

# Baking & Snack

The background of the entire page is a collage of various breads and a wheat stalk. On the left, there are several round loaves of bread, some with a golden-brown crust and others with a darker, more textured surface. In the center, a single wheat stalk with its head of grain is visible. On the right, there are more loaves of bread, some with a dark, almost black crust, suggesting a rye or pumpernickel style. The overall color palette is warm, with shades of red, orange, and brown.

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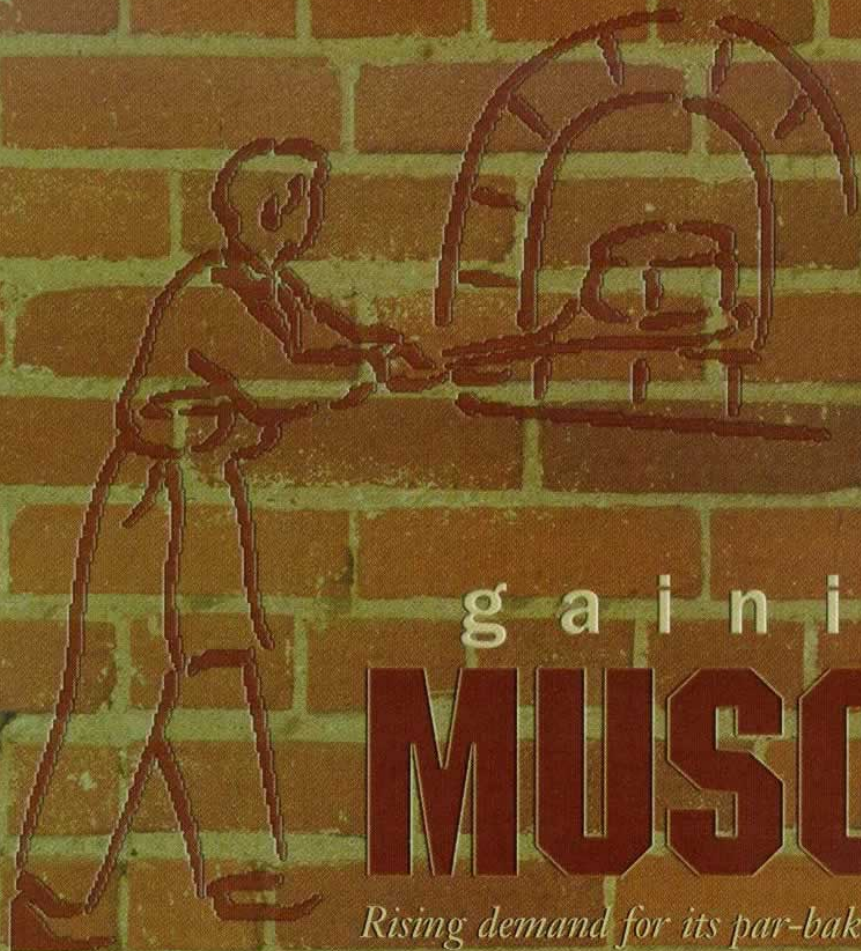
The Dennis Group and  
Maple Leaf Bakery

## MAPLE LEAF BAKERY

Increased product demand led to an  
upgrade in makeup processes at  
Maple Leaf's newest site

### The Dennis Group

*Planning, Engineering and  
Construction Management for  
the Food and Beverage  
Industries*



# g a i n i n g MUSCLE

*Rising demand for its par-baked hearth products prompted Maple Leaf Bakery to upgrade makeup at its newest site.*

BY LAURIE GORTON

**P**ar-baked is not easy. Sure, the concept is simple, and finishing is well within the capabilities of even the smallest kiosk. Put a fully formed, partially baked loaf in a steam-equipped convection oven, and a few minutes later you can hand your customer bread still warm from the oven. The fragrance of freshly baked bread perfumes the air, pulling in more shoppers. Easy and appealing — that's why par-baked is so attractive to in-store bakers and food service operators. To them, the aroma also smells of profits.

