



Water Systems That Work: A Practical Guide for Beef Producers

Water is an essential nutrient for beef cattle, impacting health, growth, lactation, and reproduction. Therefore, access to high-quality water in adequate quantities is essential. Beef producers should consider individual grazing management strategies, site characteristics, and economics when designing water systems.

There are many options to move water where it's needed—solar, wind, fuel, stream flow, electricity and gravity flow. A well-designed system can improve efficiency, reduce costs and ensure a consistent, reliable water supply, all while supporting the

long-term sustainability of your operation. In addition, selecting the right system for your unique circumstances can greatly impact your cattle's growth, health and the time spent on system monitoring and maintenance.

This resource explores beneficial practices for water management, a list of key questions and considerations to guide decision-making and a list of additional water system resources.

Beneficial Practices for Water Management

While specific approaches depend on water source and local conditions, here are a few key principles for effective water management:

- ✓ **Ensure access to high-quality water.** Regular testing helps maintain clean, safe drinking water, reduces disease risk, and improves performance.
- ✓ **Ensure access to abundant water.** Water needs increase in hot weather and during growth or lactation.
- ✓ **Use water delivery methods that promote intake and sustainability.** Pumping water into troughs, for example, can enhance water consumption and protect sensitive water sources and riparian areas.
- ✓ **Minimize direct access to natural water sources.** Fencing or alternative barriers, such as dense shrubs or strategically placed rocks, help prevent contamination and erosion.
- ✓ **Optimize water distribution to support grazing management.** Multiple watering points encourage even pasture use and better animal distribution.
- ✓ **Check water systems frequently.** Water systems should be regularly monitored to ensure reliable access. Frequent checks, either in person or using remote technology, can help detect and address failures early.
- ✓ **Have a backup plan.** Failures like power issues or pump malfunctions can leave cattle without water. The solution can be simple, like moving cattle to another pasture with a different system or temporarily allowing cattle direct access to a water source.



Watering Solutions for Beef Cattle: Key Questions & Considerations

The following table can be used to help guide decision making in developing water systems on your operation. Asking these questions is a good first step in designing a water system that best fits the needs of your operation, ensures efficiency, and is reliable and sustainable in the long-term.

Note: This is not an exhaustive list. Water system needs and considerations will vary depending on your operation’s topography, herd size, available resources, and management goals.

Considerations	Key Questions	Does this describe my operation?		What to Know
		Yes	No	
Water Sources & Availability	Are the water sources natural?			Includes streams, springs and creeks. Natural sources are often low-cost and readily accessible but require proper management to prevent contamination and protect riparian areas. To ensure continued flow and water quality, fence cattle out of the water body and use remote systems like nose pumps or troughs.
	Are the water sources human-made?			Includes wells, dugouts and dams. Human-made sources can offer greater control over water availability and quality but typically come with higher input costs.
	Is the capacity of the water source sufficient to meet the herd’s peak daily water demand?			Calves less than six months of age can consume between 20 to 50 litres of water per day depending on temperature, while growing cattle can consume between 30 and 78 litres daily. Lactating cows require 40 to 60 litres per day. All cattle will consume greater amounts of water during hot weather.
	Is the water source reliable year-round?			Deep wells typically offer consistent year-round output while dugouts may drop to unusable levels in late summer due to evaporation or reduced runoff.
	Are there any local water quality issues to consider?			Water quality can be influenced by local geographical features (e.g., Canadian Shield or the foothills of the Rocky Mountains). In the Southern Prairie region, sulphates are a common contributor to poor water quality. Additionally, water sources may show increased salinity following periods of hot weather and evaporation. Regular water testing is recommended to ensure water is safe for cattle and to monitor any changes.

Considerations	Key Questions	Does this describe my operation?		What to Know
		Yes	No	
Site Considerations	Is the water source accessible?			If the water source is inaccessible, consider off site or remote watering systems.
	Does the site have natural advantages that can be used?			Make use of advantages that allow for the use of solar-powered systems, wind or gravity flow.
	Are there any regional climate factors that may impact the system?			Consider factors that may alter water quantity, quality or accessibility such as drought risk or freezing temperatures.
Cattle & Grazing System	Has the maximum number of cattle that can use the system been calculated?			Based on the capacity of the water source being used, calculate the number of head it can support. This can be done by determining the volume of the water source and dividing by the expected water consumption of the cattle herd.
	Will the water source support the type of animal using the system?			When grazing cow-calf pairs, ensure the water source is accessible to calves as well.
	Will the water source support the grazing system in place?			Continuous grazing systems require water sources that can accommodate the entire herd at once, and ideally, water sources should be located so cattle do not have to travel more than 240 metres to access them. Grazing management systems that include mob grazing and electric fencing may use a portable water system, shallow pipeline or water truck and trough. For extended grazing systems, ensure a back-up water system is in place if snow conditions are unsuitable.

