PRODUCTION
TECHNOLOGY

BY BRYAN SALVAGE, EDITORIAL DIRECTOR

Photo courtesy of Weber Inc.

Slicing up more profits

Slicing and portioning technology providers are scrambling to make the cut in addressing a growing variety of customer needs and demands.

More sandwich set-ups, *more* deli replacement trays, *more* thinner-cut meats (ranging from a half-millimeter to seven-tenths of a millimeter thick), and *more* value-added packs are among the top trends driving and further shaping the slicing/portioning technology industries. And slicing technology providers are moving full speed ahead to create machinery and services to address these evolving trends.

Offering slicing machinery and systems with superior hygienic design is first and foremost among priorities at Weber Inc.

"The first challenge every processor has is assuring the safety of sliced product in the marketplace," says Scott Scriven, president and chief executive officer of Weber North America, Kansas City, MO. "This is requiring large investments that may include new plant and clean-room technology. It means slicers that are engineered with sanitary design as their first criteria."

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Improved sanitary design gets the highest priority when it comes to new machine design, says Wolfgang Lettgen, business unit manager —slicing solutions, CFS North America Inc., Frisco, TX.

"Easy cleanability, fast disassembly of change parts, good accessibility of all areas in the machine are just some focus points of modern machine design," he says. "This is an absolute necessity of slicers and autoloaders since they are in immediate contact with ready-to-eat [RTE] products."

Food safety and the affect it has on the design of the equipment with regards to cleanability and hygiene is a big driver, agrees Brian Sandberg, director of marketing, Formax Inc., Mokena, IL.

"The advent of the American Meat Institute's Ten Sanitary Design Principles helped to standardize equipment design with respect to hygiene," he says. "Before that we were dependent on different processors' opinions, and they didn't always agree— so it was tough to get a good standard on that topic. In addition, sanitary design is also driving more automation, as well...in looking at how we're placing product into packaging downstream, trying to minimize the handling of that product during the process."

In 2003, AMI unveiled its new Principles for Sanitary Equipment

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Design that were developed by an AMI Task Force.

"The principles have given clear sanitary design direction to equipment manufacturers, and there are many AMI member companies, including AEW Delford, Drake, Mepaco, Multivac, Formax, and Weber, that have done a great deal to improve their designs," said last year's American Meat Institute Chairman Stewart Owens, who is also chairman, president, and chief executive officer of Bob Evans Farms Inc., during AMI's 2004 Annual Convention and Innovation Showcase in Nashville, TN. CFS North America was one recipient of the 2004 *AMI Supplier of the Year Award* for its design of slicers, loaders, and packaging machines in accordance with the new sanitary design principles.

Hot trends

Sandwich set-ups are becoming more popular throughout the fast-food industry.

"We're seeing more sandwich set-ups from all fast-food chains, including those who are associated with hamburgers" Scriven says. "With so many chains introducing deli-style sandwiches and a desire to avoid a 'me too' appearance, we're seeing an assortment of side overlapping, full overlapping, and folded meats. Everyone is trying to create their own unique presentation."

Improving both food and worker safety are driving the move toward more deli replacement trays.

"We're seeing a lot of stores moving the slicing out of the deli and back to the processor level," Scriven says. "You're seeing two types of companies in this scenario: those who are introducing deli replacement trays and those who hope that this regulatory scrutiny is going to go away . The genie is already out of the bottle."

Other ongoing trends are trying to improve efficiencies and reduce the cost of operations.

