Making the switch from batch to continuous cooking and cooling of pasta

Food processors are seeing the benefits of changing from batch to continuous cooking and cooling of pasta. Mixum, AB, the leading producer of cooked pasta in Sweden, recently made the switch from batch to continuous processing with a significant improvement in the quality of its pasta and an 85% reduction in its cleanup changeover times.

Located in Motala, Sweden, about 100 miles west of Stockholm, Mixum, AB (Mixum) started producing boiled and peeled eggs for restaurants and commercial kitchens in 1989, becoming today the largest processor of cooked and peeled eggs in Sweden, handling 250,000 eggs daily. The company has since expanded its product line to include the preparation of fresh sandwiches and salads for convenience stores, and the manufacture of a line of ready meals, sauces and dressings. Mixum is also the largest producer of cooked pasta in Sweden, much of which is supplied to Picadeli, AB, the salad bar chain popular in Sweden, Scandinavia and much of northern and western Europe. Mixum provides pasta-based salads to almost 3,000 Picadeli locations throughout Sweden, Finland, Denmark, Germany and France, representing 35–40% of Picadeli's total product offering.

Mixum's success is largely due to its meticulous attention to product quality, food safety and streamlined manufacturing initiatives. The company operates in compliance with HACCP (Hazard Analysis and Critical Control Points), a management system in which food safety is addressed from raw materials through the production of the finished product. It is also certified through FSSC (Food Safety System Certification) 22000, sanctioned by the Global Food Safety Initiative, which provides a framework for effectively managing a company's food safety responsibilities. And since 2001, Mixum has been certified according to ISO 14001, the international standard that specifies requirements for an effective environmental management system.

"We are very focused on hygiene and proper food management," said Magnus Franzen, CEO of Mixum AB. "All of our staff are trained and involved in maintaining food quality, and very committed to it. Likewise, environmental issues are very important to us, reducing the use of energy and other natural resources and optimising the efficiency of our processes."

Between 2010 and 2012, Mixum rebuilt its entire production facilities from the ground up into a model food processing plant. Not only was it designed to be highly energy efficient, reducing energy consumption by 30%, it also put into place state-of-the art food processing equipment.

Batch to continuous pasta processing

One of those systems installed into Mixum's newly-built facility was a line of continuous-process blanching and cooling equipment for pasta, which replaced a batch processing system being used for over a decade.

"We were cooking our pasta in batch vessels," explained Franzen.

Mixum's Lyco Clean-Flow XT continuous-process blancher processes 2,200 lbs. of pasta per hour

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"This method did not give us much control in terms of timing of the

cooking and cooling because it was being done manually."

"We were looking for equipment that could not only cook, but that could also cool, so we could maintain better control over the entire process," added Franzen. "We needed very fast cooling, so we could get more consistent product quality."

Mixum also needed to increase its production throughput to keep pace with growing demand for its pasta products. Like many other food processors, Mixum was leaning toward shorter runs of a wider selection of products to processed, with increasing concern about quick change-overs, and faster clean-up and turn-around times.

"After reviewing many process options, we decided on a continuous-process Clean-Flow® XT blancher, from Lyco Manufacturing, and a continuous-process Easy-Flow™ cooler, also from Lyco," said Franzen.

Clean-Flow® XT continuous-process blancher

The Clean-Flow XT blancher addresses Mixum's need for more consistent pasta quality, and faster clean-up and changeovers. The blancher utilises a 40"diameter auger with flights to move the pasta through water, fully submerged, from input to output.

The machine is equipped with Hydro-Flow® agitation, a Lyco development, which enables a more uniform cooking and cooling process. Hydro-Flow uses water flow to create turbulence, so it keeps the pasta moving around to achieve a more even cook. Under- and over-cooking of the pasta is eliminated, and losses from sticking and clumping are also eliminated.