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		Yes	No	
Energy & Infrastructure	Have the available energy sources been identified?			<p>Electricity: Often the most reliable power source, but the cost to run power to systems can be prohibitive.</p> <p>Solar: Good option for remote areas and has a low operating cost. Less reliable in low-sun and higher upfront cost with batteries for storing extra power.</p> <p>Wind: Relatively inexpensive. Depends on consistent winds and can be less reliable with more maintenance required.</p> <p>Gravity: Can be simple with no electricity needed. Requires an elevation difference. Low maintenance costs once set up.</p>
	Will the water be pumped to the cattle?			Pumps or pipes move water away from the source to troughs. This can improve consumption, protect water quality, and reduce erosion.
	Will the system require pipelines, troughs, water bowls, pumps or fencing?			<p>Off site or remote watering systems require infrastructure.</p> <p>Portable water systems may require more labour, a mobile water or power source, and can be limited by tank size and terrain.</p>
Design & Practicality	Is the system reliable under different weather conditions?			<p>Surface water sources are prone to freezing.</p> <p>Dugouts are prone to evaporation.</p>
	Will equipment or maintenance be needed to keep the system from freezing?			Insulated lines, heated troughs (electric or propane), or buried lines may be needed. Larger water troughs hold more water, which delays freezing. Water sites should be well-drained to prevent ice buildup. Float devices or agitators can prevent ice formation. When available, geothermal energy can provide natural warmth to keep water from freezing.

Considerations	Key Questions	Does this describe my operation?		What to Know
		Yes	No	
Design & Practicality	Does the system need to be portable for seasonal use?			<p>Portable tanks or troughs offer flexibility, making them ideal for rotational grazing and reducing pressure on permanent water sites. They can help improve pasture use.</p> <p>Centralized systems with pipelines are reliable and low-maintenance but costly and inflexible.</p> <p>Mobile systems are flexible and cheaper to set up but require more labour and may have limited capacity.</p> <p>Hybrid systems can offer a balance of reliability and flexibility.</p>
	Will there be a need for temporary or long-term water storage?			Storage tanks may need to be used in areas that are prone to drought.
	Is there a backup plan in place in the event the system malfunctions?			<p>Dehydration is a serious concern for animal health and welfare and can develop quickly.</p> <p>Incorporating back-up water and/or power sources into the planning and design of a water system can ensure a steady supply of water.</p>
	Are there any provincial regulations to be aware of?			Provinces have different regulations regarding the ownership, use and protection of water sources. It is always a good idea to check with provincial bodies before making changes to a water source.
Cost & Efficiency	Is the cost per animal financially sustainable for your operation?			Herd size, capital costs, and current calf prices will provide an estimate of how much time it will take to pay off and maintain the water system.

Answering the questions provided in this tool can help you assess considerations that are specific to your operation. The following section provides a list of further resources as you develop or adapt a water management plan.

Additional Tools and Resources for Water System Improvement

Below is a list of resources to help you select, update, or improve your water system. Advisors, provincial livestock specialists, and fellow producers are valuable sources of support.

- BCRC Resource Highlights: [Water Systems Calculator](#); [Water Systems for Beef Cattle Page](#); [BCRC Water Infrastructure on Pasture](#)
- BCRC water testing resources (link to be added)
- [B.C. Livestock Watering Handbook](#)
- [Alberta Beef Cow-Calf Manual](#)
- [Livestock Watering Systems in Saskatchewan: Producer Experiences](#)
- [Alberta Remote Pasture Water Systems for Livestock](#)
- [Water Systems Planning Worksheet](#)
- [Pasture Pipeline Design](#)
- [Installing a Solar Powered Watering System](#)
- [Livestock Watering Systems for Pastures in Nova Scotia](#)
- [Perennia Pasture Manual](#)
- [Remote Winter Watering Systems for Beef Cattle](#)