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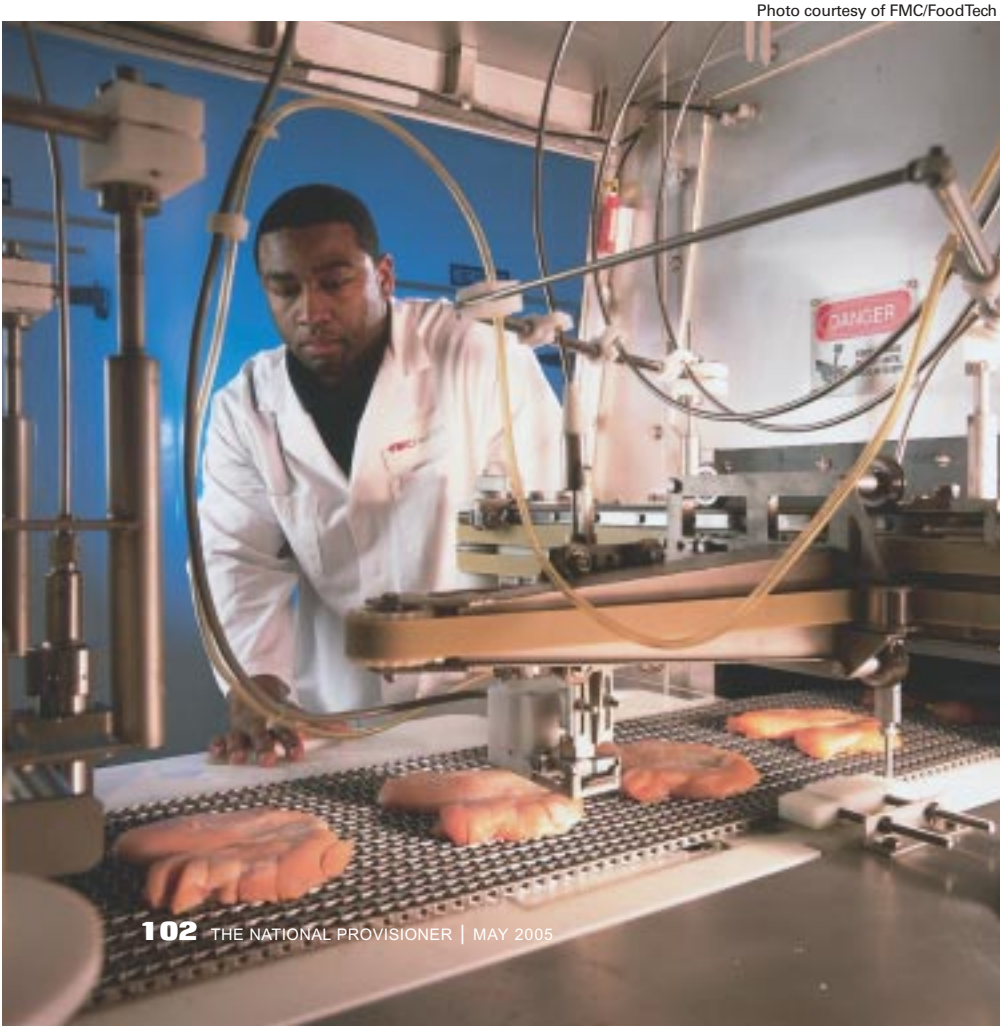

"People are looking to maximize the yields through their equipment," Sandberg says. "Weight control is very important — getting precise weight control, as well as minimizing giveaway to try to maximize profits. And trying to increase production for a given floor space is always important."

Thin is still in

Expect thinly sliced retail luncheon meats to continue growing in popularity. This offers both challenges and opportunities for slicing technology companies.

"Most eight-ounce retail packs of meat today contain thirty-five slices," Scriven points out. "Three years ago, thin-sliced meat was nine-tenths to one millimeter thick. Today, thin-sliced meat is a half-millimeter to maybe seven-tenths of a millimeter thick. Weber's ability to maintain slice integrity at these thicknesses has helped the category to explode."

The majority of applications for the U.S. market in slicing and portioning is still in stacked packages, observes Lettgen.

"These are the traditional four-by-four, four-by-six, and D-shaped products anywhere from six, eight, and twelve ounces up to one-and-a-half to two pounds."

But a new trend is growing towards value-added packs typically in the 6 to 8-ounce range.

"These are, for example, shaved meat in recloseable packages, shingled, folded, staggered, or ordinary variety-pack portions," Lettgen says. "Party trays, consisting of different types of meat in one tray using these portion types, are replacing the ordinary variety-pack portion.

"Marketing at all meat-producing companies is always looking for ways to differentiate their brand on the supermarket shelves," he adds. "Therefore, modern slicers need to be flexible enough to supply all of the various

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Photo courtesy of Formax Inc.

types of portions. Easy changeover from one product to the next and from one portion type to the other is essential."

There is a growing trend towards automatic loading of sliced portions into horizontal form-fill-seal machines (HFFS) commonly known as thermoformers, Lettgen says.

