

CONTROL

BIG CHEESE Needs BIGGER DATA

DATA ACQUISITION

Foremost Farms doubles production and adds data acquisition and historian functions to its SCADA/HMI system to find exceptions and improve operations.

By Jim Montague

Growth means change—so it's not easy for people, organizations or even, I suspect, for hardworking microorganisms turning juice into wine or milk into cheese.

Similarly, food and beverage manufacturers have always been serious about process control and automation, but they usually haven't had to be quite as obsessive as their counterparts in the oil, gas and chemical fields. This is likely because food and beverage applications don't traditionally operate at temperatures, pressures and product volumes as high as those in traditionally bigger-ticket oil, gas and chemical processes, so there's typically less potential for accidents and injuries.

Well, times are changing, and food and beverage production for many manufacturers is way up, so they're adopting more sophisticated and affordable sensing and control technologies as their applications expand, though this can mean overcoming some initial growing pains too.

For example, Foremost Farms USA (www.foremostfarms.com), in Baraboo, Wis., recently doubled the size of its cheese-making operations at its production plant in Appleton, Wis. It increased production from processing 1 million to more than 2.2 million pounds of milk per day, and from producing 65 million to 130 million pounds of cheese per year by adding a second production line, and increasing its packaging lines from two to four. But this expansion also required more data gathering, handling and analysis to keep all its processes running optimally (Figure 1). Either Foremost Farms' engineers had to install and maintain more of the paper chart recorders and loggers they'd been using, or they had to find another way manage all their critical signals and operating information.

Cooperative Venture

Foremost Farms is a farmer-owned milk-processing and marketing

DATA ACQUISITION

cooperative, and its 1,700 member/owners produce more than 5 billion pounds of milk per year, which its 12 plants use to manufacture cheese, butter, specialty whey ingredients, bulk fluid milk and other products for markets and applications worldwide (Figure 2). The cooperative is the seventh-largest U.S. dairy cooperative, and it has annual sales of \$1.7 billion, which places it 24th in annual sales among the top 100 U.S. dairy processors. Its whey products include pharmaceutical-grade lactose, which is dried and crystallized to different sizes, so it can be used to convey timed-release medicines.

To collect, organize and interpret all its extra cheese production data—and make useful decisions based on it—Foremost Farms decided skip the usual chart recorders and loggers, and expand its data acquisition (DAQ) and historian capabilities within its existing HMI/SCADA software and interfaces. As a result, the Appleton plant also expanded its use of GE Intelligent Platforms' (www.ge-ip.com) Proficy Historian DAQ functions with its existing Proficy iFix SCADA/HMI software to collect and help analyze data, find exceptions and improve operations. System integration of the project was performed by P. J. Kortens & Co. (www.pjkco.com), also of Appleton, and distributor Industrial Network Services (www.ins3.com) in Arlington Heights, Ill.

“Foremost Farms has been using Proficy iFix for about 16 years, but just for process control. About 10 years ago, we began using iFix and Proficy Historian to gather trends electronically via existing Cisco routers and Ethernet networking. That’s when we began to stop putting in new recorders and loggers, and it’s what encouraged us to use Proficy Historian for the plant expansion,” says Sheri Tuzinkewich, dairy industry consultant and Foremost Farms’ former process integration manager. “We’d also been lacking some accurate data from our loggers. We weren’t getting enough information after production. And we couldn’t drill down into our former system to the data we wanted. Foremost Farms is one of the first companies that does its own audits daily or every four to six hours, especially on new applications or plants, so we really needed better information. We also needed more complete data for state, federal and customer auditors. They each visit once or twice per year, but together this adds up to one or two visits per month. With the recorders,

we’d have an operating signal that a tank had been washed, but it wouldn’t indicate the tracking number.”

Keeping Tabs with DAQ

Tuzinkewich reports that, “Using the DAQ functions in Proficy



Foremost Farms

CURDS, WHEY AND DATA

Figure 1: Foremost Farms doubled production at its Appleton, Wis., cheese plant over the past two years from 65 million to 130 million pounds, and added GE Intelligent Platforms' Proficy Historian data acquisition (DAQ) functions to its Proficy iFix SCADA/HMI software to handle all the extra process data, find exceptions and improve operations.



Foremost Farms

COOPERATIVE COVERAGE

Figure 2: Located in seven states, Foremost Farms is a farmer-owned cooperative whose 1,700 members produce more than 5 billion pounds of milk per year. Its 12 plants manufacture cheese, butter, specialty whey ingredients and bulk fluid milk.

Historian really helped our processes because it showed any failures we needed to know about. We secure daily exception reports that highlight process areas that may need adjustment or maintenance attention. We receive tank monitoring, intake silo and clean-in-place exceptions through data comparison. Proficy software then allows supervisors to make online sign-offs on each exception. Electronic data acquisition and trending also means we can respond quicker and simply punch in a recipe and date for a new process.”

Tuzinkewich adds the team that helped Foremost Farms migrate from recorders to Proficy Historian included staff from its IT, engineering, quality assurance and safety departments, as well as its system integrator. They all reviewed the concept, plans and steps for making the transition. The team then enlisted help from the plant’s supervisors and gradually gained their support too.

Overall, using Proficy Historian instead of chart recorders saved about \$250,000, but there were other benefits as well. “These savings helped the expansion’s budget, but it also helped that we could secure our production data more easily. Once people saw it, they began to ask, ‘Can it do this, too?’” says Tuzinkewich. “So we not only had happy auditors, but we also had production supervisors who could greatly reduce the number of values they had to chase on Fridays for reports on Mondays. For example, the plant can now correlate downtime

or pump failures with increases or reductions in alkalinity, observe how changes in product quality may be related to changes in motor and equipment performance, and make the necessary adjustments to make sure quality is maintained.”

Tuzinkewich reports that other keys to Foremost Farms’ operational success at its 12 plants include: developing and publishing standard operating procedures, especially for newer technologies such as robotics; building bridges by forming alliances and teams focused on topics such as manufacturing, engineering, quality, safety and production; and always keeping up the search for new ideas. “We challenged the norms and tried to rule nothing out in looking for new ways to improve production at the plants,” says Tuzinkewich. “As a result, we had to prepare for dealing with fears of change from those who didn’t want their jobs to be different, but we also needed to be ready for those who were on board and excited so our efforts would go smoothly. In this situation, it’s extremely important to keep up momentum and stay energized. So we always kept up communications because you can never over-communicate on a project like this.”

Thanks to the success of the new system in helping the Appleton plant double its production, Tuzinkewich reports that seven of Foremost Farms’ other plants could use the same data gathering, organization and analysis. ■

Jim Montague is Control’s executive editor.

Eprinted and posted with permission to P.J. Kortens & Co. from *Control*
April © 2014 PUTMAN. Expires on 5/31/2015

PJKco
P. J. KORTENS and
COMPANY, INC