Interest by retailers in par-baked continues to grow because it mimics scratch/mix better than other baking methods. It takes less investment in labor and floor space. It offers favorable profitability and return-on-investment ratios, which are essential in today's tight labor market and consolidating re-

tail environment.

It's the production stage that makes par-baked so challenging.

Every aspect of formulating and manufacturing at the bakery must be just right. When your customer opens the case to ready products for his customers, that loaf or roll must look right and perform properly "as is." There are no fixes possible.

Rising demand for par-baked — and strong competition among its producers — means that the bar of quality is constantly being raised. What worked well yesterday may not measure up tomorrow.

That's why Maple Leaf Bakery "muscle up" the variety line making par-baked hearth items at its brand new bakery in Roanoke, Va. Based in Des Plaines, Ill., Maple Leaf turned itself into a major player in frozen baked products in just three years. But to maintain



Par-baked loaves must cool thoroughly before packaging to stabilize their structure and crust.



Dough pieces round up so that the surface is sealed and ready for further processing.

momentum, it replaced a retail-sized moulding system with twin 40-ft systems capable of running items as small as 8 oz up to 54 oz.

This isn't the first such change for Maple Leaf. In 1998 it installed a new crusty bread line in its Oxnard, Calif., plant and expanded specialty bread capacity there, too.

**POSITION BUILDING.** How did Maple Leaf Foods get into the frozen bread business? The Toronto-based company is Canada's biggest food processor and the majority owner of Canada Bread, the country's largest baker. In 1996, it bought the frozen division of Pioneer French Bakery, Inc., acquiring a frozen par-baked plant in Oxnard, Calif., and its flagship brand, California Goldminer.

Building on the West coast operation's expertise in par-baking, Maple Leaf eyed East coast opportunities. In May 1997, the company broke ground for a new 100,000-sq-ft facility on a 23-acre site at Roanoke, Va., investing \$22 million in the new bakery. The plant was up and running in February 1998, producing premium-quality specialty bread and rolls for frozen distribution.

"The new bakery is a key component in our strategy to continue to strengthen our position in the United States bakery market," said Michael H. McCain, president and chief operating officer of Maple Leaf Foods, Inc.

Maple Leaf added to that position in other ways. Late in 1997, it bought Brooklyn Bagel Boys, Inc., which has two Franklin Park, Ill., bakeries, from Canada Bread, its sister company. In three years, Maple Leaf created a four-plant network spanning the U.S., with manufacturing anchored east, west and in-between. Frozen bakery products from plants in Toronto and Calgary are also distributed by the U.S. company.

Maple Leaf has been making a name for itself with high-end, premium products. Crusty bread is a specialty, along with authentic hearth-baked bread and European-style baguette and petit pain. In September 1999, it expanded its Eurofresh line of partially baked specialty

bread to include roasted garlic, fresh rosemary, German roggenbrot, hazelnut, almond and raisin, kala-mata olive, fiesta pepper, peasant, variety grain, garden vegetable and a variety of focaccia bread. New packaging introduced last year for the California Goldminer line has also raised the profile of these products.

When announcing first half 1999 results in mid-June, Mr. McCain specifically credited the company's U.S. bakery operations for the segment's improved results. "In the U.S., gains continue to be made in sales of core par-baked bread products, where the company has a leadership market position." Expectations for the second half are even higher.

**RIGHT MOVES.** The Roanoke plant, designed, engineered and built by The Dennis Group of Springfield, Mass., has been in operation for roughly a year and a half. Now directed by plant manager David A. Leibensperger, the facility is refining its ratios.

"The trends are now going in the right direction," Mr. Leibensperger said.

Strengthening production on Line No. 1 is one of those right directions.

The busy facility operates in three zones — makeup, baking and packaging — with three busy lines feeding the on-site distribution staging freezer. The bakery employs a production staff of 40.

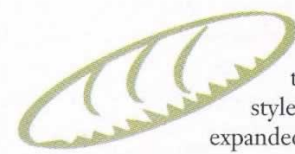
Lines No. 2 and No. 3 are highly automated, modular vertical systems from Europe. They are laid out in parallel straight lines, taking products through integrated proofing, baking, cooling and freezing stages. They produce par-baked baguette, petit pain and other European-style items.

