

Frost-free nose pump eliminates the winter water woes

No electricity? No problem!

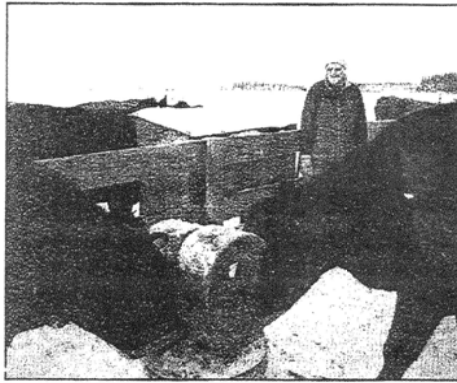
By Heather Smith Thomas
Special to the Rancher

SALMON, Idaho — Cold weather can create challenges, especially in situations where there's no available electricity for heating a stock tank. Lack of water in certain regions or pastures can make it difficult or impossible to graze these areas. In cold climates, water supplies may freeze.

Jim Anderson, at Rimbey Alberta solved this problem by creating an innovative water system in which cattle pump water for themselves from shallow wells or ponds--water that never freezes up even at 40 below zero.

Anderson's innovation is a piston pump, like the old-fashioned hand well in which a person works the handle up and down to lift water. "We modified this so cattle could push a lever with their nose to operate the piston pump by raising and lowering the piston in the cylinder, the same as a handle used to do," he explains.

"Like the old-fashioned hand pump, we have a 3-inch cylinder down inside the well. This is how we made this pump frost free; we can capture enough geothermal heat from the ground, and contain that heat all the way up to the surface, to keep the water in the well from freezing up," he says.



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Cows drink fresh running water even in the bitter cold thanks to these two nose pumps.

The waterer is a small enclosed basin on top of a vertical culvert, with a lever that can be pushed by the cow's nose. The culvert has 2 feet sticking up above ground level, going down to whatever depth is required to make use of ground water or the bottom of a pond or dugout nearby (water from the dugout is piped underground to the bottom of the culvert). A buried collection tank from a spring would work also. A regular well can be used, as long as the water level comes up to within 50 (and preferably 30 or less) feet from the surface.

"The typical installation is a road culvert at least 24 inches in diameter, set in the ground at least 20 feet. The 2 factors that determine how much geothermal heat you'll gain is how deep you go, and how big a diameter pipe you take to that depth. The bigger the pipe, the more opportunity for heat to rise, to keep the water pipe in the center warm enough," he explains.

Anderson has been watering 135 cows on his ranch with a nose pump for 15 years without any problems. "It took them a few days at first to figure out they had to take turns, but it works. To train cows, it works best to use a small group at first--15 to 30 cows--since a large group won't learn fast enough and some go thirsty too long," he says. After the small group learns, add new cows gradually, and they'll learn from the others.

The nose pump should be the only water source until cows learn to use it. They train more easily in summer, since the small drain hole in the riser pipe can be closed without risk of freezing; you can wrap electrical tape around the pipe to cover the hole. With the hole closed, the riser pipe stays full of water, and any small movement of the pendulum will bring in more water. The drain hole should be opened up again before freezing temperatures.

The water pipe coming up the well requires this small drain hole (located 5 feet down) so the upper part of the pipe is empty unless a cow is

drinking, to keep it from freezing. After the cow has pumped water and quits drinking, the water slowly drains down to this depth. The water in the drinking trough itself does NOT drain back (so there is no contamination of the water source), but there is very little left in it to freeze and the activity in the trough keeps it cleared. The first cow in line gets water on the fourth stroke of the lever, and since it takes 2.5 minutes for the water to sink down to the level of the drain hole, another cow drinking during that time period only needs to push the lever once to get more water.

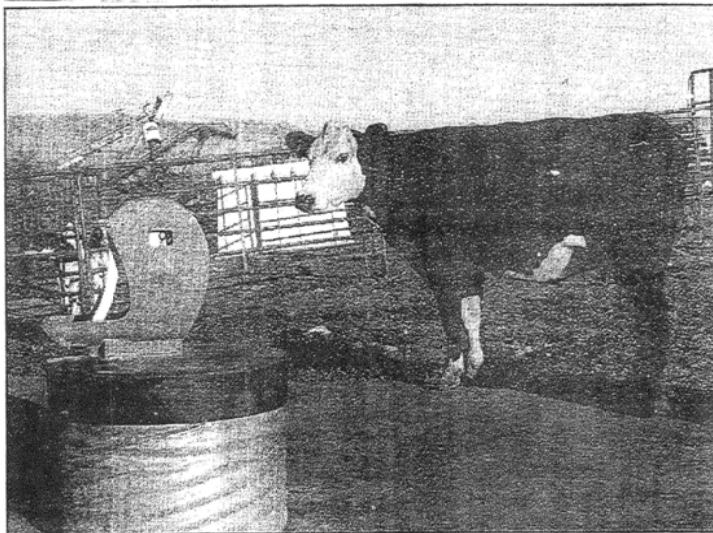
The drinking area is slightly slanted toward the back, so the animal is sipping the last of the water from the back. She readily learns to press and bunt with her nose on the horizontal bar located there; as she drinks the last of the water she's shoving her nose against it. "When a cow pushes the pendulum with her nose, it swings in an arc about 12 inches, and brings in a half liter of water. A cow will push that thing, and then she'll drink the half liter of water, and if she wants more water she has to release it and then push it again," he says.

