

Fresh Ground Beef Products.

## Wolverine Packing Co. Focuses on Logistics from the Bottom Up.

U.S. meat processor Wolverine Packing Co. (Detroit, Mich.) sells more than 500M pounds of protein products a year, and prides itself on logistics and efficiency. It ships boxed beef, pork, poultry, lamb, portioned cuts and processed meats to foodservice and retail wholesalers across the country, and typically ships the day after order.

The company's no. 1 product is fresh ground beef formed into patties and 5 lb. bricks, so mixer chilling is key to quality production at high volumes. Last September, Wolverine asked the food team from Messer LLC (Bridge-water, N.J.) to investigate a chilling-related packaging issue. By December, Wolverine not only had a solution, but one that yielded multiple advantages.

### **The Problem**

Wolverine's twin mixers needed to run near capacity 16 hours a day to meet growing demand for fresh ground beef products. Essentially, the 3,000 lb. mixers needed to move faster than the current carbon-dioxide (CO<sub>2</sub>) chilling system would allow.

In the bottom-injection (BI) chilling process, liquid cryogen is injected from multiple points at the bottom of the mixer/blender. With CO<sub>2</sub>, fine solid CO<sub>2</sub> particles (i.e. dry ice) remove heat as they work their way through the batch. During blending, the particles

shrink as they sublime to CO<sub>2</sub> gas and further chill the ground beef. However, if the CO<sub>2</sub> does not fully sublime, it can create what looks like "leakers." Moisture from the meat can accumulate in the voids left by the CO<sub>2</sub> and red liquid is visible through the packaging.

Wolverine co-owner and Vice President Jay Bonahoom notes, "Any processor can effectively use CO<sub>2</sub> if the blender has enough time to sublime it. But we couldn't afford that luxury. Our systems are running as close to 100 percent as we can get them, so we didn't have time to wait."

Riley Cronk, Food Safety and Quality Control Manager, said the actual mixer chill time with CO<sub>2</sub> was about 90-120 seconds. "Then it was another 30-60 seconds, post-chill, to ensure solid CO<sub>2</sub> no longer exists within the batch," she recalls.

### **The Solution**

"In talking with Messer, we liked the idea of converting to nitrogen," Bonahoom says. With the liquid nitrogen (LIN) BI system there is no solid phase to the cryogen – so no extra wait time after mixer chilling.

Beyond product appearance in the package, the advanced LIN BI system offered strong economic and logistic advantages. On any given day, Wolver-

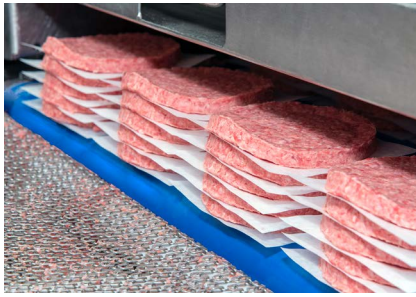
ine chills over 100 batches of ground beef. Saving at least 30 seconds per batch means a gain of at least 50 minutes of extra processing time per day. With a batch-to-batch turnaround time of 8-10 minutes at the plant, that represents at least five more batches/day — or an additional 30,000 lbs/day of mixer processing capacity for added flexibility.

### **Food Safety Advantages**

Wolverine also realized benefits in sanitation as part of its overall food safety program. The operating end of the LIN BI system uses patented hygienic KRYOJECTOR® injectors, designed to prevent the entrapment of particles in the injector orifice which is common with standard injector nozzles.

"With the old CO<sub>2</sub> injectors, daily cleaning and sanitizing was very important because the nozzles were open, and meat-fat buildup inside could provide a breeding ground for bacteria," Cronk said. The daily procedure was to remove all the bottom injectors, clean and sanitize the nozzles, and reattach them to the mixers during the sanitation shift.

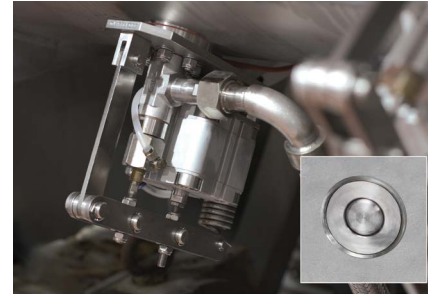
"The new injectors use a plunger design that is never left opened, so it doesn't ever have to be cleaned that way," Cronk explains.



A chilled stack of Wolverine hamburger patties.



Chilled ground beef exits the mixer equipped with KRYOJECTOR injectors at right.



Installed hygienic KRYOJECTOR injector, with view inside the mixer (inset).

Wolverine Packing Co. (Detroit, MI) cut the turnaround time on its 3,000 lb. mixers by 30 to 60 seconds after switching to a nitrogen chilling system with hygienic KRYOJECTOR bottom injectors. The switch also improved appearance of the ground beef in the package and contributed to the plant's food safety efforts.

"Before we had to clean inside the nozzles. Now the daily routine is to hose off the face of the KRYOJECTOR injectors when we clean the mixer. We still check the injectors, but from the sanitation side, there is no meat or fat buildup at all. The injectors are always closed unless there is a positive flow of nitrogen."

The BI chilling system is designed for positive flow of cryogen to all injectors for consistent equilibration of each batch, and for consistent batch-to-batch temperatures. In this case, the ground beef is chilled from about 39 °F to about 30 °F in 90-120 seconds.

The plant operates six days a week and could not go long without mixer-chilling production. So working with Wolverine, the Messer food team planned the installation over a two-weekend, back-to-back period. One weekend, the KRYOJECTOR injectors were installed. Then the next weekend, the old CO<sub>2</sub> equipment was removed.

"Throughout the process, the Messer food team was working behind the scenes, installing piping and exhaust fans while we were running production," Cronk said. "It was just a two-week span where they actually had to be inside the production room."

Once the nitrogen supply tank was installed, the team optimized the control system for the processing parameters, and trained plant personnel in safety and operating procedures. One worker operates both mixers and there are multiple shifts. "The new chilling system definitely makes the job easier, and our operators like the new control panel," Cronk said.

### Fresh Growth

Wolverine, founded more than 80 years ago, was one of only a few national meat packers that decided in the late 1990s to emphasize fresh meats. While the company still sells a high volume of frozen product, fresh meat sales have skyrocketed over the past two decades. Ground beef, as well as sliced steak and portion-controlled products, continue to drive growth.

Vice President Bonahoom says fresh beef remains Wolverine's best seller because of efficiencies both in production as well as distribution. "Logistics is one of our core strengths," he says. "We have trucks in all 48 states. So we can ship fresh meat from Detroit to San Francisco, Miami or Portland, Maine, in a couple days. It comes off our production line

in boxes that are loaded onto trucks the next morning. So that's part of how we got from essentially all frozen to fresh."

To keep up with the burgeoning demand for fresh beef products, Wolverine is building another production plant in Detroit in 2019 which will include more mixing capacity with LIN BI chilling.

## Imprint

Printed from Refrigerated & Frozen Foods February 2019



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