Line No. 1 employs advanced conventional systems for dividing, proofing makeup, hearth baking and cooling. It's the workhorse, accounting for more than half of all Roanoke's output. Sourdough varieties take up the full first shift on this line, with variety items done on the second shift.

Processing of par-baked hearth bread starts with dough mixing. Two #16 horizontal mixers were installed recently to serve Line No. 1. Originally three Diosna spiral mixers provided dough for the hearth line. Those mixers are still hard at work. They were reassigned to doughs for the baguette and petit pain lines as processing needs changed.

The mixers receive flour and water automatically, supplied by a computer-run bulk ingredient system. Minor and small ingredients are portioned manually, according to formula requirements. Mixer operators batch these materials at a weighing station next to the two horizontal mixers. The bakery uses the straight dough method and a number of formulating approaches, including tailored bases from Caravan Products, to achieve authentic flavor for its bread and rolls.

When mixing ends, operators jog the doughs out into waiting mobile troughs. The full batch of dough is elevated in its trough and dumped into the Benier B9350 divider. The pocket-style divider outputs a row of dough pieces that move quickly into the Benier cone rounder. As they travel up the chute-like guides on the



[Top] Dough balls leave the intermediate proofer to drop into the centering belt of the moulder.

[Bottom] Careful tensioning ensures the proper number of turns to the sheeted piece.

rounder, the dough changes shape from the soft brick cut by the divider into a smoothly rounded ball.

**MULTIPLE CHOICE.** The rounder sends dough pieces out to ride up a finger-style dough transfer system into the loader gates of the Benier intermediate proofer. Run by PLC, the proofer can be set up to fill its 12-pocket trays with any configuration of dough balls: two per tray, eight per tray, 11 per tray, whatever is required to achieve the needed proofing time. Maple Leaf needs this flexibility: dough piece weights range from 6 oz to 54 oz.

The intermediate proofer is new, too. It replaced two smaller proofers, installed side-by-side. The new proofer consists of two zones, allowing different levels of humidification to be selected. The two zones are physically separated by an operator walk-through and linked by an overhead dough ball transfer.

"This was quite an improvement in efficiency for intermediate proofing," Mr. Leibensperger said.

Exit chutes distribute the relaxed dough balls onto two belts, which are programmed to run either right or left, according to product spec. When making sourdough boules, for example, the belts move to the right. This carries the pieces to infeed conveyors for two Winkler Dux round loaf moulders installed to one side of the intermediate proofer.

For all other hearth items, however, the belts move left, carrying dough pieces into the two new Benier 40-ft moulders. Output

rates can reach 2,500 per hour per moulder on the longest item and up to 10,000 rolls for small pieces on the two lines combined.

"Generally, you won't find sheeting lines this long. These are monsters! We chose the long 40-ft moulders because we run items ranging from 4-in. to 23-in. long on the same line," Mr. Leibensperger said. "We had to have the length for our baguettes."

The twin moulders, built by Benier U.S.A. in At-

lanta, apply American engineering to execute a Dutch design. Key alterations for the U.S. market included its 900-mm width and integrated automatic peel loading system, supplied by Baking Machines.

"The extra width was needed to meet our specifications on product length," Mr. Leibensperger said. "At first, if we used a narrower bed we would end up with cut-style ends on the dough pieces. Maple Leaf wants moulded ends on all pieces."

The new moulders replaced the plant's two existing Benier moulders. These smaller capacity moulders stayed at Roanoke, however, and are used for short-run items and occasional overflow situations.

