



Ingenuity made to order

Slice your way to optimum profits

Equipment features can maximise your operation's performance.

by Jay Stewart, Provisur Technologies Inc, USA.

In today's cost-conscious and quality-driven marketplace for sliced meats and cheeses, every processor is looking for an edge that will help maximise slicing-line performance. Be assured, thanks to recent innovations, that new slicers, advanced blade designs and more efficient downstream machinery now make it easier than ever to reduce the cost of labour, while also reducing giveaway, increasing yields, improving portion control and overall product quality. Understanding the features to look for in slicing equipment, and examining the advantages those features deliver, can help you make informed decisions and push the boundaries of your processing operation – even (or perhaps especially) if you require equipment with a short footprint due to limited floor space available in your plant.

Balancing the features/benefits equation

When considering potential investments to improve the efficiency and profitability of your slicing line, here are a few places to begin your research:

Independent drives

While logs of meat or cheese may be commonly specified by diameter and length, relatively small variations in size, shape and weight can produce dramatic differences in both portion control and product waste. The differences can be even more pronounced when slicing irregularly shaped products, unless your slicing equipment can automatically adjust. Unlike single drives, truly independent drives can make adjustments for each log within a single slicing load. In effect, each lane acts as a separate slicing system, adjusting the log feed rate to account for variations. When coupled with independent scales and classifiers, the ultimate in product control can be achieved, allowing the machine operator to run at a target-weight set point that is closer to the desired package weight, while maintaining a high rate of on-weight portions. The result is lower giveaway, higher yields and increased profits than can be delivered by any single-drive slicer tasked with feeding multiple logs.

Product control

If you want to maximise yield on every product you slice, reducing the size of your butt ends is a productive place to begin in pursuit of that goal. Selecting the ideal gripper for each of the products you slice is one key to success. Another is to carefully evaluate and select a slicing system that presents the product to the blade as closely as possible. The best down-to-the-blade product control designs employ independently driven, upper- and lower-infeed conveyors that securely support a wide variety of product sizes, shapes and densities. A top-mounted upper hold-down conveyor can also help secure your products all the way to the blade. This dual level of product security helps assure the ability to get every last slice out of each log, leaving butt ends that are much smaller than the industry standard. When all of these pieces to your puzzle are put together, yields have been known to improve by up to 2.75%.

Open design

Today's trend toward more open, accessible designs offers processors several advantages. Easy access to all components, with a minimum of tools, makes disassembly for cleaning faster, providing more run time per shift. Sanitation and food safety are also enhanced, as protocols for cleaning tend to be more simple and easier to follow without missing critical steps. Some advanced systems also allow remote location of control panels to a wall or mezzanine, moving sensitive electronic components out of harm's way.



Blade technology

Slice integrity, product appearance and overall productivity all rely on one key component: the blade. In fact, blades are the most important component on a slicer. In the wide product range from whole muscle products to emulsified bologna, you can not achieve maximum slicing results without the right blade for each application. To improve slice integrity and portion accuracy, look for blade innovations that broaden your optimal slicing temperature ranges and help boost throughput in every slicing application. Ask suppliers about customised blade profiles, precision angles, and edge serrations that maximise throughput while minimising slice rips and tears.

- Are the blades coated to optimise performance for sticky or more challenging products?
- Are they hard enough to keep their edge when slicing crusted and pepper-coated products?
- Are they tough enough to prevent safety hazards like cracking and shattering?

Remember, blades also contribute to your maintenance costs since they must be replaced periodically. Durability is key, as is the ability to regrind multiple times before replacement is necessary.

Auto-loading

Today's consumers are not only demanding products that taste good, but ones that look appealing, too. That means processors must consider how to optimise product presentation during the slicing process. Most labour on the slicing line is focused on handling and loading sliced portions into the packager. However, sliced portions can be hard to load manually at high rates of production. Investing in equipment with slice positioning capabilities and machines that can overlap, turn and flip product to create a customer-pleasing package can help improve line efficiency, achieve high production rates with minimal manual intervention, assure consistent product placement, and result in labour savings, too. Wondering about robotic loading systems? Due to the challenges of handling and placement of sliced portions, most never reach their projected throughput. They also require substantial manual intervention, as well as large amounts of floor space – something incompatible with smaller processing operations.

There are, of course, many challenges facing processors. Fortunately, today's state-of-the-art slicing system technologies can provide you with true flexibility and positively impact many of these, including: food safety, product quality, yield, throughput and profitability. Doing your homework will help you make informed decisions that, in the end, will produce optimal results and lower the total, true costs of machine ownership.



Ingenuity made to order

Pumping up volume and profits

Processors worldwide are pumping up volume and profits with positive displacement pump grinding systems.

by Jay Stewart, Provisur Technologies Inc, USA.