A simple design yields a reliable product

The advantage of the nose pump for cold weather is that it is extremely simple, with little chance for breakdown and problems. There are no electronic components to add to the cost or risk for malfunction. "The fail point in most water systems is an electronic component. There is only one moving part in this pump—the piston that goes up and down in the cylinder. In subzero weather you need it simple—less things to go wrong or freeze up," he says.

In very cold weather (anything below minus 15 F.) nose pumps should be checked; ice should be removed if it builds up on the sides of the hood, inhibiting movement of the lever. Removing this is a quick and simple job, however, just hitting it with a hammer.

Most people who use nose pumps are ranchers with ponds or dugouts for water storage. Traditionally they had to chop holes in the ice every



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The advantages of the nose pump don't stop once the weather warms up.

day, with risk of losing cows that walk out on the ice and fall through. If cattle must depend on a hole in the ice for water, timid ones may not drink if bossy cows knock them down as they try to drink, or if footing is slippery.

A frost-free nose pump soon pays for itself if it eliminates risk of cows falling through the ice or becoming dehydrated because they aren't brave enough to try the ice.

George Widdifield, Ranch Manager at the Western Beef Development Centre's Research Ranch at Lanigan, Saskatchewan says their operation has used nose pumps for 4 years. "These work fine but the cows must learn to use it. We did it the recommended way, starting with just a few cows at a time, and they teach the others.

"There are different levels in the drain holes in the line, and when we are training cows we put it at the highest level (during warm weather with no danger of water freezing in the pipe) so it's very easy for them to pump. After they learn, we lower the drain hole." After they know how to use it they will push it as hard as necessary to pump the water. "We've found that even in summer when there is other water available, some cows prefer to use the nose pump and have cool, clean water," says Widdifield.

One nose pump will easily water 100 head. With 400 head, a person can put 4 basins on top of the upright culvert. James Madge, a rancher in Alberta, has two sites with 4 basins at each site and waters 500 cows in that pasture all winter. He has another site with 2 on it, where he waters all his bulls.

"We've never had anyone tell us a nose pump got damaged, whether they are watering bulls or bison," says Jackie Anderson, wife of Jim Anderson who invented the nose pump. "Some bison ranchers use nose pumps, including one of our neighbors. It's ideal for bison because they are strong enough to push the levers, even when water has to be brought up from deeper wells. Also, many bison producers tell us they have trouble with any water system that drains back down because hairs from bison beards get into the moving parts and cause problems. The nose pump eliminates that risk."

Using a nose pump for water is good insurance against losing cows. "Cows are worth so much right now that one cow saved from drowning in a dugout would more than pay for installing a frost-free nose pump. We heard of someone losing an entire herd because they were all out on the ice, milling around trying to find water," Jackie says.

"One fellow told us his uncle was chopping a hole in the ice and a cow pushed him in. They are so eager to get to water that they shove and push each other," she says.

Don Viste, a rancher 120 miles northeast of Calgary, Alberta, has been using frost-free nose pumps and says they work very well to provide water for his 300 cattle. "What started it for me was the year we lost 29 head that fell through the ice on a dugout. It wasn't just the expensive loss, but also the emotional tragedy. These cattle were all home raised and my wife and two daughters had them all named," he says.

"Losing those cows is why we went to the nose pumps, but there are a lot of other benefits besides making winter watering a lot safer. It keeps the dugouts cleaner through the year because cattle aren't wading into them. The cattle also seem to do better on the nose pumps because they get fresh, clean water," he says.

Some ranchers in his area have 700 to 2500 cows watering with nose pumps. Viste has 10 dugouts set up for wet wells and nose pumps, but only needs 3 working at a time. He moves the upright culverts and drinking basins around to various locations when he moves the cows.

"I have a trailer set up to do this, with timbers across it—with slots cut out, to set everything in. I just pull up the culvert, set it on the trailer, and away I go to the next location. I use a loader to pull it up, and to set it back in at the next place. Most people don't have as many dugouts as I do, and just leave the culvert/nose pump in a permanent location, but I move mine around as I move the cows," says Viste.

He eventually wants to make a tripod on the trailer so he can just pull the culvert up with a winch, and reset it with a winch at the next dugout location, so he won't have to take a loader along with the trailer. "It will just be an A-frame that I can put up and take down, for doing this. I move my nose pumps several times during winter. I just choose a warm day when it won't freeze up when I'm relocating it," he says.

