

Cow power keeps water flowing year-round

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Central Alberta beef producer Mike Poffenroth is one of a growing number of producers tapping into the potential of cow power to make water available to cattle being fed on pasture in summer and even year-round grazing systems.

Using a system known as the Frostfree Nosepump, Poffenroth, who farms near Bentley, northwest of Red Deer, lets the cattle pump their own water, as a cow figures out the device, which doesn't take long if she's thirsty, she simply pushes her muzzle against a paddle, and the energy-free watering system delivers clean, fresh water one good gulp at a time.

While it's intended as a year-round watering system, a key feature is that it operates even at -30°C and below. It's heat from the ground and the water itself rising up from below the pump that keeps the system from freezing in winter. There's no need for electricity or any other energy source other than a thirsty bovine and geothermal energy.

"It appears to be a trouble-free system that keeps the cows watered all winter and saves us all kinds of time," says Poffenroth. He's used the Frostfree Nosepump for about 5 years to water his 180-head herd of commercial beef cattle. But he still remembers the days before the nose pump. The daily winter ritual included angling a hole in the ice on a frozen dugout, putting in a sump pump, hooking up a power generator and laying a water line over the frozen ground so the pump could fill 2 bathtubs with water for the herd to drink.

"It would take us a good hour each day to get the system set up and then take it down," says Poffenroth. "We'd have to bring the generator and the pump home and drag the pipe up a slope so it would drain and then the next day we would set it all up again." The pump would run for 2 to 3 hours per day. He'd use the front-end loader of the tractor to turn over the tubs to knock out any ice.

The Frostfree Nosepump, developed in the late 1990s by Jim and Jackie Anderson, beef producers at Rimbey, Alta., uses a principle similar to the old hand pumps that at one time stood atop well platforms across the country. Instead of the farmer out there pumping the handle up and down, now cows, bulls, calves and even horses use their noses to nudge a paddle that pendulums inside the trough part of the waterer. Each push of the paddle raises and lowers a rod connected to a 3" diameter piston inside the pipe that extends below the pump into water. With each stroke of the nose paddle, the piston raises water in the pipe, allowing about half a liter (2 cups) to flow into the "trough" at a time. The cow slurps up that water, pushes the paddle again and gets another half liter in the trough. Once one animal finishes drinking, the next one moves in. The system is designed so little water is left in the trough when an animal stops drinking, and none of the water that's left can drain back into the clean water source.

"Only one animal drinks at a time, but it's available to them 24 hours a day," says Poffenroth, who figures the one nose pump will meet the winter water needs of his herd. "If you're out in the field at night there's often an

animal having a drink. The only regret I have about this watering system is that I didn't think of it first."

The Andersons developed the Frostfree Nosepump in a bid to find a better way to water their own 148 head of commercial beef cattle, especially in winter, without having to chop ice or rely on supplementary energy.

Poffenroth's cattle remain out on pasture until late fall. After the calves are weaned, the herd is moved onto swath grazing for the winter. If the swath grazing runs out, he'll haul large round bales of greenfeed to the field as needed. "The important point is to keep them out on pasture and keep the manure where it's needed," says Poffenroth. He keeps cattle fenced out of the dugout and other natural water sources. "The nose pump makes it possible to have convenient and reliable year-round use of the

the systems across North America. Farmers are using the Frostfree Nosepump with pressure systems, on existing cased wells, on bored wells, and tied into dugouts with a buried pipeline. That's how Poffenroth set up his system. He wanted the nose pump about 50' from the dugout that he'd been using as a winter water source. He hired a backhoe to dig a 16' deep hole for the culvert. He also dug a trench the same depth from the culvert to the dugout. The culvert was stood in place and then he laid a pipe in the bottom of the trench with one end tying into the bottom of the culvert, while the other end was outfitted with an intake that extended out into the middle of the dugout. It's a gravity feed with the depth of the water in the culvert matching the depth of the water in the dugout.

Again, ideally, the top of the culvert should extend out of the ground about 2'

feet, cost of concrete and any other materials. Poffenroth estimates his system cost between \$2,500 and \$3,000 complete and that did not include a concrete pad. "Once it's installed it's maintenance-free with no operating costs," he says. On the coldest days there may be some ice buildup on the inside of the hood of the pump which can affect movement of the nose paddle. "But you just tap the side of the pump with rubber mallet, the ice falls off and the system is ready to go."

After the system is installed, "Cattle have to be trained to use the nose pump but once one or 2 figure it out the rest soon follow," says Poffenroth. Anderson recommends training no more than 15 to 20 animals at first. It's easier to train in summer, and the nose pump should be the only water source. "With a small group, especially if they're getting a bit thirsty, you operate the nose paddle by hand, get some water in the trough, splash a little bit around and the cattle soon investigate," says Anderson. "They try to drink the water in the trough and they soon realize if they nudge that paddle forward more water comes out."

Although thousands of cattle across the country are being watered on Frostfree Nosepumps, the Andersons say there are still some skeptics who question whether cattle can learn to use the pump, and wonder if there is enough water from the low-volume system to optimize rates of gain. (The system delivers half a liter of water per push of the nose paddle and operates on a water source as low as 2 gallons per minute.)

But a research and demonstration project over the winter of 2005 and summer of 2006 at Olds College in Olds, Alta., showed cow-calf pairs

using the Frostfree Nosepumps had the same performance as cattle on a conventional water trough. The purpose of the project was to determine if the system worked as well as the manufacturer claimed.

During the winter of 2005, college staff observed the nose pump worked well with no freeze-ups. During a summer grazing trial, "There was no statistical difference between the 2 groups of cattle," says Trevor Hamilton, college farm manager. The grazing project involved 2 groups of 25 head each of crossbred cow-calf pairs that grazed on adjoining pastures. The only difference was that the water source for one group was a Frostfree Nosepump, while the other group was supplied water through a conventional waterer on a pressure system.

The January-born calves were weighed at the beginning of the grazing period which started in mid-June and again 90 days later at the end of the grazing period in mid-September. Cattle required little training, the cows trained the calves to use the system and weight gains between the 2 groups were comparable.

Detailed explanation, diagrams, photos and videos of the Frostfree Nosepump can be found on the web at www.frostfreenosepumps.com. And you can call the Andersons toll-free at 1-866-843-6744.

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This heifer quickly learned that a push on the nose pad will put water in the trough.

dugout and has turned summer pasture into another wintering ground. The cattle stay off dugout banks in summer and ice in the winter, and they always have clean, fresh water to drink."

THE IDEAL SETUP

The secret of the Frostfree Nosepump is to mount it on top of a 24" diameter culvert that extends down into the ground, ideally 20' deep. You need to go that depth to tap into enough geothermal heat to keep the system from freezing. The bottom of the culvert becomes the reservoir for whatever water source is being used, so you need the standing culvert deep enough so the water level in the culvert is below the typical frost line. For added insulation effect, Anderson also recommends a layer of Styrofoam insulation around the inside of the culvert extending down the top 8' of the culvert.

One Frostfree Nosepump should meet water requirements for 100 to 125 head of cattle or 50 to 75 cow-calf pairs. For larger herds 2 to 4 nose pumps can be mounted on top of each culvert. The Andersons have 5 nose pumps set up in different pastures on their farm. Most draw from a water source that's 20' or less below ground level, although one in a back pasture draws water from a source that's about 47' deep. That's about the maximum lift that can be managed by mature cows and bulls. The maximum depth recommended for calves and horses is about 20' of lift.

The Andersons have sold about 350 of