COOPERATIVE RESULTS

Value Added Products' new plant at Alva, Okla., not only produces world-class frozen pre-proofed items but also fulfills the dream of a determined group of farmers.

BY LAURIE GORTON

For now, 9,000 lb per hour of frozen pre-proofed pizza crusts flow through the state-of-the-art automated processing line at Value Added Products, Alva, Okla. But tomorrow, next week or even three hours later today, the production schedule may call for equally high volumes of baguettes, cinnamon rolls, croissants, Danish or any of 200 different products. With changeovers designed to be nearly instantaneous, the new facility is that flexible. It has to be.

"Value Added raised financing on the commitment of one large customer," said Mike Dunker, the company's general manager, "but we knew we would live or die with one product only. From the start, we recognized the need for flexibility, for having more than one item to offer customers."

The result is a new giant in the frozen pre-proofed dough category, capable of 10

▲ From pizza and cinnamon rolls to croissants and Danish, Value Added Products makes the most of the hard red winter wheat grown by its members. Directing the venture are [from left] Mike Dunker, general manager; Myron Bradt, chairman; and Harry Dunker, plant manager.

million lb of production annually. It makes products using the state's leading grain crop, hard red winter wheat, and markets them nationally via contract manufacturing and select broker/customer relationships. The $18 million, 43,000-sq-ft facility started up its pilot line in February 2000, with its main line coming on nine months later.

NEW GENERATION. Value Added Products exists because a determined group of farmers, led by Myron Bradt, wanted better returns for their hard work. Mr. Bradt farms more than 2,600 acres of wheat. He served on the Oklahoma Wheat Commission's board of directors and its value-added committee during the mid-1990s when wheat prices sank to a modern low around $2 per bushel.

"Oklahoma's state department of agriculture talked to us about the benefits of vertical integration in agribusiness," he said. "It became my quest to do a value-added project, particularly at Alva or in Woods County."

Through a $5,000 grant from the county's economic development commission, a group of 25 farmers, agribusiness managers and community businessmen explored possibilities. "We wanted to use our abundant raw material: wheat," Mr. Bradt said.

"We considered attracting a company to move here but soon decided to focus on 'growing our own,'" he continued. "We brought in a consultant to help us go over ideas. That's when we decided on a frozen food business. We learned that 50 million to 60 million people live within a 600-mile radius of Alva, but not many frozen dough companies exist in this region."

Advised by their consultant, they started talking to equipment vendors, especially those with expertise in frozen dough and pre-proofed bakery foods. The group selected Naegele, Inc. to carry out the project.

The Value Added team also sought help from the Oklahoma Food and Agricultural Products Research and Technology Center, directed by Lowell D. Satterlee. Based at Stillwater, Okla., the center is part of Oklahoma State University. It constructed financial models during the early stages of the project, helped conduct producer meetings and cooperated on formula development.

▲ In-line spiral mixers put doughs through mixing, kneading and resting stages. Multiple bowls mean maximum formula flexibility.

To qualify for government-backed loans, the group had to raise at least half the financing itself. It studied the "new generation co-op" model for organizing food manufacturing businesses. The group decided to organize the venture as a closed cooperative, and the values of its shares will fluctuate according to the business' results.

Oklahoma added another incentive: "The state legislature passed a 30% tax credit basically tailored to us," Mr. Bradt said.

LAUNCH PLAN. Armed with the financial prospectus, the Value Added team made arrangements for three meetings to talk to Oklahoma farmers. Word of mouth and good press coverage spread the news quickly. Eventually, 34 producer meetings were held, enrolling 857 farmer-investors.

"We set speed records for funding," said Mr. Bradt. "We raised $7.2 million for the charter enrollment in just two months."

Value Added's first customer posed the business' first big challenge. "The agreement we signed was large enough to take everything the plant was originally designed to produce," Mr. Bradt said. That agreement helped make the co-op's prospectus attractive to investors, but if the venture wanted to serve additional customers, then additional equipment would be needed. "So we went out for a second round of financing and two months later brought in more than $2 million."

