

June 2008

eFood

European Food Scientist

www.scientistlive.com



Continuous Processing

Improving quality and consistency

Secret process for low-fat sausages

Consumers demand healthy chocolate

Calculating food chain carbon emissions

Wireless monitoring for hygienic products

Streamlining the cooking and cooling speeds of short runs

A supplier of food to caterers recently made the switch from batch to continuous processing for its pasta cooking and cooling line with greatly improved process flow, product quality and consistency. Jim McMahon reports.

Brake Brothers (Brakes), one of the UK's leading supplier of food to caterers, recently upgraded its pasta cooking and cooling line at its Creative Foods division, switching from batch to continuous processing, utilising Clean-Flow technology from Lyco Manufacturing.

The upgrade increased throughput and flexibility, speeded clean-up for faster changeovers on short runs, improved pasta quality and automated manual functions which streamlined process continuity.

As Britain's leading supplier to caterers in the United Kingdom, with a range of more than 15 000 products and sales exceeding \$3 billion annually, Brakes is a key driver in the UK food market.

One of Brakes' many specialty divisions, Creative Foods, Ltd., makes prepared frozen meals, sauces, soups and desserts for the UK's foodservice and catering market. This includes restaurants, pubs, hotels, schools, hospitals, automotive service stations, and travel and leisure facilities. It provides its foods in a variety of formats for caterers to cover different options, like individual- and multi-portion meals, in-pouch and foil-tray varieties.

The company also produces a range of individual sauce pouches ideal for serving with meat, fish, pasta or vegetables. Quick and easy to use, caterers simply re-heat, pour and serve.

All of Creative Foods' recipes are individually tailored to meet its customers' requirements, incorporating fresh meat, vegetables and dairy products. It produces a wide range of prepared meals, from traditional British favourites like steak and ale or cottage pie, to Italian, Indian and oriental dishes.

The company also offers a broad vegetarian selection. Some of its prepared entrée delicacies include Beef Medallions in Horseradish & Juniper Berry Jus, Venison Casserole, Aubergine & Walnut

Bake, Chicken with Portabello Mushrooms & Madeira Sauce, Moroccan Chicken, Chicken & Porcini Mushroom Stroganoff. Its dessert specialties include Toffee Apple Brioche, Chocolate Waffle Meltdown, Apple & Caramel Pancake Stack, Individual New York Style Cheesecake and a range of Premium British sponge puddings including Sticky Toffee, Belgian Chocolate and Lemon Treacle.

All of Creative Foods' products are frozen immediately after production, the freezing process acts as a natural preservative, allowing the company to increase the amount of fresh ingredients in its products.

Many of the company's entrees include cooked pasta, a culinary trend which is gaining momentum in the UK. Recently, the company made the move to upgrade its process line for cooking pasta. It was looking for equipment that was diverse enough to handle all types and shapes of pasta, and particularly the long pastas like fettuccine, linguine, tagliatelle and spaghetti. These long pastas are typically difficult to process, tending to stick together, damaging the product quality and increasing waste.

This is a common problem with UK producers cooking long pastas, because most food manufacturing facilities are using the batch system for cooking, quenching and chilling.

Basically, using the batch system, a basket with pasta is dropped into a tank of hot water where it stays until it is cooked.

The basket is then elevated out and the cooked pasta is put into another tank with cold water where it is



Fig. 1. The Clean-Flow system developed by Lyco Manufacturing.



quenched to take the heat out of it, but the temperature reduction in this tank does not reach the desired chilled temperature for the pasta. So, the pasta is then put into a third tank of chilled water which brings the pasta down to below 41°F (5°C), the desired range.

“We do quite a wide range of products incorporating different pastas,” says Howard Batey, Factory General Manager at Creative Foods. “Ninety per cent of the time we are running pasta. The remaining 10 per cent is vegetables, like carrots and potatoes, and a small amount of rice.”

“An increasing part of our business is in the long pastas like spaghetti, linguine and tagliatelle,” continues Batey. “We could not find a system that could adequately cook and cool these pastas at the volumes we were processing without it sticking together. So, we resorted to buying-in our long pasta, precooked and chilled.”

“We were cooking our shaped pasta in steam-jacketed vessels,” Batey explains. “We were aware that this method did not give us as much control in terms of timing of the cooking and cooling because it was being done manually.”