"A high percentage of slicing systems today are delivered as complete slicing, loading, and packaging systems," he adds. "These start with automatic log peeling [where the casing is automatically stripped of the log], loading the ready-to-eat [RTE] product into the slicer without manually handling [thus no contamination], slicing, portioning, weighing, and automatic loading into the thermoformer. From a food-safety standpoint, [this is] an ideal situation since no person actually touches an RTE product from the time the casing is taken off until it's packed and sealed."

A major trend in portioning equipment for poultry is digital grading by means of a vision-grading system and weighing the product in a Smarte Flex line, says J.C. Verel, national sales manager, Dapec Inc., Canton, GA. Dapec is the U.S. distributor of Systemate Numafa B.V. high-technology poultry and food-processing equipment. Founded in 1970, Systemate Numafa B.V. has manufacturing operations in Holland, France, and Poland.

"The combination of digital sizing and grading creates an intelligent logistic and/or cutting system," he adds, "where the birds are being portioned, graded, and transported based on weight, grade, and logistic needs. We see a big trend in reporting directly via the corporate intranet systems where the division manager or any other corporate individual can log on from any distance through a secure intranet system into the sizing and grading system to pull any required information out of the system."

New, innovative technology

In order to meet the ever-changing needs of processors, slicing technology companies are very active in new product development. Weber's Slicer 904 is an entire departure from the way slicers had been designed in the past, Scriven points out.

"Let's start with the basics effecting throughput," Scriven says. "The Weber 904 is a four-log slicer capable if handling ten-foot logs or even longer. It involves an innovative merger of technologies."

This slicer uses a continuous belt feed until it gets down to the critical portion of the log where the grippers become more important for controlling the last half-meter or 18 inches of the logs.

"The slicer continuously feeds to the critical point where the grippers come in and finish feeding out the log," Scriven says. "It allows us to control and discard first slices and end pieces. Obviously, you have greater yields. You have greater throughput because you have fewer log changes, and you're running continuously."

Food safety was the first feature consideration when designing the 904 slicer.

"The ease in how the conveyors roll out of the machine for disassembly and cleaning is ingenious," Scriven says. "Another benefit that makes this slicer unique is the automated product positioning."

In the past, an operator would have to adjust a back fence to get properly centered product for the best slicing results, he says.

"Our new product bed is always stationary," Scriven says. "We have X and Y servo axes on the knife head," he adds. "You can store up to one-hundred different slicing programs so no matter if you're slicing three four-inch diameters and then you move to three two-inch diameters, the knife head moves itself to the pre-programmed position via servo drives. No other adjusting is required. This results in a much faster changeover between products and much more accurate slicing of products.

"We have also enhanced our dynamic weighing system," he adds. "There is no disassembly required for sanitation, and we still get up to

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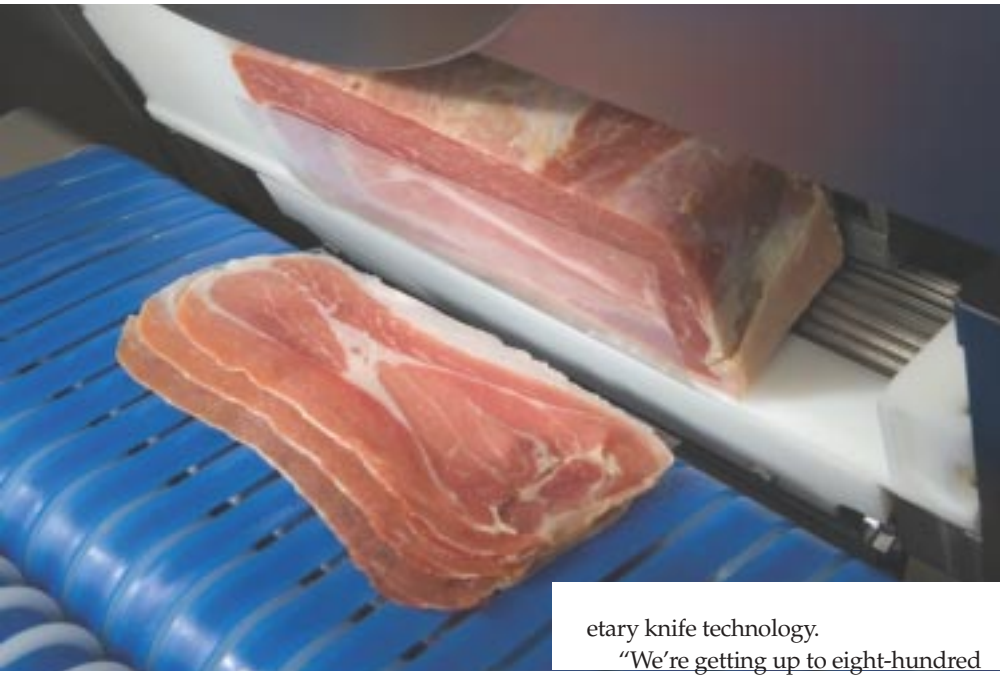

one-hundred fifty weighment per cell. On a triple scale, that equals four-hundred fifty portions per minute."

