move dry, fibrous feed through their gut



Ensure Animals Have Water

- **Conserve water in tanks**
 - Fill tanks using animal-activated valves
 - Decrease evaporation by having tanks partially covered
- **Save or bring in water**
 - Collect water in advance of drought
 - Use trucks or solar pumps to bring in additional water
- **Lease additional land with access to water**
- **Reduce herd size to reduce water need**



Distance to Water

- **Sheep and cattle can forage up to 3 miles from water points**
- **Animals that need to drink more than once a day cannot forage as far**
 - Pregnant and lactating females
 - Young animals
 - Animals eating dry feed or forages
- **Greater distance to water increases trail formation**



Water Trapping / Collection

- **Trap water in fields with swaths of crop stubble**
 - Swaths should be cut perpendicular to prevailing winds
 - Swaths collect snow in winter, adding meltwater to soil as temperatures warm
- **Water collection structures**
 - Contour ridges
 - Check dams
 - Percolation ponds
 - Holding tanks



Livestock Need Clean Water

- **Improves animal's metabolism**
- **Lowers risk of parasites and diseases**
- **Promotes healthy growth**



Drinking Water Contamination

- **Salinization**
 - Water evaporation in troughs and shallow tanks
 - Water evaporation from ponds in saline soil
- **Toxic blue-green algae grow in nutrient-rich ponds**
- **Parasites**
 - Animals deposit manure in streams and on streambanks
 - High temperatures and stagnant water favor microbial growth



Salt Increases Water Use

- **Salt intake increases animal need and desire for water**
- **Sources of salt in diet**
 - Plants with high salt content, such as saltbrush
 - Saline water
 - Salt and mineral licks



Deanna Wolf/istockphoto

Salt Tolerance

- **Animals with low salt water tolerance**
 - Young animals
 - Pregnant or lactating females
 - Aged or weakened stock
- **Symptoms of high salt intake**
 - Depressed appetite
 - Depressed growth rate
 - Scours



Toxic Blue-Green Algae

- **Risk conditions**

- Stagnant ponds
- Low water flow in streams
- High nutrient levels in water
- Hot, sunny days

- **Prevention**

- Fence off stagnant ponds
- Provide animals with access to clean water



Drought and Riparian Areas

- **Why animal congregate in riparian areas**

- Drinking water
- Seeking shade and breezes
- Grazing on riparian vegetation

- **Riparian degradation by livestock**

- Overgrazing riparian vegetation when upland vegetation is sparse
- Trampling and compacting streambank soil
- Depositing manure in and near streams



Riparian Degradation

- **Impacts of trampling and overgrazing**

- Bare soil
- Increased soil erosion and nutrient loading
- Increased evaporation and lower water table
- Establishment of noxious plant species



- **Degradation of fish and wildlife habitat**

- Loss of food
- Loss of shade and hiding areas

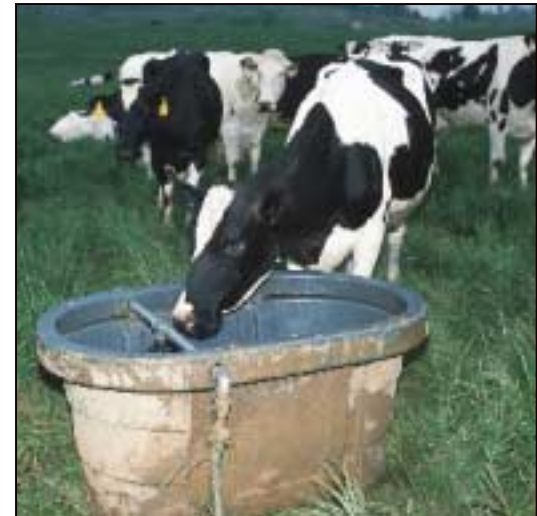
Healthy Riparian Areas

- **Water table level**
 - Height changes little throughout the year
 - Moist soil extends about two channel widths beyond either bank
- **Dense vegetation coverage**
 - Predominantly native plants
 - Diversity of young and mature grasses, forbs, and woody plants
 - Includes plants with deep, strong root systems



Keep Riparian Areas Healthy

- **Keep livestock away from streams and ponds**
 - Pump water from streams into drinking tanks
 - Fence riparian areas
 - Place feed supplements and insect control away from water bodies
- **Manage riparian grazing**
 - Graze only when soils are dry
 - Prevent overgrazing
 - Do not graze when riparian plants are reproducing



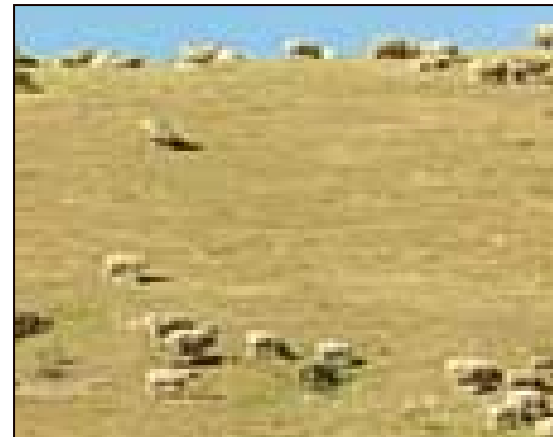
Causes of Heat Stress

- **Environmental conditions**

- High temperature — above 80°F day, 70°F night
- High humidity
- Limited air movement

- **Management factors**

- Limited access to water
- Poor water quality
- Lack of shade, especially for animals with light-colored hair
- Handling or hauling animals in hot weather



Heat Stress Concerns

- **Low feed consumption**
 - Depressed appetite
 - Difficulty digesting dry feed
- **Poor weight gain**
- **Susceptibility to disease**
- **Excessive salt intake**
- **Death**



Keep Animals Cool

- **Provide access to shade**
- **Prevent congregation in windbreaks that prevent air movement**
- **Provide animals in barns or sheds with good ventilation**
- **Provide sprinklers to cool animals**



Heat Stress Management

- **Water and feed management**
 - Provide animals with plenty of clean, fresh, and preferably cool drinking water
 - Provide animals access to salt and minerals
 - Provide additional water to allow effective use of supplements
- **Avoid handling animals during hot weather, such as between 10 a.m. and sundown**



Summary

- **Ensure that animals have access to sufficient clean water**
 - Breed and species determines water consumption
 - Age and health affects grazing distance from water
- **Protect water quality by**
 - Protecting riparian areas
 - Preventing salinity buildup
- **Prevent heat stress by**
 - Providing shade and water
 - Not working animals during hot weather



Stream Protection Benefits

- **Decreased buildup of nutrients, salt, and other contaminants in water**
- **Decreased trampling in streams and ponds**
- **Less manure concentration near water**
- **Streambank vegetation protected**
- **Increased water infiltration and storage in riparian zone**



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