

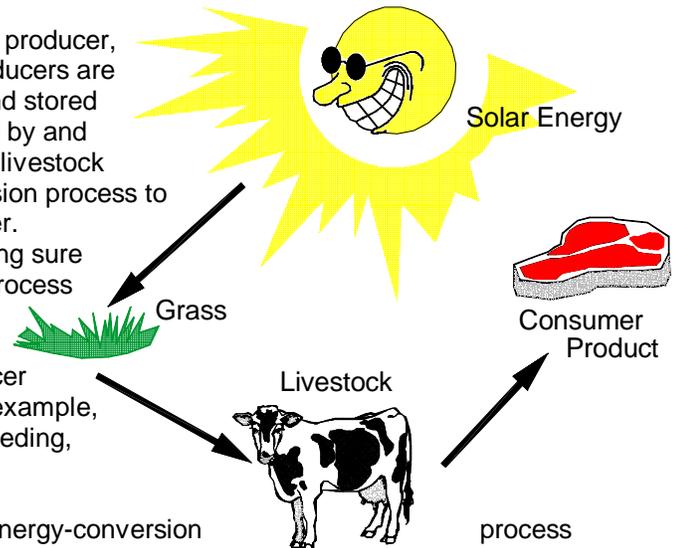
WATER SYSTEMS FOR RANGE LIVESTOCK

What is a range livestock water system?

To answer this question, one should consider what a range livestock watering system is intended to do, and in that sense, livestock producers should ask themselves, “What business am I really in?”, and “Am I part of a larger community?”.

What business am I really in?

Some possible answers might include: rancher, farmer, livestock producer, or many other labels. However, in a larger context, livestock producers are really in the *energy* business. Energy from the sun is captured and stored by grass. The energy captured by the grass is, in turn, consumed by and stored in range livestock, and it is the energy stored in the range livestock that is the saleable product (food). Managing this energy-conversion process to maximize output should be the objective of the livestock producer. Management of the energy-conversion process will involve making sure that the grass and the livestock are performing their part of the process in the most efficient manner possible, and this implies that both should be healthy. Viewed in this context, a range livestock water system is one of many tools available to a livestock producer for managing their energy-conversion business. Other tools, for example, would include vaccines, fertilizer and pesticides, supplemental feeding, appropriate stocking rates, etc.



While the livestock producer’s main objective is to manage the energy-conversion process to maximize output, they should not lose sight of the fact that they are part of a larger community, and that maximizing output should not take place at the expense of their neighbours or the environment. However, such considerations are abstract and the effects of an individual’s actions are often far removed, both in space and in time. Therefore, most producers cannot reasonably be expected to take actions that benefit the environment if there is not a direct benefit to them as well. Fortunately, utilization of water systems for range livestock can serve the direct interests of the producer, as well as the community at large.

What are the benefits of developing a pasture watering system?

The benefits accruing to a well-planned and constructed pasture watering system can include:

- ◆ **physical protection of the water source** - for example, excluding livestock from a dugout can extend the life of the dugout and reduce maintenance costs. Loss of storage and increased maintenance costs can range from \$200 to \$500 per year for an average pasture dugout where cattle are allowed direct access.
- ◆ **improved livestock health** - pasture water systems can provide livestock with easy access to good-quality water. This can reduce foot-rot, leg injuries, drowning, stress, and sickness arising from exposure to water-transmitted diseases, bacteria, viruses, toxins and cysts. If water is of good quality and easy to obtain, cattle may drink more and eat more, resulting in improved weight gain.
- ◆ **improved pasture utilization and health** - by distributing water supplies throughout the pasture, over-grazing can be prevented and nutrients from manure can be evenly distributed and kept out of water sources.
- ◆ **environmental protection** - supporting industry efforts to be viewed favourably by the public.

What options are available for developing a pasture water system?

A pasture water system can consist of various combinations of a wide variety of components, and selecting the most appropriate system can be a challenge. The individual producer should establish a list of their own priorities and try to make the best use of any natural advantages associated with their particular site and any existing equipment they may have. Some factors to consider in planning a pasture water system are:

- ◆ type and location of available water sources, and any limitations on their capacity
- ◆ water requirements, which depend primarily on the number and type of livestock
- ◆ the location and condition of proposed watering sites (remote location, topography, riparian features)
- ◆ type of grazing system (intensive or extensive)
- ◆ access to a power source (mainline electrical power, solar power, wind, animal power, etc.)
- ◆ requirement for flexibility and portability
- ◆ reliability and maintenance requirements
- ◆ pumping requirements (distance, amount of lift, automation)
- ◆ seasonal requirements (winter operation)
- ◆ water storage requirements
- ◆ cost/benefit and cost per animal
- ◆ personal preference



Shallow ploughed installation of pasture pipeline

What are some of the components that can comprise a pasture watering system?