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Many ways to install the pump

There are many ways to put in a nose pump. Some people install a large culvert in a spring, and then divert the water from that large one underground to a smaller one with the nose pump, to keep the animals away from the spring and keep it cleaner. "One fellow in Prince George had to lift water 300 feet," says Jackie. "No nose pump can do that. He was away at work all week, so he buried a gigantic tank and pumped water into it every weekend when he was home. Then the cattle used the nose pump off that big underground tank. Most farmers can be very creative," she says.

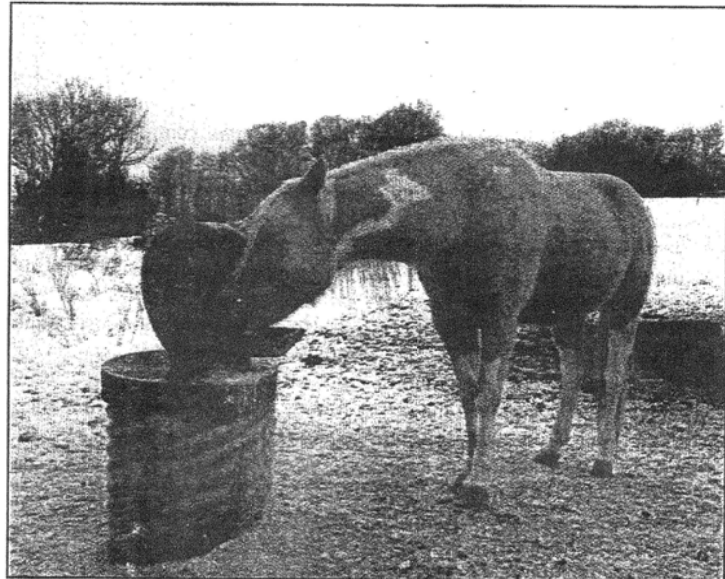
Kip Panter, a rancher in northern Utah, has been using a nose pump for several years. "I have a creek that runs through my place and NRCS has been helping ranchers get cattle away from the streams. They had a cost-share program and had information on the nose pumps. They asked if I would be a test case for one of these, and I ordered my pumps from the Andersons in Canada," says Panter. This type of watering system is a good way to provide an alternate source of clean water, away from riparian areas.

"There are multiple ways to install these pumps. My cattle are pumping water about 20 feet. Another option is piping the water from a nearby creek, pond or lake, so there are multiple ways you can do it," he explains.

"These pumps work great. Small calves have a little trouble pumping, so in hot weather you can use a second setting that is not as hard to pump," says Panter. In winter the regular setting works fine for bigger calves or dry cows.

Training the animals

"Andersons recommended that you always leave one cow that knows how to use it, whenever you put in a new group. I've never worried about that. They smell the water and know it's there and they figure it out very



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Horses can be trained to use the nose pump as well as cattle.

quickly," says Panter.

"I check the pump every few days in winter, just to make sure it's working, but it always is. Since the water coming in is always clean, and the pan is empty except when cattle are actively using it, the pan stays clean. You never have moss or algae in summer and no water is left in it to freeze in the winter," he says.

"It is very strong. I built my own lids out of steel and bolted them on. I've had 2000-pound bulls using them and they've rubbed on them and played with them and never hurt them. These pumps are really foolproof."

He put a 20-by-20 foot concrete pad around his pumps, so cattle are never standing in mud. "The pad is 4 inches thick. I've never had to clean the concrete off. The cattle mess on it occasionally, but most of the time they just come drink and then leave. The pumps are about 200 feet away from their feed source, and they defecate while traveling to the water and don't leave manure around the pump. The cattle don't hang around the water source; they just go get a drink when they want and there's no crowding," says Panter.

"I modified my pumps a little. I didn't drill the little drain hole as far down as they recommend (to

be below frost line)." This leaves the water pipe empty down to that level except when cattle are actively pumping water. Having the hole higher makes it easier and quicker for the cows to pump the water because it's already closer to the drinking basin.

"Instead of having the drain hole so deep, I put a second (larger) culvert around the outside of the first one, with insulation in between. So my drain hole is down only 3 feet, which means cows can get water as soon as they start pumping. I've never had any problem with these pumps. Our winter temperature gets down to 25 below zero and they never freeze up," says Panter.

His pumps are located near a creek. "I had a backhoe come in and dig a 20 foot hole—as far as the backhoe would dig—and put a perforated culvert down the hole and filled around it with gravel. The groundwater feeds it and is always there, even though the creek almost dries up in late summer." The creek may freeze over in winter, but water in the pump culvert never freezes.

For further information, contact Andersons at 866-843-6744 or by e-mail: info@frostfreenosepumps.com go to the website: www.frostfreenosepumps.com ♦