The new venture saved on construction costs by taking over an existing building, a former Wal-Mart store on a 8.3-acre site next to the municipal airport. Value Added could, therefore, invest the maximum "under the hood."

"We didn't want funding to limit our getting the best equipment and best management," Mr. Bradt said.

About two years into the project, the co-op team sought an experienced bakery executive to manage the business. Mike Dunker's name came up on the list of candidates. Being a bakery consultant at that time, Mr. Dunker found the new venture appealing. "I was interested in doing something in the value-added field," he said. "I liked the concept of bringing economic benefits back to the farmer, and I fell in love with Alva."

His brother, Harry Dunker, then managing production operations at a large Chicago food plant, caught the Value Added bug during a family Christmas dinner. "I said something about wanting different job challenges in a more family-friendly community, and Mike suggested I visit Alva," he said. "Two weeks later, I gave my notice and started our move here."

Mike Dunker handles the business and its day-to-day concerns, with Harry Dunker responsible for manufacturing operations as plant manager. Value Added's 9-member board of directors, chaired by Mr. Bradt, acts for the co-op, overseeing money matters and approving long-term contracts.

TECHNOLOGY CHASE. A written contract covering three years of production for its first customer decided the question of which technology to pursue first. It would be frozen pre-proofed pizza crusts.

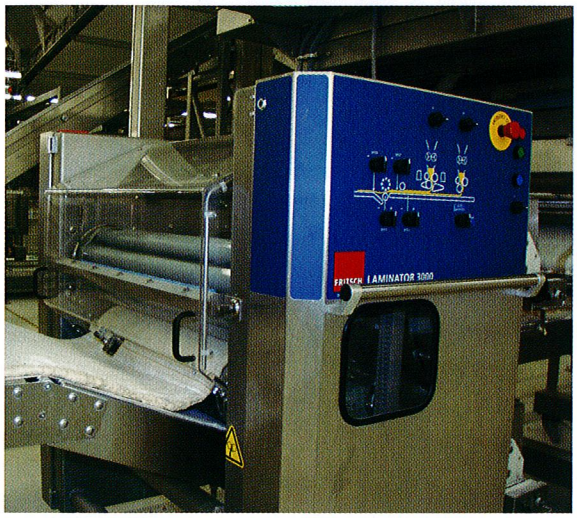
"The development of process, including formulation, was all done by Fritsch through its German and American offices," Mike Dunker said. "It had the expertise in pre-proofed we needed. Pre-proofed is very popular in Europe, and we could see a good market emerging for it here in the United States.

"Then Naegele, Inc. engineered the production lines to run more than 200 products on the same line," he continued. "We use one lamination system to feed two makeup sections, one for flat products and the other for rolled items. With this flexibility, we have the freedom to follow the direction the market takes us.

The plant is equipped with the latest in current technology for bulk ingredient handling, automated spiral mixing, laminating, makeup, proofing and freezing.

The Shick Tube-Veyor bulk ingredient system stores flour in two Tec Tank 100,000-lb (45-tonne), 2,700-cu-ft silos, mounted on a pad outside the plant alongside a BOC Gases carbon dioxide storage tank. A pressure differential truck unloading system speeds flour intake. Dust collection and dehumidifying systems control the climate within the silos.

Flour passes through a Shick pressure sifter as it travels from silo to scale hopper at the rate of 350 lb per minute. Right after the sifter, a cooling manifold injects carbon dioxide snow through valves directly into the flour stream, chilling it to the exact temperature specified by the formula. The flour line connects to scale hoppers at three drop stations: a 500-lb hopper at the pilot line, a 700-lb hopper at the industrial mixer and a 500-lb hopper at the dusting flour station.