A pasture water system can consist of one or more of the following components:

- ◆ **a water source** - natural (spring, creek, river, lake) or constructed (dugout, well)
- ◆ **fencing** - to prevent direct access to a water source and prevent damage to equipment by livestock
- ◆ **improved direct access to a water source** - usually a gently-sloping ramp with a hardened surface that provides better footing for livestock than the soft soils that usually exist around water bodies
- ◆ **remote watering sites close to a water source** - where natural or constructed water sources are distributed throughout the pasture, water is conveyed from the source to a remote site close by where animals can drink in comfort without contaminating the source. Water can be pumped directly to troughs or into an elevated storage facility from where it flows by gravity to troughs. Sources of power for pumping can consist of internal-combustion engines, electric motors powered by solar panels or grid electricity, windmills, stream power from flowing water, or the livestock themselves (nose pumps). In some cases, the site topography allows for gravity flow of water to the remote watering site.
- ◆ **remote watering sites far from the water source** - where the geographic distribution of water is limited by natural constraints, water can be conveyed from the source to one or more watering sites distributed throughout the pasture. This can be accomplished by conveying the water through pasture pipelines (pumped or gravity-driven), or by hauling water.



Wind-powered remote watering system



Solar-powered remote watering system



Livestock-powered remote watering system (nose pump)

The fact sheets in this series describe these components in greater detail. The following table presents a listing of some of the various options available for developing a pasture watering system, and discusses the impacts that developing such a system might have on livestock and the water source.

Livestock Watering Practice	Impact on Water Source and Livestock
Direct Access	<ul style="list-style-type: none"> ◆ 5-10% loss of storage capacity/year ◆ deterioration of water quality ◆ animal health and production concerns ◆ environmental concerns, especially along streams
Improved Direct Access	<ul style="list-style-type: none"> ◆ marginal loss of water storage ◆ minor concerns regarding animal health, production and water quality degradation
Water Hauling	<ul style="list-style-type: none"> ◆ no loss of water storage capacity ◆ no negative effects on animal health, productivity or water quality ◆ time and labour intensive
Gravity-fed	<ul style="list-style-type: none"> ◆ no loss of water storage capacity ◆ no negative effects on animal health, productivity or water quality
Pumped gravity flow	<ul style="list-style-type: none"> ◆ slight increase of water storage capacity ◆ no negative effects on animal health, productivity or water quality
Animal-operated pasture pumps	<ul style="list-style-type: none"> ◆ no loss of water storage capacity ◆ no negative effects on animal health, productivity or water quality ◆ two-day training period for livestock to learn pump operation
Pipelines	<ul style="list-style-type: none"> ◆ no loss of water storage capacity ◆ no negative effects on animal health, productivity or water quality
Solar Pumping Systems	<ul style="list-style-type: none"> ◆ slight increase of water storage capacity due to requirement to provide backup storage for cloudy periods ◆ no negative effects on animal health, productivity or water quality
Windmills	<ul style="list-style-type: none"> ◆ slight increase of water storage capacity due to requirement to provide backup storage for calm periods ◆ no negative effects on animal health, productivity or water quality

The Bigger Picture

A pasture water system is one tool available to livestock producers to help them manage their resources to maximize production and protect the environment. For additional information on livestock water systems, contact your local PFRA office.

Sources of information for this Fact Sheet included: *The Stockman's Guide to Range Livestock Watering From Surface Water Sources*, available from the Prairie Agricultural Machinery Institute, P.O. Box 1060, 390 River Road, Portage la Prairie, Manitoba, R1N 3C5; Pasture Water Systems for Livestock, Agdex 400/716-3, Alberta Agriculture, Food and Rural Development http://www.agric.gov.ab.ca/agdex/400/400_716-3.html; Livestock and Natural Resources, Publication No. 31-604 (Summer, 1995), University of California Cooperative Extension, PFRA Water Quality Fact Sheet "Alternatives to Direct Access Livestock Watering", <http://www.agr.ca/pfra/water/wqualite.htm>.