“Additionally, our batch cooking and cooling had limitations on how much pasta we could process at any one time,” says Batey. “We were struggling to keep up with our production demands, trying to keep all of our lines fed with cooked pasta.”

“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,” Batey continues. “We needed very fast cooling, so we could get more consistent product quality. We could not find any equipment that could cook the long pastas without the strands sticking together. That was the single biggest factor we were looking at resolving with automation.”



The pasta cooking/cooling solution which Creative Foods eventually selected is called Clean-Flow, developed by Lyco Manufacturing. The system utilises a rotary drum that provides water injection for agitation to keep the product in uniform suspension while moving through the unit.

The Clean-Flow design incorporates a very accurately made screw. It resides in a stationary wedge-wire screen that encapsulates the screw from the 3 to 9 o'clock position.

The tolerance between the screw and the screen is less than a grain of rice. The water agitation injected through the screen keeps the product off the floor of the screen, where it is maintained in total suspension. Damage to fragile product is a fraction of one per cent, even less than in a conventional rotary drum set-up.

Clean-up time is dramatically reduced in the Clean-Flow design because the screw is totally exposed for cleaning.



During clean-up the screen is released from its fixed position, and is continually rotated 360 degrees around the screw, alternately exposing the interior and exterior of the screen to clean-in-place manifolds located in the cover of the machine.

The screw can be rotated at the same time as the screen, again exposing all surfaces to the cleansing water sprays. Clean-up times are reduced as much as 75 per cent compared with conventional rotary drum blanchers.

Clean-Flow has significantly minimised the cleaning changeover time on short runs to as low as 20 minutes. This allows for an increased number of changeovers per shift, giving maximum flexibility and efficiency to food processors.

Having a truly continuous method of process is something that is a somewhat new in the UK. The flexibility of running multiple products throughout the production day at different temperatures and at different retention times is a unique feature to processors worldwide.

Consistent process parameters for temperatures and recipes, automatically controlling the pasta cooking and cooling hour after hour, has completely out-performed the batch method used formerly by Creative Foods.

Food processors are leaning toward shorter runs and wider product selections, with increasing concern about quick change-over, faster clean-up and turn-around times.

On a standard commercial cooker/cooler rotary drum, it would typically take two hours to complete the cleaning for a line transition. That makes it impractical to execute more than one transition per eight-hour shift. Creative Foods' cooking and cooling line meets the needs of quick change-over by speeding up the sanitation process, which provides the flexibility to run a variety of different products daily on the same line.

"The attraction to Clean-Flow for us was the flexibility," Batey says. "The internal parts can be cleaned much more easily, which means changing between different products within the same day could be done more quickly. Our plans were to process relatively short runs of different types of product. This meant putting

through different shapes and types of pastas, and even completely different products within the same day, such as switching from processing vegetables to pasta.

"The quality of our pasta products has improved dramatically, in part because we now have absolutely consistent cooking times, and are not relying on manual intervention, and also because the cooling cycle is now immediate," explains Batey.

"We have almost totally eliminated product damage, and we are running our long pasta through the system as well, no longer buying it out.

"The line is much more gentle on the handling of the pasta, particularly with the more delicate varieties. We are processing approximately 2640 pounds (1200 kg) of pasta per hour through the Clean-Flow line, and some days we run the line for 16 hours continuous. It is running very smoothly."

In the US alone, the frozen entree market is a \$6 billion dollar a year industry, with the average American cooking and eating a frozen meal about six times each month. New and healthier frozen food products, touting the addition of whole grains, the removal of trans-fats, and the use of organic ingredients, are continuing to keep consumers interested. Complementing this is the growing trend in ethnic frozen entrée variations.

Internationally, the desire among consumers for convenience and wholesome, home-cooked meals, especially with families, is at an all-time high and shows no signs of waning.

The United Kingdom is no exception here, proving to be a leading market for ready meals, both chilled and frozen.

Food manufacturers, like Brake Brothers, are quickly realising that the switch to more efficient automated systems for processing these entrees is critical to capturing and maintaining market share in this category. □

Jim McMahon writes on emerging technologies in food processing. Lyco Manufacturing is based in Columbus, WI, 30 miles northeast of Madison, WI, USA. www.lycomfg.com