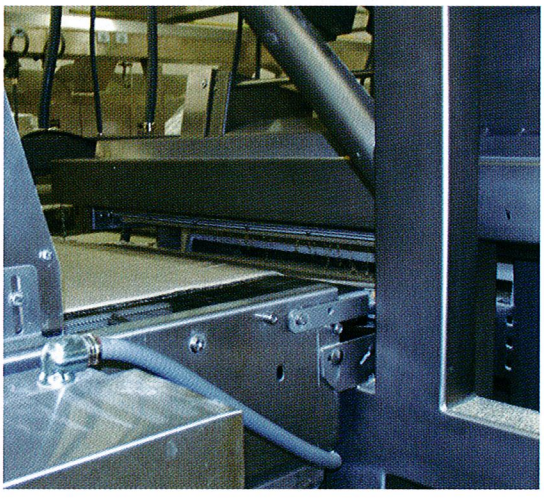


▲ The many short-duration pinnings applied by the multiple small-diameter rollers of the laminator can make a 10:1 reduction in dough depth in a single stage. The action is gentle and maintains dough structure, crucial to the success of the frozen pre-proofed process.

Shick also supplied the water system, which blends city water with the plant's chilled and hot water supplies. A Morris automatic ice maker supplies flaked ice to mixers when needed.

There's room on-site for additional silos, and the company is considering enclosing them for weather reasons. Blowers throughout the bulk system are oversized to accommodate another silo. And all piping pathways are laid out to allow easy installation of additional ingredient lines.

▼ A special depositor lays down a light dusting of corn meal for pizza crust bottoms.



LAMINATED DOUGHS. Production on the main line, like the pilot line, starts with prescale by manually batching small ingredients. Three people handle this responsibility.

VMI double spiral mixers prepare doughs. A single 550-lb mixer supplies the pilot line, while an automated in-line, 12-bowl mixing system makes doughs for the large "industrial" line. The shuttle-style in-line system sequences bowls through mixing and rest time stages, accommodating different formula needs, thus adding flexibility to the system. Hydraulics lock the gear-driven bowls in place for mixing and kneading operations. A bowl hoist transfers dough to a wide conveyor belt that feeds the main line's DS dough sheeter.

"We have one of the largest laminating lines in the world," Mr. Bradt said. Two Fritsch processing systems comprise the heart of the plant. The first to be installed, a Fritsch "Euro line," provides pilot plant capabilities and got the facility into production during commissioning of the industrial line. The pilot line is capable of 200-lb to 500-lb batches, while the industrial system produces 5,000 lb to 9,000 lb per hour. Belt speeds range from 8 ft to 33 ft per minute.

The essential technologies of both lines are the same. "This allows us a smooth transition when moving products from development to full-scale production," Harry Dunker said. "Our bottom line depends on keeping the industrial line running."

Some products, such as pizza crusts, were formulated with a percentage of scrap dough. The makeup line's scrap collection system diverts a portion of the trim dough back to the mixer and feeds the rest into a separate dough hopper ahead of the fresh dough system. It lays down a thin layer of scrap dough that is then covered by a layer of fresh dough.

Together the DS dough sheeter, RDP relax dough processor and Laminator 3000 satellite head, cross-roller unit and calibrating head handle the soft doughs required for pre-proofed items without damaging the dough's texture. The butter spreader and dough folder establish initial layering. Layout of the industrial line includes lapping stations and rest-time tables, configured in a space-saving U-shape.

TWO WAYS. At the end of the T.E.M. supply conveyor, doughs make a 90° turn into one of two parallel Fritsch makeup lines. To change from flat products (for example, pizza crusts) to rolled items (baguettes, cinnamon rolls, Danish), an operator signals the end of the supply conveyor to drop, thus routing dough to the alternate line. Changeover time is zero.

On the flat products line, dough passes through a final cross-roller for width and two gauging rollers to assure proper weight

CUSTOMER DRIVE

Value Added's marketing approach is distinctly its own. "Our plan is relatively simple but different from the norm," explained Frank J. Paolozzi Jr., the venture's Atlanta-based vice-president of sales. "Most companies try to cover every broker, scattering their coverage by trying to anticipate broad market needs.

"Because I've seen how wasteful of product and effort this style of marketing can be," he continued, "Value Added chose a different way. We want the broker to come to us with specific account needs. Thus, we can concentrate better on the individual accounts and get deeper penetration, with more products, into those accounts. This focus on the customer drives the product into the distributor because distributor has to oblige that account."