The 904 features an articulating knife head.

"In all high-speed slicers, you have an idle cut function between points," Scriven says. When a portion is complete you move the product back, away from the blade. After the correct number of idle cuts, you move the product forward to resume slicing. The product does not always move perfectly. The softer the product, the less perfectly it moved. Weber designed the 904 with a different perspective.

"Instead of moving the product backwards, we move the knife head away so the product is always presented to the knife head perfectly perpendicular," he adds. "You get perfect slices every time. You get greatly reduced particulate accumulation and migration. It's a yield improvement, but it's also a big sanitation improvement because as those particulates dry they can migrate throughout the system; and they can get into the seals of packaging machines."

The 904 also features new proprietary knife technology.

"We're getting up to eight-hundred percent longer life on the slicing blade," Scriven says. "We've taken stainless steel blades and miraged onto that mild steel that we can harden to a much greater depth."

Weber's 302 slicer is a small slicer with pure Weber quality at a price point that is hard to beat, Scriven says.

"It's a four-hundred rpm machine that does the basic slicing functions," Scriven says. "So now a processor of any level can have a Weber slicer. It's less than $80,000."

The Slicer 302 sets new standards in space savings (small, compact, portable) and in hygienic design — it's simple to strip down, easy to clean. Other features include solid stainless steel construction, precise manufacturing, and ease of operation.

Formax® has also introduced several new products. Its new FXPlus™ slicer combines a high level of slicing performance with the latest in hygienic design.

"We can get one-hundred weighments per scale out of this system," Sandberg says. "Basically, that says we can weigh one-hundred stacks or drafts per minute per scale. This means with a three-on arrangement, we can slice up to three-hundred drafts or groups per minute. The actual production will depend on several things including the number of slices in the draft. The FXplus™ is designed with a blade speed of 1,800 rpm as a standard."

The flexibility of the FXplus™ allows it to slice a wider range of products, including larger stand-up D products, Sandberg adds. Another important aspect is the slicer's hygienic design.

"The FXplus™ was designed with AMI's Ten Sanitary Design Principles in mind to simplify sanitation and provide the highest level of hygiene," he adds.

Another new slicing product development Formax® has recently introduced is its FXplus™ Stack Depositing System. Since automation is becoming increasingly important, the FXplus™ Stack Depositing System allows the company to automatically deposit stacks of sliced products into packaging with tight side clearances at high rates of speed. This system can be designed to load any packaging machine configuration and be used to deposit stacked, formed patties into case-ready packaging as well.

Dapec has introduced a new 8-inch center cut-up Flexline that allows for higher processing speeds of up to 170 birds an hour. With the shackles positioned eight inches apart, the 8-inch center cut-up line is suitable for cutting fronts and leg quarters. Shackles, modules, and guiding remain the same as all Dapec Flexlines. Weighing, vision grading, and selective bypass can be integrated into the 8-inch center lines.

In forming, Formax® offers its Maxum700® forming system, which forms a variety of products including traditional hamburger patties, 3-D chicken drummies using True-Sculpt™ tooling, and whole-muscle steak portions. The Maxum700® maximizes performance in the key areas of production, hygiene, maintenance or cost of

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ownership, and product quality.

"In terms of production, we can form up to eight-thousand pounds an hour, which represents a dramatic production increase over traditional high-capacity formers," Sandberg says. "It also incorporates numerous features to address machine hygiene and cleanability."

One such feature is the pivoting hopper and conveyor assembly.

"Now we are able to pivot the hopper to facilitate sanitation," Sandberg says. "The conveyor assembly also pivots with the hopper so that the belting can be easily removed. With the hopper and conveyor pivoted, access to the machine is significantly improved for cleaning. The pump box is a one-piece, seamless design to further simplify sanitation."

