

Pumping Up Profits

High pressure pumps help RO system keep plant running

When Mullins Cheese, Knowlton, Wis., installed a new reverse osmosis system (RO) in its whey processing operation, the main goal was to increase production. The company had no idea that it would end up saving a day's worth of profits.

Mullins manufactures Cheddar, Colby and Monterey Jack cheeses for nationwide distribution. The plant processes 1.1 million pounds of milk per day. This results in nearly a million pounds of whey per day for producers of ice cream, candy bars and cookies.

"We were at a standstill as far as how much more whey we could produce through our facilities," Don Mullins, co-owner, explains. "In order to increase production in our cheese plant, we needed to increase production in our whey plant."

To increase its whey processing capability, Mullins installed a reverse osmosis system designed by Custom Fabricating, Marshfield, Wis., as part of a multi-phase equipment upgrade project.

The RO system removes one-third of the water in the whey prior to processing in the evaporator. Water is further reduced to 36% in the evaporator before cooling and trucking.

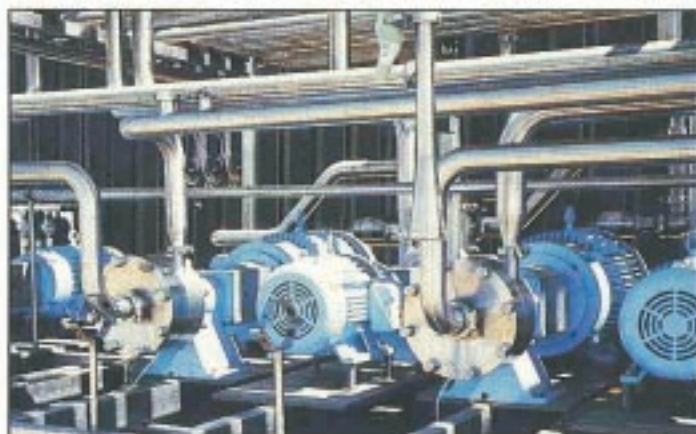
One day the evaporator went down and Mullins was forced to rely solely on the RO system to bring the whey to a salable solids level. "We couldn't run as fast," Mullins says. "Instead of running 70,000 pounds per hour, we ran 50,000 pounds per hour. But we could still run."

Mullins estimates that the RO system saved his company between \$7,000 and \$8,000 worth of product that day.

"We were able to get our solids up to about 17 to 18% coming off the RO," he says. "Without it, we would have had to dispose of the whey."

Pumps achieve high pressure

Custom Fabricating chose five Waukesha Cherry-Burrell 200MS Series multistage high-pressure centrifugal pumps for the RO system. Specially designed for recirculating service in reverse osmosis and other membrane systems, the pump offers lower start-up and run costs due to its high efficiency, two-impeller design. Competitive pumps need more stages to build



Multi-stage centrifugal pumps generate the high pressures required to keep whey flowing through the RO system.

enough pressure to force the product through the membrane.

The heavy duty stainless steel casing is designed to withstand up to 1,250 psi when placed in series. A conventional centrifugal pump casing would burst under the pressure build-up required in a system such as Mullins'.

The pumps are exceeding expectations, according to Mullins. "We

expected the RO system to take the whey to 9% solids, but current results are 10 to 11%," he says.

Not only are profits increasing with production; the company saved significantly in equipment costs. The alternative to the reverse osmosis system was adding another evaporator, which Mullins estimates would have cost in excess of \$1 million more than the RO system.

Another phase of Mullins' whey production upgrade involved installing Waukesha Cherry-Burrell Corruflow multi-tube tubular heat exchangers to replace double-tube units in the milk pasteurizing process. In addition to increased product flow, Corruflow units provide more efficient heat transfer, because the corrugations on the tubes induce turbulence in both the product and media flows. And the velocity of the product flow creates

a scrubbing action that prevents product fouling.

Also included in Mullins' upgrade was a new three-bay milk receiving system. The company chose Waukesha Cherry-Burrell Series 200 centrifugal pumps to move approximately 300,000 pounds of milk per hour. The redesign, which also incorporates Waukesha Cherry-

Burrell fittings, allows Mullins to unload three trucks while cleaning three others.

"These upgrades have helped us increase daily production by 25%," says Mullins.