The company offers a wide variety of pre-proofed breadsticks, croissants, pretzel logs, dinner rolls, sub rolls, baguettes, cinnamon rolls, puff pastry, Danish and specialty breads, trademarked Oven Ready Fresh Rise. "We can customize formulation and packaging," Mr. Paolozzi explained.

across the dough band. Some pizza crusts require a bottom coating of corn meal, so a series of short conveyors pick up the dough sheet, send it up and over to reverse its flow and expose the bottom surface. This surface is wetted and the sheet reversed again, contacting another conveyor carrying a light dusting of corn meal. This puts corn meal onto the bottom of the pizza crust — as the customer wants and consumers expect. This section can be bypassed when no corn meal is needed.

Rotary cutting dies turn the continuous band of dough into individual rounds with 7-in. to 18-in. diameters. As excess dough is pulled off by the scrap system, the system deposits the crust rounds onto paper sheets.

"Not only does the paper carry the pizza through proofing and freezing, but it also becomes a liner when packed into cases," Harry Dunker said.

Pizza edge-folding machines from Denmark, two of only six in the U.S., can be rolled into place on the flat product line to make 12-in. and 16-in. pizzas. A unique system of rolling depositors and plastic fingers fill, or stuff, and fold the crusts.

When using the parallel rolled product makeup line, the dough sheet is sent through a 90° turn into cross rollers and gauge rollers. A series of rolling cutters divide the sheet into strips, which are then spread apart on the belt. A guillotine knife separates the strips into individual pieces, and the system passes these under a curling chain and into the pressure board assembly. Breads (baguette and petit pain) are deposited into plastic fluted pans for their journey through the proofer and freezer.

The rolled product line also produces cinnamon rolls and Danish, among other items. "Value Added makes the finest pre-proofed cinnamon roll on the market today," Harry Dunker said.

ZONED SYSTEMS. A new generation of spiral systems, the I.J. White Accuproof and Thermal-Pak systems, handle proofing and freezing tasks. Each consists of two 35-tier spiral conveyors housed in separate zones with independent control of temperature and relative humidity. Because both operate with central belt cleaning systems, Value Added can run product directly on the belt or on carriers.

The systems' conveyors allow precise timing of both proofing and freezing, but it's their dual zone controls that provide the flexibility to handle products with widely varying needs. During proofing, for example, some items require dry conditions or cool resting (retarding), followed by high humidity in the second stage, while others need just the opposite. Instead of a traditional steam system, which raises temperature along with humidity, the Accuproof uses a misting system to add moisture without increasing temperature. It also includes a refrigeration system, capable of reducing zone temperature to 50°F (10°C) for retarding or resting.

The proofer also houses a bypass conveyor, running along the back of the enclosure and under the spirals. When making frozen raw (unproofed) dough, a hinge bridge passes the product from the makeup line to the bypass conveyor leading directly to the freezer.

The Thermal-Pak spiral blast freezing system acts to extend production. The patented finned coils run for up to a week between defrosts. Also, the elliptical cross-section tubes in the ammonia refrigeration coils give more primary surface area than round tubes for more efficient blast freezing. Inside the double spiral, the environment drops to -25°F (-32°C), allowing the fans to generate -75°F (-59°C) wind chill conditions.

Flooring and enclosures, too, feature advanced design. The Series 7000 floor of the freezer consists of seam-welded heavy-gauge stainless steel, not concrete. The insulated enclosures use a new interior band method. When the cam-locks between panels are closed, they also engage bands set inside the panels to create an interior "strapping" system that extends all around the enclosure, including the corners. The bands stabilize the structure and dramatically reduce moisture infiltration.

▶ Supplied by a single lamination line, the parallel makeup systems produce flat products [right] and rolled items [left]. Changeover is nearly instantaneous.

As products leave the spiral blast freezer, they are checked for quality, size and weight. Pieces move individually through a Loma metal detector and are then manually counted, stacked and placed into shipping cartons.

"We try to eliminate as many distribution problems as we can," stated Harry Dunker. Pizza crusts, still on their paper liners, are layered into the shipping cases. The company uses double-covered corrugated cartons, and it counts pizza crusts into cases of 24 or 36, rather than the usual 50. "This minimizes the opportunity for spoilage at the end user," he continued. "Also we pack small cases for customers whose on-site freezer space is limited."