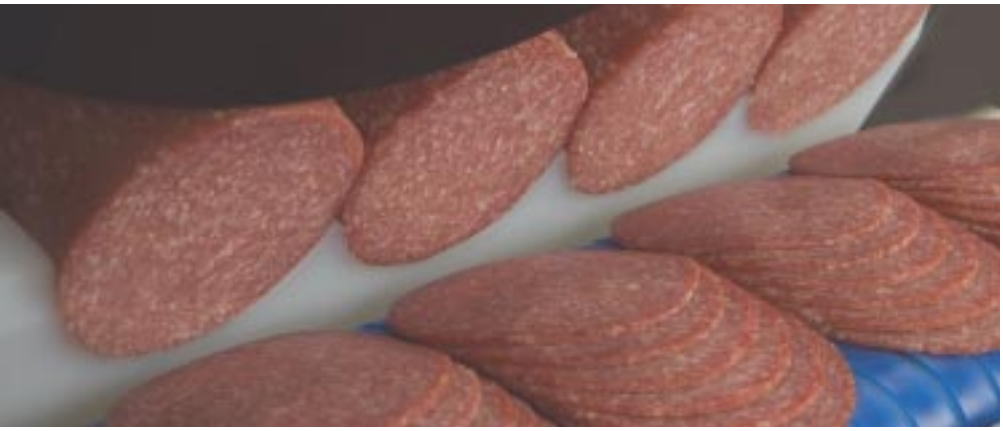

Photo courtesy of CFS North America Inc.

The amount of maintenance required on the Maxum700™ has been minimized due to the minimal number of parts used in the design of the drive assemblies, he continues. This will also serve to improve reliability and decrease the cost of ownership, he adds.

DSI waterjet cutters are "proven specialists in waterjet cutting™.

'[The waterjet cutters] take whole breasts or half breasts and creates weight and shape control sandwich portions, nuggets, or strips for some of the major QSR [quick-service restaurants]," says Jon Hocker, DSI product line manager, FMC FoodTech, an operating group of FMC Technologies Inc., Houston, TX. "People want to get better control of their processes. We can monitor the upstream process. We have the ability to watch what's coming out of the splitters, [adjust if necessary], and certify the process. We're able to communicate with an upstream splitter, which gives us full three-dimensional portioning capability."

DSI portioning systems are designed to meet the needs of medium- and high-volume processors. Hundreds of DSI machines operate two shifts a day in poultry, meat, and fish processing plants around the world. The Portioner is an automated processor. Here's how the system works:

* The plant staff loads the Portioner infeed belt.

* Product is scanned with cameras to locate fat and determine shape, thickness, and weight.

* DSI software optimizes a trim strategy for each individual piece of product based on specifications and product values that are entered.

* The computer controls the position of high-pressure waterjets to cleanly and safely execute the cuts. The computer-controlled cutting heads move both parallel and perpendicular to the direction of product flow for unbeatable cut flexibility.

Waterjet portioning in the meat and poultry industries is wide spread and increasing. Throughput using this technology ranges from 2,000 to 4,000 pounds an hour, Hocker says.

"For one major QSR, we process five-and-a-half million birds a week. That's a fraction of what we're producing throughout the world," Hocker says. In terms of sales, 2004 was DSI's best in its 20-year history, he adds.

The future

One important trend will continue driving the slicing and portioning industry.

"The one thing that won't change is a continuous emphasis on hygienic design. It as an important driver for this industry, and has been a great benefit for everybody," Scriven says.

"I look at food safety continuing to be a big driver," Sandberg says. "I see more automation being introduced."

Several years ago, insiders were talking about trying to automate the entire process from cooking all the way through to packaging by basically processing one single continuous log that would completely minimize handling throughout that process, he adds.

"That's a little 'pie in the sky,' but you can see where that's going as far as processors trying to automate the process and minimize the handling of the product and labor involved, as well," Sandberg says. "Formax®'s FXplus™ Stack Depositing System and the DSplus™ Depositing System for shaved meats enable processors to capitalize on the benefits of automated loading today. The trend toward more automation will continue in the future."

"In the future, we will see more intelligent technology to control the portioning process," Verel predicts. "Air chilling will also be the next step to a fully automated process, where the birds will be automatically transferred from the air-chill line to the portioning/sizing system. Automatic re-hanging will make it possible to trace the bird back through the complete process with data such as aging, cooling

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temperatures, live bird information, and more."