But what makes this blancher quite unique is its faster sanitary cleanup time. What would normally take several hours for a thorough sanitary cleaning, can now be done in 30 minutes. This not only

Mixum headquarters and plant in Motola, Sweden

About Mixum, AB

Started in 1989 with the three brothers Magnus, Mårten and Matts Franzén, Mixum AB is the largest processor of cooked peeled eggs in Sweden, handling 250,000 eggs daily, and the largest producer of cooked pasta. Mixum also manufactures a range of root-based salads, sandwiches and ready-meals.

About Lyco Manufacturing, Inc.

Lyco Manufacturing is a world-leading manufacturer of commercial cooking and cooling machines, liquid-solid separation screens, root crop peelers/scrubbers, and snap bean equipment for the processing of pasta, rice, dry beans and vegetables. The company has designed and installed thousands of machines for 50 of the top 100 food companies in North America and many smaller food manufacturers.

Recognised worldwide for its innovative machine designs and the quality of its engineering, Lyco's machinery has set the standard for increased capacity, improved product quality, reduced product damage and faster sanitary changeovers. The company's passion is developing the best customer-aligned, innovative food processing machinery in the world.

Founded in 1980 by owner and Chairman of the Board, David R. Zittel, Lyco Manufacturing is housed in a state-of-the-art 80,000 square-foot facility located in Columbus, Wisconsin, USA, 30 miles northeast of the capital city of Madison

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significantly reduces labor hours required for clean up, it permits the flexibility for more frequent changeovers to accommodate shorter production runs.

A clean-in-place (CIP) system utilising spray manifolds clean the auger and tank.The CIP can clean over 98% of the machine by itself.

Easy-Flow™ continuous-process cooler

The pasta exiting the blancher is gently deposited into the Easy-Flow cooler via a flume, where it is quickly and evenly cooled to bring it down to the required 40° F (4.4° C) final temperature.

Traditionally, pasta products take 12 minutes to cook, but to cool the pasta to 40° F (4.4°C) takes 5 to 10 minutes. Mixum's Easy-Flow

Mixum's Lyco EasyF

Filling prepared, cooked and chilled, pasta salad into containers for distribution

cooler is considerably faster. It receives the 180° F–200°F (82°C – 93°C) pasta, and chills it to 40°F (4.4°C), or less, in under 30 seconds.

When the pasta enters the cooler, it is pulled into a damage-free, Venturi-action water plenum and mixed with cold water where the heat begins to be removed. The cooler consists of four zones, or chambers, for cooling the pasta. Each zone submerges and mixes the pasta in chilled 33°F (0.55°C) water where it rapidly discharges heat. The first stage cools the pasta to below 70° F (21° C) in under 10 seconds. The second stage cools the pasta to 55°F (13°C), the third and fourth stages bring the pasta temperature down to 40°F (4.4°C) or below. The Easy-Flow cooler can chill any of Mixum's particulate pasta shapes.

Process results

Automatically controlling the pasta cooking and cooling, with consistent parameters for temperatures, process times and recipes, has completely out-performed the batch method used formerly by Mixum.

"Before, with the batch method, we were running about 650 pounds of pasta per hour," explained Franzen. "Now, with Clean-Flow XT and Easy-Flow we are processing about 2,200 pounds per hour. This is about 85% maximum capacity of the machines."

> **Each zone submerges and mixes the pasta in chilled 33°F (0.55°C) water where it rapidly discharges heat**

"The quality of pasta compared to batch processing is much better," added Franzen "We can reach more exact blanching and cooling process temperatures and times with the continuous system. And the speed of cooling the pasta is amazing. The cooling is directly influencing the quality of our pasta."

"We are processing the pasta two shifts per day, four days per week," said Franzen. "The Clean-Flow XT blancher makes for fast and thorough sanitary clean-up between runs." ■

Magnus and Matts Franzen, founders and owners of Mixum AB

Jeff Zitte/Patrick Roberts
Vice President of Applications and Marketing
Lyco Manufacturing, Inc
www.lycomfg.com.