FASTER COMPUTERS. Machinery controls at Value Added take advantage of the new Allen-Bradley SLC 5/04 with integrated PanelView displays.

Naegele coordinated between equipment manufacturers to connect the machinery with the controls. Automation is at the individual cell level, with no single master computer, but the interface allows data to be communicated to other stations.

At each station, software holds the "recipes," and the line operator pushes a button to sequence activities. State-of-the-art operator interface programming, such as that on the Fritsch system, are described as very user friendly. All major equipment is modem-equipped for remote troubleshooting.

Quality assurance operators, managed by Debby Klein, pull samples from each batch and from freezer stores. The second shift bakes them for daily evaluation. The plant operates under a complete HACCP program, with sanitation coordinated by Ecolab.

The plant currently runs three shifts, two for production and one for sanitation and maintenance, with a staff of 80 people. The engineering group includes a PLC specialist, hired during the installation period.

Evaporative coolers maintain a constant 65°F (18°C) in processing areas. A separate dry goods warehouse handles stores of sugar, salt and other minor ingredients, while yeast is held in a walk-in cooler close to the mixer stations of the pilot and industrial lines. The -10°F (-23°C) storage freezer contains up to 23 truckloads of finished products. A second set of pallet racks will soon be installed in this freezer, and a second dock door will be added next spring. The company is now digging a wastewater retention pond behind the plant.

During construction, the roof above the plant's proofer and freezer was raised 17 ft. It's so tall that the city asked Value Added to put red landing lights on top of this section and the flour silos: they sit directly under the municipal airport's flight path.

While Value Added owns the entire property, it does not yet occupy the full building. Some space is rented to other businesses, but as the leases expire, the bakery plans to expand. It is already converting one storefront into a small retail bakery cafe to serve the Alva community and the company's investors. It will also function as a demonstration and training site for customers. Renovation started in earnest during September.

Another storefront will be converted into offices and employee support facilities.

"We can fill the entire site, including the parking lot," Harry Dunker said, "but we can't go farther back because of the airport. Instead, the city plans to make available land it owns across the road."

WHEAT EQUATION. "Our goal is to use as much wheat, particularly hard red winter wheat, as possible," Mike Dunker said. An important part of the investment made by individual co-op shareholders is the allocation they make to Value Added Products of a portion of their crops.

Farmer-members deliver their wheat to their storage facility as usual. They transfer the rights for a set percentage of their harvest to Value Added. The plant buys flour based on what the farmers allocate. Ranchers who belong to the co-op make a similar designation according to the value of the livestock they bring to market each year.

"At present, this is a paper transaction," Mr. Bradt explained. "But I can see the day when I deliver high-quality wheat to my transfer point, pocket the protein premium and then earn additional returns on that same wheat from its allocation to this bakery."

"All wheat flour is a blend," said Mike Dunker, "but we work with our millers to use as much hard red winter wheat as possible." When Value Added team members visited machinery vendors in Europe, they brought along a supply of hard red winter wheat flour. Fritsch's in-house master bakers developed the pre-proofed formulas specifically for this type of flour.

▲ Proofing and freezing take place in enclosed twin-spiral systems, each consisting of two zones with independent temperature and humidity control.

"Winter wheat is not traditionally used in frozen dough," Mike Dunker observed, "but with the assistance of Fritsch and O.S.U., we got surprisingly happy results. It contributes a unique texture and character to our products."

Might Value Added someday operate its own flourmill? The plant would have to run 10 or more lines before milling economics become favorable, according to Mike Dunker. But it's a subject about which some co-op members speculate. "When they visit here, many of our members like to joke about unloading their next harvest directly onto our parking lot," he said.

In May, the Oklahoma Wheat Commission presented its Staff of Life Award to Value Added Products. It recognizes an Oklahoma business for exceptional promotion of wheat through the use of wheat foods.

"This business, this bakery, is a dream come true for me," Mr. Bradt said, "and a dream come true for a lot of Oklahoma farmers." ■