Scriven predicts that one major processor will step forward to totally service and operate delis for supermarkets. This processor is going to pre-slice and provide all meats that go to the deli counter and provide all staffing as well.

Processors face many challenges in slicing and portioning meat and poultry products. Incorporating greater levels of automation can be challenging for any processor.

"Processors are trying to get less handling of the product by operators, either by automatic casing strippers, automatic loaders into the slicers, or automatic loading into a packaging machine — they're trying to take as much labor out of that equation as they can," Scriven says.

Increasing throughput of thinly-sliced meats is another major challenge. In the past, a normal 1-pound stack had 16 slices. Today, a 1-pound portion may have 70 slices.

"Think what this does to the throughput of a machine," Scriven says. "The slicers can only slice so many revolutions a minute. So when it takes four times as many slices to make a draft as it did before, you have throughput issues. It's going to require slicers with greater capacities. Instead of three logs you're going to have to go to four. Instead of five-foot logs, you're going to have to be able to slice ten-foot logs. These are significant challenges."

One of the biggest challenges facing all processors is the need to improve efficiencies while reducing costs, Sandberg says.

"The industry is becoming increasingly competitive while companies are pressured to improve returns for their shareholders, whether they be public or private," he adds. "This impacts the capital equipment purchasing decisions that customers make. Cost is obviously a big factor. However, when you buy equipment you have to look at the service the supplier provides behind it as well. It's not enough just to focus on the equipment, you also have to focus on making that equipment work at optimum efficiency over its life."

Since most production is volume-based, there is a permanent need to increase capacity in order to increase productivity, Lettgen says.

"Therefore, high-speed slicers using involute blade technology have become

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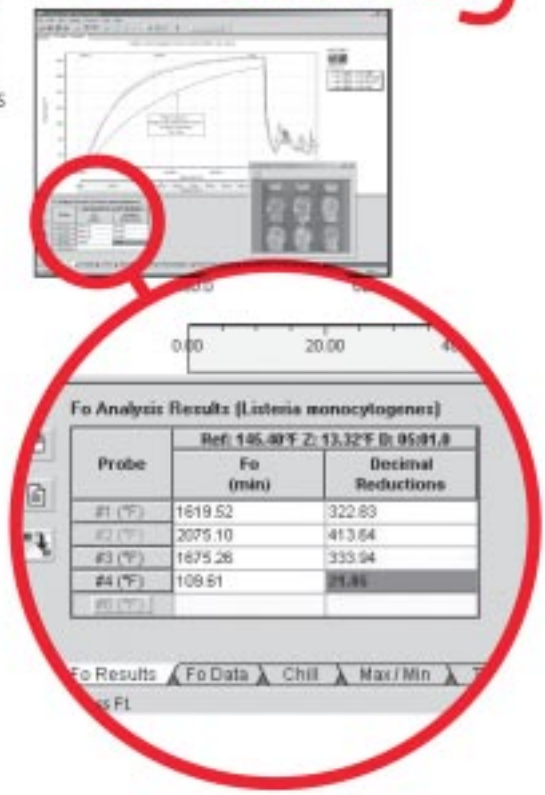

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the industry standard for this kind of production," he adds. "Modern, high-speed slicers are working with blade speeds up to two-thousand RPM. Conventional circular-blade slicers were limited to 600 rpm, but are still used for certain applications and where a wide variety of products are sliced on the same machine."

Optimizing yields is another important aspect of slicing, he adds.

"Therefore, modern slicers are using sophisticated computer-controlled weighing systems, which permanently evaluate production data and constantly regulate the slicer in order to reduce giveaway to a minimum," he says. "Vision systems are used to control portion weight on inconsistent products, such as whole-muscle meats. Special control functions, such as variable slice count or portion completion, are additional features that state-of-the-art slicers offer to fight the constant battle of increasing yields."

"The biggest challenge poultry processors are facing at the moment is the need to decrease downgrades coming from first processing, as well as controlling the formality of the birds to better control the portioning process. With an optimal portioning process, there will be a higher yield. Another challenge will be traceablity," Verel says.

What's the best way for processors to successfully meet these challenges?

"Don't be married to doing things the way you've always done them," Scriven advises. "You have to look outside of your current method of operation. If you're going to operate in yesterday's paradigm, you cannot expect different or better results." **NP**

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