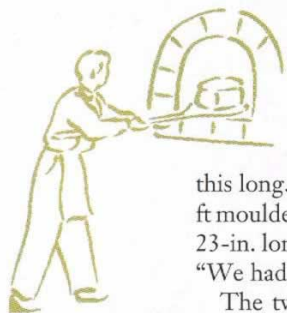
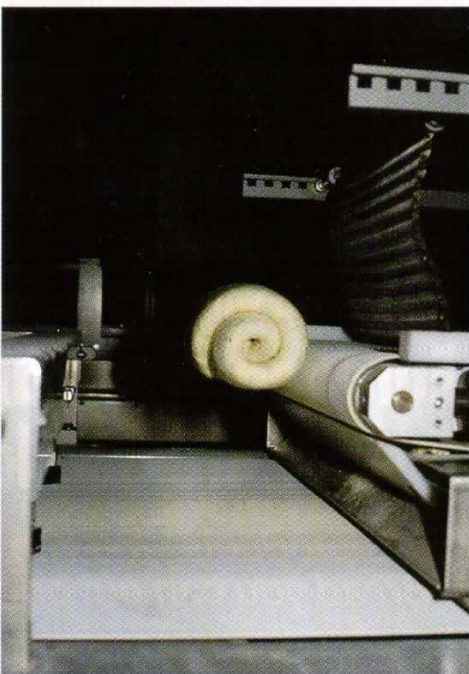
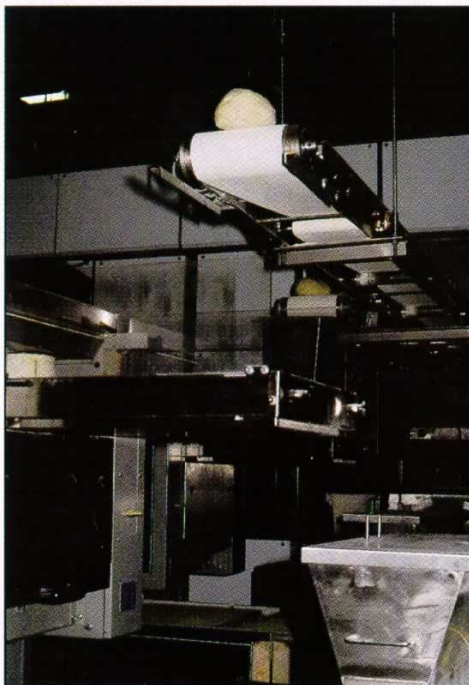
Changing the moulding technology allowed Roanoke to reduce staffing needs by three or four people. This allowed managers to reassign those operators to other duties.

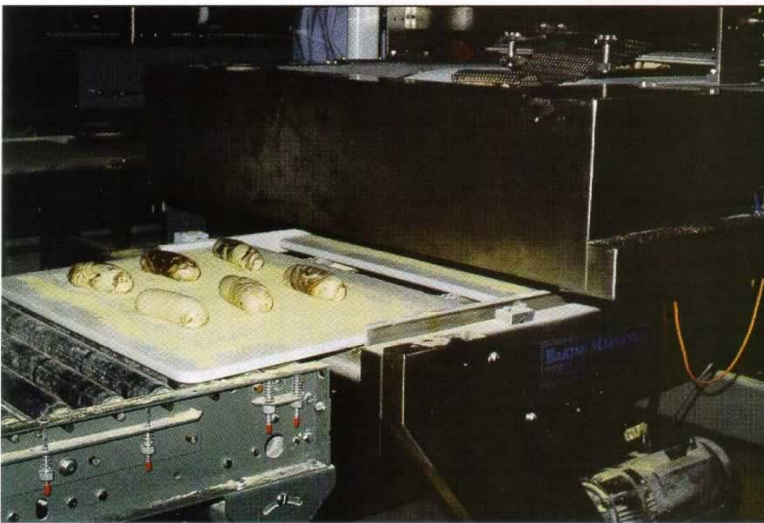
**UNDER PRESSURE.** An operator stacks clean high-density polyethylene peel boards into the dispensing bins at the front of each moulder. The system draws peel boards from the bottom of the bin automatically and gives them a light dusting of either flour or farina as they pass under the twin dispensing hoppers. The integrated Baking Machines peel system carries the peels along below the moulder synchronizing their movement with the output of finished dough pieces.

Dough balls from the intermediate proofer drop through the positioning gate at the end of the transfer conveyor. They pass through the moulder's centering mechanism before being sheeted. The sheeting head is spring loaded. This

keeps the dough piece under tension as it sits under the roller, which is claimed to be more gentle on the dough than conventional pre-set gap methods.