Large volume processors around the globe have slowly and independently come to the same conclusion: there is more money to be made by integrating the latest generation of pump grinding technology into their operations.

The results of converting from vein pump or screw-fed grinders to the latest pump grinding technology, can be 'quite amazing', say many processors, including Evan Schnitker, Corporate Engineer at US-based FPL Food, LLC. Within his Thomasville, GA processing facility, Schnitker and his team use Provisur's MPG Dominator 14/7225 Mixer Pump Grinder to process up to 127,000kg (280,000lb) of beef per week into burger patties, bricks, chubs and loaves.

"Our Pump Grinding system will never be the bottleneck at FPL," Schnitker says of the comprehensive system that includes both Provisur's Beehive and Weiler equipment brands. "We have not begun to challenge the capacity limits of the Provisur system," he marvels.

In addition to the high throughput generated by the system in place at FPL Food, Schnitker lists product quality and a lower total cost of ownership as primary distinguishing characteristics of a positive displacement pump grinding system when compared to other available technologies.

"Our owner loves the high-quality textures coming out of the Weiler Mixer Pump Grinder. We have been able to grind every type of product that interests us, even more difficult raw materials like some of the grass-fed beef we grind and package that is growing in popularity with today's clean-label-oriented consumers," Schnitker relates.

Similarly pleasing results, based on quality textures and versatility have been reported by processors with problematic applications ranging from briny poultry meats used for chicken nuggets to tough and sticky pork formulations used in sausage production. In all of these cases, this newest generation of pump grinding technology has been able to help produce products with improved particle definition and less smearing, even while processors enjoy increased grind rates and low cost of ownership. For these and other reasons, many of the world's largest and most successful processors have already adopted this new technology.

The state-of-the-art pump grinding system in use at FPL Food also includes an innovative bone removal system pioneered by Provisur's Beehive brand. According to Schnitker, this in-line Piranha technology has also contributed to the company's product quality success. "In my 15 months in this particular job with FPL, not a single complaint concerning bone fragments in the end product has made its way back to our processing team," he says.

Pump grinding versus alternative technologies

There is enough empirical evidence and case study data to make a convincing argument for investing in pump grinding versus the alternative technologies.

Among the areas of comparison where pump grinding technology clearly shines are grind rates and efficiency; product quality; repeatable and consistent particle definition and reduced product slippage, and lower overall maintenance costs.

Production flexibility can also be a consideration, for processors handling multiple raw materials and, particularly, on more difficult products that are difficult to grind at higher speeds.

Consider a few of these advantages:

● Product quality related to pump grinding

- Less mechanical energy is transferred into the meat
 - No slippage due to a feedscrew
 - Less turbulence and roll back in the hopper
- Better particle definition
 - Minimise 'smearing' – reduced mechanical action minimises the breaking down of fat cells, which results in dispersing the fat particles into the lean portion.
- Predictable and repeatable results
 - Consistent production: efficient pumping with positive feed that does not change over time
 - Precision tuning: variable frequency drives, an exclusive benefit available on some pump grinders, allows processors to dial in the precise definition desired
- Appearance
 - Definite particle definition: lean is distinct from fat
 - No smearing: fat will take on the colour of the spices, which is generally undesirable.
 - Less product cupping during cooking (for example sliced sausage applications)
 - Homogenous grind
 - Consistent, longer fibres maintain shape better
 - Less product shrinkage equals less cupping

● Grind rates

Using the newest technology, pump grinding throughput rates can be considerably higher than feed-screw driven technologies. Available case study data illustrates grind rate increases up to 38%. Variable speed drives and frequency drives on critical components help significantly increase processing speed and provide processors the flexibility to dial in exact needs for each product application. Available grind rates can be measured against these standards:

- Grind rate up to 350kg/minute with 150mm pump
- Grind rate up to 227kg/minute with 100mm pump

● Cost of ownership

When it comes to calculating the total cost of ownership for pump grinding technology, processors know that things can get complicated. Multiple factors can affect your total cost of equipment ownership and are variable not only by durability and maintenance requirement of the grinding system you use, but also by the raw materials processed and the grind rates achieved and the applications performed. Still there are some easily demonstrated savings, such as:

- No hopper or feedscrew to rebuild/replace
- Normal Weiler brand configuration of cutting parts
- Less turbulence reduces mechanical wear on parts
- Substantial savings in cutting parts
- Low cost, lower maintenance pump compared to vein or screw style pumps

As Evan Schnitker of FPL Food declares, The results of Provisur's converting latest pump grinding technology, can be 'quite amazing'.

