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Sizing Water Supply Systems for Livestock Operations

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A new ground water well needs to be adequately sized and located on a livestock operation. An on-site water supply provided by wells requires that the well(s) have a **minimum 300-foot separation** from all livestock and poultry buildings and manure storage facilities.

Sizing Water Supply

The size of the water supply for a livestock production site needs to be calculated as a daily estimate. The daily estimate helps determine the required water distribution system capabilities and any intermediate water storage requirements.

The primary water uses on a livestock operation include drinking water, supplemental cooling water, and building and/or equipment wash water. Secondary water uses include animal wash water, and worker uses like restroom and shower activities and farm clothes washing. Water supply sizes are typically determined on the primary water uses. The secondary uses can be estimated by adding 5% to 20% to the primary use quantity, depending upon operation size and management preferences. The daily primary water use can be calculated using the water use information given in Table 1 for various types of operations.

Intermediate Water Storage

Intermediate water storage structures have been used to extend low yield water supplies and to provide an available volume of water during periods of high usage. Intermediate water storage should probably be an integral component of the water system for large livestock production units. The main purpose of the storage would be to provide a readily available source of water if flow from the primary water supply should be interrupted. The importance of this readily available volume of water is to maintain production and to ensure the well-being of the animals. Intermediate water storage units should:

- Be designed to provide, as a minimum, storage for one day's water usage at full production. This volume of water storage will provide a minimum time frame to correct a water interruption problem or to arrange for the delivery of water by other means. Required intermediate storage volumes may need to equal the anticipated water usage over a 48-72 hour period. The availability of service personnel and repair parts required to keep the water system operational will be a major factor in determining the intermediate storage volume requirement.

- Be easily accessible for delivery of water from a tanker if this should be necessary.
- Have the capability to be either filled or pumped from while the production facility is operating on stand-by-power.

An intermediate water storage tank may either be located above or below ground depending on particular site-specific conditions and owner preferences. Intermediate storage tanks also provide a readily available source of water for fire protection.

Table 1. Primary Water Uses and Quantities for Various Livestock Operations

Livestock Type	Drinking Water (gallons/animal/day)	Supplemental Cooling Water (gallons/head/day)	Wash Water
Swine			Building Wash Water (gallons/head/day)
Breeding & Gestation	6	1 to 5	0.1
Farrowing	8	20	1
Nursery	1	0 to 2	0.05
Grow-Finish	4	1	0.1
Dairy			Milking Parlor (gallons/cow/day)
Calves	6 to 10		
Heifers	10 to 15		
Dry Cows	20 to 30	8 to 12	
Milking Cows	35 to 50	10 to 15	10 to 50
Beef			
Cow-calf pairs	30 to 35		
Dry cows	30		
Calves	12		
Growing cattle, 400-800/1,200 lbs	12 to 24		
Bred Heifers (800 lbs)	24		
Bulls	30 to 40		
Sheep			
Rams and ewes	2 to 3		
Lambs 5 to 30 lbs 30 – 110 lbs	0.1 to 0.3 1.5		
Goats			
Bucks & Nannies	2 to 3		
Kids	Same as lambs		
Dairy goats	3 gal/goat/day plus 1 added quart of water per pint of milk production		