The flattened disk of dough encounters a curling chain. The sheeting is accurate enough to give each dough piece five rounds as it curls up under the chain. The stubby, rolled dough piece drops onto the moulding belt entering the first set of pressure boards. Guide rails, positioned by the operator at the start of each





[Top] At 40 ft long, Maple Leaf's new moulders provide the length and width to handle products ranging from 8 oz to 54 oz in weight and 4 in. to 23 in. in length.

[Bottom] At the end of the moulder, a shuttle conveyor drops finished loaves in pre-selected patterns onto waiting, farina-dusted peel boards.

new product style, keep the dough piece centered as it travels through the two sets of pressure boards. A gap of a few inches between the two sets of boards gives the dough pieces a few moments of relaxation, or "snap back," thus ensuring a properly moulded piece at the end of the second set of boards.

At the end of the moulder, the dough pieces fall into a positioning mechanism, a unique system that moves left and right to drop the piece onto the waiting peel in a pre-programmed pattern. Peels are sequenced to accept up to eight pieces per board. To change the loading pattern, the operator turns a switch.

Within a few weeks, Maple Leaf will install a set of tapered pressure boards to allow production of torpedo rolls. The taper boards are easily changed out for the regular flat boards when required by production schedules.

**PROOF, TOP, BAKE, COOL.** Peels filled with moulded dough pieces move down a powered roller conveyor. An operator pulls the board off the conveyor and inserts it into a waiting mobile proofing rack. As racks are filled, Line No. 1 operators push them into the Industrial Air Conditioning roll-through proof box.

Maple Leaf opted for conventional proofing meth-

ods because its products vary greatly in proofing time. Marble rye, for example, needs two hours, while the sourdough "squares" made earlier in the day need as many as five hours.

The proof box links makeup operations to the oven room. At the proper time, operators pull racks out of the proofer and load the peels onto a conveyor. While toppings and seeds are automatically dispensed, Maple Leaf bakers slit the proofed loaves manually as they travel to the Capway automatic oven loader. Manual slitting adds the handmade appearance that's important to the appearance of par-baked hearth bread.

"Line No. 1 is more hands-on than our other lines," Mr. Leibensperger said. "But we have a lot of flexibility with this system."

Automatically pulled off peels and placed onto the hearth, the loaves proceed through the Winkler indirect fired oven. The three zones are controlled by PLC, programmed to apply steam and adjust baking temperature according to the product's SKU.

Traveling the length of the hearth oven, the now partially baked loaves and rolls slide down a short chute. They reach another conveyor that carries them to the Northfield spiral cooler. Fresh from the oven, par-baked breadstuffs are relatively fragile and need additional cooling time in order to stabilize internal structure and crusts. As they travel up the ambient cooler's long belt, their internal temperature decreases so they can be packaged without damage.

Reaching the top of the spiral, loaves transfer into the packaging room. This area of the bakery is kept at 48°F (9°C). Every product must pass through a Safeline metal detector before being placed into poly-lined cases for freezing and distribution.

Nearly all of Roanoke's products are par-baked. Only a few sliced bread items, made on contract, bake fully.

**ENHANCED RESULTS.** Maple Leaf kept to tight deadlines for installation of the new moulders, and the changeover went smoothly. Only minimal training was required to bring operators up-to-speed on adjustments and applications. Products were tested on-line at the time of installation.

"This line is responsible for more than half of all production here," Mr. Leibensperger said. "We have no margin for error."

The control points, too, are straight forward. Operators record weights, heights and lengths on rounded dough balls as well as finished moulded pieces. They track proof times, bake times and steam application readings. After the oven, products are again checked for weight, height and length. And, of course, the metal detector is carefully monitored.

With the new moulders now on-line, Roanoke is ramping up new products. One by one, items made in other company locations are being "qualified" to run at Roanoke. By gaining muscle and expanding its capabilities, Roanoke strengthens the national position of the whole Maple Leaf Bakery production network. ■