Ingenuity made to order

Rethinking spiral

by Mark Rijpma, Provisur Technologies Inc, USA

For processors of fully cooked and roasted products, the standard of industrial-scale oven technology has been the innovation of a compact, technically advanced solution that ensures the even distribution air, heat and steam throughout the oven, enveloping products in a way that consistently delivers high product quality and appearance at an economical cost per pound of cooked product. Provisur Technologies has created just that with the introduction of its T-HEX Series of Spiral Cookers. With input from global customers, Provisur's experienced team of engineers and applications experts developed a long list of 'must have' recommendations for functionality and flexibility. We wanted to fundamentally change spiral cookers; and we have.

Complex problems solved

The result of Provisur's approach to efficiently roasting, grilling and steaming products as diverse as meat and veggie patties, spare ribs, chicken wings, fillets, drumsticks and nuggets is the new and unique T-HEX Series.

"T-HEX, the next generation spiral cooker design, is based on one or more separate, independent drums, rather than the conventional single box design offered by other industry suppliers," explains Walter Van Genderen whose engineering team designed the new system.

The primary benefit is the ability to closely control a quartet of process features crucial to product quality and uniformity: temperature, air speed, steam circulation and belt speed. Quite often, these process components cannot be fully or consistently controlled. Some ovens may have cold spots, while temperatures in other locations are too high for the intended application. This uneven distribution of heat and air causes product colour and quality differences that are dependent on whether products are positioned on the inside or the outside of the belt. Understanding this shortcoming, the team designed the T-HEX to assure uniform airflow and temperature at every position on the belt. The resulting new design also addresses several other prominent concerns of spiral oven users. Among them: the new T-HEX enhances process flexibility by allowing intermediate steps between cooking zones; provides infinite expandability to match growing capacity demands; and integrates an environmentally responsible clean-in-place (CIP) system.

Unique, modular approach

For processors, there is an immediate, space-saving benefit of the modular T-HEX design. Any processor that wants to scale up from a linear oven to a spiral oven, often discovers that the move to a two drum system is an overreach. The T-HEX, however, makes a smaller, single drum solution possible. Later, when growth requires greater capacity, it is easy to increase your throughput by connecting a second space-saving T-HEX drum to the first. As an example, including infeed and outfeed, a standard linear cooker is about 11.5m long. A T-HEX can provide about five times the cooking capacity from its 40 or 50m cooking belt, in about half the length of that same linear oven.

New design boosts flexibility

Separate drums also permit truly independent cooking controls. To make a crunchy product you need high air speed, high temperature, and low moisture to roast the surface. Next, to fully cook the product and retain moisture, you must lower the air speed. But, how can those contrasting cooking environments be separated in a single box oven?

Eventually, the temperatures and moisture become almost even. T-HEX allows processors to cook in stages without process mixing. You can cook, steam, or roast in each spiral. The intermediate

stages between drums that T-HEX makes possible also heighten layout flexibility, even to the extent that corners can be turned. Process options also increase. Marinating, glazing, coating, smoking, herb injections, and other value-added techniques can occur between cooking stages. One product with three or more stages, that is impossible with other systems.



Next generation heat and airflow

Unlike conventional spiral oven designs, we do not have a drum driving the belt. Instead, the T-HEX core is open space into which we have placed the heaters. This design innovation creates uniform airflow and temperature and delivers a very stable, high quality product, no matter where it is positioned in the oven. In processor tests of roasted butterflied chicken fillets, core temperatures were all within 10 °C on products positioned throughout the belt. This is accomplished through six independent heaters and six independent zones. A fan atop each zone pushes down the air evenly over the belt. The opposing fans create alternating airflows. Heat cannot go from one zone to the next and cannot mix within the core. Energy savings result from this design, as well. Because T-HEX heaters are so close to the belt, they can be smaller – around 50kw each – and run at lower temperatures, consuming less energy in the process.

Environmentally friendly CIP system

The CIP process is not new to the industry, but Provisur's T-HEX water recycling system is unique. The open inner core allows the machine to integrate a lighter weight support frame on the outside of the machine where its pipes serve a double purpose, adding stability and carrying water to the system's 129 spray nozzles. The T-HEX system's six zones are cleaned in sequence and the water is collected for cleaning, filtering and reuse. Two one-hour cycles clean the whole machine. While comparisons are difficult, Provisur customers have told us that T-HEX water consumption is significantly lower than their current system's usage. Another hygienic design element built into T-HEX is a heavy duty, continuous belt-cleaning unit fully independent of the CIP. Here again, cleaning and recycling the water is unique to T-HEX.

The bottom line

What really counts for processors is the lower total cost of ownership, paired with predictable and consistent product quality. T-HEX delivers demonstrably lower energy, water and steam consumption, along with precise temperature control so customers know that it costs less money to fully cook or roast their products with T-HEX. At the end of the day, those factors can provide processors a competitive advantage and Provisur Technologies is the only company that can provide those unique advantages.